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design
environment
surveying



OUR REF: 5093-10-BG/BJW
GCCC REF:

8th November 2011

The Chief Executive Officer
Gold Coast City Council
Implementation and Assessment Branch, Nerang
PO Box 5042
GOLD COAST MC QLD 9729

GOLD COAST CITY COUNCIL CUSTOMER SERVICE - NERANG	
RECEIVED TIME:	4.05 PM
DATE:	9/11/2011
RECEIPT No:	16061013 v 16061014
SIGNED BY:	WJ

BY HAND DELIVERY

Dear Sir,

RE: LODGEMENT OF DEVELOPMENT APPLICATION - IMPACT ASSESSABLE
APPLICATION: PRELIMINARY APPROVAL FOR INDUSTRIAL USES PURSUANT TO S.242 OF THE SUSTAINABLE PLANNING ACT 2009; AND PRELIMINARY APPROVAL FOR OPERATIONAL WORKS (CHANGES TO GROUND LEVEL - EARTHWORKS) PURSUANT TO S.241 OF THE SUSTAINABLE PLANNING ACT 2009
PROPERTY: 60 STAPYLTON-JACOBS WELL ROAD, 82 CHRISTENSEN ROAD, STAPYLTON AND YELLOWOOD ROAD, EAGLEBY Q 4207 (LOT 1 ON RP6882, LOT 240 ON W31320 & LOT 4 ON RP6843 RESPECTIVELY)

We refer to the above land, and hereby lodge an impact assessable development application on behalf of the Applicants, William and Patricia Hester, for the following:

1. **Preliminary Approval** for Industrial uses pursuant to s.242 of the *Sustainable Planning Act 2009*; and
2. **Preliminary Approval** for Operational Works (Changes to Ground Level - Earthworks) pursuant to s.241 of the *Sustainable Planning Act 2009*.

Please find **enclosed** as follows:

1. Three (3) copies of a Development Application including a Planning Assessment Report with all relevant **Forms, Plans** and **Technical Reports**;
2. One (1) electronic copy the full submission on CD-ROM; and
3. The Applicant's fee payment of **\$29,243.00** made payable to Gold Coast City Council, being the prescribed application fee calculated as follows:



3097617



Email mail@gassman.com.au
Web www.gassman.com.au
A.B.N. 62 010 752 388 A.C.N. 010 752 388
Director Brian F Gassman BAppSc (Surv), LS, MSSl
Director David R Hansen BRTP, MPiA, CPP

Brisbane Office
Level 13, 97 Creek Street
Brisbane Q 4000
Phone (07) 3221 6732
Fax (07) 3221 7308
Post GPO Box 999 Brisbane Q 4001

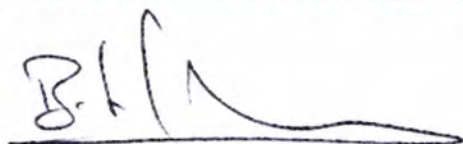
Gold Coast & Logan Office
Access Business Park
76 Business Street Yatala Q 4207
Phone (07) 3807 3333
Fax (07) 3287 5461
Post PO Box 392 Beenleigh Q 4207

Application Type	Fee Calculation	Total
Preliminary Approval (s.242) for industrial uses	"MCU assessment (SPA s242). Fee amount is 100% of current Impact Assessment fee." Industry (> 200m²): \$6,212 Manufacturer's Shop: \$3,104 Open Storage Area (not defined in register): 'Storage Area' - \$6,212 Service Industry (> 200m²): \$6,212 Warehouse (> 500m²): \$6,212	\$27,952.00
Preliminary Approval (s.241) for operational works (earthworks – changes to ground level)	"MCU assessment (SPA s241). Fee amount is 100% of current application fee." All earthworks, including cut/fill, dam and car park Major Works: 5001m² or more" \$2,582.00 x 50% = \$1,291.00	\$1,291.00
TOTAL FEE		\$29,243.00

If you require any further information, please don't hesitate to contact the undersigned.

Yours faithfully,

GASSMAN DEVELOPMENT PERSPECTIVES PTY. LTD.



.....
BRENDON WALKINSHAW

Encl.



Administration Centre, Gold Coast, Queensland

Surfers Paradise Telephone: 07 5582 8211 Fax: 07 5581 6346

Nerang Telephone: 07 5582 8211 Fax: 07 5586 3653

PO Box 5042 Gold Coast MC Qld 9729 Australia

goldcoastcity.com.au

PAGE 1

TAX INVOICE

RECEIPT

ABN: 84 858 548 460

DATE 09/11/11

REGISTER 1018

TAX INV.NO. 16061013

TIME 16:05:56

DEVELOPMENT PERSPECTIVES PTY LTD

TAX INV.DATE

09/11/11

PO BOX 392

BEENLEIGH Q 4207

PRELIMINARY APPROVAL L1 RP6882
L240 W31320 & L4 RP6843

Allocations

REVENUE TOWNPLAN TOWN PLANNING FEES REF: 359535
ACCOUNT 96051 MATERIAL CHANGE OF USE APPLICATION
MATERIAL CHANGE OF USE APPLICATION 201100650

Value	GST	Price
1,291.00	0.00	1,291.00

Total Amounts:	1,291.00	0.00	1,291.00
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Which consists of:

CHEQUE	011753	1,291.00
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Total Tendered:	1,291.00
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THIS PAYMENT MAY NOT REPRESENT FULL AND FINAL SETTLEMENT OF THE DEBT ON COUNCIL'S RECORDS.

The receiving of the application documentation and tendered fee does not mean that an application is either "Properly Made" or "Well Made". If the application is not "Well Made", a surcharge fee may apply. If not "Properly Made", the application may not be processed.

201100650 MCU



Administration Centre, Gold Coast, Queensland
 Surfers Paradise Telephone: 07 5582 8211 Fax: 07 5581 6346
 Nerang Telephone: 07 5582 8211 Fax: 07 5586 1653

PO Box 5042 Gold Coast MC Qld 9729 Australia

goldcoastcity.com.au

PAGE 1

TAX INVOICE

RECEIPT

ABN: 84 858 548 460
 DATE 09/11/11
 REGISTER 1018
 TAX INV.NO. 16061014
 TIME 16:08:40

HESTER
 PA & WA
 C/O GASSMAN DEVELOPMENT PERSPECTIVES
 PO BOX 392
 BEENLEIGH Q 4207

TAX INV.DATE
 09/11/11

PRELIMINARY APPROVAL L1 RP6882
 L240 W31320 & L4 RP6843

Allocations	Value	GST	Price
REVENUE TOWNPLAN TOWN PLANNING FEES REF: 359535	27,952.00	0.00	27,952.00
ACCOUNT 96051 MATERIAL CHANGE OF USE APPLICATION			
MATERIAL CHANGE OF USE APPLICATION 201100650			

Total Amounts:	27,952.00	0.00	27,952.00
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Which consists of:

CHEQUE	200140	27,952.00
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Total Tendered:	27,952.00
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THIS PAYMENT MAY NOT REPRESENT FULL AND FINAL SETTLEMENT OF THE DEBT ON COUNCIL'S RECORDS.

The receiving of the application documentation and tendered fee does not mean that an application is either "Properly Made" or "Well Made". If the application is not "Well Made", a surcharge fee may apply. If not "Properly Made", the application may not be processed.
 201100650 MCU

DEVELOPMENT APPLICATION

- A PRELIMINARY APPROVAL FOR A MATERIAL CHANGE OF USE FOR INDUSTRY (S.242 OF THE SUSTAINABLE PLANNING ACT 2009); AND
- A PRELIMINARY APPROVAL FOR OPERATIONAL WORKS (CHANGES TO GROUND LEVEL - EARTHWORKS)

ADDRESS

60 STAPYLTON-JACOBS WELL ROAD & 82 CHRISTENSEN ROAD,
STAPYLTON Q 4207 (LOTS 1 ON RP6882, 240 ON W31320 AND
4 ON RP6843)

PREPARED FOR:

PATRICIA AND WILLIAM HESTER

NOVEMBER 2011

FOLDER 1 of 2



GENERATIONS
INDUSTRIAL PARK



g a s s m a n
**development
perspectives**

project coordination
urban + regional planning
landscape + urban design
environmental management
visualisation + spatial services
surveying services
advisory services

APPENDICES

1. IDAS AND GCCC FORMS (GASSMAN DEVELOPMENT PERSPECTIVES)
2. PLANNING ASSESSMENT REPORT (GASSMAN DEVELOPMENT PERSPECTIVES)
3. GENERATIONS INDUSTRIAL PARK PLACE CODE (GASSMAN DEVELOPMENT PERSPECTIVES)
4. SITE ANALYSIS PLAN, CONSTRAINT AND CONTEXT PLANS, STATEMENT OF LANDSCAPE INTENT (GASSMAN DEVELOPMENT PERSPECTIVES)
5. SURVEY PLAN (GASSMAN DEVELOPMENT PERSPECTIVES)
6. CIVIL ENGINEERING BULK EARTHWORKS PLANS (HYDER)
7. CODE RESPONSES (GASSMAN DEVELOPMENT PERSPECTIVES)
8. STORMWATER MANAGEMENT PLAN (HYDER CONSULTING)
9. ENGINEERING SERVICES REPORT (HYDER CONSULTING)
10. TRAFFIC IMPACT ASSESSMENT (HYDER CONSULTING)
11. ECOLOGICAL ASSESSMENT (GASSMAN DEVELOPMENT PERSPECTIVES)
12. OPEN SPACE MANAGEMENT STATEMENT & REHABILITATION PLAN (GASSMAN DEVELOPMENT PERSPECTIVES)
13. ACOUSTIC REPORT (GASSMAN DEVELOPMENT PERSPECTIVES)
14. ACID SULFATE SOIL INVESTIGATION (ADG CONSULTING)
15. PRELIMINARY SITE INVESTIGATION (CONTAMINATION) (ADG CONSULTING)
16. GEOTECHNICAL ASSESSMENT (MORRISON GEOTECHNIC)
17. RELEVANT PRE-LODGEMENT MEETING MINUTES AND SEARCHES (GASSMAN DEVELOPMENT PERSPECTIVES)

1 – IDAS AND GCCC FORMS

- GCCC checklist and pre-certification exemption certificate
- IDAS forms and Checklists
- Letter of landowners consent

Application for a Material Change of Use (MCU) and/or Reconfiguring of Lot (ROL)

Gold Coast City Council is collecting your personal information in accordance with The Sustainable Planning Act 2009 in order to assist with the assessing of your application. The information will only be used by authorised Council officers for the purpose of assessment, statistical reporting and ensuring our records are accurate. Your information will not be given to any other person or agency unless you have given us permission or we are required by law.

Material Change of Use application	Proposed use	Pre-assessment ☐	Preliminary ☒	Code ☐	Impact ☒
	Future Industry to Various Industry (s.242)				
Reconfiguration of Lot application	Proposed use	Pre-assessment ☐	Code ☐	Impact ☐	
	☐ Freehold Subdivision (FRE)	☐ Boundary Realignment (BR)	☐ Management Lot Subdivision (MAG)		
	☐ Subdivision by Lease (LE)	☐ Access Easement (AE)	☐ Miscellaneous (MIS)		
	☐ Volumetric Subdivision (VOL)	☐ Community Title (CT)			

- ☐ **Pre-assessment request**
- For pre-assessment applications, please refer to Council's website for more information.
http://www.goldcoast.qld.gov.au/t_standard2.aspx?pid=286#development

☒ **Pre-assessment exemption certificate provided**

☒ **Prelodgement meeting held?** Yes ☒ No ☐ If yes, please attach minutes

Refer to the checklist below for information that is required for your application to be considered 'well made'. A well made application is one that provides as much detail as possible on which the Assessment Manager will base a decision.

Note: Combined Material Change of Use, Reconfiguration of Lot and Operational Works applications should address all requirements where relevant.

Correct versions of these forms must be provided to be considered a properly made application		Provided ☒
Mandatory requirements for a 'Properly Made' application		
<i>Refer to Section 260 of the Sustainable Planning Act 2009</i>		
The property owner(s) provide written consent to the making of the application (owners consent)		☒
Correct application fee as prescribed by current Council budget		☒
All parts of relevant IDAS application forms completed. Ensuring that all completed IDAS forms are the current version number		☒
① Forms	Application details – IDAS Form 1	☒
Relevant SPA IDAS Forms – <i>Mandatory Requirement</i>	Material Change of Use assessable against a planning scheme – IDAS Form 5	☒
	And/or	☒
	Reconfiguring a Lot – IDAS Form 7	☐

Requirements for a 'Well Made' application

- Correct number of application copies including all forms and supplementary information
 - 3x complete hard copies
 - 1x CD Copy
 - 2x A3 size copies of the plans
- Supporting information:
 - Outlining the development proposal
 - Addressing the relevant codes and constraints
 - Including all necessary information as detailed in this form
- Supporting information for Priority Infrastructure Plan.
A surcharge of 50% of the standard application fee will be applied to all applications determined not to have provided this information.

Relevant SPA IDAS Form	Development Application IDAS Assessment Checklists	☒
Relevant GCCC Forms	Form Application for a Material Change of Use or Reconfiguring of Lot	☒
	Infrastructure Charge MCU or ROL	☐
	Infrastructure Charges Credit Request (per Existing Lot) (if applicable)	☐

Reference Material (include where necessary)	- Infrastructure Charges Land Use Category Table of Material Change of Use (MCU) and Building Applications (BA) - Infrastructure Charges Impervious Area Work Sheet - Infrastructure Charges Form Requirements	☐
	If Priority Infrastructure Forms are not applicable please provide the reasoning below. Supporting information for Priority Infrastructure Plan. (if not applicable, please provide reason) Preliminary Approval only for a s.242 material change of use – no specific development proposed	☒
Documentation	Applicable OR Not Applicable?	Comments
② Planning Assessment Report Refer to IDAS Form 5 and 7 for mandatory requirements for inclusion in this report.	Applicable	Planning Assessment Report with accompanying Place Code for preliminary approval
③ Economic Needs Analysis (MCU only) Refer to IDAS Form 5 for mandatory requirements for inclusion in this report.		Economic comment provided in planning report
④ Visual Impact Analysis (MCU only)		
Planning Scheme Codes • Domain Place Code • Specific Development Code • Constraint Codes	Applicable Applicable Applicable	Relevant Place Code, constraint code and specific development codes responded to.
⑥ Hydraulic, Water Quality and Geotechnical Engineering • Flood Search Report • Hydraulics Report • Stormwater Management Plan • Geotechnical Report • Dewatering Management Plan • Lake Management Study • Waterway Study • Water Quality Management Plan • Other relevant requirements	Applicable Applicable	SWMP and Geotechnical report attached
⑦ Environmental, Open Space and Landscaping Refer to Landscape Works Specific Development Code – Sections 2.1 and 6.1.1 and refer to Gold Coast City Landscape Strategy Part 2 Landscape Works Documentation Manual Section B 3.0 • Statement of Landscape Intent • Bushfire Management Plan • Vegetation Management Plan • Ecological Assessment • Open Space Management Statement • Arborist Reports • Photographs identifying all trees on the site • Effluent Disposal Areas • Acid Sulphate Soils Investigation & Management Plan • Other relevant requirements	Applicable Applicable Applicable Applicable Applicable	Relevant LIP, Ecological, OSMS and Rehab Plans provided. Acid Sulfate Soils and contaminated land investigation also submitted.

⑧ Transport and Traffic - Road Traffic Assessment Report - Other relevant requirements	Applicable	
Has the Department of Main Roads been triggered as a concurrence agency for this proposal? If yes, has pre lodgement advice been obtained from Main Roads?	Yes ☒ / No ☐ Yes ☒ / No ☐	Applicable comments and plans provided by DTMR are incorporated into reporting and development plan.
⑨ Environmental Health - Acoustic Report - Odour / Dust Management Plan - Waste Management	Applicable	
⑩ Plans and Drawings (MCU) - Architectural Floor Plans & Colour Elevations - Site Plan - Building Elevations - Site Analysis Plan - Other drawings relevant to development	Refer IDAS Form 31	Regarding preliminary approval place code and land use designation plan
⑩ Plans and Drawings (ROL) - Subdivisional Proposal Plan (Site Plan) - Slope Analysis Plan - Site Analysis Plan - Building Envelope Plan - Proposed Earthworks Plan - Photographs - Other drawings relevant to development	N/A	
⑪ Other/Misc List any additional information provided to support the application		

Attachments

Information notes providing further clarification of requirements.

Information Notes to Assist Applicants in completing Material Change of Use and Reconfiguring a Lot forms

To be read in conjunction with the Application for Material Change of Use and Reconfiguring a Lot form
http://www.goldcoast.qld.gov.au/t_standard2.aspx?pid=286#development

Guide to Owners Consent Requirements

Refer to section 371 of the *Sustainable Planning Act 2009* for full requirements. Listed below are other requirements. An application is Properly Made if the mandatory requirements part of the approved form is correctly completed. Owner's consent is a mandatory requirement of Application Details IDAS Form 1. The term of "owner" of land is defined in Schedule 3 of the *Sustainable Planning Act* to mean: "The person for the time being entitled to receive the rent for the land or would be entitled to receive the rent for it if it is let to a tenant at a rent." Schedule 3 of the *Sustainable Planning Act* further defines "land" to include: "Any estate in, on, over or under land..." Therefore in most instances, the registered property owner is the owner of the land for the purposes of the *Sustainable Planning Act* and must provide owner's consent to the making of the application. If the application is over a number of lots, the owner/s of all lots of the subject of the application must consent to making of the application. Applicants are to provide owner's consent as follows:

Property ownership

If there are multiple owners of a single lot, the consent of each owner of the lot is required (e.g. four persons owning one lot requires a signature from each of the four owners).

Corporation / company

Where the owner is identified as a corporation, the following is required:

- ☐ the ACN number accompanied with one of the three below:
 - the names, titles and signatures of two (2) directors of the company
 - the name, title and signature of a director and the company secretary
 - where the company has only one (1) director, the name and signature of that director in conjunction with written indication that the company has only one (1) director (i.e. sole director)

Body Corporate

Where the owner is identified as a Body Corporate, the following is required:

- ☐ Body Corporate Seal and
- ☐ Body Corporate resolution consenting to the proposal (i.e. minutes of meeting where proposal was adopted) and
- ☐ two (2) signatures, one of which must be the chairperson

or

- ☐ Body Corporate Seal and
- ☐ a letter of consent signed by the chairperson and secretary

- ☐ Signed letter of consent from each lot owner covered by the Body Corporate

Other ownership arrangements

If the land is:

- ☐ leased – the lessors of the land must give owner's consent
- ☐ dedicated parkland – the owner or the trustee, within the terms of the trust or reserve, must give owner's consent

Material Change of Use ⓘ Forms

Relevant IDAS Forms – Mandatory Requirement

⌚ Planning Assessment Report	Proposal including covering letter, report, alternate solutions and conclusion. Refer to IDAS Form 5 for mandatory requirements for inclusion in this report.
⌚ Economic Needs Analysis	Provide information if applicable to the nature of the proposal. Refer to IDAS Form 5 for mandatory requirements for inclusion in this report.
⌚ Visual Impact Analysis	Provide a photo montage outlining the proposal
⌚ Codes (MCU) Relevant to subject site and proposed development to be completed using Council's Code Table Template. The relevance of these codes can be identified by using the Property Enquiry tool on Council's website. <i>Note: Not all constraint codes triggered by the Property Enquiry tool may be relevant to your application.</i>	Domain Place Code Specific Development Code Constraint Code
 Hydraulic, Water Quality and Geotechnical Engineering	Flood Search Report Hydraulics Report Stormwater Management Plan Geotechnical Report Dewatering Management Plan Lake Management Study Waterway Study Water Quality Management Plan Any other relevant hydraulic and water quality documents or notes regarding applicability of the required plans and documents.
⌚ Environmental, Open Space and Landscaping Refer to Landscape Works Specific Development Code – Sections 2.1 and 6.1.1 and refer to Gold Coast City Landscape Strategy Part 2 Landscape Works Documentation Manual Section B 3.0	Statement of Landscape Intent Bushfire Management Plan Vegetation Management Plan Ecological Assessment Open Space Management Statement Arborist Reports Photographs identifying all trees on the site

Effluent Disposal Areas	
Acid Sulphate Soils Investigation and Management Plan	
Any other relevant environmental, open space or landscaping documents or notes regarding applicability of the required plans and documents.	
ⓘ Transport and Traffic	Road Traffic Assessment Report Has the Department of Main Roads been triggered as a concurrence agency for this proposal? If yes, has pre lodgement advice been obtained from Main Roads? Any other relevant transport and traffic documents or notes regarding applicability of the required plans and documents.
ⓘ Environmental Health Railway noise Applies to noise sensitive development within 100 metres of a rail corridor. Commercial / Industrial Operational Noise Applies to commercial / industrial development adjacent to existing / proposed noise sensitive developments. Applies to residential development in proximity to industry/commercial activities which release airborne contaminants. e.g. Asphalt Manufacturing Plants, Marine and or Waterfront Industries, Bulk. Landscape Supplies, Service Stations	Acoustic Report Odour / Dust Management Plan
Applies to commercial/industrial/residential development and must have practical, user and environmentally friendly solid waste management storage and collection design. Reference should be made to the Environmental Protection (Waste Management) Regulation 2000 and the "Waste Management Policy Relating to Refuse Requirements for Proposed and Existing Building Developments Within the City of Gold Coast" Dated January 1995, 1st Edition, to address the minimum requirements for refuse facilities and information on refuse vehicle access, egress and manoeuvring.	Waste Management
ⓘ Plans and Drawings	Refer to IDAS Form 5 for mandatory requirements for inclusion in the application.
Other drawings relevant to development including Photo Montage and Colour Perspectives	Please provide details
ⓘ Other/Misc	List any additional information provided to support the application

Reconfiguring a Lot 🕒 Report	Proposal including covering letter, report and conclusion. Refer to IDAS Form 7 for mandatory requirements for inclusion in this report.
🕒 Codes Relevant to subject site and proposed development to be completed using Council's Code Table Template. The relevance of these codes can be identified by using the Property Enquiry tool on Council's website. <i>Note: Not all constraint codes triggered by the Property Enquiry tool may be relevant to your application.</i>	Domain Place Code Specific Development Code Constraint Code
🕒 Hydraulic, Water Quality and Geotechnical Engineering	Flood Search Report Hydraulics Report Stormwater Management Plan Geotechnical Report Dewatering Management Plan Lake Management Study Waterway Study Water Quality Management Plan Any other relevant hydraulic and water quality documents or notes regarding applicability of the required plans and documents.
🕒 Environmental, Open Space and Landscaping refer to Landscape Works Specific Development Code – Sections 2.1 and 6.1.1 and refer to Gold Coast City Landscape Strategy Part 2 Landscape Works Documentation Manual Section B 3.0	Statement of Landscape Intent Bushfire Management Plan Vegetation Management Plan Ecological Assessment Rehabilitation Management Plan Environmental Covenant Management Plan Open Space Management Statement Arborist Reports Effluent Disposal Areas Acid Sulphate Soils Investigation and Management Plan Any other relevant environmental, open space or landscaping documents or notes regarding applicability of the required plans and documents.

🕒 Transport and Traffic	Road Traffic Assessment Report
	Has the Department of Main Roads been triggered as a concurrence agency for this proposal? If yes, has pre lodgement advice been obtained from Main Roads?
	Any other relevant transport and traffic documents or notes regarding applicability of the required plans and documents.
🕒 Environmental Health An Acoustic Report is required when: Road noise impacts onto a noise sensitive area. Road noise from a local road (10000 VPD) or from a state controlled road whereby the local/state controlled road is NOT directly adjacent but within 100 metres to the proposed noise sensitive development. or Road noise from a state controlled road or local road (10000 VPD) directly adjacent to the noise sensitive development. Railway noise Applies to noise sensitive development within 100 metres of a rail corridor. Commercial / Industrial Operational Noise Applies to commercial / industrial development adjacent to existing / proposed noise sensitive developments. Applies to residential development in proximity to industry/commercial activities which release airborne contaminants. e.g. Asphalt Manufacturing Plants, Marine and or Waterfront Industries, Bulk Landscape Supplies, Service Stations. Applies to commercial/industrial/ residential development and must have practical, user and environmentally friendly solid waste management storage and collection design. Reference should be made to the Environmental Protection (Waste Management) Regulation 2000 and the "Waste Management Policy Relating to Refuse Requirements for Proposed and Existing Building Developments Within the City of Gold Coast" Dated January 1995, 1st Edition, to address the minimum requirements for refuse facilities and information on refuse vehicle access, egress and manoeuvring.	
	Odour / Dust Management Plan
	Waste Management
🕒 Plans and Drawings	Refer to IDAS Form 7 for mandatory requirements for inclusion in the application.
Photographs	Photographs to support application

From: DART [mailto:dart@goldcoast.qld.gov.au]
Sent: Tuesday, 4 March 2008 1:00 PM
To: Gassman Development Perspectives Pty Ltd (TH)
Subject: Exemption from the Requirement for Council's Pre Assessment Certificate

GCCC PREASSESSMENT CERTIFICATE EXEMPT CONSULTANT

4 March 2008

In recognition of your development applications consistently meeting Council's Properly Made, Well Made requirements your company has been placed on our "Exempt Consultants List". This negates the requirement to submit your applications for a Pre Assessment Certificate.

Checks will continue to be undertaken on all applications to ensure compliance with Properly Made requirements. Random audit checks will be undertaken to ensure continued compliance.

Please ensure you include a copy of this email when submitting applications to ensure Customer Service staff can easily identify that you are not required to seek a Pre Assessment Certificate prior to submission of your applications.

Thank you for your cooperation in presenting your applications in a style that allows Council to present consistent and legible information to the public on PD Online and for the use of our internal referral sections.

Thank you again.

Regards,

Jan Higley

Senior Technical Officer

Development Assessment Review Team (DART)

for the Chief Executive Officer

Gold Coast City Council

Ph: (07) 5582 8866(option #4) **Fax:** (07) 5582 8286

PO Box 5042 Gold Coast Mail Centre Qld 9729

<http://www.goldcoastcity.com.au>

To help shape the future of the Gold Coast over the next 30 years, visit www.boldfuture.com.au

Gold Coast City Council - confidential communication

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Development assessment checklist - IDAS checklist 1

(Sustainable Planning Act 2009, version 1.0 18 December 2009)

This checklist applies to the carrying out of development generally.

You are not required to complete this checklist as part of your development application, however you may submit the checklist with your application if you wish. The purpose of the checklist is to assist you in identifying:

- whether you need to make a development application for the proposed development
- if a development application is required, the relevant IDAS forms you need to complete as part of your application
- whether you need to give a copy of your application to any referral agencies.

If your development involves a material change of use, reconfiguring a lot or operational works, it is recommended that you complete *Material change of use - IDAS checklist 2*, *Reconfiguring a lot - IDAS checklist 3* or *Operational works - IDAS checklist 4*, as applicable.

If you are unsure how to answer any questions on this checklist, phone or visit your local government, or go to the Department of Infrastructure and Planning's website at www.dip.qld.gov.au.

All terms used in this checklist have the meaning given in the *Sustainable Planning Act 2009* or the *Sustainable Planning Regulation 2009*.

Part 1 - General questions

1.1 Have you received a referral agency response in relation to this proposed development prior to making an application?

☒ No	
☐ Yes	• To assist you in preparing your application, completing <i>Referral agency responses - IDAS checklist 6</i> is recommended

1.2 Do you wish the proposed development to be assessed against a superseded planning scheme?

☒ No	
☐ Yes	• You must complete <i>Request to apply a superseded planning scheme - Sustainable Planning Act form 2</i> and give this notice to the relevant local government. If the local government agrees to your request, details must be provided in <i>Application details - IDAS form 1</i>

1.3 Does the proposal involve removing quarry material from a watercourse or lake for which an allocation notice is required under the *Water Act 2000*?

☒ No	
☐ Yes	• It is recommended that you complete part 2 of this checklist

1.4 Is any part of the proposed development intended to be carried out on a Queensland heritage place under the *Queensland Heritage Act 1992*?

☒ No	
☐ Yes	• It is recommended that you complete part 3 of this checklist

**1.5 Does the proposal involve development on a local heritage place?**

- ☒ No
- ☐ Yes • It is recommended that you complete part 4 of this checklist

1.6 Does the proposal involve an environmentally relevant activity, other than an agricultural ERA, a mining activity or a chapter 5A activity?

- ☒ No
- ☐ Yes • It is recommended that you complete part 5 of this checklist

1.7 Is any part of the development on strategic port land or airport land (other than development for a material change of use that is inconsistent with the land use plan for the strategic port land or airport land)

- ☒ No
- ☐ Yes • It is recommended that you complete part 6 of this checklist

1.8 Is any part of the development on land below a high water mark within the limits of a port under the *Transport Infrastructure Act 1994*?

- ☒ No
- ☐ Yes • It is recommended that you complete part 7 of this checklist

1.9 Is any part of the premises designated for community infrastructure?

- ☒ No
- ☐ Yes • It is recommended that you complete part 8 of this checklist

1.10 Does the proposal involve the establishment or expansion of a waste water disposal system?

- ☒ No
- ☐ Yes • It is recommended that you complete part 9 of this checklist

1.11 Is the development on land that adjoins a declared fish habitat area under the *Fisheries Act 1994*?

- ☒ No
- ☐ Yes • It is recommended that you complete part 10 of this checklist

Privacy - please refer to your assessment manager for further details on the use of information recorded in this checklist.

Disclaimer:

While the Department of Infrastructure and Planning (DIP) believes that this information contained on this checklist and provided as part of this process will be of assistance to you, it is provided on the basis that you will not rely on the information without first making your own enquiries regarding the interpretation and application of the applicable legislation to your circumstances.

To the full extent permitted by law DIP expressly disclaims all liability (including but not limited to liability for negligence) for errors or omissions of any kind or for any loss (including direct and indirect losses), damage or other consequence which may arise from your reliance on this process and the information contained on this checklist.



OFFICE USE ONLY

Date received

Reference numbers

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure and Planning.



Material Change of Use - IDAS Checklist Part 2

(Sustainable Planning Act 2009 version 1.0 effective 18 December 2009)

This checklist only applies when the development application seeks approval for a material change of use of premises.

You are not required to complete this checklist as part of your development application, however you may submit the checklist with your application if you wish. The purpose of the checklist is to assist you in identifying:

- whether you need to make a development application for the proposed development
- if a development application is required, the relevant IDAS forms you need to complete as part of your application, and
- whether you need to give a copy of your application to any referral agencies.

Before completing this checklist, it is recommended that you complete Development Assessment Checklist - IDAS checklist part 1. If your development involves reconfiguring a lot or operational works, it is recommended that you also complete Reconfiguring a lot - IDAS checklist 3 and Operational works - IDAS checklist 4, as applicable.

If you are unsure how to answer any questions on this checklist, phone or visit your local government, or go to the Department of Infrastructure and Planning's website at www.dip.qld.gov.au

All terms used in this checklist have the meaning given in the *Sustainable Planning Act 2009* or the *Sustainable Planning Regulation 2009*.

Part 1 - General questions

1.1 Is the proposed use assessable development under the planning scheme?

☒ No	
☐ Yes	• You must complete <i>Material change of use assessable against a planning scheme - IDAS form 5</i> • Continue on to question 1.3

1.2 Is the proposed use assessable development under a State planning regulatory provision?

☐ No	• Go to question 1.17
☒ Yes	• Go to question 1.4

1.4 Does *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils* apply to the development?

☐ No	
☒ Yes	• It is recommended that you complete part 3 of this checklist

1.5 Is any part of the premises located in a coastal management district?

☐ No	
☒ Yes	• It is recommended that you complete part 4 of this checklist

1.6 Is the size of the lot two hectares or larger?

☐ No	
☒ Yes	• It is recommended that you complete part 5 of this checklist



1.7 Is any part of the premises in an area for which an area management advice has been given for unexploded ordnance?

☐ No	
☒ Yes	- You must complete <i>Contaminated land - IDAS form 24</i>. - This application requires assessment by the administering authority (either the chief executive administering the <i>Environmental Protection Act 1994</i>, or the local government) as a concurrence agency.

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, item 11

1.8 Is the proposed use of the premises listed in schedule 12 of the *Sustainable Planning Regulation 2009* and does it meet the specified threshold?

☐ No	
☒ Yes	This application requires assessment by the Department of Transport and Main Roads as a concurrence agency

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, item 14

1.9 Is the proposed use of the premises listed in schedule 13 of the *Sustainable Planning Regulation 2009* and does it meet the specified threshold?

☐ No	
☒ Yes	This application requires assessment by the Department of Transport and Main Roads as a concurrence agency

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, item 15

1.10 Is any part of the premises in an interim koala habitat protection area to which the provisions of the *South East Queensland koala State planning regulatory provisions* apply?

☒ No	
☐ Yes	It is recommended that you complete Part 6 (starting from question 6.1) of this checklist

1.11 Is any part of the premises in a koala conservation area or koala sustainability area, which is located outside the current SEQ urban footprint area?

☒ No	
☐ Yes	It is recommended that you complete Part 6 (starting from question 6.3) of this checklist

1.12 Is the proposed use associated with a reconfiguration of a lot?

☒ No	It is recommended that you complete Part 7 of this checklist
☐ Yes	

1.13 Is any part of the premises in a wild river area declared under the *Wild Rivers Act 2005*?

☒ No	
☐ Yes	It is recommended that you complete Part 8 of this checklist



1.14 Is the proposed use for a domestic housing activity?

- | | |
|--|--|
| ☒ No | • It is recommended that you complete Part 9 of this checklist |
| ☐ Yes | |

1.15 Does the use of the premises include a lot sharing a common boundary with a Queensland Heritage place under the *Queensland Heritage Act 1992*?

- | | |
|--|--|
| ☒ No | |
| ☐ Yes | • This application requires assessment by the Department of Environment and Resource Management as an advice agency
• You must also complete <i>Queensland Heritage Place - IDAS form 3</i> |

Section reference:

- *Sustainable Planning Regulation 2009*, schedule 7, table 3, item 23

1.16 Is preliminary approval sought for the application under the *Sustainable Planning Act 2009*, section 242?

- | | |
|---|---|
| ☐ No | |
| ☒ Yes | • This application requires assessment by the Department of Infrastructure and Planning as a concurrence agency
• You must complete <i>Preliminary approval varying the effect of the local planning instrument - IDAS form 31</i> |

Section reference:

- *Sustainable Planning Regulation 2009*, schedule 7, table 3, item 24

1.17 Is the proposed use for a brothel as defined under the *Prostitution Act 1999*?

- | | |
|--|---|
| ☒ No | |
| ☐ Yes | • It is recommended that you complete Part 10 of this checklist |

1.18 Is any part of the proposed use on strategic port land under the *Transport Infrastructure Act 1994*?

- | | |
|--|---|
| ☒ No | |
| ☐ Yes | • It is recommended that you complete Part 11 of this checklist |

1.19 Is any part of the proposed use on airport land under the *Airport Assets (Restructuring and Disposal Act 2008)*?

- | | |
|--|---|
| ☒ No | |
| ☐ Yes | • It is recommended that you complete Part 12 of this checklist |

1.20 Is the proposed use a major hazard facility or possible major hazard facility under the *Dangerous Goods Safety Management Act 2001*?

- | | |
|--|--|
| ☒ No | |
| ☐ Yes | • This application requires assessment by the Department of Justice and Attorney-General (JAG). If JAG is not your assessment manager for the application, the role of the agency will be as concurrence agency.
• You must also complete <i>Major hazard facility - IDAS form 22</i> . |

Section reference:

- *Sustainable Planning Regulation 2009*, schedule 3, part 1, table 2, item 5
- *Sustainable Planning Regulation 2009*, schedule 7, table 2, item 8



1.21 Is all or part of the premises on the environmental management register or contaminated land register under the *Environmental Protection Act 1994*?

☐ No	
☒ Yes	• It is recommended that you complete Part 13 of this checklist

1.22 Is all or part of the land forming the premises currently used for a notifiable activity or if there is no existing use, was it last used for a notifiable activity?

☐ No	
☒ Yes	• It is recommended that you complete Part 14 of this checklist

1.23 Is all or part of the land forming the premises currently used for an industrial activity (other than for a mining activity or petroleum activity) or if there is no existing use, was it last used for an industrial activity (other than for a mining activity or petroleum activity)?

☐ No	
☒ Yes	• It is recommended that you complete Part 15 of this checklist

1.24 Is any part of the premises in an area for which an area management advice has been given for natural mineralisation or industrial activity (other than for a mining or petroleum activity)?

☒ No	
☐ Yes	• It is recommended that you complete Part 16 of this checklist

1.25 Is the proposed use for aquaculture defined under the *Fisheries Act 1994*?

☒ No	
☐ Yes	• It is recommended that you complete Part 17 of this checklist

1.26 Is any part of the premises in a wild river area declared under the *Wild Rivers Act 2005*?

☒ No	
☐ Yes	• It is recommended that you complete Part 18 of this checklist

1.27 Is any part of the premises within the South East Queensland designated region?

☐ No	
☒ Yes	• It is recommended that you complete Part 19 of this checklist

1.28 Is any part of the premises within the Far North Queensland (FNQ) designated region?

☒ No	
☐ Yes	• It is recommended that you complete Part 20 of this checklist

1.29 Is the proposal for urban purposes, as defined under the *Sustainable Planning Regulation 2009*?

☐ No	
☒ Yes	• It is recommended that you complete Part 21 of this checklist



1.30 Can the proposed use be performed without the removal, destruction or damage of marine plants under the Fisheries Act 1994?

- | | |
|--|---|
| ☒ No | • It is recommended that you complete Part 22 of this checklist |
| ☐ Yes | |

1.31 Is any part of the premises within the Wide Bay Burnett (WBB) designated region?

- | | |
|--|---|
| ☒ No | |
| ☐ Yes | • It is recommended that you complete Part 23 of this checklist |

Part 2 - State-controlled roads

2.1 Is the proposed use listed in schedule 11 of the Sustainable Planning Regulation 2009 and does it exceed the specified threshold?

- | | |
|---|---|
| ☐ No | • End of part 2 checklist |
| ☒ Yes | • This application requires assessment by the Department of Transport and Main Roads as a concurrence agency. You must give a copy of the application to the Department of Transport and Main Roads |

Section reference:

- Sustainable Planning Regulation 2009, schedule 7, table 3, items 1 and 2

Part 3 - Acid sulfate soils

3.1 Is the natural ground level of any part of the premises less than 20 metres Australian Height Datum (AHD)?

- | | |
|---|------------------------------|
| ☐ No | • End of part 3 of checklist |
| ☒ Yes | |

3.2 Does the proposed use involve the following?

- | | | |
|--|-----------------------------|---|
| excavating more than 1000 cubic metres of soil or sediment | ☐ No | ☒ Yes |
| Using more than 1000 cubic metres of material as fill | ☐ No | ☒ Yes |

- If you answered yes to either of the above then this application requires assessment by the Department of Environment and Resource Management as an advice agency

Section reference:

- Sustainable Planning Regulation 2009, schedule 7, table 3, item 3
- State planning policy 2/02: Planning and managing development involving acid sulfate soils, section 2.2



Part 4 - Coastal management district

4.1 Will the proposed use involve carrying out any of the following?

operational work	☐ Yes	☒ No
building work that is the construction of new premises with a gross floor area (GFA) of at least 1000 metres squared	☐ Yes	☒ No
building work that is the enlargement of the GFA of existing premises by more than 1000 metres squared	☐ Yes	☒ No

- If you answered yes to any of the above then this application requires assessment by the Department of Environment and Resource Management as concurrence agency

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, item 5

Part 5 - Vegetation clearing

5.1 Does the lot contain the following?

category A or B shown on a property map of assessable vegetation	☐ Yes	☒ No
if there is no property map of assessable vegetation for a lot, native vegetation shown as remnant vegetation on a regional ecosystem or remnant map.	☐ Yes	☒ No

- If no to both of the above then end of part of the checklist.

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, item 10

Part 7 - Easements and substations

7.1 Is, or will there be any part of any structure or work that is the natural and ordinary consequence of the use located completely or partly in the easement?

☒ No	Go to question 7.4
☐ Yes	

7.4 Is any part of the premises situated within 100 metres of a substation site under the *Electricity Act 1994*?

☒ No	
☐ Yes	This application requires assessment by the entity responsible for the substation as an advice agency

Section reference:

- Sustainable Planning Regulation 2009*, schedule 7, table 3, items 8, 9 and 16



Part 9 - Wetland

9.1 Does the premises include a lot situated in or, or within 100 metres of, a wetland shown on the 'Map of referable wetlands' a document approved by the chief executive of the Department of Environment and Resource Management?

☐ No	
☒ Yes	• This application requires assessment by the Department of Environment and Resource Management as an advice agency

Section reference:

- Sustainable Planning Regulation 2009, schedule 7, table 3, item 21

Part 13 - Contaminated land - registered land

13.1 Do any of the following apply?

a suitability statement has been given and a site management plan has been approved for the intended use for the land and the application involves only the following: • the fit-out of a building on the land • minor site excavation (e.g. post holes for open-sided non-habitable structures)	☐ Yes	☒ No
there is currently a notifiable activity on the land and the activity is continuing	☒ Yes	☐ No
the proposed use is industrial and only involves minor site excavation (i.e. post holes for open-sided non-habitable structures)	☐ Yes	☒ No
the land is used for a mining activity or petroleum activity.	☐ Yes	☒ No
the land is an urban development area	☐ Yes	☒ No

- If no to all of the above:
 - you must complete Contaminated land --IDAS form 24
 - this application requires assessment by the Department of Environment and Resource Management (DERM). If DERM is not your assessment manager for the application, the role of the agency will be as a concurrence agency

Section reference:

- Sustainable Planning Regulation 2009, schedule 3, part 1, table 2, item 6
- Sustainable Planning Regulation 2009, schedule 7, table 2, item 23



Part 14 - Contaminated land - notifiable activity

14.1 Do any of the following apply?

a suitability statement removing the land from the environmental management register has been given under the <i>Environmental Protection Act 1994</i> for the existing use or if there is no existing use, the last use and the following both apply: - no new notifiable activity has occurred on the land since the suitability statement was issued - the land is not otherwise contaminated by a hazardous contaminant	☐ Yes ☒ No
a suitability statement has been given and a site management plan has been approved for the intended use of the land and the application only involves only: - the fit-out of a building on the land - minor site excavation, including for example, post holes for open-sided non-habitable structures	☐ Yes ☒ No
the land is used for a mining activity or petroleum activity	☐ Yes ☒ No

- If no to all of the above:
 - You must complete Contaminated land - IDAS form 24
 - This application requires assessment by the Department of Environment and Resource Management (DERM). If DERM is not your assessment manager for the application, the role of the agency will be as a concurrence agency

Section reference:

- Sustainable Planning Regulation 2009*, schedule 3, part 1, table 2, item 7
- Sustainable Planning Regulation 2009*, schedule 7, table 2, item 23

Part 15 - Contaminated land - industrial activity

15.1 Is the proposed use for child care, educational, recreational or residential purposes (including a caretakers' accomodation on industrial land)?

☒ No	
☐ Yes	- This application requires assessment by the Department of Environment and Resource Management (DERM). If DERM is not your assessment manager for the application, the role of the agency will be as a concurrence agency - You must complete <i>Contaminated land - IDAS form 24</i>.

Section reference:

- Sustainable Planning Regulation 2009*, schedule 3, part 1, table 2, item 8
- Sustainable Planning Regulation 2009*, schedule 7, table 2, item 23



Part 19 - South East Queensland Region

19.1 Do any of the following apply?

the application is only for development proposed in a rural precinct and the development is consistent with the rural precinct	☒ No	☐ Yes
the application is only for development identified as exempt from assessment under the <i>Sustainable Planning Regulation 2009</i> , schedule 4	☒ No	☐ Yes
the application is only for development carried out under a development approval which has not lapsed for a development application: - that was properly made before 28 July 2009 or - to which division 2 of the SEQ 2009-2031 regulatory provisions applied	☒ No	☐ Yes
the application is only for development that is consistent with a preliminary approval which has not lapsed, for the part of a development application mentioned in section 3.1.6 of the repealed <i>Integrated Planning Act 1997</i> (IPA) that states the way in which the effect of a local planning scheme is varied, where the development application for the preliminary approval was: - properly made before 28 July 2009 or - assessed against division 2 of the SEQ 2009-2031 regulatory provisions	☒ No	☐ Yes
the application is only for development that is generally in accordance with a rezoning approval where the development entitlements from the rezoning approval are conferred by the following: - the resulting zone in a transitional planning scheme or - a development permit or acknowledgement notice mentioned in section 3.2.5(1)(a) of the repealed <i>Integrated Planning Act 1997</i> for a development application (superseded planning scheme) for the resulting zone in a transitional planning scheme which is a superseded planning scheme, or a notice issued under section 97 of the <i>Sustainable Planning Act 2009</i> (SPA) agreeing to apply the superseded planning scheme or - a planning scheme (other than a transitional planning scheme)	☒ No	☐ Yes
the application is only for development that is declared to be a significant project under the <i>State Development and Public Works Organisation Act 1971</i> , section 26(1)(a)	☒ No	☐ Yes
the premises are completely within a state development area under the <i>State Development and Public Works Organisation Act 1971</i>	☒ No	☐ Yes

- If you answered yes to any of the above, end of part 19 of the checklist.

19.2 Is any part of the premises within a development area defined by the SEQ 2009-2031 regulatory provisions?

☒ No	• Go to question 19.4
☐ Yes	

19.4 Is the proposed use for an extension of more than 10 000 metres squared of retail floor space?

☒ No	
☐ Yes	• This application requires assessment against section 4.1 of the SEQ 2009-2031 regulatory provisions

19.5 Is any part of the premises outside the urban footprint area?

☒ No	• End of part 19 of the checklist
☐ Yes	



Section reference:

- *South East Queensland Regional Plan 2009-2031 Regulatory Provisions*, divisions 2 and 4
- *Sustainable Planning Regulation 2009*, schedule 7, table 3, item 12
- *SEQ Regional Plan 2009-2031 Regulatory Provisions* for the meaning of rural precinct.

Part 21 - Conservation estate

21.1 Is the proposed use on a lot situated in, or within 100 metres of, any of the following?

a protected area, forest reserve, critical habitat or area of major interest under the <i>Nature Conservation Act 1992</i>	☒ No ☐ Yes
a state forest or timber reserve under the <i>Forestry Act 1959</i>	☒ No ☐ Yes
a marine park under the <i>Marine Parks Act 2004</i>	☒ No ☐ Yes
a recreation area under the <i>Recreation Area Management Act 2006</i>	☒ No ☐ Yes
a world heritage area listed under the World Heritage Convention	☒ No ☐ Yes
Brisbane forest park under the <i>Brisbane Forest Park Act 1977</i>	☒ No ☐ Yes

- If you answered yes to any of the above, then this application needs to be referred to the Department of Environment and Resource Management as advice agency.

Section reference:

Sustainable Planning Regulation 2009, schedule 2, table 2, item 45

Part 22 - Removal, destruction or damage of a marine plant

22.1 Is the proposed removal, destruction or damage of marine plants reasonably necessary for:

the removal, destruction or damage of dead marine wood on unallocated State land, other than in a wild river area, for trade or commerce	☒ No ☐ Yes
the maintenance of existing structures, including for example (providing the structures were constructed in compliance with all the requirements under any Act): • boat ramps, boardwalks, drains, fences, jetties, roads, safety signs, swimming enclosures and weirs • drainage structures • powerlines or associated powerline infrastructure	☒ No ☐ Yes
educational or research purposes or for monitoring the impact of development on marine plants	☒ No ☐ Yes
the construction or placement of structures, including, for example, swimming enclosures, safety signs, aids to navigation, fences, pontoons, public boat ramps and pipelines, if - • the extent of the removal, destruction or damage is minor and • the structures were constructed in compliance with all the requirements, under any Act, relating to a structure of that type	☒ No ☐ Yes
the construction of runnels for mosquito control, removal of Lyngbya, seed collection for site rehabilitation or the collection of marine plants for fishing bait, or handicraft	☒ No ☐ Yes

- If you answered yes to one or more of the above, a permit is not required for that aspect of the proposed operational work, but it must comply with any applicable self-assessable code. End of part 22 of the checklist.



Section reference:

- Sustainable Planning Regulation 2009, schedule 3, part 1, table 4, item 8 (assessable development)
- Sustainable Planning Regulation 2009, schedule 3, part 2, table 4, item 4 (self-assessable development)
- Sustainable Planning Regulation 2009, schedule 5, part 1, table 4, item 10
- Sustainable Planning Regulation 2009, schedule 5, part 2, table 4, item 4
- Sustainable Planning Regulation 2009, schedule 7, table 2, item 32
- Fisheries Act 1994, section 76DB (wild river area)

Privacy - please refer to the assessment manager for further details on the use of information recorded in this checklist.

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OFFICE USE ONLY

Date received

9/11/2011

Reference numbers

DA 2011/01644 MCU 2011/00650

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure and Planning.



Application Details - IDAS form 1

(Sustainable Planning Act 2009 version 1.0 effective 18 December 2009)

You **MUST** complete **ALL** questions unless the form indicates otherwise. Incomplete forms or forms without all necessary information and documentation will result in your application not being a properly made application.

For all development applications, you must:

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

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

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.)

Please note: If there is more than one applicant, provide additional applicant details by clicking the "Add another applicant" button below.

Name/s (individual or company name in full)

William and Patricia Hester c/- Gassman Development Perspectives

For companies, contact name

Brendon Walkinshaw

Postal address

PO Box 392

Contact phone number

(07) 3807 3333

Mobile number (non-mandatory)

Fax number (non-mandatory)

e-mail address (non-mandatory)

bwalkinshaw@gassman.com.au

1. What is the nature of development proposed? (tick all applicable boxes)

- ☒ material change of use of premises
- ☐ building work
- ☒ operational work
- ☐ reconfiguring a lot



**2. What type of approval is being sought?**

- ☐ development permit
☒ preliminary approval
☐ both - provide details below

3. Is the application for a mobile and temporary environmentally relevant activity (ERA)?

- ☒ No
☐ Yes - complete table A and then go to question 5

4. Location of the premises (complete table B and/or table C as applicable. Identify each lot in a separate row)**Table B** - street address/lot for the premises or street address/lot on plan for the land adjoining or adjacent to the premises

	Street Address				Lot on plan description		Local government area (e.g. Logan, Cairns)
	Unit No.	Street No.	Street name and official suburb/locality name	Post code	Lot No.	Plan type and plan no.	
1		60	Stapylton-Jacobs Well Road, Stapylton	4207	1	RP6882	Gold Coast City Council

☒ Street address / lot on plan

☐ Street address / lot on plan for the land adjoining or adjacent to the premises (appropriate for development in water e.g. jetty, pontoon)

2		82	Christensen Road, Stapylton	4207	240	W31320	Gold Coast City Council
---	--	----	-----------------------------	------	-----	--------	-------------------------

☒ Street address / lot on plan

☐ Street address / lot on plan for the land adjoining or adjacent to the premises (appropriate for development in water e.g. jetty, pontoon)

3			Yellowwood Road, Eagleby	4207	4	RP6843	Gold Coast City Council
---	--	--	--------------------------	------	---	--------	-------------------------

☒ Street address / lot on plan

☐ Street address / lot on plan for the land adjoining or adjacent to the premises (appropriate for development in water e.g. jetty, pontoon)

Table C - premises coordinates (appropriate for development in remote areas, over part of a lot or in water e.g. channel dredging in Moreton Bay)

	Coordinates (note: place each set of coordinates in a separate row)				Zone reference	Datum	Local government area (If applicable)
	Easting	Northing	Latitude	Longitude			
1						☐ GDA94 ☐ WGS84 ☐ other	

5. Total area of the premises on which the development is proposed (indicate hectares or m²)

73.114Ha

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

1	Rural homestead and accompanying sheds, Industrial use for soil conditioning and fertilising (Lot 240 only)
---	---

7. Provide a brief description of the proposal (e.g. six unit apartment building, 30 lot residential subdivision etc.)

Preliminary approval to change land uses from 'future industry' to 'industry' in nature including preliminary earthworks.

8. 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 D, table E or table F as applicable

Table D (note: do not complete this table if lodging the application on-line using Smart eDA)

Name of owner/s of the land

I/We, the above-mentioned owner/s of the land, consent to the making of this application.

Signature of owner/s of the land

Date

Table E

Name of owner/s of the land

William and Patricia Hester

- ☒ The owner's written consent is attached or will be provided separately to the assessment manager

Table F

Name of owner/s of the land

- ☐ By making this application, I, the applicant, declare that the owner has given written consent to the making of the application.

9. Does the application involve a state resource? (e.g. the application involves state land, or taking quarry materials. Refer to the notes at the end of this form for more information)

- ☒ No ☐ Yes - complete table G

10. 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 H
- ☐ on strategic port land under the *Transport Infrastructure Act 1994* - complete table I
- ☐ in a tidal water area - complete table J



Table H

Name of water body, watercourse or aquifer

1

Sandy Creek

11. 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

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

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

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

☒ No - Go to question 15 ☐ Yes

15. 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 - provide details below

16. 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 Smart eDA)

	Description of attachment or title of attachment	Method of lodgement to assessment manager
1	Development application including planning report and code responses, place code accompanying plans, earthworks plans, stormwater and hydraulic reporting, traffic analysis, Acid sulfate and contaminated land investigations, ecological and landscaping reporting, searches etc	over the counter

17. 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

Question 8:

- 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.
- Owner's consent is not required for a mobile and temporary ERA.

Question 9:

- Section 264 of the *Sustainable Planning Act 2009* provides that if a development involves a state resource, a regulation may require the application to be supported by certain evidence prescribed under the regulation. Schedule 14 of the *Sustainable Planning Regulation 2009* prescribes the state resources for which evidence is required to be given, and the evidence required, to support the application.

Question 13:

- 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 14:

- 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 www.qleave.qld.gov.au.

Privacy -the information collected in this form will be used by the Department of Infrastructure and Planning (DIP) in accordance with the processing and assessment of your application. Your personal details will not be disclosed for a purpose outside of the IDAS process, except where required by legislation (including the *Right to Information Act 2009*) or as required by Parliament. This information may be stored in a departmental database. 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



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
1						

The *Sustainable Planning Act 2009* (SPA) is administered by the Department of Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agencies.



Material change of use assessable against a planning scheme - IDAS form 5

(Sustainable Planning Act 2009 version 1.0 effective 18 December 2009)

This form must be completed for development applications for a material change of use assessable against a planning scheme.

You **MUST** complete **ALL** questions unless the form indicates otherwise. Incomplete forms or forms without all necessary information and documentation will result in your application not being a properly made application.

For all development applications, you must:

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

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

This form can also be used for development on strategic port land under the *Transport Infrastructure Act 1994*.

1. How is the premises identified / zoned in the applicable planning scheme? (if the premises involves multiple zones, clearly identify the relevant zone for each lot in a separate row in the below table) Non-mandatory

	Lot description (i.e. street address or lot on plan details)	Applicable zone / precinct	Applicable overlays
1	60 Stapylton-Jacobs Well Road, Stapylton	Yatala Enterprise Area Local Area Plan - Precinct 3/4 - Future Business and Industry	• OM10 Low & Medium potential bushfire hazard • OM11 Natural wetland and waterways • OM13 Canals and waterways • OM14 Acid Sulfate Soils Hazard • OM17 Potential flood inundation • OM20 Conservation vegetation mapping • OM22 Scenic tourist routes
2	82 Christensen Road, Stapylton	Yatala Enterprise Area Local Area Plan - Precinct 3/4 - Future Business and Industry	• OM10 Low & Medium potential bushfire hazard • OM11 Natural wetland and waterways • OM13 Canals and waterways • OM14 Acid Sulfate Soils Hazard • OM17 Potential flood inundation • OM20 Conservation vegetation mapping



• OM22 Scenic tourist routes

3 Yellowwood Road, Eagleby

Rural Domain

• OM 2 Good quality agricultural land
• OM10 Medium potential bushfire hazard
• OM13 Canals and waterways
• OM14 Acid Sulfate Soils Hazard
• OM16 Potential unstable soils (no risk)
• OM17 Potential flood inundation
• OM20 Conservation vegetation mapping
• OM22 Scenic tourist routes

2. How is the proposed use/s defined in the applicable planning scheme?

	General explanation of the proposed use	Planning scheme definition (include each definition in a new row) (non-mandatory)	No. of dwelling / tenancy units (if applicable)	Days and hours of operation (if applicable)	No. of employees (if applicable)
1	Preliminary approval for various industrial uses	Industry, Manufacturer's Shop, Open storage area, Service industry, Warehouse		N/A	

3. What type of approval is being sought for the material change of use?

☐ development permit ☒ preliminary approval ☐ both - provide details below

4. Are there any current approvals associated with this application for the change of use of the premises?
(eg. a preliminary approval)

☒ No ☐ Yes - provide details below

5. Does the proposed use involve (tick applicable box/es)

the reuse of existing buildings on the premises ☒ No ☐ Yes
new building work on the premises ☒ No ☐ Yes
the reuse of existing operational works on the premises ☒ No ☐ Yes
new operational work on the premises ☒ No ☐ Yes



6. Confirm that the following mandatory supporting information accompanies this application

All applications	Confirmation of lodgement	Method of lodgement
a site plan drawn to scale (1:100, 1:200 or 1:500 are the recommended scales) which shows the following: - the location and site area of the land to which the application relates (<i>relevant land</i>) - the north point - the boundaries of the relevant land - any road frontages of the relevant land, including the name of the road - the location and use of any existing or proposed buildings or structures on the relevant land (note: where extensive demolition or new buildings are proposed, two separate plans (an existing site plan and proposed site plan) may be appropriate) - any existing or proposed easements on the relevant land and their function - the location and use of buildings on land adjoining the relevant land - all vehicle access points and any existing or proposed car parking areas on the relevant land. Car parking spaces for persons with disabilities and any service vehicle access and parking should be clearly marked. - for any new building on the relevant land, the location of refuse storage - the location of any proposed retaining walls on the relevant land and their height - the location of any proposed landscaping on the relevant land - the location of any stormwater detention on the relevant land	☒ confirmed	over the counter
a statement about how the proposed development addresses the local government's planning schemes and any other planning documents relevant to the application	☒ confirmed	over the counter
a statement about the intensity and scale of the proposed use (e.g. number of employees, days and hours of operation, number of visitors, number of seats, capacity of storage area etc.)	☒ confirmed	over the counter
information that states: - the existing or proposed floor area, site cover, maximum number of storeys and maximum height above natural ground level for existing or new buildings (e.g. information regarding existing buildings but not being reused) - the existing or proposed number of on-site car parking bays, type of vehicle cross-over (for non-residential uses) and vehicular servicing arrangement (for non-residential uses)	☐ confirmed ☒ not applicable	over the counter



	Confirmation of lodgement	Method of lodgement
When the application involves the reuse of existing buildings		
plans showing the size, location, existing floor area, existing site cover, existing maximum number of storeys, and existing maximum height above natural ground level of the buildings to be reused	☐ confirmed ☒ not applicable	over the counter
When the application involves new building work (including extensions)		
floor plans drawn to scale (1:50, 1:100 or 1:200 are the recommended scales) which show the following: - the north point - the intended use of each area on the floor plan (for commercial, industrial or mixed use developments only) - the room layout (for residential development only) with all rooms clearly labelled - the existing and the proposed built form (for extensions only) - the gross floor area of each proposed floor area	☐ confirmed ☒ not applicable	over the counter
elevations drawn to scale (1:100, 1:200 or 1:500 are the recommended scales) which show plans of all building elevations and facades, clearly labelled to identify orientation (e.g. north elevation)	☐ confirmed ☒ not applicable	over the counter
When the application involves the reuse of other existing works		
plans showing the nature, location, number of on-site car parking bays, existing area of landscaping, existing type of vehicular cross-cover (non-residential uses), and existing type of vehicular servicing arrangement (non-residential uses) of the works to be reused	☐ confirmed ☒ not applicable	over the counter
When the application involves new operational work		
plans showing the nature, location, number of new on-site car parking bays, proposed area of new landscaping, proposed type of new vehicle cross-cover (non-residential uses), proposed maximum new vehicular servicing arrangement (non-residential uses) of the proposed new operational works	☐ confirmed ☒ not applicable	over the counter

Notes for completing this form:

- This form can also be used for a material change of use assessable against the land use plan for Cairns airport land or Mackay airport land. Whenever a planning scheme is mentioned, take it to mean land use plan for the airport land.

Privacy - please refer to your assessment manager 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 Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agencies.



Contaminated land - IDAS form 24

(Sustainable Planning Act 2009 version 1.0 effective 18 December 2009)

This form must be completed for development applications for:

- a material change of use that is assessable development under the *Sustainable Planning Regulation 2009*, schedule 3, part 1, table 2, items 6 to 9
- reconfiguring a lot that requires referral under the *Sustainable Planning Regulation 2009*, schedule 7, table 2, item 22.

You **MUST** complete **ALL** questions unless the form indicates otherwise. Incomplete forms or forms without all necessary information and documentation will result in your application not being a properly made application.

For all development applications you must:

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

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

1. What is the nature of the application? (tick applicable box/es)

- ☒ material change of use ☐ reconfiguring a lot

2. What is the nature of the contamination? (tick applicable box/es)

- ☒ all or part of the premises is on the environmental management register
- ☐ all or part of the premises is on the contaminated land register
- ☐ all or part of the premises is currently used for, or was last used for, a notifiable activity
- ☐ all or part of the premises is currently used for, or was last used for, an industrial activity and the proposed use is for child care, educational, recreational or residential purposes (including a caretakers' accommodation on industrial land)
- ☐ in an area where an area management advice has been given for natural mineralisation or industry activity and the proposed use is for child care, educational, recreational or residential purposes (including caretakers' accommodation on industrial land)
- ☐ is in an area for which an area management advice has been given for unexploded ordnance



3. Confirm that the following mandatory supporting information accompanies this application

Plans	Confirmation of lodgement	Method of lodgement
plans showing where any notifiable activities, hazardous contaminant or potentially contaminated activity has occurred on the premises	☒ confirmed	over the counter
Written documentation		
if the application involves a material change of use from an industrial use to a more sensitive use (e.g. child care, educational, recreational or residential purposes), then a detailed site history outlining previous potentially contaminated uses on the premises	☐ confirmed ☒ not applicable	over the counter

Privacy - please refer to your assessment manager 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 Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agencies.



Application for preliminary approval varying the effect of the local planning instrument - IDAS form 31

(Sustainable Planning Act 2009 version 1.0 effective 18 December 2009)

This form must be completed for development applications for a preliminary approval that seeks to vary the effect of any local planning instrument for the land the subject of the application.

You **MUST** complete **ALL** questions unless the form indicates otherwise. Incomplete forms or forms without all necessary information and documentation will result in your application not being a properly made application.

For all development applications, you must:

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

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

1. What type of development is proposed?

- ☒ material change of use - complete table A
- ☐ development other than a material change of use - complete table B
- ☐ both - provide details below and complete table A & B

2. How does the application seek to vary the effect of the local planning instrument? (tick applicable box/es)

Table A

- ☐ by stating that the material change of use or development relating to the material change of use is exempt development
- ☒ by stating that the material change of use or development relating to the material change of use is self-assessable development
- ☐ by stating that the material change of use or development relating to the material change of use is development requiring compliance assessment
- ☒ by stating that the material change of use or development relating to the material change of use is assessable development requiring code or impact assessment, or both code and impact assessment
- ☒ by identifying or including codes for the proposed development - provide details of the codes below

Generations Industrial Park Place Code is enclosed for review and approval seeking graduation of existing 'future indu



3. Please nominate the period after which the approval should lapse if the proposed development is started but not completed within the period (non-mandatory)

20 years

4. Confirm that the following mandatory supporting information accompanies this application

	Confirmation of lodgement	Method of lodgement
details about the way in which the applicant seeks the approval to vary the effect of any local planning instrument	☒ confirmed	over the counter
written statement about the consistency of the proposed variations with aspects of the local planning instrument, other than the aspects sought to be varied	☒ confirmed	over the counter

Privacy - please refer to your assessment manager for further details on the use of information recorded in this form.

OFFICE USE ONLY

Date Received

Reference Numbers

The *Sustainable Planning Act 2009* (SPA) is administered by the Department of Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agencies.

October 2011

The Chief Executive Officer
Gold Coast City Council
PO Box 5042
GOLD COAST MC QLD 9729

Dear Sir,

RE: PROVISION OF LANDOWNER'S CONSENT
APPLICATION: A PRELIMINARY APPROVAL FOR OPERATIONAL WORKS
(CHANGES TO GROUND LEVEL – EARTHWORKS)
PROPERTY: YELLOWOOD ROAD, EAGLEBY, 4207 (LOT 4 ON RP6843)

I hereby state that I, Mr William Arthur Hester, own Lot 4 on RP6843 (title search enclosed).

I consent to the making of a development application seeking a preliminary approval for operational works (changes to ground level – earthworks) over the abovementioned sites.

Yours Faithfully,

W A Hester
Signature
Name: **William A. Hester**

Date: *12/10/11*

Encl. Title search Lot 4 on RP6843

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 11739459

Search Date: 17/06/2011 13:55

Title Reference: 13168037

Date Created: 24/12/1958

Previous Title: 10391085

REGISTERED OWNER

Dealing No: 705557478 19/04/2002

WILLIAM ARTHUR HESTER

ESTATE AND LAND

Estate in Fee Simple

LOT 4 REGISTERED PLAN 6843
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10112135 (POR 19)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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Requested By: D APPLICATIONS CITEC CONFIRM

October 2011

The Chief Executive Officer
Gold Coast City Council
PO Box 5042
GOLD COAST MC QLD 9729

Dear Sir,

RE: PROVISION OF LANDOWNER'S CONSENT
APPLICATION: A PRELIMINARY APPROVAL AFFECTING A LOCAL
PLANNING INSTRUMENT FOR A MATERIAL CHANGE OF
USE (VARIOUS INDUSTRY) UNDER S.242 OF THE
SUSTAINABLE PLANNING ACT 2009 AND A
PRELIMINARY APPROVAL FOR OPERATIONAL WORKS
(CHANGES TO GROUND LEVEL - EARTHWORKS)
PROPERTY: 60 STAPYLTON JACOBS WELL ROAD, STAPYLTON, 4207
(LOT 1 RP6882) AND 82 CHRISTENSEN ROAD,
STAPYLTON (LOT 240 W31320)

We hereby state that Mr William Arthur Hester and Mrs Patricia Ann Hester jointly own Lot 1 on RP6882 and Lot 240 on W31320 (title searches **enclosed**).

We consent to the making of a development application seeking approvals for a preliminary approval affecting a local planning instrument for a material change of use (Industry, Manufacturer's Shop, Open Storage Area, Service Industry, Warehouse) under s.242 of the *Sustainable Planning Act 2009* and a preliminary approval for operational works (changes to ground level – earthworks) over the abovementioned allotments.

Yours Faithfully,

W.A. Hester
Signature
Name: **William A Hester**

Date: 12/10/11

P.A. Hester
Signature
Name: **Patricia A Hester**

Date: 12/10/11

Encl. Title searches lot 1 on RP6882 and lot 240 on W31320

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10503084
Search Date: 22/11/2010 13:56

Title Reference: 11060216
Date Created: 07/06/1906

Creating Dealing: 602739225

REGISTERED OWNER

Interest

Dealing No: 709915935 07/09/2006

PATRICIA ANN HESTER
WILLIAM ARTHUR HESTER

1/2
1/2

AS TENANTS IN COMMON

ESTATE AND LAND

Estate in Fee Simple

LOT 1 REGISTERED PLAN 6882
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10695064 (POR 128)

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 09/04/2008 711561745 Certificate No. 2

** End of Current Title Search **

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Requested By: D APPLICATIONS CITEC CONFIRM

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10776460

Search Date: 12/01/2011 08:42

Title Reference: 10526129

Date Created: 08/12/1884

REGISTERED OWNER

Interest

Dealing No: 709915914 07/09/2006

PATRICIA ANN HESTER

1/2

WILLIAM ARTHUR HESTER

1/2

AS TENANTS IN COMMON

ESTATE AND LAND

Estate in Fee Simple

LOT 240 CROWN PLAN W31320

County of WARD

Parish of ALBERT

Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10526129 (SEL 814)
2. LEASE No 707931618 29/07/2004 at 10:43
ENVIROGREEN PTY LIMITED A.C.N. 069 900 456
OF LEASE A ON SP 125788
TERM: 01/07/2005 TO 30/06/2010 OPTION 5 YEARS
3. CHANGE OF NAME No 713027062 01/02/2010 at 12:03
LEASE: 707931618
AMGROW PTY LIMITED A.C.N. 069 900 456
4. AMENDMENT OF LEASE No 713076568 23/02/2010 at 15:03
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL
5. AMENDMENT OF LEASE No 713369769 23/07/2010 at 14:54
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 30/07/2010 713375783 Certificate No. 5

Corrections have occurred - Refer to Historical Search

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: D APPLICATIONS GLOBAL X

Page 1/1

2 – PLANNING ASSESSMENT REPORT (GDP)

PLANNING ASSESSMENT REPORT

- A PRELIMINARY APPROVAL AFFECTING A LOCAL PLANNING INSTRUMENT FOR A MATERIAL CHANGE OF USE FOR INDUSTRIAL USES (S.242 OF THE *SUSTAINABLE PLANNING ACT 2009*); AND
- A PRELIMINARY APPROVAL FOR OPERATIONAL WORKS (CHANGES TO GROUND LEVEL - EARTHWORKS)

ADDRESS:

60 STAPYLTON-JACOBS WELL ROAD & 82 CHRISTENSEN ROAD,
STAPYLTON Q 4207 (LOTS 1 ON RP6882, 240 ON W31320 AND 4
ON RP6843)

PREPARED FOR:

PATRICIA AND WILLIAM HESTER

NOVEMBER 2011



gasman
development
perspectives

project coordination
urban + regional planning
landscape + urban design
environmental management
visualisation + spatial service
surveying service
advisory service

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1.0 SITE AND APPLICATION SUMMARY

Table 1: Site and application summary – main site

Development site for preliminary approval for industrial uses (s.242)	
Site Characteristics	Details
Address of site	60 Stapylton-Jacobs Well Road & 82 Christensen Road, Stapylton Qld 4207 (Preliminary Approval for industrial uses)
Real property description	Lot 1 on RP6882 & Lot 240 on W31320
Area of site	73.114Ha
Easements	N/A
Leases (Registered)	Lease No 707931618 being Lease A on SP125788 to Amgrow Pty Ltd over Lot 240 on W31320 Term – 1/7/05 – 30/6/2015
Land owner	Patricia and William Hester
SEQ Regional Plan designation	Urban Footprint
Local Government Authority	Gold Coast City Council
Relevant Planning Scheme	Gold Coast Planning Scheme 2003, Version 1.2 (amended October 2010)
Planning Scheme land use designation	Yatala Enterprise Area LAP: Future Industry (Precinct 3/4)* Yatala Enterprise Area LAP: Open Space (Precinct 6)
Planning Scheme overlay constraints	Preliminary Approval, Subdivision and Preliminary Earthworks: - OM10 Low & Medium potential bushfire hazard - OM11 Natural wetland and waterways - OM13 Canals and waterways - OM14 Acid Sulfate Soils Hazard - OM17 Potential flood inundation - OM20 Conservation vegetation mapping - OM22 Scenic tourist routes



Development site for preliminary approval for industrial uses (s.242)	
Site Characteristics	Details
Existing land use/s	Lot 1 and part Lot 240: Rural homestead and accompanying sheds Part Lot 240: Industrial use – Soil and fertilizer reconditioning and distribution
Approval type	Preliminary Approval for: - Under S.242 of the SPA 2009 affecting a local planning instrument for Industrial uses pursuant to the Generations Industrial Park Place Code; - Under S.241 of the SPA 2009 for Earthworks – Changes to Ground Level
Description of development	Preliminary approval for specific industrial uses and earthworks
Level of assessment	Impact assessable

* NB - It is noted that the associated Precinct Plan, LAP Map 29.2, identifies the site to be located in **Precinct 3 – Future Industry**. For the purposes of this report and the planning application as a whole the historical term **Precinct 4 – Future Industry** will be used, as it is used within the text of the Planning Scheme document, as required.

Table 2: Site and application summary – secondary site

Development site for preliminary earthworks approval only (s.241)	
Site Characteristics	Details
Address of site	Yellowwood Road, Eagleby Qld 4207 (Preliminary earthworks)
Real property description	Lot 4 on RP6843
Area of site	Lot 4 on RP6843 – 4.047Ha
Easements	N/A
Leases (Registered)	N/A
Land owner	Patricia and William Hester
SEQ Regional Plan designation	Regional Landscape Rural Production Area
Local Government Authority	Gold Coast City Council
Relevant Planning Scheme	Gold Coast Planning Scheme 2003, Version

Development site for preliminary earthworks approval only (s.241)	
Site Characteristics	Details
	1.2 (amended October 2010)
Planning Scheme land use designation	Rural Domain
Planning Scheme overlay constraints	Preliminary Earthworks only: • OM 2 Good quality agricultural land • OM10 Medium potential bushfire hazard • OM13 Canals and waterways • OM14 Acid Sulfate Soils Hazard • OM16 Potential unstable soils (no risk) • OM17 Potential flood inundation • OM20 Conservation vegetation mapping • OM22 Scenic tourist routes
Existing land use/s	Lot 4 on RP6843: Vacant rural land
Approval type	Preliminary Approval for: • Under S.241 of the SPA 2009 for Earthworks – Changes to Ground Level
Description of development	Preliminary approval for earthworks
Level of assessment	Impact assessable (overall)

Applicant:
Contact Details:

Patricia and William Hester
c/- Mr Brendon Walkinshaw
Gassman Development Perspectives Pty Ltd
(‘GDP’)
PO Box 392, Beenleigh, QLD 4207
Phone: (07) 3807 3333
Fax: (07) 3287 5461
Email: bwalkinshaw@gassman.com.au
5093-10

GDP Reference:

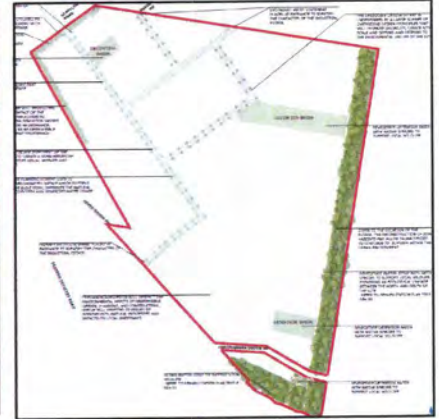
2.0 EXECUTIVE SUMMARY

This report has been prepared by Gassman Development Perspectives on behalf of Patricia and William Hester in support of an **impact assessable** development application over an industrial site situated along the frontages of Stapylton-Jacobs Well Road and Christensen Road, Stapylton. In brief, the proposed development comprises as follows:

- A request for a s.242 (pursuant to the *Sustainable Planning Act 2009* ('SPA 2009')) preliminary approval affecting the local planning instrument over the development site in order to increase its latent development potential for key industrial uses. An accompanying preliminary approval for earthworks pursuant to s.241 of the SPA 2009 is also proposed.
- Ultimately, the development seeks to increase the ability for businesses to locate upon the site by making the development assessment of popular and generally acceptable industrial land-uses more convenient and efficient – Industry, Manufacturer's Shop, Warehouse and Service Industry (as defined under the Gold Coast Planning Scheme) - whilst also allowing transitional uses to take place until the site is fully developed (Open storage area). This is facilitated through the use of the Generations Industrial Park Place Code which outlines the key intents, precincts, preferred land-uses and code constraints that shall apply to the site, all of which, where possible, seek to be consistent with the requirements of Council's existing Local Area Plan for the Yatala Enterprise Area.
- Extensive reporting has been undertaken in order to demonstrate that the site may achieve an ultimate development scenario that is considerate of all key site constraints, opportunities, impacts and influences. Reports address essential matters such as the impacts the development may potentially have upon nearby local residents, road impacts and connectivity, ecological linkages and open space allowances, flooding & stormwater requirements, connection to reticulated services, soil assessment plus preliminary bulk earthworks and retaining wall planning. The reporting supports a pro-active approach to the proposed development which has included pre-emptive consultation with Council representatives and referral agency officers. Direct community consultation will also be undertaken by the applicant's representatives with residents living nearby.
- The site is in a key position within the Yatala Enterprise Area as it is flanked by industrial development to the north and south notwithstanding its 'future business and industry' land-use designation under the presiding Local Area Plan. A



combined strategy of demonstrating how the site may link with key infrastructure whilst also responding to key site constraints and land-use impacts shows how the site, in terms of its contextual relationship with nearby land-uses, can effectively complement the structured growth of one of the major employment hubs of the Gold Coast - the Yatala Enterprise Area. Accordingly, the proposed development will act to encourage appropriate development upon the site in a manner that is considered and reasonable.



Figures 1, 2 & 3: Aerial view of site, broad view of development proposal and broad view of landscaping intent
Source: GDP various

A detailed discussion of the proposed development is offered in section 5 of this report. This report presents the facts and circumstances known to the author at this time

3.0 LAND AND REPORT DETAILS

3.1 RELEVANT LAND DETAILS

Table 3: Land Details

Lot Details (RP description)	Lot Area (m ² /Ha)	Relevant Encumbrances	Planning Scheme land use designation
Lot 1 on RP6882	20.505 Ha	Nil	YEA LAP Precinct 4 - Future Industry
Lot 240 on W31320	52.609 Ha	Lease No 707931618 being Lease A on SP125788 to Amgrow Pty Ltd over Lot 240 on W31320	Part YEA LAP Precinct 4 - Future Industry Part YEA LAP Precinct 6 – Open Space
Lot 4 on RP6843	40,470m ²	Nil	YEA LAP Precinct 6 – Open Space

3.2 OWNERSHIP DETAILS

Table 4: Ownership Details

Lot Details (RP description)	Owner of land	Landowner's consent?
Lot 1 on RP6882	Patricia and William Hester	Yes
Lot 240 on W31320	Patricia and William Hester	Yes
Lot 4 on RP6843	William Hester	Yes

3.3 DEVELOPMENT DETAILS

Table 5: Development Details

	Type of development	
	Preliminary approval	Development permit
Code Assessable		
Impact Assessable	- S.242 preliminary approval affecting a local planning instrument under the SPA 2009 for Industrial uses. - S.241 preliminary approval for earthworks (changes to ground level)	



3.4 CONSULTANT REPORTS AND DEVELOPMENT PLANS

Within this development application, and in support of the proposed development, are enclosed the following reports and development plans:

- **Place Code (Appendix 3):** The Generations Industrial Park Place Code is provided in support of the preliminary approval component of the development application (under s.242 of the SPA 2009). The code creates a separate Place Code intent, tables of development, and development assessment criteria, all of which seek to begin aligning with the requirements of the Precinct 1 (General Business and Industry) land-use designation of the Yatala Enterprise Area Local Area Plan Place Code in addition to other industrial uses. The Place Code corresponds with a land-use classification plan which identifies the areas within the site that are subject to specific land-use designations.
- **Site Analysis Plan, Constraint and context plans, Statement of Landscape Intent (Gassman Development Perspectives)(Appendix 4):** A site analysis plan places the site within the context of surrounding land uses and the landscape intent plan illustrates how the site design shall be best approached from a landscaping and visual amenity perspective. The landscape intent plan, in particular, provides sections of vegetation in places of interest such as detention basins, major road frontages of the site and the proposed landscaping buffer between the site and the residential community to the south. Discussion plans showing the context of the site as it relates to critical planning and constraint overlays (including slope analysis etc) are provided to Council officers to aid assessment of the site.
- **Survey Plan (Gassman Development Perspectives)(Appendix 5):** A contour and detail survey plan of the site is provided. Survey has also been undertaken over the area of Lot 4 that will be the subject of preliminary operational works approval. These contours have been used when undertaking the required bulk earthworks and stormwater assessments of the site. It is noted that an identification survey over the site has also been undertaken.
- **Civil Engineering Bulk Earthworks Plans (Hyder Consulting)(Appendix 6):** Earthworks plans are provided illustrating the changes to ground level required in order to develop a conceptual layout for the finalised site. Reference to proposed lots etc is indicative only and does not form part of this particular development application. The earthworks plans demonstrate conceptually how the site may be developed from a design perspective. Relevant levels, volumes, sections and areas are provided in the plans. These plans also display stormwater treatment design along with proposed sewer and water alignments for the developed site.



- **Code Responses (Appendix 7):** Relevant planning development codes of the Gold Coast Planning Scheme are responded to. All relevant codes are highlighted in Section 8 of this report. Specifically, this Appendix addresses a code response to the Yatala Enterprise Area Local Area Plan Place Code. The **enclosed** Engineering Services Report (**Appendix 9**) provides code responses to the Car parking and traffic integration, Changes to ground level, Flood, Sediment and erosion control (engineering comment) Codes. The enclosed Ecological Assessment (**Appendix 11**) provides code responses to the Natural wetland and waterways, and Nature conservation Codes.
- **Stormwater Management Plan (Hyder Consulting)(Appendix 8):** Relevant stormwater assessments relating to quality and quantity of stormwater discharge are provided in this report. The site is subject to flood risks near the boundary of the Stapylton-Jacobs Well Road frontage and so compensatory earthworks are proposed upon another site owned by the applicant (ie., Lot 4) in order to retain a site flood storage balance. Four stormwater detention basins are to be located upon the site within the relevant discharge and catchment areas. Designs of the basins are provided in the earthworks plans (**Appendix 6**) and vegetated sections of the basins are displayed in the Landscape intent plan (**Appendix 4**).
- **Engineering Services Report (Hyder Consulting)(Appendix 9):** This report demonstrates that satisfactory connections to water, sewer, telecommunications and stormwater networks are achieved as part of the development proposal. Comment is also provided in relation to key site constraints such as flood. It is noted that relevant capacity analyses are undertaken with respect to key infrastructure components and appropriate connections and improvements are proposed, where necessary.
- **Traffic Impact Assessment (Hyder Consulting)(Appendix 10):** Traffic advice is supplied in relation to the appropriate integration of the concept design with Stapylton-Jacobs Well Road, Christensen Road and other roads connecting from the north of the site. Advice confirms the suitability of the concept design from a traffic impact and safety viewpoint. The traffic report comments on the ultimate impacts the site will have on nearby intersections, including the Pacific Motorway interchange where the future widening and intersections works in relation to Stapylton-Jacobs Well Road will be proposed. It is commented that the site shall be developed in a staged manner with Stapylton-Jacobs Well Road upgrades only necessary once the proposed stage containing the intersection is proposed. Other items such as car parking, vehicle loading requirements, refuse collection are mentioned if not otherwise commented upon in the relevant development codes.

- **Ecological Assessment (GDP)(Appendix 11):** An ecological assessment was undertaken over the site. Due attention was provided to the vegetation located on site within the development context, the Planning scheme and the higher order ecological goals sought for the site. To that end, relevant vegetated buffers have been proposed on the basis that they will retain some of the natural ecological features of the site as well as being used as ecological links reflective of relevant Planning Scheme mapping intents. Consideration has been made for relevant state-based ecological features such as the location of the site near referrable wetlands and the existence of some remnant 'of concern' vegetation near the banks of Sandy Creek. No sensitive vegetation is proposed to be cleared as part of this development.
- **Open Space Management Statement and Rehabilitation Plan (GDP)(Appendix 12):** This report identifies the areas to be vegetated as part of the buffering and rehabilitation strategy of the site and proposes planting, weeding, management and maintenance requirements of these vegetated areas consistent with Council requirements.
- **Acoustic Report (TTM Consulting)(Appendix 13):** This acoustic report was commissioned primarily to address the noise impacts the development shall have upon the residential community located to the adjacent south-west of the site. This report should be considered within the context of the existing conditions experienced by the residential community which has been located adjacent to industrial uses to the south west and south east and is not located far from the existing Pacific Motorway and the Stapylton transfer station. The recommendations of the report indicate that the development of the site along the common boundary of the site and the residential community should be restricted in terms of setback allowances in order to ensure noise impacts are minimised. These recommendations are incorporated into the code requirements of the Generations Industrial Park Place Code (**Appendix 3**).
- **Acid Sulfate Soil Investigation (ADG Consulting)(Appendix 14):** Minor acid sulphate soil risks affect the site. These have been investigated and an appropriate treatment plan shall be implemented in order to address the earthworks in affected areas, when they are undertaken.
- **Preliminary Site Investigation (ADG Consulting)(Appendix 15):** The site is located on the EMR on account of the existence of a now disused dip site/spray race facility. The facility was used during times when the site was being more intensively used for agricultural purposes. This preliminary site investigation has been undertaken and concludes that further investigation shall ultimately be required before it can be determined what mitigation procedures will be undertaken as the site is developed. At this early stage of the development assessment it is submitted that further investigation

be undertaken when bulk earthworks within the area of the dip site are more imminent, now that the item has been identified and can be monitored.

- **Geotechnical Assessment (Morrison Geotechnic)(Appendix 16):** A preliminary geotechnical assessment was undertaken over the site identifying that the soils of the site are adequate for the proposed development. The report contains relevant advice in relation to earthworks treatments, where necessary, as development pads are constructed.
- **Pre-lodgement meeting minutes and searches (Appendix 17):** A copy of the GCCC pre-lodgement meeting minutes are provided within this Appendix as are the pre-lodgement meeting minutes issued by DTMR (with plans). Comments in relation to these meetings are located in **section 10** of this report. Various relevant searches are also enclosed. Title searches, smart maps, remnant vegetation mapping, referrable wetlands mapping etc are included in this section of the report. Comment on the results of these searches is located in section 7 of this planning report.

4.0 SITE DETAILS

4.1 SITE LOCATION

The site to be developed (being the primary focus of this application) is located along both Stapylton-Jacobs Well Road and Christensen Road frontages within the Gold Coast suburb of Stapylton (4207). The full site has an area of 73.114Ha. The site is located approximately:

- 500m from the Pacific Motorway, Yatala north interchange;
- 5.5km from existing shopping facilities in Beenleigh;
- 5km from Beenleigh train station and 11km from Ormeau train station;
- 12 Minutes drive from the nearest public hospital – Logan Hospital;
- 30 Minutes drive from the Southport CBD; and
- 30 Minutes drive from the Brisbane CBD.



Figure 4: Site Location – Stapylton-Jacobs Well Road, Stapylton
Source: Google Maps

4.2 LAND USE

- Lot 1 and part Lot 240: Rural homestead and accompanying old farming sheds. Agricultural uses are near dormant with only some cattle grazing on the vegetation over the site. Site is selectively cleared in places whilst other areas have been either thinned of mature vegetation or left unattended. In respect to the existing vegetation please refer to the Ecological Assessment (**Appendix 11**).
- Part Lot 240: Industrial use – Soil and fertilizer reconditioning and distribution. The site tenant, Amgrow, mixes and distributes fertiliser on a wholesale basis. Warehouse buildings and ancillary offices are located within the dedicated leasehold area for the tenant as are mixing mounds and basins which form part of the fertiliser mixing and packaging operation.
- Part Lot 240: The area of this allotment located on the southern side of Christensen Road abuts Sandy Creek and remains uncleared scrub and bushland.
- Lot 4 on RP6843: Vacant rural land used for cattle grazing at a very low scale. Most of this lot and the surrounding area is cleared of vegetation.

4.3 FRONTAGE AND ACCESS

The site possesses dual frontage to Stapylton-Jacobs Well Road and Christensen Road. Existing dwelling access is gained from Stapylton-Jacobs Well Road via a rural crossover. Existing industrial access onto the site servicing the Amgrow soil conditioning tenancy is gained via Christensen Road. There are three industrial crossovers servicing this section of the site. No other formal access services the site from the Christensen Road frontage.

The frontage of the site along Stapylton-Jacobs Well Road is signposted at a speed of 60km/h. Stapylton- Jacobs Well Road is defined as an Arterial-Major industrial road under the YEA local area plan and links with the Pacific Motorway to the west and eventually arrives at Jacobs Well to the east. The frontage of the site along Christensen Road is also signposted at a speed of 60km/h and is currently a no through road. Christensen Road is defined as a major industrial road and links with Stapylton-Jacobs Well Road to the west and terminates to the east until it is linked with industrial development further eastwards.

Given the semi-rural and industrial nature of the surrounding areas, no footpaths exist along either road frontage of the site.



4.4 VEGETATION ON SITE

An ecological assessment has been performed over the site (**Appendix 11**). The assessment identifies features of the existing vegetation on-site and outlines how the proposed development, in terms of the clearing and rehabilitation of the site, shall take place consistent with existing state and local ecological guidelines.

4.5 SITE CONTAMINATION

Searches (**Appendix 17**) indicate that one of the site allotments (Lot 1) is listed on the Environmental Management Register for the existence of a disused Livestock Dip or Spray race (see Table 6 below). Additional specialist investigation has been undertaken in respect to this contamination trigger and a preliminary site investigation has been performed by ADG Consulting which is located at **Appendix 15**. Additional, more detailed investigations will be required as the property is developed in order to mitigate these contamination issues.

Table 6: Lot contamination potential

Lot	Land-use	Contamination
Lot 1 on RP6882	Low scale agriculture and homestead	Listed on EMR for the notifiable activity – <i>Livestock Dip or Spray Race</i>
Lot 240 on W31320	Part agriculture, part industrial activity – manufacturing and distribution of soil conditioners, potting mixes, fertilisers etc.	Not listed on EMR or CLR
Lot 4 on RP6843	Low scale agriculture	Not listed on EMR or CLR



5.0 VISUAL AMENITY AND SURROUNDING USES

5.1 TOPOGRAPHY / VIEWS

A contour and detail survey plan of the site is located in **Appendix 5** of this submission. The site is over 73Ha in size and ranges in topography from low points of between 3 – 6m AHD located along the Staplyton Jacobs Well Road frontage of the site and high points of between 20 – 23m AHD in sections located in the north-east of the site and along the western-most frontage of the site along Christensen Road.

The site grades down generally to the west, being the frontage of Staplyton-Jacobs Well Road, and a gully to the east towards the eastern boundary and south east near Christensen Road. The site is roughly split by an undulating ridgeline that moves from south-west to north-east. Views are gained from this ridgeline to the west and east/south-east.



Figure 5: Aerial view of site displaying surrounding development
Source: Nearmap

5.2 SURROUNDING LAND USES

Surrounding land uses to the site are outlined in Table 7 below (Please also refer to the Site Analysis Plan at **Appendix 4**).

Table 7: Surrounding land-uses

Surrounding land uses	
Direction	Land uses
North	- The site immediately abuts a range of industrial uses to the north. Of particular note are industrial uses along Angel and de Bortoli Roads such as Dick Johnson Racing, Fabtex and Yatala Landscape supplies. Two large warehousing sites are also located to the immediate north of the site. - To the further north and north-west along Quarry and Rossmanns Roads lie the Stapylton Landfill and a deactivated quarry that has now given way to the approved Gold Coast Moto-cross facility.
South	- To the immediate south of the site, lying closest to Stapylton Jacobs Well Road is 'The Lodge' residential community. This gated community houses 160 homes which appear to be separately owned but under the control of a body corporate and park managers. Further eastwards along the southern boundary lie a range of industrial uses. - To the further south west lies the service road/Stapylton-Jacobs Well interchange for the Pacific Motorway. Beyond the Motorway to the immediate south lie more industrial uses such as the Carlton United Brewery etc which form part of the Yatala Enterprise Area.
East	- To the immediate east of the site lies the Stapylton land-fill and recycling centre which is buffered from the site with vegetation. - Further east lies the Boral quarry which is still active.
West	- To the immediate west / north-west of the site is Stapylton Jacobs Well Road and farming land. Almost all of this land is flood-prone. - To the further west lies the BP Service Centre which eventually gives way along Henry Hester Drive to the yet to be opened Beenleigh Outlet Centre.



5.3 SITE PHOTOS



Photo 1

View of site from Stapylton-Jacobs Well Road from the north-west looking south-east.



Photo 2

View of existing access to the site from Stapylton-Jacobs Well Road looking east.



Photo 3

View of site and residences abutting the southern boundary of the site looking south-east.



Photo 4

View of cattle crossing / culvert underneath Stapylton-Jacobs Well road looking west.



Photo 5

View of centre of site from the south-west looking north-east.



Photo 6

View looking west from higher point along northern boundary of site observing interface between the site and existing industrial land-uses to the north.



Photo 7

View of existing vegetation on-site looking east along the northern boundary.



Photo 8

View of topography and vegetation on-site looking south-west from central part of site.



Photo 9

View of vegetation located on the site located to the south of Christensen Road.



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**GENERATIONS
INDUSTRIAL PARK**

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Photo 10

View of frontage of warehouse facility servicing the fertiliser tenancy located upon the site.



Photo 11

View of industrial use located to the immediate south, across the road, of the Amgrow tenancy located upon the site.



Photo 12

View of existing industrial uses located along Christensen Road.

6.0 THE PROPOSED DEVELOPMENT

6.1 THE PROPOSAL

This development application seeks a range of approvals itemised as follows:

- Preliminary Approval affecting a local planning instrument for industrial uses pursuant to s.242 of the *Sustainable Planning Act 2009 (SPA 2009)*; and
- Preliminary approval pursuant to s.241 of the *SPA 2009* for operational works (Changes to ground level – earthworks).

In general terms, the development sought is a change to the preferred underlying land-uses allowed to be developed upon the site primarily allowing uses consistent with those that are preferred to be developed within the Precinct 1 – General Business and Industry land use designation of the Yatala Enterprise Area Local Area Plan.

In terms of the plans and associated documents that are specifically sought to be approved by Council, table 8 below summarises the relevant documents and where they are located within this submission:

Table 8: Plans for assessment and approval

Development permit type	Plan Reference	Plan Type	Appendix
Preliminary approval under s.242 of the SPA2009	Generations Industrial Park Place Code & GDP Plan 5093 P 00 09C	Land-use classification plan	Appendix 3
Preliminary approval for earthworks	Hyder Consulting	Bulk earthworks plans	Appendix 6
Landscape (S.242)	GDP Plan 5093 L LI 01	Statement of Landscape intent	Appendix 4

Accompanying these plans is a range of supporting technical reports and documents identifying and commenting upon the many features of the development proposal. These documents are itemised and summarised in **section 3** of this report.

Key features of the proposed development are highlighted within the sections below.



6.1.1 The s.242 Preliminary Approval - Generations Industrial Park place Code

The intent of the s.242 preliminary approval is to 'graduate' the preferred land-use and subdivision potential of the site from its existing land use designation of **Precinct 4 – Future Business and Industry** (of the Yatala Enterprise Area Local Area Plan) to uses more suited to **Precinct 1 – General Impact Business and Industry – Industry, Manufacturer's Shop, Warehouse and Service Industry** (plus **Open storage area**). To explain it broadly, the impact of this 'graduation' would be to have available for development upon the site a wider range of industrially-related land-uses at lower levels of assessment and to facilitate a reduction in the minimum lot size allowable for subdivision (4,000m² in area).

The desired changes are implemented through the Generations Industrial Park Place Code (**Appendix 3**) which seeks to amend the existing planning controls relevant to the site as they currently appear in the Yatala Enterprise Area Local Area Plan (YEA LAP) Place Code of the Gold Coast Planning Scheme. For a detailed description of the Place Code and comments concerning the specific planning control changes that are being introduced please refer to the discussions provided in **Section 9.9** of this report. The section outlines each part of the Place Code and how they propose to change the existing code criteria. The majority of the changes seek to tailor land uses and code requirements to the features and characteristics of the site and the proposed development. In short, the Place Code seeks to introduce two separate, but related, precincts, the intents of which are described within the precinct intent of the Place Code document. These precinct intents are as follows:

Precinct 1 (General Impact Business and Industry): The land-uses promoted in this precinct, which covers the bulk of the developed site, are largely consistent with those itemized within the Precinct 1 land use designation of the YEA LAP. The ultimate intent of this precinct is to promote the land uses and allotment sizes that would ordinarily be located within Precinct 1 land located within the YEA LAP. The proposal does not specifically seek all preferred land-uses within Precinct 1, but rather, selected popular uses that are often frequent within industrial estates.

An area within the Precinct 1 designation forms a smaller 'sub-precinct' that is located adjacent to a gated community title residential village to the south. In accordance with relevant acoustic advice, this sub-precinct shall accommodate for the range of uses allowable under Precinct 1 although the built form requirements of development within this area will be subject to appropriate acoustic attenuation measures which are incorporated into the self-assessable criteria of the Place Code.

Precinct 6 (Open Space/Reserve): This precinct is reflective of the land-uses that would otherwise be promoted within the Precinct 6 – Open Space land-use designation of the YEA LAP. All areas within the site that are highlighted as Precinct 6 are either existing protected vegetation or future rehabilitated buffer / ecological reserve consistent with ecological analyses and rehabilitation plans forming part of the overall development of the site.

The locations of these precinct areas are displayed in the land-use classification plan which forms part of the Place Code, an excerpt of which is provided below. The figure emphasises the location of the sub-area that is subject to additional design controls and its proximity to adjacent residences.

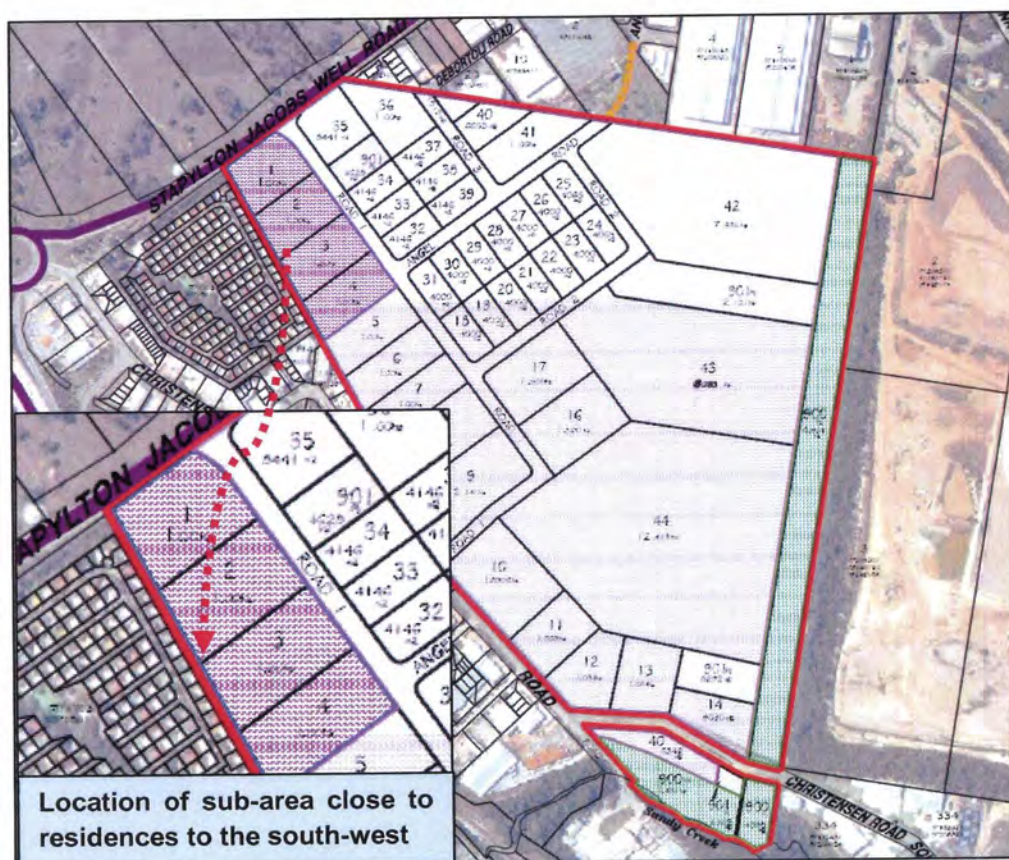


Figure 6 : Land-use classification plan
Source: Generations Industrial Park Place Code (Appendix 3)

- Variations to land uses

In respect to the Generations Industrial Park Place Code, the approach to preferred land-uses begins with a base reflecting various major land-uses located within the table of development for Precinct 1 – General Impact Business and Industry as it is compared to the existing Precinct 4 – Future Business and Industry land-use designation of the site. It is submitted that this is the more efficient approach to be taken in terms of viewing and implementing the document when used by others in the future. The proposed changes to preferred land-uses from the existing land use designation (Precinct 4) to the proposed land-use designations are outlined in table 9 below.

Table 9: Changes to level of assessment for uses within proposed table of development

Change to level of assessment	Land uses
Retained (same level of assessment)	Exempt: Agriculture, Animal Husbandry, Conservation (natural area management), Low-Impact Telecommunications facility, Minor Change in the scale or intensity of an existing lawful use, Park, Public Utility.
	Self Assessable: Detached Dwelling, Milk Depot, Temporary Use
	Code Assessable: Bulk garden supplies, Caretaker's residence, Estate sales office, Family accommodation, Rural industry, Telecommunications facility n.e.i, Wholesale nursery
	Impact Assessable: Salvage yard, Transport terminal
Excluded (out of table of development)	Farm forestry, Farm stay, Refuse disposal, Refuse transfer station
Impact (P4) to Self Assessable	Industry
Introduced to Self Assessable	Manufacturer's shop, Open storage area, Warehouse
Introduced to Code Assessable	Service industry
Introduced to Impact Assessable	Nil

In short, four new uses are introduced to the site, all of which are to be assessed on a self-assessable basis apart from Service industry which will remain assessable on a code assessable basis. All of these proposed uses are reflective of the levels of assessment these uses would hold with Precinct 1 of the YEA LAP apart from Open storage area. This use is introduced in order to aid the existing landowner to add temporary value to its site during challenging economic times. As a matter of course, once future development



opportunities arise to develop the site in a more formal and permanent fashion, any Open storage areas will fall away in favour of a properly developed industrial site.

- Variations to assessment criteria

As mentioned above, the primary variations to the existing place code criteria of the YEA LAP are those that are tailored towards the location of the site and the development options provided in the land-use classification plan. All changes have been itemised and commented upon within **section 9.9** of this report. In summary, the changes address matters such as the following:

1. *Acoustic impact mitigation:* The location of the site near sensitive receivers to the south west, 'the lodge' residential community, has prompted the applicant to adopt an approach to ensure the impacts of the development, primarily noise related, are addressed at this stage of the development process. Accordingly, acoustic advice has been obtained (**Appendix 13**) recommending that nil lot side setbacks be used during future development of the site in order to create an acoustic barrier between the future uses on the lots located within precinct 1 and the residences to the south west. A 10m rear setback requirement has also been considered in order to pull the uses away from residences and to address the height differences between the finished lot levels and nearby housing (5m height difference in places) through the construction of batters and retaining walls. This setback area shall be vegetated and maintained by lot owners with lot access being gained from the Stapylton Jacobs Well Road frontage of the site (See the Landscape intent plan at **Appendix 4**). These setback allowances have been incorporated into the Place Code.
2. *Conservation/Ecological linkages:* The main differences between the YEA LAP Place Code conservation requirements and the proposed Place Code requirements are the development controls that will be specifically tailored to the development of the site rather than the YEA in general. A 50m setback from Sandy Creek is proposed as is a 50m vegetated buffer from the eastern boundary which provides a good separation between future uses and the Stapylton transfer station. These setback requirements are incorporated into the Place Code through endorsement of the land-use classification plan and the refined land-use controls of Precinct 6.
3. *Minimum and average lot sizes:* Given that the pursuit of the preliminary approval is to 'graduate' the land-use designations of the site to those similar to Precinct 1 of the YEA LAP, the Place Code and table of development have been varied to ensure that the Precinct 1 minimum and average lot size requirements are the only lot size requirements applicable to the development of the site.



Discussions in relation to the planning justifications for this preliminary approval are provided in **section 8** of this report. Further discussion in relation to the issue of 'need' for the preliminary approval is also provided in **section 6.2** below.

6.1.2 The s.241 Preliminary Approval – Earthworks (Changes to ground level)

The proposed preliminary approval for earthworks (changes to ground level) seeks Council endorsement in principle of bulk earthworks plans proposed for the development of the site (**Appendix 6**). Given the variation of slope over the site, reasonably extensive earthworks are proposed in order to produce future levels and allotments that are both large and flat, which are essential features for the provision of functional industrial parks. The earthworks plans outline all areas of proposed cut and fill and provide details of indicative retaining walls and batters that shall be built as part of the earthworks component of the development. Proposed stormwater basin design and sediment and erosion control plans are also provided within the suite of earthworks sketches.

As identified at pre-lodgement with Council, it is noted that part of the site is located under Q100 flood levels. This area, located along the Stapylton-Jacobs Well frontage of the site, shall be raised above flood levels via compensatory earthworks and, to ensure a flood storage balance for the earthworks is achieved, the proposed fill will be taken from a nearby site owned by the applicant located within the existing floodplain catchment area. This site is included in the formal documentation of the development application. It is located along Yellowwood Road, not far from the development site and is rural in nature. After the applicable earthworks have been performed, the lot shall be returned to its existing use as grazing land for dairy cattle. It must be emphasised that the preliminary approval for earthworks only applies to this site, and no other development is proposed over this land.

Relevant searches and investigations over the 'flood balance' site have been conducted. It is generally cleared land with no concerns raised in relation to relevant vegetation mapping. As there is no urban development being proposed over the site, the proposed earthworks do not conflict with any significant planning features or constraints associated with the lot. The figure below displays the earthworks proposed over the lot. A full discussion of the proposed earthworks is provided in the attached stormwater management plan by Hyder Consulting (**Appendix 8**).

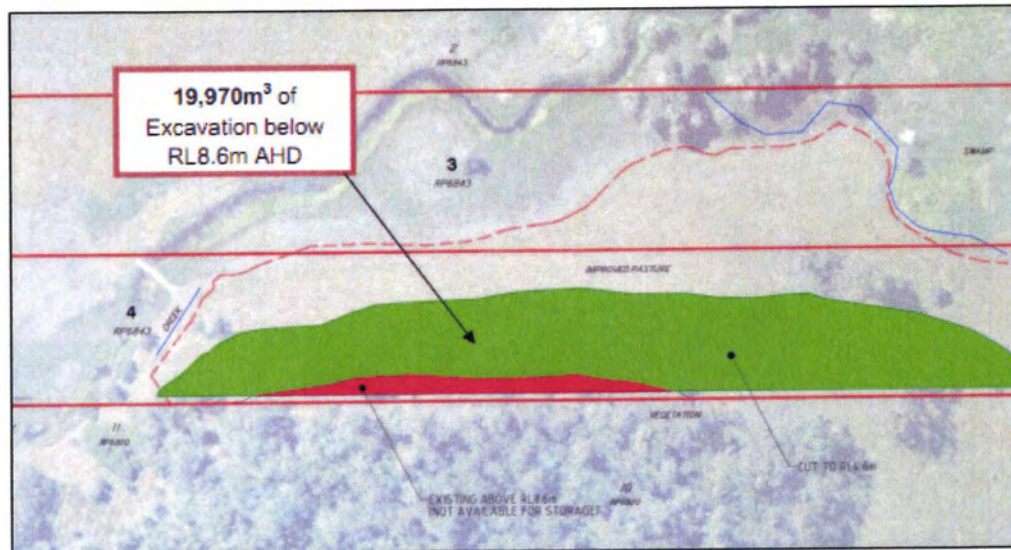


Figure 11 : Excerpt of bulk earthworks design plan
Source: Hyder Stormwater management plan (**Appendix 8**)



6.2 KEY ISSUES SUMMARY

Items of relevance as they relate to Council's Planning Scheme requirements or comments at pre-lodgement, are identified and discussed below (also, see **section 11** of this report).

6.2.1 Comment in respect to 'Need'

Given the nature of the development application, being a s.242 preliminary approval for a Precinct 1 – General impact business and industry land-use designation (from Precinct 4 – Future business and industry) it has been raised by Council officers at pre-lodgement that a 'needs analysis' would be necessary in order to justify the conversion of the site from its existing land-use designation under the YEA LAP to its 'ultimate' land-use designation. It is submitted that a 'needs analysis' is not required for this development application for the following reasons (please also refer to **section 9.8.2** of this report in respect to planning analysis regarding this issue):

- Infrastructure provision: It is noted in the planning discussions in **section 9.8.2** below that one of the key elements required to be satisfied in order for Precinct 4 land to be changed to its ultimate precinct land-use designation is a satisfactory connection to infrastructure. An engineering services report has been supplied by Hyder Consulting (**Appendix 9**). This report, among other things, indicates how the site shall connect to essential infrastructure (such as stormwater, water, sewer, electricity, gas and telecommunications) as it is developed. Relevant network analyses were conducted and the report demonstrates that connection to relevant infrastructure will be successful. Details of these recommendations are provided within the report, however, in general, the report recommendations indicate that lack of connection to infrastructure shall not be an impediment to the development moving forward. This, in turn, validates the argument, on planning grounds, that the site may be moved from a Precinct 4 to a Precinct 1 land-use designation without the requirement for a 'needs analysis' to be undertaken.
- Nature of surrounding development: As the various context plans (**Appendix 3**) and site observations (**Section 4** of this report) indicate, extensive industrial development has taken place to the north and the south of the site. Development to the east and the west is limited by flooding - land-use restrictions over land to the west and the existence of the Stapylton transfer and recycling facility on land immediately to the east. The proposed development would essentially provide the essential road linkages between Angel Road (see also details of development approval over the Drive-inn movie theatre site – **GCCC Ref. MCU 2900044**) and de Bortoli Street in the north to Christensen Road in the south and would formalise the



connection between developed lot frontages located to the east and west of the site along Christensen Road. Significant development has also taken place to the further north of the site along Stapylton-Jacobs Well Road where, it is fair to presume, access to infrastructure and planning concerns would be even more unfavourable for such sites. Accordingly, the context of the site, as it relates to surrounding industrial development, is such that its actual location should not be an impediment to the development of the site. If anything, given the critical location the site holds in relation to the eastern side of the Yatala Enterprises Area, development of the land should be encouraged in order to generate the natural road and ecological linkages that would be provided as a result.

- Consistency with respect to previous Council decisions: As touched upon in the above point, land located to the north of the site (designated Precinct 4 of the YEA LAP) has been extensively developed. In particular, an approval was issued by Council in relation to a proposed preliminary approval and subdivision on a site located along Stapylton Jacobs Well Road (**GCCC Ref. PN128398/12/DA4**) which did not require a 'needs analysis' to be completed. Comparing the locations of that development site and the subject site, logic would suggest that the greater need for a 'needs analysis' would be required for the site located further away from existing Precinct 1 land. Given Council's previous decision, and the close proximity of the site to developed industrial land, it would be fair, therefore, to suggest that a needs analysis should not be required.

In general, it is submitted that the requirement for a 'needs analysis' in respect to the development of the site has been 'outstripped' by the pace and status of development within the surrounding proximity of the site. Key concerns relating to provision of infrastructure can be resolved and so there appears to be no underlying or need to require a needs analysis for this development application.

6.2.2 Impacts of development upon residential uses to the south west

As discussed at pre-lodgement, Council and the applicant are both, quite rightly, aware of the impacts that the development of the site shall have upon the residential community located along the south-western border of the site. It is important to note, however, the existing circumstances of, and the level of development surrounding, this residential estate. From a noise impact point of view, for example, it is noted that it is located very close to Stapylton-Jacobs Well Road (a state-controlled road) and the Pacific Motorway interchange as well as being adjacent to industrial uses. From an odour point of view it is noted that the Stapylton waste transfer station is located several hundred metres away to the north-west. So, essentially, the existing levels of amenity enjoyed by residents are largely compromised at this point in time.

It is, however, acknowledged that the development will have additional impacts upon the amenity of the residential community. Areas that cannot be addressed by this development application are those such as dust and odour which are generated by specific users and would come later on during future development applications. It was considered that a restriction to particular land uses over the area of the site closely located to the residential estate should be implemented via the proposed Generations Industrial Park Place Code. However, after consideration of acoustic advice, it was resolved to be appropriate that the requested land use designations remain because other development criteria and regulations should capably address the impacts that future users could potentially have. Accordingly, a focus upon acoustic and visual amenity with respect to the welfare of the residents has been considered in this application. Comments in relation to these items are as follows:

- Acoustic amenity: Relevant acoustic reporting has been undertaken (**Appendix 13**) and report recommendations have been incorporated into the self assessable built form criteria within the Generations Industrial Park Place Code (**Appendix 3**). The recommendations require nil building side boundary setbacks in order to provide, by operation, a large acoustic barrier along the widths of future allotments located close to this boundary. A specific precinct within the Place Code is created to ensure, spatially, end users of the site know **where** these setback requirements shall apply.
- Visual amenity: To buffer the industrial units from the residential uses a 10m wide vegetated buffer is also proposed along the rear boundaries of future allotments. This 10m building setback requirement is also incorporated into the Place Code. This vegetated buffer will provide residents with a reasonable separation from the rear concrete wall panels of the industrial buildings. The nature of this vegetation is identified in the attached Landscape intent plan (**Appendix 4**). Maintenance of this area will be the responsibility of individual lot owners and access to the buffer area shall be gained via Stapylton-Jacobs Well Road. It is noted that the finished height differential between the industrial allotments and the residential community will vary. Where possible, batters will be used instead of retaining walls to ensure a gradual buffered effect is evident. The slope of the batters will likely be 1 in 2 which will still be accessible and able to be maintained manually by lot owners.

6.3 PUBLIC CONSULTATION

Community consultation with the landowners and body corporate representatives of the 'Lodge' residential community regarding the proposed development shall be undertaken prior to issue of Council's acknowledgement notice. It is hoped that commencing a dialogue with the property owner's early on in the development assessment process will enable the applicant to communicate its views to residents and, by the same token, residents can provide input to the applicant prior to the commencement of formal public notification of the development application.

NB. There are several other more technical issues that could be discussed at length in this section of the report such as stormwater basin design, landscape design, detailed infrastructure provision and site contamination (dip site) but direct reference to the technical reports in relation to these issues (and others) is a more effective approach to analysing these items in isolation.

7.0 THE SUSTAINABLE PLANNING ACT 2009

7.1 RELEVANT SECTION(S) OF THE SUSTAINABLE PLANNING ACT 2009

Sections 314 and 316 of the *Sustainable Planning Act 2009* (SPA 2009) specify those matters that must be addressed by the assessment manager as part of any **Impact Assessable** development application including a preliminary approval under s.242 of SPA 2009. Reference items raised within these sections are summarised as follows:

- Relevant State planning regulatory provisions;
- Relevant regional plans;
- Applicable codes under IDAS or the SPA 2009;
- Relevant State planning policies;
- Any codes within relevant structure plans, master plans, temporary local planning instruments, preliminary approvals or planning schemes;
- Any development approval for, or lawful use of, premises the subject of the application or adjacent premises;
- Any referral agency's response; and
- Regarding the s.242 component the consistency the proposed variations will have with aspects of the local planning instrument and the effect the proposed variations would have on any right a submitter may be entitled to for following applications.

We consider the information contained in this report and the submission as a whole to be sufficient for Council to make an informed assessment of the proposal.

In relation to the preliminary approval it is noted that this planning report makes provision for the assessment of the proposal against the existing Planning Scheme controls before individually assessing the merits of the proposed Generations Industrial Park Place Code.

7.2 PUBLIC NOTIFICATION

The proposed development shall be Impact Assessable. Accordingly, public notification under Chapter 6, Part 4, Division 2 of the *Sustainable Planning Act 2009* will be required.

8.0 REGIONAL AND STATE POLICY MATTERS

8.1 RELEVANT OVERLAY ANALYSIS

SOUTH EAST QUEENSLAND REGIONAL PLAN 2009-2031

The site to be developed is located within the Urban Footprint designation of the South East Queensland Regional Plan. Lot 4 is located in the Rural Production and Regional Landscape designation of the SEQRP. It is noted that Lot 4 is subject to proposed preliminary earthworks only.

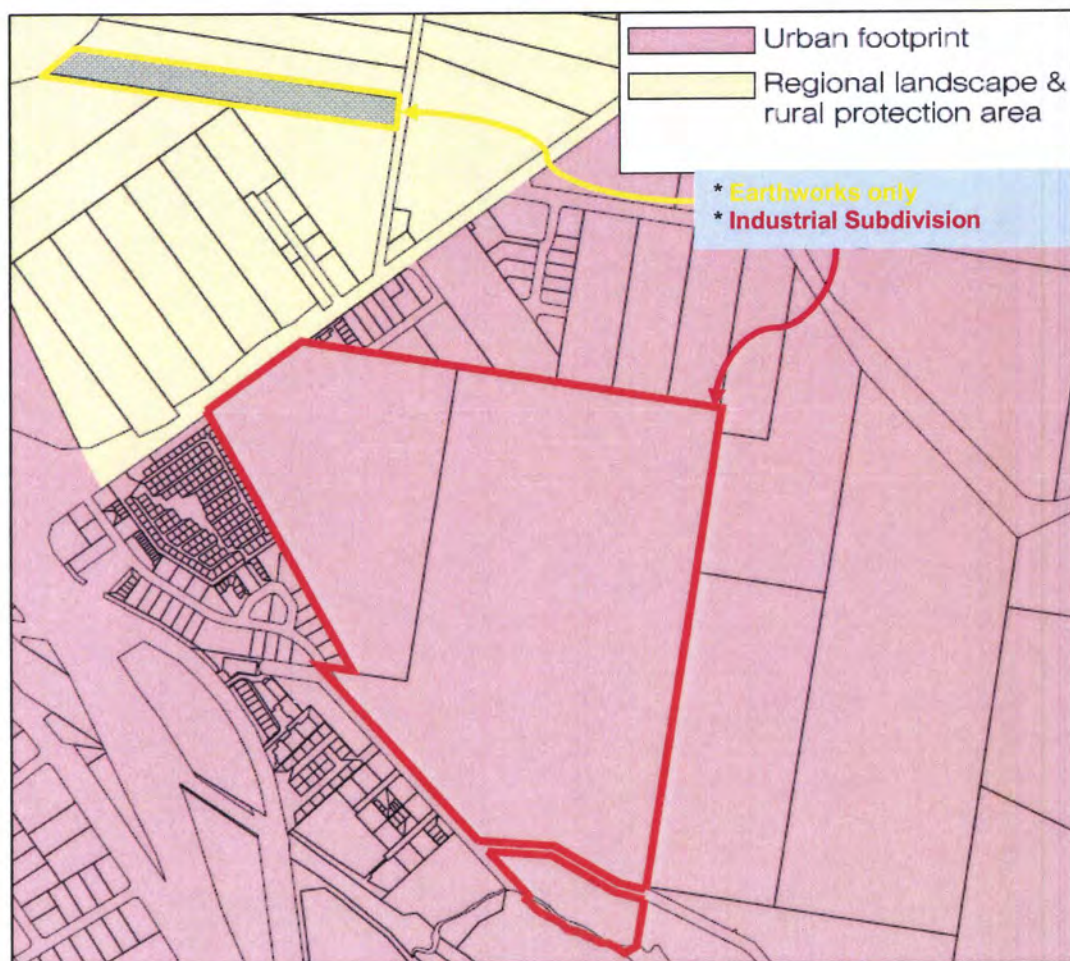


Figure 12 – SEQRP designation
Source: DLGP, 2011

EXISTING SIGNIFICANT VEGETATION

An inspection of the latest DERM Regional Ecosystem maps indicates the site retains vegetation that is included within the Remnant of Concern and Remnant Not of Concern Regional Ecosystems. The Remnant of Concern vegetation is not proposed to be cleared as part of this application. No vegetation on site is identified in the Remnant Endangered Regional Ecosystem. Please refer to the Ecological Assessment enclosed at **Appendix 11** for further comment.

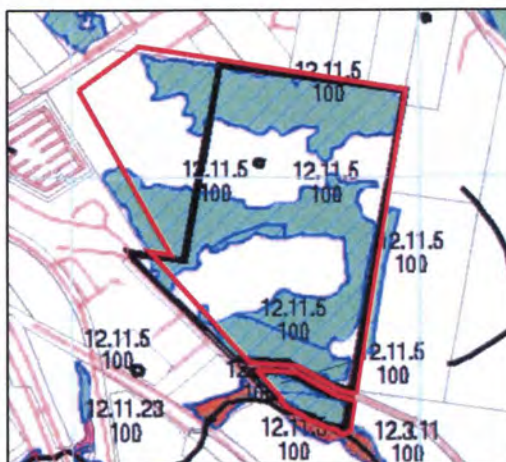


Figure 13 – Regional Ecosystem Mapping
 Source: DERM, 2011

REFERRABLE AREAS

An inspection of the latest DERM mapping of Referrable Areas indicates the site *is not* included within:

- Conservation Estate; or
- Heritage Places.



Figure 14 – Referrable Areas Mapping
 Source: DERM, 2011



REFERRABLE WETLANDS

An inspection of the latest DERM mapping of Referrable Wetlands indicates the site *is* included within or located sufficiently near to:

- Referrable Wetland Areas.



Figure 15 – Referrable Wetlands Mapping
Source: DERM, 2011

SIGNIFICANT KOALA VEGETATION

An inspection of the latest South East Queensland Koala Conservation State Planning Regulatory Provisions (Assessable Development Areas) indicates the State Planning Regulatory Provisions shall not apply to the site.

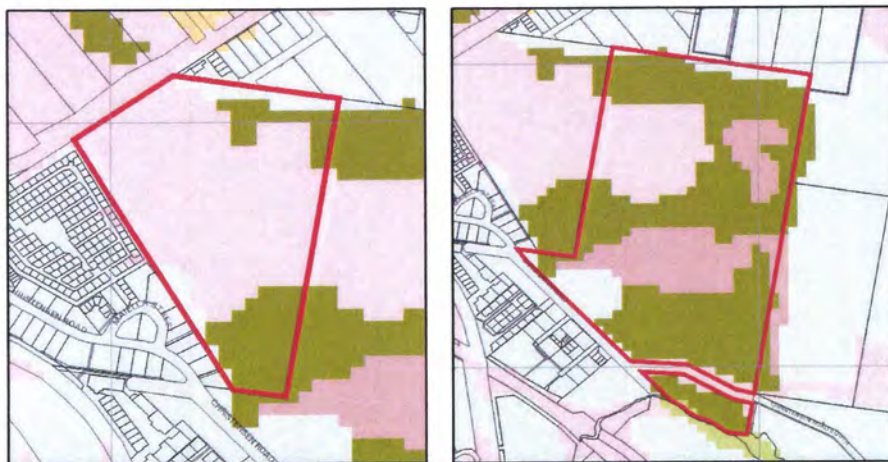


Figure 16 – SEQ Koala SPRP
Source: DERM, 2011



STATE CONTROLLED ROAD NETWORK

An inspection of the latest Department of Transport and Main Roads (DTMR) State Controlled Roads mapping indicates that the site is located on a state-controlled road. The application shall be referred to the Department of Transport and Main Roads (DTMR) as a concurrence agency. Pre-lodgement discussions have been undertaken with DTMR planners and engineers. Notes of these discussions are provided in **Section 11** of this planning report.

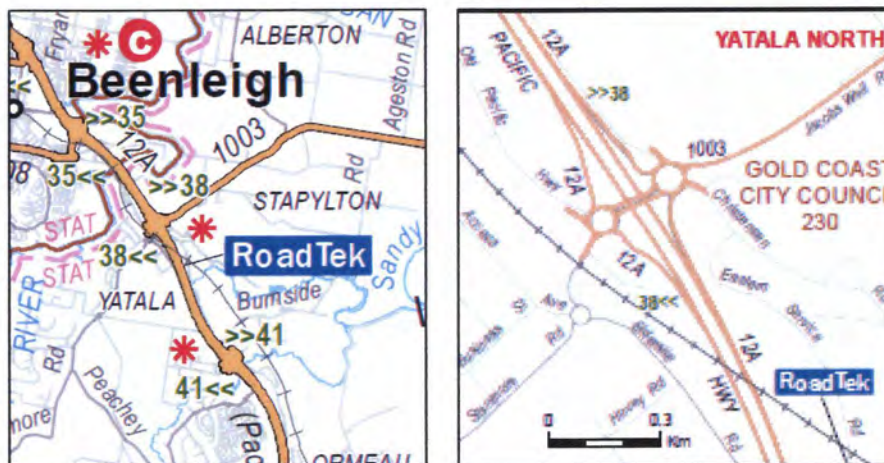


Figure 17 – State Controlled Roads mapping
Source: DTMR, 2011

8.2 STATE PLANNING POLICIES

Table 11 below contains details of each State Planning Policy (SPP) with comments on their respective relevance to this application.

Table 11: State Planning Policies

State Planning Policies and comment	
State Planning Policy	Comment
SPP 1/92 Development and the Conservation of Agricultural Land	Applicable – the site to be developed for urban purposes is not highlighted for agricultural activity under this policy. However, Lot 4 is raised as relevant for GQAL purposes. It is noted, however, that lot 4 shall be used for flood storage balance earthworks requirements only. The lot shall return to agricultural use once the relevant earthworks have been performed over the site. The earthworks will not compromise the ability of the land to be used for agricultural purposes.
State & Regional Coastal Management Plans	Not Applicable – the site is not located within a coastal zone.
SPP 1/02 Development in the Vicinity of Certain Airports and Aviation Facilities	Not Applicable – the site is not within the vicinity of the airports and aviation facilities mentioned within the State Planning Policy.
SPP 2/02 Planning and Managing Development Involving Acid Sulfate Soils	Applicable – Given the location of the site, the site contours and the amount of bulk earthworks proposed an Acid Sulfate Soils investigation and management plan have been undertaken and are attached herein at Appendix 14 .
SPP 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide	Applicable – the site is not affected by any landslide constraints. The site is partially flood affected. It is proposed that any future developed allotments shall be raised above the applicable flood height and flood storage balance will be obtained through earthworks undertaken on another site located within the existing flood-plain and catchment area. Applicable earthworks plans display how the site may potentially be developed in order to address this site constraint. For full detail in relation to this matter refer to the enclosed bulk earthworks plans (Appendix



State Planning Policies and comment	
State Planning Policy	Comment
	6) and Stormwater Management Plan (Appendix 8). The site is highlighted as being affected by low and medium bushfire risks. It is noted that surrounding development is primarily cleared developed industrial land and the site itself shall be cleared in anticipation of future industrial development. Accordingly, it is submitted that bushfire management requirements are not relevant unless otherwise raised by Council.
SPP 1/07 Housing and Residential Development	Not Applicable – the applicant is not a local government.
SPP 2/07 Protection of Extractive Resources	Applicable – The site is located close to the Boral Quarry which is located along Rossmanns Road which gains access onto Stapylton-Jacobs Well Road – a major extractive haulage route. In respect to the impacts that the development shall have upon the haulage route itself please refer to the Traffic Impact Assessment at Appendix 10. Note also that preliminary discussions have been entered into with DTMR officers about the impacts the development shall have upon the state-controlled road network and what upgrades shall be required. In respect to the Extractive Resources Policy, in particular, it is noted that the proposed development is for a preliminary approval that is strictly industrial in nature and that no intensive independent residential uses are allowable under the Table of Development contained within the Generations Industrial Park Place Code. Therefore, the proposed development satisfies the critical elements of the specific outcomes within the planning policy as it minimises the potential harm that may afflict people congregating on the site. Such people will be future workers only. From a human health point of view, the proposed uses shall restrict the potential for human harm and from a traffic impact point of



State Planning Policies and comment	
State Planning Policy	Comment
	view, the development will be gradual in impact and traffic analysis has been undertaken to consider how the development shall effectively integrate with the haulage route.
SPP 1/09 Reconfiguration of a Lot Code for land in Indigenous Local Government Areas to which a local Planning Scheme does not apply	Not Applicable – the site is not located within a local government area, as per Part 2 of the policy.
SPP 2/09 Acceleration of Compliance Assessment	Not Applicable – compliance assessment is not sought as part of this application.
SPP 1/10 Protecting wetlands of high ecological significance in Great Barrier Reef catchments	Not Applicable – the site is not located within a Great Barrier Reef catchment area..
SPP 2/10 South East Queensland Koala Conservation	Not Applicable – the site is not located within a koala habitat protection area. For further comment in relation to this item please refer to the Ecological Assessment herein at Appendix 11 .
SPP 5/10 Air, Noise and Hazardous Materials	Not Applicable – the site is not located within a designated management area under the SPP. The DERM guideline in relation to this SPP states as follows: <i>“The SPP only applies in development assessment if the policy outcome for the SPP has not been reflected in the relevant local planning instrument. If this has not yet occurred, the development assessment part of the SPP applies if the following three criteria are met (all have to be met):</i> <i>• The development is already assessable development.</i> <i>• The development is a reconfiguration of a lot, or a material change of use for the purpose of a sensitive use.</i> <i>• The development or any part of the development is within a management area.”</i> The only management area within the Gold Coast LGA is located over Beattie Road, Waterway Drive and Shipper Drive in Coomera

State Planning Policies and comment	
State Planning Policy	Comment
	which does not involve the subject site. As noted in other areas of this submission, however, due attention to the amenity of the nearby residents has been provided and satisfactory buffering requirements are recommended for implementation.

8.3 STATE PLANNING REGULATORY PROVISIONS

Table 12 below contains details of each State Planning Regulatory Provision (SPRP) with comments on their respective relevance to this application. All other remaining SPRP are deemed not to be relevant to the development application on the basis that the proposed development does not trigger involvement or the site is not located within a specific catchment area.

Table 12: Relevant State Planning Regulatory Provisions

State Planning Regulatory Provisions and comment	
State Planning Regulatory Provision	Comment
South East Queensland Regional Plan 2009-2031 (SEQRP 2009-2031)	Applicable – Refer to figures in Section 8.1 above. The site to be developed is located within the Urban Footprint designation of the SEQRP. Urban activity within this area is suitable. Lot 4 is agricultural land that will be subject to compensatory flood balance earthworks only. This lot is located within the Regional Landscape and Rural Production designation of the SEQRP although the proposed earthworks on the site do not conflict with the regulatory provisions as the lot will be retained as agricultural land once the earthworks have been performed.
South East Queensland Koala SPRP	Not Applicable – the site is not located within a koala habitat protection area. For further comment please refer to the Ecological Assessment in Appendix 11.
Draft SPRP (adopted charges)	Applicable – It is expected that infrastructure charges based on this policy and the subsequent resolution adopted by Council to



State Planning Regulatory Provisions and comment

State Planning Regulatory Provision	Comment
	either apply or vary these charges shall be considered and the decision notice conditioned appropriately.



9.0 LOCAL PLANNING ASSESSMENT

9.1 RELEVANT LAND-USE DESIGNATION

The site is located within **Precinct 4 – Future Industry** of the Yatala Enterprise Area Local Area Plan.

Again, it is noted that the associated Precinct Plan, LAP Map 29.2, identifies the site to be located in **Precinct 3 – Future Industry**. For the purposes of this report and the planning application as a whole the historical term **Precinct 4 – Future Industry** will be used, as required.

9.2 DEFINITION OF DEVELOPMENT

- A preliminary approval affecting a local planning instrument pursuant to s.242 of the *SPA 2009* is proposed as part of this development. The Generations Industrial Park Place Code with accompanying land-use classification plan seeks to affect the local planning instrument.
- A preliminary approval pursuant to s.241 of the *SPA 2009* is proposed as part of this development for earthworks – changes to ground level and retaining walls.

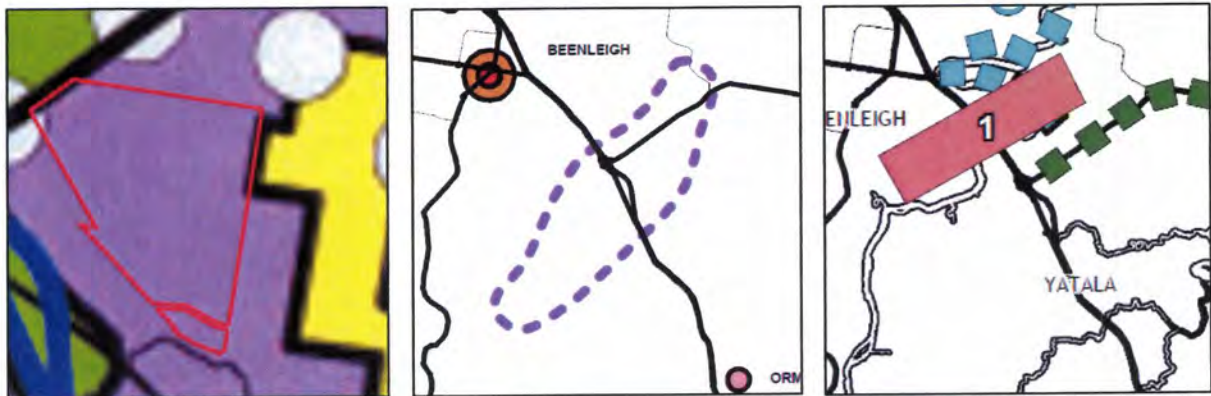
9.3 LEVEL OF ASSESSMENT

The proposed preliminary approval for industrial uses is determined as **impact assessable** development pursuant to the requirements of s.242 of the *SPA 2009*.



9.4 DESKTOP INVESTIGATION

9.4.1. Relevant Planning Strategy Maps



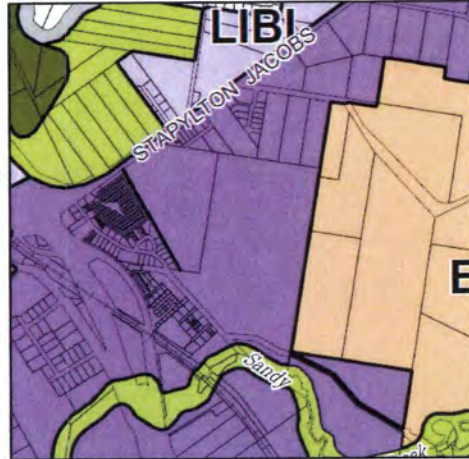
Figures 18, 19 & 20 above – GC Planning strategy maps PS1, PS4 & PS14
Source: GC Planning Scheme

Comments in relation to the above Planning Strategy Mapping are provided below:

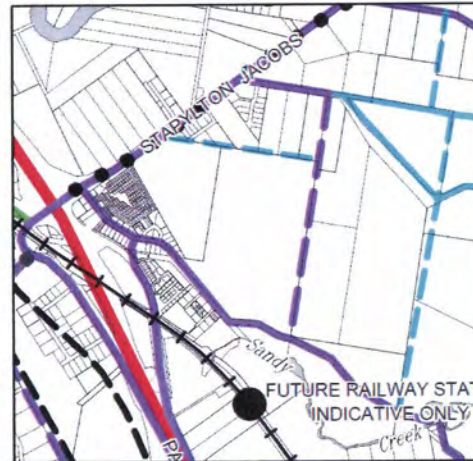
- Planning Strategy Map PS1 (Land use themes): The site lies in the 'industrial' land-use theme within this plan. The proposed development, being industrial in nature, does not conflict with this land use theme.
- Planning Strategy Map PS4 (Employment, Investment and Services Centres): The site lies in an 'Industrial Employment Cluster' within this plan. The proposed development, being industrial in nature, is consistent with this strategic goal for the site as it will, fully developed, create consistent employment opportunities for residents in and around the Gold Coast region.
- Planning Strategy Map PS14 (City Image Major Scenic Routes and Transitory Gateways): The site has frontage to Stapylton-Jacobs Well Road which is identified to be a scenic route (land) upon this plan. Given the fact that the site is located in a developed industrial area the frontage of the site, as it relates to the road, shall be industrial in nature. That said, adequate landscaping treatments will be provided to ensure (see Landscape Intent in **Appendix 3**) the future industrial park and access onto the site is adequately buffered yet visually appealing.

It is noted that other Planning Strategy Maps also apply to the site but the above maps are those that appear to be most relevant to the site in terms of its location and the proposed development.

9.4.2 Relevant LAP Plans



Figures 21 & 22 above – YEA LAP Place Code Maps 29.2 & 29.4
Source: GC Planning Scheme



Figures 23 & 24 above – YEA LAP Place Code Maps 29.3 & 29.5
Source: GC Planning Scheme

Comments in relation to above Local Area Plan Mapping are provided below:

- LAP Map 29.2 (Precincts):** The site is located within Precinct 4 – Future Industry of the Local Area Plan (LAP). The proposed preliminary approval seeks to convert the land from its existing land-use designation to uses mainly found within Precinct 1 – General Business and Industry, in line with development that has taken place around the site, the ability to provide relevant infrastructure, and the ultimate precinct designation targeted for the site under the LAP.

- LAP Map 29.4 (Ultimate Precincts): The 'ultimate' precinct designation for the site shall be Precinct 1 – General Impact Business and Industry. The proposed Place Code seeking to override the existing Planning Scheme 'Future Industry' designation shall promote the relevant tables of development and place codes
- LAP Map 29.3 (Conservation Area and Priorities): Conservation reserves and links affect the site as the relevant plan identifies. Alternatives to these linkages have been put to Council officers in prior meetings with agreement upon the proposed buffering and rehabilitation areas being met. Please also refer to the attached Ecological Assessment and Open Space Management Statement (**Appendices 11 & 12**). For more comment regarding Council feedback on this issue please refer to the Pre-lodgement meeting minutes (**Appendix 17**).
- LAP Map 29.5 (Transport Infrastructure): Proposed road links affect the site as the relevant plan identifies. Alternatives to these roads have been put to Council officers in prior meetings with agreement upon the proposed layout being met. Please also refer to the attached Traffic Impact Assessment (**Appendix 10**). For more comment regarding Council feedback on this issue please refer to the Pre-lodgement meeting minutes (**Appendix 17**).

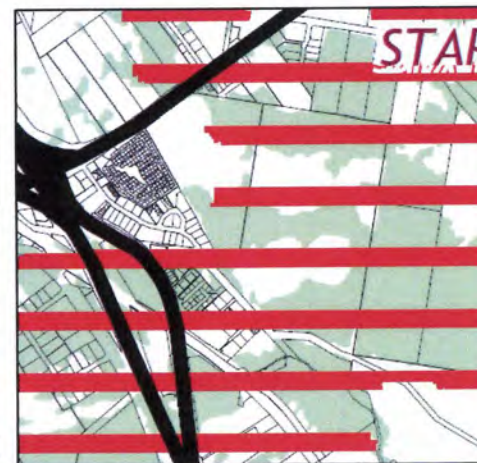
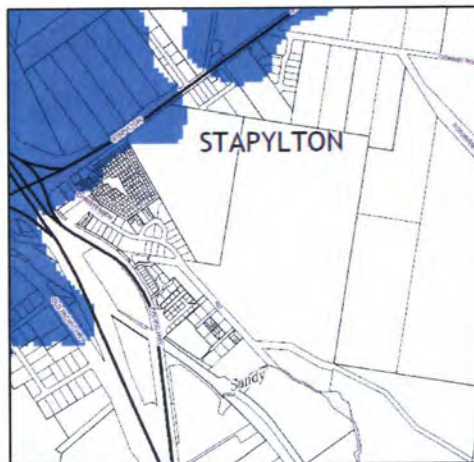
It is noted that other Local Area Plan Maps also apply to the site but the above maps are those that appear to be most relevant to the site in terms of the features of the proposed development and relevant issues to be discussed.



9.4.3 Relevant Constraint Plans



Figures 25 & 26 above – Overlay Maps OM10 & OM11
Source: GC Planning Scheme



Figures 27 & 28 above – Overlay Maps OM17 & OM20
Source: GC Planning Scheme

Comments in relation to the above relevant Overlay Mapping are provided below:

- Overlay Map 10 (Potential Bushfire Hazard Areas): It is noted that both low and medium bushfire risks are applicable to the site. It is noted, however, that the proposed development shall ultimately clear this vegetation and so the bushfire risks are minimal. This also applies to the surrounding sites, all of which are now significantly cleared of vegetation.



- Overlay Map 11 (Natural Wetland and Waterway Areas): Some man-made dams are located upon the site which shall be filled in as part of the ultimate development of the site. Sandy Creek is identified as a tidal wetland and so relevant setbacks from the creek have been incorporated into the proposed layout.
- Overlay Map 17 (Natural Hazard (Flood) Management Areas): The site is partially flood-affected. Relevant engineering comment and earthworks plans addressing this constraint are located in the bulk earthworks plans (**Appendix 6**) and Stormwater Management Plan (**Appendix 8**) herein.
- Overlay Map 20 (Conservation strategy plan): Remnant vegetation is located upon the site, however, it is noted as being committed to development. It is noted that the overlay plan does not identify any relevant vegetation to exist over the site to be the subject of future earthworks for flood storage balance purposes.

It is noted that other Overlay Maps also apply to the site but the above maps are those that appear to be most relevant to the site in terms of the features of the proposed development and relevant issues to be discussed.



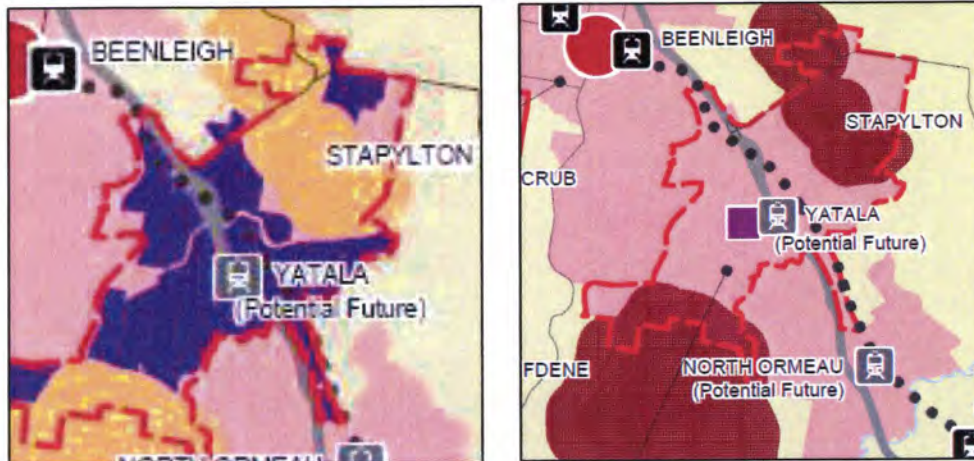
9.5 COMMENT ON SOUTH EAST QUEENSLAND REGIONAL PLAN

As identified in above sections the site is located within the **urban footprint** designation of the South East Queensland Regional Plan (SEQRP). Accordingly, the relevant level of urban activity that is being proposed for the site does not conflict with the regulatory provisions of the SEQRP.

It is noted that the lot to be exposed to future earthworks approvals is located within the Regional Landscape and Rural Production land-use designation. Such approvals shall not conflict with the relevant regulatory provisions and, as stated in other sections of this report, shall retain the existing agricultural land-uses of the land.



9.6 GOLD COAST CITY COUNCIL DRAFT LOCAL GROWTH MANAGEMENT STRATEGY 2007



Figures 29 & 30 above –Maps excerpts from GCCC Draft LGMS
Source: GCCC Draft LGMS 2007

The Major Implementation Activities recommended to be pursued for the Yatala Enterprise Area under the Draft LGMS are itemised as follows (s.5.3.1, p.85):

- "i Yatala Enterprise Hub is to be declared a Major Development Area under the SEQ Regional Plan, recognising its regional significance as a major enterprise area.*
- ii Structure planning of the Yatala Enterprise Hub will be undertaken commencing in 2007-08..."*

The proposed development is consistent with the Draft LGMS in that it seeks to ensure that further industrial development and economic activity shall be drawn to the Yatala Enterprise Area (YEA). It is not inconsistent with the major implementation activities sought for the YEA as the LGMS has not been formally adopted and the recommendations of the construction of a structure plan and the designation of the site as a major development area under the SEQRP have not been moved forward. Accordingly, the proposed development is seeking to 'bridge the gap' between the intent of the SEQRP, the desired outcomes of the Draft LGMS and the content of YEA LAP by graduating the site to its Ultimate Precinct designation under the YEA LAP. Such an approach, given the industrial development that has been undertaken around the site, endorses a structured progression of the development of the YEA in the absence of same being provided.



9.7 GOLD COAST PLANNING SCHEME - CITYWIDE DESIRED ENVIRONMENTAL OUTCOMES

Provided below are relevant comments applicable to the Citywide Desired Environmental Outcomes of the Gold Coast Planning Scheme as they relate to the proposed development. The reader is reminded that the approvals being sought are essentially for a preliminary approval to guide future industrial development upon the site at a level reflective of Precinct 1 of the existing YEA LAP and a development permit to subdivide the site. This development application does not seek specific endorsement for development permits for any specific uses upon the site.

9.7.1 Ecological Processes

There are four Desired Environmental Outcomes (DEOs) in part 2 of the Planning Scheme relating to ecological processes. A comment on each DEO is provided below:

"DEO Ecol. 1 – The conservation of areas containing native vegetation of international, national, state, regional or local significance, and of other natural ecosystems, to ensure maintenance of the city's biodiversity and natural landscape values."

Comment – Mature vegetation is found on the site and, as discussed in the Ecological Assessment, any vegetation requiring removal shall be considered in context and sympathetic to ecological sustainability. The development does not propose to remove any state-significant protected vegetation and seeks to adhere to all buffering and rehabilitation requirements.

"DEO Ecol. 2 – The protection of natural drainage catchments, river systems and other waterbodies to maintain the ecological values and functions of the ecosystems and health of the human communities that they support, and to enhance their value for maintenance of flora and fauna, recreation and other uses."

Comment – through dedication and management of drainage easements and allowing an area within the site to focus upon future ecological linkages, the development will provide suitable alternatives to existing drainage lines, river systems or other water bodies, and shall be developed in accordance with an approved stormwater management strategy. Sandy Creek, and the vegetation surrounding that waterway, shall not be interfered with as part of the proposed development.

"DEO Ecol. 3 – The maintenance of high standards of air quality, including minimising and reducing greenhouse gas emissions."



Comment – the future development of the site will inevitably result in some emission of particulates, either through the possible operation of certain land uses, or exhaust from heavy vehicles required in the day to day operation of industrial land uses.

Having stated this, the site already experiences a degree of air emissions from other sources including surrounding industry and the transfer station to the east as well as the nearby quarries.

Should a future change of use on the site involve relevant ERAs, measures exist to assess the impact of air quality at the time of its assessment.

“DEO Ecol. 4 – The minimisation of waste products and the provision of efficient systems to ensure their effective reuse, treatment or, where unavoidable, disposal.”

Comment – The Applicant proposes to bring services to the site that shall allow wastewater to be disposed of, in order to minimise environmental impact. Through further development of the site, various land uses shall address waste management issues as they relate to the particular characteristics of the final land uses. It is reasonable to use current Council and other authority guidelines and standards in the assessment of waste management.

9.7.2 Economic Development

“DEO Econ. 1 – The provision of an efficient land use pattern that is conducive to business activity, and attractive for new business opportunities, particularly those that complement existing or emerging business activity and those that offer opportunities for sustainable new businesses which diversify the existing economic base of the city.”

Comment – the proposed land use Place Code encourages a variety of general impact industrial and ancillary land uses to the locality, which enables the adoption and promotion of appropriately located new business opportunities. Such flexibility ensures the development of the site can be tailored to the uses that most desirable for location within the GCCC LGA.

“DEO Econ. 2 – Enhanced employment and investment opportunities through better integration of residential and business activity, whilst protecting the residential amenity.”

Comment – the development shall increase investment and employment opportunities within the northeast Gold Coast area with the proposed land uses encouraging a variety of general impact industry and ancillary land uses. The site is located adjacent to Stapylton-Jacobs Well Road which provides access to the Pacific Motorway and convenient access to the site for future workers.



The location of nearby residential uses to the immediate south of the site is such that acoustic measures have been implemented in order to address the noise impacts the developed site shall have upon the residents. These measures have been incorporated into the proposed Place Code.

By the same token, however, the site is reserved for industrial use within an area dominated by industrial, commercial and extractive uses and so, although the residential community is entitled to certain levels of amenity, it must be recognised that the dominant land-uses for the area shall, for the most part, supersede many of the impact concerns the residents may have. The amenity concerns for this residential community known as 'the Lodge' must not be held to the same levels as would residential amenity levels in dominantly suburban residential neighbourhoods because the dominant 'neighbourhood' in this instance are industrial tenants.

"DEO Econ. 3 – The provision of a viable system of Activity Centres (based on service catchments) and Activity Clusters (based on the locational needs of productive business sectors) to ensure that the City's communities have access to a wide range of suitably planned and located goods and services."

Comment – Yatala is recognised as an 'industrial employment cluster' within the Planning Scheme. The planned use of the site for future industrial activity shall support this DEO.

"DEO Econ. 4 – The enhancement of the tourism industry, including the protection of existing attractions, the protection and ecologically sustainable use of the City's significant natural assets and the further diversification of the industry."

Comment – the site is located upon a 'scenic tourist route – land' as shown on Overlay Map 22. The frontage of the site as it relates to Stapylton-Jacobs Well Road, shall be visually soft and appealing. Please refer to the Landscape Intent (**Appendix 4**) and the treatments proposed for the relevant road frontage of the site and the eventual Business Park entry statement. The development shall not conflict with this DEO.

"DEO Econ. 5 – The prudent use of renewable and non-renewable natural resources, having regard to their sustainable management."

Comment – the proposed development shall not consume resources at a rate which is in excess of other industrial or commercial developments within the City, and shall not include activities that present a significant risk to the sustainable management of the City's natural assets.

"DEO Econ. 6 – The use and safe operation of existing and committed infrastructure is maximised and future infrastructure is provided efficiently."



Comment – existing infrastructure can be sustainably augmented to service the proposed development. Please refer to the relevant sections of the Engineering Services Report (**Appendix 9**) in this regard.

9.7.3 Community Wellbeing

“DEO Soc. 1 – The establishment, conservation and enhancement of local character and the promotion of a distinctive local identity and sense of place for the various communities of Gold Coast City.”

Comment – the site is located within the suburb of Stapylton, recognised at a Council, regional and State level as being of importance due to the industries establishing within the suburb that support the City. The provision of industrial uses over the site shall support the character intended for the Yatala Enterprise Area and the suburbs within which it is located.

“DEO Soc. 2 – The location and design of residential areas and support facilities to maximise accessibility to community facilities and places of employment, and to maximise opportunities for community interaction.”

Comment – development of the site shall provide employment opportunity during construction and operation, allowing greater diversity of employment choice and location for nearby residents. Moreover, the continued development of the site shall most likely seek to promote engaging jobs from nearby residents in order to support local and surrounding agricultural uses.

“DEO Soc. 3 – The provision of a range of diverse housing choice, including affordable housing, that is responsive to the changing demographic structure of the City's population and promotes equity in access to goods and services.”

Comment – development of the site promotes an industrial form that is consistent with Council's intent for the Stapylton area, and does not affect the choice of housing within the City.

“DEO Soc. 4 – The identification and protection of places and objects of recognized historic, indigenous and cultural heritage significance.”

Comment – duty of care measures noted in relevant legislation shall be acknowledged as part of development of the site.

“DEO Soc. 5 – The maintenance of residential amenity, through the minimization of any environmental harm or adverse social impacts occurring from the construction

and operation of commercial, community, tourism, industrial and extractive industry activities."

Comment – whilst the site is shown as being located within Precinct 4 of the Yatala Enterprise Area Local Area Plan the site abuts industrial uses and high impact uses such as the Stapylton transfer station. The preferred form of industrial activity within Precinct 1 of the LAP is general impact industry, given the general absence of sensitive receiving environments within the locality. The development incorporates proposed lot uses consistent with a general impact industrial area which is located close to existing and proposed industrial uses, and is consistent with the LAP.

It is acknowledged that some future land uses may have the potential to cause environmental harm. Such uses are termed Environmentally Relevant Activities under the *Environmental Protection Act 1994* and require approval from authorities (such as Council or the Environmental Protection Agency) prior to commencement. Such a procedure ensures that an acceptable level of amenity for the area shall be maintained. Moreover, the proposed ERA is also being assessed in a manner compliant with regulatory requirements.

With specific reference to the residential community located to the immediate south of the site, comments from above items are echoed in that the site is reserved for industrial use within an area dominated by industrial, commercial and extractive uses and so, although the residential community is entitled to certain levels of amenity, it must be recognised that the dominant land-uses for the area shall, for the most part, supersede many of the impact concerns the residents may have. The amenity concerns for this residential community known as 'the Lodge' must not be held to the same levels as would residential amenity levels in dominantly suburban residential neighbourhoods because the dominant 'neighbourhood' in this instance are industrial tenants.

It is reasonable to place a condition on a decision notice limiting hours of operation when construction can be conducted on the site, and acoustic measures implemented (as suggested) in order to maintain a reasonable level of amenity to nearby residential areas.

"DEO Soc. 6 – The provision of a safe, clean, accessible and affordable transport system that efficiently connects the various parts of the city, and offers choice and convenience for residents and visitors."

Comment – Stapylton-Jacobs Well Road is a State-controlled road and is conveniently accessible to the site either directly or via Christensen Road. Opportunities for access to the site in a manner conducive to the future planning of the area are integrated well as part of this proposal.

"DEO Soc. 7 – The location and design of development to minimise the potential risk to life and property from known natural hazards."

Comment – natural hazards are identified in a State Planning Policy as incorporating flooding, bushfire and landslide risk. Each potential risk is identified and appropriately managed in reports contained within this application, where necessary.



9.8 GOLD COAST PLANNING SCHEME – LOCAL AREA PLAN

9.8.1 Yatala Enterprise Area Local Area Plan – Desired Environmental Outcomes

3.1 DEO 3.1: *The development of the YEA as an integrated employment area, including the establishment of industrial and business development, having particular regard to:*

- a) regional population growth within the Brisbane/Gold Coast City corridor;*
- b) the availability of a regionally significant extractive industry resource in the Luscombe Hill area;*
- c) emerging environmental industries related to recycling with a focus on Council's landfill and recycling centre at Stapylton;*
- d) the servicing needs of boat building and other marine industries in the northern Gold Coast City region; and*
- e) tourism support industry needs (refer to **DEO Econ.1**).*

Comment – The proposed development shall provide additional industrial land area to the land supply of the Yatala Enterprise Area which shall in turn encourage employment in the area from construction up to final implementation and beyond. Accordingly, it shall have a dramatic impact upon the potential employment and business opportunities within this industrial hub. Responses to the above specific criteria are as follows:

- a) The future industrial development of the site shall encourage employment opportunities and hence residential growth within the Gold Coast-Brisbane corridor.
- b) The future industrial development of the site shall not conflict with the surrounding extractive operations.
- c) Given the proximity of the site to the existing transfer station, it is in a prime position to take advantage of opportunities to synergise business with the use of the recycling centre.
- d) The proposed development shall not impede the location of such service industries onto the site and into the YEA.
- e) The proposed development shall not impede the location of such service industries onto the site and into the YEA.

3.2 DEO 3.2: *Establishment of a highly desirable industrial/business environment, featuring a range of locational opportunities with ancillary facilities and services which will facilitate the activities of business (refer to **DEO Econ.3**).*

Comment – The location of the site and the assortment of preferred land-uses within the Place Code support this DEO. The development shall encourage the location of a wide variety of

businesses in nature and scale into the YEA. The land-uses available to the site are only limited by those that Council may not ultimately find appropriate for the site in future applications.

3.3 DEO 3.3: *A planned land use and transport system that enables the efficient movement of people and goods within the YEA and provides for integration with existing and future transport systems operating in the region (refer to **DEOs Econ.6** and **Soc.6**).*

Comment – It is noted that, as part of the planning stages of this development application, both the Department of Transport and Main Roads and traffic planners within GCCC were separately consulted in order to ensure that the conceptual road layout within the site met both DTMR and GCCC road integration and connectivity goals. Notwithstanding the indicative intent of the YEA LAP Plan 29.5 (transport infrastructure), the meetings with officers have confirmed that the indicative site design meets north-south and east-west connectivity requirements and does not conflict with existing or future road requirements.

3.4 DEO 3.4: *The sustainable management of the regionally significant extractive resources of the northern Darlington Range and Stapylton areas (refer to **DEO Econ.5**).*

Comment – The proposed development shall have no conflict with the extractive industries based in and around the YEA. With future proposed upgrades to Stapylton-Jacobs Well Road forming part of the proposed staged development of the site, if anything, the development shall improve the trafficability of this major extractive haulage route.

9.8.2 Yatala Enterprise Area Local Area Plan – Intent & Precinct Intents

Both the Local Area Plan and existing precinct intents are identified below with relevant responses with regard to the proposed development.

Local Area Plan Intent

*"The purpose of this Local Area Plan (LAP) is to provide for the detailed planning and development of the Yatala Enterprise Area (YEA). The YEA is a highly valuable resource for the City. There is an opportunity to create a dedicated area that could be a market leader in terms of innovative industrial development that would facilitate growth in long term employment in the 21st century. Therefore, the purpose of this LAP is to **promote the orderly economic development of the YEA as a major industrial employment district for both the Gold Coast City and the South East Queensland region**. The LAP provides locational and assessment criteria for the establishment of industrial activities in the defined Yatala/Stapylton area (refer **Yatala Enterprise Area LAP Map 29.1 – Boundary**)."* (**Emphasis added**)



Comment – The proposed development shall create additional development and business opportunities within the YEA. The goals of the preliminary approval seek to increase the development potential of the site from 'Future Industry' land-uses to selected uses that are encouraged within the 'General Business and Industry' precinct (Precinct 1) of the YEA LAP. It is noted that the proposed uses within the Generations Industrial Park Place Code seek to encourage uses that are flexible for end users, primarily upon a self assessable basis (eg, Industry, Warehouse) to ensure easier and swifter development and delivery of generic industrial uses, when required. The proposal does not compromise the ability to deliver such uses on the site in an orderly fashion. Ultimately, the preliminary approval provides flexibility, and hence, the appeal, to proposed land-users and does not conflict with any need for the site to be developed in a staged and orderly manner. Accordingly, the proposed development seeks to align keenly with this core intention of the YEA LAP.

It should also not go unmentioned, as this issue has been identified in a variety of sections within this report, that the development site is ultimately surrounded by industrial development to the north, east and south. The surrounding context of the site should be a tangible guide to others that the site is certainly 'ready' to be taken from the 'Future Industry' designation that it possesses to a land-use designation that is more reflective of the existing environment.

Precinct Intent: Future Business and Industry

*"Ultimately, the Future Business and Industry Precinct is intended to be developed for industry purposes as an extension of the development that is contemplated for Precincts 1 and 2. **Such development is not envisaged in the short term, due to the lack of adequate infrastructure.** The only forms of development that are intended to be permitted in the meantime are those that will neither compromise the capacity of these areas to develop intensively for industry in the future nor compromise the development of other parts of the plan area for intended purposes.*

***This purpose does not preclude out of sequence business and industry development where the proponent is prepared to pay the full cost to offset the impact of out of sequence development, as determined by Council.** This out of sequence development will be assessed by the criteria applicable for either Precincts 1 or 2, as determined by the ultimate development scenario illustrated by Yatala Enterprise Area LAP Map 29.4 – Ultimate Precincts.*

The Future Business and Industry Precinct to the east of the Pacific Motorway is expected to become General Impact Business and Industry. The area to the west of the Pacific Motorway, west of Stanmore and Sandy Creek Roads, will be appropriate for a mixture of General and Low Impact Business and Industry, depending on its proximity to residential areas.

Development that proposes to reconfigure allotments is not considered appropriate for the precinct, unless all allotments created have a minimum



area of 20 hectares. *This will facilitate future development of the area for major industrial development.” (Emphasis added)*

Comment – It is noted within the above Precinct Intent that the ultimate precinct designation of the site shall be Precinct 1 and so, as mentioned previously, the Generations Industrial Park Place Code ensures that many elements of the precinct intent are met in terms of proposed land-uses. Other items are deliberately emphasised for separate responses below:

- i. *'lack of adequate infrastructure'*: This item within the Precinct intent precludes further development of sites within the 'future industry' precinct due to inadequate provision of services. This is not the case for this site and the proposed development. The proposal provides a strategy to connect to reticulated water and, in particular, sewer services in the area. The Engineering Services Report (**Appendix 9**) details how this is achieved on the back of efforts to negotiate same with GCCC / Allconnex representatives. The sewer connection solution is sound and ensures the site is developed efficiently given the location of existing services. The site is also located near existing arterial roads and the proposed conceptual design ensures integration with existing and proposed road networks. Accordingly, lack of infrastructure is not an impediment to the development of the site and reliance upon such an argument is not valid.
- ii. *'out of sequence'*: Given the progressed state of industrial development immediately surrounding the development site it is contended that, given such context, the proposed development does not qualify as being 'out of sequence'. It is neither 'piecemeal' in fashion nor is it being developed away from crucial services.
- iii. *Subdivision limitations*: The comments above support the contention that the proposed development is suitably located and may access services adequately. Any future proposed subdivision layout shall ensure that the site is developed in a practical and incremental manner. Accordingly, this subdivision restriction is effectively 'superseded' by operation of the above arguments suggesting that the site is ready to be developed consistently with its ultimate precinct land-use designation – Precinct 1 – which attracts a 4,000m² lot size minimum which is reflected in the proposed Place Code.

For the reasons above it is identified that the proposed development does not conflict with the existing precinct intent of the site.



It is noted that an intent statement is provided within the Generations Industrial Park Place Code. This intent statement will not be responded to at this point in time as it applies to development that is undertaken subsequent to the adoption of the Place Code. In this regard, it is noted that any future subdivision of the site is code assessable under the operation of the Place Code table of development although support for any future subdivision is ultimately provided for, on an **impact assessable** basis, in the above sections given that this submission is subject to **impact assessment** in accordance with the requirements of the SPA 2009.

9.9 SECTION 242 PRELIMINARY APPROVAL – CONTENTS AND COMMENTS

This section of the planning report should be read in conjunction with the content of the Generations Industrial Park Place Code (**Appendix 3**). The function of this section is to summarise the contents of the Place Code and provide, where necessary, notes relating to the proposed Place Code and how they intend to vary the existing planning controls of the Gold Coast Planning Scheme.

1. Firstly, the primary changes that are proposed (when comparing the Place Code to the YEA LAP) are those related to the material change of use table of development and the levels of assessment of land-uses contained within it. For a detailed outline identifying which land-uses are introduced/varied from Precinct 4 please refer to the discussion in **Section 6.1.1** of this report and table 13 below.

Any other changes within the development Place Code (as it relates to the YEA LAP Place Code) focus upon tailoring the assessment criteria to the features and characteristics of the site such as the vegetation buffer and reserve requirements and the 'acoustic' precinct that has been created in order to address the residential community located adjacent to the site along the south-western boundary. In this respect, it is noted that self assessable criteria in relation to setback requirements have been introduced in order to mitigate noise concerns that would arise from industrial uses being located close to residences.

2. Secondly, it is noted that the Place Code seeks to, wherever reasonable, mirror the terminology, structure and formatting of the existing YEA LAP Place Code. The Place Code has its own intent and accompanying sections explaining how it may be implemented and how it integrates with the Gold Coast Planning Scheme. It also sheds some of the exact tabulations and figures contained in the YEA LAP Place Code (including the original numbering) so that it may be more easily viewed as a single document and a point of reference for others seeking to use the Place Code. The intention, however, is to reflect the requirements of the Department of Local Government and Planning's Statutory Guideline relevant to the drafting of s.242 preliminary approvals. In this respect, table 13 below identifies for Council the proposed changes to the YEA LAP Place Code as they are expressed within the Generations Industrial Park Place Code and comments in relation to why these changes were undertaken.



Table 13: Changes to YEA LAP Place Code by Generations Industrial Park Place Code

Generations Industrial Park Place Code		
Section #	Section title	Comment
1	N/A	This section of the Place Code provides a basic development context with development goals and summaries of the key features of the proposed precincts within the development site.
2	N/A	This section explains how the code shall be implemented and outlines the relationship of the code with the Gold Coast Planning Scheme.
3	TABLE OF DEVELOPMENT	This section primarily identifies the key uses to be provided within an amended table of development. It is noted that the relevant table of development pertains specifically to those precincts located within the land use classification plan, the terminology of which seeks to mirror, where possible, the terminology contained in the GC Planning Scheme.
Proposed change		Comment
TOD – TABLE A Summary – non-relevant land uses deleted		Non-relevant land uses such as Farm forestry, Farm stay, refuse disposal and refuse transfer station are deleted as they are either not relevant to the site or not desired to be located upon the site.
TOD – TABLE A Introduction of new land-uses Precinct 1 Industry – Self assessable Manufacturer's Shop – Self assessable Open storage area – Self assessable Service industry – Code assessable Warehouse – Self assessable		Industry, Manufacturer's shop, Warehouse: The introduction of these uses as self assessable development ensures the streamlined delivery of most industrial uses to be located upon the site in the future. It is reflective of the level of assessment of all of these land-use definitions within the Precinct 1 table of development of the YEA LAP. Service Industry: This is also a common land-



Generations Industrial Park Place Code		
Section #	Section title	Comment
		use within industrial parks and is code assessable within Precinct 1 of the YEA LAP. Open storage area: This is a defined use within the Planning Scheme although it is not a considered use within any precinct of the YEA LAP. The proposed open storage is intended to aid the applicant to use parts of the site for storage purposes as a transitional opportunity until the site can be fully developed.
TOD – TABLE A Precinct 6 – deletion of many impact and code assessable uses		The deletion of these uses seeks to ensure that the environmental buffers and linkages within the site retain their ecological feature without risk of clearing due to future development.
TOD – TABLE B Subdivision: Minimum lot size reduced to 4,000m ²		Consistent with the minimum lot-size requirements of Precinct 1 of the YEA LAP, these lot size minimums are applied in order to facilitate the future development of the site. Appropriate subdivision of the site in a structured and staged manner will ensure that the proposed industrial uses to be located upon the site will be able to be shared in terms of land ownership.
TOD – TABLE D Advertising devices for site limited to 20m ² in area.		This seeks to align the table of development with the requirements of Precinct 1 of the YEA LAP.
4	RELEVANT CODES FOR ASSESSMENT	This section identifies those codes that future development under the Place Code shall be assessed against. They are deliberately similar to the formatting and requirements of the Gold Coast Planning Scheme and the section also identifies what shall occur should there be a conflict between Planning Scheme codes and the Place Code.
Proposed change		Comment
Replacement of relevant Place Code from Yatala Enterprise Area Place Code to Generations Industrial Park Place Code		This ensures relevant integration of the place code into future development assessments of the site.



Generations Industrial Park Place Code		
Section #	Section title	Comment
5	PLACE CODE – DEVELOPMENT REQUIREMENTS	This section provides the relevant assessment criteria of the Place Code. Formatting and terminology of the YEA LAP Place Code is mirrored at all times, where relevant and possible. Numbering has been changed after deletion of particular code criteria to allow fluid reading and use of Place Code.
Proposed change		Comment
BUILDING HEIGHT AS1.2: Deleted		Has no relevance to the proposed development. Self assessable criteria shall be two stories.
AREA DESIGN CONTROLS AS5.1: Additional built form and setback requirements		To reflect setback allowances for battering and landscaping purposes against residential use to the south. Nil setbacks also required in accordance with specific acoustic reporting.
DESIGN OF DEVELOPMENT NEAR MAJOR ROADS PC & AS6: Amended to focus criteria requirements upon Stapylton-Jacobs Well Road frontage, only.		To tailor the criteria to the site location.
CONSERVATION LINKS AND OPEN SPACE LINKAGES Deleted		Deleted in order to be tailored to the site.
RESERVE AREA PC & AS19: Introduced to cater for specific buffering requirements.		Introduced in order to tailor the code criteria to the proposed site layout and vegetation and buffering requirements.
LOT SIZE (FOR SUBDIVISION ONLY) AS27: Minimum and average lot size at 4,000m ² and 1Ha respectively.		Tailoring the AS to the future site controls.
AS32: change to reference to numbering of AS referred to.		Catering to changes in numbering of performance criteria.
ROAD DESIGN AS33.3: Introduction of reference to land use classification plan with respect to existing road hierarchy.		Tailoring criteria to the development site and any future road layout within same. This strategy is consistent with the requirements of both DTMR and GCCC.
AS36.1: Introduction of reference to land use classification plan with respect to footpath		Tailoring criteria to the development site and the land use plan.



Generations Industrial Park Place Code		
Section #	Section title	Comment
	requirements.	
AS37.1:	Introduction of reference to land use classification plan with respect to public transport requirements.	Tailoring criteria to the development site and the land use plan.



9.10 APPLICABLE CODES

Tables 13 to 15 list the applicable codes for an apartment complex with the relevant site constraints. All codes are addressed in full in **Appendix 5** of this submission or relevant engineering reports, where specified.

LOCAL AREA PLAN CODE

Please refer to table 14 below.

Table 14: Relevant Local Area Plan Code

Local Area Plan Code	
Relevant Code	Comment
The Generations Industrial Park Place Code shall replace the Yatala Enterprise Area Local Area Plan Place Code	Applicable – It is noted that the SPA 2009 requires assessment of the development against the existing planning scheme criteria and so a response to the Yatala Enterprise Area LAP Place Code shall be provided. Please see code responses in Appendix 7 .

SPECIFIC DEVELOPMENT CODES

Table 15 below outlines the relevant Specific Development Codes applicable to the proposal.

Table 15: Relevant Specific Development Codes

Specific Development Code	
Relevant Code	Comment
Adult Entertainment Premises	Not Applicable: The proposal is not for an Adult Entertainment Premises.
Advertising Devices	Not Applicable: Advertising Devices are not proposed as part of the application.
Aged Persons Accommodation	Not Applicable: The proposal is not for Aged Persons' Accommodation.
Animal Husbandry	Not Applicable: The proposal is not for Animal Husbandry.
Aquaculture	Not Applicable: The proposal does not involve Aquaculture.
Attached Dwellings and Medium Density Detached Dwellings	Not Applicable: Attached Dwelling or Medium Density Detached Dwellings are not proposed as part of this application.
Bed and Breakfast tourist Accommodation	Not Applicable: A Bed and Breakfast Tourist Accommodation is not proposed as part of this application.

Specific Development Code	
Relevant Code	Comment
Brothels	Not Applicable: The proposal does not involve a Brothel.
Caravan Parks	Not Applicable: The proposal does not involve a Caravan Park.
Caretaker's Residence	Not Applicable: The proposal does not involve a Caretaker's Residence.
Changes to Ground level and Creation of New Waterbodies	Applicable: The proposal involves changes to ground level and creation of new waterbodies. Please see code responses in the Engineering Services Report at Appendix 9 .
Child Care Centres	Applicable: A Child Care Centre is not proposed.
Detached Dwellings	Not Applicable: Detached Dwellings are not proposed as part of this application.
Display Homes and Estate Sales Offices	Applicable/Not Applicable: The proposal does not involve Display Homes and/or Estate Sales Offices.
Ecotourism Facility	Applicable/Not Applicable: An Ecotourism Facility is not proposed as part of this application.
Family Accommodation	Applicable/Not Applicable: Family Accommodation is not proposed as part of this application.
Farm Forestry	Applicable/Not Applicable: A Farm Forestry is not proposed as part of this application.
Farm Stay	Applicable/Not Applicable: A Farm Stay is not proposed as part of this application.
High Rise Residential and Tourist Accommodation	Applicable/Not Applicable: The proposal does not involve a High Rise Residential and Tourist Accommodation.
Kennels	Applicable/Not Applicable: Kennels are not proposed as part of this application.
Landscape Works	Applicable/Not Applicable: Detailed Landscape Works are not proposed as part of this application.
Low Rise Apartment Building	Applicable: A Low Rise Apartment Building is not proposed as part of this application.
Low Rise Commercial Tourist Accommodation	Not Applicable: A Low Rise Commercial Tourist Accommodation is not proposed as part of this application.
Office	Not Applicable: An office is not proposed as part of this application.
Private Recreation	Not Applicable: Private Recreation is not proposed as part of this application.
Relocatable Home Parks	Not Applicable: A Relocatable Home Park is not proposed as part of this application.
Retail and Related Establishments	Not Applicable: A Retail and Related Establishment is not proposed as part of this application.
Reconfiguring a Lot	Not Applicable: No reconfiguration of a lot is proposed.



Specific Development Code	
Relevant Code	Comment
Rural Industry	Not Applicable: The proposal is not for a Rural Industry.
Salvage Yards	Not Applicable: A Salvage Yard is not proposed as part of this application.
Service Stations	Not Applicable: A Service Station is not proposed as part of this application.
Surf Life Saving Clubs	Not Applicable: A Surf Life Saving Club is not proposed as part of this application.
Telecommunications Facilities	Not Applicable: A Telecommunications Facility is not proposed as part of this application.
Temporary Use	Not Applicable: The proposal does not involve a Temporary Use.
Tourist Cabins	Not Applicable: Tourist Cabins are not proposed as part of this application.
Vegetation Management	Not Applicable: The proposal does not require the involvement of a Vegetation Management Plan or associated documents at this stage of development.
Vehicle Sales	Not Applicable: Vehicles Sales are not proposed as part of this application.
Working from Home	Not Applicable: The proposal does not involve a Work from Home operation.
Works for Infrastructure	Applicable: This code is addressed by the project engineers. Please see code responses in the Engineering Services Report at Appendix 9 .

CONSTRAINT CODES

Table 16 below outlines the relevant constraint codes applicable to the site and the proposed use.

Table 16: Relevant Constraint Codes

Constraint Code	
Relevant Code	Comment
Gold Coast Airport and Aviation Facilities	Not Applicable: The site is not within close proximity to the Gold Coast Airport or Aviation Facilities.
Bushfire Management Areas	Applicable: The site is identified to have relevant low and medium bushfire risks based on observations of the slope and vegetation located upon the land. As part of the overall development of the site, it will be subject to mass clearing and bulk earthworks. Accordingly, bushfire management shall not be relevant unless otherwise raised by Council.



Constraint Code	
Relevant Code	Comment
	This is also reinforced within code responses located in the Ecological Assessment at Appendix 11 .
Canals and Waterways	Not Applicable: The site is not within close proximity to a relevant Canal or Waterway with respect to the overlay mapping although it is noted that relevant buffering shall be undertaken from the banks of Sandy Creek consistent with the code requirements of the YEA LAP place Code.
Car Parking, Access and Transport Integration	Applicable: Please see code responses in the Engineering Services Report at Appendix 9 .
Cultural Heritage (Historic)	Not Applicable: The site is not within a Cultural Heritage (Historic) Area.
Cultural Heritage (Indigenous)	Not Applicable: The site is not within a Cultural Heritage (Indigenous) Area.
Dam Catchment Areas	Not Applicable: The site is not within a Dam Catchment Area.
Flood Affected Areas	Applicable: The site is partially flood affected. Please see code responses in the Engineering Services Report at Appendix 9 .
Natural Wetland Areas and Natural Waterways	Applicable: It is noted that part of the site is identified on OM11 as tidal wetland being the banks of Sandy Creek. This code is responded to within the Ecological Assessment at Appendix 11 .
Nature Conservation	Applicable: Please see responses in relation to this code within the Ecological Assessment at Appendix 11 .
Ocean Front Land	Not Applicable: The site is not Ocean Front Land.
Rail Corridor Environs	Not Applicable: The site is not within sufficient proximity to any significant Rail Corridor(s).
Road Traffic Noise Management	Not Applicable: The site is located along Stapylton-Jacobs Well Road which is a major haulage route however no sensitive noise receptors are proposed as part of this development application and so the code is not relevant. Relevant consideration of the acoustic impacts of the development up[on adjacent land-uses is considered in other areas of this report and specifically commented upon within the acoustic report at Appendix 13 .
Sediment and Erosion Control	Applicable: This code is addressed by the project engineers. Please see code responses in the Engineering Services Report at Appendix 9 .
Service Roads (Pacific Motorway)	Not Applicable: The site is not located along a Pacific Motorway Service Road.
Steep Slopes or Unstable Soils	Not Applicable: The site is not within a Steep Slopes or



Constraint Code	
Relevant Code	Comment
	Unstable Soils Area.
Unsewered Land	Not Applicable: The site shall be serviced by reticulated sewer.

10.0 RELEVANT REFERRAL AGENCIES

RELEVANT REFERRAL AGENCY

Table 17 below outlines the relevant referral agencies triggered as a consequence of the proposed development. Please refer to the relevant IDAS forms located at **Appendix 1** of this submission for more information.

Table 17: Referral agency triggers

Referral Agency Triggers		
Referral Agency	Referral Type	Trigger
Department of Environment and Resource Management	Advice	<i>Sustainable Planning Regulation 2009, schedule 7, table 3, item 3</i> SPP 2/02 Earthworks related to Acid Sulfate Soils
Department of Environment and Resource Management	Advice	<i>Sustainable Planning Regulation 2009, schedule 7, table 3, item 21</i> Proximity to referable wetlands
Department of Environment and Resource Management	Concurrence	<i>Sustainable Planning Regulation 2009, schedule 3, part 1, table 2, item 7</i> <i>Sustainable Planning Regulation 2009, schedule 7, table 2, item 23</i> Presence of site on the EMR with a notifiable activity
Department of Transport and Main Roads	Concurrence	<i>Sustainable Planning Regulation 2009, schedule 7, table 3, items 1 & 2</i> Proximity to a state-controlled road and relevant development thresholds
Department of Local Government and Planning	Concurrence	<i>Sustainable Planning Regulation 2009, schedule 7, table 3, item 24</i> Preliminary Approval under s.242 of the Sustainable Planning Act 2009

In respect to comments made by Council environmental officers at pre-lodgement regarding the possible need to refer the application to the Department of Environment and Resource Management (DERM) on the grounds of vegetation removal on a site that may



not be 'urban' in classification, clarification of this issue was sought from DERM officers and the below comment by email dated 22nd June 2011 was provided:

*"I have reviewed the information you have provided and confirm that any proposed development (RaL/MCU and Ops works vegetation clearing) **would be considered an urban purpose in an urban area and therefore will not trigger DERM as a concurrence agency.***

*This information is based on the premise that the development application would be consistent with the GCCC planning scheme with respect to Halfway **(sic.)** Creek, that is no clearing of vegetation is proposed within 10 metres of the high bank and no clearing within the creek for water/waste water infrastructure." **(Emphasis added)***

Accordingly, the site shall not be referred to DERM as a concurrence agency for this reason.



11.0 ADDITIONAL MATTERS RELEVANT TO THE APPLICATION

11.1 PRE-LODGEEMENT MEETING AND RELEVANT AGENCY ADVICE

11.1.1 Gold Coast City Council Pre-lodgement meeting – 7th June 2011

A Pre-lodgement Meeting was held with Gold Coast City Council in relation to this development application. A copy of the pre-lodgement meeting minutes issued by Council are enclosed in this submission at **Appendix 17**.

NB. The pre-lodgement meeting discussed the proposal as an industrial subdivision which is now not being pursued as part of this development application. Accordingly, some comments from the pre-lodgement meeting shall not be directly applicable to this proposal but are nevertheless included.

In short, the pre-lodgement meeting raised the following matters, which are considered and responded to in this submission, in particular as follows:

Subdivision Engineering:

- The previously submitted layout design was considered satisfactory. It is noted that the road widths for all internal drives shall be 23m notwithstanding the road interface with de Bortoli Road being narrower. This decision is made to ensure that consistent, safe and comfortable turning allowances are achieved in all areas of the industrial park. Although the development application is now only for a preliminary approval, these comments have been noted.

Hydraulic Engineering:

- Flood matters to be addressed – these are attended to in the enclosed earthworks and stormwater management reporting;
- Northern-most legal point of discharge with retention basin not required. This is reflected in the stormwater and earthworks reporting.

Planning:

- Impact concerns were raised with respect to the industrial uses to be located close to the adjacent residential community. These impacts, in particular acoustic impacts, have been addressed within the proposed Place Code of the preliminary approval component of the submission. Details of the buffering against the residential community are provided in this planning report and illustrated in the Landscape Intent document at **Appendix 4**;
- Retaining wall heights (and indicative retaining wall cross-sections) are provided within the bulk earthworks plans (**Appendix 6**);



- The request for the provision of a needs analysis is addressed in discussions within Section 5 of this report;
- Relevant consideration, in terms of landscape buffering along the Stapylton-Jacobs Well Road frontage of the site, has been made.

Environmental and Landscape:

- An ecological assessment is provided with this report (**Appendix 11**) and appropriate buffering along Sandy Creek and the eastern boundary of the site is provided. A landscape intent document (**Appendix 4**) and rehabilitation statement (**Appendix 12**) are also provided which outline how the buffering and landscaping shall integrate with the ecological features of the site.

Transport Planning:

- A detailed traffic assessment has been undertaken as part of this proposal and is located at **Appendix 10** which addresses the primary concerns of Council's transport planning department.

Allconnex:

- An engineering services report at **Appendix 9** outlines how the development may connect to reticulated sewer and water. Relevant strategies with respect to design and capacity are provided within this report.

Parks and Recreation:

- Council shall require stormwater basins to be constructed in accordance with relevant guidelines with attention drawn to maintenance access and requirements. It is noted that the stormwater basin designs (**Appendix 8**) comply with Council requirements.
- A relevant open space management statement (**Appendix 12**) and landscape intent (**Appendix 4**) are provided in this submission.

Health and Regulatory Services:

- Impact concerns were raised with respect to acoustic issues, in particular. An acoustic report has been provided (**Appendix 13**), the features of which are incorporated into the proposed Generations Industrial Park Place Code for sites located adjacent to the 'Lodge' residential community to the south-west.

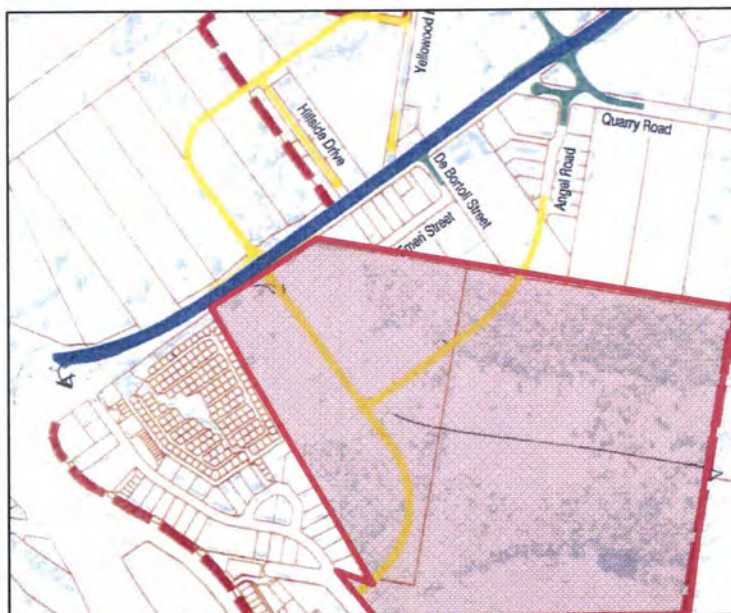
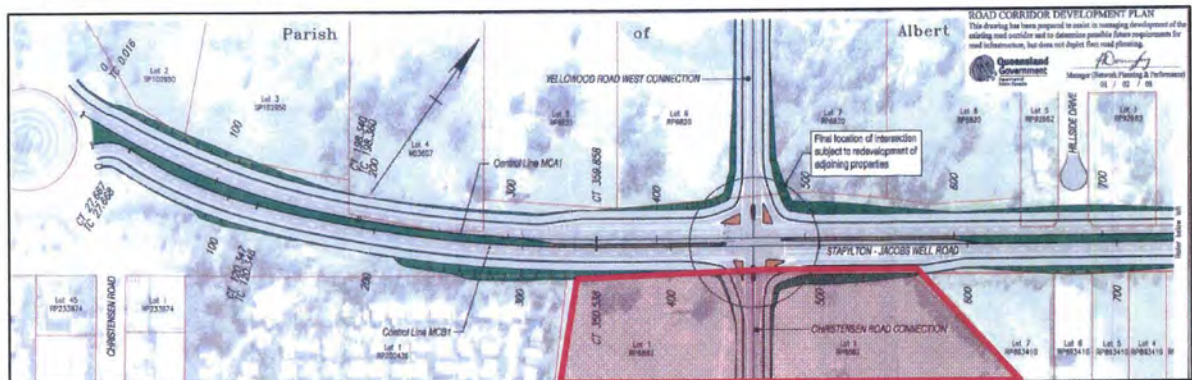


11.1.2 Preliminary advice from the Department of Transport and Main Roads (DTMR) – 14th March 2011

A pre-lodgement meeting was held with the Department of Transport and Main Roads on 14th March 2011. Discussions with Department officers revolved around the following:

- The intersection of the site with Stapylton-Jacobs Well Road;
- The impact of the development upon the nearby Pacific Motorway interchange; and
- The linkages and connectivity the site shall provide between existing road networks.

A record of the pre-lodgement meeting is provided in **Appendix 17**. It is noted that the proposal addresses the Department's main requirements and a detailed traffic analysis is provided in **Appendix 10** of this submission. Excerpts of relevant plans provided by the Department are supplied below.



Figures 31 (above) & 32 (left) –
Separate intersection and strategic
road hierarchy plans provided to
applicant by DTMR
Source: DTMR

11.2 PREVIOUS APPROVALS

To the best knowledge of the Applicant, there are no existing or outstanding approvals over the subject site that are relevant to this application. It is understood that the existing tenant and industrial operator possessing frontage along Christensen Road, Amgrow, has obtained the necessary approvals in relation to the operation of its business.

11.3 TIMING OF PROPOSAL

The Applicant will wish to proceed with the development of the site in a manner consistent with the context, scale and staging of the proposal. On this basis, it is **requested that the preliminary approvals provide for an extended currency period of 20 years.**

12.0 CONCLUSION

The Applicants, Patricia and William Hester, have demonstrated that the proposed development for a preliminary approval (S.242 under the *SPA 2009*) to affect the local planning instrument and preliminary approval (S.241 under the *SPA 2009*) for operational works is considered consistent, where relevant, with the development provisions contained within the Gold Coast Planning Scheme.

The proposed preliminary approvals represent development that is:

- Consistent with the general planning principles and desired environmental outcomes within the Planning Scheme;
- Consistent with the performance criteria of the applicable development codes, with alternative solutions provided, where necessary;
- Suitably responsive to, and compliant with, all relevant State Planning Policies, State Planning Regulatory Provisions and Regional planning instruments

Accordingly, the proposed development is reasonable and appropriate within the context of the site and the surrounding area. It is recommended that the proposed development be considered favourably by Council and subsequently approved subject to reasonable and relevant conditions.

3 – PLACE CODE (GDP)

- Generations Industrial Park Place Code (GDP)

GENERATIONS INDUSTRIAL PARK PLACE CODE

A PRELIMINARY APPROVAL AFFECTING A LOCAL
PLANNING INSTRUMENT FOR A MATERIAL CHANGE
OF USE FOR INDUSTRIAL USES (S.242 OF THE
SUSTAINABLE PLANNING ACT 2009)

ADDRESS:

60 STAPYLTON-JACOBS WELL ROAD & 82 CHRISTENSEN ROAD,
STAPYLTON Q 4207 (LOTS 1 ON RP6882, 240 ON W31320 AND 4
ON RP6843)

PREPARED FOR:

PATRICIA AND WILLIAM HESTER

NOVEMBER 2011



g a s s m a n
**development
perspectives**

project coordination
urban + regional planning
landscape + urban design
environmental management
visualisation + spatial services
surveying services
advisory services

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SCHEDULE 1 – GENERATIONS INDUSTRIAL PARK LAND USE CLASSIFICATION PLAN

1.0 GENERATIONS INDUSTRIAL PARK PLACE CODE INTENT

1.1 PLACE CODE INTENT

The Generations Industrial Park Place Code shall provide opportunities for industrially-related development at a scale that has regional economic significance and shall offer long-term employment benefits to the northern Gold Coast area. Ideally, the Generations Industrial Park Place Code area ('the site') shall provide a location for the development of a variety of scales of general impact business and industry uses to complement and support the major industries that have, and will continue to, establish themselves in the ultimate precinct designation of the site which is General Business and Industry – Precinct 1 under the Yatala Enterprise Area Local Area Plan (YEA LAP).

The site is presently located in the 'Future Industry' precinct of the YEA LAP and the intention of the Place Code is to graduate the site in land-use priorities to underlying land-use designations that are reflective of the following:

1. Uses that are considered to be reflective of the ultimate intended land-use precinct designation for the site, being Precinct 1 – General Business and Industry under the existing YEA LAP;
2. The developments surrounding the site which have achieved Precinct 1 development outcomes to both the north and south; and
3. Complementary to underlying site constraints such as ecological corridors and road connectivity.

Accordingly, the Generations Industrial Park Place Code, in conjunction with the **enclosed** land-use classification plan creates the following Precincts:

- **Precinct 1 (General Impact Business and Industry):** The majority of the land-uses promoted in this precinct, which covers the bulk of the developed site, are consistent with those itemized within the Precinct 1 land use designation of the YEA LAP. Those that are not, are industrially related and benefit the future development prospects of the site and the YEA LAP generally. The ultimate intent of this precinct is to promote the land uses and allotment sizes that would ordinarily be located within Precinct 1 land located within the YEA LAP. It is also noted that the proposed subdivision lot-size parameters from Precinct 1 of the YEA LAP have been adopted within this precinct.

An area within the Precinct 1 designation forms a smaller 'sub-precinct' that is located adjacent to a gated community title residential village to the south. In accordance with relevant acoustic advice, this sub-precinct shall accommodate for the range of uses allowable under Precinct 1 although the built form requirements of development within this area will be subject to appropriate acoustic attenuation measures which are incorporated into the self-assessable criteria of the Place Code.

- **Precinct 6 (Open Space/Reserve):** This precinct is reflective of the land-uses that would otherwise be promoted within the Precinct 6 – Open Space land-use designation of the YEA LAP. All areas within the site that are highlighted as Precinct 6 are either existing protected vegetation or future rehabilitated buffer / ecological reserve consistent with ecological analyses and rehabilitation plans forming part of the overall development application.

The site area shall be easily accessible from the existing and proposed arterial road system, being Stapylton-Jacobs Well Road and Christensen Road – both of which link to the Pacific Motorway. The site design accommodates for north-south road linkages consistent with underlying connectivity requirements within the YEA LAP.

Proposals under the Generations Industrial Park Place Code area shall consider the relative proximity of the site to residential neighbors located to the south and the Stapylton landfill located to the east. Accordingly, a high level of screening is encouraged along the eastern portion of the site and relevant acoustic treatments along part of the southern section of the site. Further, attention is given to improving visual appearance and providing high landscape amenity along the Stapylton-Jacobs Well Road frontage. Buildings shall address the street, incorporate articulated exterior walls and rooflines, a mixture of building materials and exterior finishes, and other architectural details or features to enhance the appearance of any structures associated with a business/industry activity.

1.2 BACKGROUND

1.2.1 Strategic Considerations

The Generations Industrial Park Place Code seeks to activate the industrial land-use potential of 'future industry' land that is included within the YEA LAP. The site is strategically located within/near a cluster of developed industrial uses that are located within both the 'future industry' and 'general business and industry' precincts of the YEA LAP. Accordingly, the site effectively brings forward several preferred land-uses of the site consistent with surrounding development and the ultimate intent of the YEA LAP.

1.2.2 The Site Context

The site is suitably located within the YEA LAP and shall enable the ordered growth of industrial development in the area. This Generations Industrial Park Place Code recognise the site's strategic position along major roads servicing the Yatala Enterprise Area, being Stapylton Jacobs-Well Road. The plan accommodates for appropriate transport connectivity to the north and south, as intended under the YEA LAP. Satisfactory ecological linkages are also supplied within this Place Code to ensure the ecological priorities of the YEA LAP are also met.

1.2.3 The Land Use Classification Plan

Please refer to the **attached** plan 5093 P 00 09C (Schedule 1) specifying the part of the site that is affected by the Generations Industrial Park Place Code. It communicates the area of the site that will be developed after taking into account relevant amenity, ecological, stormwater, connectivity and constraint issues. To avoid confusion the land use classification plan shall adopt similar colouring, terminology and symbology of the GCCC Planning Scheme. This shall also provide an understanding that the purpose of the development is to enable an extension to the Yatala Enterprise Area rather than a land use area in conflict with the ultimate land uses intended for the local area plan.

2.0 APPLICATION OF THE GENERATIONS INDUSTRIAL PARK PLACE CODE

2.1 APPLICATION

- 2.1.1 The Generations Industrial Park Place Code applies to all proposed development located within the Place Code area, as indicated in the **Generations Industrial Park Land Use Classification Plan 5093 P 00 09C**.
- 2.1.2 The Table of Development indicated in **Clause 3.0** identifies the levels of assessment for development occurring within this development area.
- 2.1.3 The codes that may be relevant to the assessment of development in this Place Code area are listed in **Clause 4.0**.
- 2.1.4 It should be noted that self assessable development is deemed to be development that is consistent with the intent of this Place Code, and therefore need only comply with the self assessable acceptable solutions of the **Generations Industrial Park Place Code** contained in **Clause 5.0** and any other acceptable solutions identified in the relevant codes explicitly referred to in **Subclauses 4.1 – 4.7**.
- 2.1.5. The definitions of all relevant terms and land uses contained within this Place Code are to be found within **Part 4, Division 1, Chapters 1-3 of the Gold Coast City Planning Scheme 2003, as amended**.
- 2.1.6. The operation of this Place Code is guided, where necessary, by the protocols of **Part 6, Division 1, Chapters 2 of the Gold Coast City Planning Scheme 2003, as amended**.

3.0 GENERATIONS INDUSTRIAL PARK PLACE CODE – TABLE OF DEVELOPMENT

3.1 TABLE OF DEVELOPMENT

Pursuant to s.242 of the *Sustainable Planning Act 2009*, the **Yatala Enterprise Area Local Area Plan Table of Development (as modified)** below, is nominated as the applicable Table of Development. It applies to the area specified within the Generations Industrial Park Land Use Classification Plan. Precincts nominated in this plan and the following tables of development and Place Code are as follows:

- Precinct 1 (Industrial)
- Precinct 6 (Open Space/Reserve)

In relation to the intent and context of these precincts please refer to Sections 1.1 & 1.2 above.

* Please note that the highlighted terminology within the proposed table of development and place code is terminology that has been introduced, varied or deleted from the text that would otherwise be observed within the Yatala Enterprise Area Local Area Plan Place Code.

TABLE A – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – MATERIAL CHANGE OF USE

- The below table is based upon the Table of Development for the Yatala Enterprise Area Local Area Plan – **Precincts 4 and 6 only**. This ensures that the proposed uses for the site are becoming reflective of surrounding and ultimate precinct industrial land uses intended for the site as raised within the YEA LAP.

MATERIAL CHANGE OF USE incorporating or not incorporating BUILDING WORK				
Exempt	Self Assessable	Code Assessable	Impact Assessable	
Precinct 1 (Industrial)				
Agriculture	Detached Dwelling	Bulk Supplies	Garden	Any proposed use with water consumption exceeding 30EP per hectare
Animal Husbandry	Industry	Caretakers Residence		Industry
Conservation (natural area management)	Manufacturer's Shop	Estate Sales Office		Refuse-Disposal
Low-Impact Telecommunications Facility	Milk Depot	Family Accommodation		Refuse Transfer
	Open Storage Area			
	Temporary Use			

MATERIAL CHANGE OF USE incorporating or not incorporating BUILDING WORK			
Minor Change in the scale or intensity of an existing lawful use Park Public Utility	Warehouse	Farm Forestry Farm Stay Rural Industry Service Industry Telecommunications Facilities n.e.i. Wholesale Nursery	Station Salvage Yard Transport Terminal
Precinct 6 (Open Space/Reserve)			
Conservation (natural area management) Low-Impact Telecommunications Facility Minor Change in the scale or intensity of an existing lawful use Park	Temporary Use	Caretaker's Residence Telecommunications Facility n.e.i.	Agriculture Amusement Park Cafe Convenience Shop Ecotourism Facility Farm Forestry Farm Stay Indoor Recreation Facility Minor Tourist Facility Outdoor Sport and Recreation where including Golf Course and ancillary uses

TABLE B – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – RECONFIGURING A LOT

RECONFIGURING A LOT			
Exempt	Self Assessable	Code Assessable	Impact Assessable
Precinct 1 (Industrial)			
		Precincts 4 and 6 results in no lots with an area less than 20 hectares; OR entails only a Community Title Subdivision (including Standard Format Plans and/or	Precincts 4 and 6 results in one or more lots with an area less than 20 hectares Results in one or more lots with an area less than 4,000m ²

RECONFIGURING A LOT			
Exempt	Self Assessable	Code Assessable	Impact Assessable
Precinct 1 (Industrial)			
		Volumetric Lots), or a Volumetric Lot within a building, or a leasehold subdivision of an existing or approved development Results in no lots with an area less than 4,000m² Entails only a Community Title Subdivision (including Standard Format Plans and/or Volumetric Lots)	

TABLE C – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – OPERATIONAL WORK

OPERATIONAL WORK – CHANGES TO GROUND LEVEL			
Exempt	Self Assessable	Code Assessable	Impact Assessable
Operational Work that involves extraction, excavation or fill that:			
		exceeds a volume of 100 cubic metres of fill or excavation, or is closer than 20 metres from the allotment boundary and is within or adjoins an allotment containing places, sites, or landscapes of indigenous cultural heritage significance listed on the Queensland Heritage Register – Cultural Records (Landscapes Queensland and Queensland Estate) Act 1987; OR is located on land	

OPERATIONAL WORK – CHANGES TO GROUND LEVEL			
		which is the subject of a native title claim; OR is located on land that is known to the owner and/or the developer to be of indigenous cultural heritage value	

TABLE D – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – OPERATIONAL WORK

OPERATIONAL WORK – ADVERTISING DEVICES			
Exempt	Self Assessable	Code Assessable	Impact Assessable
	Advertising Device that is: a) not illuminated, nor animated, and where the total area of signage per street frontage does not exceed the following for each precinct: Precinct 1: 20m² b) not on land with frontage to an arterial road or any State-controlled road	Advertising Devices n.e.i.	

TABLE E – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – OPERATIONAL WORK

OPERATIONAL WORK – INFRASTRUCTURE AND LANDSCAPE WORK			
Exempt	Self Assessable	Code Assessable	Impact Assessable
Minor Landscape Work		Landscape Work n.e.i. Works for Infrastructure	

TABLE F – YATALA ENTERPRISE AREA LOCAL AREA PLAN TABLE OF DEVELOPMENT (AS MODIFIED) – OPERATIONAL WORK

OPERATIONAL WORK – VEGETATION CLEARING			
Exempt	Self Assessable	Code Assessable	Impact Assessable
Vegetation Clearing that:			
	results in the removal of, or damage to, vegetation that is equal to, or in excess of, 40 centimetres in girth (circumference) measured at 1.3 metres above average ground level, and complies with the Acceptable Solutions of Specific Development Code 36 – Vegetation Management; OR results in the removal of, or damage to, vegetation that is equal to, or in excess of, four metres in height, and complies with the Acceptable Solutions of Specific Development Code 36 – Vegetation Management	results in the removal of, or damage to, vegetation that is equal to, or in excess of, 40 centimetres in girth (circumference) measured at 1.3 metres above average ground level, and alternate solutions to the Acceptable Solutions of Specific Development Code 36 – Vegetation Management are proposed; OR results in the removal of, or damage to, vegetation that is equal to, or in excess of, four metres in height, and alternate solutions to the Acceptable Solutions of Specific Development Code 36 – Vegetation Management	

4.0 GENERATIONS INDUSTRIAL PARK PLACE CODE – RELEVANT CODES FOR ASSESSMENT

4.1 RELEVANT CODES

References to Relevant Codes

The Codes relevant for development assessment in this Place Code area are listed and contained within the **Gold Coast Planning Scheme and are as follows:**

4.1.1 All proposed development within the site is subject to the **Generations Industrial Park Place Code**.

4.1.2 Self Assessable Development: The following codes apply to development that is self assessable under the Tables of Development herein (Section 3).

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park Place Code	2 Advertising Devices 4 Animal Husbandry 10 Caretaker's Residence 13 Detached Dwelling 24 Office 25 Private Recreation 27 Retail and Related Establishments 34 Temporary Use 36 Vegetation Management 38 Working From Home	2 Bushfire Management Areas 3 Canals and Waterways 4 Car Parking, Access and Transport Integration 8 Flood Affected Areas 10 Nature Conservation 16 Steep Slopes or Unstable Soils

4.1.3 Material Change of Use: The following codes apply to development that is code or impact assessable under the Tables of Development herein (Section 3).

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park Place Code	4 Animal Husbandry 10 Caretaker's Residence 12 Child Care Centres 13 Detached Dwellings 14 Display Homes and Estate Sales Offices 15 Ecotourism Facility	2 Bushfire Management Areas 3 Canals and Waterways 4 Car Parking, Access and Transport Integration 5 Cultural Heritage (Historic) 6 Cultural Heritage (Indigenous) 8 Flood Affected Areas

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
	17 Farm Forestry 20 Kennels 21 Landscape Work 23 Low Rise Commercial Tourist Accommodation 24 Office 25 Private Recreation 27 Retail and Related Establishments 29 Rural Industry 30 Salvage Yards 31 Service Stations 33 Telecommunications Facilities 38 Working From Home 39 Works for Infrastructure	9 Natural Wetland Areas and Natural Waterways 10 Nature Conservation 12 Rail Corridor Environs 13 Road Traffic Noise Management 14 Sediment and Erosion Control 15 Service Roads (Pacific Motorway) 16 Steep Slopes or Unstable Soils 17 Unsewered Land

4.1.4 Operational Work – Changes to Ground Level: The following codes apply to development that is self or code assessable Operational Work – Changes to Ground Level under the Tables of Development herein (Section 3).

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park Place Code	11 Changes to Ground Level and Creation of New Water bodies	2 Bushfire Management Areas 3 Canals and Waterways 4 Car Parking, Access and Transport Integration 6 Cultural Heritage (Indigenous) 7 Flood Affected Areas 9 Natural Wetland Areas and Natural Waterways 10 Nature Conservation 14 Sediment and Erosion Control 16 Steep Slopes or Unstable Soils

4.1.5 Operational Work – Advertising Devices, Landscape Work and Infrastructure: The following codes apply to development that is code assessable Operational Work –

Advertising Devices, Landscape Work or Infrastructure under the Tables of Development herein (Section 3)

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park Place Code	2 Advertising Devices 21 Landscape Work 39 Works for Infrastructure	2 Bushfire Management Areas 3 Canals and Waterways 4 Car Parking, Access and Transport Integration 5 Cultural Heritage (Historic) 6 Cultural Heritage (Indigenous) 8 Flood Affected Areas 9 Natural Wetland Areas and Natural Waterways 10 Nature Conservation 14 Sediment and Erosion Control 15 Service Roads (Pacific Motorway) 16 Steep Slopes or Unstable Soils

4.1.6 Operational Work – Vegetation Clearing: The following codes apply to development that is code assessable Operational Work – Vegetation Clearing under the Tables of Development herein (Section 3).

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park Place Code	36 Vegetation Management	2 Bushfire Management Areas 5 Cultural Heritage (Historic) 6 Cultural Heritage (Indigenous) 9 Natural Wetland Areas and Natural Waterways 10 Nature Conservation 14 Sediment and Erosion Control 16 Steep Slopes or Unstable Soils

4.1.7 Reconfiguring a Lot: The following codes apply to development that is code or impact assessable Reconfiguring a Lot under the Tables of Development herein (Section 3).

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Generations Industrial Park	11 Changes to Ground Level and Creation of New Water bodies	2 Bushfire Management Areas

PLACE CODE	SPECIFIC DEVELOPMENT CODES	CONSTRAINT CODES
Place Code	21 Landscape work 28 Reconfiguring a Lot 36 Vegetation Management 39 Works for infrastructure	3 Canals and Waterways 4 Car Parking, Access and Transport Integration 5 Cultural Heritage (Historic) 6 Cultural Heritage (Indigenous) 8 Flood Affected Areas 9 Natural Wetland Areas and Natural Waterways 10 Nature Conservation 12 Rail Corridor Environs 13 Road Traffic Noise Management 14 Sediment and Erosion Control 15 Service Roads (Pacific Motorway) 16 Steep Slopes or Unstable Soils 17 Unsewered Land

- Where a development proposal includes one or more types of development, all of the identified codes must be referred to for each of the components of development.
- Where a number is listed prior to the name of a Code, this Code shall be located in Part 7 of the Gold Coast Planning Scheme.
- Where a number is not listed before the name of a Code, this Code shall be located within this Place Code.

4.2 PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

The relevant Acceptable Solutions must comply with self assessable acceptable solutions in order to retain self assessable development status.

It is desirable that code assessable development comply with the Acceptable Solutions to ensure that each Performance Criterion is met. However, code assessable development may comply with an alternative solution, provided that the alternative solution can be demonstrated to meet the relevant Performance Criterion to Council's satisfaction. Where no acceptable solution is provided for a Performance Criterion in the code, the development must provide its own solution to meet that particular Performance Criterion.

It is desirable that impact assessable development comply with the Acceptable Solutions to ensure that each Performance Criterion is met. However, impact assessable development may comply with an alternative solution, provided that the alternative solution can be demonstrated to meet the relevant Performance Criterion, to Council's satisfaction. Note that impact assessable development must comply with all relevant planning measures of the whole Planning Scheme. Where no

alternative solution is provided for a Performance Criterion in the code, the development must provide its own solution to meet that particular Performance Criterion.

4.3 CONFLICT BETWEEN PLACE CODE AND PLANNING SCHEME

In situations where the Performance Criteria and/or Acceptable Solutions contained in Codes within this Generations Industrial Park Place Code conflict with the Performance Criteria and/or Acceptable Solutions of a Council Code, the Performance Criteria and/or Acceptable Solution of the Code within the relevant Generations Industrial Park Place Code shall prevail.

In situations where this Code is silent on matters, the development shall be subject to the provisions contained within the 'Our Living City – Gold Coast Planning Scheme' and its associated policies.

5.0 GENERATIONS INDUSTRIAL PARK PLACE CODE – DEVELOPMENT REQUIREMENTS

5.1 PURPOSE

The Generations Industrial Park Place Code seeks to ensure that the scale and intensity of development including the impact, design and appearance of industrial development for this land is consistent with the role of the site and the YEA as a regionally significant location for industrial development. These provisions also aim to ensure that the intent of the Place Code is followed and high standards of urban design and architecture are promoted.

5.2 APPLICATION

- This Code applies to all development taking place within the Place Code area as nominated within the Generations Industrial Park Land Use Classification Plan.

5.3 DEVELOPMENT REQUIREMENTS

GENERATIONS INDUSTRIAL PARK PLACE CODE

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
DEVELOPMENT THAT IS SELF ASSESSABLE, CODE ASSESSABLE OR IMPACT ASSESSABLE	
BUILDING HEIGHT	
PC1 The height of buildings is to be consistent with the role of the site as a predominantly industrial use area. Buildings are to be constructed to a height that complements the surrounding built form and the local landscape character.	AS1 The building has a maximum of two storeys. OR AS1.2 The height of buildings in each precinct does not exceed the maximums shown on Yatala Enterprise Area LAP – Maximum Building Height .
ACCOMMODATION DENSITY	
PC2 Accommodation density must be consistent with the predominant character of the YEA as an industrial location. Accordingly, very low residential densities are envisaged for the LAP area.	AS2 The maximum dwelling density does not exceed one dwelling per lot.
SITE COVERAGE	
PC3	AS3

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
The site coverage of development shall be in accordance with the open space landscape character of the YEA.	The maximum site coverage shall not exceed 70%
BUILDING SETBACK	
PC4 The layout of buildings, structures and activities achieves an attractive and orderly appearance where development is visible from the public domain. A good standard of visual amenity is achieved through generous building setbacks and high quality landscaping.	Precinct 1 AS4.1 Buildings are set back from frontages: a) 10 metres from the primary frontage; and b) 7 metres from the secondary frontage. Precinct 1 AS4.2 Where the site adjoins a residential lot or public open space area, the building or structure is set back a minimum of three metres from the common boundary with the residential lot or public open space, and the setback area includes: • A landscape buffer strip a minimum width of two metres; and • Acoustic screen fencing on the common boundary to the residential lot or public open space area.
AREA DESIGN CONTROLS	
PC5 Those developments located within the area designated within the Generations Industrial Park Land Use Classification Plan may potentially have undesirable impacts upon the residential uses located to immediate south-west of the site. Accordingly, the impacts of proposed development must be mitigated and all uses and structures need to be sufficiently buffered from sensitive receivers.	AS5.1 Where proposed allotments adjoin the residential community located to the south (see the Generations Industrial Park Land Use Classification Plan attached hereto 5093 P 00 09C) acoustic control measures must be complied with as follows: • Acoustic attenuation measures as detailed within the acoustic report prepared by TTM Group dated 4th November 2011 must be complied with, including, but not limited to, nil side setback requirements; and • Landscaping buffering to the minimum width of 10m and treatments specified within the Landscape Intent Plan by Gassman Development Perspectives 5093 L LI 02
DESIGN OF DEVELOPMENT NEAR MAJOR ROADS	
PC6 Those developments visible from, or facing Stapylton-Jacobs Well Road must exhibit a high standard of architectural presentation.	AS6 Facades visible from, or facing Stapylton-Jacobs Well Road are designed to incorporate: a) materials such as glass, brick and coloured/textured block work (standard concrete block should not be used). If metal cladding is used, it should be pre-coated in an appropriate colour and have some form of relief;

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	b) relatively unobtrusive, earth toned colours, such as subdued greens, blues, browns and greys (bright colours and/or materials which cause glare are avoided); c) horizontal/vertical articulation of walls at least at 15 metre intervals; d) 'humanising' elements, such as entry forecourts, porticos, verandahs, windows, awnings and fenestration; e) other features which contribute to an interesting and attractive appearance These design features are to be applied to the main facade facing the relevant road, as well as along a brief return or the full length of side walls.
VEHICULAR CROSSINGS	
PC7 Vehicular crossings associated with the development must be designed and constructed to ensure: a) A safe footpath environment; b) Safe vehicular access to the property; c) Appropriate hydraulic performance of the stormwater infrastructure; d) No damage to vehicle or road infrastructure; e) Minimal loss of on-street parking spaces; and f) Continued amenity of the neighbourhood.	AS7 Driveways are designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines.
DEVELOPMENT THAT IS CODE ASSESSABLE OR IMPACT ASSESSABLE	
BUILDING HEIGHT	
PC8 The height of buildings is to be consistent with the role of the site as a predominantly industrial use area. Buildings are to be constructed to a height that complements the surrounding built form and the local landscape character.	AS8 The maximum height of buildings does not exceed three storeys.
SITING	
PC9 All buildings must be sited to complement the industrial character and the predominant built form of the surrounding area and to reduce potential conflicts between uses having regard to a site analysis, prepared in accordance with Planning Scheme Policy 17 - Site Analysis.	AS9 No acceptable solution provided.
PC10 The layout of the site must provide a clear separation between the public access areas and the areas set aside for servicing the building.	AS10 No acceptable solution provided.
PC11	AS11

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
Industrial structures, storage or service areas, which are likely to appear visually dominating or unsightly, are located to the rear or sides of sites or are otherwise designed and screened to enhance their appearance, when viewed from the street.	No acceptable solution provided.
BUILDING AND LAYOUT DESIGN, SAFETY AND COMFORT	
PC12 Buildings are sited and designed such that suitable external spaces remain available for future expansion of buildings, and internal spaces are of a size and shape suited to variable internal layout, maximum vertical storage and addition of mezzanine floors.	AS12.1 Building shapes are regular so as to provide opportunities for future expansion in different directions, and for flexibility in internal location of activities and equipment. AS12.2 Internal column spacing and column heights are generous (for example, building spans of 18 metres and over, bay spacing of 12-18 metres, and column heights of at least eight metres).
PC13 Buildings are sited and designed to suit climatic conditions.	AS13.1 Wherever practicable, buildings are oriented to the north east to take advantage of summer breezes and winter sun. Western aspects are avoided, wherever possible. AS13.2 Where not air conditioned, buildings incorporate a maximum of openings (ie. louvring, windows, doorways) on eastern walls. AS13.3 Windows are minimised and trees are planted along west walls for protection from hot afternoon sun. AS13.4 Shading devices (ie: large roof overhangs, window hoods/blinds, awnings and verandahs) are attached to buildings on all sides, particularly eastern and western sides. Where possible, shading devices are retractable on northern sides during winter. AS13.5 Semi-enclosed workstations, where relatively strenuous manual labour takes place, are located in the cooler and more ventilated parts of the building.
PC14 All buildings must be designed and constructed to a high aesthetic standard and to complement or enhance the local character of the YEA.	AS14.1 The massing and proportions of new industrial buildings are consistent with those of adjoining industrial buildings. AS14.2 Building materials, patterns, textures and colours used in new buildings are complementary to those of nearby buildings.

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
PC15 Building design and appearance must be conducive to the safety and comfort of all building users.	AS15.1 Glass which forms all or part of any external wall of a building does not exceed a maximum degree of reflection of both heat and light of 20%. The glass area does not exceed 60% of the total area of the external wall. AS15.2 Entrances to premises are clearly visible from the street, and are not obscured or dominated by car parking.
DESIGN OF CAR PARK AREAS	
PC16 All ground level parking is to be suitably landscaped to provide an attractive and pleasant outlook and shade for parked vehicles, and to contribute towards the quality presentation of new developments.	AS16.1 Significant trees are preserved and incorporated into car parking areas. AS16.2 Landscaped bays for the planting of shade trees are provided at regular intervals throughout car parking areas, at the rate of one landscaped bay per 40 vehicle parking bays or one large shade tree per ten parking spaces. Landscape bays have the same dimensions as a vehicle parking space. AS16.3 Large car parking areas and all heavy/service vehicle parking are situated to the side or rear of sites. Smaller car parking areas, particularly for short term and disabled parking, may be located to the front of sites. AS16.4 Car parking areas located in frontage setback areas are set back behind a minimum three metre landscaped buffer to the frontages. To reduce their visual impact, front car parking areas may be lowered and mounds incorporated in frontage landscaping.
ADVERTISING DEVICES	
PC17 Advertising signage does not dominate the visual amenity of the area.	AS17 No advertising, freestanding or otherwise, is erected which would be readily visible from the Pacific Motorway of the Gold Coast City Rail Line.
PC18 Signs and other forms of advertising on business/industry premises are kept to a minimum. Any advertising relates directly to the activity/process conducted on the premises, rather than general product advertisements.	AS18.1 There is one sign per premises. Multi-unit developments display a single index sign at the entrance to the development which details each occupant, its activity/process and respective unit number. AS18.2 The design and construction of signs meets the following parameters:

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	a) signs are situated near site entries and are well placed for viewing by pedestrians and drivers; b) free-standing signs have a maximum area of 3m²; c) signs on facades have a maximum area of 5m²; d) signs utilise company logos or symbolic representations for quick and easy identification; e) wording on signs is limited to the name, location, business and products of the establishment; f) signs do not utilise fluorescent paints; g) signs do not rotate, flash or move; h) signs are integrated with the form of development and are not visually dominating. AS18.3 All signs are consistent with the provisions for the Industry 2 Domain set out in Specific Development Code 2 – Advertising Devices.
CONSERVATION AREAS AND OPEN SPACE LINKAGES	Deliberately deleted and replaced with the PC in order to be consistent with site design and ecological requirements.
RESERVE AREA	
PC19 The area identified as Precinct 6 within the Land Use Classification Plan areas remain in a substantially undeveloped condition, with vegetation retained to the fullest extent possible and, where necessary, rehabilitated using local native species.	AS19.1 Areas identified as Precinct 6 (Open Space/Reserve) on the Land Use Classification Plan are reserved for conservation purposes, through: a) reservation of the area of Precinct 6 as open space which will be subject to the application of an open space management plan/statement that is suitable to Council. b) Eventual commitment of part of the land to Council as reserve in accordance with the requirements of an approved open space management plan/statement. AS19.2 Areas identified within the Precinct 6 area (ie., only those areas specifically identified for revegetation within an approved open space management plan) highlighted to require revegetation are managed in the following manner: a) the land remains largely undisturbed by any buildings, clearing and earthworks; b) Existing trees are retained, and additional trees planted within a 50 metre wide band;

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	c) the areas may form part of the landscape open space areas, associated with individual development proposals. If so, they should generally remain free of building and earthworks; additional tree planting utilises species similar to those existing naturally in the area; d) any parallel roads or services are grouped on one side of the areas, to minimise disturbance; e) any breaks in the vegetation canopy, necessary for roads or services, are minimised by cutting through perpendicular to the link at a point where damage and discontinuity are minimised, such as where the canopy is already broken or sparse.
LANDSCAPE DESIGN	
PC20 Landscape design is used to enhance the landscape character of the YEA.	AS20.1 Frontage setback areas are attractively landscaped, including: a) at least 25% of the frontage having a landscaped buffer of minimum five metres depth and the remainder, excluding access ways, a landscape buffer of minimum three metres depth; b) one metre landscaped area adjacent to building walls facing the street. AS19.2 Planting of shade trees occurs along pathways, throughout car parking areas and in any other exposed areas where relief from sun and glare would be beneficial. AS20.3 Dwarf walls prevent vehicles breaching landscaped areas along frontages. AS20.4 Screen planting, utilising an appropriate mix of tall trees and lower level shrubs, is used around outdoor parking, equipment, storage and other unsightly areas, particularly where visible from roads. AS20.5 Landscape Design includes: a) provision of pleasant, shaded areas with appropriate furniture for lunch/relaxation areas for workers and visitors; b) retention of existing mature vegetation, wherever possible; c) retention of existing natural drainage channels and planting to strengthen their resistance to erosion; d) especially where proposed development is expected to result in increased volume and

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	velocity of stormwater runoff; e) use of garden edges, lines of trees and mass planting to frame pathways and define site and building entries.
PC21 Potentially obtrusive noise, odour and visual impacts are effectively buffered.	AS21.1.1 Development incorporates landscape buffers, earth mounds and acoustic fencing appropriate to the likely off-site impacts of particular developments. OR AS21.1.2 A landscape buffer of a 20 metre width, densely planted with shrubs and trees, is provided along the relevant frontage. A landscape buffer to a minimum width of ten metres may be acceptable, depending on the potential of proposed planting arrangements to effectively screen development behind. Species selection, use of mature or semi mature trees, and density of planting will be important in this respect.
PC22 The street side environment and other public spaces are developed to enhance their visual appeal and create a physical continuity and legibility throughout the YEA area and its component precincts.	AS22 Individual developments contribute to streetscape enhancement work (including street tree planting, paving, landscaping of traffic islands and provision of street lighting and furniture), in accordance with any adopted Council streetscape strategy.
PC23 Public open spaces are developed to enhance their recreational amenity for workers and visitors to the Yatala area and the wider community.	AS23 Individual developments contribute (through works or financial contribution) towards construction of footpaths and cycle ways, seating, picnic facilities, play areas and/or other facilities in existing public open spaces and additional spaces established as a result of the development.
PC24 Landscape design contributes to the creation of a distinctive, memorable and legible town centre, local centres and surrounding suburban areas for YEA.	AS24.1 Street design and plantings and major pedestrian paths are aligned to take advantage of attractive local and distant views (eg, views to the mountains or other important landscape elements). AS24.2 Footpath paving treatments and street furniture integrate with adjoining development, and setback areas are integrated with public footpaths. AS24.3 Landscape plantings utilise local native species to promote a distinctive site character.
PC25	AS25

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS									
Open space and pedestrian areas are to be designed to be both functional and safe.	Development is designed to ensure a high degree of casual surveillance from nearby residents, employees or passing traffic, public and semi-public spaces, pedestrian and cyclist paths, car parking areas and building entrances.									
PC26 All ground level car parking, open space and buffer areas must be landscaped and maintained to complement the character of the local area, and any adjoining residential or public open space areas.	AS26 The car park area, open space and buffer areas of the lot are landscaped with landscape design and use of plant species generally consistent with that of adjacent and nearby lots. The landscape design may incorporate extensive paved areas for pedestrian use.									
LOT SIZE (FOR SUBDIVISION ONLY)										
PC27 All lots are to be of sufficient size to comfortably accommodate the type of development envisaged in the LAP and the relevant precinct intent.	AS27 Any new lots created are sized in accordance with the following schedule: <table><tr><th>Precinct</th><th>Min Area</th><th>Ave Area</th></tr><tr><td>1</td><td>4000m²</td><td>1 hectare</td></tr><tr><td>1A</td><td>4000m²</td><td>1 hectare</td></tr></table>	Precinct	Min Area	Ave Area	1	4000m ²	1 hectare	1A	4000m ²	1 hectare
Precinct	Min Area	Ave Area								
1	4000m ²	1 hectare								
1A	4000m ²	1 hectare								
PC28 Allotments prior to development have suitable topography for industry.	AS28 Industrial allotments generally have a ground slope not greater than 10%, and access ways associated with battle axe allotments generally have a ground slope not greater than 16%.									
PC29 Allotments are of regular shapes suited to the intended uses, and allowing design flexibility, efficient development and access.	AS29.1 Development generally incorporates all of the following features: a) allotments that are rectangular shapes; b) allotments which have frontage to depth ratios between 1:2 and 1:4. OR AS29.2 Alternative allotment shapes are provided where warranted, due to: a) the special site requirements of particular industries; and/or b) exceptional physical constraints. OR AS29.3 The development incorporates a small proportion of battle axe allotments, where particular industries have special requirements for square or long and narrow sites. (Battle-axe allotments are useful for creating allotments of such shapes, as well as reducing road frontage construction costs and providing appropriate sites for visually offensive industries.).									
PC30	AS30									

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
Allotments are oriented to suit climatic conditions.	Allotments are arranged in a manner that maximizes the number of allotments oriented to the north east to take advantage of breezes and enable optimal building orientation for energy efficiency and use of natural lighting.
PC31 Reconfiguration of land incorporates open space provision in a way which takes account of the location and attributes of the site and its surrounds, and the need to set aside certain areas for purposes such as: a) conservation of vegetation/habitat; b) retention of creek corridors and natural drainage patterns; c) provision of pedestrian/cycle linkages and recreational facilities; and/or d) creation of landscaped entrances, focal points and streetscape.	AS31.1 Where reconfiguration takes place, an area of up to 10% of the site is provided as open space. This open space is set aside for public park or conservation purposes, developed with pathways and/or recreational facilities, landscaped and/or rehabilitated to its natural state. AS31.2 Reconfiguration proposals incorporate a plan showing street planting to be undertaken. Planting themes contribute to the overall streetscape character of the estate.
PC32 Reconfiguration may take place in the form of Community Title subdivision, allowing for sharing of space, facilities and services, while at the same time ensuring allotments created are suited to the intended businesses/industries.	AS32 Community Title subdivisions within Precinct 1 (Industrial) are provided, which: a) are consistent with the Acceptable Solutions for PCs 27-31 b) generally maintain a minimum lot size of 100-200m² within a minimum overall site area of 2,000m²; c) are not used for heavy manufacturing, metal/food processing, or noxious, offensive or hazardous industries.
ROAD DESIGN	
PC33 Roads are provided so as to form a road hierarchy, with each road serving a particular function according to the intended land use characteristics of the estate, expected traffic volumes and types, and external existing and future road linkages to anticipated development on adjoining lots.	AS33.1 Concept plans submitted with reconfiguration and/or development applications identify all roads proposed to be upgraded and/or newly constructed and their intended function within a road hierarchy. AS33.2 Concept plans submitted with reconfiguration and/or development applications identify road connections with adjacent allotments that will promote connectivity; and AS33.3 Proposed road hierarchies are consistent with hierarchy identified on the Generations Industrial Park Land Use Classification Plan.
PC34 The width, pavement, curvature, sight distances, intersections, turning radii and design features of roads convey the particular function of each road with the hierarchy mentioned in AS36.3, and	AS34.1 Road design and construction is in accordance with Planning Scheme Policy 11 - Land Development Guidelines and the Table to this Acceptable Solution.

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
reflect the nature of traffic management. In particular, road design ensures the safe movement of heavy articulated vehicles.	AS34.2 Distances between intersections are not less than 60 metres. AS34.3 Streets intersect at right angles, or as near as topography or other limiting factors permit. AS34.4 Various vehicle control devices are used to regulate traffic speed and enhance pedestrian safety (such as traffic lights and illuminated pedestrian crossings). AS34.5 Paving surfaces, landscape treatment and signage are used to define entrances to the estate and joint use areas within the estate AS34.6 Road pavements are designed and constructed for long life, hard wearing and suitability to the load capacity of expected vehicles. AS34.7 Median strips, roundabouts and footpaths are to be aesthetically treated and planted and paved accordingly; and AS34.8 The design of road networks avoids the use of culs-de-sac.
PC35 The alignment of roads reflects the physical land characteristics, and provides adequate drainage and safety.	AS35.1 Road drainage is designed and situated along natural drainage courses. AS35.2 Road grades are established to avoid excessive grading, indiscriminate removal of ground cover and tree growth, and unnecessary topographical levelling.
PC36 A network of pedestrian paths and cycleways is provided which considers: a) expected levels of pedestrian and cyclist activity; b) linkages between public transport, major employment activities, and parks; c) recreation opportunities along open space corridors; d) safe integration of users and vehicles, particularly at intersections; e) provision of end-of-journey facilities.	AS36.1 Footpaths are provided as follows: a) on at least one side of all major industrial roads, shown on the Generations Industrial Park Land Use Classification Plan. b) as specified in any relevant Council adopted strategy. AS36.2 Paths are designed and constructed in accordance with Council standards and AUSTROADS Part B. AS35.3 Features such as signs, road markings, lighting, paving, bollards and street furniture are provided to enhance the safety and amenity of foot/cycle

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	paths. AS36.4 Individual establishments, particularly those with 100 employees or more, provide bike racks, showers/change rooms, and other-end-of journey facilities.
PC37 The road network is designed to accommodate the extension and integration of the public transport system, with accessible linkages and routes and stops providing for passenger comfort without obstructing traffic flow.	AS37.1 Bus routes are located along the major industrial roads shown on the Generations Industrial Park Land Use Classification Plan., or as specified by Council's City Transport Plan. AS37.2 Road design and construction incorporates bus lay-bys and sheltered passenger waiting areas at regular intervals along bus routes, or as specified in any relevant Council strategy.
SITE ACCESS	
PC38 Site access is designed and constructed to provide for the safe ingress/egress of vehicles to the site.	AS38 Vehicular access to the site is designed and constructed in accordance with Council, Department of Main Roads and AUSTROAD standards, and/or the following minimum requirements: a) comprises a single vehicular driveway (entrance/exit), wherever possible; b) is not closer than ten metres to an intersecting street on the same side of the street; c) provides a minimum sight distance of 110 metres; d) shares adjoining property access driveways, wherever possible; e) always enters the street at right angles; f) where the site has frontage to two roads, access is taken off the secondary/minor road, if possible.
PC39 Treatment of access points to the site maintains appropriate sight distances and visually enhances its identification.	AS39 Access points incorporate decorative paving treatment and landscaping which distinguishes the access point, but which does not obstruct the safe sight distance requirements outlined above.
PC40 Provision is made for safe pedestrian and disabled access.	AS40.1 Pedestrian paths designed for disabled access are provided between building entrances, public footpaths and car parking areas. AS40.2 Pedestrian paths are separated from vehicular driveways.
AMENITY PROTECTION	

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
PC41 The proposed use must not detract from the amenity of the local area, having regard, but not limited, to the impact of: a) noise; b) hours of operation; c) traffic; d) lighting; e) signage; f) visual amenity; g) privacy; h) odour and emissions.	AS41 No acceptable solution provided.
PC42 The proposed development must take into account and seek to ameliorate any negative aspects of the existing amenity of the local area, having regard, but not limited, to the existing impact of: a) noise; b) hours of operation; c) traffic; d) lighting; e) signage; f) visual amenity; g) privacy; h) odour and emissions.	AS42 No acceptable solution provided.
URBAN/RURAL USE CONFLICTS	
PC43 Conflicts between urban and rural uses are to be avoided by effective development design.	AS43 The development of land adjacent to the agricultural character areas includes a suitable buffer.
EXTRACTIVE INDUSTRY	
PC44 Extractive industry operations are managed to make effective use of the extractive resource, while containing any impacts on the subject site.	AS44 The extractive industry is managed and developed consistent with the Extractive Industry Domain Place Code.
ON-SITE VEHICLE PARKING AND MOVEMENT	
PC45 Internal driveways are provided for safe and easy maneuvering of vehicles.	AS45.1 Internal driveways are designed and constructed to enable all vehicles to enter and exit the site in a forward motion. AS45.2 Minimum driveway widths are as follows: a) six metres to accommodate non articulated vehicles; b) ten metres to accommodate articulated

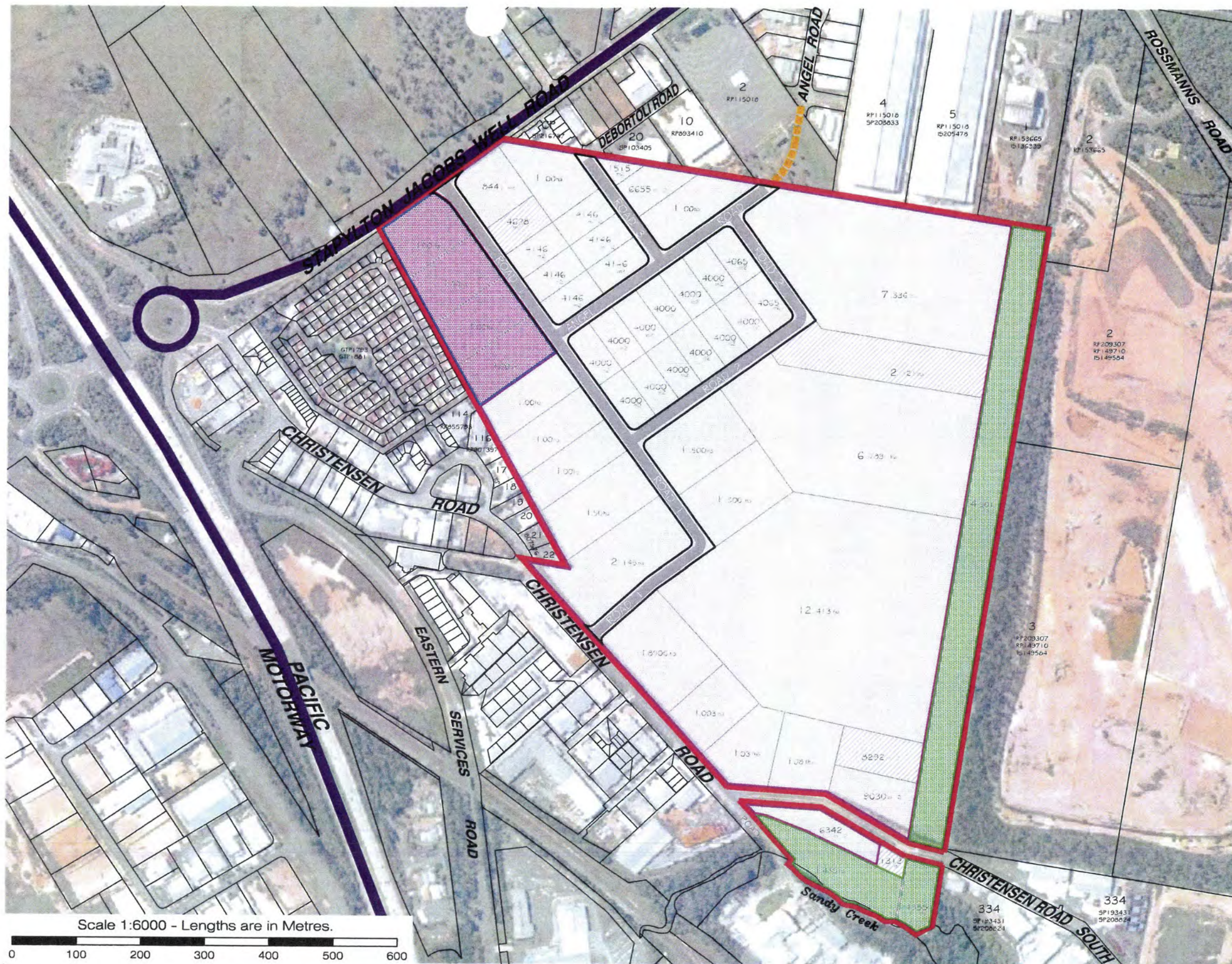
PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
	vehicles; c) 4.5 metres for one-way driveways.
PC46 On-site vehicle parking is provided to meet expected demand, having regard to: a) The size of the proposed workforce; b) The likely number of visitors to the site; c) The likely size and number of service and transport vehicles to be on the site at any one time; d) On-site parking and loading/unloading activities within sites; e) The availability of conveniently located on-street parking; f) Any possible future expansion, redevelopment or change of use.	AS46.1 The number of car parking spaces provided on-site generally meets the standards set out in the Constraint Code 4 - Car Parking, Access and Transport Integration in the Gold Coast City Planning Scheme (version 1.1 Amended January 2007). AS46.2 For multi-unit or multi-use developments, the total car parking provided is an aggregate of the standard parking required for each individual unit and/or component use. AS46.3 A lesser provision may be acceptable where it can be demonstrated, to Council's satisfaction, that the parking needs of a particular development will be adequately met. Where less than the standard amount of parking is provided, the left over space is retained as landscaped open space and placed so as to be suited to ready conversion to additional parking, should the use of the site change and/or the actual car parking demand rise.
PC47 On-site vehicle parking is located: a) to allow easy access to building entrances; b) to provide visitor spaces for short term/high turnover use clearly visible from the street and signposted accordingly; c) to be adequately screened from the street; d) compatible with surrounding development and, where possible, facilitating shared use with adjacent land users.	AS47.1 In areas where visual amenity is important and/or where relatively large amounts of parking are provided, parking areas are generally situated to the rear or side of the site. In particular, employee parking is situated at the rear of the site, with staff entrances at the rear of the building. AS47.2 Some parking may be located toward the front of the site convenient to the street, provided it is behind landscaping strips and treated aesthetically. AS47.3 Short term/high turnover visitor parking and disabled parking spaces are located close to the main building entrance and clearly signposted. AS47.4 Driveways and parking areas may be constructed to property boundaries and linked to adjoining car parking areas. Similarly, loading areas may be located to facilitate shared turning areas across property boundaries.
LOADING AND UNLOADING	

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
PC48 All loading and unloading activities take place onsite, unless access is from a service street and effectively screened.	AS48 Loading docks are located in the side or rear portions of the site, separate from public/visitor parking and access points, and screened by vegetation or walls to avoid public view.
PC49 Adequate provision is made for on-site manoeuvring of heavy vehicles.	AS49.1 On sites over 4,000m² and/or where the uses thereon involve regular servicing by heavy vehicles, on-site service areas are provided. On-site service areas comprise an area of land with an appropriate hard surface to enable a heavy vehicle to turn around within the site (based on standard design turning templates given by AUSTROADS AS 2890.1, 2890.2), and space for additional service vehicle parking and storage requirements. AS49.2 It may be acceptable for two or more developments to share heavy vehicle turning areas.
SITE SERVICING	
PC50 The design and provision of water, stormwater drainage, sewerage, electricity, gas and communications networks meets the needs of industry and business, and provides an orderly and economic progression of service development in the region.	AS50.1 The design and supply of water, stormwater drainage, sewerage, electricity, gas and communication services is in accordance with the requirements of Planning Scheme Policy 11 – Land Development Guidelines and the responsible authority (eg. Telstra, Queensland Electricity Boards, and Queensland Emergency Services). AS50.2 Car park entrances and ramps, loading docks and access ways are minimised, suitably designed and treated to ensure that they do not adversely impact on the streetscape and adjoining development.
PC51 Conflicts between pedestrians and vehicles at entrance points to parking areas are to be minimised.	AS51.1 The number of vehicle entry points to a development site is minimised, particularly in areas which have high volumes of pedestrian traffic and on streets with a significant through road function. AS51.2 Entrance points to parking and loading areas have clear and unobstructed visibility of pedestrian pathway areas, with pedestrian crossing points clearly identified which give priority to pedestrians.
PC52 Development is to be designed to support the	AS52 Development is designed to support the functional operation of the local and regional

PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS
functional operation of the cycle network.	cycleway system. (Local cycle ways will be determined at time of subdivision of each development.)
PUBLIC CONVENIENCE FACILITIES WITHIN BUILDINGS	
PC53 Commercial developments are to include public convenience facilities, where there is a need for their provision.	AS53 Where provided, public toilet facilities are open and readily accessible to the general public during retail trading hours or other trading hours relevant to the development.

SCHEDULE 1:

**GENERATIONS INDUSTRIAL PARK LAND USE
CLASSIFICATION PLAN**



- LEGEND**
Site Area: 73.114 Ha
- Limit of Application
 - Major State controlled Roads
 - Proposed northern link to site
 - Indicative site north-south / east-west connectivity
 - Indicative site lot layout only

PRECINCT ONE DEVELOPMENT AREA (INDUSTRIAL)	59.049Ha
DESIGN CONTROL AREA	4.0Ha
STORMWATER DRAINAGE / DETENTION (INDUSTRIAL)	3.544Ha
PRECINCT SIX (OPEN SPACE / RESERVE)	6.521Ha



planning
design
environment
surveying

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e: mail@gasman.com.au
w: www.gasman.com.au

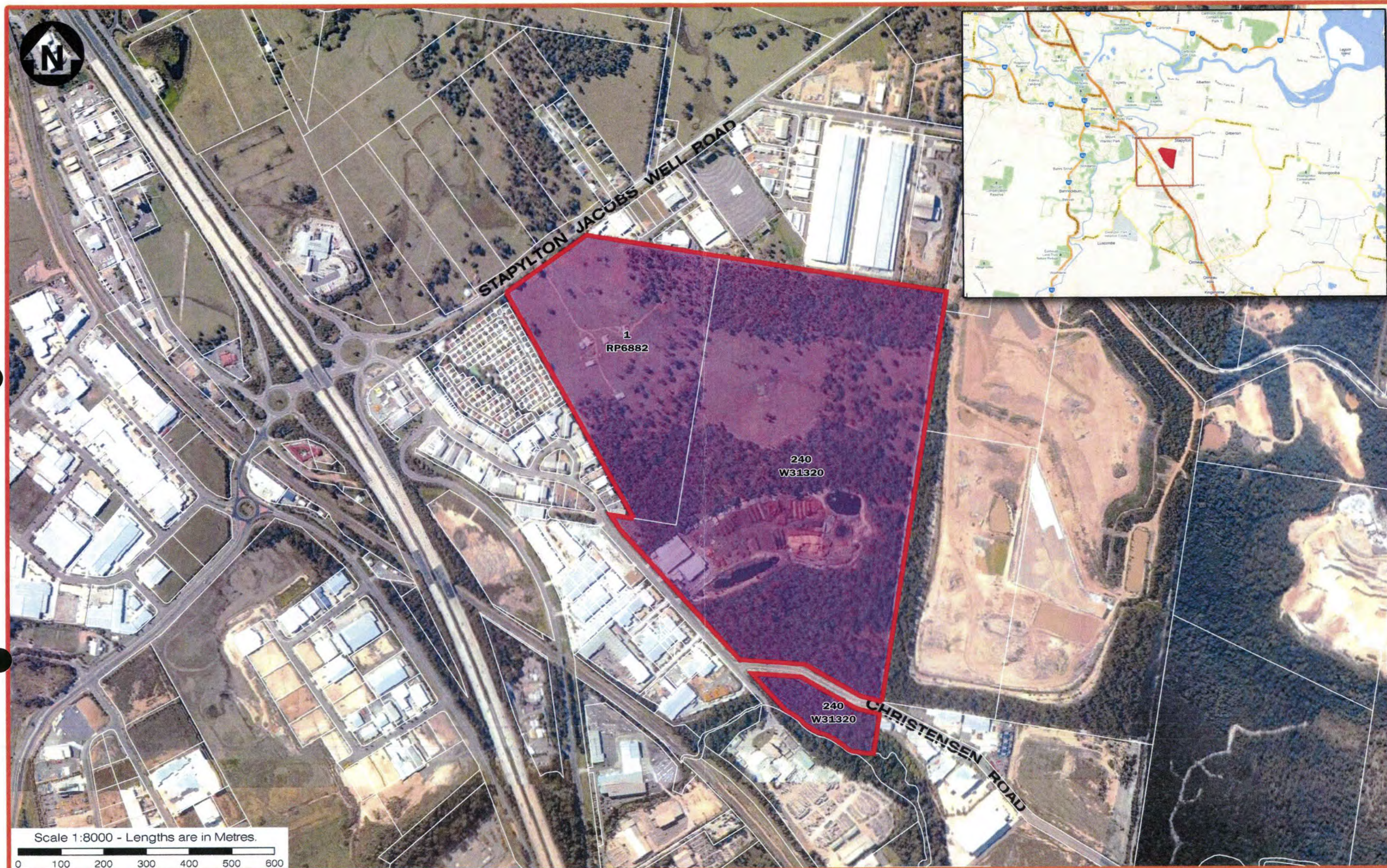


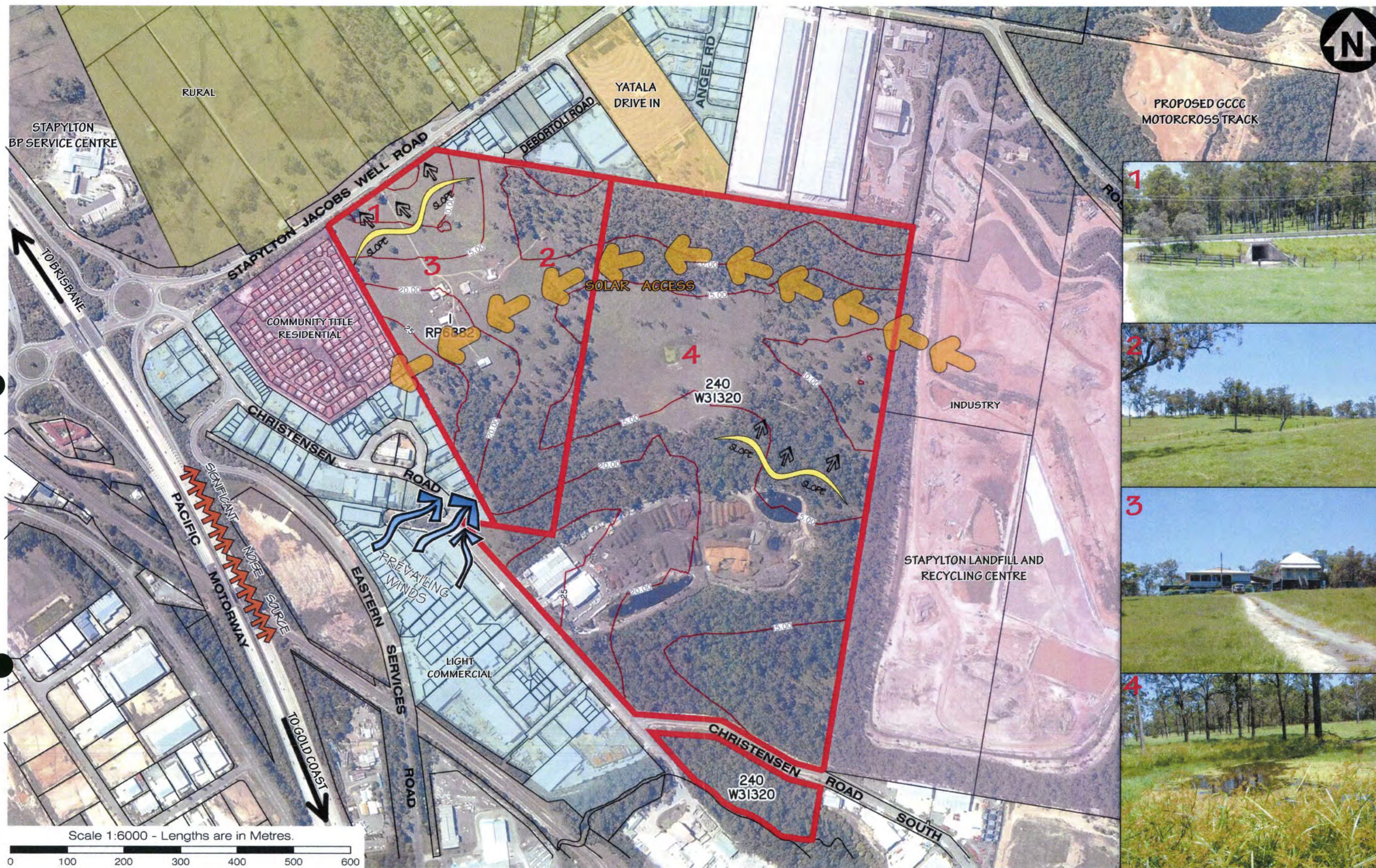
land-use stapylton-jacobs well road, stapylton
classification plan generations industrial park

date: 02-11-11
scale: 1:6000
design: BJW/SJH
plan: 5093 P 00 09C

4 – PLANS (GDP)

- Site Analysis Plan (GDP)
- Relevant Constraint and Context Plans (GDP)
- Statement of Landscape Intent (GDP)







Scale 1:8000 - Lengths are in Metres.
0 100 200 300 400 500 600

LEGEND

— LIMIT OF APPLICATION



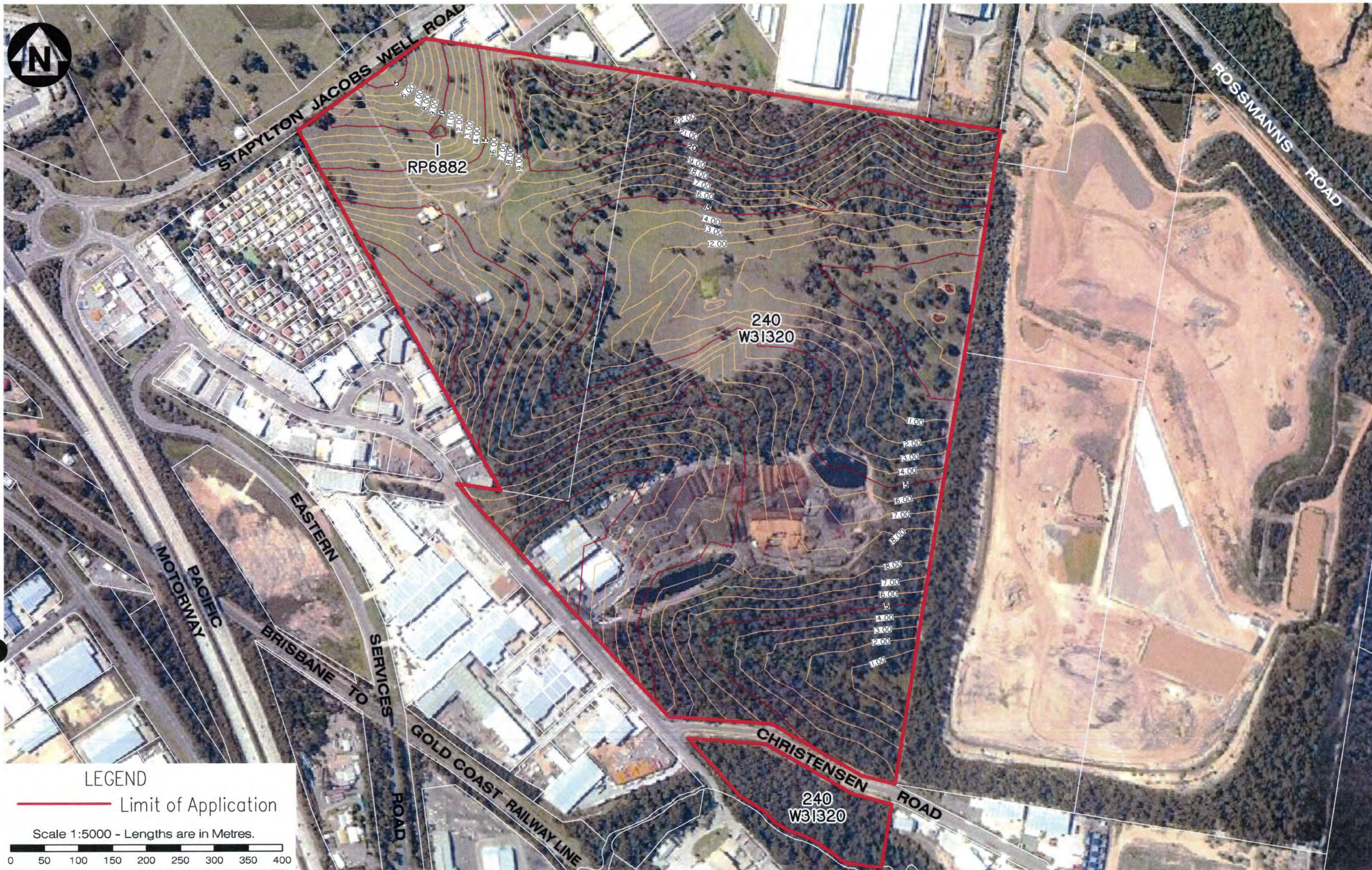
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w: www.gassman.com.au

aerial and location plan

stapylton jacob's well road, stapylton
generations industrial park

date: 01-04-11
scale: 1:8000
design: BJW/SJH
plan: 5093 P 00 01A



gassman
development
perspectives

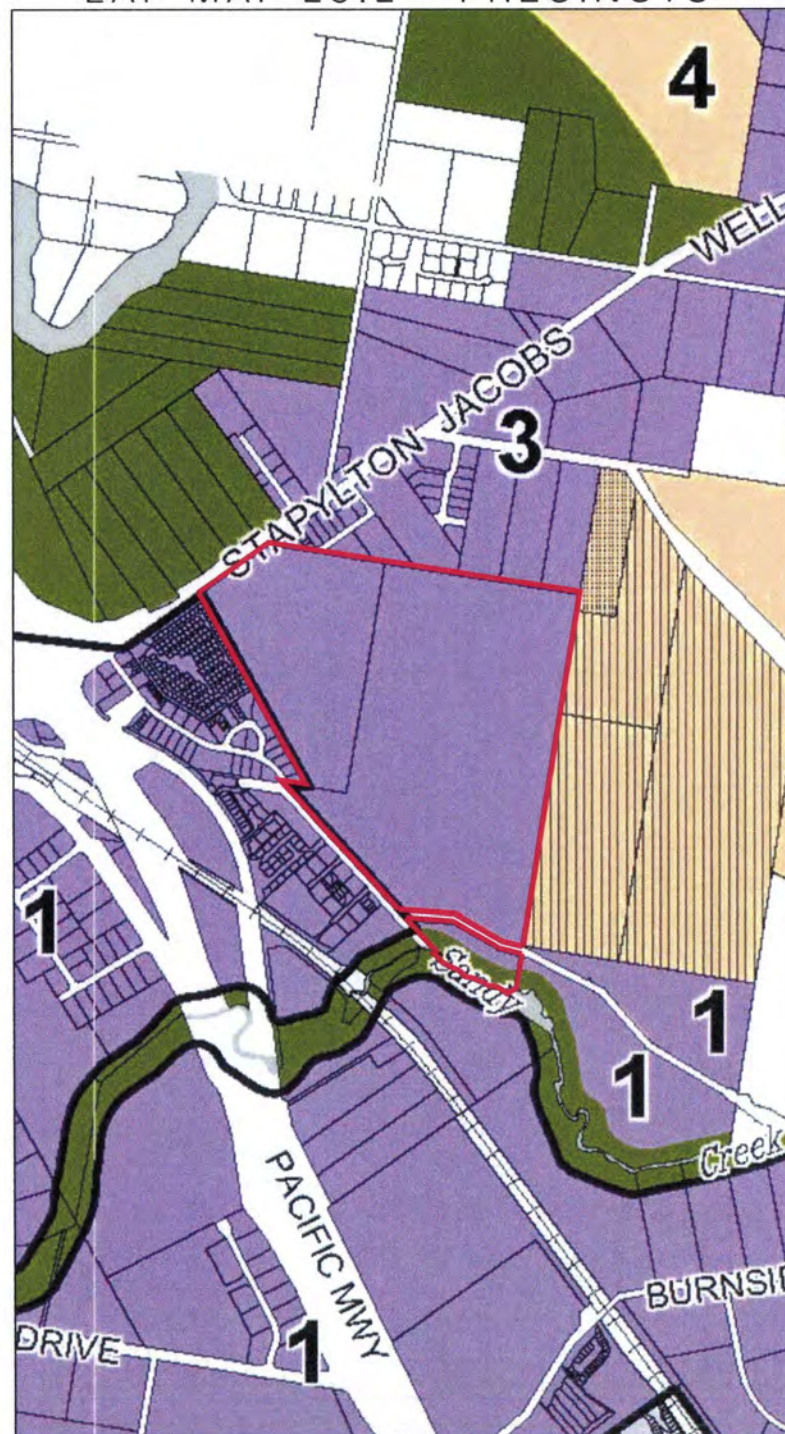
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aerial and contour plan stapylton-jacobs well road, stapylton
generations industrial park

date: 01-04-11
scale: 1:5000
design: BJW/SJH
plan: 5093 P 00 03

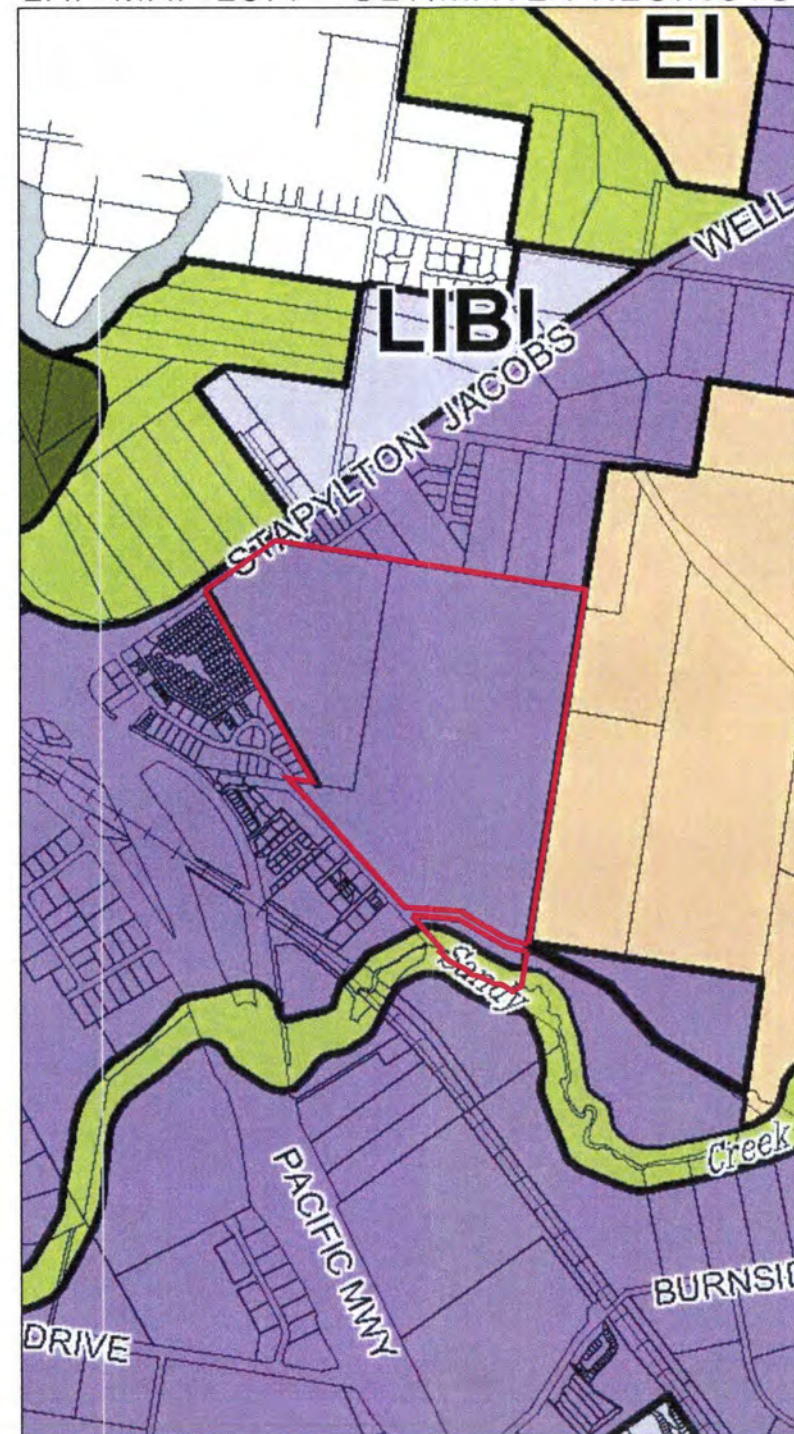
YATALA ENTERPRISE AREA LOCAL AREA PLAN
LAP MAP 29.2 - PRECINCTS



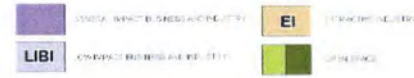
Legend



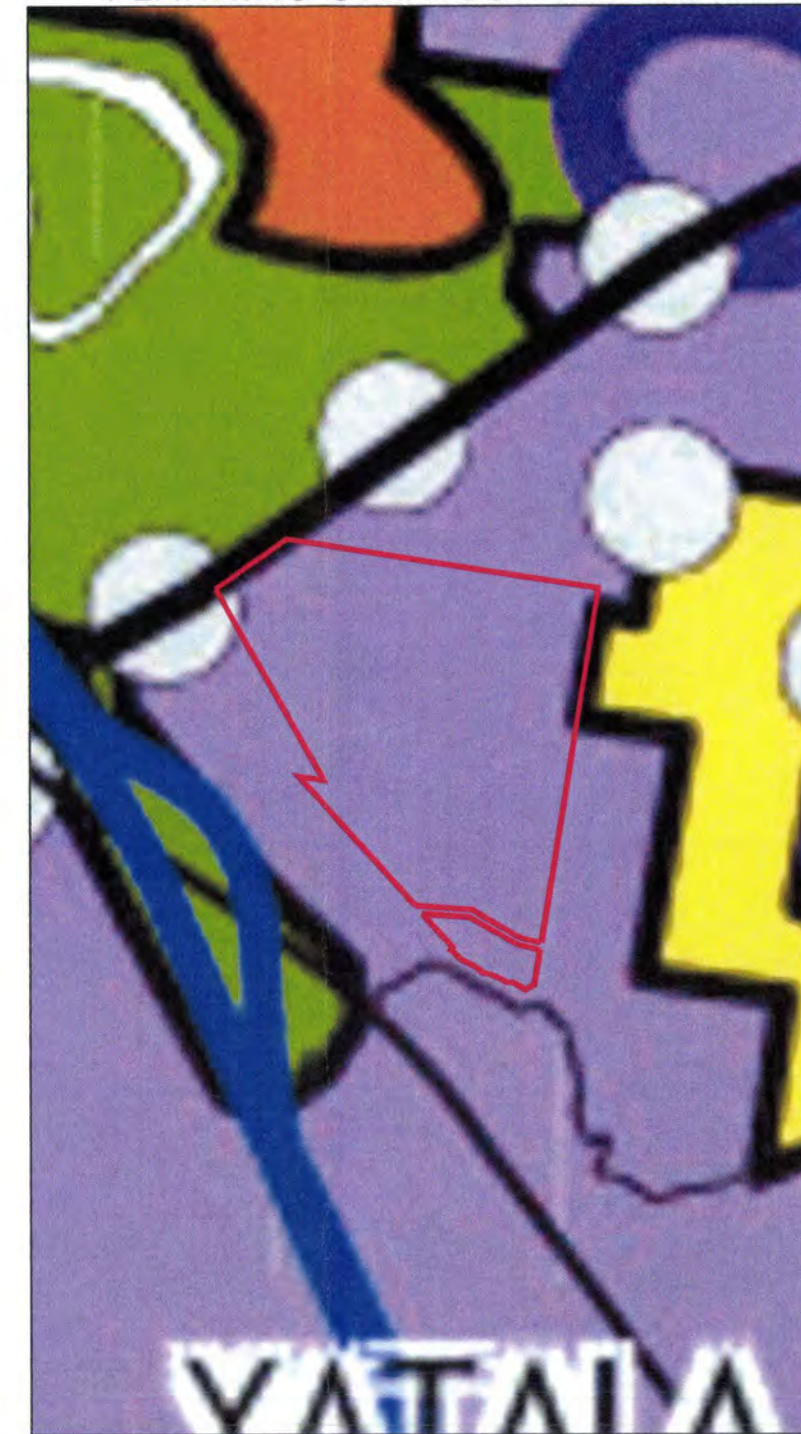
YATALA ENTERPRISE AREA LOCAL AREA PLAN
LAP MAP 29.4 - ULTIMATE PRECINCTS



Legend

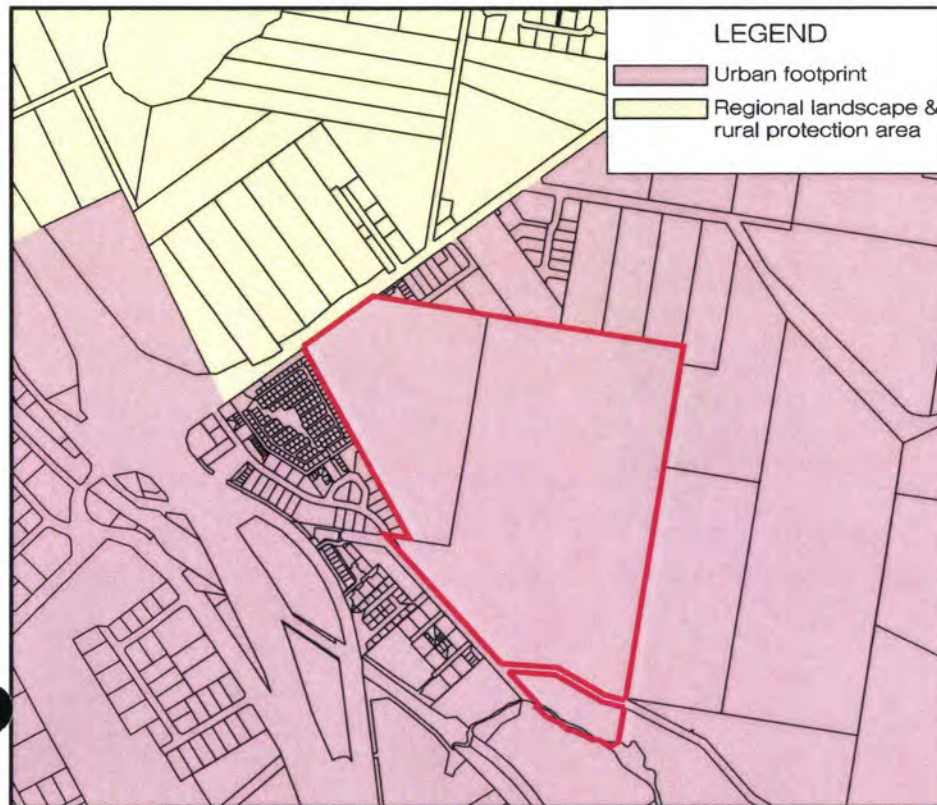


LAND USE THEMES -
PLANNING STRATEGY MAP PS1

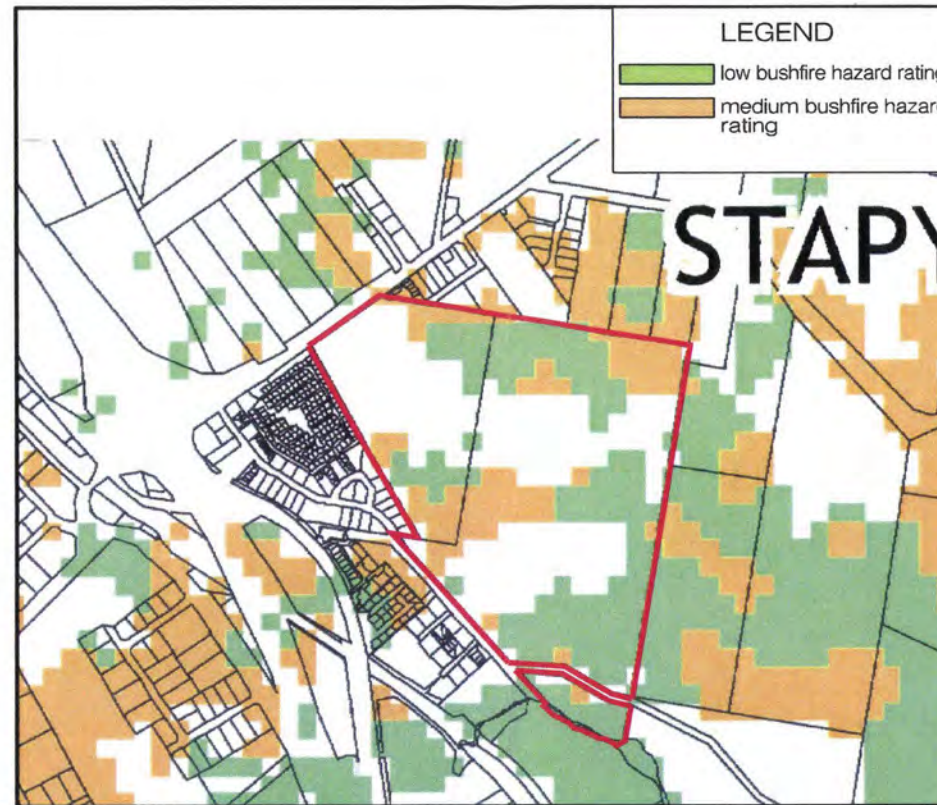


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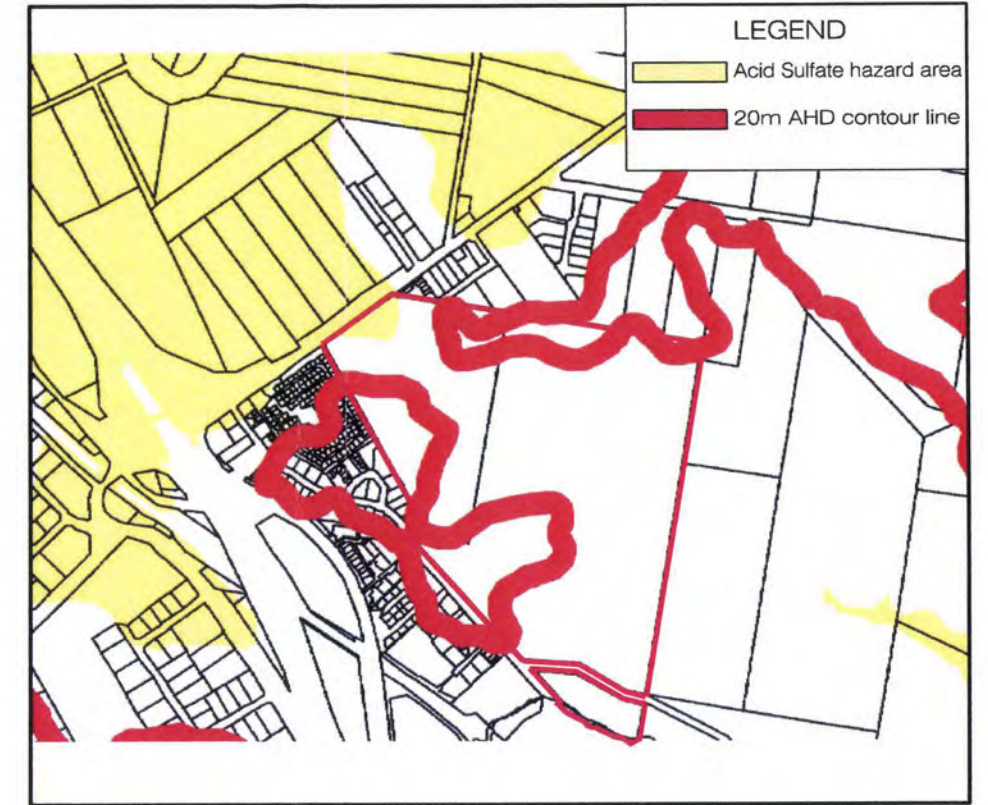




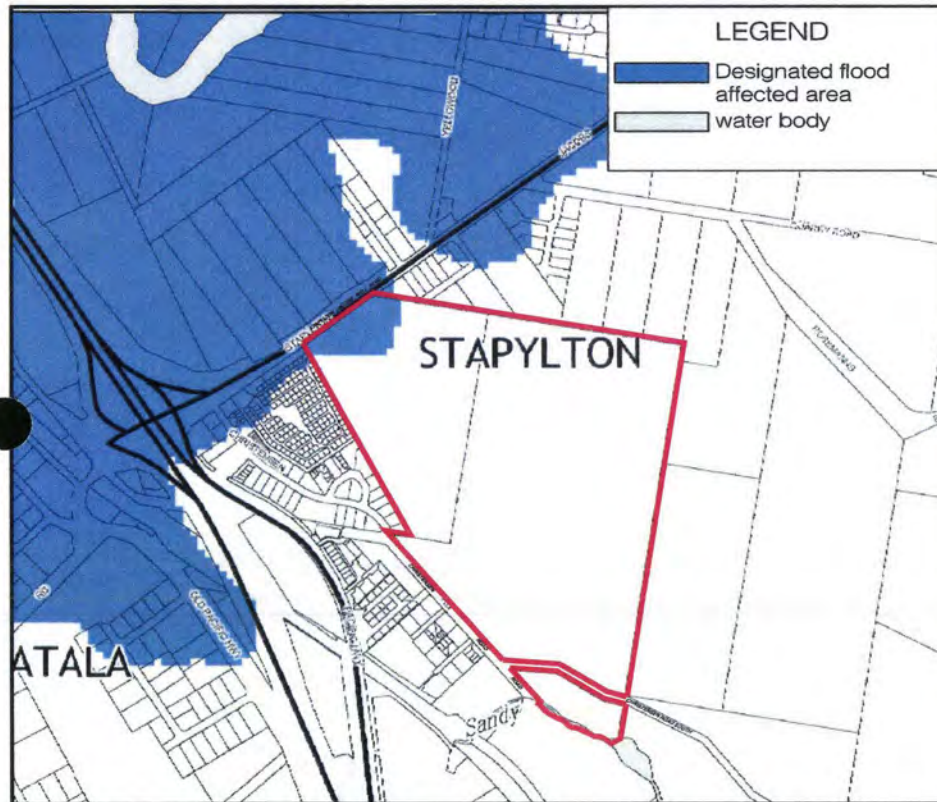
SEQ regional planning



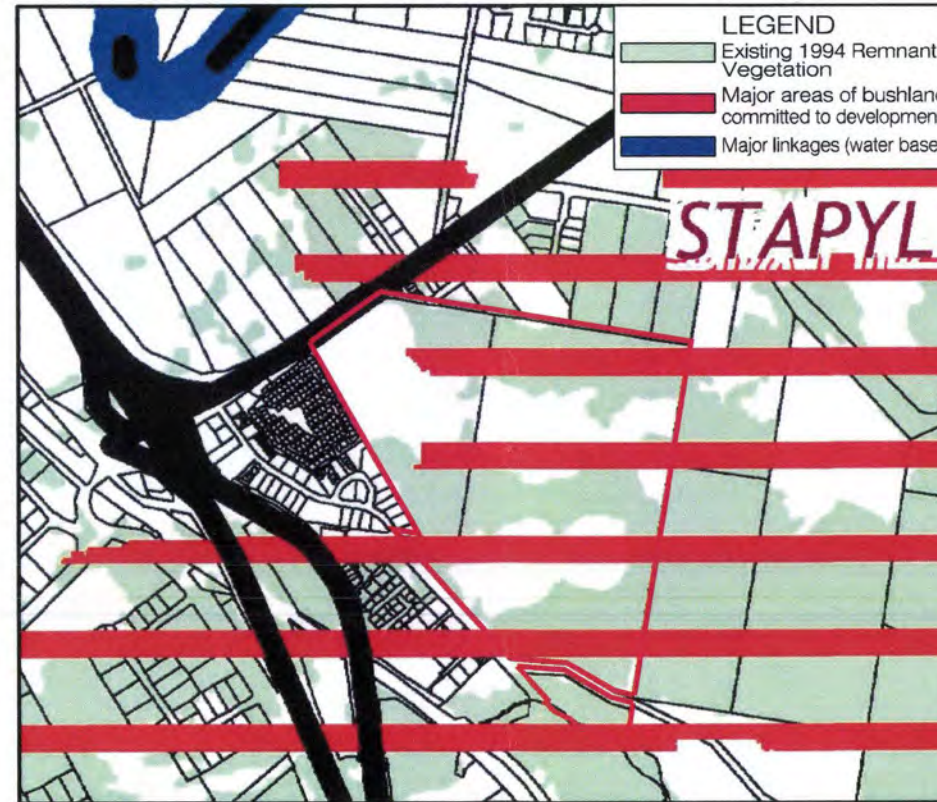
GCCC bushfire hazard - OM10



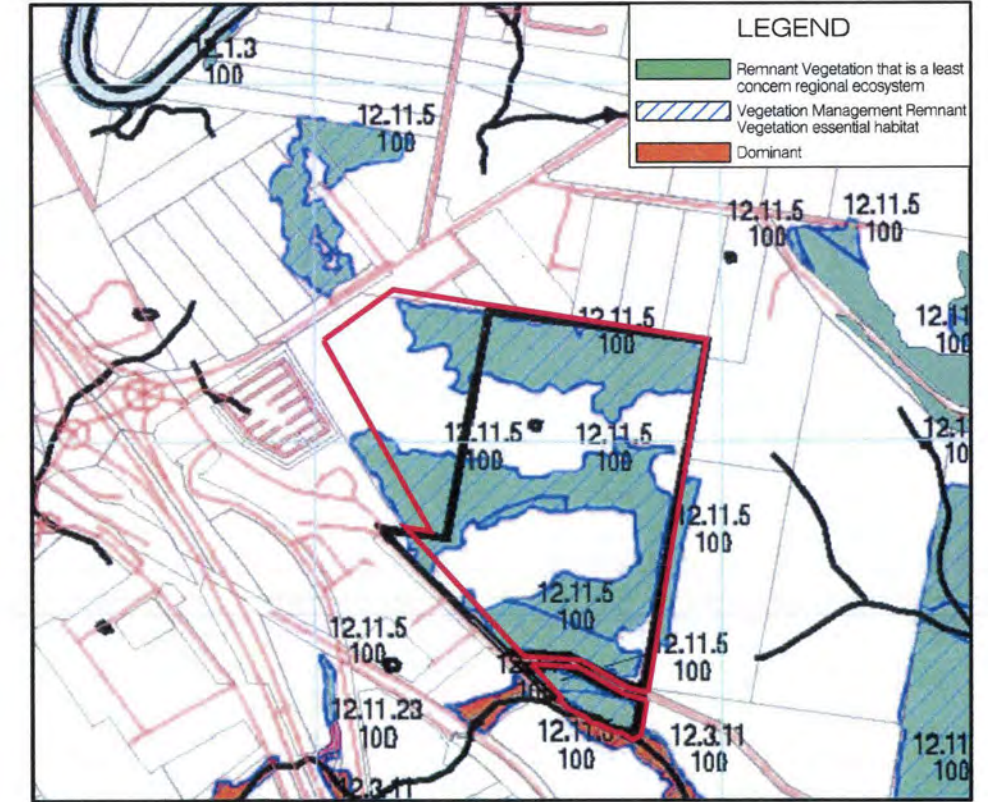
GCCC acid soils overlay - OM14



GCCC flood hazard risk mapping - OM17



GCCC conservation strategy plan - OM20



2003 regional ecosystem map

Landscape Intent

The landscape design intent for the industrial estate is underpinned by a number of overriding design principles that will promote legibility, create site scale and setting and respond to the environmentally values of the site.

Design details, finishes and materials will be complimentary to provide visual consistency throughout the estate. The softscape palette has been selected in response to the location of the site. Accompanied by an appropriate species list, the result will be a variety of landscape forms that meet both the needs of the estate and the local fauna.

The planting hierarchy throughout the development will reflect Crime Prevention through Environmental Design principles. By utilising plants with low heights and trees with thin trunks, this will allow for passive surveillance as well as recognition of traffic and pedestrian movements. By increasing the planting areas and providing a shared network, the overall aesthetics of the estate will be greatly enhanced.

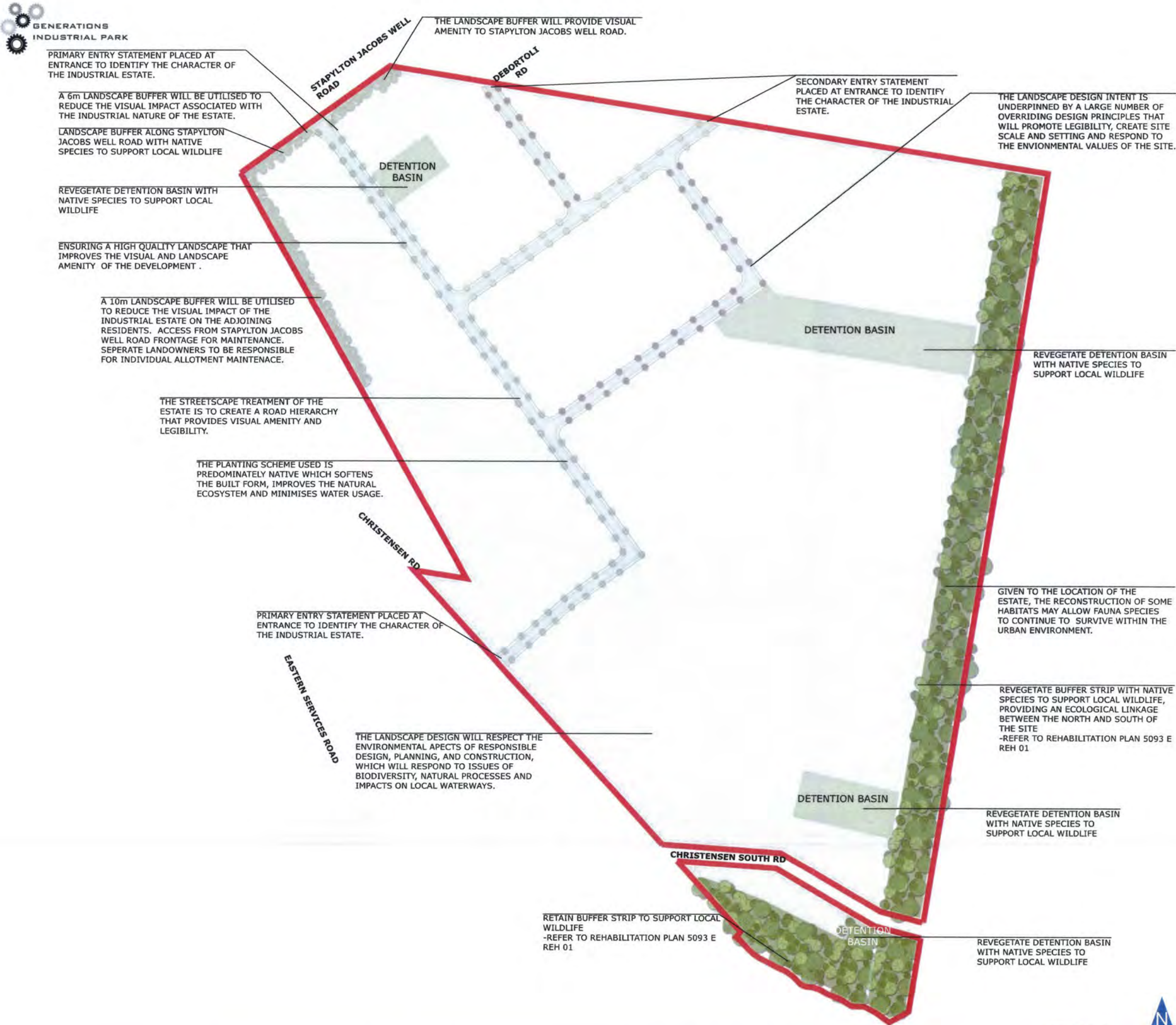
Water Sensitive Urban Design principles will be applied to the industrial estate where space allows. The principles will be incorporated into openspace areas, allowing for water filtering and harvesting and other landscape purposes.

The scale and nature of the landscaping materials shall be appropriate to the size of the structures and the available space.

Planting has been selected for ease of maintenance as well as the suitability and tolerance to the varying conditions of the site.

The planting scheme used is predominately native which softens the built form, improves natural ecosystems and minimised water usage.

The design will respect the environmental aspects of responsible design, planning, and construction, which will respond to issues of bio diversity, natural processes and impacts on local waterways.

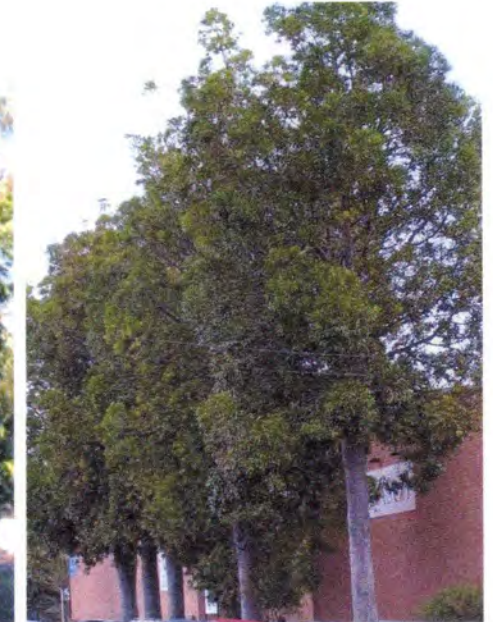


Landscape Intent

Plant Selection

The intent for the streetscape treatments of the estate is to create a road hierarchy that provides visual amenity and legibility. The main street will be treated at a boulevard scale with large shade trees, while medium trees will be planted on the feeder roads, thus creating legibility through the industrial development. The use of mature tree species will reinforce the streetscape and provide a sense of enclosure, shade and visual softening to the public and private interfaces.

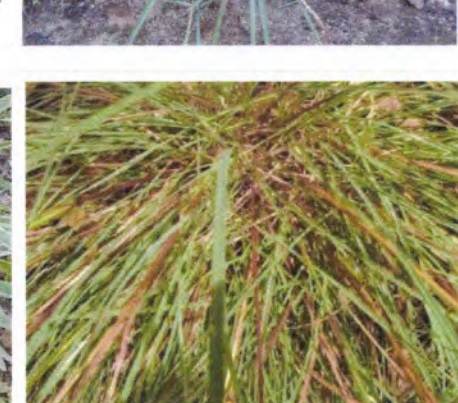
The design will incorporate local and native plants throughout the development. Due to the location, the reconstruction of habitat is a priority and will allow fauna species to continue to survive and prosper within the urban environment.



STREET TREES



ENTRY STATEMENT

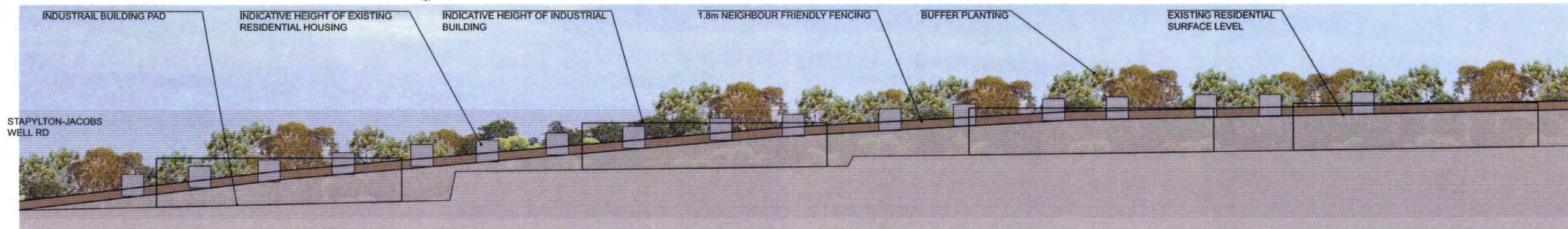


Code	Botanical Name	Common name	Size	Density
CAN bre	Carex brevifolia	Short-stem sedge	tube	8
CAN pol	Carex polytricha	Creek Sedge	tube	8
JUN fl	Juncus flaccidus	Yellow Rush	tube	8
DIA len	Diocella linearifolia	Pale Flax-lily	tube	8
LOM fl	Lonsandra filiformis ssp. filiformis	Wallie Mat-rush	tube	8
LOM len	Lonsandra longistylis	Spiry-headed Mat Rush	tube	8
LEP lin	Leptopogonum linearifolium	Lemon-scented Olive Tea-tree	tube	4
MEL en	Melaleuca ericifolia	Swamp Paperbark	tube	1
MEL lin	Melaleuca linearifolia	Flax-leaf Paperbark	tube	1
JUN fl	Juncus flaccidus	Yellow Rush	tube	8
LOM fl	Lonsandra filiformis ssp. filiformis	Wallie Mat-rush	tube	8
LOM non	Lonsandra confertifolia	Mat Rush	tube	8
EUC rac	Eucalyptus racemosa	Scribbly gum	tube	1/5m2
EUC rob	Eucalyptus robusta	Swamp Mahogany	tube	1/5m2
EUC ter	Eucalyptus tereticornis	Queensland Blue Gum	tube	1/5m2
MEL qui	Melaleuca quinquenervia	Broad-leaf Paperbark	tube	1/5m2
CYM ref	Cymbopogon refractus	Barbed Wire Grass	tube	8
DIA bre	Diocella brevipedunculata	Flax Lily	tube	4
DIA cas	Diocella caerulea var. 'Breeze'	Pale Flax-lily	tube	8
LOM non	Lonsandra confertifolia	Mat Rush	tube	4
THE aus	Themeda australis	Kangaroo Grass	tube	8

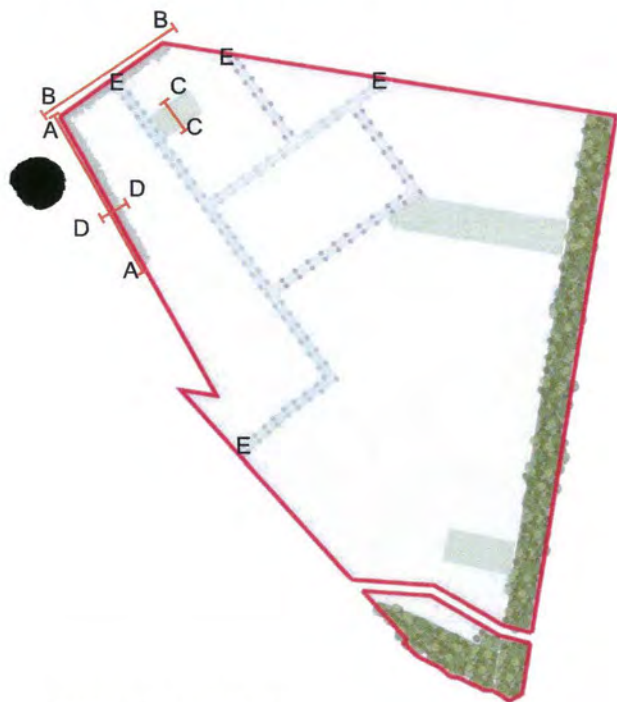
DETENTION BASIN



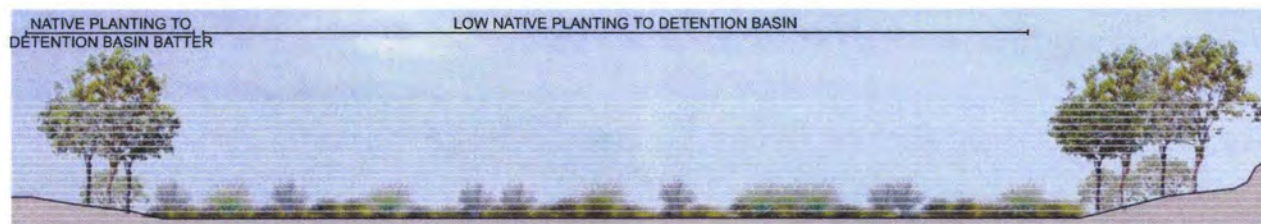
Landscape Intent



INDICATIVE ELEVATION OF THE INTERFACE BETWEEN THE PROPOSED INDUSTRIAL ESTATE AND EXISTING RESIDENTIAL VILLAGE (A-A)



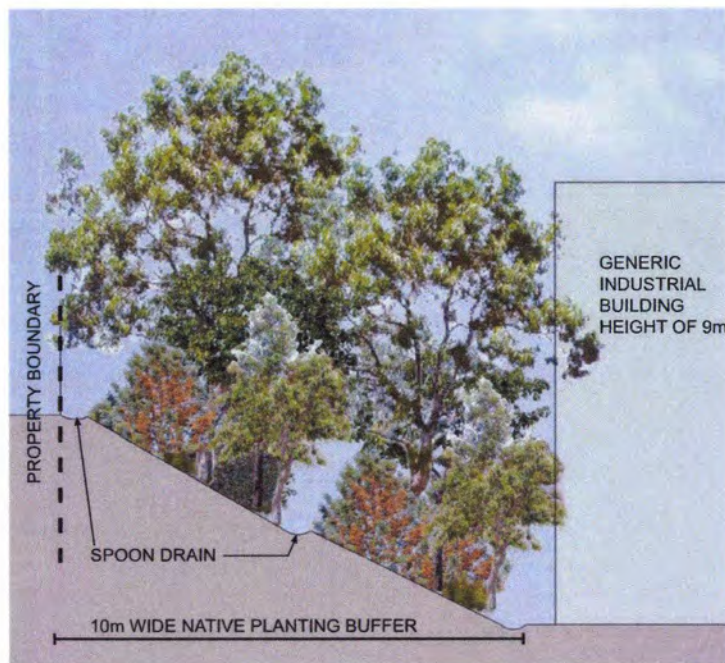
OVERALL SITE PLAN



INDICATIVE DETENTION BASIN PROFILE (C-C)



ENTRY STATEMENT OPTIONS (E)



INDICATIVE BATTER PROFILE (D-D)



INDICATIVE ELEVATION OF THE DEVELOPMENT FROM STAPYLTON JACOBS WELL ROAD (B-B)



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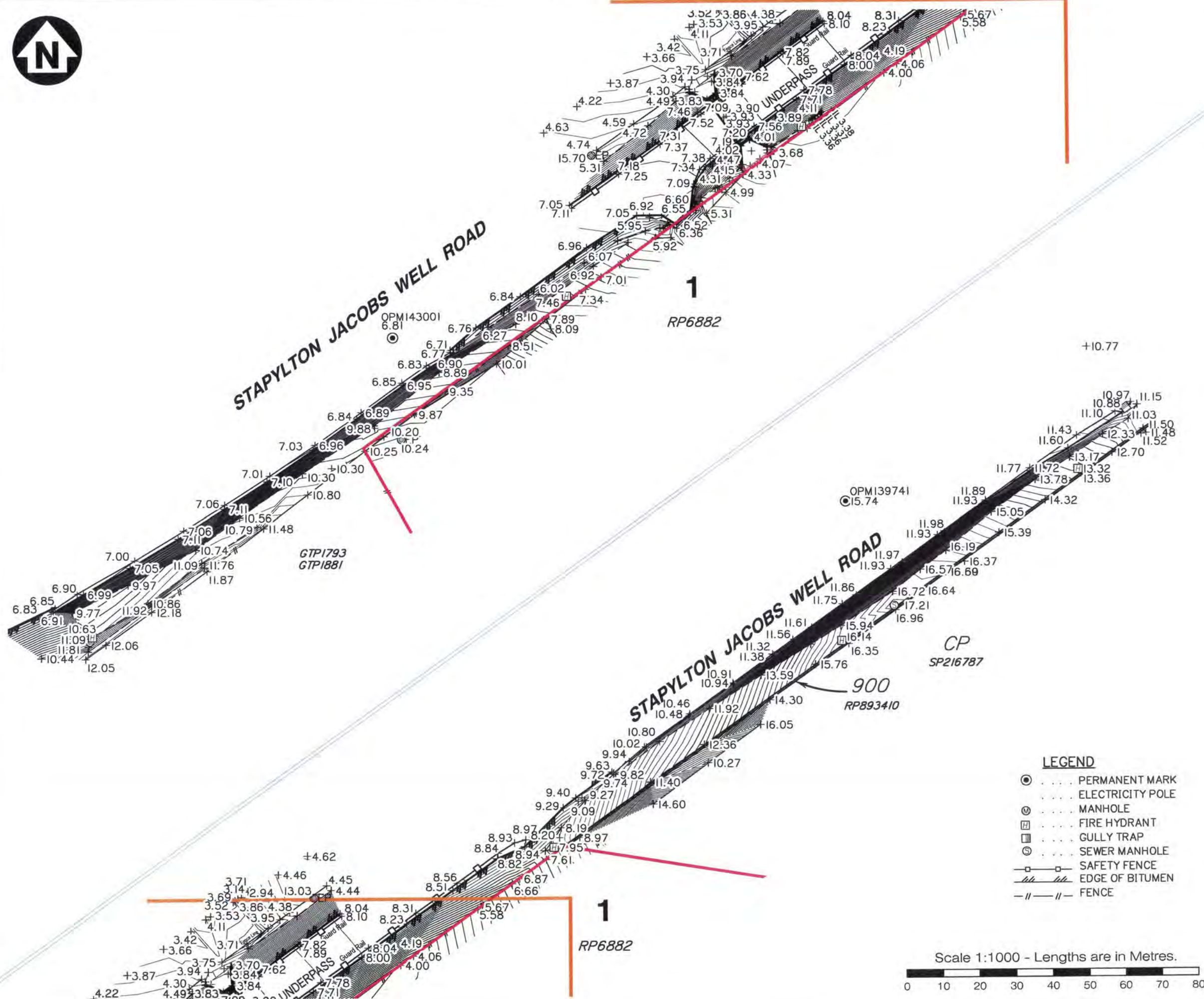
Generations Industrial Park
Stapylton-Jacobs Well Road, Stapylton

LANDSCAPE INTENT

date: 03-11-11
scale: nts @ A1
page 03 of 03 plan: 5093 L LI 02
design: IS

5 – SURVEY PLAN (GDP)

- Survey Plan (GDP)



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CONTOUR AND DETAIL PLAN

Over par of Stapylton-Jacobs Well Road, Stapylton, along Lot 1 on RP6882

Parish of **ALBERT**
County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Feb 2011
Meridian	IS216853	Surveyor	S White
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-03-2011
Origin	PSM 133471 RL 22.169	Checked	

Scale (on A3 original)	Designed
1:1000	Drawn
	Date Designed



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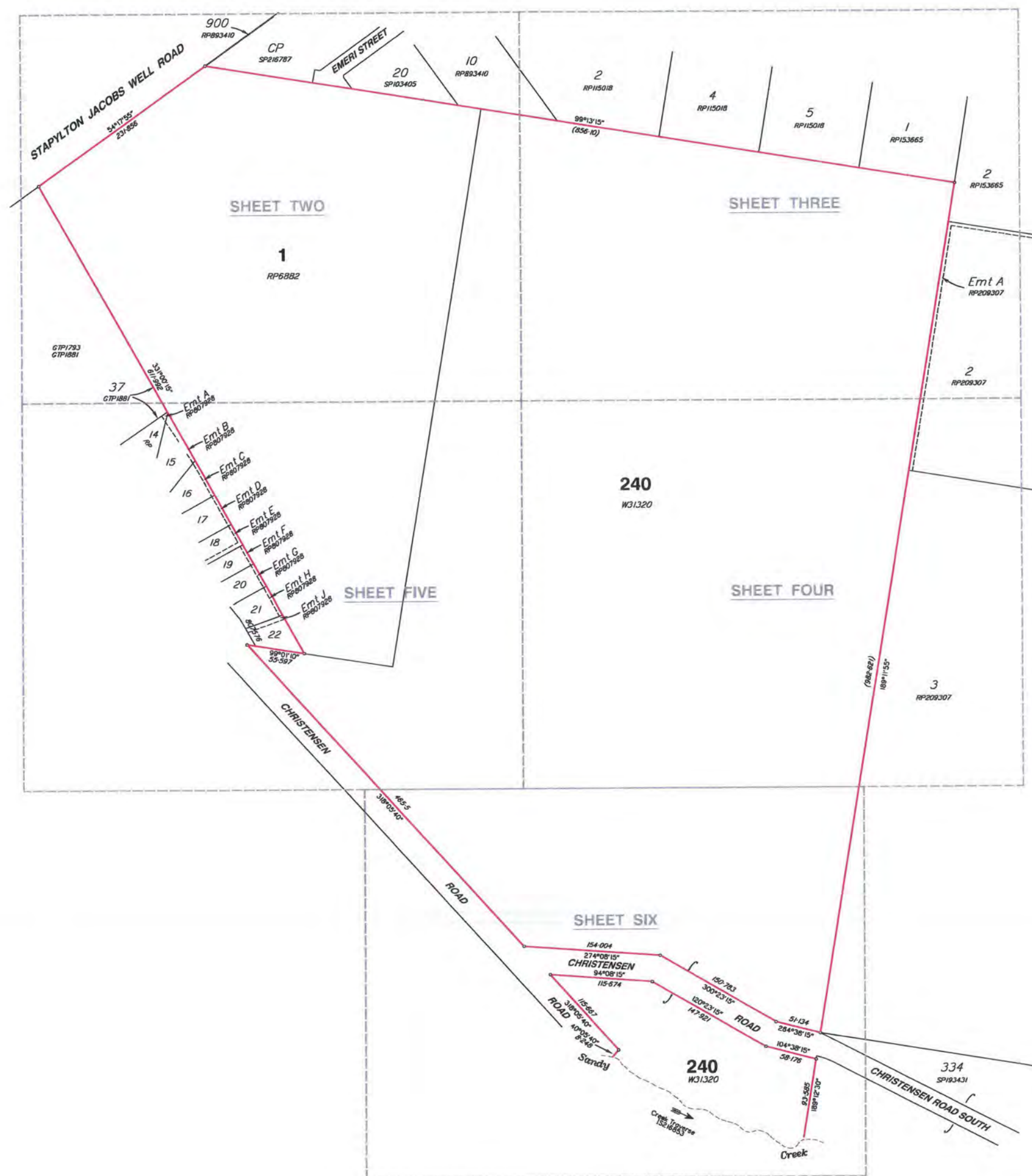
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REFERENCE No. **5093-10**

PLAN No. **5093 S CD 02**



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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

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Meridian	IS216853	Surveyor	A. Macdonald
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	Rt. 22.169		

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	Date Designed



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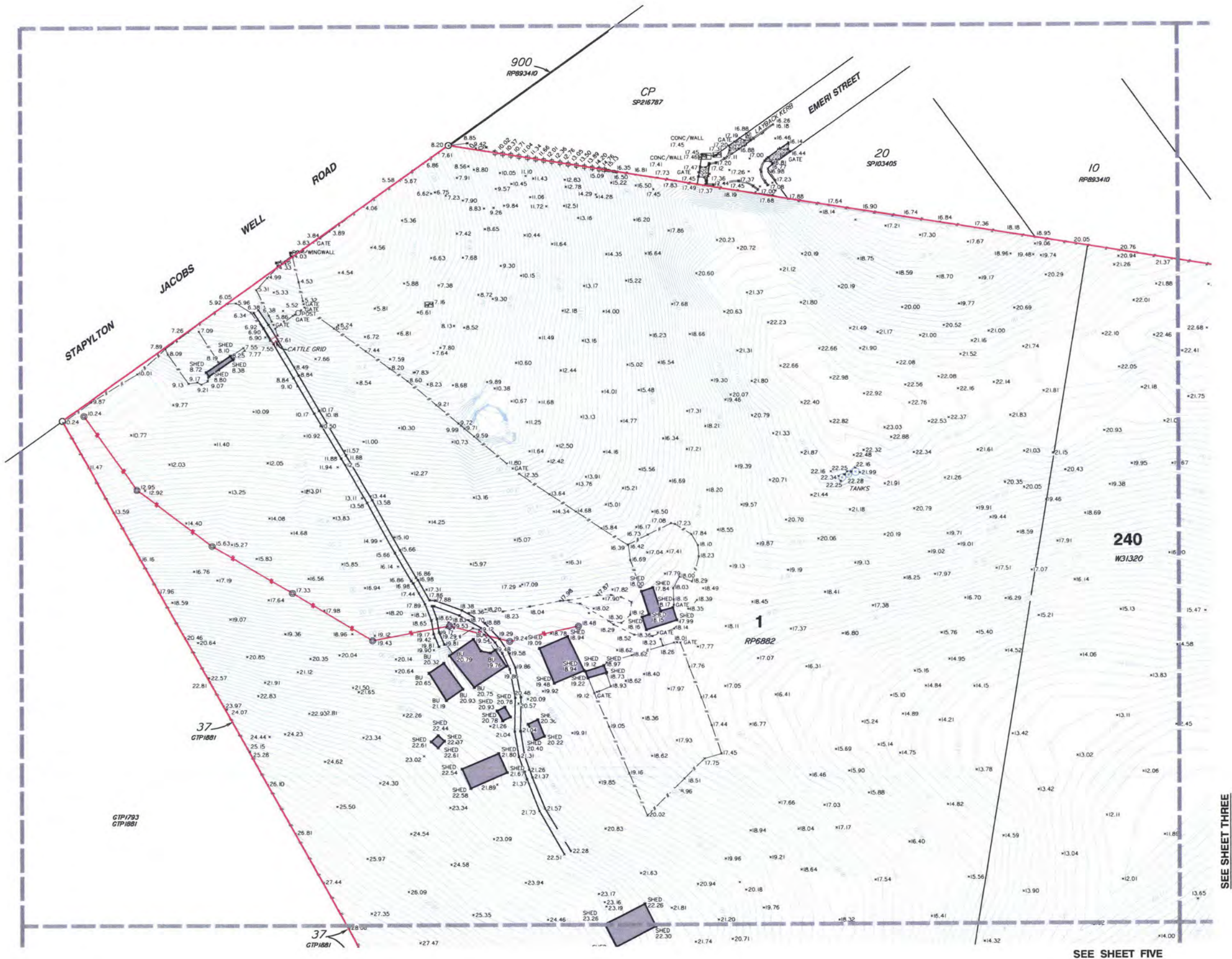
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REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**

SHEET 1 OF 6



- LEGEND**
- PERMANENT MARK
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 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
 - ELECTRICITY POLE
 - ELECTRICITY POLE WITH LIGHT
 - TELSTRA PIT
 - MANHOLE
 - STORMWATER MANHOLE
 - GULLY TRAP
 - WATER METER
 - FIRE HYDRANT
 - VALVE
 - GATE
 - BOLLARD
 - CONCRETE
 - EDGE OF BITUMEN
 - FENCE
 - OVERHEAD ELECTRICITY
 - OPEN DRAIN
 - RETAINING WALL
 - EDGE OF GARDEN
 - CONTOUR LEVEL

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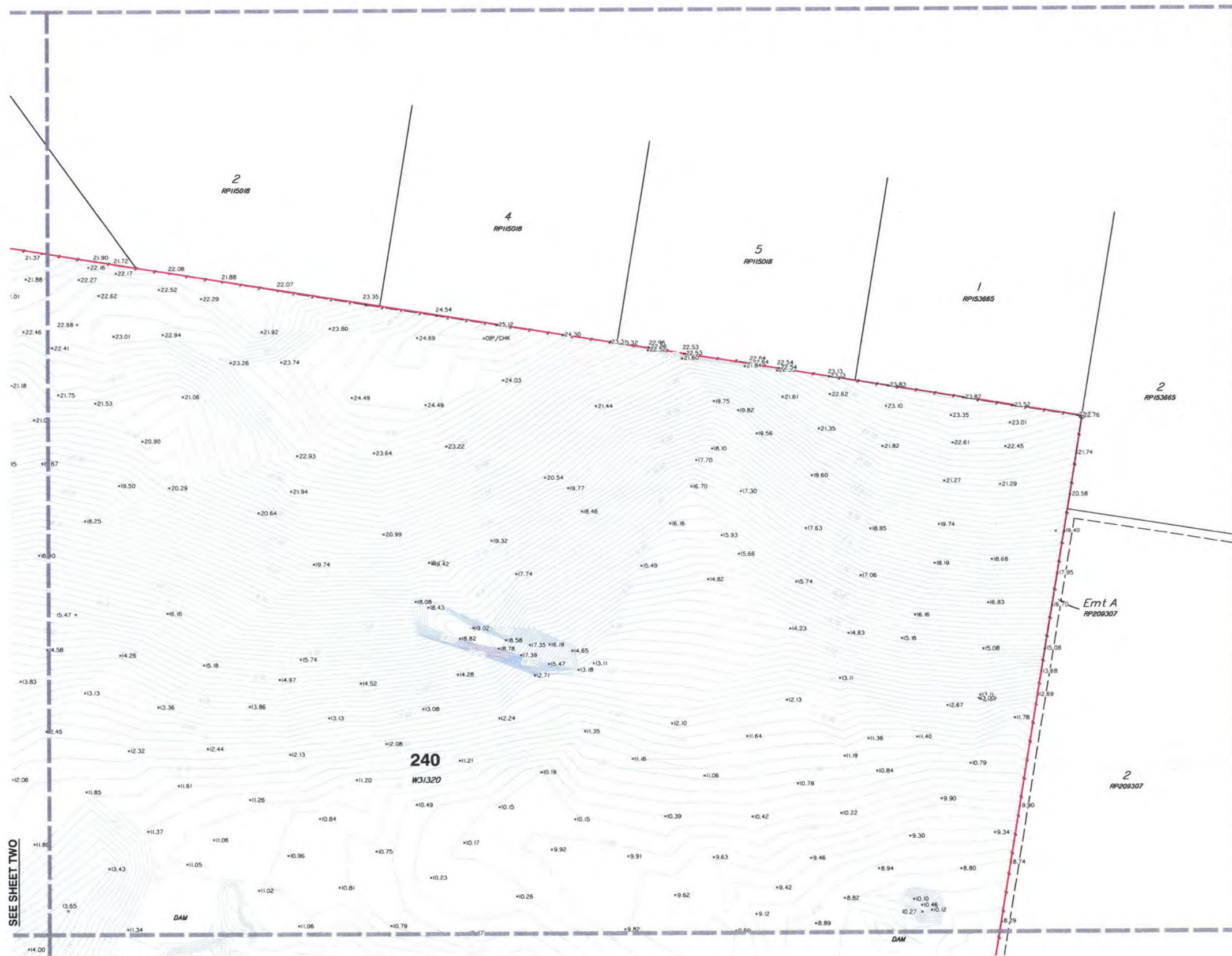
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CONTOUR AND DETAIL PLAN	
Over Lot 1 on RP6882 and Lot 240 on WD31320	
Parish of ALBERT	
County of Ward	
Local Govt GOLD COAST CITY COUNCIL	
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Contour Interval	0.2
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Origin	PSM (3347)
Scale (on A1 original)	1:1000
Date Surveyed	Jan 2011
Surveyor	A. Macdonald
Drawn	S. Holt
Date Drafted	02-02-2011
Checked	
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Date Designed	

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Parish of ALBERT
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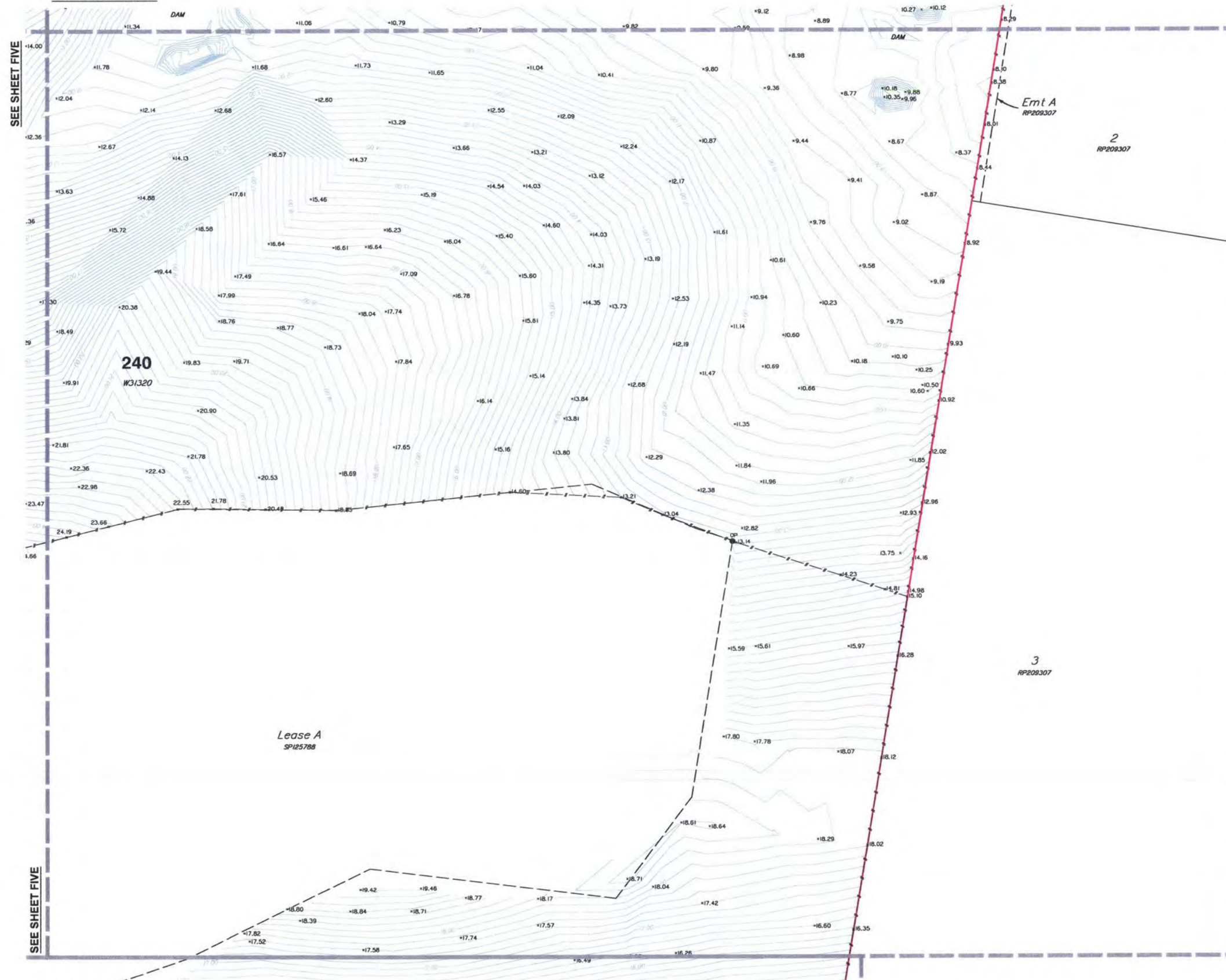
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PLAN No. 5093 S CD 01



SEE SHEET THREE



SEE SHEET SIX

LEGEND

- PERMANENT MARK
- SEWER MANHOLE
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- ELECTRICITY PILLAR
- ELECTRICITY POLE
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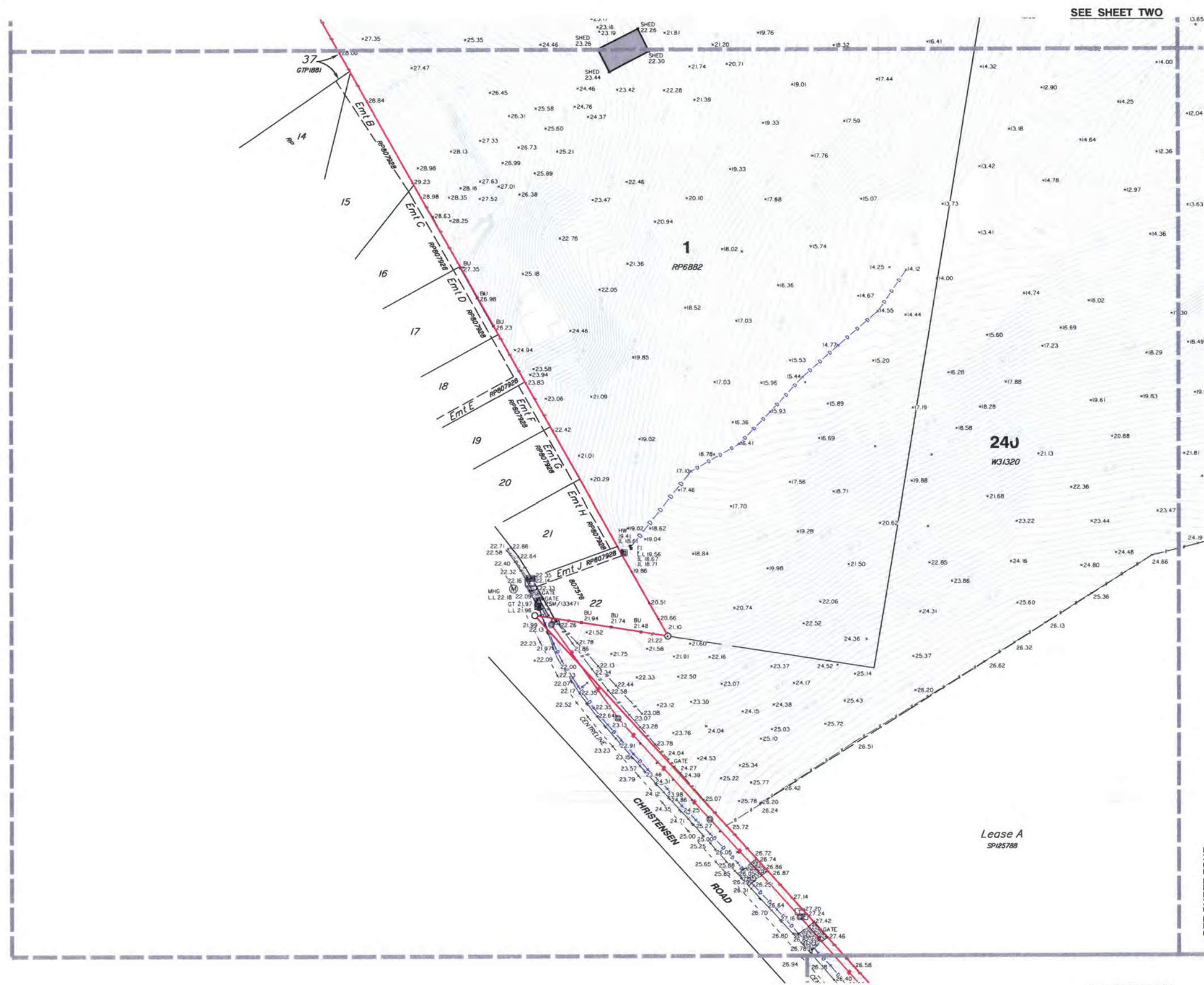
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PLAN No. **5093 S CD 01**

SHEET 4 OF 6

Scale 1:1000 - Lengths are in Metres.
0 10 20 30 40 50 60 70 80



Scale 1:1000 - Lengths are in Metres.

0 10 20 30 40 50 60 70 80

SEE SHEET TWO

SEE SHEET FOUR

SEE SHEET SIX

- LEGEND**
- PERMANENT MARK
 - SEWER MANHOLE
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILE
 - ELECTRICITY POLE WITH LIGHT
 - TELSTRA PIT
 - MANHOLE
 - STORMWATER MANHOLE
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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

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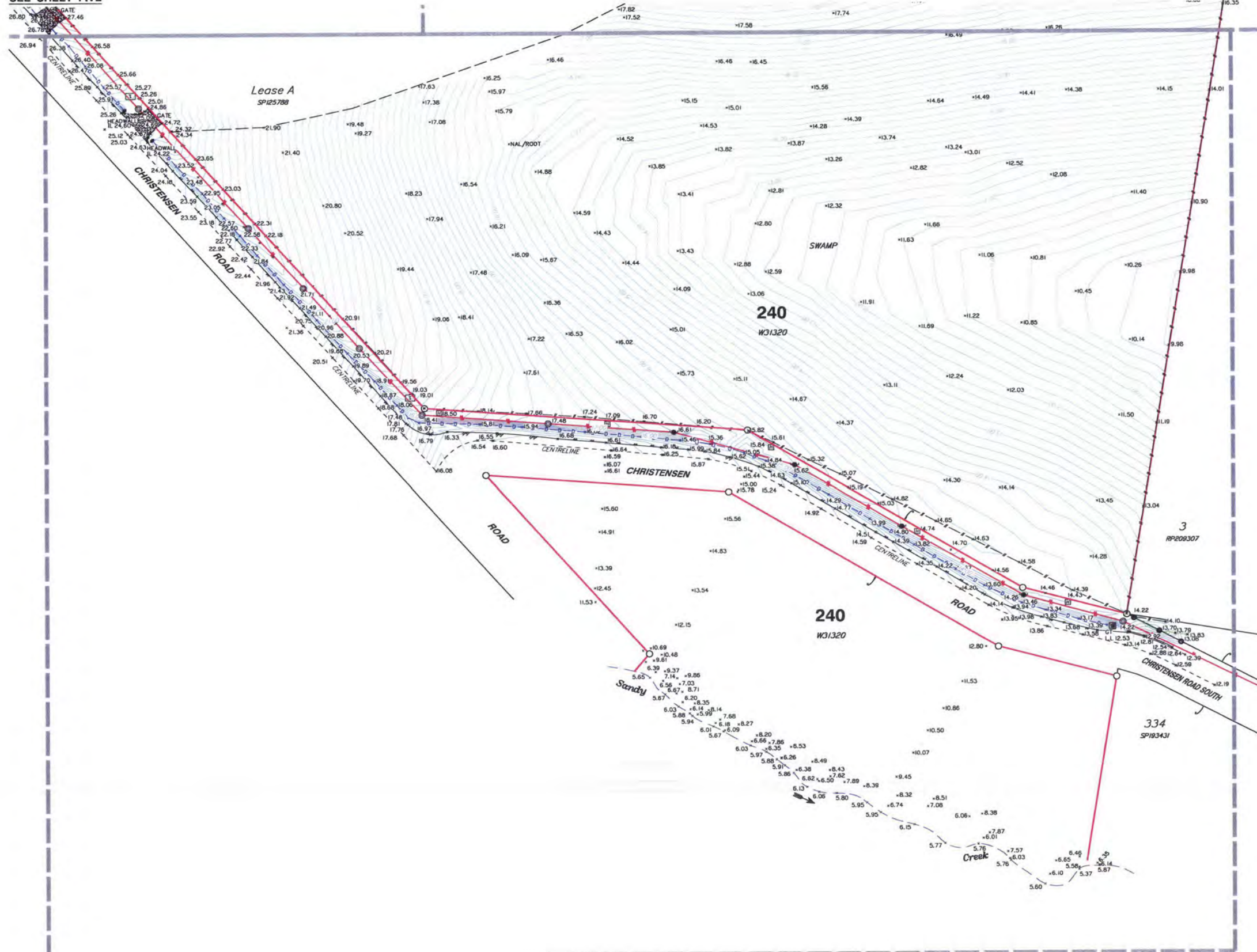
REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**



SEE SHEET FIVE

SEE SHEET FOUR



LEGEND

- PERMANENT MARK
- SEWER MANHOLE
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- ELECTRICITY POLE WITH LIGHT
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Origin	PSM 133471	Checked	
Scale (on A1 original)		Designed	
		Drawn	
		Date Designed	



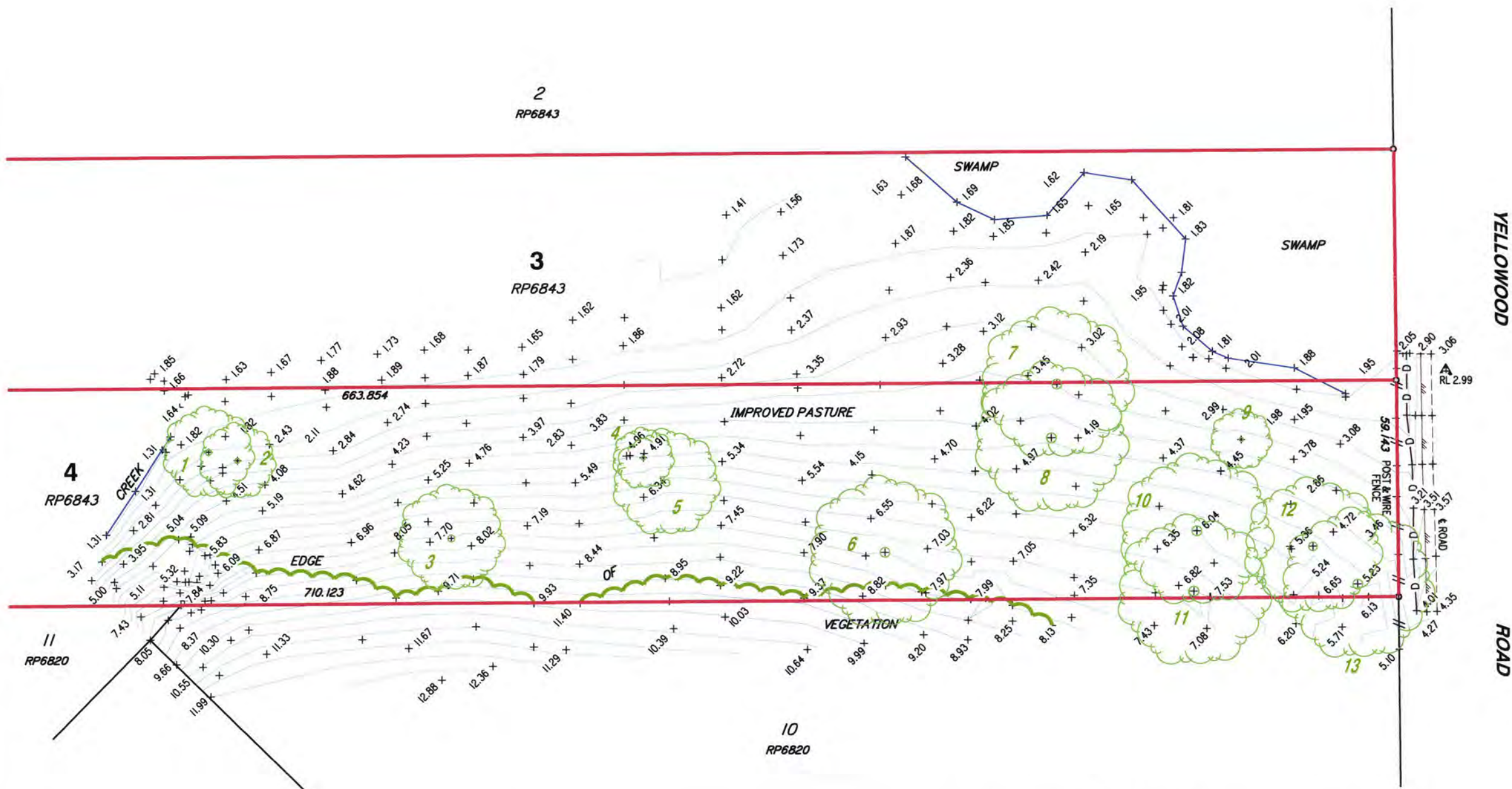
ACN 010 752 388
Brisbane Office
Level 13
97 Creek Street Brisbane Q. 4000
T: (07) 32218732
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70 Business Street Traralgon G. 4207
T: (07) 38273333
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w: www.gasman.com.au

REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**

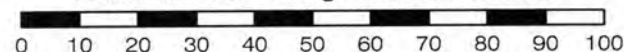
SHEET 6 OF 6

Scale 1:1000 - Lengths are in Metres.



- LEGEND**
- △ BENCH MARK
 - D-D- OPEN DRAIN
 - /// EDGE OF BITUMEN
 - // -// - FENCE

Scale 1:1250 - Lengths are in Metres.



TREE TABLE

TREE No.	Ø	SPREAD	HEIGHT
1	0.40	12m	14m
2	0.40	10m	14m
3	1.00	14m	20m
4	0.30	8m	10m
5	0.60	14m	12m
6	0.80	20m	10m
7	1.00	20m	20m
8	1.00	20m	20m
9	0.40	8m	8m
10	1.50	20m	26m
11	1.50	20m	26m
12	0.60	16m	20m
13	1.20	20m	26m

Notes

This plan has been prepared for the exclusive use and purposes of the client as stated on this plan and should not be used by any other person or corporation and for any other purpose.

Property boundaries have not been defined by this survey.

Underground features and services have not been located by this survey. Those underground services shown have been compiled from the records of the relevant authority where available. Prior to any construction, demolition or excavation on the site, the relevant authority should be contacted for the location of any further underground services and detailed location of all services.

This plan may not be photocopied unless these notes are included.

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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

BORROW SITE

on Part of Lots 3 & 4 on RP6843

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	21-07-2011
Meridian	RP6843	Surveyor	S. White
Contour Interval	0.5	Drawn	S. Holt
F.B.	No	Date Drafted	22-07-2011
Origin	PSM130468	Checked	
	7.744		

Scale (on A3 original)	Designed
1:1250	Drawn
	Date Designed



ACN 010 752 388

Brisbane Office

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Gold Coast and Logan Office

Access Business Park

76 Business Street Yatala Q. 4207

t: (07) 38073333

f: (07) 32875461

e: mail@gassman.com.au

w: www.gassman.com.au

REFERENCE No. **5093-11**

PLAN No. **5093 S CD 03**

6 – CIVIL ENGINEERING BULK EARTHWORKS PLANS (HYDER)

HESTER DEVELOPMENT STAPYLTON JACOBS WELL ROAD, YATALA INDUSTRIAL DEVELOPMENT

CIVIL ENGINEERING WORKS FOR : CLIENT

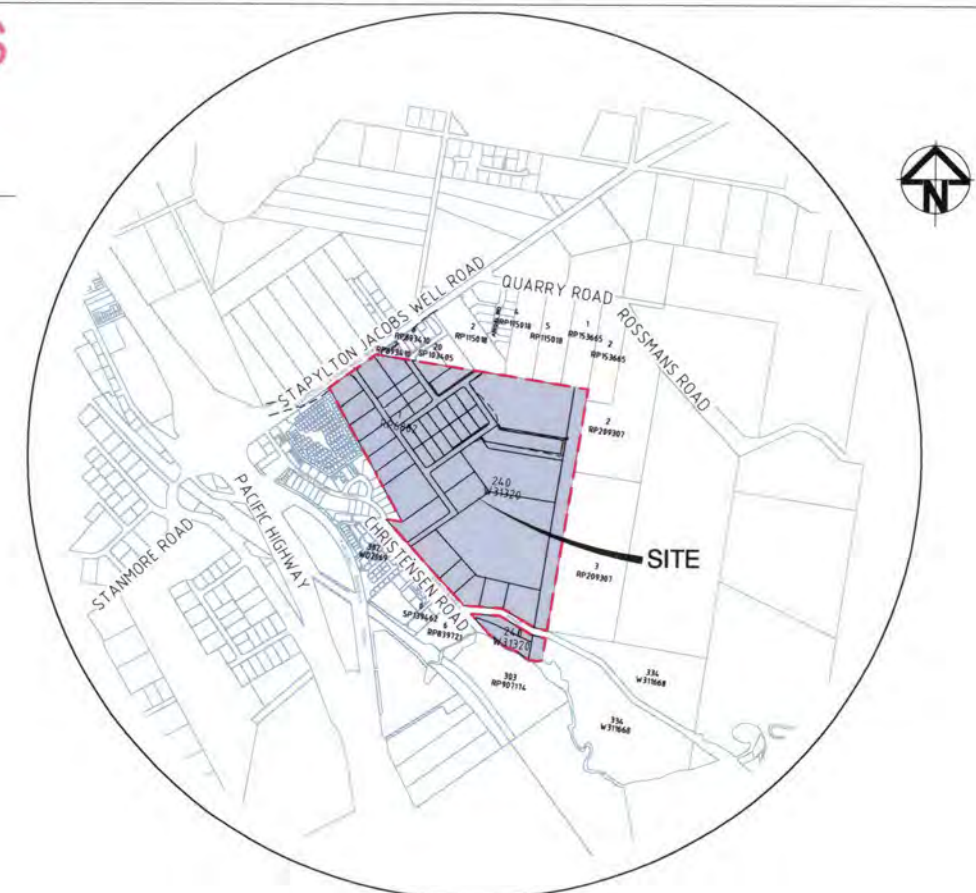
DRAWING SCHEDULE

DWG. No. DESCRIPTION

C001-AA003837	DRAWING SCHEDULE & LOCALITY PLAN
C002-AA003837	EXISTING FEATURES SURVEY PLAN/KEY PLAN
C003-AA003837	SEDIMENT AND EROSION CONTROL PLAN - SHEET 1 OF 4
C004-AA003837	SEDIMENT AND EROSION CONTROL PLAN - SHEET 2 OF 4
C005-AA003837	SEDIMENT AND EROSION CONTROL PLAN - SHEET 3 OF 4
C006-AA003837	SEDIMENT AND EROSION CONTROL PLAN - SHEET 4 OF 4
C007-AA003837	SEDIMENT AND EROSION DETAILS
C008-AA003837	BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 4
C009-AA003837	BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 4
C010-AA003837	BULK EARTHWORKS LAYOUT PLAN - SHEET 3 OF 4
C011-AA003837	BULK EARTHWORKS LAYOUT PLAN - SHEET 4 OF 4
C012-AA003837	ROADWORKS & DRAINAGE LAYOUT PLAN - SHEET 1 OF 4
C013-AA003837	ROADWORKS & DRAINAGE LAYOUT PLAN - SHEET 2 OF 4
C014-AA003837	ROADWORKS & DRAINAGE LAYOUT PLAN - SHEET 3 OF 4
C015-AA003837	ROADWORKS & DRAINAGE LAYOUT PLAN - SHEET 4 OF 4
C016-AA003837	TYPICAL ROAD CROSS SECTIONS & BOULDER WALL DETAIL
C017-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 6
C018-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 6
C019-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 6
C020-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 4 OF 6
C021-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 5 OF 6
C022-AA003837	ROAD LONGITUDINAL SECTIONS - SHEET 6 OF 6
C023-AA003837	BIO RETENTION / DETENTION BASIN 1 LAYOUT PLAN
C024-AA003837	BIO RETENTION / DETENTION BASIN 2 LAYOUT PLAN
C025-AA003837	BIO RETENTION / DETENTION BASIN 3 LAYOUT PLAN
C026-AA003837	BIO RETENTION / DETENTION BASIN 4 LAYOUT PLAN
C027-AA003837	BIO RETENTION / DETENTION BASIN DETAILS
C028-AA003837	SEWER RETICULATION LAYOUT - SHEET 1 OF 4
C029-AA003837	SEWER RETICULATION LAYOUT - SHEET 2 OF 4
C030-AA003837	SEWER RETICULATION LAYOUT - SHEET 3 OF 4

DWG. No. DESCRIPTION

C031-AA003837	SEWER RETICULATION LAYOUT - SHEET 4 OF 4
C032-AA003837	WATER RETICULATION LAYOUT - SHEET 1 OF 4
C033-AA003837	WATER RETICULATION LAYOUT - SHEET 2 OF 4
C034-AA003837	WATER RETICULATION LAYOUT - SHEET 3 OF 4
C035-AA003837	WATER RETICULATION LAYOUT - SHEET 4 OF 4
C036-AA003837	VEGETATION REMOVAL PLAN



LOCALITY PLAN
SCALE N.T.S.

LEVELS & GRID

LEVELS to AHD
(AUSTRALIAN HEIGHT DATUM)
GRID to GDA94
(GEOCENTRIC DATUM OF AUSTRALIA 1994)

			Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com							
			Architect				Approved R.E.P.D. No.		Current Issue Signatures				Title					
			Scale				Scales N T S		Author N DREISE				Designer R RONALDS					
							Original Size A1		Reviewer M BRAY				DRAWING SCHEDULE & LOCALITY PLAN					
02 01			ISSUE FOR SUBMISSION TO G.C.C.C. ORIGINAL ISSUE		ND ND		19.08.11 05.01.11											
Issue			Description		Date				Filename: C001-AA003837-01-DRAWING SCHEDULE.DWG									
									Grid GRID		© Copyright reserved		Drawing No C001		Project No AA003837		Issue 02	

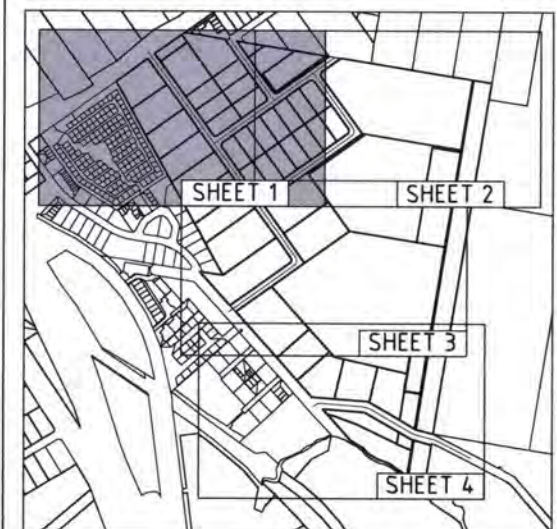


LEGEND

- SWD --- EXISTING STORMWATER RETICULATION
- S --- EXISTING SEWERAGE RETICULATION
- W --- EXISTING WATER RETICULATION
- PROPOSED SURFACE CONTOURS
- STAGE BOUNDARY

02 ISSUE FOR SUBMISSION TO G.C.C.C. ND 17.08.11 01 ORIGINAL ISSUE ND 06.01.11 Issue Description Date			Scale 0 50 100 150 200 250m 1 : 2500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C002-AA003837-01-EX FEATURES.DWG		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved RE.P.Q No. Scales 1:2500 Original Size A1 Height Datum DATUM Grid GRID Current Issue Signatures Author N.DREISE Designer R. RONALDS Reviewer M.BRAY Copyright reserved		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title EXISTING FEATURES & SURVEY PLAN		HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P.O. Box 1853, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com Drawing No. C002 Project No. AA003837 Issue 02	
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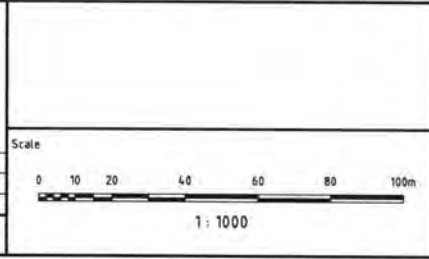
18/Aug/2011 2:12 PM F:\AA003837\E-CAD\Civil\0-D-Final\C002-AA003837-01-Ex Features.dwg



- NOTES**
1. FOR SILTATION MANAGEMENT DETAILS REFER DWG. No. C007-AA003837
 2. SEDIMENT & EROSION CONTROL PLAN IS TO BE READ IN CONJUNCTION WITH THE ENVIRONMENT MANAGEMENT PLAN AND LANDSCAPING DRAWINGS.

- LEGEND**
- SWD PROPOSED STORMWATER LINE
 - S.O. PROPOSED SURFACE CONTOURS
 - TOP/TOE OF BATTER
 - 1m WIDE TURF BEHIND KERB
 - SILT FENCE
 - XXX SAG GULLY TREATMENT
 - GRADE GULLY TREATMENT
 - CHECK SAND BAG CHECK DAM
 - SP SEDIMENTATION POND
 - VEHICLE SHAKEDOWN
 - FIELD INLET TREATMENT
 - DIRECTION OF OVERLAND FLOW

Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



Surveyor
GASSMAN DEVELOPMENT PERSPECTIVES

Architect

Filename: C003-C006-AA003837-01-SED & EROS.DWG

Client
MRS PARTRICIA & MR WILLIAM HESTER

Status
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Approved

REPO No

Current Issue Signatures

Author: N.DREISE

Designer: T.DINGLE

Reviewer: M.BRAY

Original Size: A1

Height Datum: DATUM

Grid: GRID

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Project
STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE

Title
SEDIMENT AND EROSION CONTROL PLAN SHEET 1 OF 4

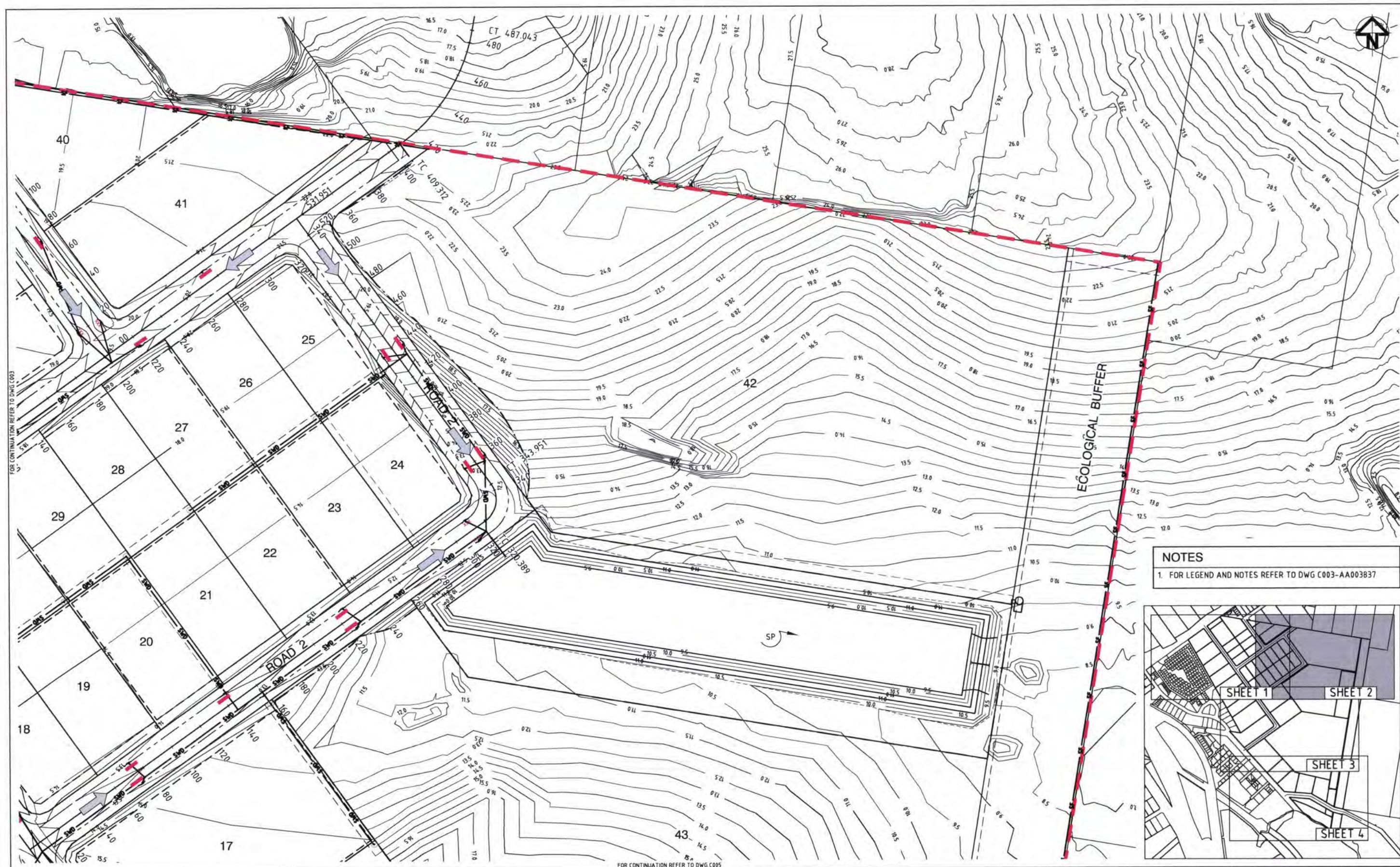
Hyder Consulting

HYDER CONSULTING PTY. LTD
ABN 48 010 924 866
P O Box 1653, Southport, Queensland, 4215 Australia
Tel: (+617) 5532 3693
Fax: (+617) 5591 4778
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Web: www.hyderconsulting.com

Drawing No: C003

Project No: AA003837

Issue: 03



			Scale		Surveyor		Client		Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION			Project		 HYDER CONSULTING PTY. LTD. ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5501 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com			
			Architect		GASSMAN DEVELOPMENT PERSPECTIVES		MRS PATRICIA & MR WILLIAM HESTER		Approved: R.E.P.Q No.:			STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE					
			1: 1000								Scales: 1:1000			Title		SEDIMENT AND EROSION CONTROL PLAN SHEET 2 OF 4	
											Original Size: A1						
											Height Datum: DATUM						
											Grid: GRID						
											Current Issue Signatures						
											Author: N.DREISE						
											Designer: T.DINGLE						
											Reviewer: M.BRAY						
											© Copyright reserved						
											23/Aug/2011 8:53 AM						
											F:\AA003837\E-CAD\Civil\D-Final\VC003-C006-AA003837-01-Sed & Eros.dwg						

03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11		
02 DESIGN AMENDED ND 20.07.11		
01 ORIGINAL ISSUE ND 06.01.11		
Issue	Description	Date

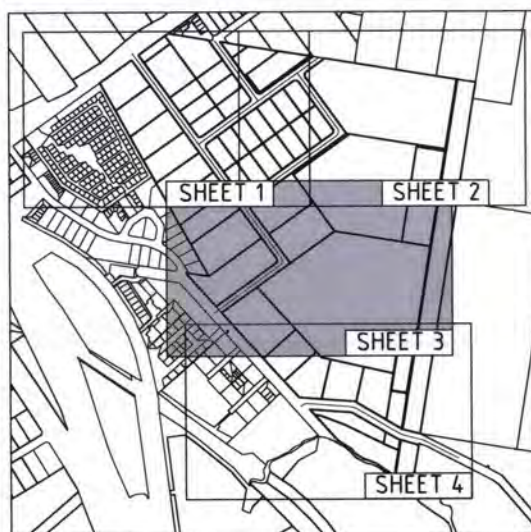
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Drawing No	Project No	Issue
C004	AA003837	03



NOTES

1. FOR LEGEND AND NOTES REFER TO DWG C003-AA003837



03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11
Issue	Description	Date

Scale

0 10 20 40 60 80 100

1 : 1000

GASSMAN DEVELOPMENT PERSPECTIVES

Architect

Filename: C003-C006-AA003837-01-SEO & EROS.DWG

Client	
--------	--

MRS PARTRICIA &
MR WILLIAM HESTER

Status **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved	_____
----------	-------

R.E.P.Q No :	
Scale :	Current Issue Signature :

Scales	1:1000	Current Issue Signature	
		Author	

		AGENT N.DREISE	
--	--	-------------------	--

Original Size	A1	Designer T.DINGLE	
---------------	----	----------------------	--

Height Datum	DATUM	Reviewer MURRAY	
-----------------	-------	--------------------	--

Dayum	DATE	M.BRAY
Grid	GRID	© Copyright reserved

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
---------	--

Title	SEDIMENT AND EROSION CONTROL PLAN SHEET 3 OF 4
-------	--



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E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com

Drawing No.	Project No.	Issue
C005	— AA003837	— 03



NOTES

1. FOR LEGEND AND NOTES REFER TO DWG C003-AA003837



				Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3633 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
				Architect				Approved R.E.P.D No.		Title SEDIMENT AND EROSION CONTROL PLAN SHEET 4 OF 4			
Scale  1 : 1000				Architect				Scales 1:1000		Current Issue Signatures			
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11								Original Size A1		Author N.DREISE			
02 DESIGN AMENDED ND 20.07.11								Height Datum DATUM		Designer T.DINGLE			
01 ORIGINAL ISSUE ND 06.01.11								Grid GRID		Reviewer M.BRAY			
Issue Description Date				Filename: C003-C006-AA003837-01-SED & EROS.DWG				© Copyright reserved				Drawing No. Project No. Issue C006 — AA003837 — 03	
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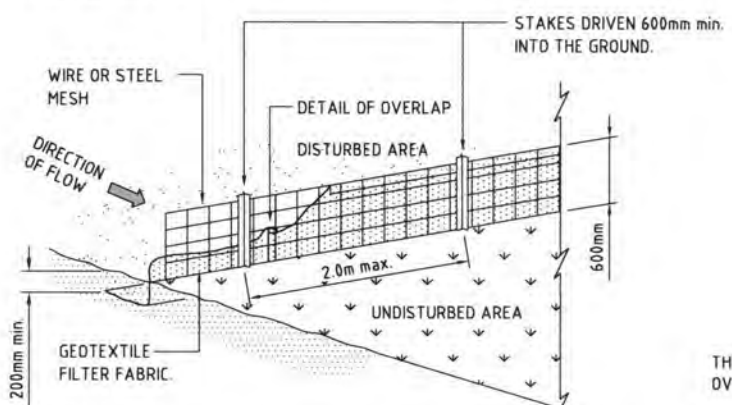
SILT MANAGEMENT PROGRAM

PHASE	DESCRIPTION
ALL WORKS	- SILT FENCES TO BE ERECTED ALONG TOE OF FILL BATTERS OR AS DIRECTED BY SUPERINTENDENT.
SEWER/WATER STORMWATER/SERVICES,	- EXCAVATED MATERIAL TO BE PLACED ON HIGH SIDE OF TRENCH IN ORDER TO PROTECT PIPE WORK AND DIRECT SURFACE FLOW AWAY FROM EXCAVATIONS.
ROADWORKS	- MEASURES ARE TO BE TAKEN TO PREVENT SILT INGRESS TO STORMWATER SYSTEM.
MAINTENANCE PERIOD	- EROSION CONTROL MEASURES ARE TO BE INSPECTED AFTER MAJOR EVENTS (> 25mm). ANY REPAIRS REQUIRED ARE TO BE EFFECTED IMMEDIATELY.

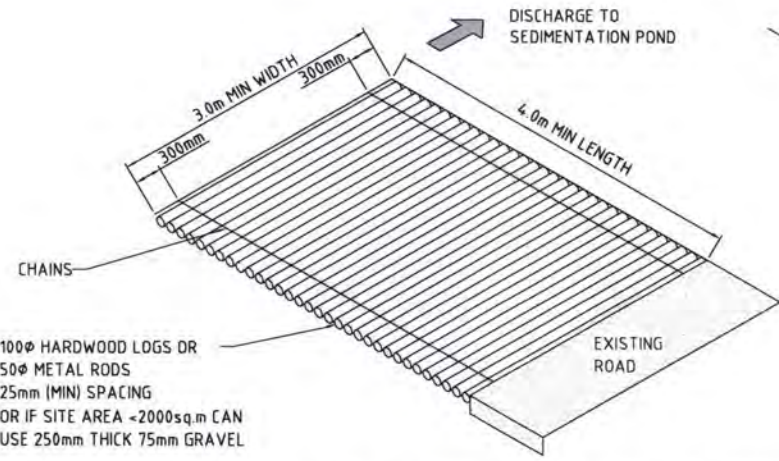
GENERAL NOTES

1. THE CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS TO CONTROL EROSION AND DOWNSTREAM SEDIMENTATION DURING ALL STAGES OF CONSTRUCTION INCLUDING THE MAINTENANCE PERIOD.
2. ALL SEDIMENT CONTROL DEVICES SHALL BE MONITORED, CLEANED AND/OR REPAIRED WHENEVER THE ACCUMULATED SEDIMENT REDUCES THE CAPACITY BY 50%.
3. ALL PERIMETER BANK/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
4. THE EXTENT OF GRASSING SHALL BE DETERMINED BY THE SUPERINTENDENT AND SHALL BE SEEDED, AS SPECIFIED, WITHIN SEVEN DAYS OF FINAL TRIMMING.
5. EXTENT AND POSITION OF SILT FENCE CONTROL MEASURES TO BE DETERMINED ON SITE BY SUPERINTENDENT. MEASURES SHOWN ON THIS DRAWING ARE MINIMUM REQUIREMENTS ONLY.
6. SCOUR PROTECTION AND SILT MANAGEMENT MEASURES TO BE PROVIDED AT STORMWATER OUTLET HEADWALLS.
7. PROVISION TO BE MADE FOR DIRT/SAND REMOVAL FROM CONSTRUCTION VEHICLES PRIOR TO TRAVEL ON PUBLIC ROADS. METHOD TO BE APPROVED BY SUPERINTENDENT PRIOR TO COMMENCEMENT OF WORK.
8. ANY SILT OR SEDIMENT CAUSED BY THE MOVEMENT OF CONSTRUCTION TRAFFIC ON EXISTING ROADS IS TO BE REMOVED DAILY.
9. THE APPLICANT SHALL IMPLEMENT EROSION AND SEDIMENT CONTROL PROCEDURES DURING CONSTRUCTION AND MAINTENANCE STAGES OF THE DEVELOPMENT AND SHALL TAKE ALL NECESSARY ACTIONS TO COMPLY WITH THE POLICY OBJECTIVES OF THE GOLD COAST CITY COUNCIL LOCAL PLANNING POLICY - EROSION AND SEDIMENT CONTROL.
10. THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE DAILY REMOVAL OF SILT FOR THE DURATION OF THE CONSTRUCTION AND MAINTENANCE PERIOD, THAT HAS BEEN BLOWN, WASHED OR TRACKED FROM THE SITE ONTO COUNCIL ROADS OR INTO COUNCIL DRAINAGE SYSTEMS, WATERCOURSES AND ANY PRIVATE PROPERTY.
11. THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE CONTROL OF DUST EMANATING FROM THE SITE AT ALL TIMES, INCLUDING ON WEEKENDS AND PUBLIC HOLIDAYS, FOR THE DURATION OF THE CONSTRUCTION AND MAINTENANCE PERIOD.
12. ALL RUBBISH, WASTE MATERIALS, OILS AND FUELS ARE TO BE CONTAINED APPROPRIATELY. OIL AND FUEL SPILLS ARE NOT TO ENTER ANY DRAINAGE SYSTEM OR WATERCOURSE.
13. THE CONTRACTOR IS TO ENSURE THAT NO SILT REACHES THE DOWNSTREAM WATER COURSE AND IS TO PROVIDE ADEQUATE PROTECTION TO PREVENT THIS OCCURRING.
14. WHERE TOPSOIL STOCKPILES ARE TO REMAIN IN PLACE FOR A PERIOD OF MORE THAN 14 DAYS, THE STOCKPILE SHALL BE GRASSED WITH A SUITABLE QUICK STRIKING CEREAL GRASS. PROVIDE A DIVERSION DRAIN OR BUND ON THE UPHILL SIDE AND A SEDIMENT FENCE ON THE DOWNHILL SIDE OF ALL STOCKPILES.

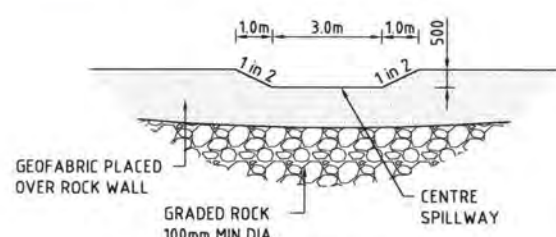
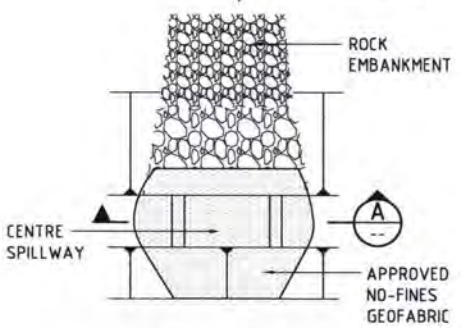
DRAINAGE AREA 0.6ha. MAX. SLOPE GRADIENT 1:2 MAX. SLOPE LENGTH 60m MAX.



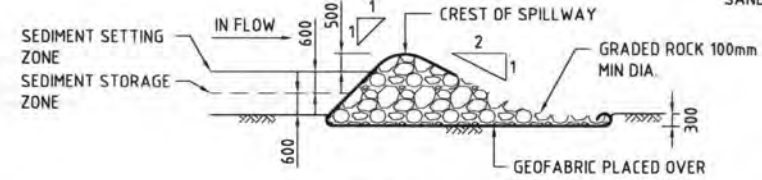
GEOTEXTILE SEDIMENT FENCE
SCALE N.T.S.



METAL GRID SHAKE DOWN (OR APPROVED EQUIVALENT)
SCALE N.T.S.

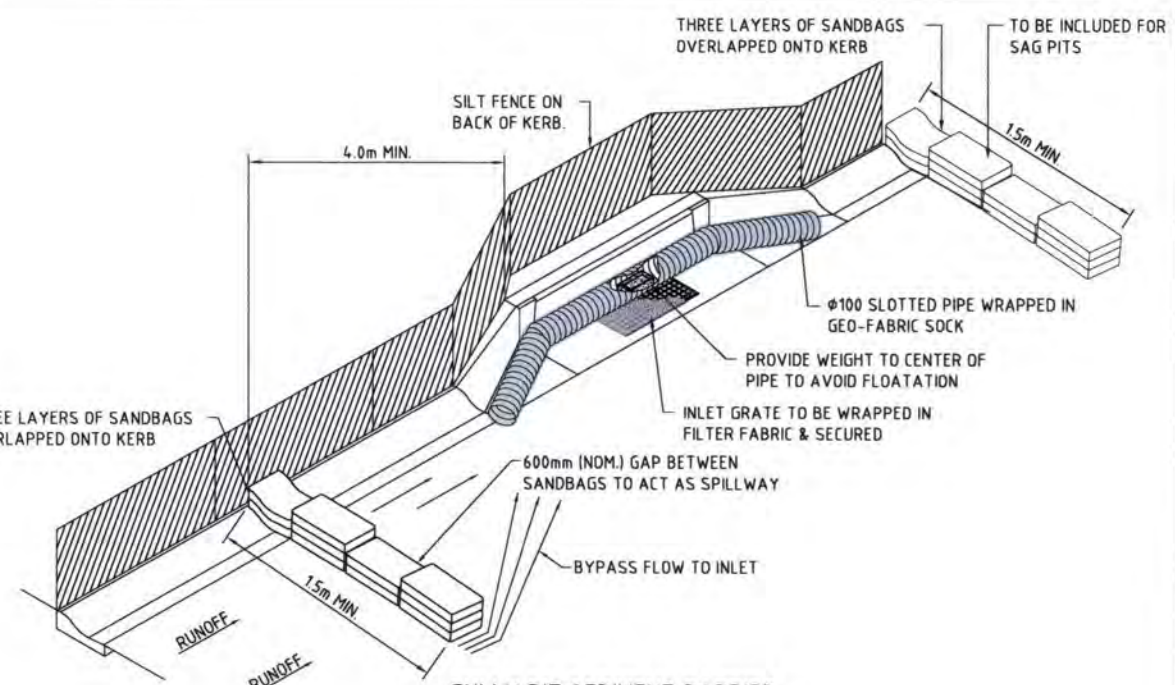


SECTION A
N.T.S.



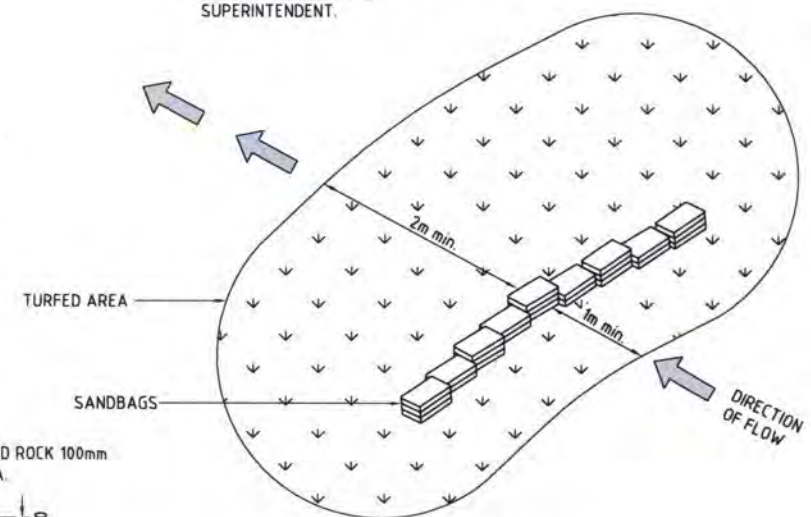
SECTION B
N.T.S.

SEDIMENT BASIN DETAILS
N.T.S.

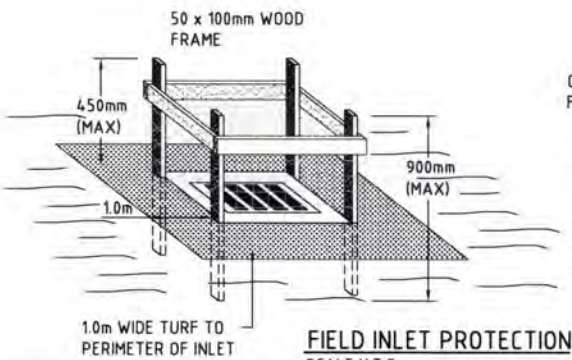


GULLY PIT SEDIMENT BARRIER
SCALE N.T.S.

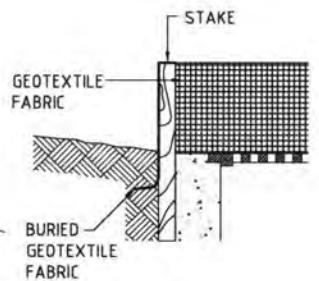
PROVIDE SAND BAGS ACROSS FLOW PATH. PROVIDE TURF AROUND SAND BAGS, TO A MINIMUM OF 1m IN FRONT AND 2m BEHIND. EXTENT TO BE DETERMINED ON SITE BY SUPERINTENDENT.



SAND BAG CHECK DAM
SCALE N.T.S.



FIELD INLET PROTECTION
SCALE N.T.S.



02 ISSUE FOR SUBMISSION TO G.C.C.C.		ND	19.08.11	Scale 0 50 100 150 200 250m 1:2500	Surveyor GASSMAN DEVELOPMENT PERSPECTIVES	Client MRS PARTRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	Hyder Consulting HYDER CONSULTING PTY. LTD. ABN 48 010 924 866 P.O. Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com
01 ORIGINAL ISSUE		ND	06.01.11		Architect				
Issue Description		Date		Filename: C007-AA003837-01-SED & EROS DETAILS.DWG		23/Aug/2011 8:53 AM		F:\AA003837\1E-CAD\1C-Civil\1D-Final\1C007-AA003837-01-Sed & Eros Details.dwg	

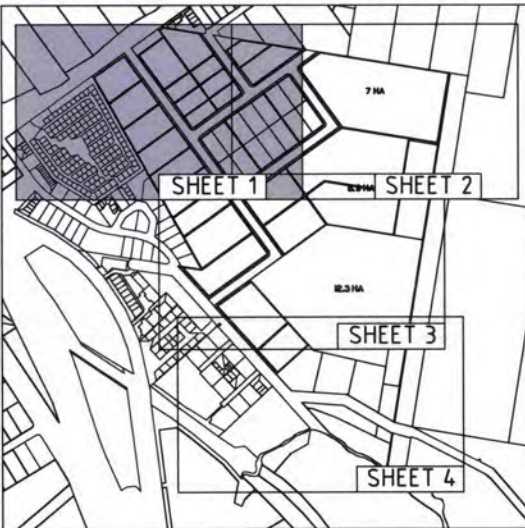


LEGEND

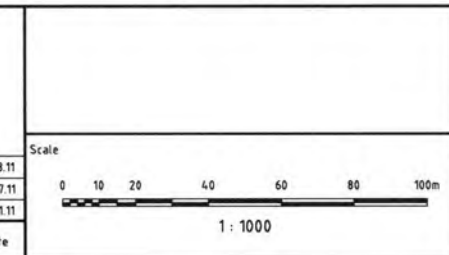
	PROPOSED SURFACE CONTOURS
	EXISTING SURFACE CONTOURS
	TOP/TOE OF BATTER
	CUT
	FILL
	NOMINAL KERB LINE
	BOULDER WALL
	STAGE BOUNDARY

NOTES

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS.
2. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3798 UNDER LEVEL 1 SUPERVISION.
3. ALL NEW WORKS TO MATCH NEATLY WITH EXISTING. THE CONTRACTOR SHALL CONFIRM LOCATION OF ALL EXISTING SERVICES AND PROTECT THESE SERVICES DURING CONSTRUCTION. DAMAGED SERVICES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
4. ALL OF THE SITE SHALL BE KEPT FREE DRAINING DURING ALL PHASES OF THE PROJECT.
5. REFER TO ROAD CROSS SECTIONS FOR BATTER GRADES WERE GRADE ARE NOT SPECIFIED:-
FILL - 1:4
CUT - 1:4
6. MINIMUM TOPSOIL THICKNESS 100mm
7. UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT ALL FILL SHALL BE PLACED AT BETWEEN +2% AND -2% OF OPTIMUM MOISTURE CONTENT.



Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



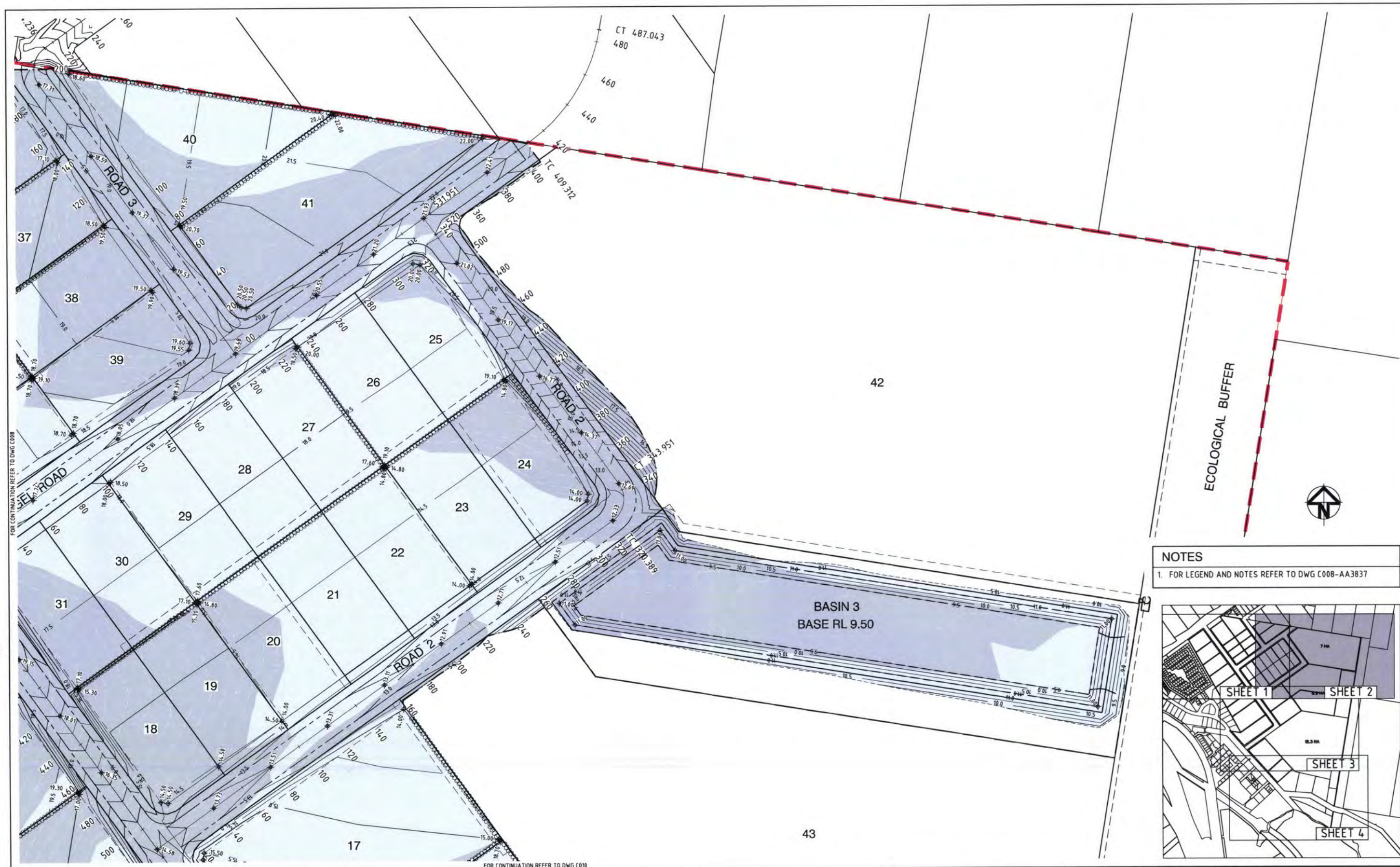
Surveyor	GASSMAN DEVELOPMENT PERSPECTIVES
Client	MRS PARTRICIA & MR WILLIAM HESTER
Architect	
Filename	C008-C011-AA003837-01-PRE BULK WRKS.DWG

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
Approved	RE.P.Q. No.:
Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
Title	BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 4

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
Title	BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 4

23/AUG/2011 8:53 AM	F:\AA003837\E-CAD\VC-Final\VC008-C011-AA003837-01-Pre Bulk Wrks.dwg	V1
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NOTES
 1. FOR LEGEND AND NOTES REFER TO DWG C008-AA3837



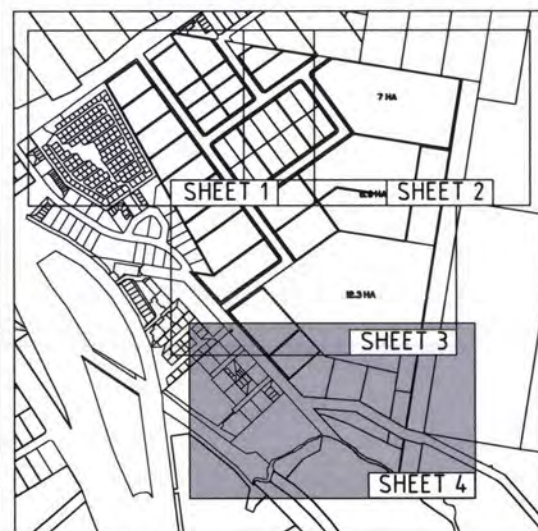
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11			Scale 0 10 20 40 60 80 100m 1 : 1000		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect MRS PARTRICIA & MR WILLIAM HESTER Client	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved R.E.P.Q. No : Scales 1:1000 Original Size A1 Height Datum DATUM Grid GRID	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 4	 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P.O. Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com
Issue Description Date 03 100mm on Original			Filename: C008-C01-AA003837-01-PRE BULK WRKS.DWG		Drawing No. C009	Project No. AA003837	Issue 03	23/Aug/2011 8:53 AM F:\AA003837\1-CAD\1-Civil\1D-Final\C008-C01-AA003837-01-Pre Bulk Wrks.dwg V1



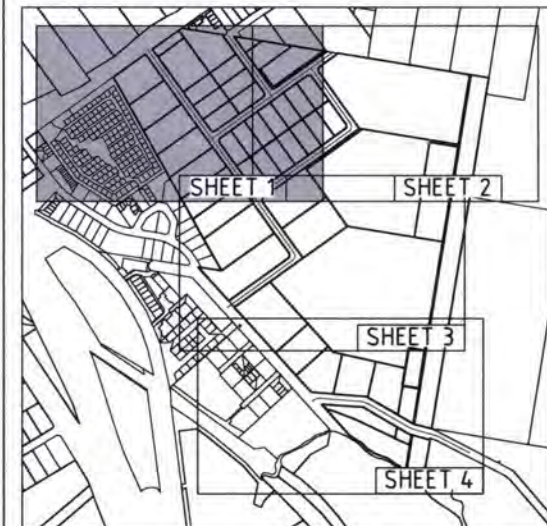
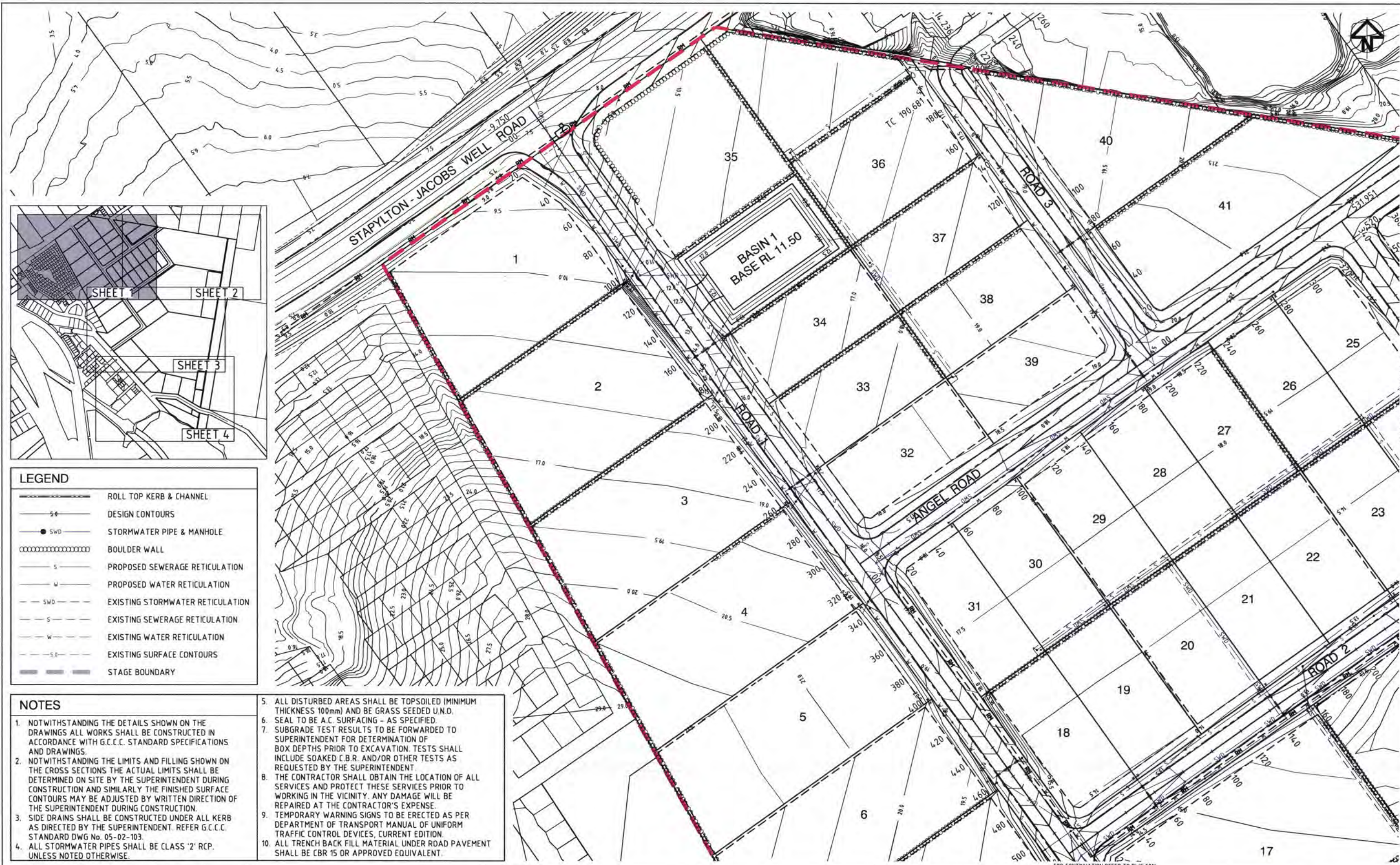
NOTES
1. FOR LEGEND AND NOTES REFER TO DWG C008-AA3B37



				FOR CONTINUATION REFER TO DWG C011				FOR CONTINUATION REFER TO DWG C011							
				Scale				Surveyor				Client			
								GASSMAN DEVELOPMENT PERSPECTIVES				MRS PARTRICIA & MR WILLIAM HESTER			
				Architect											
				Filename: C008-C011-AA003837-01-PRE BULK WRKS.DWG											
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11				02 DESIGN AMENDED ND 20.07.11				01 ORIGINAL ISSUE ND 06.01.11							
Issue Description				Date				Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION				Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE			
								Approved R.E.P.Q. No :							
								Scales 1:1000				Current Issue Signatures			
								Original Size A1				Author N.DREISE			
								Height Datum DATUM				Designer T.DINGLE			
								Grid GRID				Reviewer MBRAY			
												Title BULK EARTHWORKS LAYOUT PLAN SHEET 3 OF 4			
												Hyder Consulting			
												HYDER CONSULTING PTY. LTD.			
												ABN 48 010 924 866			
												P O Box 1053, Southport, Queensland, 4215 Australia			
												Tel: (+617) 5532 3933			
												Fax: (+617) 5591 4778			
												E-mail: goldcoast@hyderconsulting.com			
												Web: www.hyderconsulting.com			
								Drawing No. C010				Project No. AA003837			
												Issue 03			



03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11		Scale 0 10 20 40 60 80 100m 1 : 1000	Surveyor GASSMAN DEVELOPMENT PERSPECTIVES	Client MRS PATRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215, Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	Hyder Consulting
Issue Description Date		Architect Filename: C:\008-C011-AA003837-01-PRE BULK WRKS.DWG	Approved R.E.P.Q. No.	Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY Copyright reserved	Original Size A1	Title BULK EARTHWORKS LAYOUT PLAN SHEET 4 OF 4	Drawing No. C011 Project No. AA003837 Issue 03	23/AUG/2011 8:53 AM F:\AA003837\E-CAD\VC-Civil\VD-Final\VC008-C011-AA003837-01-Pre Bulk Wrks.dwg



LEGEND	
	ROLL TOP KERB & CHANNEL
	DESIGN CONTOURS
	STORMWATER PIPE & MANHOLE
	BOULDER WALL
	PROPOSED SEWERAGE RETICULATION
	PROPOSED WATER RETICULATION
	EXISTING STORMWATER RETICULATION
	EXISTING SEWERAGE RETICULATION
	EXISTING WATER RETICULATION
	EXISTING SURFACE CONTOURS
	STAGE BOUNDARY

- NOTES**
- NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS AND DRAWINGS.
 - NOTWITHSTANDING THE LIMITS AND FILLING SHOWN ON THE CROSS SECTIONS THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE SUPERINTENDENT DURING CONSTRUCTION.
 - SIDE DRAINS SHALL BE CONSTRUCTED UNDER ALL KERB AS DIRECTED BY THE SUPERINTENDENT. REFER G.C.C.C. STANDARD DWG No. 05-02-103.
 - ALL STORMWATER PIPES SHALL BE CLASS '2' RCP, UNLESS NOTED OTHERWISE.
 - ALL DISTURBED AREAS SHALL BE TOPSOILED (MINIMUM THICKNESS 100mm) AND BE GRASS SEED U.O.
 - SEAL TO BE A.C. SURFACING - AS SPECIFIED.
 - SUBGRADE TEST RESULTS TO BE FORWARDED TO SUPERINTENDENT FOR DETERMINATION OF BOX DEPTHS PRIOR TO EXCAVATION. TESTS SHALL INCLUDE SOAKED C.B.R. AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT.
 - THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 - TEMPORARY WARNING SIGNS TO BE ERECTED AS PER DEPARTMENT OF TRANSPORT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
 - ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.

				Surveyor		Client		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
				GASSMAN DEVELOPMENT PERSPECTIVES		MRS PARTRICIA & MR WILLIAM HESTER		Approved R.E.P.Q No.		STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE			
				Architect				Scales 1:1000 Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY © Copyright reserved		Title ROADWORKS & DRAINAGE LAYOUT PLAN SHEET 1 OF 4			
				Scale 0 10 20 40 60 80 100m 1 : 1000		Filename: C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG							
03 ISSUE FOR SUBMISSION TO G.C.C.C.		ND 19.08.11											
02 DESIGN AMENDED		ND 20.07.11											
01 ORIGINAL ISSUE		ND 06.01.11											
Issue Description		Date										Drawing No. C012 — Project No. AA003837 — Issue 03	



NOTES
1. FOR LEGEND AND NOTES REFER TO DWG C012-AA003837

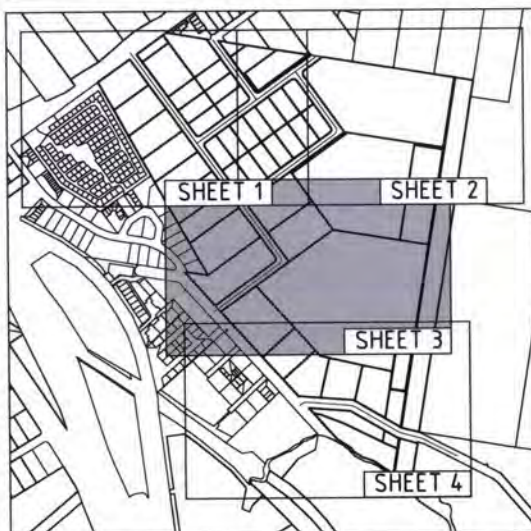


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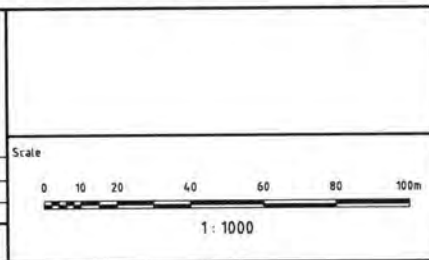


NOTES

1. FOR LEGEND AND NOTES REFER TO DWG C012-AA003837



Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



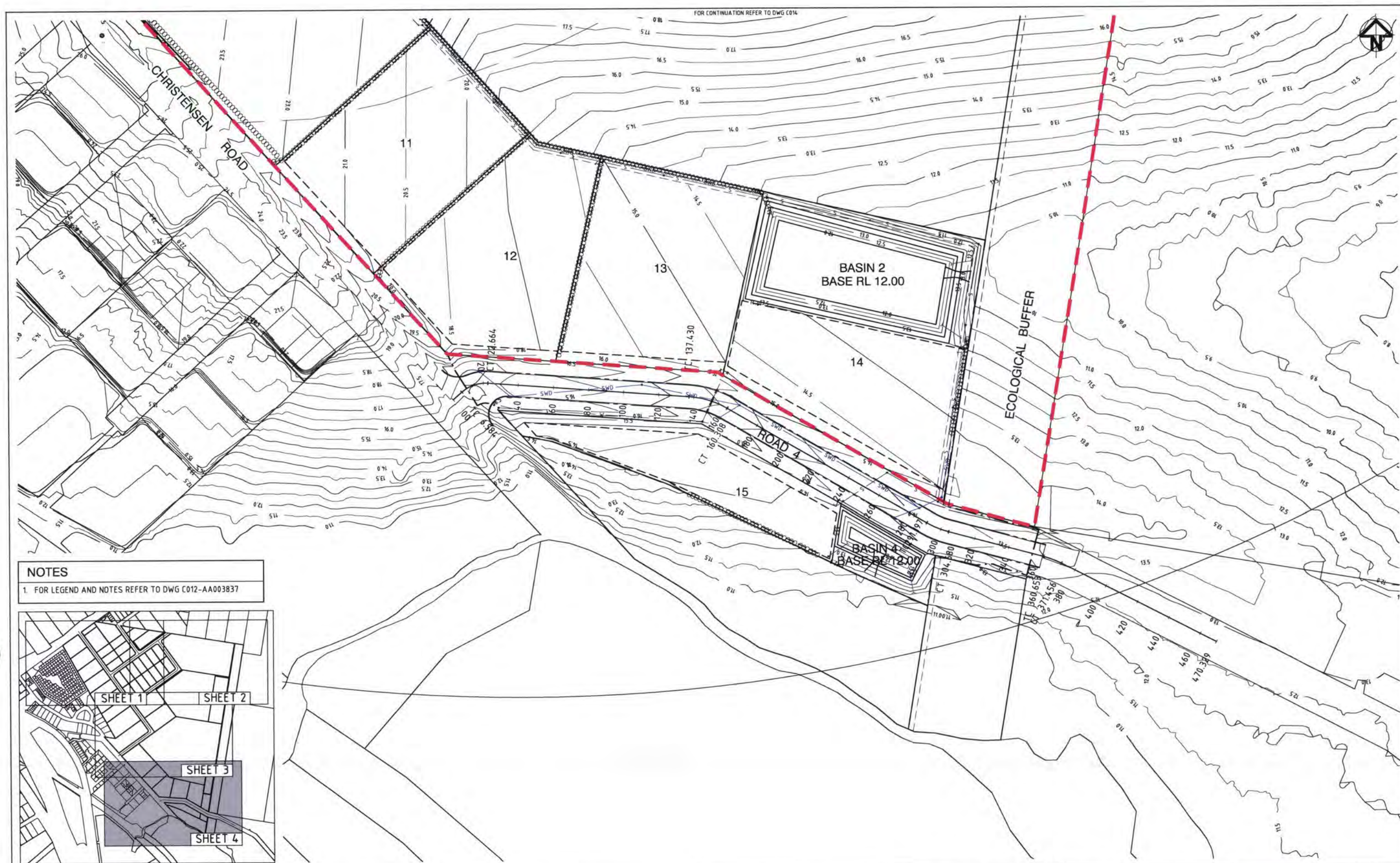
Surveyor	GASSMAN DEVELOPMENT PERSPECTIVES
Architect	
Client	MRS PARTRICIA & MR WILLIAM HESTER
Filename	C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
Approved	REP.Q No:
Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID

Author	N.DREISE
Designer	T.DINGLE
Reviewer	M.BRAY
Grid	GRID

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
Title	ROADWORKS & DRAINAGE LAYOUT PLAN SHEET 3 OF 4

	HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Drawing No	Project No	Issue
C014	AA003837	03

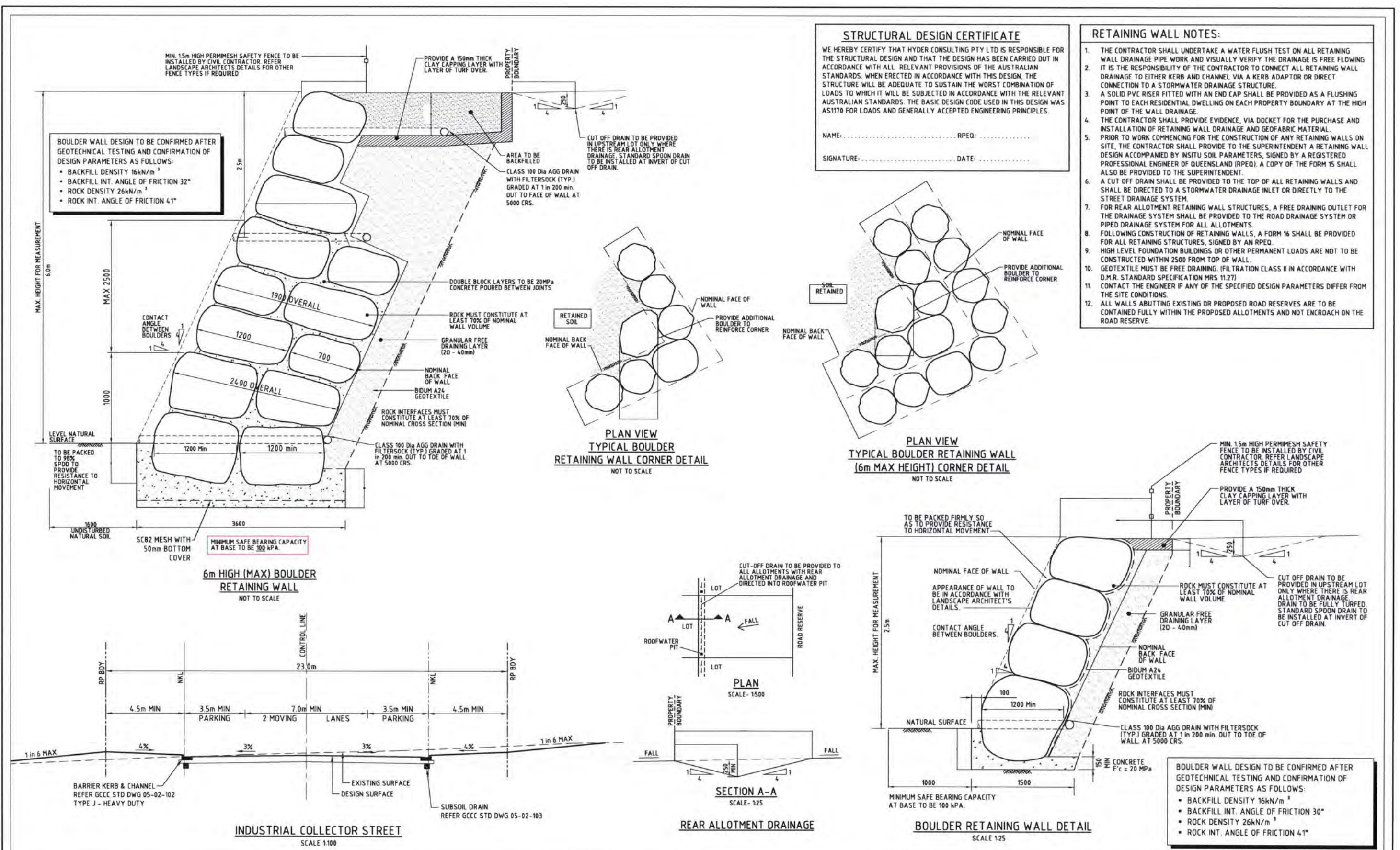


NOTES

1. FOR LEGEND AND NOTES REFER TO DWG C012-AA003837



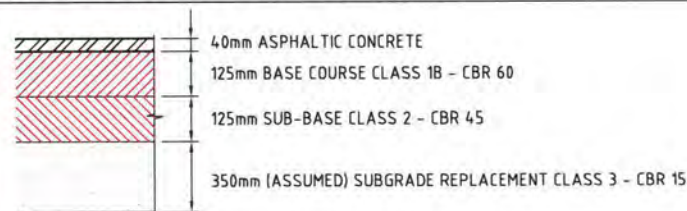
					Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION			Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE			 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1853, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com					
			Scale  1 : 1000		Architect				Approved R.E.P.Q. No.:			Scales 1:1000 Current Issue Signatures Author N.DREISE			Title ROADWORKS & DRAINAGE LAYOUT PLAN SHEET 4 OF 4					
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11									Original Size A1 Designer T.DINGLE			Height Datum DATUM Reviewer M.BRAY						Drawing No. C015 Project No. AA003837 Issue 03		
02 DESIGN AMENDED ND 20.07.11									Grid GRID Copyright reserved											
01 ORIGINAL ISSUE ND 06.01.11																				
Issue Description Date					Filename: C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG															



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ROAD 1 - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



NOTE:
ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Grade (%)
Vertical Curve (1 in ...)
Horizontal Curve Radius (m)

DATUM RL. -3.000

design	existing merged	EXISTING SURFACE ON ROAD CENTRELINE	CUT / FILL DEPTH	DESIGN LEVELS ON ROAD CENTRELINE	PEGGED CHAINAGE
7.953	5.616			7.953	-9.750
7.661	7.294			7.660	0.000
7.36	6.441			7.360	10.014
7.201	5.218	1.983		7.201	20.000
7.2	5.243	1.958		7.200	20.664
7.228	5.403	1.824		7.227	25.014
7.727	6.111	1.616		7.727	40.000
7.728	6.112	1.616		7.728	40.014
8.817	7.417	1.400		8.817	60.000
9.908	8.804	1.103		9.908	80.000
10.998	10.024	0.974		10.998	100.000
12.088	11.363	0.725		12.088	120.000
13.178	12.731	0.448		13.178	140.000
14.071	13.809	0.262		14.071	156.368
14.267	14.051	0.217		14.267	160.000
15.116	15.161	-0.045		15.116	176.368
15.297	15.407	-0.111		15.297	180.000
16.072	16.633	-0.560		16.072	196.368
16.118	16.714	-0.597		16.118	197.360
16.236	16.931	-0.696		16.236	200.000
16.977	18.380	-1.403		16.977	220.000
17.182	18.778	-1.595		17.183	227.360
17.45	19.183	-1.733		17.450	240.000
17.643	19.429	-1.786		17.643	257.360
17.657	19.443	-1.786		17.657	260.000
17.746	19.545	-1.799		17.746	276.916
17.766	19.566	-1.800		17.766	280.000
17.992	19.387	-1.396		17.991	296.916
18.054	19.361	-1.307		18.054	300.000
18.516	19.262	-0.746		18.516	316.916
18.518	19.271	-0.743		18.528	317.281
18.616	19.336	-0.721		18.616	320.000
19.09	19.876	-0.785		19.090	340.000
19.267	20.336	-1.069		19.267	360.000
19.268	20.377	-1.109		19.268	361.822
19.257	20.500	-1.243		19.257	367.281
19.145	20.785	-1.640		19.145	380.000
18.724	20.949	-2.224		18.724	400.000
18.121	20.363	-2.242		18.121	417.281
18.009	20.270	-2.261		18.009	420.000
17.181	19.402	-2.220		17.181	440.000
16.354	18.472	-2.118		16.354	460.000
15.546	17.347	-1.800		15.546	479.525
15.527	17.308	-1.781		15.527	480.000
14.861	15.700	-0.838		14.861	500.000
14.654	15.143	-0.490		14.653	509.525
14.505	14.834	-0.329		14.505	520.000
14.439	14.450	-0.011		14.439	533.055
14.455	14.794	0.162		14.455	539.525
14.458	14.783	0.175		14.458	540.000
14.502	14.750	0.252		14.502	548.831
14.626	14.313	0.313		14.626	560.000
14.971	14.917	0.053		14.971	573.831
15.192	15.243	-0.051		15.192	580.000
16.127	16.323	-0.196		16.127	598.831
16.197	16.431	-0.234		16.197	600.000
17.397	18.228	-0.831		17.397	620.000
18.597	19.909	-1.312		18.597	640.000
18.612	19.930	-1.318		18.612	640.250

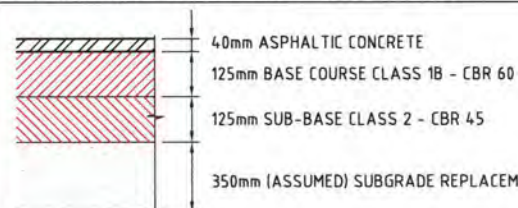
ROAD 1 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

03 ISSUE FOR SUBMISSION TO G.C.C.C. NO 19.08.11 02 DESIGN AMENDED NO 20.07.11 01 ORIGINAL ISSUE NO 06.01.11		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved Scales Original Size Height Datum Grid		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title ROAD 1 LONGITUDINAL SECTION SHEET 1 OF 6		HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue Description Date 03 19.08.11 02 20.07.11 01 06.01.11		Scale 0 10 20 40 60 80 100m 0 1 2 4 6 8 10m 1: 1000 (HORIZ) 1: 100 (VERT)		Client MRS PARTRICIA & MR WILLIAM HESTER File name: C017-C022-AA003837-01-RD LONG SECS.DWG		R.E.P.Q. No.: Current Issue Signatures Author NDREISE Designer T.DINGLE Reviewer MBRAY © Copyright reserved		Drawing No. C017 Project No. AA003837 Issue 03	

ROAD 1 - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



NOTE:
ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Grade (%)
Vertical Curve (1 in ...)
Horizontal Curve Radius (m)

DATUM RL.11.000

design	existing merged	EXISTING SURFACE ON ROAD CENTRELINE	CUT / FILL DEPTH	DESIGN LEVELS ON ROAD CENTRELINE	PEGGED CHAINAGE
18.612	19.93	19.930	-1.318	18.612	640.250
19.797	21.596	21.596	-1.799	19.797	660.000
20.997	22.745	22.745	-1.748	20.997	680.000
21.848	23.483	23.483	-1.635	21.848	694.179
22.182	23.836	23.836	-1.654	22.182	700.000
23.092	24.978	24.978	-1.886	23.092	720.000
23.236	25.093	25.093	-1.857	23.236	724.179
23.636	25.507	25.507	-1.870	23.636	740.000
23.8	25.822	25.822	-2.022	23.8	754.179
23.83	25.859	25.859	-2.029	23.83	760.000
23.931	26.091	26.091	-2.159	23.931	780.000
24.033	26.137	26.137	-2.103	24.033	800.000
24.135	26.178	26.178	-2.043	24.135	820.000
24.236	26.245	26.245	-2.009	24.236	840.000
24.338	26.298	26.298	-1.960	24.338	860.000
24.439	26.294	26.294	-1.855	24.439	880.000
24.541	26.267	26.267	-1.726	24.541	900.000
24.643	25.914	25.914	-1.271	24.643	920.000
24.649	25.885	25.885	-1.236	24.649	921.164
24.706	25.761	25.761	-1.055	24.705	926.164
25.673	25.673	25.673	-0.849	24.824	931.164
25.059	25.059	25.059	0.030	25.089	940.000

ROAD 1 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

FOR CONTINUATION SEE DWG C017

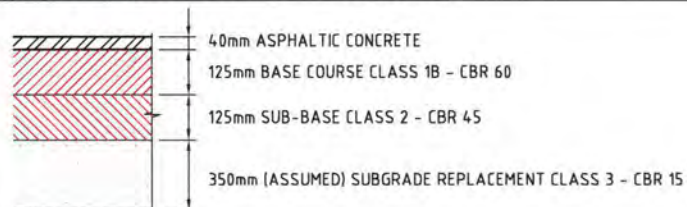
EXISTING SURFACE
DESIGN SURFACE

CHRISTENSEN ROAD

03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11		Scale: 10 20 40 60 80 100m 1:1000 (HORIZ) 1:100 (VERT)		Surveyor: GASSMAN DEVELOPMENT PERSPECTIVES Architect: _____ Client: MRS PARTRICIA & MR WILLIAM HESTER Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved: _____ Scales: 1:1000 (HORIZ) 1:100 (VERT) Original Size: A1 Height Datum: DATUM Grid: GRID		Project: STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title: ROAD 1 LONGITUDINAL SECTION SHEET 2 OF 6 Drawing No: C018 Project No: AA003837 Issue: 03		HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3833 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
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ANGEL ROAD - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



NOTE:

ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Grade (%)
Vertical Curve (1 in ...)
Horizontal Curve Radius (m)

DATUM RL 6.000

design	EXISTING SURFACE ON ROAD CENTRELINE	CUT / FILL DEPTH	DESIGN LEVELS ON ROAD CENTRELINE	PEGGED CHAINAGE
18.336	19.288	-0.952	18.336	0.000
17.736	18.462	-0.726	17.736	20.000
17.718	18.433	-0.715	17.718	20.616
17.613	18.193	-0.581	17.613	23.616
17.589	18.053	-0.464	17.589	25.152
17.593	18.018	-0.425	17.593	30.616
17.642	17.758	-0.117	17.642	40.000
17.744	17.202	0.543	17.744	60.000
17.847	16.981	0.866	17.847	80.000
17.95	17.023	0.927	17.95	100.000
18.053	17.361	0.692	18.053	120.000
18.141	17.792	0.350	18.141	137.157
18.158	17.849	0.309	18.158	140.000
18.39	18.461	-0.070	18.39	160.000
18.428	18.538	-0.110	18.428	162.157
18.825	19.145	-0.320	18.825	180.000
19.029	19.362	-0.333	19.029	187.157
19.091	19.451	-0.360	19.091	189.215
19.401	19.798	-0.397	19.401	200.000
19.756	19.850	-0.094	19.756	214.215
19.884	19.938	-0.054	19.884	220.000
20.234	20.216	-0.042	20.234	239.215
20.246	20.290	-0.044	20.246	240.000
20.553	21.029	-0.477	20.553	260.000
20.783	21.060	-0.277	20.783	275.000
20.861	21.071	-0.210	20.861	280.000
21.204	21.166	0.039	21.204	300.000
21.597	21.365	0.232	21.597	320.000
21.703	21.593	0.110	21.703	325.000
22.026	22.268	-0.242	22.026	340.000
22.076	22.295	-0.219	22.076	342.341
22.314	22.770	-0.456	22.314	360.000
22.33	22.832	-0.502	22.33	364.841
22.331	22.835	-0.505	22.331	366.033
22.242	22.738	-0.496	22.242	380.000
22.125	22.641	-0.517	22.125	387.341
22.087	22.615	-0.529	22.087	389.312
21.838	22.378	-0.540	21.838	400.000
21.554			21.554	409.312
21.149			21.149	420.000
20.729			20.729	429.312
20.621			20.621	431.531
20.180			20.180	440.000
19.485			19.485	451.531
18.905			18.905	460.000
18.020			18.020	471.531
17.832			17.832	473.845
17.357			17.357	480.000
16.487			16.487	493.845
16.188			16.188	500.000
15.713			15.713	513.845
15.562			15.562	520.000
15.413			15.413	526.095
15.258			15.258	538.743
15.259			15.259	540.000
15.263			15.263	541.095
15.549			15.549	556.095
15.633			15.633	558.600
15.678			15.678	560.000
15.884			15.884	573.493
15.883			15.883	573.600
15.836			15.836	580.000
15.626			15.626	588.600
15.530			15.530	591.413
15.199			15.199	600.000
14.900			14.900	606.413
14.123			14.123	620.000
14.031			14.031	621.413
13.815			13.815	624.688

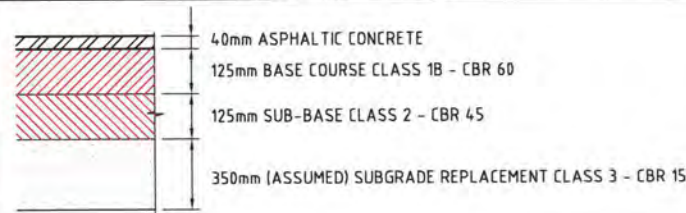
ANGEL ROAD LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 DESIGN AMENDED ND 20.07.11 ORIGINAL ISSUE ND 06.01.11		Scale: 10 20 40 60 80 100m 1: 1000 (HORIZ) 0 1 2 4 6 8 10m 1: 100 (VERT)		Surveyor: GASSMAN DEVELOPMENT PERSPECTIVES Architect: MRS PARTRICIA & MR WILLIAM HESTER Filename: C017-C022-AA003837-01-RD LONG SECS.DWG		Client: MRS PARTRICIA & MR WILLIAM HESTER		Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved: Scales: 1:1000 (HORIZ) 1:100 (VERT) Original Size: A1 Height Datum: DATUM Grid: GRID		Project: STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title: ANGEL ROAD LONGITUDINAL SECTION SHEET 3 OF 6		Hyder Consulting HYDER CONSULTING PTY. LTD ABN 48 010 824 866 P O Box 1053, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue Description Date 03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11		Drawing No: C019 Project No: AA003837 Issue: 03		23/Aug/2011 8:54 AM F:\AA003837\1-CAD\1-Civil\1D-Final\1D-C017-C022-AA003837-01-Rd Long Secs.dwg		Copyright reserved							

ROAD 2 - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



NOTE:
ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Grade (%)
Vertical Curve (1 in ...)
Horizontal Curve Radius (m)
DATUM RL.4.000

design	EXISTING SURFACE ON ROAD CENTRELINE	CUT / FILL DEPTH	DESIGN LEVELS ON ROAD CENTRELINE	PEGGED CHAINAGE

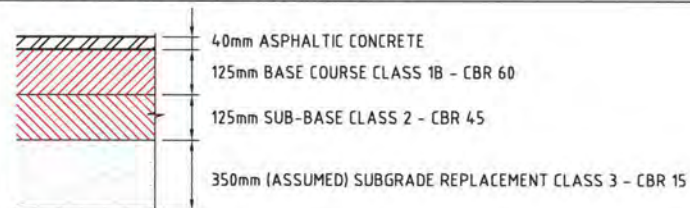
ROAD 2 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11		Scale 0 10 20 40 60 80 100m 0 1 2 4 6 8 10m 1:1000 (HORIZ) 1:100 (VERT)		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect File name: C017-C022-AA003837-01-RD LONG SECS.DWG		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved Scales 1:1000 (HORIZ) 1:100 (VERT) Original Size A1 Height Datum DATUM Grid GRID		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title ROAD 2 LONGITUDINAL SECTION SHEET 4 OF 6		HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
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ROAD 3 - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



NOTE:
ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING

Vertical Curve Length (m)
Vertical Curve Radius (m)
Vertical Grade (%)
Vertical Curve (1 in ...)
Horizontal Curve Radius (m)
DATUM RL.3.000

EXISTING SURFACE ON ROAD CENTRELINE	19.814	20.450	20.748	20.857	21.046	21.049	21.912	22.254	23.000	22.974	22.840	22.812	22.558	22.239	21.799	21.587	20.965	20.679	20.603	18.448	15.685	16.83	16.417	16.288	16.256	15.187	15.113	13.899	13.817	12.843	12.71	11.816	11.724	11.027	10.951	10.396	10.38
CUT / FILL DEPTH	-0.333	-1.268	-1.661	-1.777	-1.945	-1.946	-2.608	-2.879	-3.469	-3.374	-3.309	-3.303	-3.186	-3.182	-3.066	-2.995	-2.880	-3.102	-3.295	-1.382	15.685	16.83	16.417	16.288	16.256	15.187	15.113	13.899	13.817	12.843	12.71	11.816	11.724	11.027	10.951	10.396	10.38
DESIGN LEVELS ON ROAD CENTRELINE	19.481	19.182	19.087	19.080	19.102	19.102	19.303	19.375	19.531	19.550	19.530	19.509	19.372	19.057	18.732	18.591	18.084	17.577	17.307	17.066	16.779	16.518	16.208	15.932	15.892	15.186	15.122	14.086	13.998	12.934	12.787	11.814	11.709	11.059	10.993	10.419	10.380
PEGGED CHAINAGE	0.000	9.961	14.961	16.790	19.961	20.000	24.435	40.000	60.000	69.897	80.000	84.435	100.000	120.000	134.435	140.000	160.000	180.000	190.658	200.000	210.658	220.000	230.658	240.000	241.365	260.000	261.365	280.000	281.365	297.698	300.000	317.698	320.000	337.698	340.000	360.000	361.365

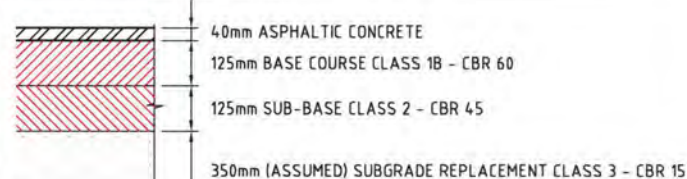
ROAD 3 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

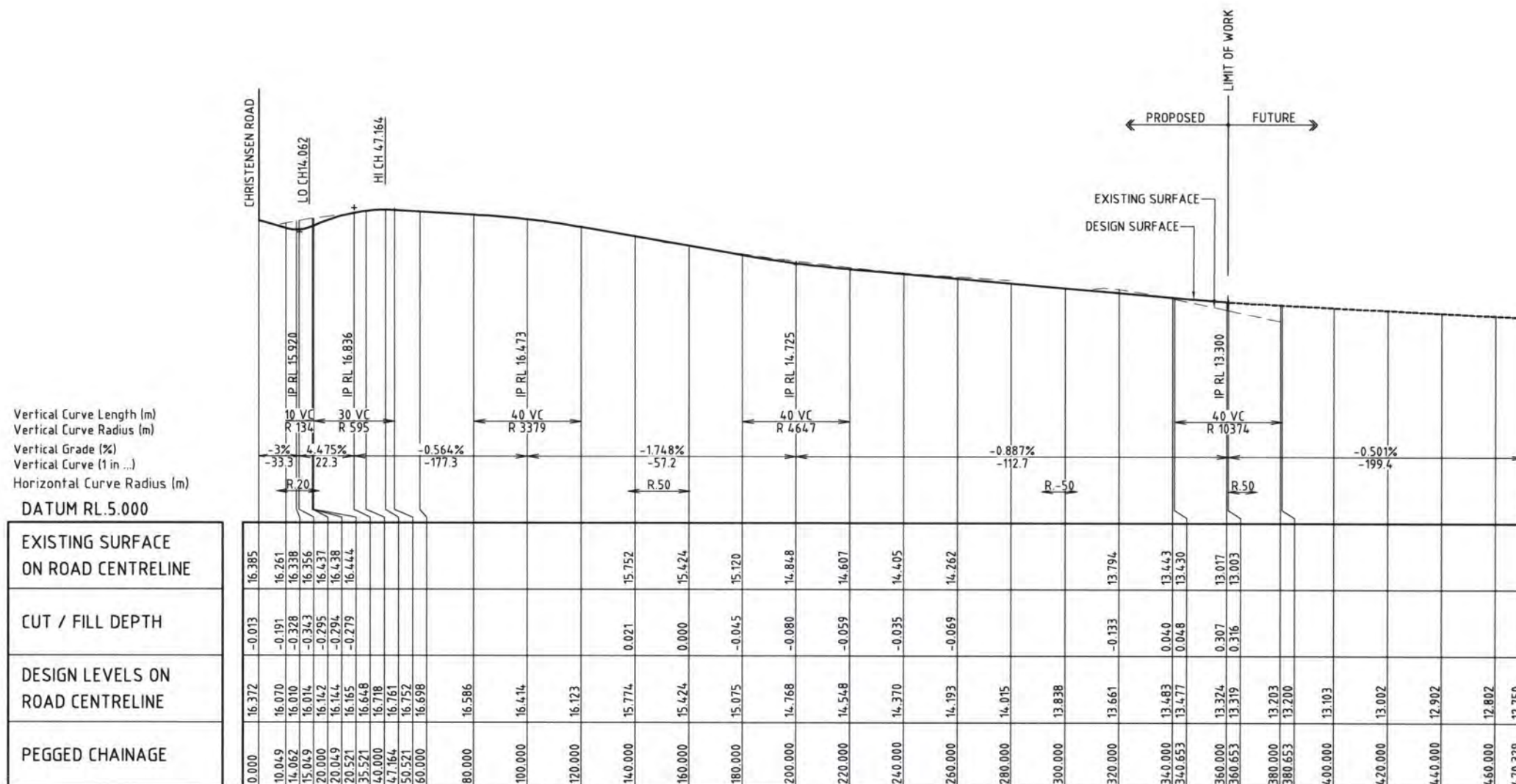
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11			Scale 10 20 40 60 80 100m 1: 1000 (HORIZ) 0 1 2 4 6 8 10m 1: 100 (VERT)		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C017-C022-AA003837-01-RD LONG SECS.DWG		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved Scales 1:1000 (HORIZ) 1:100 (VERT) Original Size A1 Height Datum Grid		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title ROAD 3 LONGITUDINAL SECTION SHEET 5 OF 6		HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue Description Date			Drawing No. C021 Project No. AA003837 Issue 03											

ROAD 4 - PAVEMENT SPECIFICATION

23.0m INDUSTRIAL COLLECTOR STREET - ASSUMED CBR 3.0



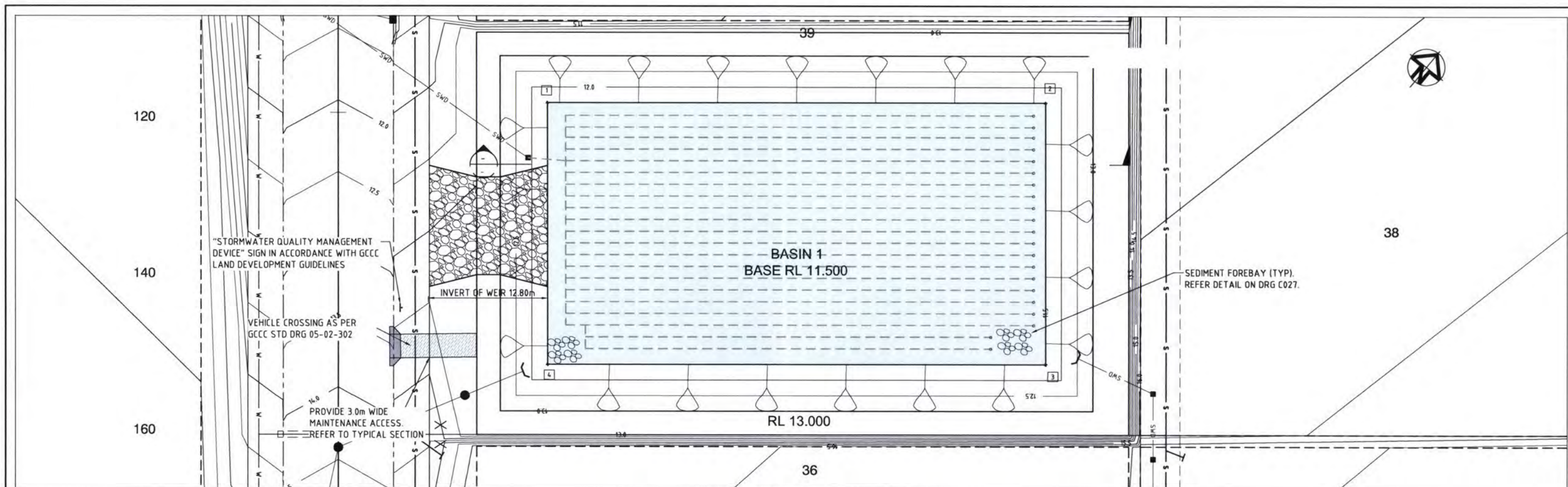
NOTE:
ROAD PAVEMENT LAYER DEPTHS ARE SUBJECT TO (4 DAY SOAKED) SUBGRADE CBR TESTING



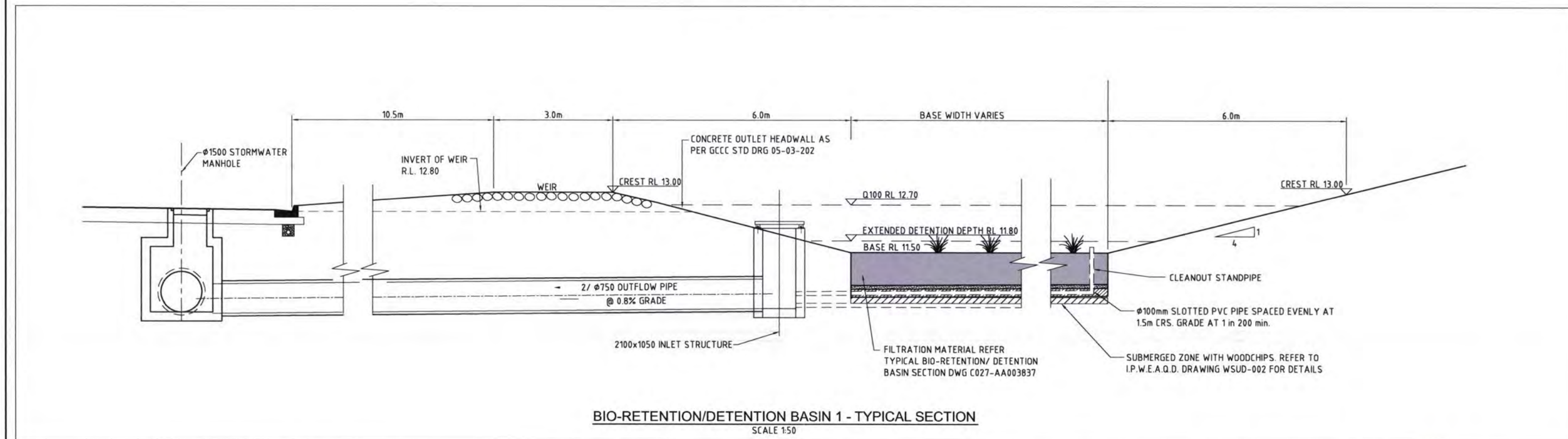
ROAD 4 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:100

03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11 02 DESIGN AMENDED ND 20.07.11 01 ORIGINAL ISSUE ND 06.01.11		Scale 0 10 20 40 60 80 100m 1 : 1000 (HORIZ) 0 1 2 4 6 8 10m 1 : 100 (VERT)		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C017-C022-AA003837-01-RD LONG SECS.DWG		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved Scales 1:1000 (HORIZ) 1:100 (VERT) Original Size A1 Height Datum Grid RE.P.O. No: Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY Copyright reserved		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title ROAD 4 LONGITUDINAL SECTION SHEET 6 OF 6		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue Description Date 03 19.08.11 02 20.07.11 01 06.01.11										Drawing No. C022 Project No. AA003837 Issue 03			

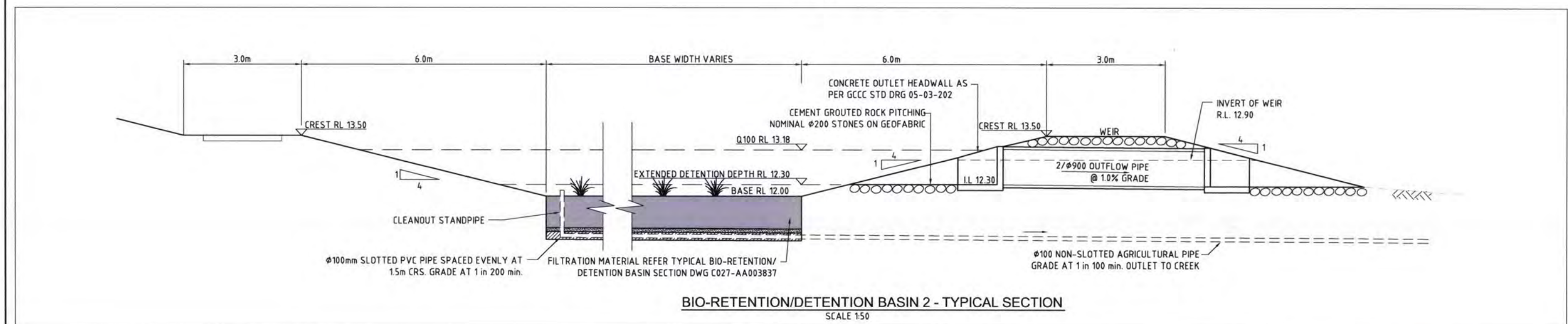
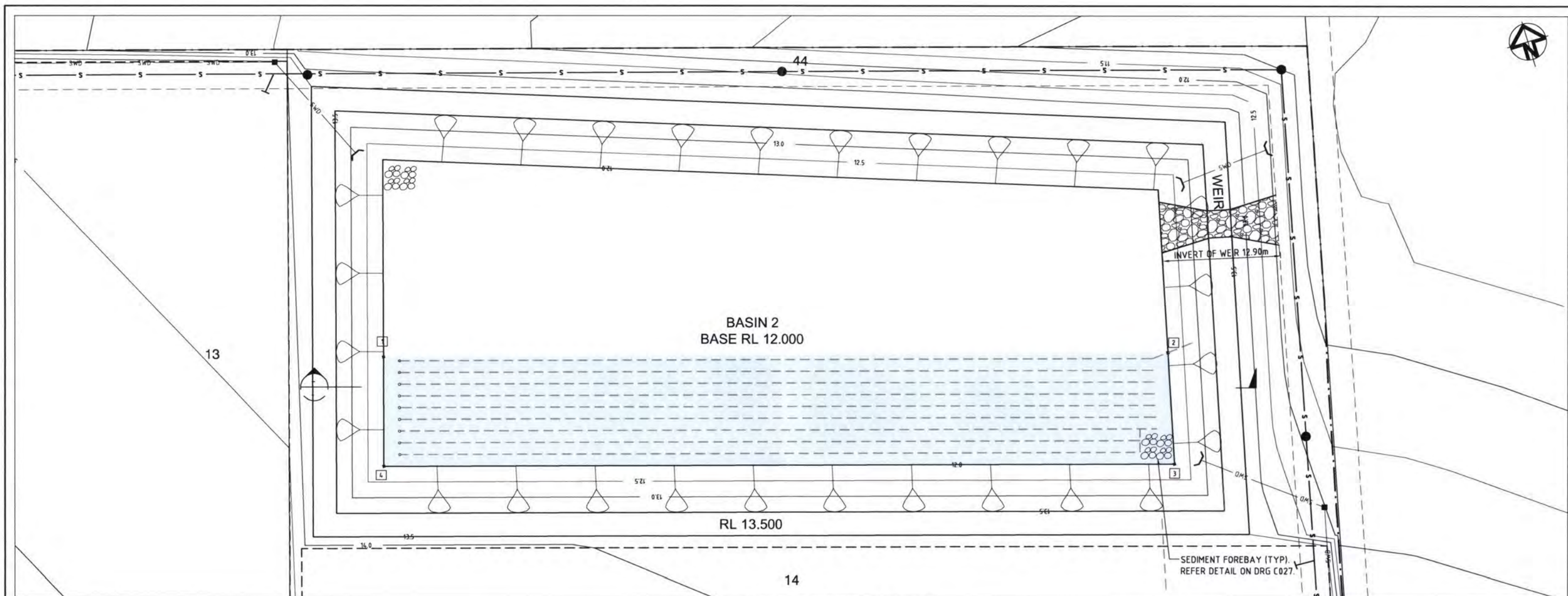


BIO-RETENTION/DETENTION BASIN 1
SCALE 1:250

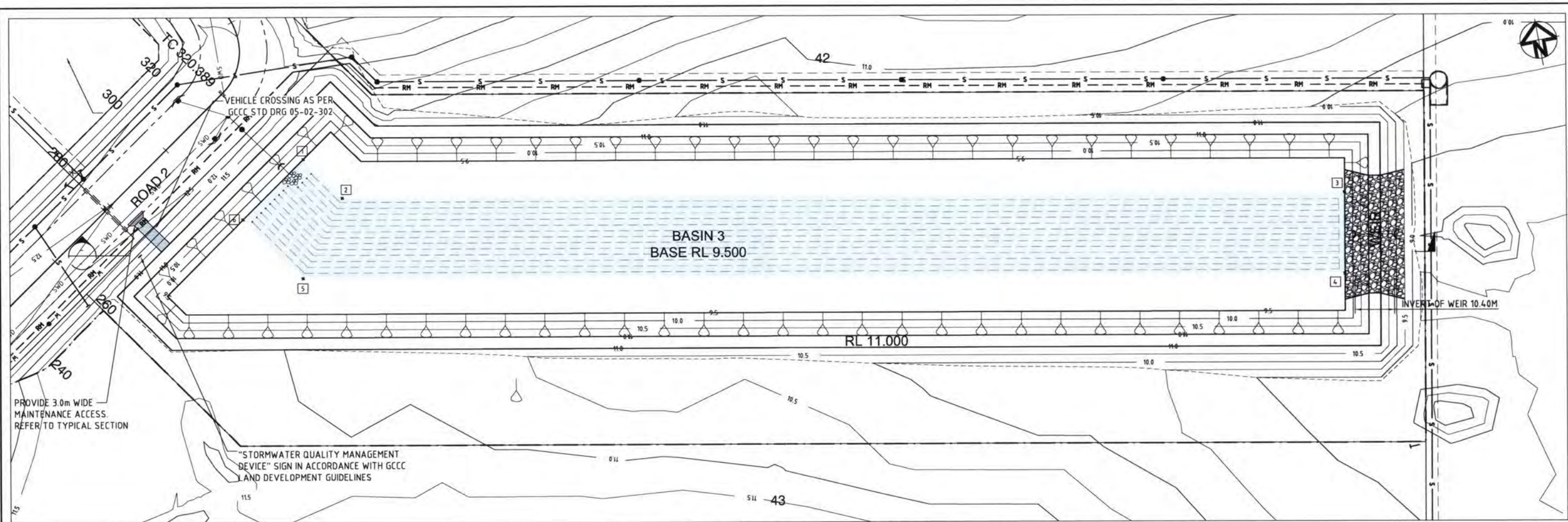


BIO-RETENTION/DETENTION BASIN 1 - TYPICAL SECTION
SCALE 1:50

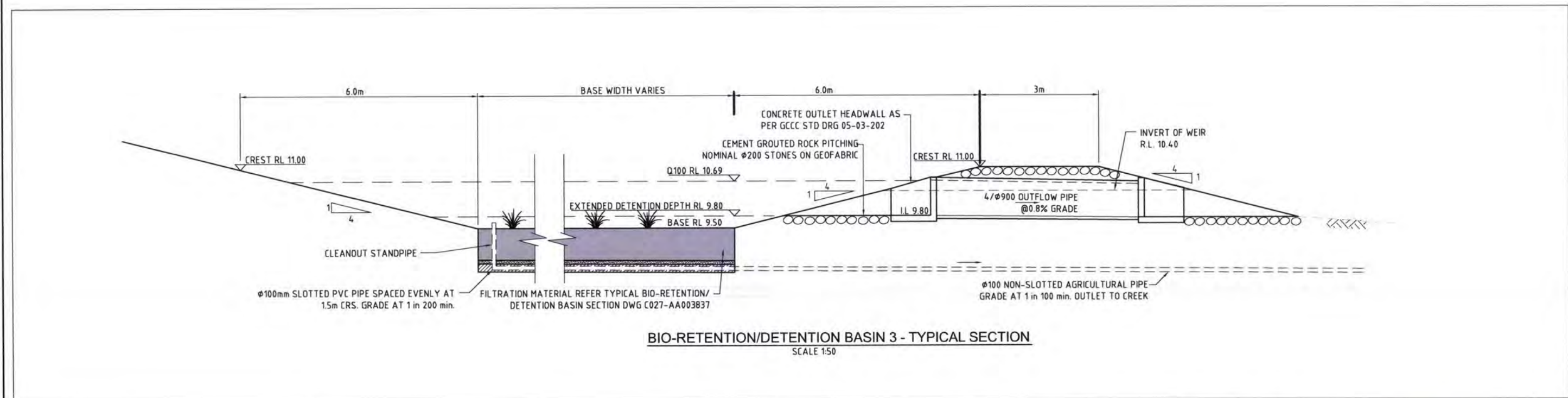
ISSUE FOR SUBMISSION TO G.C.C.C. 03 02 01 ISSUE Description Date			GASSMAN DEVELOPMENT PERSPECTIVES Surveyor Architect Client MRS PARTRICIA & MR WILLIAM HESTER Filename: C023-C027-AA003837-01-BASINS.DWG			PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved Scales Original Size Height Grid			STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title BIO RETENTION / DETENTION BASIN 1 LAYOUT PLAN Drawing No. C023			HYDER CONSULTING PTY. LTD ABN 48 010 924 886 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com			Project No. AA003837 Issue 03		
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					Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1053, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com			
			Scale 0 5 10 15 20 25m 1:250 0 0.5 1 2 3 4 5m 1:50		Architect				Approved R.E.P.Q. No :		Scales AS SHOWN		Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY		Title BIO RETENTION / DETENTION BASIN 2 LAYOUT PLAN	
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11											Original Size A1					
02 DESIGN AMENDED ND 20.07.11											Height Datum DATUM					
01 ORIGINAL ISSUE ND 06.01.11											Grid GRID					
Issue Description			Date		Filename: C023-C027-AA003837-01-BASINS.DWG								Drawing No C024		Project No AA003837	
													Issue 03			

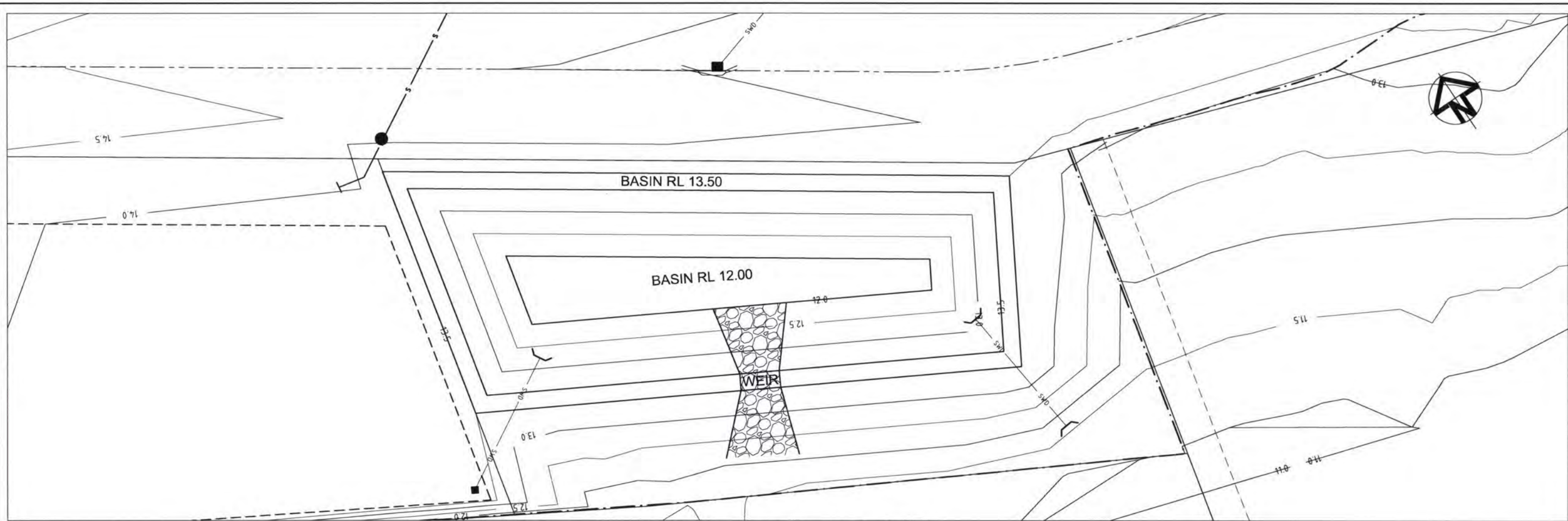


BIO-RETENTION/DETENTION BASIN 3
SCALE 1:500

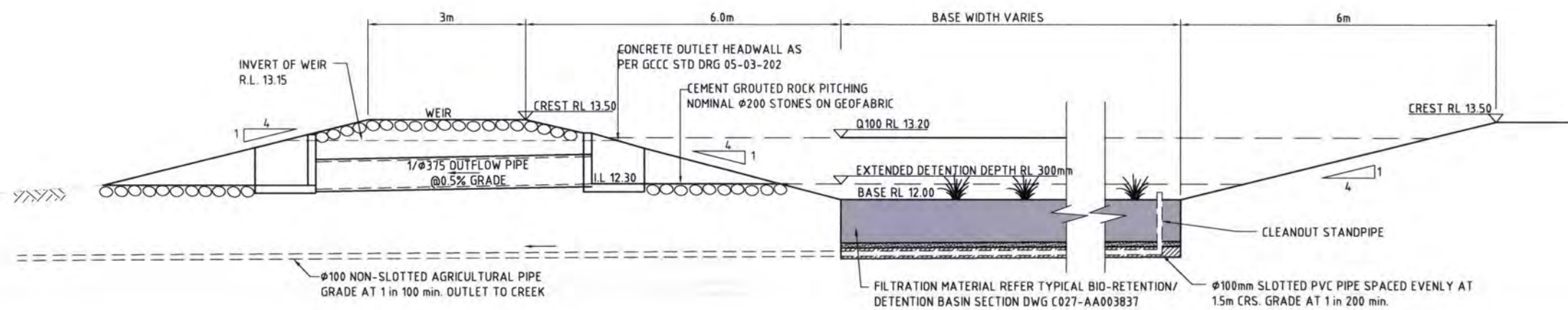


BIO-RETENTION/DETENTION BASIN 3 - TYPICAL SECTION
SCALE 1:50

					Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION			Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE			 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com			
			Scale		Architect					Approved R.E.P.Q. No.:			Title					
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			0 0.5 1 2 3 4 5m							Original Size			Author N.DREISE					
			1 : 500							A1			Designer T.DINGLE					
			1 : 50							Height Datum			Reviewer M.BRAY					
							Filename: C023-C027-AA003837-01-BASINS.DWG			Grid			GRID			© Copyright reserved		
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11										23/Jan/2011 8:56 AM			F:\AA003837\Final\Civil\023-C027-AA003837-01-BASINS.dwg					
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01 ORIGINAL ISSUE ND 06.01.11																		
Issue Description			Date													Drawing No. C025 Project No. AA003837 Issue 03		

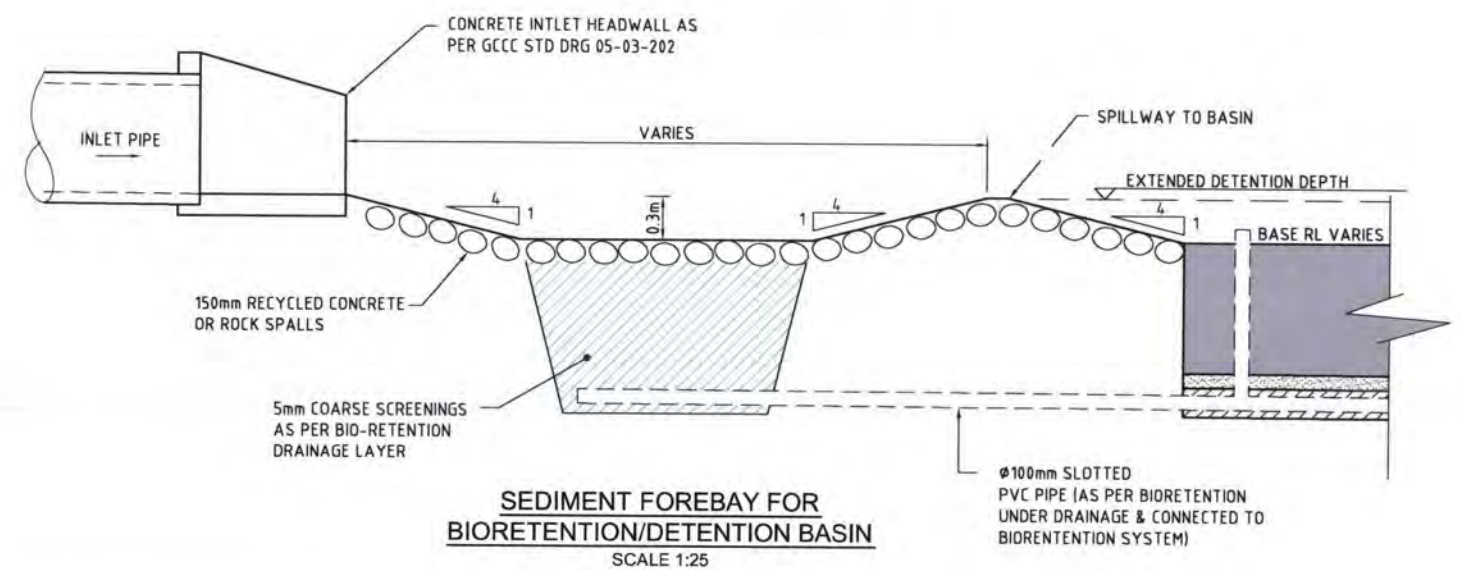
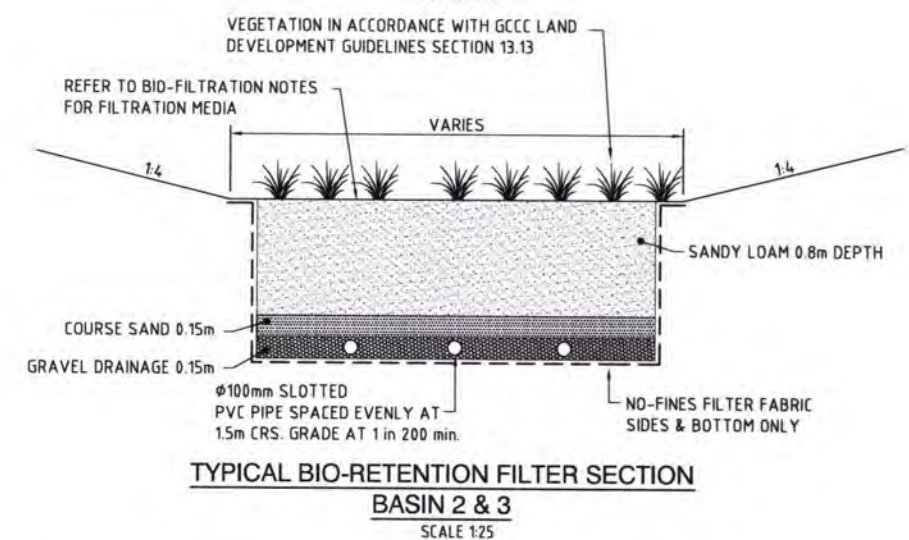
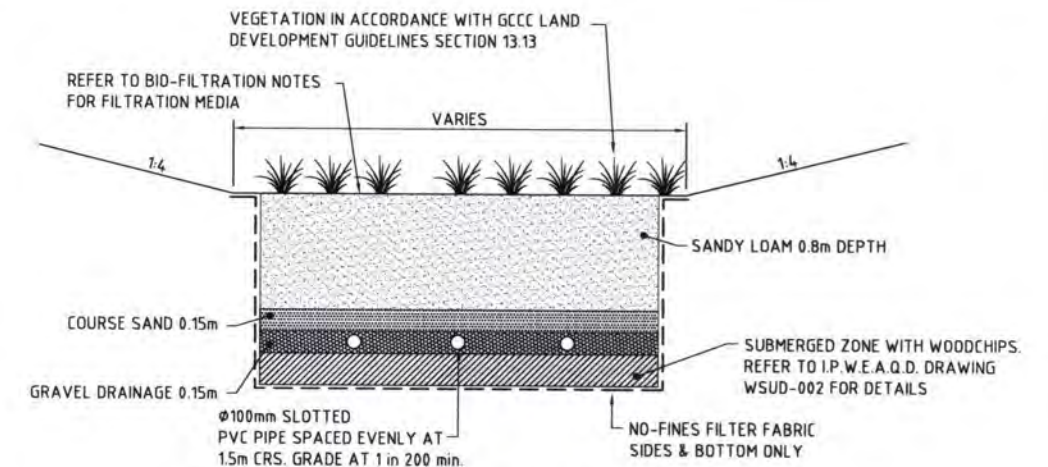
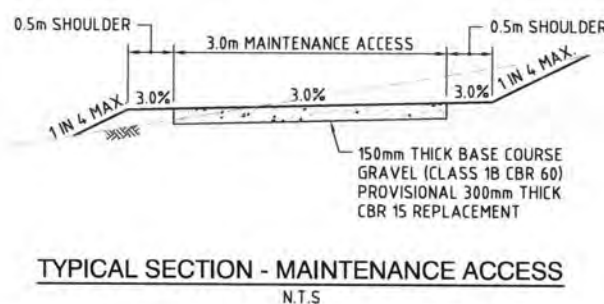
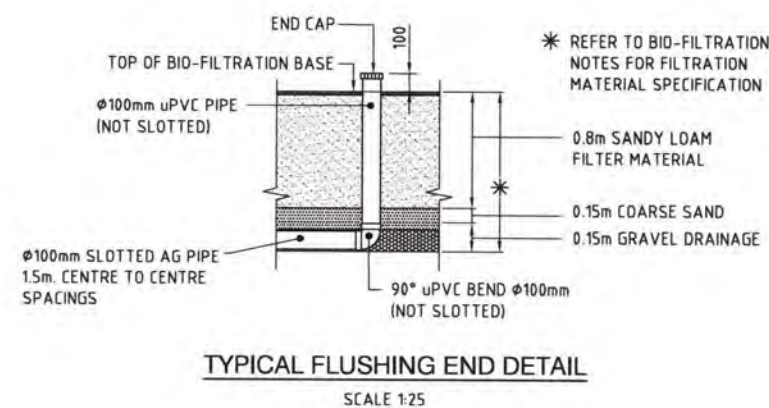
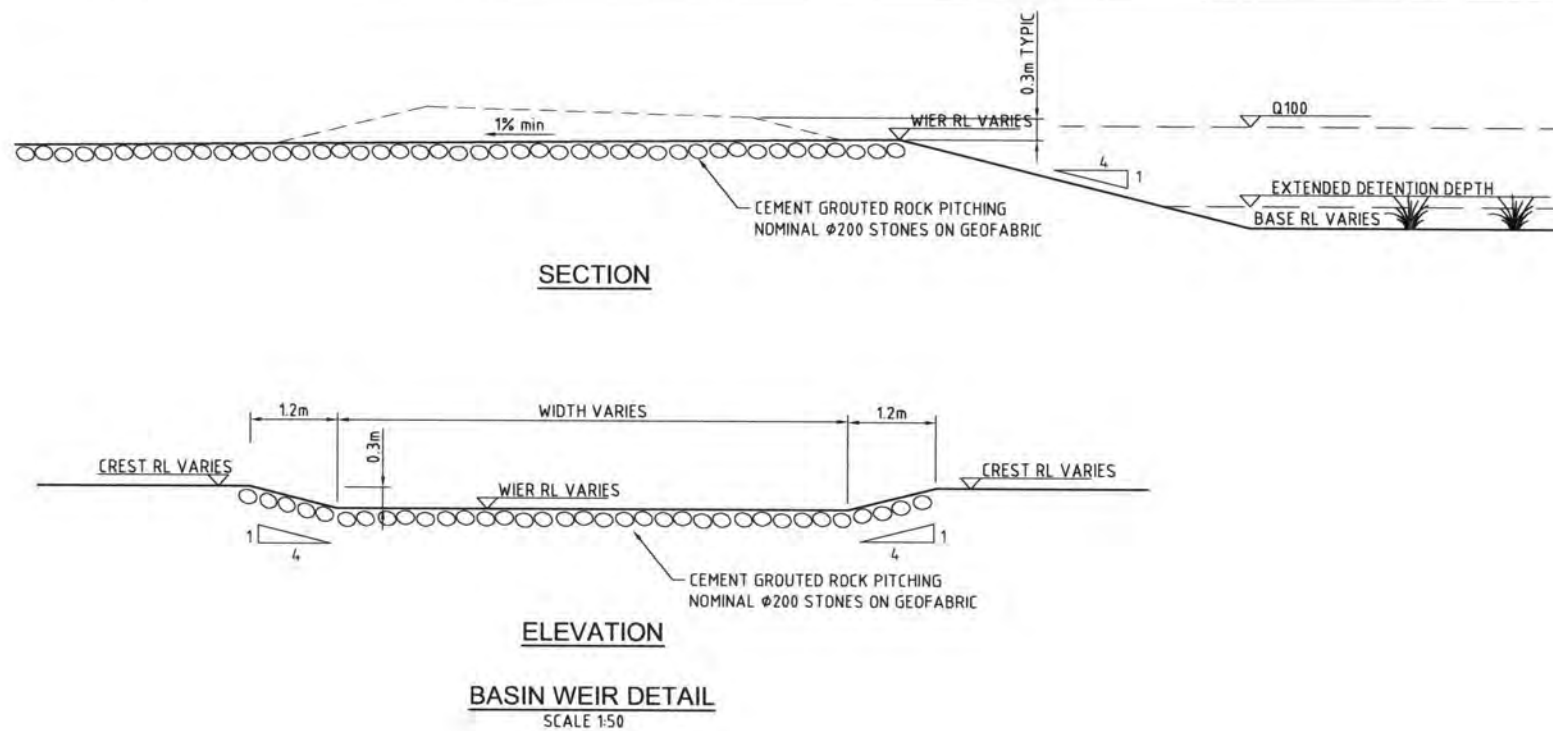


BIO-RETENTION/DETENTION BASIN 4
SCALE 1:250



BIO-RETENTION/DETENTION BASIN 4 - TYPICAL SECTION
SCALE 1:50

03 ISSUE FOR SUBMISSION TO G.C.C.C. 02 DESIGN AMENDED 01 ORIGINAL ISSUE			Scale 5 10 20 30 40 50m 0 0.5 1 2 3 4 5m 1: 500 1: 50		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C023-C027-AA003837-01-BASINS.DWG	Client MRS PATRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved RE.P.Q. No. Current Issue Signatures Author NDREISE Designer T DINGLE Reviewer MBRAY Grid GRID © Copyright reserved	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title BIO RETENTION / DETENTION BASIN 4 LAYOUT PLAN	Hyder Consulting HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com
Issue Description Date			Scale 5 10 20 30 40 50m 0 0.5 1 2 3 4 5m 1: 500 1: 50		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C023-C027-AA003837-01-BASINS.DWG	Client MRS PATRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved RE.P.Q. No. Current Issue Signatures Author NDREISE Designer T DINGLE Reviewer MBRAY Grid GRID © Copyright reserved	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title BIO RETENTION / DETENTION BASIN 4 LAYOUT PLAN	Hyder Consulting HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com
Issue Description Date			Scale 5 10 20 30 40 50m 0 0.5 1 2 3 4 5m 1: 500 1: 50		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES Architect Filename: C023-C027-AA003837-01-BASINS.DWG	Client MRS PATRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved RE.P.Q. No. Current Issue Signatures Author NDREISE Designer T DINGLE Reviewer MBRAY Grid GRID © Copyright reserved	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title BIO RETENTION / DETENTION BASIN 4 LAYOUT PLAN	Hyder Consulting HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com



SURFACE TREATMENT DETAILS

TURFING TO ALL AREAS 1:4 SLOPE OR FLATTER.
VEGETATION TO ALL AREAS STEEPER THAN 1:4. REFER
TO LANDSCAPE ARCHITECT DRAWINGS AND WETLAND
SPECIFICATION FOR DETAILS

BIO-FILTRATION NOTES

MINIMUM FILTER DEPTH IS TO BE 1.2m AND IS TO CONSIST
OF THE FOLLOWING MEDIA:

× 0.8m OF SANDY LOAM MATERIAL WITH A HYDRAULIC
CONDUCTIVITY OF 50-200mm/h AND A PARTICLE SIZE OF
0.45-0.5mm.

× 0.15m OF COARSE SAND. PARTICLE SIZE TYPICALLY 1mm.

× 0.15m OF GRAVEL DRAINAGE. PARTICLE SIZE 5-10mm
SCREENING.

× CONTRACTOR TO ERECT SIGNAGE IDENTIFYING THE
PURPOSE OF THE BIO-RETENTION / DETENTION BASIN AS
PER COUNCIL REQUIREMENTS.

						Surveyor		GASSMAN DEVELOPMENT PERSPECTIVES		Client		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
										MRS PARTRICIA & MR WILLIAM HESTER		Approved RE.P.Q. No:		Title BIO RETENTION / DETENTION DETAILS			
				Scale: 0.5 1 1.5 2 2.5m		Architect						Scales AS SHOWN		Current Issue Signatures			
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11												Original Size A1		Author N.DREISE			
02 DESIGN AMENDED ND 20.07.11				0 0.5 1 2 1:25 3 4 5m								Height Datum DATUM		Designer T.DINGLE			
01 ORIGINAL ISSUE ND 06.01.11												Grid GRID		Reviewer M.BRAY			
Issue Description Date				1:50		Filename: C023-C027-AA003837-01-BASINS.DWG								© Copyright reserved			

LEGEND

SEWERAGE RETICULATION

SEWER RISING MAIN RETICULATION

PROPOSED STORMWATER DRAINAGE

PROPOSED WATER RETICULATION

EXISTING WATER RETICULATION

EXISTING SEWERAGE RETICULATION

EXISTING STORMWATER RETICULATION

NOMINAL KERB LINE

PROPOSED SURFACE CONTOURS

STAGE BOUNDARY

NOTES

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS AND DRAWINGS.

2. ALL PIPES SHALL BE Ø150 uPVC CLASS 'SN8' OR APPROVED EQUIVALENT U.N.O.

3. EACH LOT SHALL BE SERVICED BY A Ø100 HOUSE CONNECTION IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS & DRAWINGS. HOUSE CONNECTIONS SHALL BE LOCATED 0.5m UPSTREAM OF ALLOTMENT BOUNDARIES.

4. CONTRACTOR SHALL VERIFY FINISHED SURFACE LEVELS ON SITE BEFORE CONSTRUCTION OF SEWERS AND HOUSE CONNECTION BRANCHES.

5. THE CONTRACTOR SHALL HAVE PROPERTY BOUNDARIES PEGGED AND THE LOCATION OF HOUSE CONNECTIONS CONFIRMED PRIOR TO COMMENCING CONSTRUCTION OF HOUSE CONNECTION BRANCHES.

6. FINISHED SURFACE LEVELS SHOWN ON LONGITUDINAL SECTIONS ARE INDICATIVE ONLY AND MANHOLE LIDS SHALL FINISH TO THE GRADE OF THE FOOTPATH IN ROADWAYS AND 75mm ABOVE THE SURROUNDING LEVELS IN THE ALLOTMENTS.

7. ANY WORK ASSOCIATED WITH LIVE SEWERS AND MANHOLES TO BE CARRIED OUT BY G.C.C.C. AT THE CONTRACTOR'S EXPENSE.

8. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

9. THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT IMMEDIATELY IF MIN. & MAX. DEPTHS AS DEFINED BY G.C.C.C. ARE EXCEEDED DURING CONSTRUCTION.

10. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.

03 ISSUE FOR SUBMISSION TO G.C.C.C.

ND

19.08.11

02 DESIGN AMENDED

ND

20.07.11

01 ORIGINAL ISSUE

ND

06.01.11

Issue

Description

Date

Scale

0 10 20 40 60 80 100m

1 : 1000

Surveyor

GASSMAN DEVELOPMENT PERSPECTIVES

Client

MRS PATRICIA & MR WILLIAM HESTER

Architect

Filename

C028-C031-AA003837-01-SEWER.DWG

Status

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

Approved

RE.P.D. No.

Scales

1:1000

Original Size

A1

Height

DATUM

Grid

GRID

Current Issue Signatures

Author

N. DREISE

Designer

T. DINGLE

Reviewer

M. BRAY

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Project

STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE

Title

SEWER RETICULATION LAYOUT PLAN SHEET 1 OF 4

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Drawing No

C028

Project No

AA003837

Issue

03

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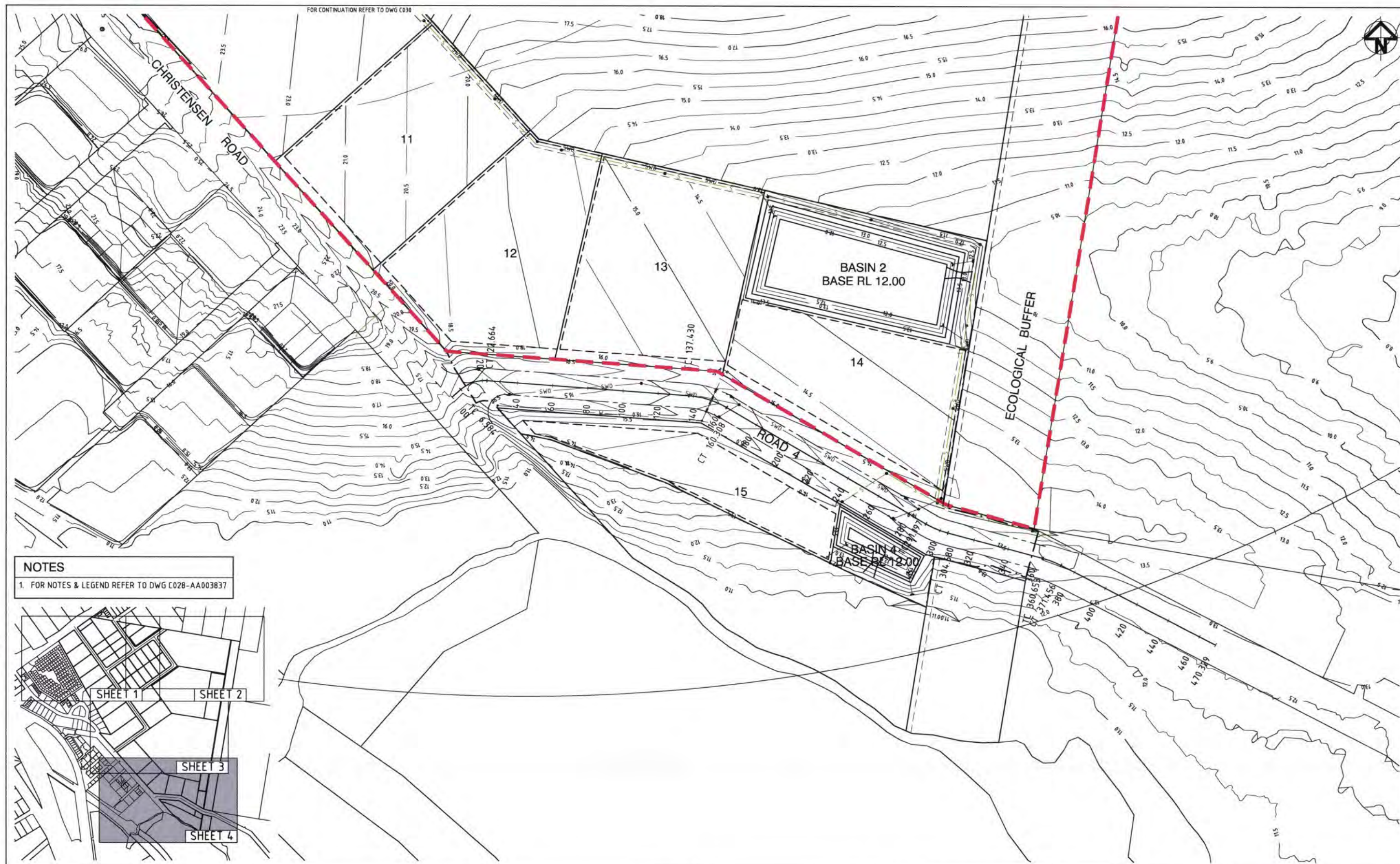
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02 DESIGN AMENDED ND 20.07.11									Author NDREISE								
01 ORIGINAL ISSUE ND 06.01.11									Designer T.DINGLE								
Issue Description Date									Reviewer MBRAY								
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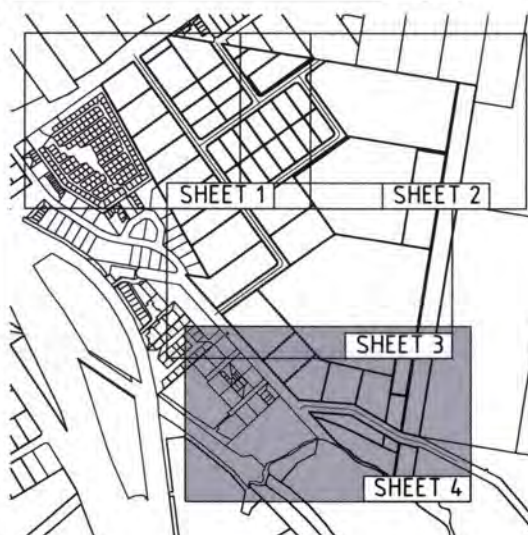
NOTES
1. FOR NOTES & LEGEND REFER TO DWG C028-AA003837



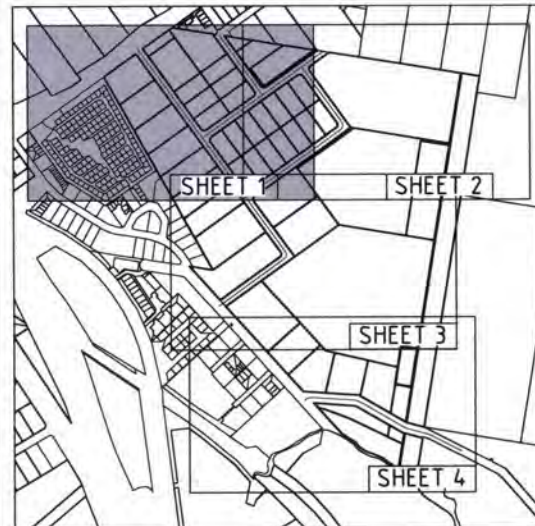
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								Filename: C028-C031-AA003837-01-SEWER.DWG		Scales 1:1000 Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY Grid GRID Copyright reserved				Drawing No: C030 Project No: AA003837 Issue: 03	
03 ISSUE FOR SUBMISSION TO G.C.C.C. ND 19.08.11															
02 DESIGN AMENDED ND 20.07.11															
01 ORIGINAL ISSUE ND 06.01.11															
Issue Description Date															



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			Architect				Approved R.E.P.Q.No:		Title SEWER RETICULATION LAYOUT PLAN SHEET 4 OF 4		
Scale 0 10 20 40 60 80 100m 1 : 1000			Filename: C028-C031-AA003837-01-SEWER.DWG				Scales 1:1000		Current Issue Signatures		
							Original Size A1		Author N.DREISE		
							Height Datum DATUM		Designer T.DINGLE		
Issue Description Date							Grid GRID		Reviewer M.BRAY		
03 ISSUE FOR SUBMISSION TO G.C.C.			ND 19.08.11								
02 DESIGN AMENDED			ND 20.07.11								
01 ORIGINAL ISSUE			ND 06.01.11								



LEGEND

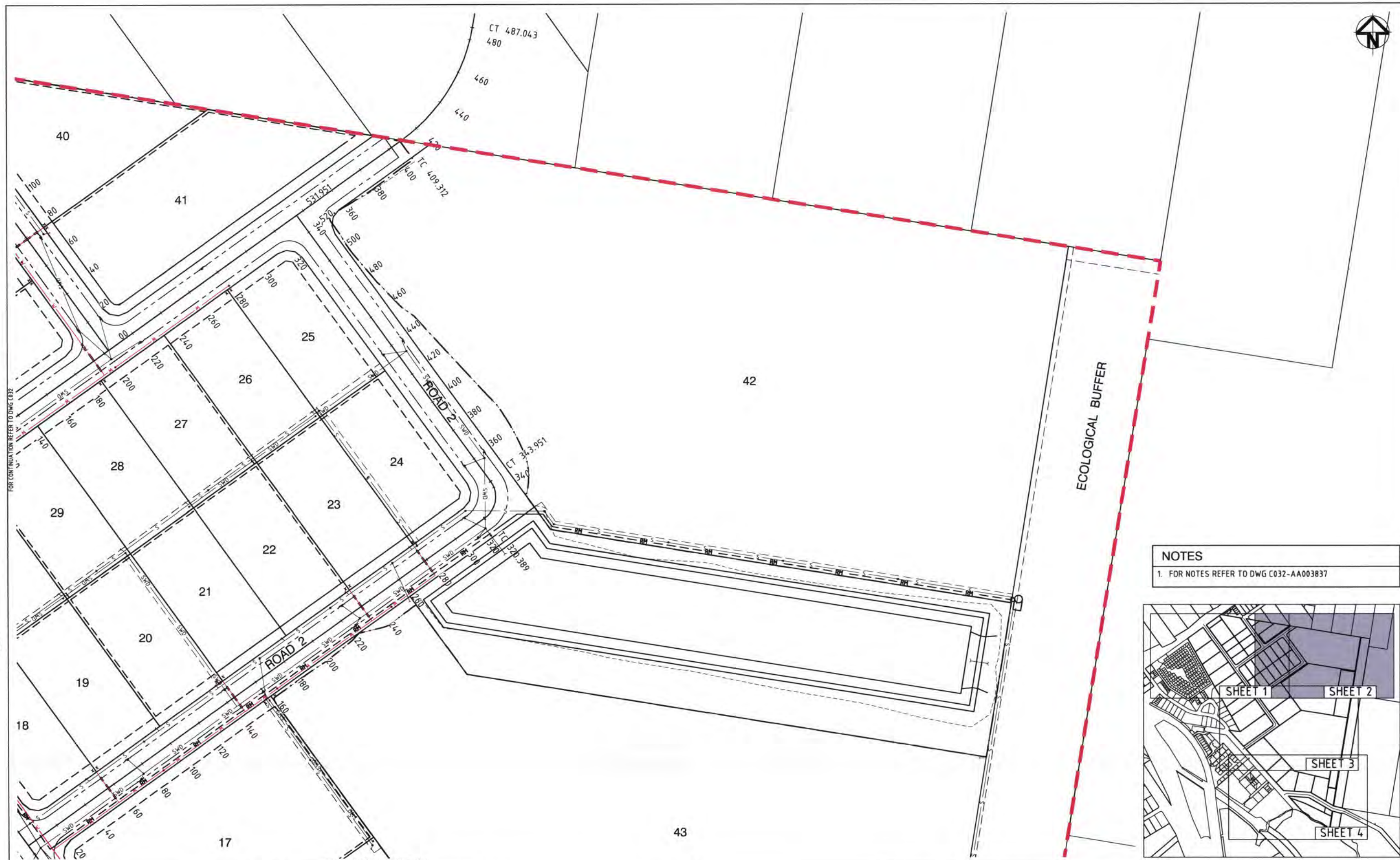
- WATER MAIN, SWABBING FIRE HYDRANT, SLUICE VALVE, FIRE HYDRANT, REDUCER & END CAP
- ROAD CROSSING
- Ø100 uPVC CLASS 16 CONDUIT
- WATER SERVICES
- PROPOSED STORMWATER DRAINAGE
- PROPOSED SEWERAGE RETICULATION
- EXISTING STORMWATER RETICULATION
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- NOMINAL KERB LINE
- STAGE BOUNDARY

- NOTES**
- NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS AND DRAWINGS.
 - ALL FITTINGS SHALL BE D.I.C.L. CLASS K9 RUBBER RING JOINTED SPIGOT AND SOCKET TO AS 2280-1986.
 - ANCHOR BLOCKS SHALL BE INSTALLED AT ALL BENDS, JUNCTIONS AND DEAD ENDS.
 - THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 - OFFSET FROM BOUNDARY TO WATER MAIN 15m UNLESS NOTED OTHERWISE.
 - PROVIDE Ø100 uPVC CLASS 16 CONDUITS TO ALL ROUNDABOUTS, ISLANDS AND MEDIANS.
 - PROVIDE WATER SERVICE TO ALL LOTS TO G.C.C.C. STANDARD DRAWING 05-06-602 AND 05-06-603.
 - ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.

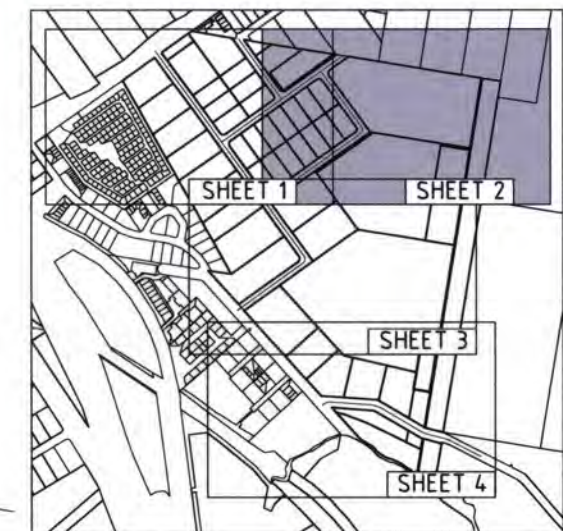


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Issue 03 ISSUE FOR SUBMISSION TO G.C.C.C. NO 19.08.11 02 DESIGN AMENDED NO 20.07.11 01 ORIGINAL ISSUE NO 06.01.11		Architect GASSMAN DEVELOPMENT PERSPECTIVES		Architect GASSMAN DEVELOPMENT PERSPECTIVES		Approved RE P.O. No. 1 Author: N.DREISE Designer: T.DINGLE Reviewer: H.BRAY © Copyright reserved		Title WATER RETICULATION LAYOUT PLAN SHEET 1 OF 4		Drawing No. C032	
File Name: C032-C035-AA003837-01-WATER.DWG		Scale 1 : 1000		Client MRS PATRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		Issue 03	

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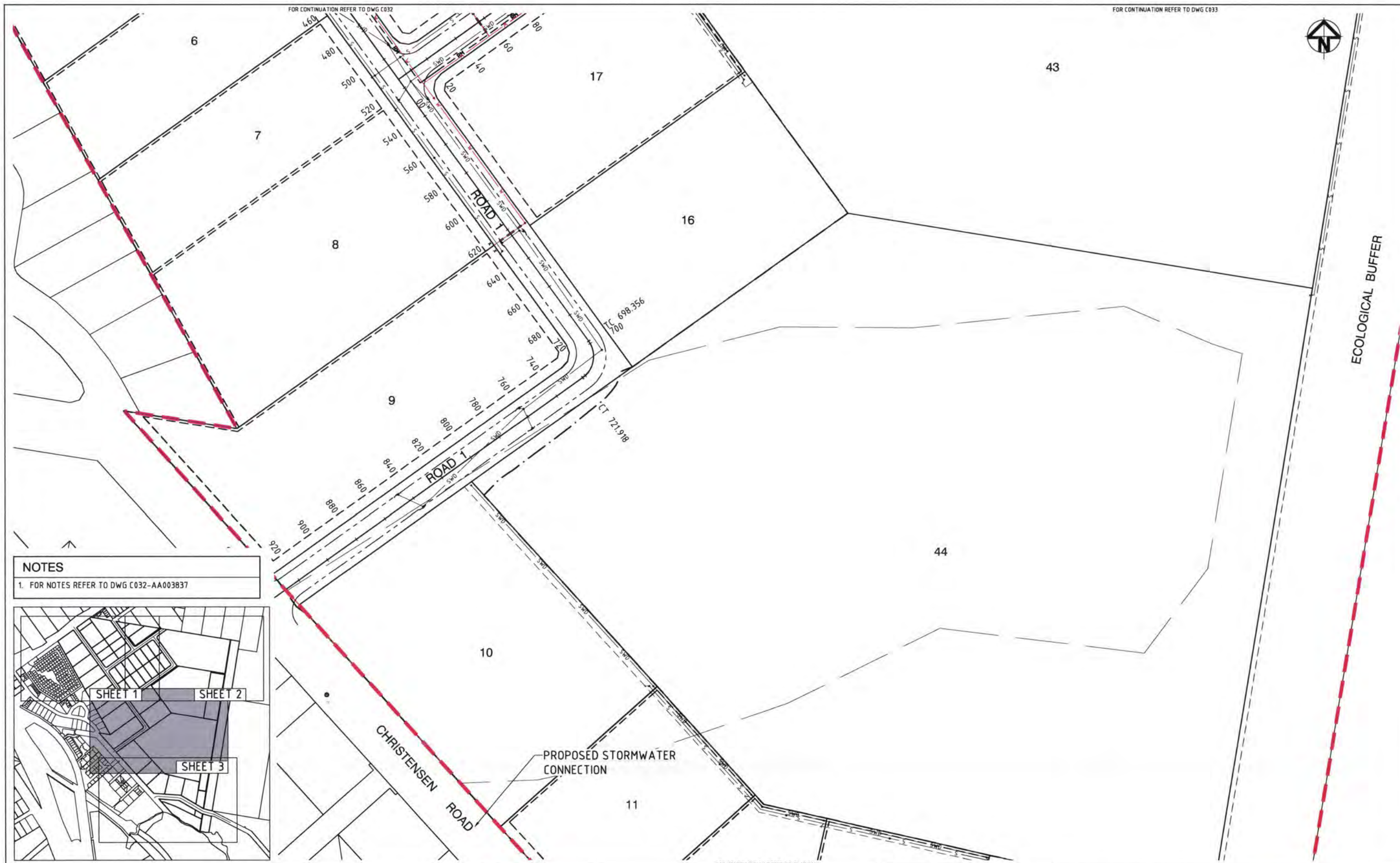


NOTES
1. FOR NOTES REFER TO DWG C032-AA003837



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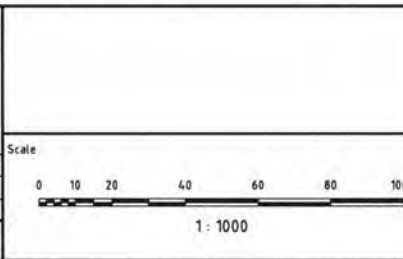
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1. FOR NOTES REFER TO DWG C032-AA003837



Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	19.08.11
02	DESIGN AMENDED	20.07.11
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Surveyor	GASSMAN DEVELOPMENT PERSPECTIVES
Client	MRS PATRICIA & MR WILLIAM HESTER
Architect	
Filename:	C032-C035-AA003837-01-WATER.DWG

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
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Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
Title	WATER RETICULATION LAYOUT PLAN SHEET 3 OF 4

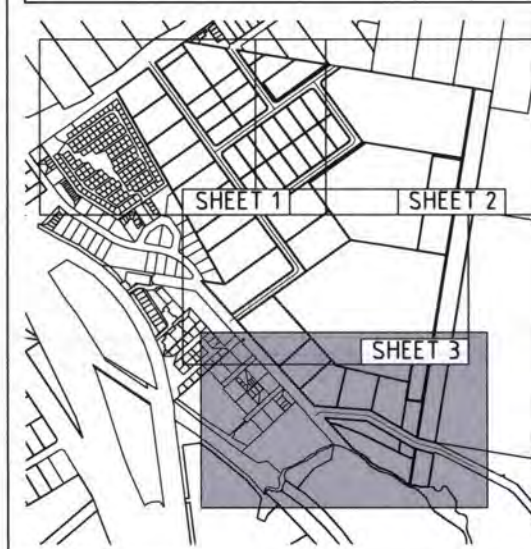
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Reviewer	M.BRAY
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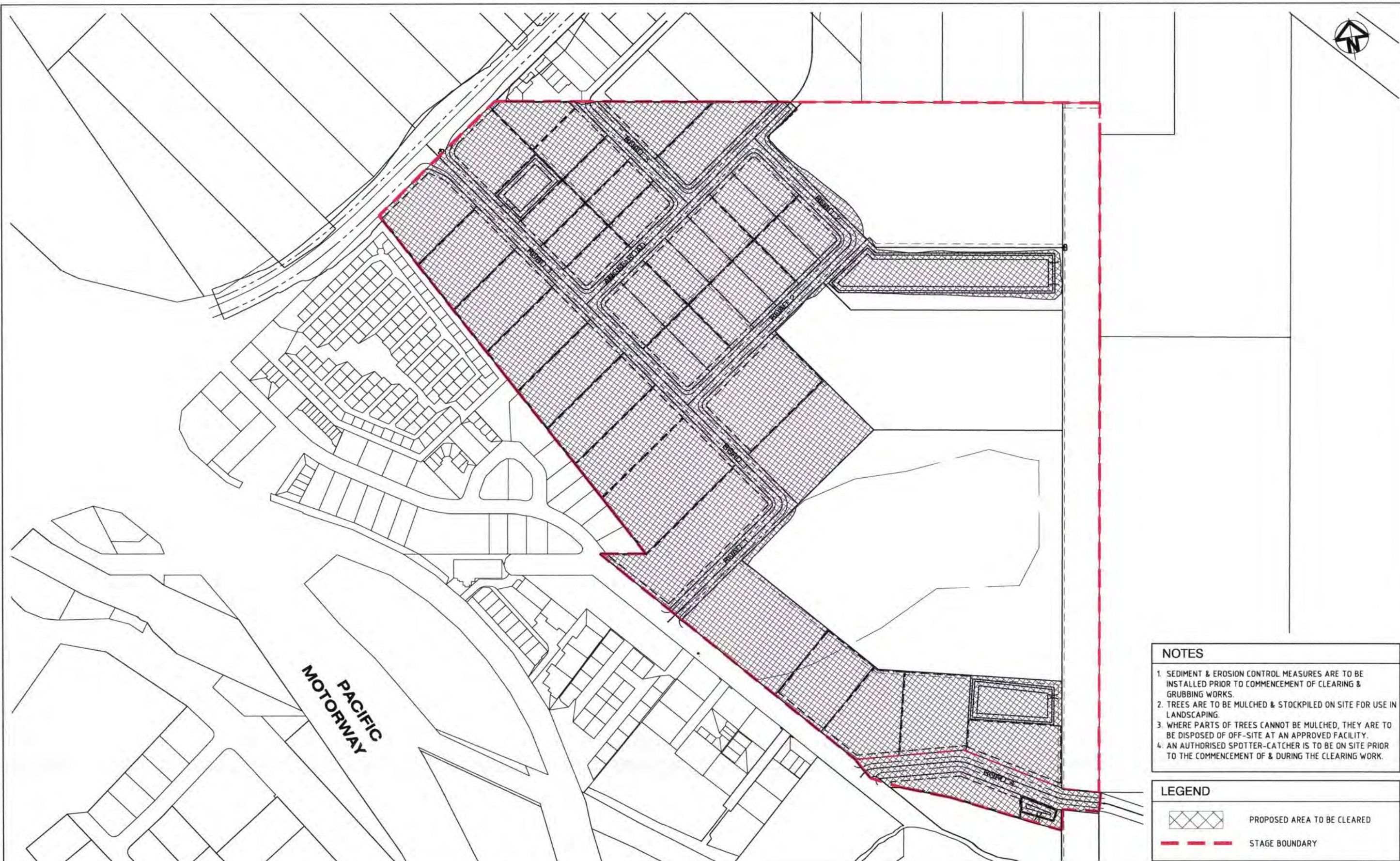
Drawing No: C034
Project No: AA003837
Issue: 03



NOTES
1. FOR NOTES REFER TO DWG C032-AA003837



					Surveyor		GASSMAN DEVELOPMENT PERSPECTIVES		Client		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		Hyder HYDER CONSULTING PTY, LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
									MRS PARTRICIA & MR WILLIAM HESTER		Approved R.E.P.Q.No.		Title WATER RETICULATION LAYOUT PLAN SHEET 4 OF 4		Drawing No. C035	
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											Original Size A1		Author N.DREISE		Issue 03	
											Height Datum DATUM		Designer T.DINGLE			
											Grid GRID		Reviewer MBRAY			
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- NOTES**
1. SEDIMENT & EROSION CONTROL MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCEMENT OF CLEARING & GRUBBING WORKS.
 2. TREES ARE TO BE MULCHED & STOCKPILED ON SITE FOR USE IN LANDSCAPING.
 3. WHERE PARTS OF TREES CANNOT BE MULCHED, THEY ARE TO BE DISPOSED OF OFF-SITE AT AN APPROVED FACILITY.
 4. AN AUTHORISED SPOTTER-CATCHER IS TO BE ON SITE PRIOR TO THE COMMENCEMENT OF & DURING THE CLEARING WORK.

LEGEND

 PROPOSED AREA TO BE CLEARED

 STAGE BOUNDARY

01 ISSUE FOR SUBMISSION TO G.C.C.C.		ND 19.08.11	Scale 0 50 100 150 200 250m 1: 2500		Surveyor: GASSMAN DEVELOPMENT PERSPECTIVES		Client: MRS PARTRICIA & MR WILLIAM HESTER		Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project: STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3833 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue		Date	Architect:		R.E.P.Q. No.:		Current Issue Signatures		Title: VEGETATION REMOVAL PLAN					
Description			Filename: C036-AA003837-01-TREE CLEARING.DWG		Scales: 1:2500		Author: N.DREISE							
					Original Size: A1		Designer: R. RONALDS							
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													Issue 01	

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7 – CODE RESPONSES (GDP)



Part 6 Local Area Plans

Division 2 Local Area Plans

Chapter 29 Yatala Enterprise Area

8.0 Yatala Enterprise Area LAP Place Code

8.1 Purpose

This Place Code seeks to ensure that the scale and intensity of development and, in particular the impact, design and appearance of industrial development is consistent with the role of the YEA as a regionally significant location for industrial development. These provisions also aim to ensure that YEA becomes a distinctive and recognisable location within the City, where high standards of urban design and architecture are promoted.

8.2 Application

8.2.1 The Yatala Enterprise Area LAP Place Code applies to development being any **Building Work, Operational Work, Reconfiguring a Lot** and/or **Material Change of Use** indicated as self, code or impact assessable in the Yatala Enterprise Area LAP Table of Development at **Clause 6.0** of this LAP.

8.2.2 Performance Criteria PC1-PC55 apply to all code and impact assessable development in this LAP. For development identified as self assessable in **Clause 6.0**, only the Acceptable Solutions to Performance Criteria PC1-PC6 apply.

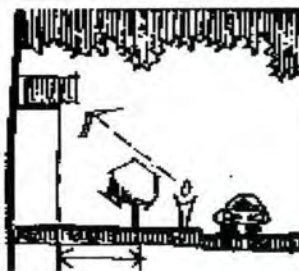
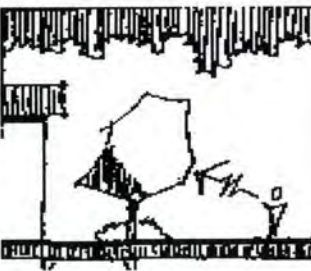
8.3 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Self Assessable, Code Assessable or Impact Assessable			
Building Height			
PC1 The height of buildings is to be consistent with the role of the YEA as a predominantly industrial use area. Buildings are to be constructed to a height that complements the surrounding built form and the local landscape character.	AS1.1 The building has a maximum of two storeys. OR AS1.2 The height of buildings in each precinct does not exceed the maximums shown on Yatala Enterprise Area LAP – Maximum Building Height .	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
Accommodation Density			
PC2 Accommodation density must be consistent with the predominant character of the YEA as	AS2 The maximum dwelling density does not exceed one dwelling per lot.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
an industrial location. Accordingly, very low residential densities are envisaged for the LAP area.			
Site Coverage			
PC3 The site coverage of development will be in accordance with the open space landscape character of the YEA.	Precincts 1, 2, 3 and 4 AS3.1 The maximum site coverage does not exceed 70%. Precincts 5 and 6 AS3.2 The maximum site coverage does not exceed 10%.	Complies: The Generations Industrial Place Code aligns with this code requirement by seeking the same site coverages for proposed precincts 1 and 6 respectively.	
Building Setback			
PC4 The layout of buildings, structures and activities achieves an attractive and orderly appearance where development is visible from the public domain. A good standard of visual amenity is achieved through generous building setbacks and high quality landscaping.	Precinct 1 AS4.1 The building or structure is set back not less than: a) 10 metres from the primary road frontage of the site; b) 7 metres from the secondary road frontage(s). Precincts 2, 4, 5 and 6 AS4.2 Buildings are set back from frontages: a) low set buildings less than five metres high, a minimum setback of six metres; b) buildings less than eight metres in height, a minimum setback of ten metres; c) buildings eight metres or more in height, a minimum setback of 15 metres. AS4.3 The site adjoins a residential lot or public open space area, and the building or structure is set back a minimum of three metres from the common boundary with the	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor setbacks for a specific location within the site. It is noted that proposed PC5 and accompanying acceptable solutions of the Place Code do address setback requirements to ensure acoustic goals are met for development taking place near the south-western boundary of the site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	residential lot or public open space, and the setback area includes: a landscape buffer strip a minimum width of two metres; and acoustic screen fencing on the common boundary to the residential lot or public open space area.		
Figure 29-1 Factors Affecting Appropriate Building Setback			
			
Only small setback required since building is low-set with screening from vegetation.	Increased height of building requiring larger setback.	Established tall vegetation may reduce building bulk allowing small setback.	
			
Setbacks can be reduced and heights increased according to topography.			



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	Setbacks are also affected by viewing points.		

Design of Development Adjacent to the Motorway and the Rail Line

PC5 Those developments visible from the Pacific Motorway or the Gold Coast City Rail Line must exhibit a high standard of architectural presentation.	AS5.1.1 Facades visible from the Pacific Motorway or the Gold Coast City Rail Line are designed to incorporate: a) materials such as glass, brick and coloured/textured block work (standard concrete block should not be used). If metal cladding is used, it should be pre-coated in an appropriate colour and have some form of relief; b) relatively unobtrusive, earth toned colours, such as subdued greens, blues, browns and greys (bright colours and/or materials which cause glare are avoided); c) horizontal/vertical articulation of walls at least at 15 metre intervals; d) 'humanising' elements, such as entry forecourts, porticos, verandahs, windows, awnings and fenestration; e) other features which contribute to an interesting and attractive appearance. These design features are to be applied to the main facade facing the relevant roads/railway, as well as along a brief return or the full length of side walls. OR AS5.1.2 A landscaped buffer is provided to the Pacific Motorway or to the Rail Line. Where conservation areas or links are established	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except for the purposes of tailoring it to the appearance of the site from Stapylton-Jacobs Well Road. PC6 and accompanying acceptable solutions outline these revised code criteria.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	along the relevant road/railway frontages, such that development behind will be largely screened by vegetation, the design requirements of AS5.1.1 need not be met.		

Vehicular Crossings

PC6 Vehicular crossings associated with the development must be designed and constructed to ensure: a) a safe footpath environment; b) safe vehicular access to the property; c) appropriate hydraulic performance of the stormwater infrastructure; d) no damage to vehicle or road infrastructure; e) minimal loss of on-street parking spaces; f) continued amenity of the neighbourhood.	AS6 Driveways are designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
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Figure 29-2 Aspects of Fencing Design

Negative Fences

			
High security fencing on street alignment dominated streetscape.	Chain fencing has a prison-like effect and is highly reflective. Height barriers can be visually intrusive.		



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Positive Fences			
Unattractive fencing should be placed inside the front alignment and planted out.	Palisade of pickets set close together with horizontal rails that climbers might use. Solid masonry fence supporting vine.	Obtrusive fence placed in a swale to minimise visual impact.	

Development that is Code Assessable or Impact Assessable

Building Height

PC7 The height of buildings is to be consistent with the role of the YEA as a predominantly industrial use area. Buildings are to be constructed to a height that complements the surrounding built form and the local	AS7 The maximum height of buildings does not exceed three storeys.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
--	--	--	--



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
landscape character.			
Siting			
PC8 All buildings must be sited to complement the industrial character and the predominant built form of the surrounding area and to reduce potential conflicts between uses having regard to a site analysis, prepared in accordance with Planning Scheme Policy 17 – Site Analysis.	AS8.1 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC9 The layout of the site must provide a clear separation between the public access areas and the areas set aside for servicing the building	AS9 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC10 Industrial structures, storage or service areas, which are likely to appear visually dominating or unsightly, are located to the rear or sides of sites or are otherwise designed and screened to enhance their appearance, when viewed from the street.	AS10 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
Building and Layout Design, Safety and Comfort			
PC11 Buildings are sited and designed such that suitable external spaces remain available for future expansion of buildings, and internal spaces are of a size and shape suited to variable internal layout, maximum vertical storage and addition of mezzanine floors.	AS11.1 Building shapes are regular so as to provide opportunities for future expansion in different directions, and for flexibility in internal location of activities and equipment. AS11.2 Internal column spacing and column heights are generous (for example, building spans of 18 metres and over, bay spacing of 12-18 metres, and column heights of at least eight metres).	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC12	AS12.1	Complies: The Generations Industrial Place	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Buildings are sited and designed to suit climatic conditions.	Wherever practicable, buildings are oriented to the north east to take advantage of summer breezes and winter sun. Western aspects are avoided, wherever possible. AS12.2 Where not air conditioned, buildings incorporate a maximum of openings (ie. louvring, windows, doorways) on eastern walls. AS12.3 Windows are minimised and trees are planted along west walls for protection from hot afternoon sun. AS12.4 Shading devices (ie: large roof overhangs, window hoods/blinds, awnings and verandahs) are attached to buildings on all sides, particularly eastern and western sides. Where possible, shading devices are retractable on northern sides during winter. AS12.5 Semi-enclosed workstations, where relatively strenuous manual labour takes place, are located in the cooler and more ventilated parts of the building.	Code does not seek to vary this code requirement.	
PC13 All buildings must be designed and constructed to a high aesthetic standard and to complement or enhance the local character of the YEA.	AS13.1 The massing and proportions of new industrial buildings are consistent with those of adjoining industrial buildings. AS13.2 Building materials, patterns, textures and colours used in new buildings are complementary to those of nearby buildings.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC14 Building design and appearance must be conducive to the safety and comfort of all building users.	AS14.1 Glass which forms all or part of any external wall of a building does not exceed a maximum degree of reflection of both heat and light of 20%. The glass area does not exceed 60% of the total area of the external	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	

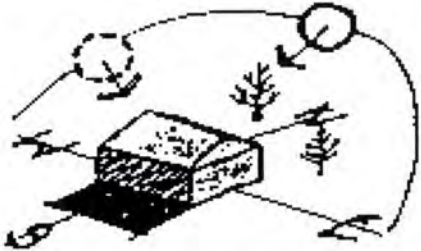
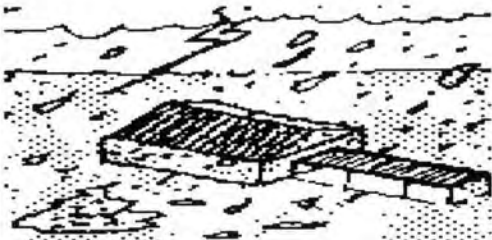
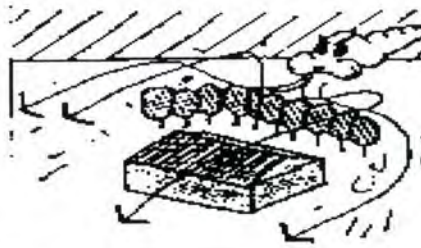


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	wall. AS14.2 Entrances to premises are clearly visible from the street, and are not obscured or dominated by car parking.		
Figure 29-3 Example of an Appropriate Site Layout in General Yatala Enterprise Area			

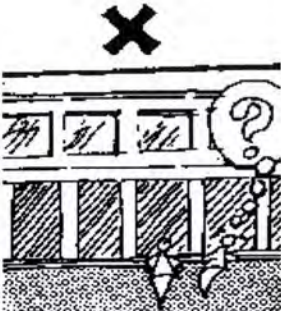
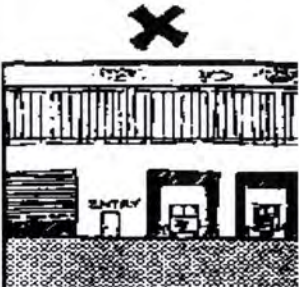
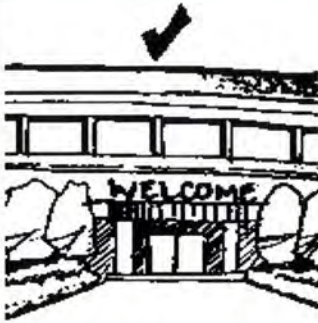
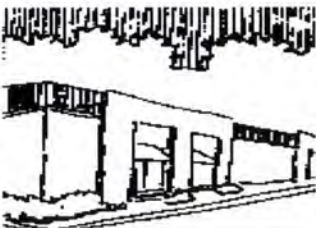


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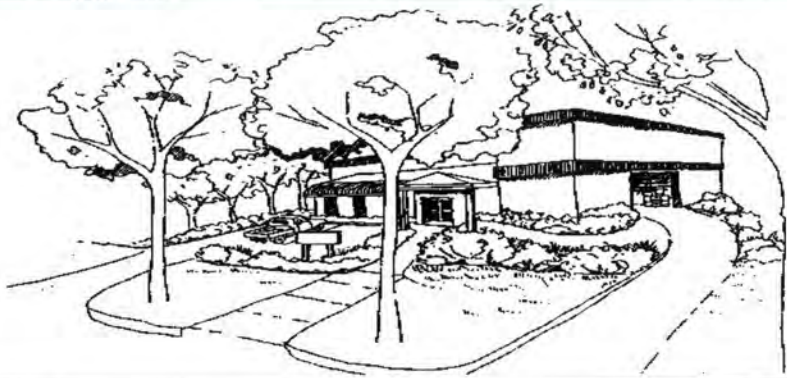


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Figure 29-4 Buildings and Landscaping Designed to Suit Climatic Conditions			
			
Avoid western aspects due to hot afternoon sun.	Covered walkways provide protection against rain.		
			
Windbreaks provide protection against unpleasant winds.	Planting to shade westerly walls in summer.		
Figure 29-5 Aspects of Good Building Design			



Performance Criteria			Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
					
Unfenced entrance.	Main entrance with poor legibility.	Main entrance with good legibility.			
					
Fenestration and facade treatment to create interest and human scale.	Free standing facade treatments.	Window coverings and other architectural details to enhance appearance.			
Figure 29-6 Well Presented Buildings Set in Orderly Landscaped Grounds					



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
			
	Figure 29-7 Unobtrusive Industrial Development Behind Neat Screens of Vegetation		
			

Design of Car Park Areas

PC15 All ground level parking is to be suitably landscaped to provide an attractive and pleasant outlook and shade for parked vehicles, and to contribute towards the quality presentation of new developments.	AS15.1 Significant trees are preserved and incorporated into car parking areas. AS15.2 Landscaped bays for the planting of shade trees are provided at regular intervals throughout car parking areas, at the rate of	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.
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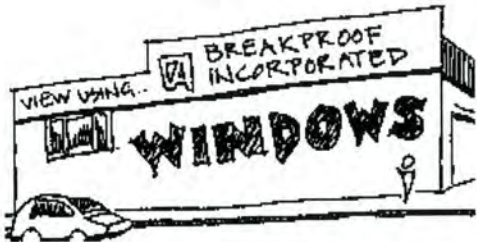


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	one landscaped bay per 40 vehicle parking bays or one large shade tree per ten parking spaces. Landscape bays have the same dimensions as a vehicle parking space. AS15.3 Large car parking areas and all heavy/service vehicle parking are situated to the side or rear of sites. Smaller car parking areas, particularly for short term and disabled parking, may be located to the front of sites. AS15.4 Car parking areas located in frontage setback areas are set back behind a minimum three metre landscaped buffer to the frontages. To reduce their visual impact, front car parking areas may be lowered and mounds incorporated in frontage landscaping.		
Advertising Devices			
PC16 Advertising signage does not dominate the visual amenity of the area.	AS16 No advertising, freestanding or otherwise, is erected which would be readily visible from the Pacific Motorway or the Gold Coast City Rail Line.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC17 Signs and other forms of advertising on business/industry premises are kept to a minimum. Any advertising relates directly to the activity/process conducted on the premises, rather than general product advertisements.	AS17.1 There is one sign per premises. Multi-unit developments display a single index sign at the entrance to the development which details each occupant, its activity/process and respective unit number. AS17.2 The design and construction of signs meets the following parameters: a) signs are situated near site entries and are well placed for viewing by pedestrians and drivers; b) free-standing signs have a maximum area of 3m²; c) signs on facades have a maximum area	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



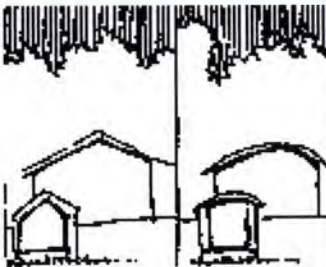
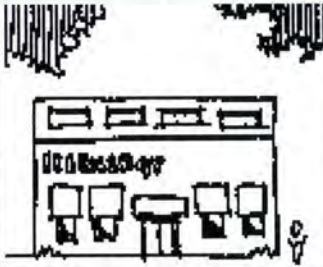
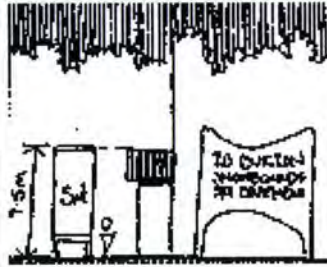
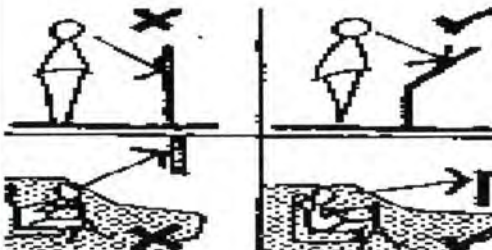
Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	of 5m²; d) signs utilise company logos or symbolic representations for quick and easy identification; e) wording on signs is limited to the name, location, business and products of the establishment; f) signs do not utilise fluorescent paints; g) signs do not rotate, flash or move; h) signs are integrated with the form of development and are not visually dominating. AS17.3 All signs are consistent with the provisions for the Industry 2 Domain set out in Specific Development Code 2 – Advertising Devices.		
Figure 29-8 Appropriate Signage Design			

Negative Signage

			
Facade signage dominating a visual amenity.	Signage of different colours graphics, appear disjointed.		

Positive Signage



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
			
Signage integrated with development form.	Signage on facades discreet with aesthetic graphics.	Signage of appropriate size with wording limited to locations, name and products.	
			
Using landscape to integrate signage.	Pedestrian and vehicular signage placement.		

Conservation Areas and Open Space Linkages

PC18 Identified conservation areas remain in a substantially undeveloped condition, with vegetation retained to the fullest extent possible and, where necessary, rehabilitated using local native species.	AS18.1 Areas identified as Conservation on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities are reserved for conservation purposes, through: a) transfer to Council; b) dedication of a conservation easement; or c) reservation of an area of the site as open space. AS18.2	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor it to the conservation values of the site. PC19 and accompanying acceptable solutions – 'Reserve Area' – addresses the necessary ecological linkages and requirements that are relevant to the site.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	Reserved Conservation Areas are managed in the following manner: a) the land remains largely undisturbed by any buildings, clearing and earthworks; b) rehabilitation of natural features is undertaken, where necessary, particularly by way of revegetation of any previously cleared areas and stabilisation of any eroding banks of watercourses. AS18.3 In Conservation Areas associated with the Albert River and Sandy and Halfway Creeks, there is no discharge of waste water or contaminants or piped discharge of stormwater. Any development within the catchment of these waterways retains natural drainage patterns as far as possible, and utilises appropriate stormwater management techniques to minimise any increase in the volume, velocity or sedimentation of runoff into the river or creeks. AS18.4 For linear Conservation Areas, any parallel roads or services are grouped on one side of the corridor to minimise disturbance. Fencing through Conservation Areas is avoided, wherever possible. Any breaks in the vegetation canopy, necessary for roads or services, are minimised by cutting through perpendicular to the corridor at a point where damage and discontinuity are minimised, such as where the canopy is already broken or sparse. AS18.5 On land adjacent to Conservation Areas, buildings, clearing and earthworks are sited as far away as practicable from reserved Conservation Areas, with the greatest possible separation in the case of ridges, gullies and watercourses.		



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS18.6 Existing trees are retained, and additional trees planted within a 40 metre wide band, generally along the lines of the links identified on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities: a) the links may form part of the landscape open space areas, associated with individual development proposals. If so, they should generally remain free of building and earthworks; additional tree planting utilises species similar to those existing naturally in the area; b) any parallel roads or services are grouped on one side of the link, to minimise disturbance; c) any breaks in the vegetation canopy, necessary for roads or services, are minimised by cutting through perpendicular to the link at a point where damage and discontinuity are minimised, such as where the canopy is already broken or sparse.		
PC19 In areas identified as Other Open Space on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities as having open space values, development is of a limited scale and intensity, compatible with retention of habitat, landscape and/or buffer values.	AS19 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor it to the conservation values of the site. PC19 and accompanying acceptable solutions – 'Reserve Area' – addresses the necessary ecological linkages and requirements that are relevant to the site.	
PC20 Other areas within sites (not identified on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities), with natural features, such as stands of remnant vegetation, gullies/ridges and watercourses, are to be incorporated in the open space/landscape areas associated with	AS20 In these areas, existing vegetation and natural drainage patterns are retained and rehabilitated using local native species, as far as practical.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor it to the conservation values of the site. PC19 and accompanying acceptable solutions – 'Reserve Area' – addresses the necessary ecological linkages and requirements that are relevant to the site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
individual development proposals. Other features of ecological and/or landscape value are to be protected and enhanced, where practicable.			
PC21 Riparian areas include vegetated buffers of sufficient width to operate as wildlife corridors.	AS21 The following minimum buffer widths are provided: a) 50 metres from the top of the bank on either side of Sandy Creek; b) 50 metres from the top of the bank on the south side of Halfway Creek, west of the Pacific Motorway; c) 100 metres from the top of the bank on the north side of Halfway Creek, west of the Pacific Motorway, for fauna corridor purposes; d) ten metres from the top of the bank on either side of Halfway Creek, east of the Pacific Motorway.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor it to the conservation values of the site. PC19 and accompanying acceptable solutions – 'Reserve Area' – addresses the necessary ecological linkages and requirements that are relevant to the site.	

Landscape Design

PC22 Landscape design is used to enhance the landscape character of the YEA.	AS22.1 Frontage setback areas are attractively landscaped, including: a) at least 25% of the frontage having a landscaped buffer of minimum five metres depth and the remainder, excluding access ways, a landscape buffer of minimum three metres depth; b) one metre landscaped area adjacent to building walls facing the street. AS22.2 Planting of shade trees occurs along pathways, throughout car parking areas and in any other exposed areas where relief from sun and glare would be beneficial. AS22.3 Dwarf walls prevent vehicles breaching	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	landscaped areas along frontages. AS22.4 Screen planting, utilising an appropriate mix of tall trees and lower level shrubs, is used around outdoor parking, equipment, storage and other unsightly areas, particularly where visible from roads. AS22.5 Landscape Design includes: a) provision of pleasant, shaded areas with appropriate furniture for lunch/relaxation areas for workers and visitors; b) retention of existing mature vegetation, wherever possible; c) retention of existing natural drainage channels and planting to strengthen their resistance to erosion, especially where proposed development is expected to result in increased volume and velocity of stormwater runoff; d) use of garden edges, lines of trees and mass planting to frame pathways and define site and building entries.		
PC23 Potentially obtrusive noise, odour and visual impacts are effectively buffered.	AS23.1.1 Development incorporates landscape buffers, earth mounds and acoustic fencing appropriate to the likely off-site impacts of particular developments. OR AS23.1.2 A landscape buffer of a 20 metre width, densely planted with shrubs and trees, is provided along the relevant frontage. A landscape buffer to a minimum width of ten metres may be acceptable, depending on the potential of proposed planting arrangements to effectively screen development behind. Species selection, use of mature or semi mature trees, and density of planting will be	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



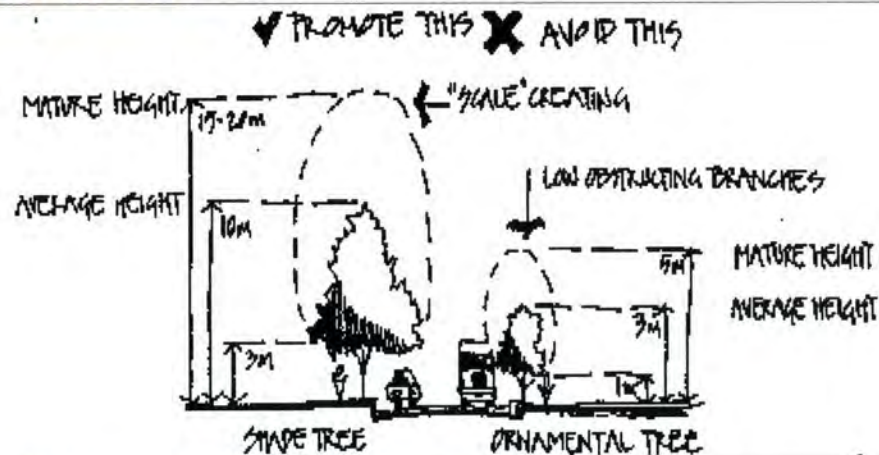
Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	important in this respect.		
PC24 The street side environment and other public spaces are developed to enhance their visual appeal and create a physical continuity and legibility throughout the YEA and its component precincts.	AS24 Individual developments contribute to streetscape enhancement work (including street tree planting, paving, landscaping of traffic islands and provision of street lighting and furniture), in accordance with any adopted Council streetscape strategy.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC25 Public open spaces are developed to enhance their recreational amenity for workers and visitors to the Yatala area and the wider community.	AS25 Individual developments contribute (through works or financial contribution) towards construction of footpaths and cycle ways, seating, picnic facilities, play areas and/or other facilities in existing public open spaces and additional spaces established as a result of the development.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC26 Landscape design contributes to the creation of a distinctive, memorable and legible town centre, local centres and surrounding suburban areas for the YEA.	AS26.1 Street design and plantings and major pedestrian paths are aligned to take advantage of attractive local and distant views (eg, views to the mountains or other important landscape elements). AS26.2 Footpath paving treatments and street furniture integrate with adjoining development, and setback areas are integrated with public footpaths. AS26.3 Landscape plantings utilise local native species to promote a distinctive YEA or Albert Corridor character.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC27 Open space and pedestrian areas are to be designed to be both functional and safe.	AS27 Development is designed to ensure a high degree of casual surveillance from nearby residents, employees or passing traffic, public and semi-public spaces, pedestrian and cyclist paths, car parking areas and building entrances.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC28 All ground level car parking, open space and buffer areas must be landscaped and maintained to complement the character of the local area, and any adjoining residential or public open space areas.	AS28 The car park area, open space and buffer areas of the lot are landscaped with landscape design and use of plant species generally consistent with that of adjacent and nearby lots. The landscape design may incorporate extensive paved areas for pedestrian use.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	

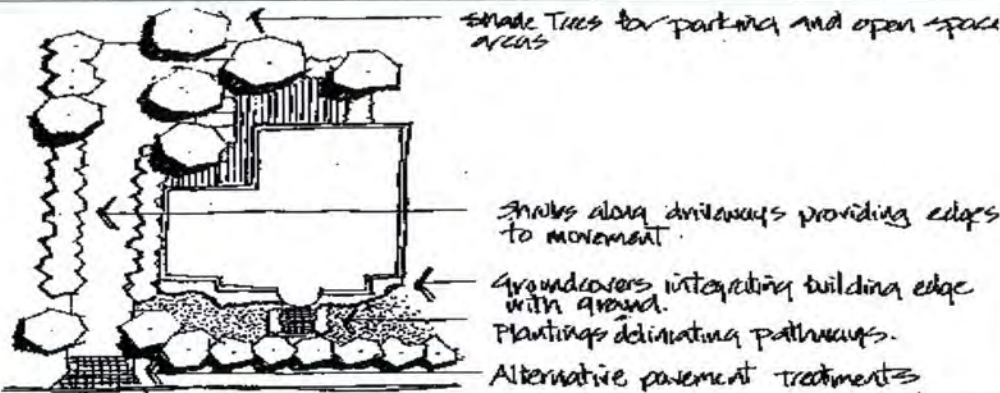
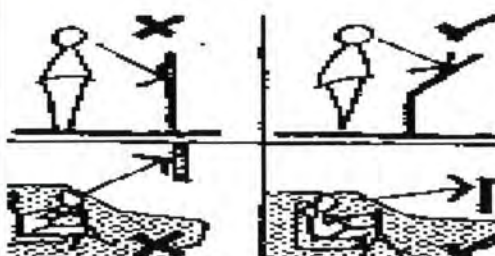
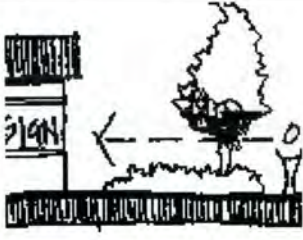
Figure 29-9 Site Landscaping and Street Planting

Street Tree Selection

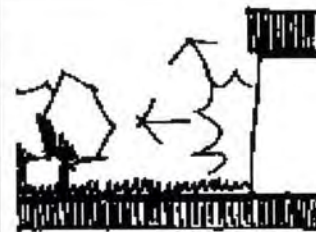
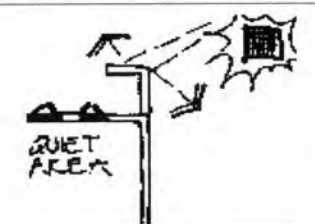
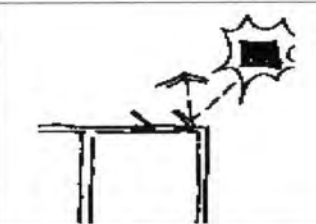
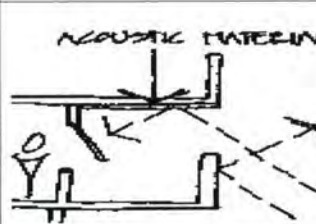
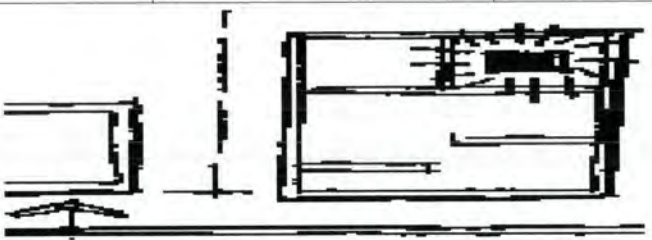


Provide Landscaping that has Meaning and Purpose



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
			
Incorporate Significant Existing Vegetation			
			
Existing vegetation should be retained where possible and fenced off during construction operations – could be incorporated into parking areas, perimeter planting or screening.			
Figure 29-10 On-Site Landscaping			
			



Performance Criteria		Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Screen planting should be used sparingly because it reduces passive surveillance.	Framing views and maximum passive observation for security and to reduce crime.	Screening storage areas.		
Figure 29-11 Noise Attenuation Techniques				
				
Solid barriers – walls buildings and beams – most effective as sound barriers if the source cannot be effectively muffled.	High walls close to the source are most effective.	For low noise, vegetation screening and soft surfaces will assist in attenuation.		
				
Screen wall to shield noise.	Direction of window opening away from noise.	Bottom opening windows.		
				
Noise sources located away from more sensitive areas.				



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?																		
Lot Size (For Subdivision Only)																					
PC29 All lots are to be of sufficient size to comfortably accommodate the type of development envisaged in the LAP and the relevant precinct intent.	AS29 Any new lots created are sized in accordance with the following schedule: <table><tr><th>Precinct</th><th>Min Area</th><th>Ave Area</th></tr><tr><td>1</td><td>4,000m²</td><td>1 hectare</td></tr><tr><td>2</td><td>2,000m²</td><td>4,000m²</td></tr><tr><td>4</td><td>20 hectares</td><td>20 hectares</td></tr><tr><td>5</td><td>2 hectares</td><td>2 hectares</td></tr><tr><td>6</td><td>20 hectares</td><td>20 hectares</td></tr></table>	Precinct	Min Area	Ave Area	1	4,000m ²	1 hectare	2	2,000m ²	4,000m ²	4	20 hectares	20 hectares	5	2 hectares	2 hectares	6	20 hectares	20 hectares	Complies: The Generations Industrial Place Code seeks to vary the minimum lot size and average lot size to those consistent with Precinct 1 of the YEA LAP given the intention of the place code to intensify the industrial use of the site. This code requirement has been varied to reflect this.	
Precinct	Min Area	Ave Area																			
1	4,000m ²	1 hectare																			
2	2,000m ²	4,000m ²																			
4	20 hectares	20 hectares																			
5	2 hectares	2 hectares																			
6	20 hectares	20 hectares																			
PC30 Allotments prior to development have suitable topography for industry.	AS30 Industrial allotments generally have a ground slope not greater than 10%, and access ways associated with battle axe allotments generally have a ground slope not greater than 16%.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.																			
PC31 Allotments are of regular shapes suited to the intended uses, and allowing design flexibility, efficient development and access.	AS31.1 Development generally incorporates all of the following features: a) allotments that are rectangular shapes; b) allotments which have frontage to depth ratios between 1:2 and 1:4. OR AS31.2 Alternative allotment shapes are provided where warranted, due to: a) the special site requirements of particular industries; and/or b) exceptional physical constraints. OR AS31.3 The development incorporates a small proportion of battle axe allotments, where particular industries have special requirements for square or long and narrow sites. (Battle-axe allotments are useful for	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.																			



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	creating allotments of such shapes, as well as reducing road frontage construction costs and providing appropriate sites for visually offensive industries.)		
PC32 Allotments are oriented to suit climatic conditions.	AS32 Allotments are arranged in a manner that maximises the number of allotments oriented to the north east to take advantage of breezes and enable optimal building orientation for energy efficiency and use of natural lighting.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC33 Reconfiguration of land incorporates open space provision in a way which takes account of the location and attributes of the site and its surrounds, and the need to set aside certain areas for purposes such as: a) conservation of vegetation/habitat; b) retention of creek corridors and natural drainage patterns; c) provision of pedestrian/cycle linkages and recreational facilities; and/or d) creation of landscaped entrances, focal points and streetscape.	AS33.1 Where reconfiguration takes place, an area of up to 10% of the site is provided as open space. This open space is set aside for public park or conservation purposes, developed with pathways and/or recreational facilities, landscaped and/or rehabilitated to its natural state. AS33.2 Reconfiguration proposals incorporate a plan showing street planting to be undertaken. Planting themes contribute to the overall streetscape character of the estate.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC34 Reconfiguration may take place in the form of Community Title Subdivision, allowing for sharing of space, facilities and services, while at the same time ensuring allotments created are suited to the intended businesses/industries.	AS34 Community Title Subdivisions are provided, which: a) are consistent with the Acceptable Solutions for PC29 – PC33 ; b) generally maintain a minimum lot size of 100-200m ² within a minimum overall site area of 2,000m ² ; c) are not used for heavy manufacturing, metal/food processing, or noxious, offensive or hazardous industries.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	

Road Design



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC35 Roads are provided so as to form a road hierarchy, with each road serving a particular function according to the intended land use characteristics of the estate, expected traffic volumes and types, and external existing and future road linkages to anticipated development on adjoining lots.	AS35.1 Concept plans submitted with reconfiguration and/or development applications identify all roads proposed to be upgraded and/or newly constructed and their intended function within a road hierarchy. AS35.2 Concept plans submitted with reconfiguration and/or development applications identify road connections with adjacent allotments that will promote connectivity. AS35.3 Proposed road hierarchies are consistent with hierarchy identified on Yatala Enterprise Area LAP Map 29.5 – Transport Infrastructure.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement except to tailor it to the road hierarchies that are proposed within the land-use classification plan which are underpinned by detailed traffic analysis and consultation with Council and DTMR.	
PC36 The width, pavement, curvature, sight distances, intersections, turning radii and design features of roads convey the particular function of each road with the hierarchy mentioned in AS35.3, and reflect the nature of traffic management. In particular, road design ensures the safe movement of heavy articulated vehicles.	AS36.1 Road design and construction is in accordance with Planning Scheme Policy 11 – Land Development Guidelines and the Table to this Acceptable Solution. AS36.2 Distances between intersections are not less than 60 metres. AS36.3 Streets intersect at right angles, or as near as topography or other limiting factors permit. AS36.4 Various vehicle control devices are used to regulate traffic speed and enhance pedestrian safety (such as traffic lights and illuminated pedestrian crossings). AS36.5 Paving surfaces, landscape treatment and signage are used to define entrances to the estate and joint use areas within the estate. AS36.6	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	Road pavements are designed and constructed for long life, hard wearing and suitability to the load capacity of expected vehicles. AS36.7 Median strips, roundabouts and footpaths are to be aesthetically treated and planted and paved accordingly. AS36.8 The design of road networks avoids the use of <i>culs-de-sac</i>.		
PC37 The alignment of roads reflects the physical land characteristics, and provides adequate drainage and safety.	AS37.1 Road drainage is designed and situated along natural drainage courses. AS37.2 Road grades are established to avoid excessive grading, indiscriminate removal of ground cover and tree growth, and unnecessary topographical levelling.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC38 A network of pedestrian paths and cycleways is provided which considers: a) expected levels of pedestrian and cyclist activity; b) linkages between public transport, major employment activities, and parks; c) recreation opportunities along open space corridors; d) safe integration of users and vehicles, particularly at intersections; e) provision of end-of-journey facilities.	AS38.1 Concept plans submitted with reconfiguration and/or development applications identify all footpaths and, where appropriate, cycle paths proposed to be upgraded and/or newly constructed. AS38.2 Footpaths are provided as follows: a) throughout the main strip of Yatala township; b) on at least one side of all major industrial roads, shown on Yatala Enterprise Area LAP Map 29.5 – Transport Infrastructure; c) as specified in any relevant Council adopted strategy. AS38.3 Cycle paths are provided along major open	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	space corridors, such as alongside the Albert River and Upper and Lower Sandy Creek, or as specified in any relevant adopted Council strategy. AS38.4 Paths are designed and constructed in accordance with Council standards and AUSTROADS Part B. AS38.5 Features such as signs, road markings, lighting, paving, bollards and street furniture are provided to enhance the safety and amenity of foot/cycle paths. AS38.6 Individual establishments, particularly those with 100 employees or more, provide bike racks, showers/change rooms, and other-end-of journey facilities.		
PC39 The road network is designed to accommodate the extension and integration of the public transport system, with accessible linkages and routes and stops providing for passenger comfort without obstructing traffic flow.	AS39.1 Bus routes are located along the major industrial roads shown on Yatala Enterprise Area LAP Map 29.5 – Transport Infrastructure, or as specified by Council's City Transport Plan. AS39.2 Road design and construction incorporates bus lay-bys and sheltered passenger waiting areas at regular intervals along bus routes, or as specified in any relevant Council strategy.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
Site Access			
PC40 Site access is designed and constructed to provide for the safe ingress/egress of vehicles to the site.	AS40 Vehicular access to the site is designed and constructed in accordance with Council, Department of Main Roads and AUSTROAD standards, and/or the following minimum requirements: a) comprises a single vehicular driveway	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	(entrance/exit), wherever possible; b) is not closer than ten metres to an intersecting street on the same side of the street; c) provides a minimum sight distance of 110 metres; d) shares adjoining property access driveways, wherever possible; e) always enters the street at right angles; f) where the site has frontage to two roads, access is taken off the secondary/minor road, if possible.		
PC41 Treatment of access points to the site maintains appropriate sight distances and visually enhances its identification.	AS41 Access points incorporate decorative paving treatment and landscaping which distinguishes the access point, but which does not obstruct the safe sight distance requirements outlined above.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
PC42 Provision is made for safe pedestrian and disabled access.	AS42.1 Pedestrian paths designed for disabled access are provided between building entrances, public footpaths and car parking areas. AS42.2 Pedestrian paths are separated from vehicular driveways.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement.	
Amenity Protection			
PC43 The proposed use must not detract from the amenity of the local area, having regard, but not limited, to the impact of: a) noise; b) hours of operation; c) traffic; d) lighting; e) signage;	AS43 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement. Relevant reporting in relation to the future amenity impacts of the development of the site have been undertaken and form part of this development proposal.	

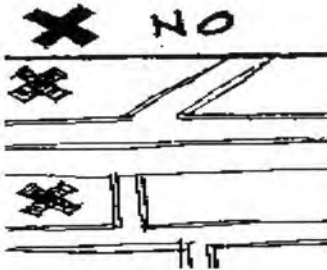
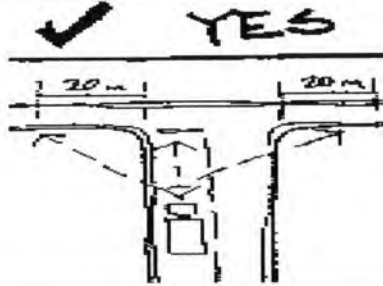
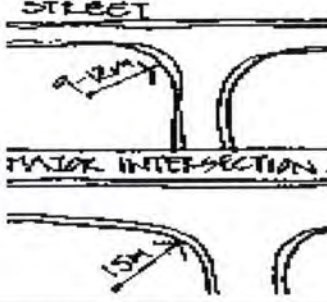
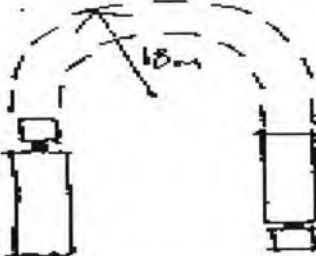


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
f) visual amenity; g) privacy; h) odour and emissions.			
PC44 The proposed development must take into account and seek to ameliorate any negative aspects of the existing amenity of the local area, having regard, but not limited, to the existing impact of: a) noise; b) hours of operation; c) traffic; d) lighting; e) signage; f) visual amenity; g) privacy; h) odour and emissions.	AS44 No acceptable solution provided.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement. Relevant reporting in relation to the future amenity impacts of the development of the site have been undertaken and form part of this development proposal.	
Urban/Rural Use Conflicts			
PC45 Conflicts between urban and rural uses are to be avoided by effective development design.	AS45 The development of land adjacent to the agricultural character areas includes a suitable buffer.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
Extractive Industry			
PC46 Extractive industry operations are managed to make effective use of the extractive resource, while containing any impacts on the subject site.	AS46 The extractive industry is managed and developed consistent with the Extractive Industry Domain Place Code.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
On-Site Vehicle Parking and Movement			
PC47 Internal driveways are provided for safe and easy manoeuvring of vehicles.	AS47.1 Internal driveways are designed and constructed to enable all vehicles to enter and exit the site in a forward motion.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS47.2 Minimum driveway widths are as follows: a) six metres to accommodate non-articulated vehicles; b) nine metres to accommodate articulated vehicles; c) 4.5 metres for one-way driveways.		
PC48 On-site vehicle parking is provided to meet expected demand, having regard to: a) the size of the proposed workforce; b) the likely number of visitors to the site; c) the likely size and number of service and transport vehicles to be on the site at any one time; d) on-site parking and loading/unloading activities within sites; e) the availability of conveniently located on-street parking; f) any possible future expansion, redevelopment or change of use.	AS48.1 The number of car parking spaces provided on-site generally meets the standards set out in Constraint Code 4 – Car Parking, Access and Transport Integration. AS48.2 For multi-unit or multi-use developments, the total car parking provided is an aggregate of the standard parking required for each individual unit and/or component use. AS48.3 A lesser provision may be acceptable where it can be demonstrated, to Council's satisfaction, that the parking needs of a particular development will be adequately met. Where less than the standard amount of parking is provided, the left over space is retained as landscaped open space and placed so as to be suited to ready conversion to additional parking, should the use of the site change and/or the actual car parking demand rise.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
Figure 29-12 Aspects of Good Road Design			

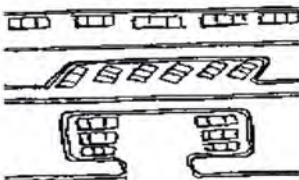
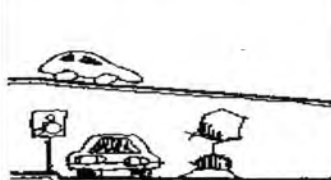
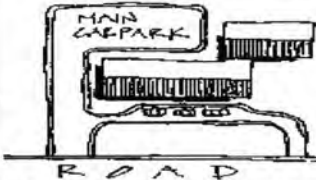
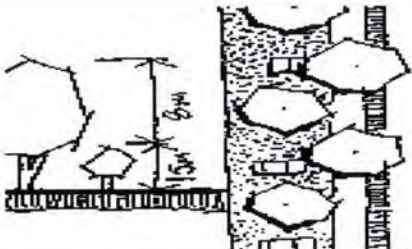
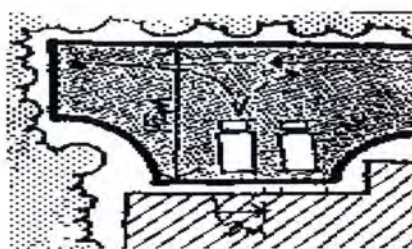


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
			
Intersections should be near perpendicular. Off-set distances should be considered depending on road types and design speeds.	Sight distances depend on design speeds. However a driver 20m from an intersection should see the entire intersection plus 20m of the intersecting street either side.		
			
Kerb radii requirements for heavy vehicles.	Minimum turning radius for heavy vehicles.		
PC49 On-site vehicle parking is located: a) to allow easy access to building entrances; b) to provide visitor spaces for short term/high turnover use clearly visible from the street and signposted accordingly; c) to be adequately screened from the street; d) compatible with surrounding development and, where possible,	AS49.1 In areas where visual amenity is important and/or where relatively large amounts of parking are provided, parking areas are generally situated to the rear or side of the site. In particular, employee parking is situated at the rear of the site, with staff entrances at the rear of the building. AS49.2 Some parking may be located toward the front of the site convenient to the street, provided it is behind landscaping strips and		

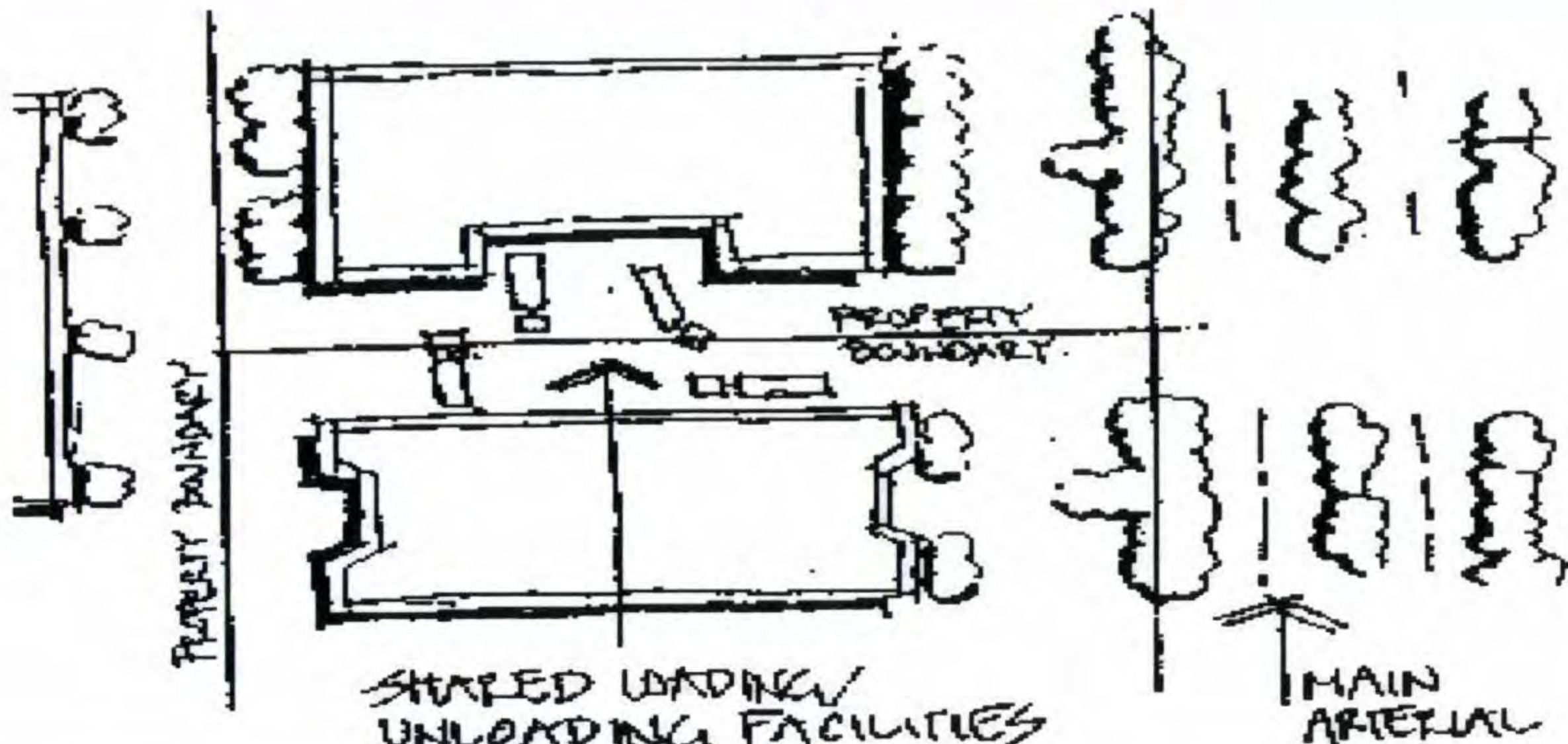


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
facilitating shared use with adjacent land users.	treated aesthetically. AS49.3 Short term/high turnover visitor parking and disabled parking spaces are located close to the main building entrance and clearly signposted. AS49.4 Driveways and parking areas may be constructed to property boundaries and linked to adjoining car parking areas. Similarly, loading areas may be located to facilitate shared turning areas across property boundaries.		
Loading and Unloading			
PC50 All loading and unloading activities take place on-site, unless access is from a service street and effectively screened.	AS50 Loading docks are located in the side or rear portions of the site, separate from public/visitor parking and access points, and screened by vegetation or walls to avoid public view.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
PC51 Adequate provision is made for on-site manoeuvring of heavy vehicles.	AS51.1 On sites over 4,000m² and/or where the uses thereon involve regular servicing by heavy vehicles, on-site service areas are provided. On-site service areas comprise an area of land with an appropriate hard surface to enable a heavy vehicle to turn around within the site (based on standard design turning templates given by AUSTROADS AS 2890.1, 2890.2), and space for additional service vehicle parking and storage requirements. AS51.2 It may be acceptable for two or more developments to share heavy vehicle turning areas.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
Figure 29-13 Design Aspects – On-Site Car Parking & Circulation			



Performance Criteria		Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
				
One way loop.	Two way entry.	Separate entry.		
				
Car parking layouts.	Slopes in any direction across car park 5% maximum and 1% minimum spaces provided for physically challenged.	Visitor spaces for short term high turnover.		
				
One tree every 6 parking spaces 1.5m high at time of planting capable of reaching a maximum height of 8m.	Loading unloading areas to provide for adequate turning circles.			
Figure 29-14 Shared Vehicle Access				



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
 SHARED LOADING/ UNLOADING FACILITIES MAIN ARTERIAL			
	Shared site facilities allows for more efficient use of space could be achieved by access easements. Close attention to detail design required to avoid conflict during heavy usage periods may require some staggering of docking facilities.		
Site Servicing			
PC52 The design and provision of water, stormwater drainage, sewerage, electricity, gas and communications networks meets the needs of industry and business, and provides an orderly and economic progression of service development in the region.	AS52.1 The design and supply of water, stormwater drainage, sewerage, electricity, gas and communication services is in accordance with the requirements of Planning Scheme Policy 11 – Land Development Guidelines and the responsible authority (eg. Telstra, Queensland Electricity Boards, and Queensland Emergency Services). AS52.2 Car park entrances and ramps, loading docks and access ways are minimised, suitably designed and treated to ensure that they do not adversely impact on the streetscape and adjoining development.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
PC53 Conflicts between pedestrians and vehicles at entrance points to parking areas are to be minimised.	AS53.1 The number of vehicle entry points to a development site is minimised, particularly in areas which have high volumes of pedestrian traffic and on streets with a significant through road function.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS53.2 Entrance points to parking and loading areas have clear and unobstructed visibility of pedestrian pathway areas, with pedestrian crossing points clearly identified which give priority to pedestrians.		
PC54 Development is to be designed to support the functional operation of the cycle network.	AS54 Development is designed to support the functional operation of the local and regional cycleway system. (Local cycle ways will be determined at time of subdivision of each development.)	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	
Public Convenience Facilities Within Buildings			
PC55 Commercial developments are to include public convenience facilities, where there is a need for their provision.	AS55 Where provided, public toilet facilities are open and readily accessible to the general public during retail trading hours or other trading hours relevant to the development.	Complies: The Generations Industrial Place Code does not seek to vary this code requirement	

8 – STORMWATER MANAGEMENT PLAN (HYDER)



GENERATIONS INDUSTRIAL PARK

STORMWATER MANAGEMENT PLAN

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STORMWATER MANAGEMENT PLAN

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Report No F0002-AA003837-AAR-01

Date 24 August 2011

This report has been prepared for Patricia & William Hester in accordance with the terms and conditions of appointment for Stapylton-Jacobs Well Road, Stapylton dated February 2011. Hyder Consulting Pty Ltd (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

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Appendix A

SITE SURVEY DATA

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Appendix D

STORMWATER TREATMENT DEVICE MAINTENANCE CHECKLISTS

SUMMARY

This Stormwater Management Plan (SWMP) has been prepared for submission to the Gold Coast City Council in support of a development application for Material Change of Use and Operational works (Change to Ground Level) permits to create the "Generations Industrial Park" at Stapylton-Jacobs Well Road, Stapylton.

This SWMP has been prepared to demonstrate suitable compliance with local, state and national requirements in the planning and design of the proposed subdivision with respect to stormwater management.

This SWPM covers two primary objectives;

1. **Site Based Hydrologic/Hydraulic Assessment**

This SWMP aims to demonstrate a no-worsening effect on the capacity, performance and potential effect of flooding of the downstream infrastructure owned by Gold Coast City Council, neighbouring properties and the receiving South-East Queensland waterways. In doing so, hydrologic modelling has been undertaken to determine the existing and proposed case stormwater runoff and local flooding characteristics. Measures are presented within this report to mitigate any potential negative impacts which may result from the development; the results of the proposed mitigation measures are then modelled to demonstrate effectiveness.

2. **Water Sensitive Urban Design.**

This SWMP aims to address the water quality objectives of the proposed development in both the operational and construction phases. Details are provided of suitable stormwater quality improvement devices which are modelled to demonstrate effectiveness in the satisfactory removal of pollutants. Construction phase water quality treatment measures are also discussed.

2 SITE DESCRIPTION

2.1 Site Locality

The subject site for the proposed development is located within the Stapylton region of the Gold Coast and is bounded by Stapylton-Jacobs Well Road to the north-west and Christensen Road to the south. The site is also bound by a residential/retirement village to the south-west, existing industrial development to the north and the current construction of industrial development to the east.

Figure 2.1 provides a site locality plan.



Figure 2.1 – Site Locality Plan

2.2 Property Description

The subject site covers two registered properties, described as Lot 1 on RP6882 and Lot 240 on W31320.

2.3 Zoning

The subject site is identified on the Yatala Enterprise Area Local Area Plan – Precincts (GCCC LAP Map 29.2) and is described as “Future Industry”. The subject site is also identified on the on the Yatala Enterprise Area Local Area Plan – Ultimate Precincts (GCCC LAP Map 29.4) and is described as “General Impact Business and Industry”.

2.4 Area of Land

The total area of the site is taken as 73.114ha. Each individual allotment has the following registered areas:

- LOT 1 RP6882 = 205,050m²
- LOT 240 W31320 = 532,558m²

2.5 Site Conditions and Built Form Elements

In its existing state Lot 1 on RP6882 is occupied by a number of built form elements which include a brick farm-house building, ten (10) sheds, access tracks, fenced areas and earth-cut dams.

Lot 240 on W31320 is largely undeveloped consisting of open space, with the exception of an area of approximately 1.35ha, known as Lease A on SP125788, which is currently cleared for usage as industrial buildings and storage of stockpiled materials. Lease A on SP125788 consists of large impervious areas for parking and access, large industrial sheds and two (2) large dams which receive runoff from the area at the two lowest regions of the area prior to discharge of runoff into the surrounding undeveloped areas.

2.6 Existing Surface Levels

The site is generally dissected in a north-south fashion by a ridge line, connecting levels of approximately 25m AHD on the northern boundary to levels of approximately 30m AHD on the south-western boundary with minimum ridge-line levels of approximately 18m AHD.

From this general ridge-line through the centre of the site, the site falls to the west toward Stapylton-Jacobs Well Road to lowest site levels of 3.8m AHD, to the north toward Emeri Street to lowest site levels of 17.21m AHD, and to the east toward the adjoining property where a vegetation conservation area is to be dedicated as part of the proposed development. To the east the site falls toward two localised points where the lowest site levels are 8.38m and 9.98m from north to south respectively.

The small portion of Lot 240 on W31320 located to the south of Christensen Road generally falls to the south toward Sandy Creek from maximum levels around 15.6m AHD to minimum levels on the upper fringe of the creek bank at 8.38m AHD.

3 HYDROLOGIC ASSESSMENT

3.1 Rainfall Data

Rainfall intensity-frequency-distribution (IFD) data for the site has been gathered using the Gold Coast City Councils Design Rainfall Isopleth Charts, Skew Coefficient Charts, and Geographical Factor F2 & F50 Charts (Standard Drawings 05-03-401 to 05-03-409). As necessary, the charts have been interpolated to accurately describe the subject site. Standard Rainfall intensities used for generating IFD data are presented in Table 3.1.

Table 3.1 Rainfall Intensity Data

	1 Hour Duration	12 Hour Duration	72 Hour Duration
50 Year ARI	75.99mm/hr	19.13mm/hr	6.57mm/hr
2 Year ARI	44.08mm/hr	9.22mm/hr	2.84mm/hr

- Skewness = 0
- Geographic Factor F2 = 5.09
- Geographic Factor F50 = 19.12

3.2 Existing Case Catchments

As described in Section 2.6, the site is dissected by a general ridge line which causes runoff to be split and spread from the site in many directions. As a result the site contains a number of internal catchments and a number of lawful points of discharge.

Figure 3.1 below presents a description of the catchment boundaries described in Section 2.6.

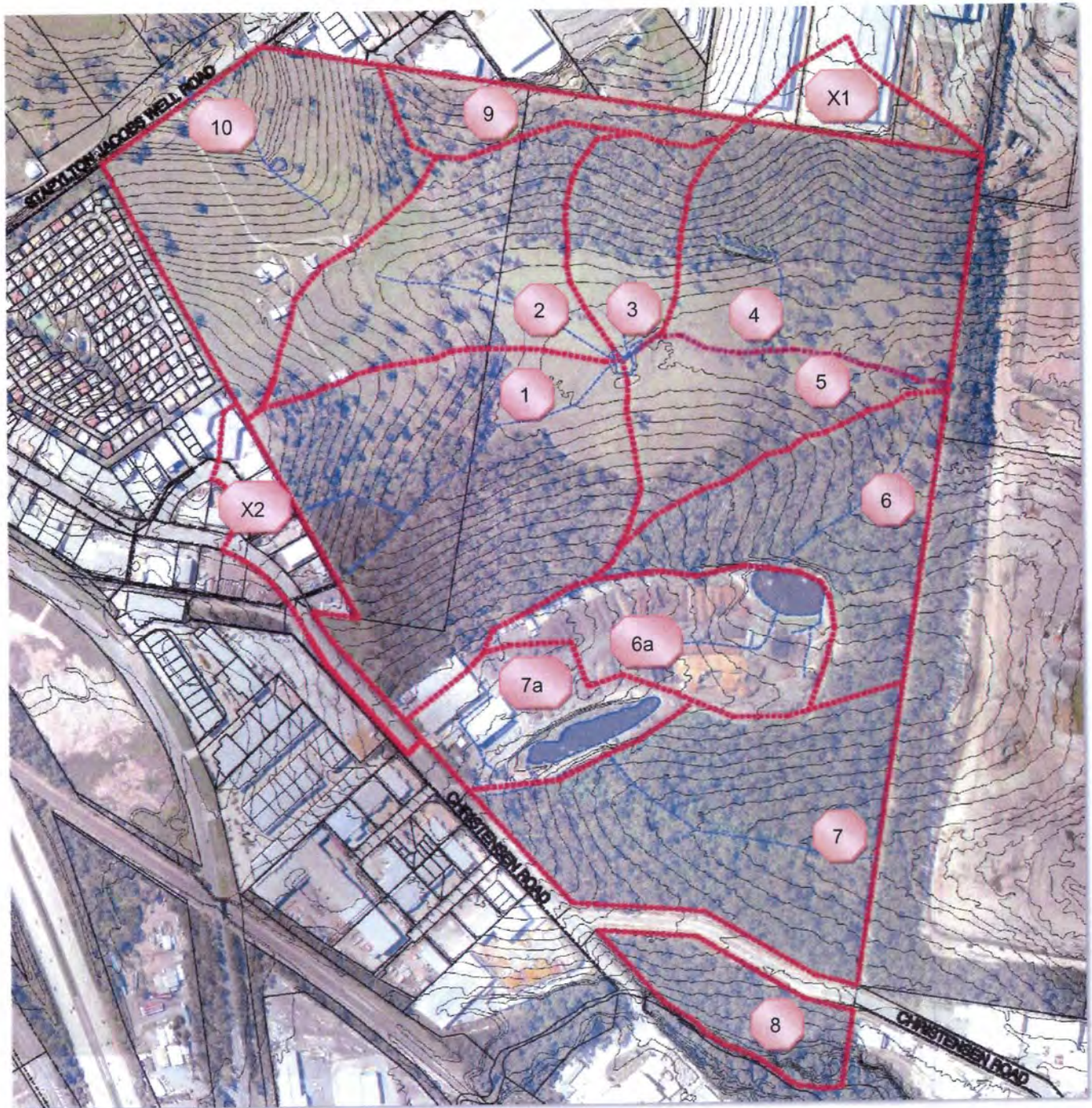


Figure 3.1 – Existing Case Catchment Areas

It is noted that the site has been separated into ten (10) internal catchment areas and two (2) external catchment areas. The existing development on Lease A on SP125788 has also been recognised and separated from the major catchments 6 and 7 and identified as Sub-catchments 6a and 7a respectively for the premise of the hydrologic assessment.

3.3 Existing Lawful Points of Discharge

From the ten (10) catchments described above, it is noted that five (5) existing lawful points of discharge currently exist; one toward Stapylton Jacobs Creek Road, one toward Emiri Street in the North, two toward the eastern property boundary and one to the south toward Sandy Creek.

The existing lawful points of discharge area shown on Figure 3.2 below:



Figure 3.2 – Lawful Points of Discharge

It is noted that a total of six (6) internal catchments (including sub-catchment 6a in Lease A on SP125788) and two (2) external catchments contribute runoff to Discharge1. This approach has been adopted to more accurately reflect the hydraulic behaviour of the full catchment area including the collection of the catchments via the central semi-permanent waterway. This approach additionally allows for more detail and accuracy during the developed case assessment.

Table 3.1 – Lawful Point of Discharge and Catchment Summary

Lawful Point of Discharge	Contributing Catchment Label	Total Area (ha)
1	1	12.64
	2	7.11
	3	3.01
	4	7.31
	5	4.06
	6	9.46
	X1	1.49
	X2	2.15
2	7	11.66
3	8	0.76
4	9	2.20
5	10	8.60

Hyder Drawing K009-AA003837 shows the catchment boundaries, site contours and lawful points of discharge in further details and is included as an Appendix to this report

3.4 Hydrologic Calculations

To evaluate the potential impacts of the proposed development on the existing downstream receiving infrastructure/waterways a hydrologic assessment has been undertaken on both the existing case and the proposed developed case for the affected catchments.

XP-RAFTS hydrologic modelling software has been used to calculate event hydrographs for each sub-catchment's resultant discharge. XP-RAFTS requires input parameters of catchment area, initial and continuing losses, imperviousness, slope and Manning's roughness coefficients in addition to rainfall data to determine storm event hydrographs. XP-RAFTS additionally allows for the detailed modelling of stormwater detention structures and routing through channels and pipes.

XP-RAFTS forms the basis of the hydrologic calculations presented in the report. In the following sections the process, inputs and results of the XP-RAFTS based hydrological analysis are presented.

The peak discharge flow rates generated by XP-RAFTS have been verified/calibrated against detailed Rational Method calculations undertaken in accordance with QUDM (2008). The results of the verification are presented separately in Section 3.9.

3.5 Existing Case Hydrology

The existing case hydrology was modelled using XP-RAFTS with all input parameters determined via a detailed assessment of each sub-catchment.

Table 3.1 provides the input parameters used for each existing sub-catchment:

Table 3.1 – Existing Sub-Catchment Summary

Lawful Point of Discharge	Contributing Catchment	Contributing Catchment Area (ha)	Percentage Impervious (%)	Vectored Slope (%)	Manning's Roughness (n)
1	1	12.64	0	5.41	0.08
	2	7.11	0	5.95	0.05
	3	3.01	0	5.54	0.08
	4	7.31	0	5.80	0.10
	5	4.06	0	4.02	0.05
	6	4.71	0	3.91	0.10
	6a	4.75	40	3.50	0.03
	X1	1.49	90	1.00	0.02
	X2	2.15	90	1.00	0.02
	7	8.25	0	3.51	0.06
2	7a	3.41	50	2.50	0.02
	8	0.76	0	3.00	0.06
3	9	2.20	0	2.21	0.06
4	10	8.60	7.5	6.20	0.03

In addition to the flow runoff volumes generated by each internal catchment and sub-catchment a number of physical hydraulic factors impact the behaviour of stormwater runoff at the discharge locations. It is important to include these physical factors in the modelling as they may potentially cause hydrograph lag or coincident peak in the discharging flow.

Specifically, it is observed that Catchments 1, 2 and 3 converge at a junction around the centre of the site where a low-lying semi-permanent sluggish waterway carries the converged flow in a west to east direction before joining runoff from Catchments 6 and 7 at Discharge 1. Additionally, both catchments which are subject to the existing industrial usage on Lease A on SP125788 (6a and 7a) have constructed dams which receive stormwater and control runoff prior to discharge, acting as stormwater detention basins.

To reflect these physical impacts on the existing hydrology, these physical factors have been incorporated into the modelling of the existing case of the site.

Figure 3.3 below presents a diagram of the modelling environment used in XP-RAFTS, showing the connection of catchment nodes to the physical barriers described above and the lawful points of discharge.

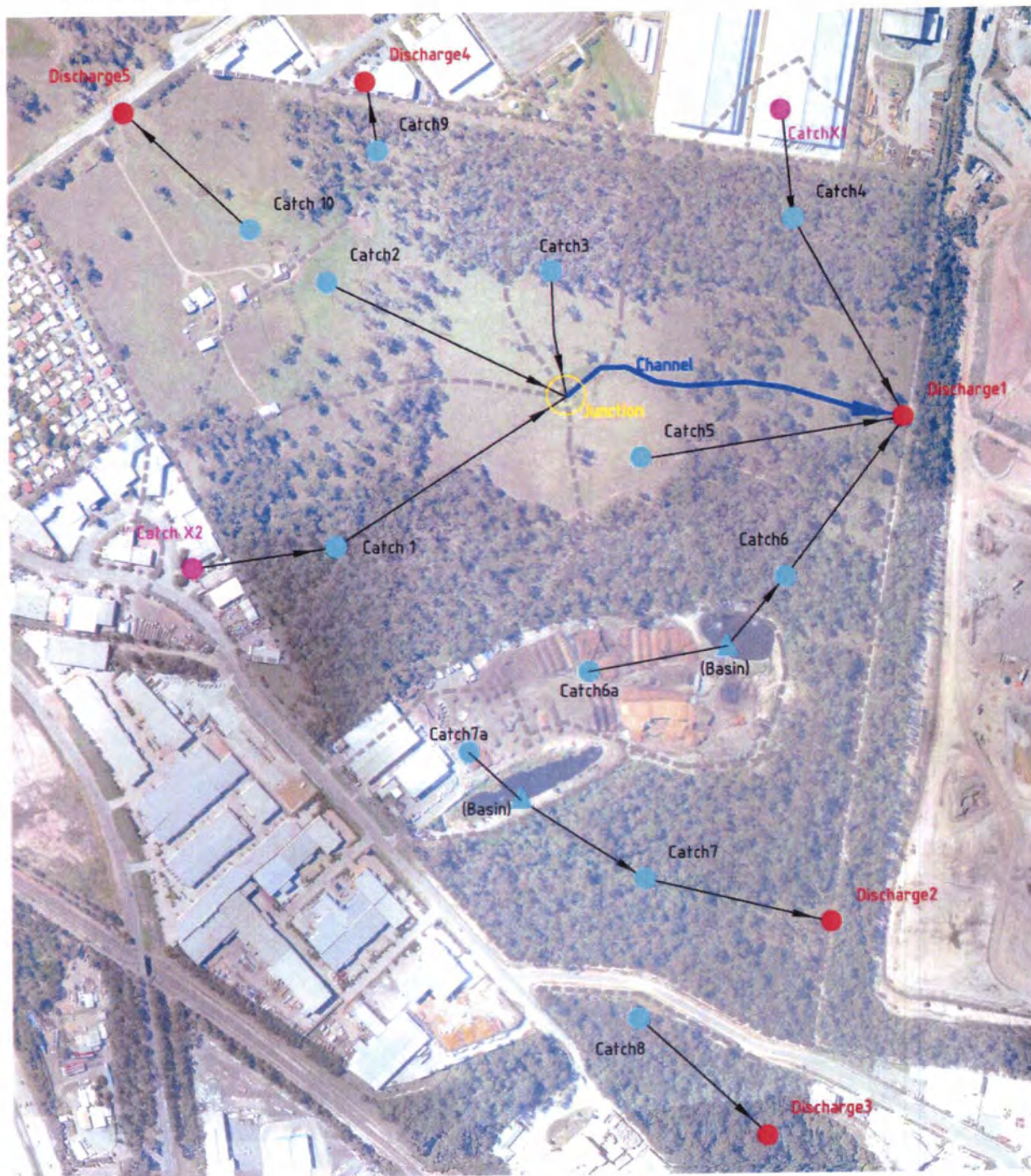


Figure 3.3 – Diagram of Existing Case XP-RAFTS Modelling Environment

Details of the existing physical constraints on the stormwater runoff which have been modelled are summarised below:

Existing Overland Channel Details:

- Length = 520m
- Slope = 0.7%
- Lateral inflow = 60m
- Channel banks = 1:10 slope up to 0.3m height and 1:20 slope above

Existing Basin in Catchment 6a:

- Detention storage depth available = 300mm
- Detention storage volume = 1,080m³
- Spillway = 15m width at 100mm stage

Existing Basin in Catchment 7a:

- Detention storage depth available = 300mm
- Detention storage volume = 1,200m³
- Spillway = 30m width at 100mm stage

For each point of discharge a range of storm events were modelled for each standard ARI to determine the critical storm duration. Table 3.2 below shows the critical storm durations which were identified as yielding the highest peak discharge flow rates for each lawful point of discharge.

Table 3.2 Critical Storm Durations

Lawful Point of Discharge	Critical Storm Duration
1	120 mins
2	90 mins
3	25 mins
4	60 mins
5	25 mins

Figures 3.4 to 3.8 below present the critical storm duration hydrographs for each lawful point of discharge in the existing case scenario.

The maximum peak discharge flow rates for each lawful point of discharge depicted on these hydrographs for each ARI storm event will become the design objectives for the developed case scenario.

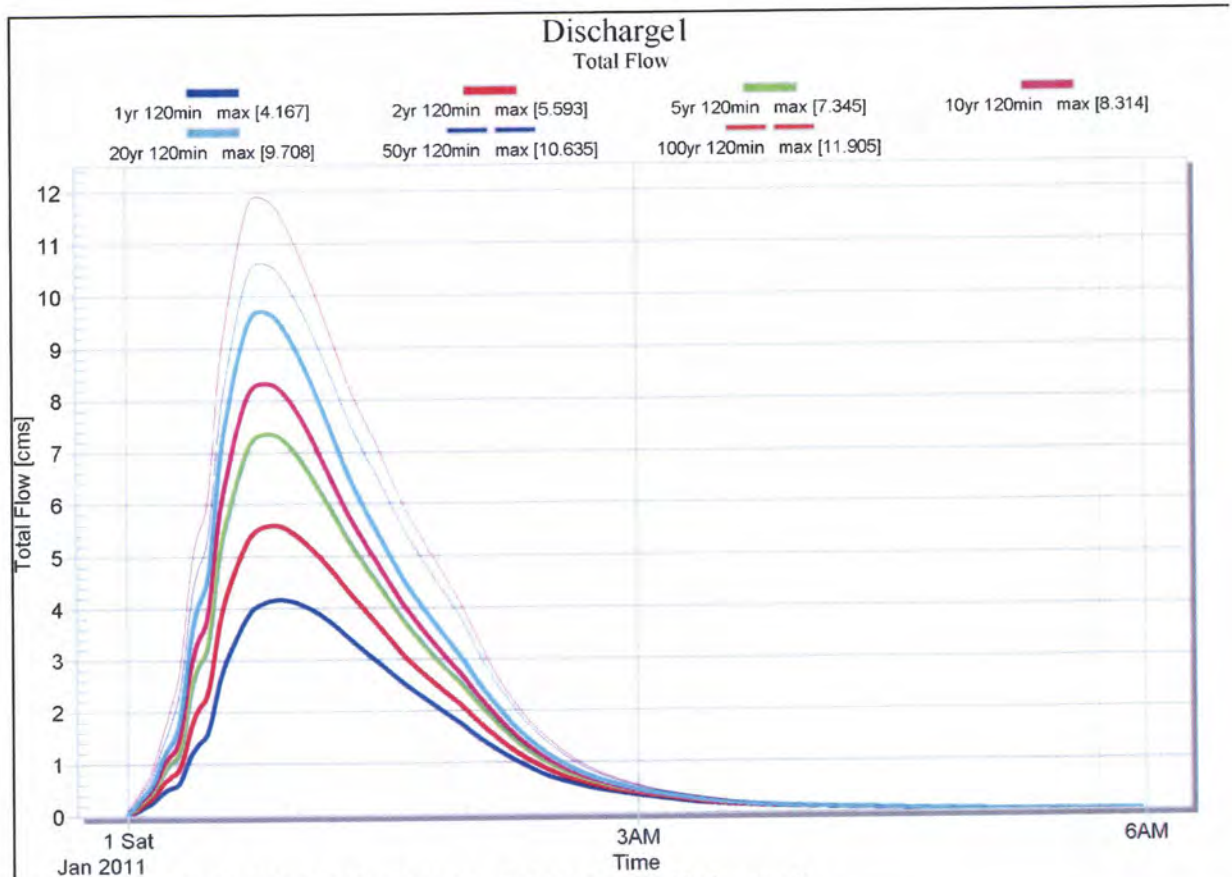


Figure 3.4 – Lawful Point of Discharge 1 Existing Flow Hydrograph

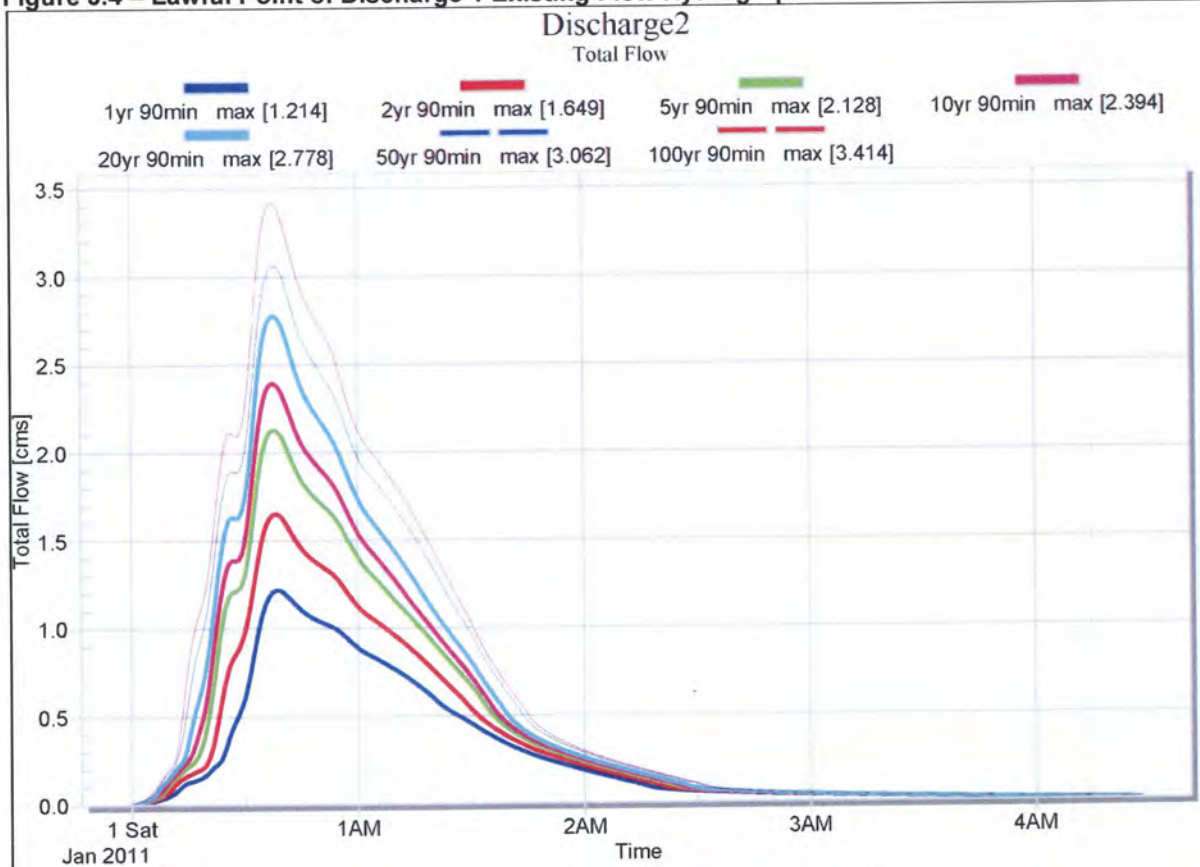


Figure 3.5 – Lawful Point of Discharge 2 Existing Flow Hydrograph

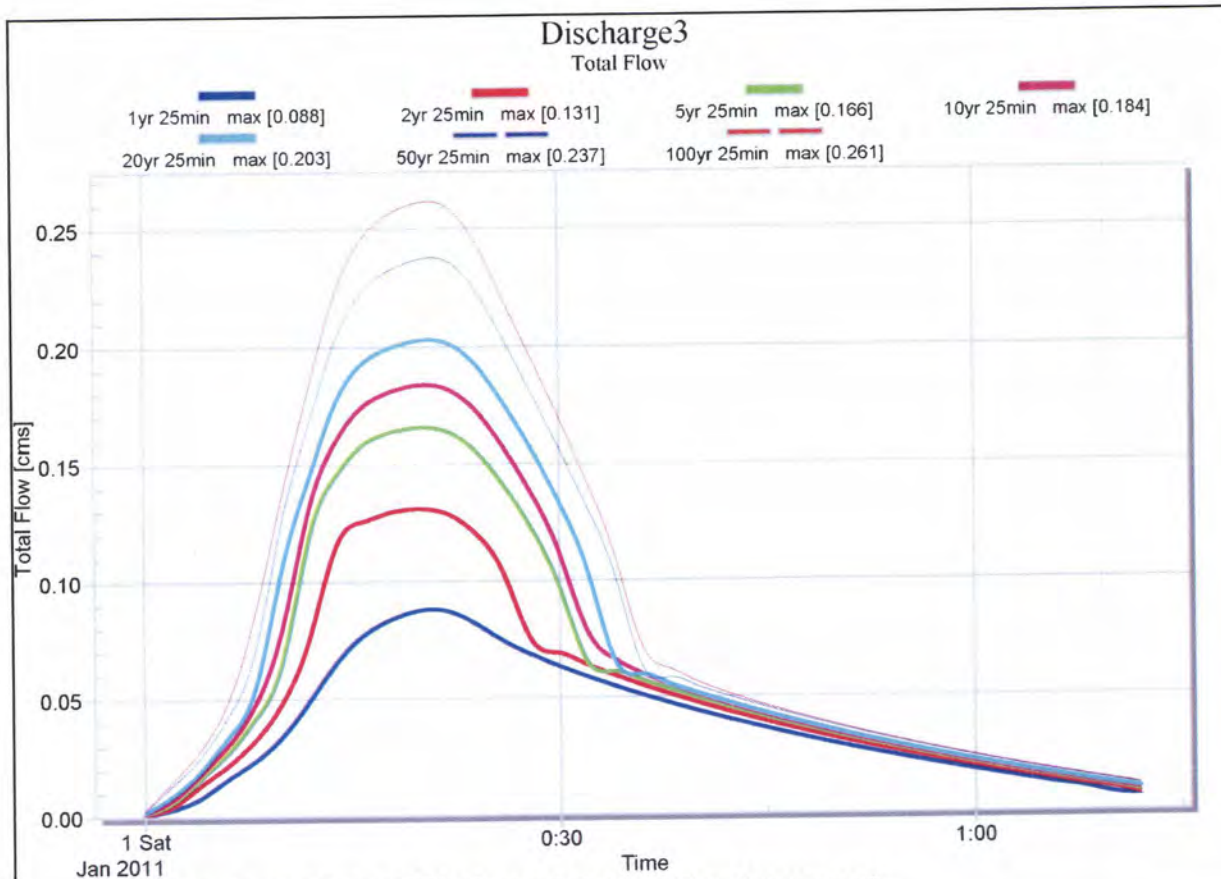


Figure 3.6 – Lawful Point of Discharge 3 Existing Flow Hydrograph

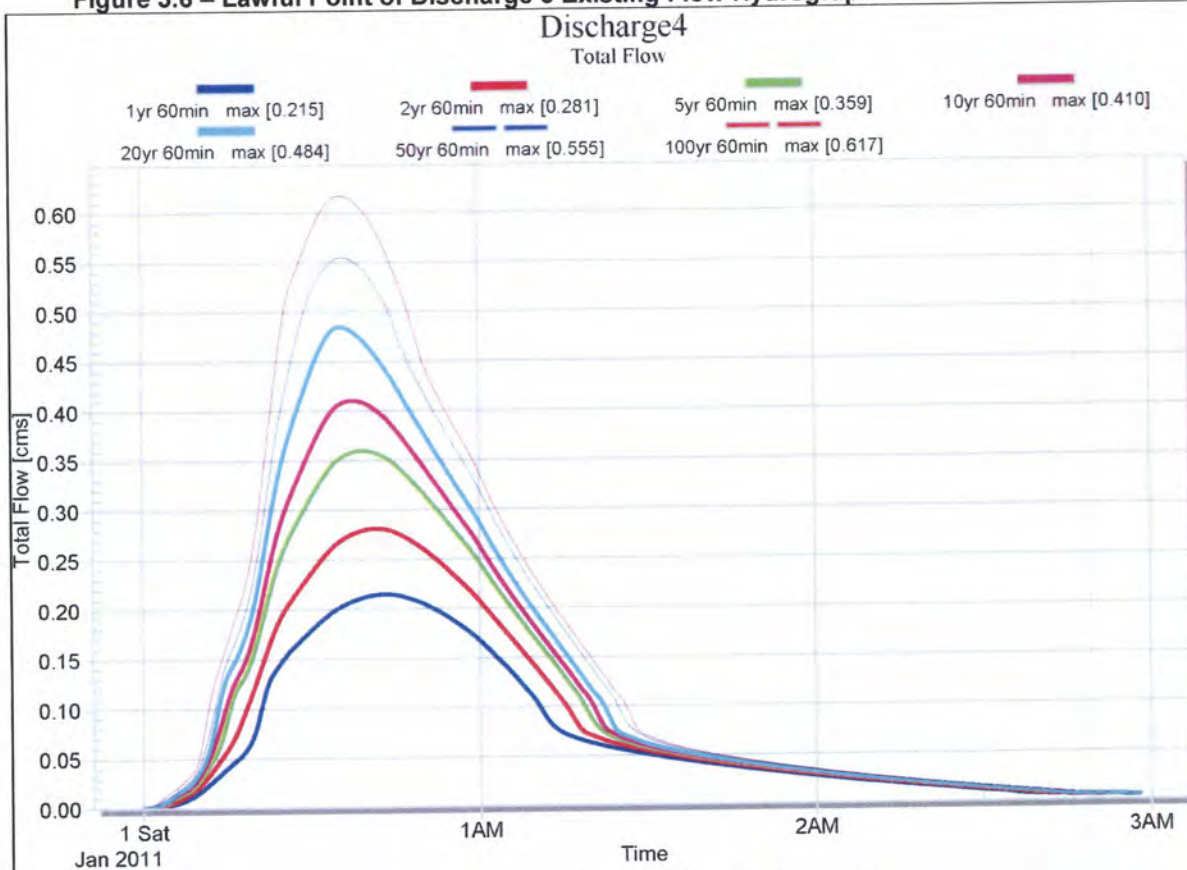


Figure 3.7 - Lawful Point of Discharge 4 Existing Flow Hydrograph

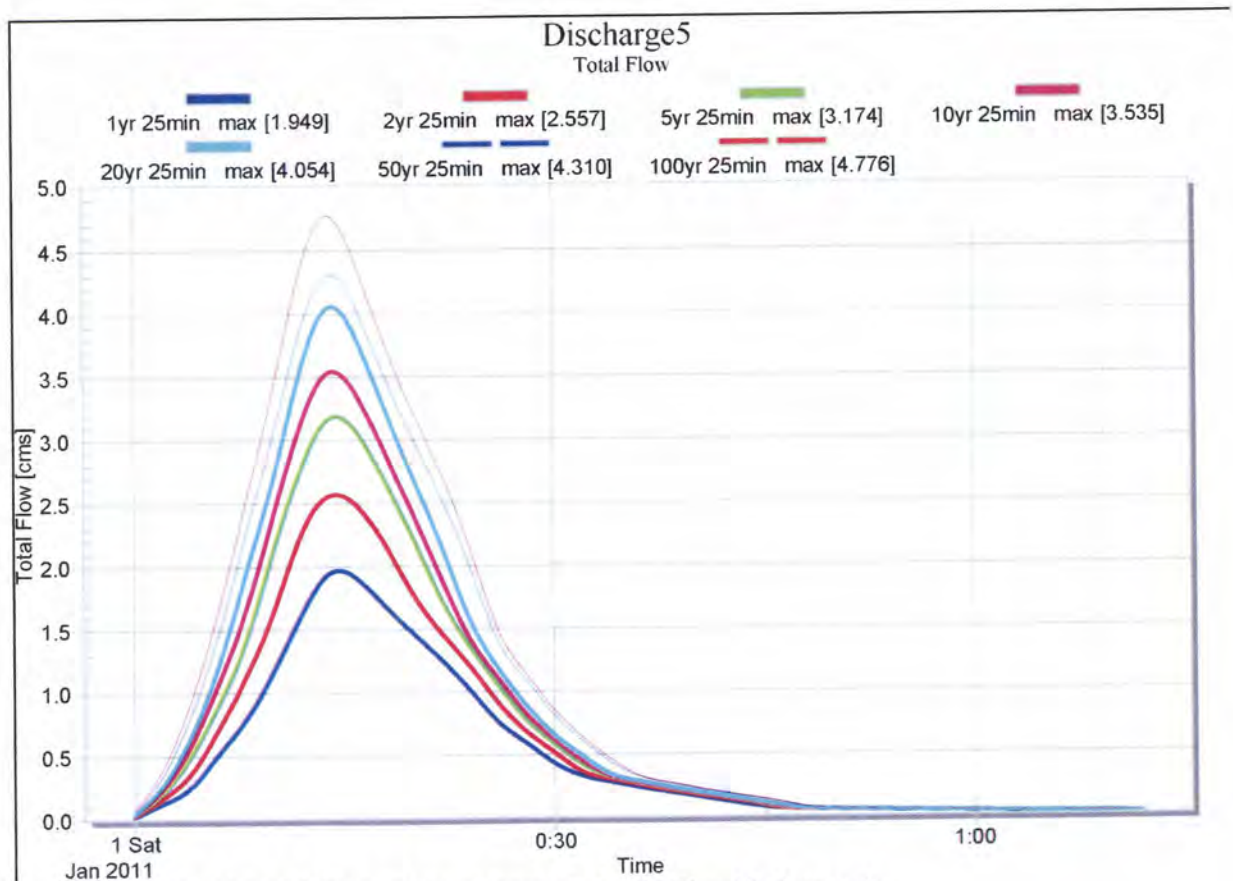


Figure 3.8 - Lawful Point of Discharge 4 Existing Flow Hydrograph

3.6 Developed Case Catchment Augmentation

As an inevitable result of the earthworks and modifications to the ground level involved in the creation of developable allotments the stormwater catchment boundaries, land-fall gradients and imperviousness of the surfaces are altered. These alterations generally lead to shortened times of concentration and increased total peak stormwater runoff.

Figure 3.9 below presents a description of the catchment boundaries which would be resultant from the proposed development.

It is noted that each of the lawful points of discharge remain in the same location as the existing case scenario. It is also noted that the catchment and discharge naming conventions remain to allow for comparison and assessment of potential impacts.



Figure 3.9 – Developed Case Catchment Areas

Table 3.3 below presents a summary of the resulting catchment parameters anticipated during the developed and operational scenario of the site.

Table 3.3 – Developed Catchment

Lawful Point of Discharge	Contributing Catchment	Contributing Catchment Area (ha)	Percentage Impervious (%)	Vectored Slope (%)	Manning's Roughness (n)
1	1	19.37	90	1.0	0.020
	4	5.630	90	1.0	0.020
	5	3.777	90	1.0	0.020
	6	9.590	90	1.0	0.020
	X1	1.490	90	1.0	0.020
	X2	2.150	90	1.0	0.020
2	7a	6.097	90	1.0	0.020
	7b	5.055	90	1.0	0.020
3	8	0.639	90	1.0	0.020
4	9	0.800	90	1.0	0.020
5	10a	7.701	90	1.0	0.020
	10b	3.856	90	1.0	0.020

3.7 Developed Case Hydrology & Stormwater Detention

In addition to creating a separate XP-RAFTS model to represent the augmented developed case catchment scenario, stormwater detention structures have been included in the modelling which are specifically designed to mitigate increases in peak stormwater runoff resulting from the development of the site.

The peak discharge flow rates for each lawful point of discharge shown on Figures 3.3 to 3.8 were used as the design objectives for each detention basin.

The stormwater detention basins have been specifically designed in accordance with GCCC and QUDM requirements to ensure that peak discharge flow rates are not increased during critical storm durations for all standard ARI's up to 1 in 100 year events.

Details of the proposed stormwater detention devices area as follows:

Detention Basin 1 (Catchment 5):

- Total depth = 1.5m (base = RL11.5m AHD, crest = RL13.0m AHD)
- Detention storage depth in basin = 1.2m (allowing 300mm freeboard)
- Detention storage volume = 2,570m³
- Spillway = 8m width at RL12.5m AHD
- Outlet pipe = 2No. 750mm @ 0.8%

Detention Basin 2 (Catchment 7):

- Total depth = 1.5m (base = RL12.0m AHD, crest = RL13.5m AHD)
- Detention storage depth in basin = 1.2m (allowing 300mm freeboard)
- Detention storage volume = 3,950m³
- Spillway = 8m width at RL13.0m AHD
- Outlet pipe = 2No. 900mm @ 1.0%

Detention Basin 3 (Catchment 1):

- Total depth = 1.5m (base = RL9.5m AHD, crest = RL11.0m AHD)
- Detention storage depth in basin = 1.2m (allowing 300mm freeboard)
- Detention storage volume = 12,360m³
- Spillway = 10.5m width at RL10.3m AHD
- Outlet pipe = 4No. 900mm @ 0.8 %

Detention Basin 4 (Catchment 8):

- Total depth = 1.5m (base = RL12.0m AHD, crest = RL13.0m AHD)
- Detention storage depth in basin = 0.7m (allowing 300mm freeboard)
- Detention storage volume = 205m³
- Spillway = 1.5m width at RL12.6m AHD
- Outlet pipe = 1No. 375mm @ 0.5 %

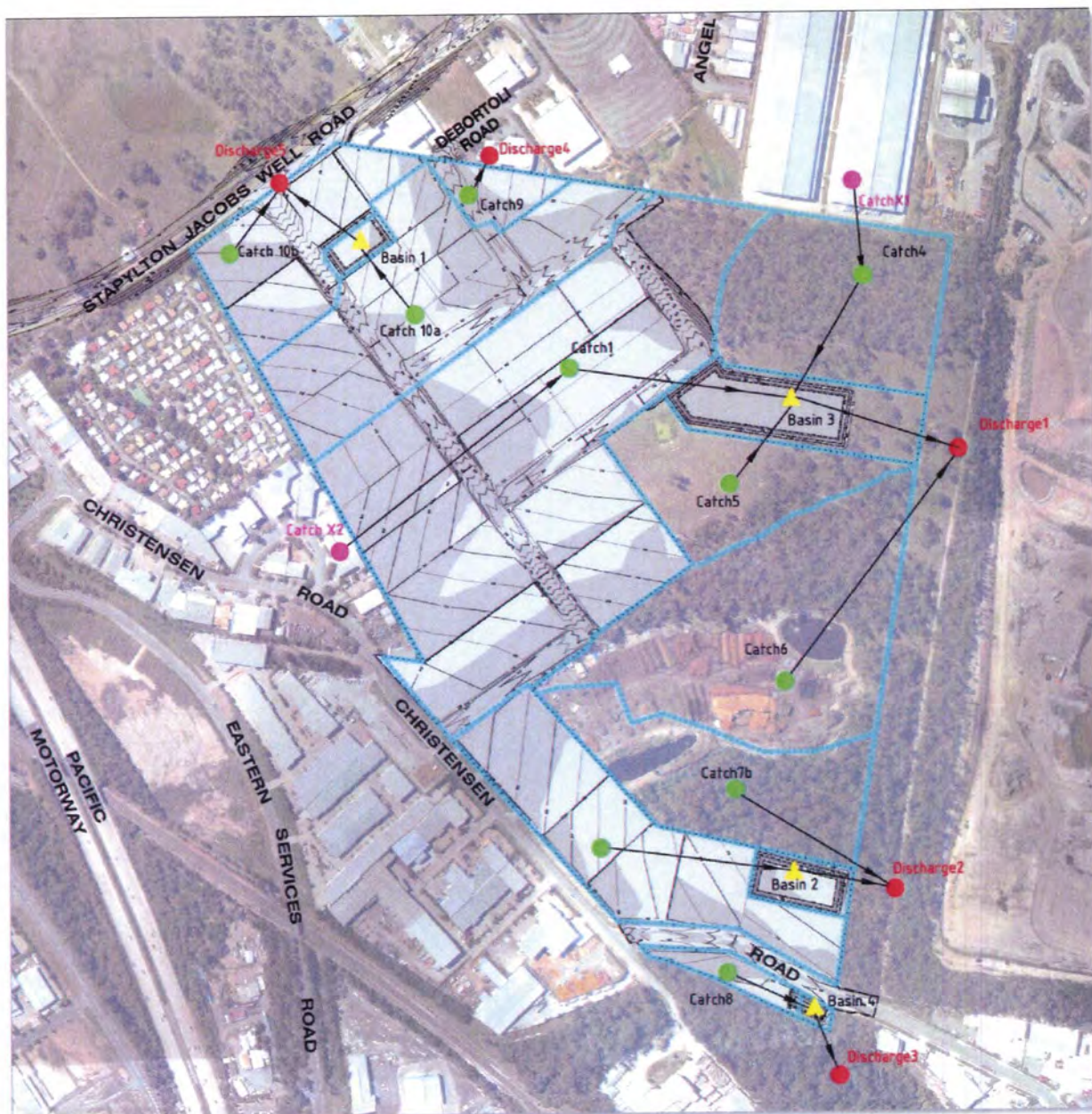


Figure 3.10 – Diagram of Developed Case XP-RAFTS Modelling Environment

Figures 3.11 to 3.15 below present the critical storm duration hydrographs for each lawful point of discharge in the developed case scenario.

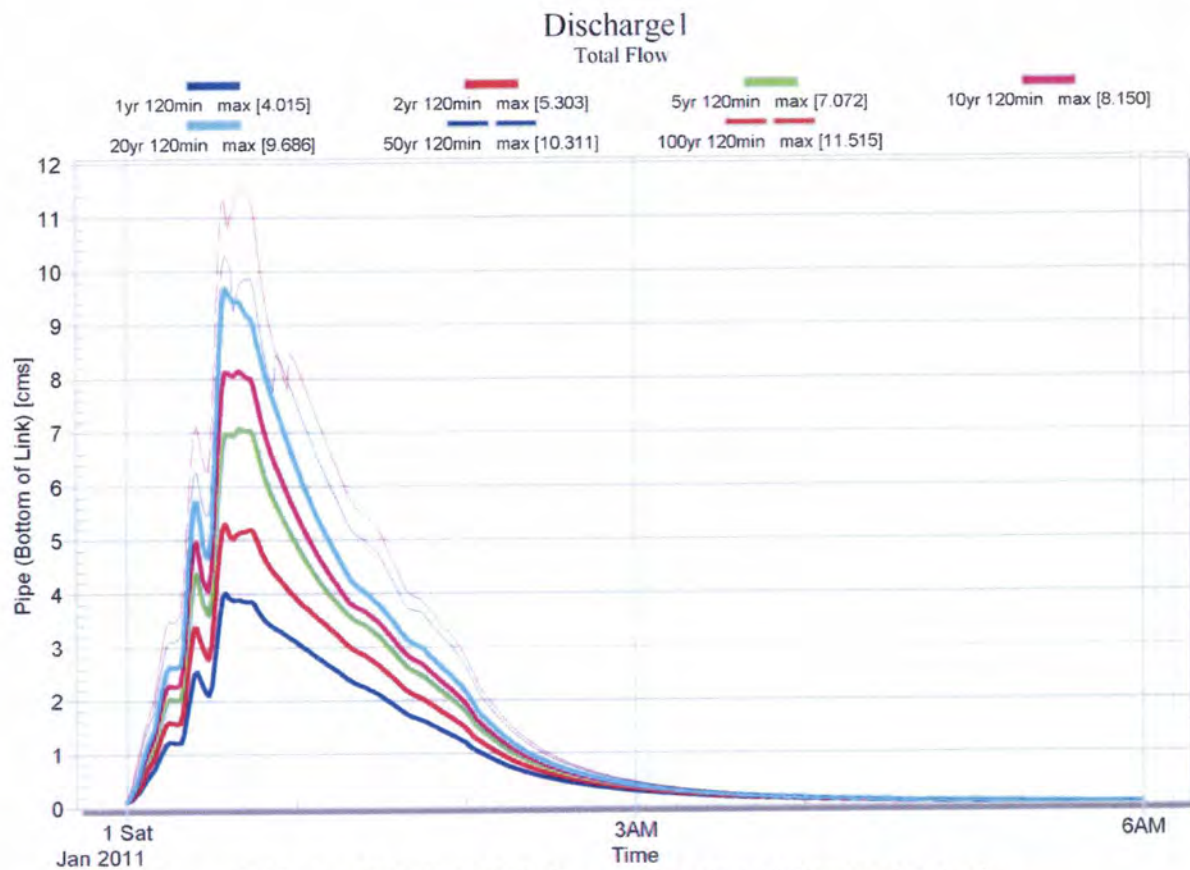


Figure 3.11 - Lawful Point of Discharge 1 Developed Flow Hydrograph

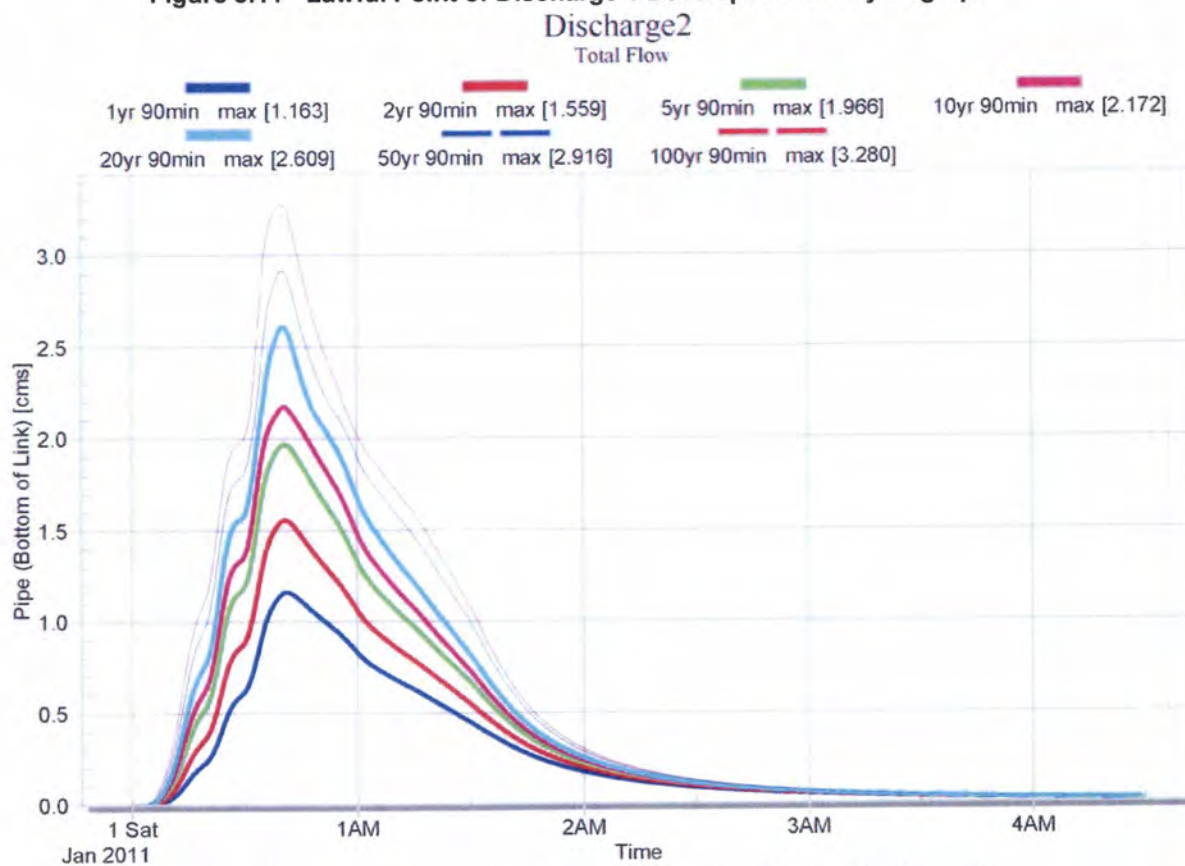


Figure 3.12 - Lawful Point of Discharge 2 Developed Flow Hydrograph

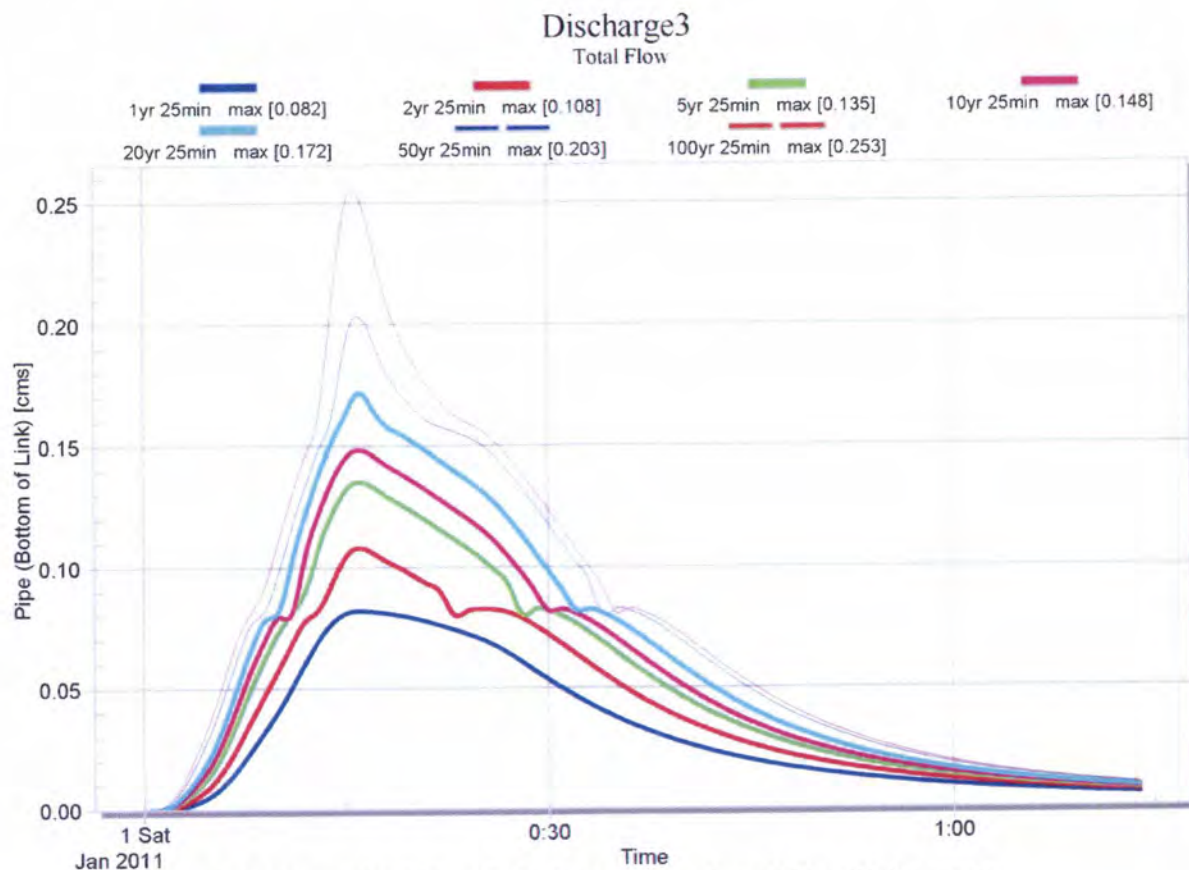


Figure 3.13 - Lawful Point of Discharge 3 Developed Flow Hydrograph

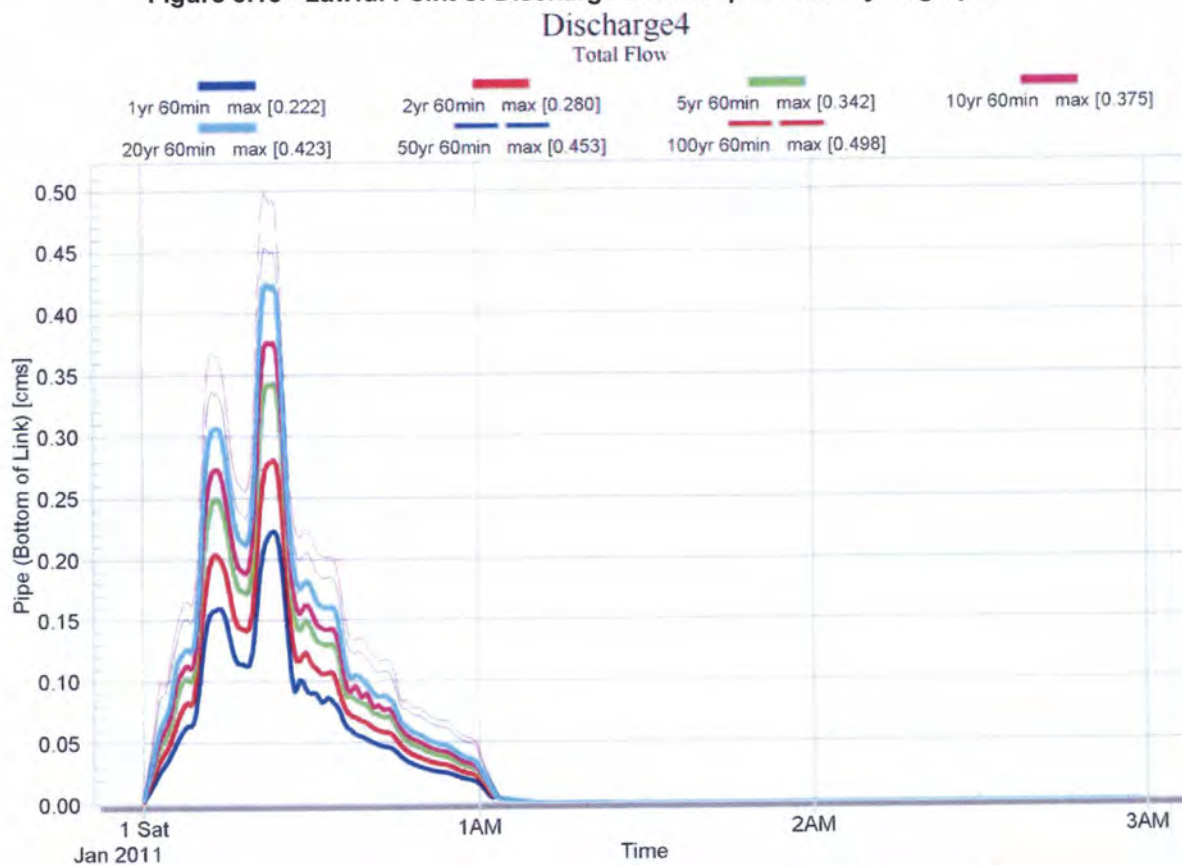


Figure 3.14 - Lawful Point of Discharge 4 Developed Flow Hydrograph

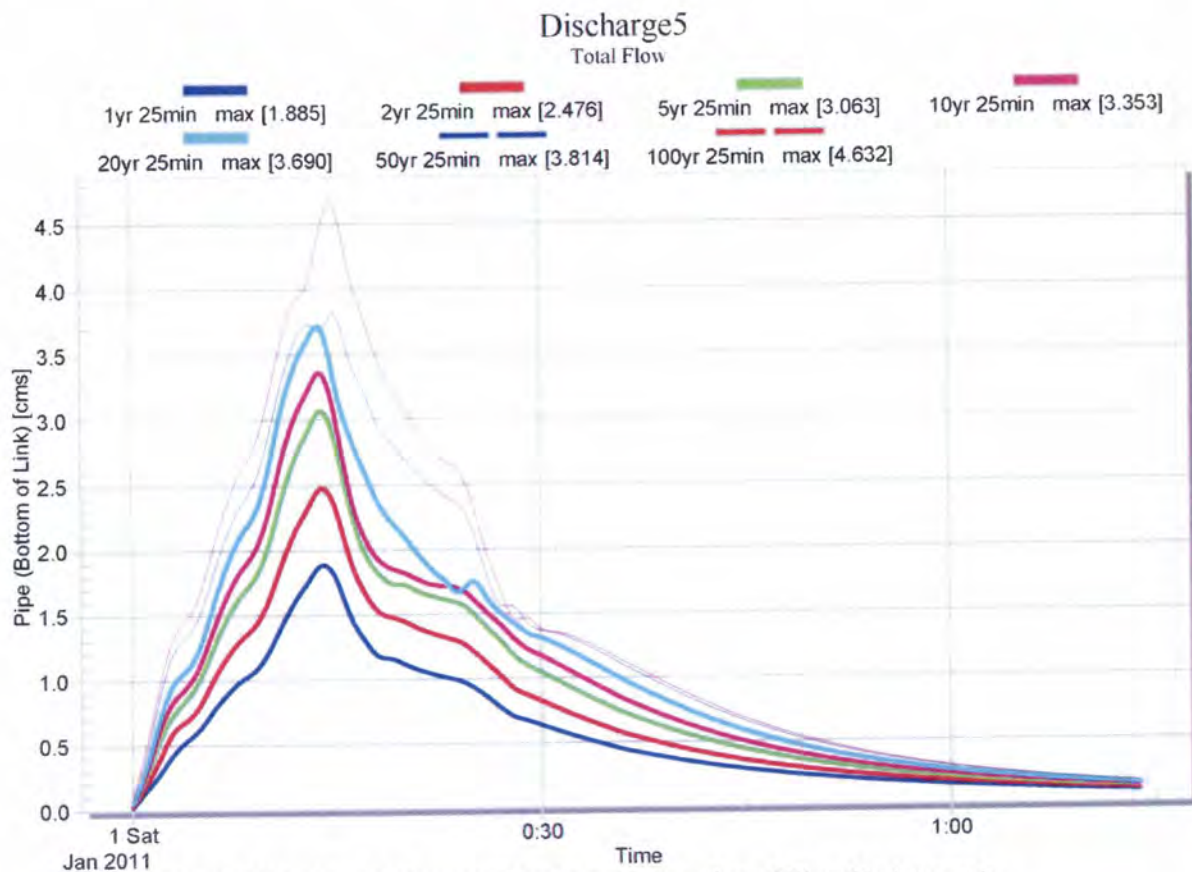


Figure 3.15 - Lawful Point of Discharge 5 Developed Flow Hydrograph

3.8 Model Verification

The Rational Method as described by QUDM (2008) was employed to verify the results generated by the XP-RAFTS hydrologic model. Table 3.3 below presents the input parameters used for calculating peak discharge flow rates via the Rational Method, Table 3.4 below presents a comparison of the Rational Method results against the XP-RAFTS results.

Table 3.3 – Rational Method Calculation Inputs

Discharge	Area (ha)	Coefficient of Runoff	Calculation Method & Parameters	Total Time of Concentration
1 (existing)	43.59	0.62	Bransby Williams: Flow Path Length = 905m Equal Area Slope = 1.1%	35mins
2 (existing)	11.66	0.62	Bransby Williams: Flow Path Length = 580m Equal Area Slope = 1.6%	24mins
3 (existing)	0.76	0.62	Sheet Flow Equation: Flow Path Length = 80m Surface Slope = 3%	15mins
4 (existing)	2.20	0.52	Bransby Williams: Flow Path Length = 320m Equal Area Slope = 2.2%	14mins
5 (existing)	8.80	0.8	Bransby Williams: Flow Path Length = 440m Equal Area Slope = 5.9%	14mins
1 (developed)	42.01	0.95	Standard Inlet = 5mins Pipe & Channel = 1000m	15mins
2 (developed)	11.66	0.95	Standard Inlet = 5mins Pipe & Channel = 500m	10mins
3 (developed)	0.64	0.95	Standard Inlet = 5mins Pipe & Channel = 150m	6mins
4 (developed)	0.81	0.95	Standard Inlet = 5mins Pipe & Channel = 100m	6mins
5 (developed)	11.83	0.95	Standard Inlet = 5mins Pipe & Channel = 330m	10mins

Table 3.4 – Rational Method / XPRAFTS Model Verification Table

Discharge	Storm Event	Rational Method	XPRAFTS	Difference
1 (existing)	Q2	4.33	5.30	22%
	Q10	6.79	8.15	20%
	Q100	11.39	11.52	1%
2 (existing)	Q2	1.32	1.60	21%
	Q10	2.06	2.17	5%
	Q100	3.45	3.28	-5%
3 (existing)	Q2	0.11	0.11	0%
	Q10	0.17	0.15	-12%
	Q100	0.29	0.25	-14%
4 (existing)	Q2	0.29	0.28	-3%
	Q10	0.45	0.37	-18%
	Q100	0.76	0.50	-34%
5 (existing)	Q2	1.68	2.48	48%
	Q10	2.62	3.35	28%
	Q100	4.38	4.63	6%
1 (developed)	Q2	8.94	11.25	26%
	Q10	13.94	15.85	14%
	Q100	21.53	20.04	-7%
2 (developed)	Q2	2.9	3.20	10%
	Q10	4.51	4.40	-2%
	Q100	6.96	5.53	-21%
3 (developed)	Q2	0.22	0.26	18%
	Q10	0.34	0.35	3%
	Q100	0.50	0.44	-12%
4 (developed)	Q2	0.28	0.28	0%
	Q10	0.43	0.37	-14%
	Q100	0.63	0.50	-21%
5 (developed)	Q2	3.42	4.73	38%
	Q10	5.31	6.31	19%
	Q100	7.75	7.90	2%

It is noted that the calculated discharge from each sub-catchment in each condition of development is within an allowable range of error to consider the XP-RAFTS model verified by the Rational Method calculations.

4

4.1

The subject site is identified on Gold Coast City Council Natural Hazard (Flood) Management Areas – Overlay May OM17-5. An extract of which is presented below:

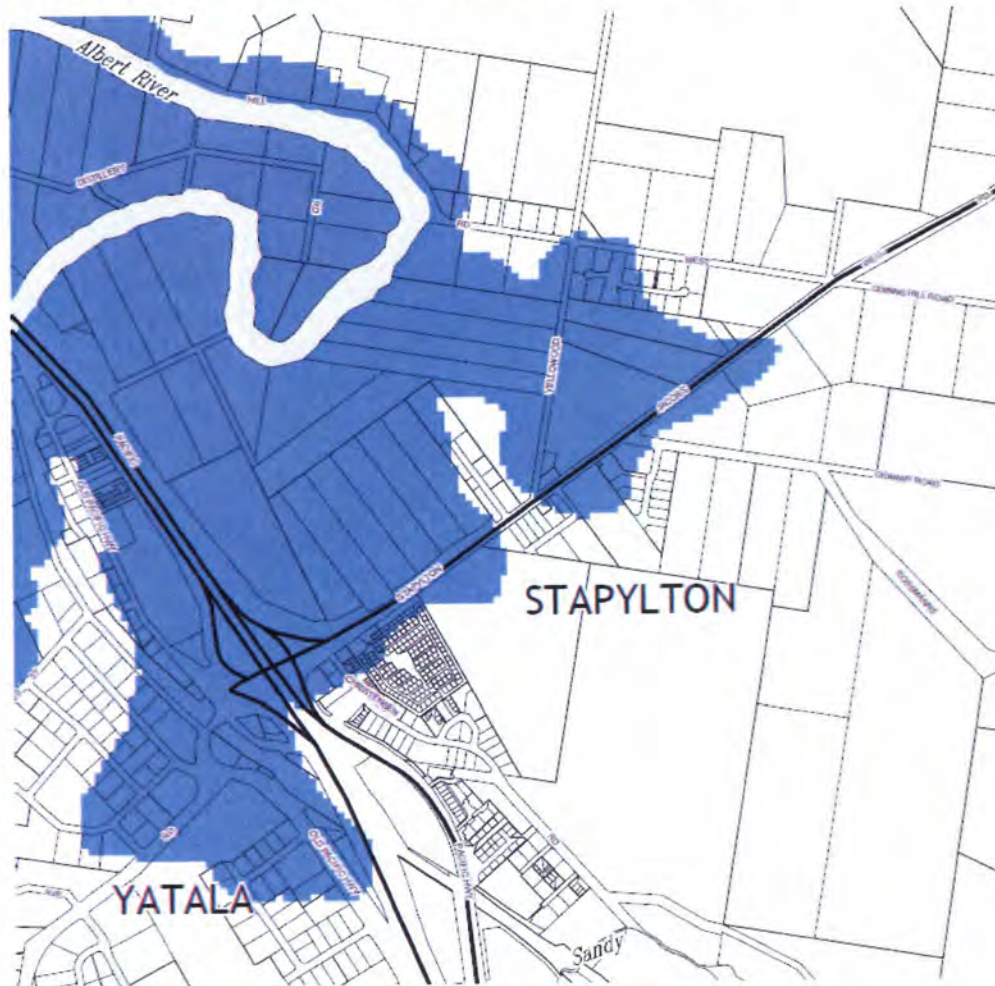


Figure 4.1 – GCCC Overlay May OM17-5.

In addition to this, Gold Coast City Council has issued a flood search report for the site indicating that the designated flood level is at RL 8.6m AHD; some 5.0m above the lowest site levels located around the culverts under Stapylton-Jacobs Well Road.

This mapping indicates that the site is subject to flooding from the Albert River. To ensure that this assumption is correct and that local flooding impacts are not affecting the site in excess of the regional floods, a one-dimensional HEC-RAS flood model of the subject site was created.

The results of the existing site flood modelling are presented below. Whilst indicating that the actual site flooding is not as extreme as the GCCC mapping, a large amount of inundation still occurs surrounding the Stapylton-Jacobs Well Road boundary of the site.

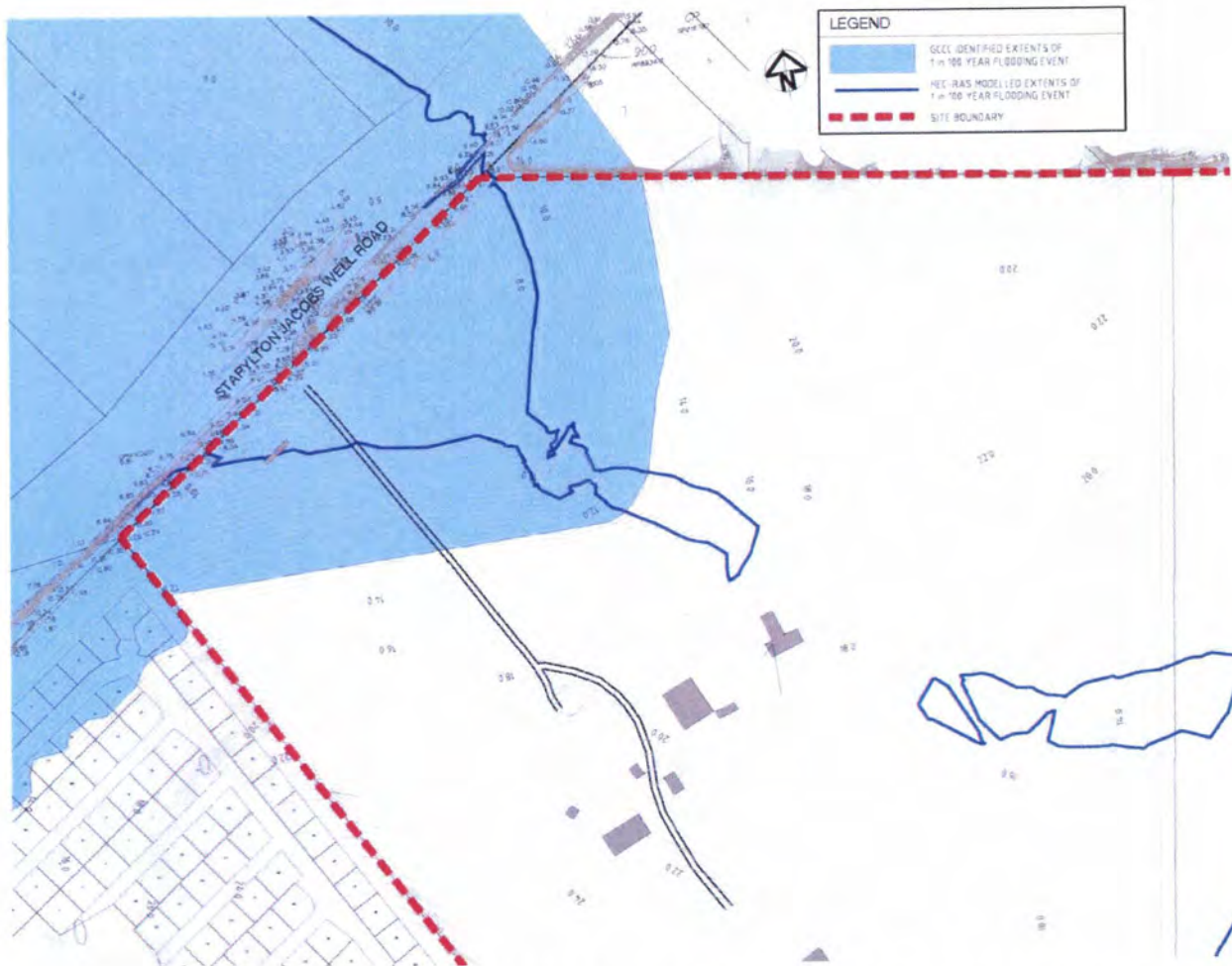


Figure 4.2 – GCCC Mapping & HEC-RAS Modelled Q100 Flooding in Plan (Local & Regional)

Further investigation of the on-site flooding in section reveal that regional flooding far exceeds local events and has a major impact on the site frontage to Stapylton-Jacobs Well Road.

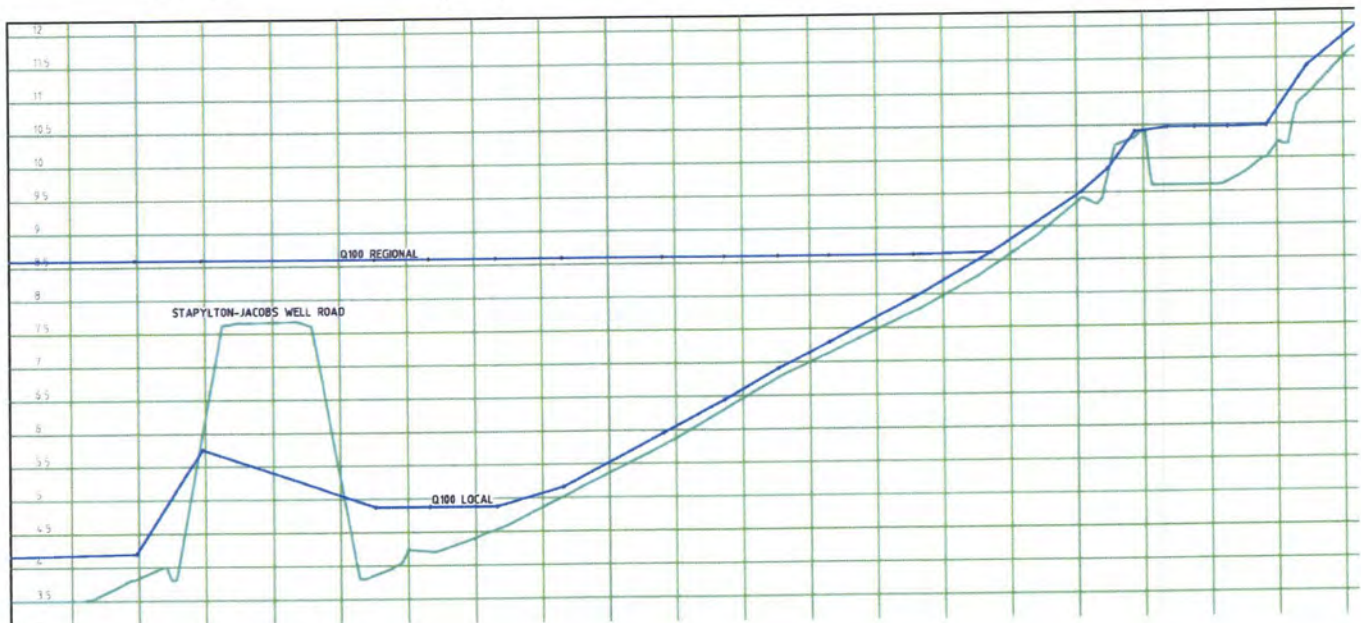


Figure 4.3 – Q100 Flooding at Stapylton-Jacobs Well Road Section (Local & Regional)

4.2 Existing Scenario Flood Volumes

On-site regional flood storage volumes have been calculated for the site based on the GCCC provided flood level of 8.6m AHD and the existing surface levels within the property boundary.

The exact volume of on-site regional flood storage is equal to **19,970m³**.

A description of the area used to calculate the regional flood storage volume is shown below:

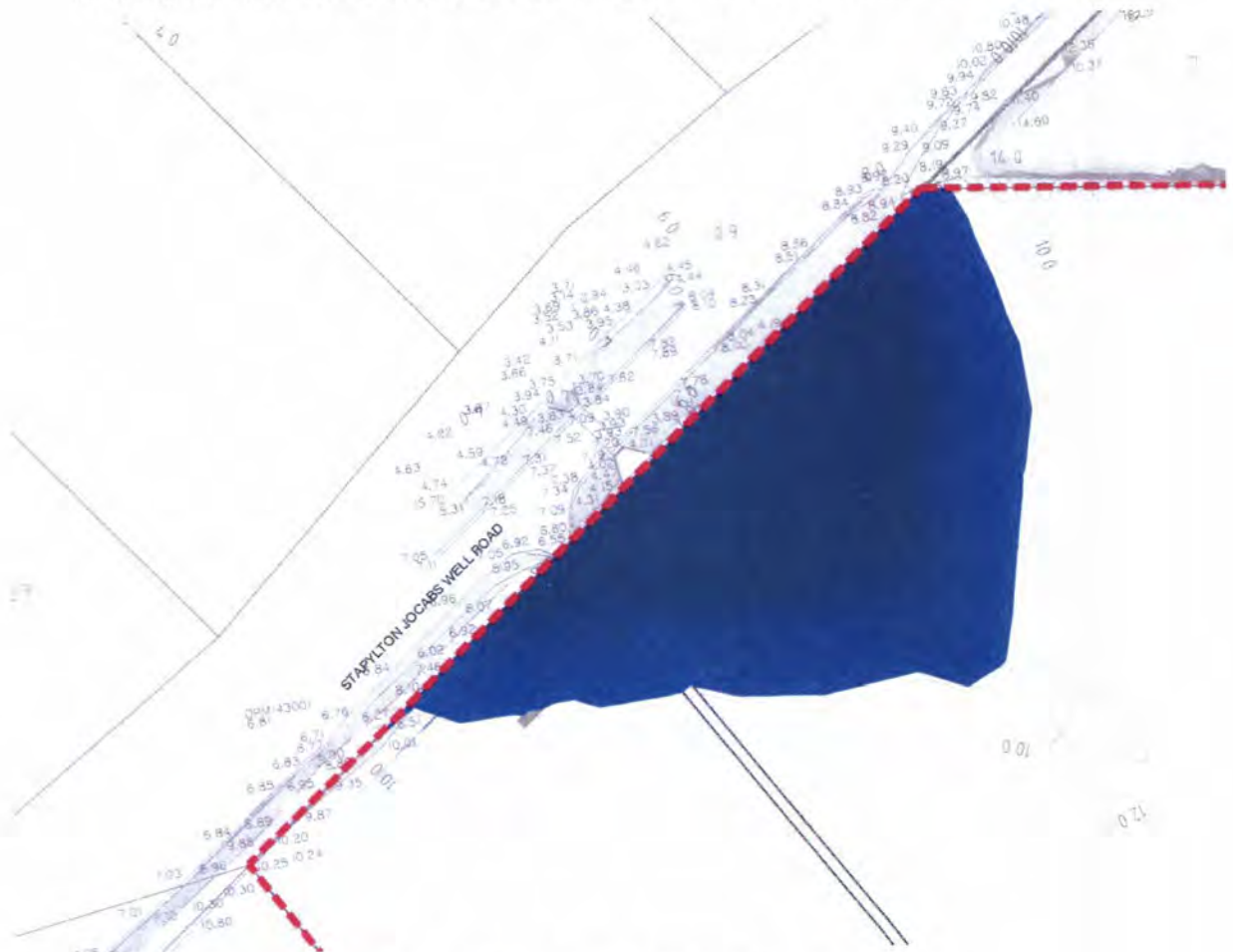


Figure 4.4 – Existing Regional Flood Volume Storage Calculation Description

4.3 Developed Scenario Site Flooding

To provide safe building levels for the proposed development, site earthworks are proposed to raise all allotment levels above the regional Q100 flood level, with the additional provision of freeboard as necessary.

In addition, the internal roadways have been designed to provide free conveyance of local storm events up to Q100.

A combined one-dimensional hydraulic model was created using HEC-RAS to assess the effectiveness of the roadways in conveying local storm events in combination with a simultaneous regional flooding event from the Albert River. At the critical location at the intersection of Road 1 and Stapylton-Jacobs Well Road the flooding extents are shown diagrammatically below:

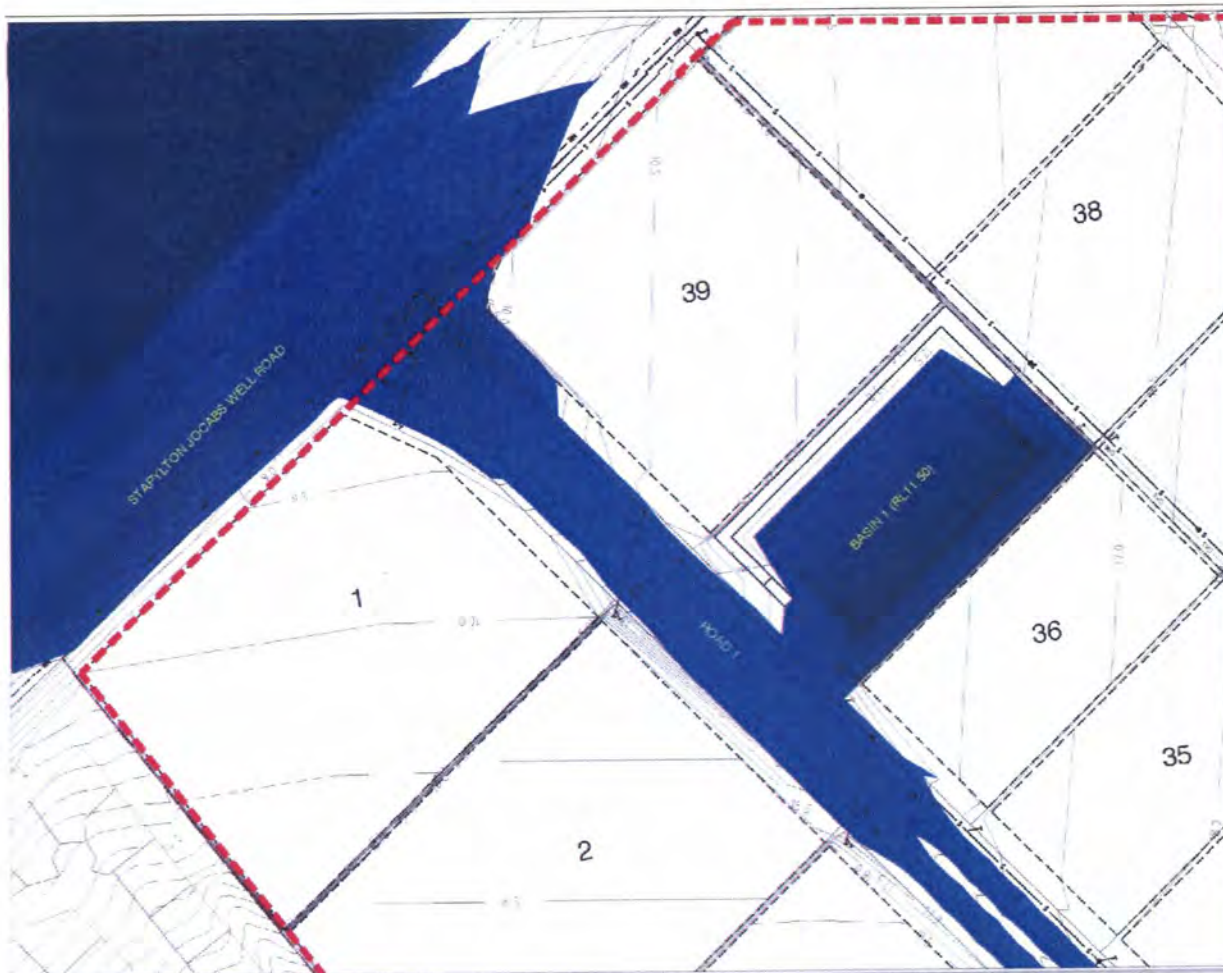


Figure 4.5 – Developed Case Flooding (Combined Local & Regional)

Regional flooding conditions do not affect the other four points of discharge. At these locations the combination of piped reticulation and overland flow via the roadways has been adequately designed to ensure the safe discharge of local storm event runoff.

The design of the proposed allotments and internal roadways has been undertaken to ensure that the proposed development is not unduly affected by local or regional flooding effects.

4.4 Developed Scenario Flood Volumes

As mentioned above, it is proposed to raise all allotments to safe levels above the regional Q100 flood event.

It is acknowledged that the filling of land within regional flood designated areas without the provision of compensatory flood storage can have adverse effects on the flood levels of adjoining properties or elsewhere within the flood extents.

It is therefore proposed that a compensatory excavation of **19,970m³** is undertaken on the allotments to the north-west of the subject site, identified as Lot 4 on RP6843, which is also owned by the property owner of the subject site.

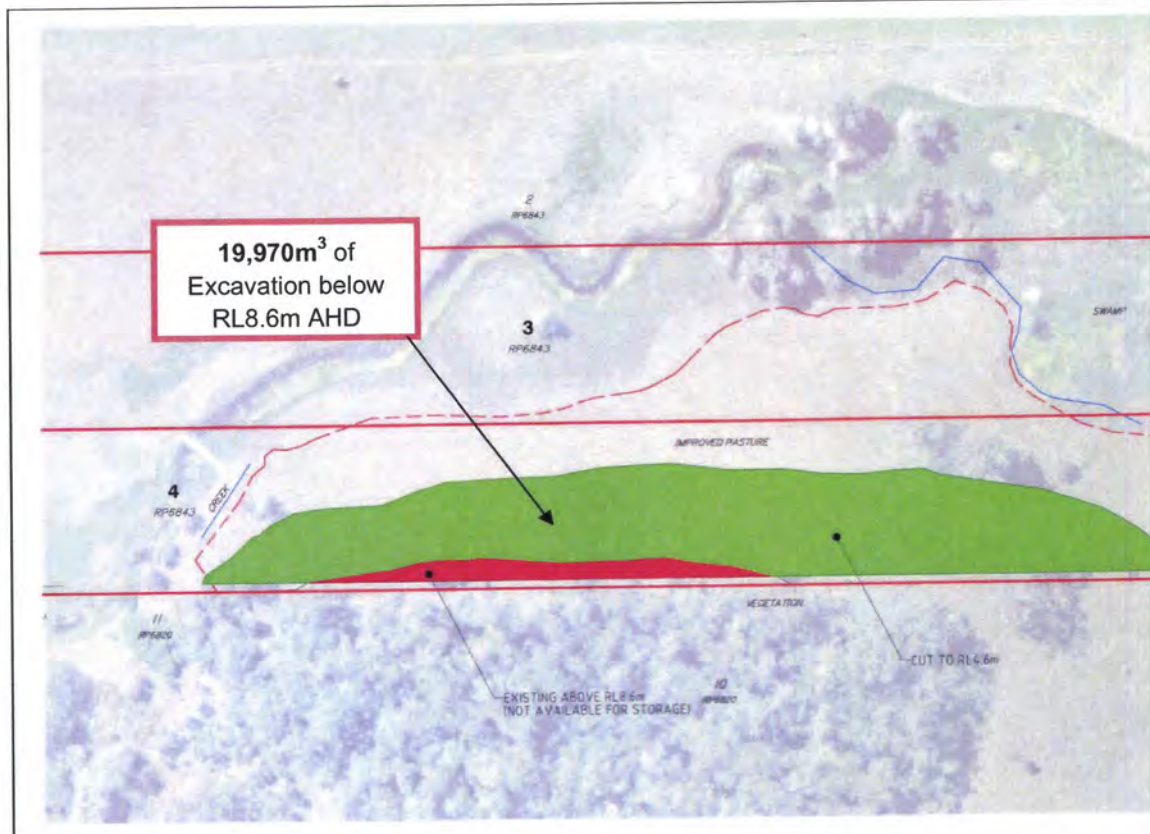


Figure 4.6 – Compensatory Excavation for Flood Storage Volume Balance

The area identified in Figure 4.6 is located immediately north-west of the subject site and is within the same flood plain which affects the subject site. Excavation of 19,970m³ of material below RL8.6m AHD and above the standing water line in this area will ensure a balance of flood storage volumes lost from the proposed development of the subject site.

Using three dimensional modelling of the site, the area identified in green above, excavated to RL4.6m AHD will provide suitable flood storage balance to compensate for the loss incurred by the filling of the subject site

4.5 Emergency Access and Egress

The proposed development has a total of four (4) main access locations. The intersection of Road 1 and Stapylton-Jacobs Well Road is subject to major flood inundation (refer to Figure 4.5) and is therefore unsuitable for access or egress during any flood events.

The staging of the development must be planned so that at least one of the following proposed alternative access and egress locations are available at all times the site is in operation:

- Road 3 and Debortoli Road (North)
- Angel Raod (North)
- Road 1 and Christensen Road (South)
- Road 4 and Christensen Road (West)

5 WATER SENSITIVE URBAN DESIGN (STORMWATER QUALITY)

5.1 Water Quality Environmental Values and Water Quality Objectives (WQO)

The Generations Industrial Park is located within the lower sub-catchments of the Logan River. As described previously in Section 3.4, stormwater runoff from the site is directed toward five (5) clearly defined and separate lawful points of discharge. From these points of discharge, runoff is directed in one of two general directions; either to the north-west and toward the Albert River, or to the south-east and toward Sandy Creek. Ultimately however both downstream receiving waterways join the Logan River at its lower estuarine reaches prior to discharge into the Southern Bay.

The Albert River receives runoff from approximately 10.8ha of the site. This runoff is directed under the culverts in Stapylton-Jacobs Well Road and via drainage in Debortoli Road, across the flood plain on the adjoining property and into the river.

The Sandy Creek receives runoff from approximately 43.4ha of the site. The runoff is directed toward the western boundary of the site where it is either received via drainage in the adjoining properties, or directly into the creek.

Both the Albert River and Logan River estuarine regions surrounding the development site are currently struggling with water quality issues. The Albert Estuary and Logan Estuary both received an "F" on the 2010 Healthy Waterways Report Card Results, being attributed to poor water quality, continued high nutrients, turbidity and low dissolved oxygen.

It is for these reasons that stormwater quality issues have been addressed in detail during the planning and design of the proposed development.

The Queensland Government Department of Environment and Resource Management has released specific Environmental Values and Water Quality Objectives for both the Albert River and the Logan River under Schedule 1 of the Environmental Protection (Water) Policy 2009. Both documents stipulate that stormwater design objectives for urban development are to be as per the "Urban Stormwater Quality Planning Guidelines 2009 (2010, as amended).

Therefore, in accordance with the Environmental Protection (Water) Policy 2009, the identified Water Quality Objectives are defined as:

Table 5.1 – Construction Phase Performance Criteria

Pollutant	Criteria
Drainage Control	Design life and design storm of temporary drainage works: 1. Disturbed area open for <12 months—1 in 2 ARI 2. Disturbed area open for 12-24 months—1 in 5 ARI 3. Disturbed area open for > 24 months—1 in 10 ARI
Erosion Control	1. Minimise exposure of disturbed soils at any time 2. Avoid or minimise large construction activities in the wet season 3. Divert water run-off from undisturbed areas around disturbed areas 4. Use erosion risk ratings to determine appropriate erosion control measures
Sediment Control	Use soil loss rates to determine appropriate sediment control measures Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water run-off Site discharge during sediment basin dewatering should not exceed 50 mg/L TSS and pH between 6.5–8.5
Water Quality Outcomes	Stormwater flows from undisturbed and disturbed areas —manage to help protect environmental values Coarse sediment —coarse sediment is retained on site Fine sediment —Site discharge during sediment basin dewatering has a TSS concentration less than 50 mg/L Turbidity —Site discharge during sediment basin dewatering has a turbidity (NTU) less than 10% above receiving waters turbidity— measured immediately upstream of the site Nutrients (N & P) —Nitrogen and phosphorus are managed through sediment control. pH —Site discharge during sediment basin dewatering has a pH range 6.5–8.5 Litter and other waste —Prevent litter/waste entering the site, the stormwater system or watercourses that discharge from the site. Also minimise or sufficiently contain on-site litter and waste production and regularly clear waste bins Hydrocarbons and other contaminants —Hydrocarbons and other contaminants are prevented from entering the stormwater system or internal watercourses that discharge from the site Wash down water —Wash down water is prevented from entering the stormwater system or internal watercourses that discharge from the site Cations and anions —Cations and anions including aluminium, iron and sulfate are managed as required under an approved acid sulphate soil management plan
Stormwater Drainage / Flow Management	Hydraulics and hydrology—Take all reasonable and practicable measures to minimise significant changes to the natural waterway hydraulics and hydrology from: • peak flow for the one-year and 100-year ARI event (respectively for aquatic ecosystems and flood protection) • run-off frequency and volumes entering receiving waters • uncontrolled release of contaminated stormwater

Table 5.2 – Water Quality Operational Phase Performance Criteria

Pollutant	Minimum reductions in mean annual loads from unmitigated development (%)
Total Suspended Solids (TSS)	80
Total Phosphorus (TP)	60
Total Nitrogen (TN)	45
Gross Pollutants > 5mm	90

5.2 Proposed Stormwater Improvement Devices

Water Sensitive Urban Design (WSUD) aims to minimise the impact of a development on the natural water cycle by reducing the export of pollutants, sediments and nutrients from the site into the natural watercourse. In order to treat the stormwater runoff from the site, various treatment devices can be used throughout the development area and these concepts can be integrated into the overall design of the road layouts, road cross sections, stormwater layouts and water supply reticulation systems. Stormwater from the development will follow a specially designed *stormwater quality treatment train* prior to discharge from the site, which will ensure compliance with the water quality objectives.

As identified in Section 3 there are five separate Lawful points of discharge. The proposed stormwater treatment train shall include specific devices aimed at achieving the water quality objectives at each of the discharge locations.

The stormwater treatment train for each discharge location shall include a combination of the following treatment devices:

5.2.1 Rainwater Tanks

Rainwater tanks behave as stormwater quality improvement devices by removing stormwater from the treatment train which is used for irrigation, toilet flushing, car washing and various other non-potable uses.

Rainwater tanks are a requirement of all new developments under the Queensland Development Code so it is therefore considered appropriate to assume and model a volume of rainwater capture and re-use in the assessment of stormwater quality and treatment train effectiveness.

The following steps were taken to calculate the volume of rainwater tanks which are assumed to be included in the operational phase of the development and the amount of re-used rainwater which will be removed from the treatment train for toilet flushing.

1. The total equivalent tenements (ETs) assumed to use each lot and catchment area was calculated using the development yield of 12ET/ha.
2. A conversion of 4 equivalent people (EP) per ET was then used to calculate the total people using the developed areas.

3. Using the Building Code of Australia (BCA), Section F states that one pedestal is required for each 20 people for the proposed type of development.
4. The Queensland Development Code (QDC) MP4.3 states that the proposed type of buildings in the operational phase are required to supply 50% of the total toilets with flushing water from an alternative source. The code then states that each required toilet is to be supported by 1,500L of tank storage capacity if a rainwater tank is to be used.
5. A total tank volume for each MUSIC modelled catchment was then calculated based on the proposed end usage and the toilet flushing requirements in accordance with the BCA and QDC.
6. The re-use rate of the captured rainwater for toilet flushing was then calculated using the Water by Design MUSIC Modelling Guidelines to be 40L/person/day.

Table 5.3 below provides a summary of the modelled rainwater tank inputs and calculations:

Table 5.3 – Rainwater Tank Modelling Summary

Sub-Catchment	Area (ha)	ET's (12ET/ha)	EP's (4EP/ET)	Pedestals	Required Pedestals (50%)	Tank Vol (kL)	Re-use (kL/d)
1	19.37	309.92	1239.68	62	31	46.5	49.5872
4	5.63	90.08	360.32	19	10	15	14.4128
5	3.777	60.432	241.728	13	7	10.5	9.66912
6	9.59	153.44	613.76	31	16	24	24.5504
7a	6.067	97.072	388.288	20	10	15	15.53152
7b	5.055	80.88	323.52	17	9	13.5	12.9408
8	0.639	10.224	40.896	3	2	3	1.63584
9	0.8	12.8	51.2	3	2	3	2.048
10a	7.701	123.216	492.864	25	13	19.5	19.71456
10b	3.86	61.76	247.04	13	7	10.5	9.8816

5.2.2 Bio-Retention Basins

A bio-retention area is a vegetated region where runoff is filtered through a filter media layer (e.g. sandy loam) as it percolates downwards to receiving underlying reticulation. Specific vegetation is incorporated into the landscaping of bio-retention areas which promote nutrient uptake and effectively reduce nutrient loads on the discharging stormwater. Appendix A of Healthy Waterways' Water Sensitive Urban Design Technical Guidelines for South East Queensland provides guidance on selecting appropriate plant species for systems where the plants have a functional role in stormwater treatment, such as the aforementioned bio-retention basins.

Bio-retention areas are incorporated into the proposed development with both sediment forebays and planted bio-retention filter areas. The sediment forebay is to mitigate the accumulation of coarse sediment near the basin inflow, which may smother vegetation and reduce infiltration.

A typical section of a bio-retention area is presented in Figure 4.1 below.

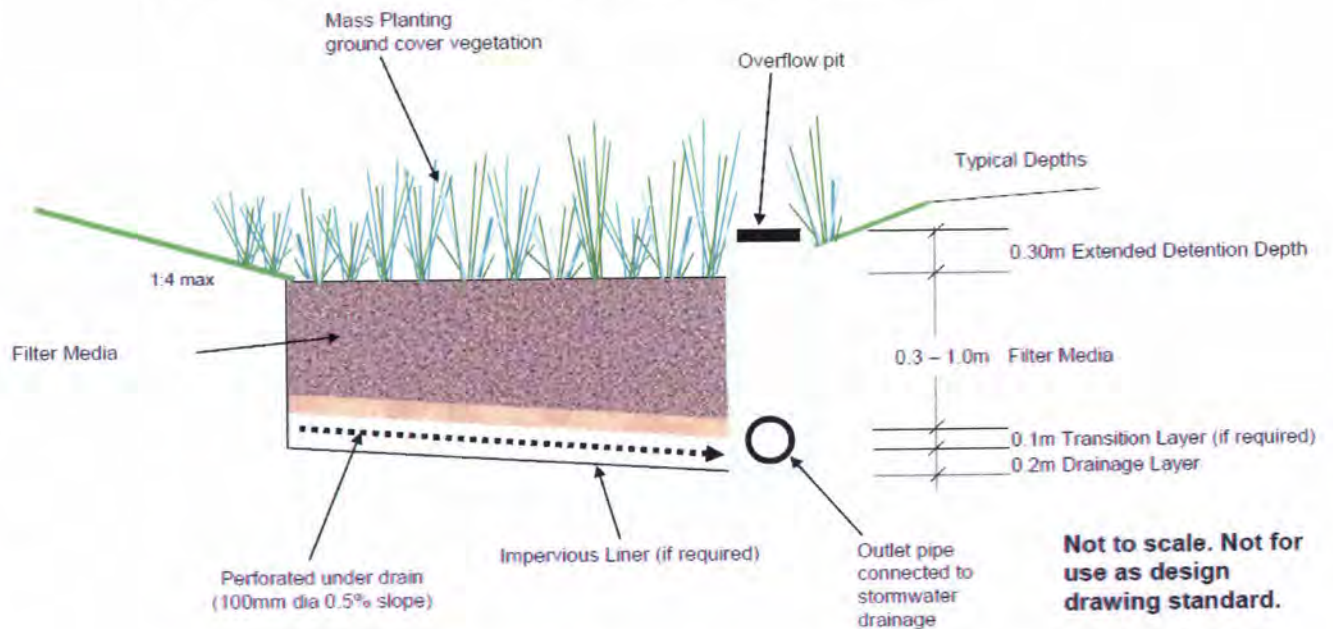


Figure 5.1 – Bio-Retention Basin Typical Cross-Section (courtesy of Healthy Waterways)

Sediment Forebays

Given the potential for coarse sediment accumulation in the proposed industrial-use allotments being created it is considered critical to ensure the accurate design and provision of sediment forebays upstream of each of the proposed bio-retention basins to ensure that the vegetation within the basin is not smothered by high sediment loadings, and that the receiving waterways downstream are also protected.

Each sediment forebay has been designed specifically in accordance with Section 5.3.3.2 of the Healthy Waterways WSUD Technical Guidelines (2006). Each forebay has been designed to achieve 80% efficiency in the removal of particles that are 1mm or greater in diameter from the 1 year ARI storm event and provide appropriate storage for coarse sediment to ensure de-silting is required once every 2 years.

Bio-retention Areas

Each bio-retention area has been designed specifically in accordance with Chapter 5 of the Healthy Waterways WSUD Technical Guidelines (2006). All bio-filtration areas have been modelled with an extended detention depth of 0.3m, a high flow bypass relative to the inlet from the internal reticulation (i.e. 2 year ARI storm event), filter median particle diameter of 0.45mm and a saturated hydraulic conductivity of 200mm/hr (sandy loam). The following table summarises the individual spatial requirements of the bio-retention areas in each area of the development.

Details of the exact locations and design of the proposed treatment devices areas are also presented in the Engineering Drawings in Appendix B.

Table 5.4 – Bio-Retention Area Requirements

Basin	Contributing Catchments	Contributing Catchment area	Coarse Sediment Forebay Details	Filter Media Surface Area	Total Base Area of Basin
Basin 1	Catchment 10	3.86ha	Area = 17m ² depth = 0.5m	2,080m ²	2,097m ²
Basin 2	Catchment 7	1.80ha	Area = 15m ² depth = 0.5m	1,300m ²	3,657m ²
Basin 3	Catchment 1	19.37ha	Area = 37m ² depth = 0.3m	3,900m ²	10,975m ²
	Catchment 4	5.63ha	Area = 14m ² depth = 0.3m		
	Catchment 5	3.77ha	Area = 8m ² depth = 0.3m		
	Catchment 6	9.59ha	Area = 17m ² depth = 0.3m		
Basin 4	Catchment 8	0.22ha	Area = 2m ² depth = 0.3m	0m ²	165m ²

The Bio-retention basins have additionally been modelled with the following general data for the filter media and civil engineering design:

Table 5.5 – Bio-retention Basin General Data Summary

Basin	Filter Depth	Filter Media Hydraulic Conductivity	Submerged Zone with Carbon (Wood chips)	Filter Media Surface Area	Total Base Area of Basin
Basin 1	500mm	200mm/hr	250mm	2,080m ²	2,097m ²
Basin 2	500mm	200mm/hr	0mm	1,300m ²	3,657m ²
Basin 3	500mm	200mm/hr	0mm	3,900m ²	10,975m ²

5.2.3 Gross Pollutant Traps

Gross Pollutant Traps (GPT's) are devices used for the removal of solids conveyed by stormwater. The GPTs which are proposed for use in the site are Rocla CDS Units (or approved equivalents), which also target the removal of smaller particles, as well as oil and grit. A GPT like the CDS unit protects lakes, rivers, streams and coastal areas from hazardous material spills and daily stormwater runoff.

The CDS unit includes a continuously deflective screen to divert solids in the stormwater and a sump designed to capture and store gross pollutants and coarse sediment.

The GPTSs have been specifically sized to receive the piped reticulation system on-line (i.e. Q₂) and divert and treat the more frequent design flows closer to Q_{3month}.

The CDS GPT unit is a major component of the stormwater treatment train and is relied upon for a large portion of the treatment to runoff discharging toward Albert River. The First Defence GPT unit is a smaller system, included to assist treatment to the runoff directed to Debortoli road, which does not discharge via any bio-retention.

Water by Design Music Modelling Guidelines (2010) state that where GPTs are reported, accompanying information must be provided to describe the independently verified pollutant reduction parameters, performance under dry weather flows, high flow bypass rate, and calculations relating to storage volumes. An independent assessment of the CDS units has been undertaken by Alison et al (1999) which provides pollutant reduction parameters and dry weather performance. No such independent testing data is available for the First Defence unit, therefore the pollutant reduction values provided in the GCCC Music Modelling Guidelines (2006) have been employed.

In accordance with Alison et al (1999) and the GCCC Music Modelling Guidelines (2006), the following pollutant reduction values have been applied to each of the GPT units:

Table 5.6 – GPT Pollutant Reductions

Pollutant	CDS Unit	First Defence
TSS	91%	50%
TP	30%	20%
TN	13%	0%

The high flow bypass rates for the GPT systems have been designed using the hydrologic assessment presented in Section 3. Below is a summary of each unit.

Table 5.7 – GPT Flow Rates

Unit	Location	Catchment Area	Q ₂ Flow Rate	Q _{3month} Flow Rate
CDS1015	Stapylton-Jacobs Well Road Discharge (Catchment 10)	11.561ha	2.48m ³ /s	0.94m ³ /s
First Defence	Debortoli Road Discharge (Catchment 9)	0.812ha	0.13m ³ /s	0.34m ³ /s

The storage capacity of the GPT units has been confirmed via the use of manufacturer's specifications and the results of the MUSIC modelling of the pollutant generation and capture. Volumetric conversions have been calculated based on a rate of 260kg/m³ for gross pollutants and 1600kg/m³ for TSS.

Table 5.8 – GPT Storage Volume

Unit	Sump Volume	Mean Annual Loads of Suspended Solids	Mean Annual Loads of Gross Pollutants
CDS1015	>10.0m ³	4020kg/year (2.52m ³ /year)	516.1kg/year (2.07m ³ /year)
First Defence	2.46m ³	870kg/year (0.55m ³ /year)	138.6kg/year (0.53m ³ /year)

Based on three outputs, the CDS1015 will accumulate 4.59m³ of combined TSS and gross pollutants a year. The First Defence will accumulate 1.08m³ of combined TSS and gross pollutants a year.

Therefore, each unit will require cleaning out at an average rate of once every two years.

5.2.4 Grass Swale

Referring to Figures 3.9 and 3.10, Catchment 6 directs runoff toward Discharge 1 and ultimately toward Sandy Creek. Whilst the exact lot layout and site earthworks within this catchment are not fully determined at the time of preparation of this report, site constraints resulting from the existing topography and proposed layout of the surrounding allotments are likely to restrict the ability for this catchment to be directed into Basin 3.

The modelling of the site, which is discussed in the next section, indicates that the overall discharge toward Sandy creek is compliant with regards to nitrogen and phosphorus reductions based solely on the two large bio retention basins (Basin 2 & Basin 3), however the untreated discharge from Catchment 6 contributes too much total suspended solids.

Based on the topography of the catchment, it is expected that the site will be generally graded toward the eastern property boundary where a drainage system will most likely be located to direct runoff in a northerly direction toward Discharge 1. Based on this assumption, the allocation of a grass swale in the future design is proposed to both convey this runoff, and provide the necessary TSS reduction to contribute to the overall compliance of the Sandy Creek discharge.

A grass swale has therefore been modelled with 100m length (i.e. half the assumed constructed length), a 1m base, a 4m wide top width and 1 in 4 batters, running at a nominal 1% grade.

A sensitivity analysis has also been undertaken on Catchment 6 to provide options for the future development of the allotments, which has indicated that a CDS1015 GPT unit (or approved equivalent) may be utilised in replacement of the swale.

5.3 Modelling of the Developed Site

Modelling of the site was undertaken using the 'Model for Urban Stormwater Improvement Conceptualisation (MUSIC)' as promoted by the South East Queensland Healthy Waterways Partnership. An appropriate type of land use was applied to all developed sub-catchments based on the proposed development's characteristics for an industrial land use. Each individual treatment system was assigned the relevant modelling treatment module. Consequently, a treatment train was established for each sub-catchment and ultimately combined to control the total discharge from the development area.

5.3.1 Rainfall Data

Meteorological data for input to MUSIC was obtained for the "Beenleigh Bowls Club", Station ID 40406, from the Australian Bureau of Meteorology. Six-minute time step rainfall data was obtained from the years 1990 - 2000.

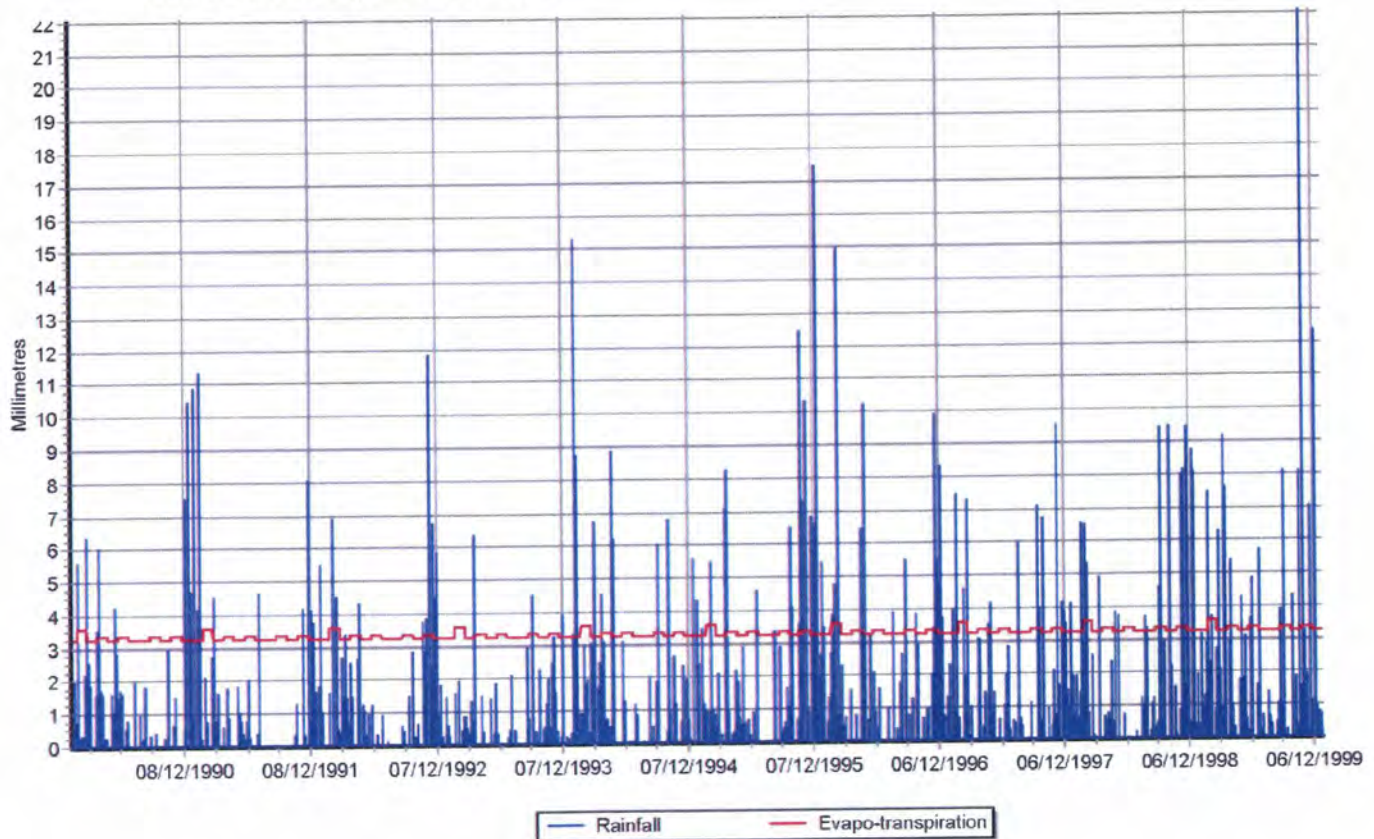


Figure 5.2 Bureau of Meteorology Rainfall Data

The catchment parameters of the MUSIC modelling were applied in accordance with the South East Queensland Healthy Waterways Partnerships' Water by Design MUSIC Modelling Guidelines for South East Queensland Version 1 (2010).

5.3.2 Pollutant Source Node Details

Table 4.6 and 4.7 below show the pollutant source node parameters input to the MUSIC model determined using the South East Queensland Healthy Waterways Partnership's Water by Design MUSIC Modelling Guidelines for South East Queensland.

Table 5.9 – Rainfall – Runoff Parameters

(Industrial)	
Soil Storage Capacity (mm)	18
Initial Storage (%)	10
Field Capacity (mm)	80
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Baseflow Rate (%)	0

Table 5.10 –Rainfall – Runoff Parameters

Lumped Industrial Catchment	TSS log values		TP log values		TN log values	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Base Flow	0.78	0.45	-1.11	0.48	0.14	0.20
Storm Flow	1.92	0.44	-0.59	0.36	0.25	0.32

5.3.3 MUSIC Model Layout

The layout of the site and the proposed drainage pattern were considered in the creation of the MUSIC model. Figure 4.3 below presents the layout of source, treatment and receiving nodes used in the modelling.

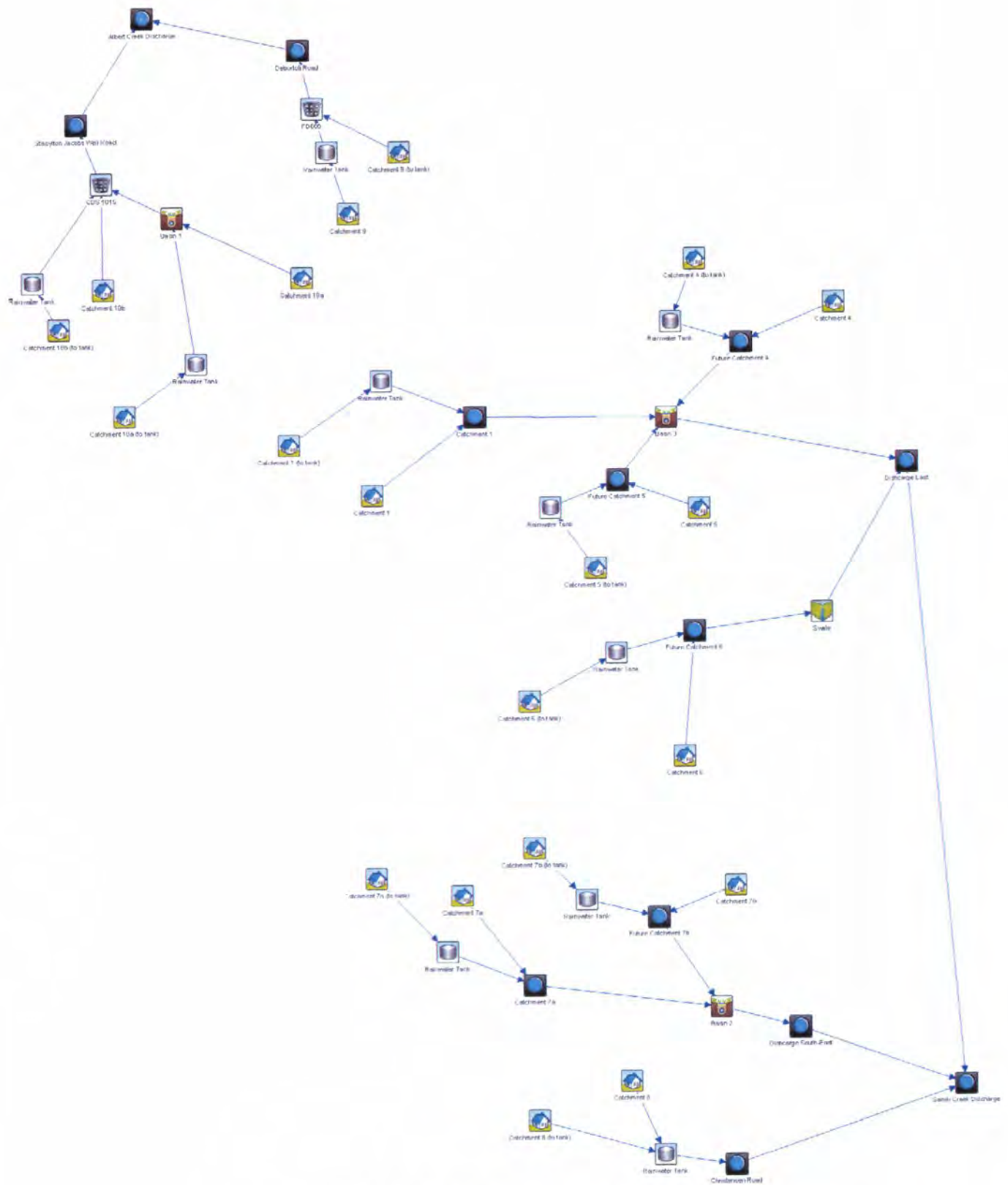
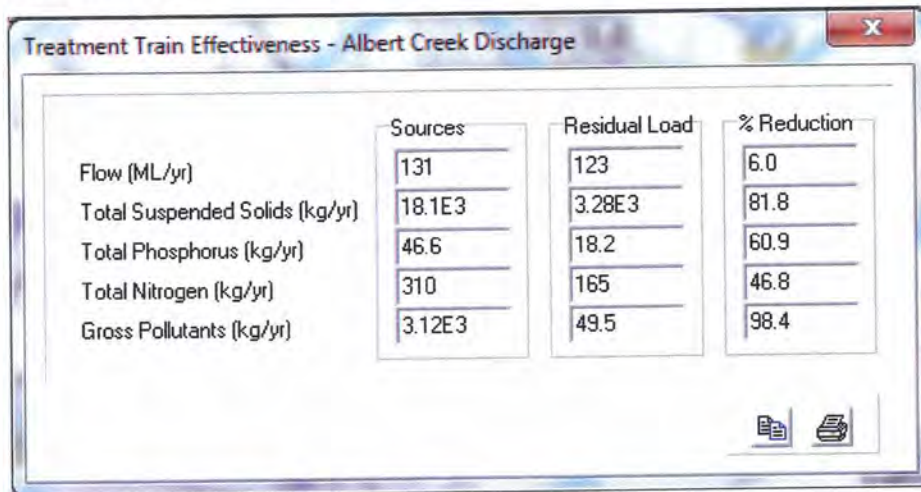


Figure 5.3 – MUSIC Model Layout

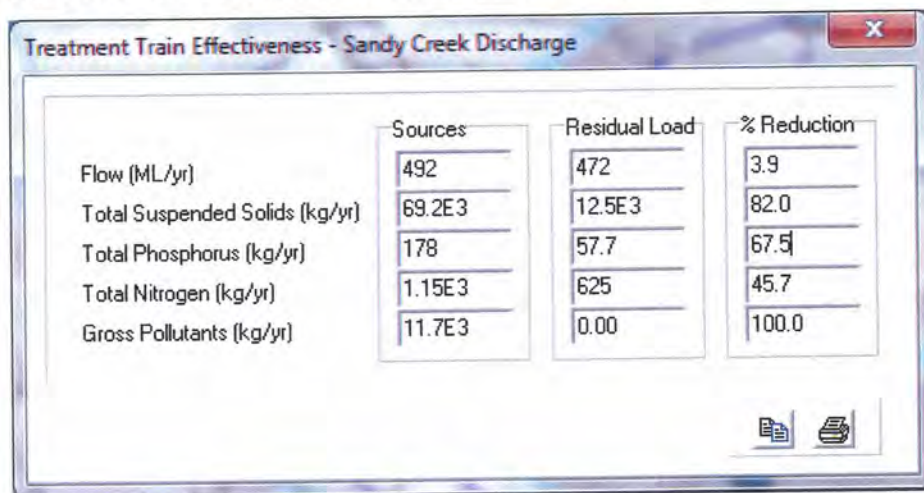
5.3.4 MUSIC Results

The results of the treatment train effectiveness for each identified lawful point of discharge are presented below.



	Sources	Residual Load	% Reduction
Flow (ML/yr)	131	123	6.0
Total Suspended Solids (kg/yr)	18.1E3	3.28E3	81.8
Total Phosphorus (kg/yr)	46.6	18.2	60.9
Total Nitrogen (kg/yr)	310	165	46.8
Gross Pollutants (kg/yr)	3.12E3	49.5	98.4

Figure 5.4 – MUSIC Results – Albert Creek Discharge



	Sources	Residual Load	% Reduction
Flow (ML/yr)	492	472	3.9
Total Suspended Solids (kg/yr)	69.2E3	12.5E3	82.0
Total Phosphorus (kg/yr)	178	57.7	67.5
Total Nitrogen (kg/yr)	1.15E3	625	45.7
Gross Pollutants (kg/yr)	11.7E3	0.00	100.0

Figure 5.5 – MUSIC Results – Sandy Creek Discharge

It is noted that the MUSIC results indicate that the treatment train is effective for each lawful point of discharge in achieving the load reduction targets given in Table 4.2.

5.4 Construction Phase Water Quality

During the construction phase of the development, an Erosion and Sediment Control Program will be implemented to minimise water quality impacts. A detailed Erosion and Sediment Control Program will be employed throughout the site; the sediment control measures shall include silt fences, cut-off drains for polluted stormwater and diversion channels for clean stormwater runoff, gully pit sediment barriers, field inlet sediment traps and temporary bio-retention filter protection.

Details of the sediment and erosion control measures shall be provided on the engineering drawings for the clearing, site earthworks and civil engineering works. The stormwater detention/bio-retention basins which are to be utilised in the operational phase have been

strategically located to serve as construction phase sediment basins for 1 – 5, 7, 8 and 10. Catchments 9 and 6 do not discharge via basins in the developed case scenario and will therefore most likely require the construction of temporary sediment basins during construction phase.

Details of the required construction phase water quality control measures shall be provided on the engineering drawings and shall be in accordance with the Queensland State Planning Policy for Healthy Waters (SPP4/10). However, the contractor shall be responsible for the provision of the construction phase water quality objectives which shall be enforced by the preparation and implementation of an Erosion and Sediment Control Program.

The following information is provided to identify controls and procedures, and who is responsible for them, which will be incorporated into the Erosion and Sediment Control Program.

5.4.1 Pre-Construction

- Establish a single stabilised entry/exit point (rumble pad) for each stage of construction. This point should also include a vehicle shakedown device to mitigate the transportation of dust and dirt.
- Sediment fences are to be placed along the low side of the site to slow flows, reduce scour and capture some sediment runoff.
- Sediment fences are to be constructed at the base of fill embankments.
- Divert up-slope water around the work site and appropriately stabilise any drainage channels.
- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds.
- Diversion banks are to be created at the upstream boundary of construction activities to ensure upstream runoff is diverted around any areas to be exposed. Catch drains are to be created at the downstream boundary of construction activities.
- Construction of temporary sediment basins.
- Site personnel are to be educated to the sediment and erosion control measures implemented on site.

5.4.2 During Construction

- Progressive re-vegetation of filled areas and fill batters.
- Construction activities are to be confined to the necessary construction areas.
- The provision of a construction exit to prevent the tracking of debris from tyres of vehicles onto public roads. Only one construction exit will be nominated to limit the movement of construction equipment.
- The topsoil stockpile location will be nominated to coincide with areas previously disturbed. A sediment fence is to be constructed around the bottom of the stockpile to trap sediment. A diversion drain is to be installed upstream of the stockpile if required.
- Roof downpipes should be installed as soon as practicable after the roof is laid.
- Transport loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants to the stormwater system.
- Regular inspection and maintenance of silt fences, sediment basins and other erosion control measures. Following rainfall events greater than 50mm inspection of erosion

control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be preformed immediately.

5.4.3 Post Construction

- The Contractor/Developer will be responsible for the maintenance of erosion and sediment control devices from the possession of the site until the site is accepted 'Off Maintenance' or until stabilisation has occurred to the satisfaction of the superintendent and Council.
- Key stormwater quality improvement devices requiring maintenance during the operational phase of the project following construction are the bio-retention areas and the gross pollutant traps.

Maintenance requirements for these devices consist of:

- Regular and storm event inspection to ensure:
 - Sufficient vegetation within bio-retention areas; and
 - Ensuring no erosion has occurred.
 - Regular mowing/harvesting to ensure vegetation is maintained at acceptable levels.
 - Removal of litter within verges, swales and bio-retention areas.
 - Regular trash removal.
- The Sediment and Erosion Control Management Plans should be provided to all people involved with the site, including sub-contractors, private certifiers, home owners and regulators. These guidelines have been formed in accordance with the Healthy Waterways Fact Sheet 'Erosion and Sediment Control Management Plans' and the 'Best Practice Erosion and Sediment Control.'

5.5 Water Quality Monitoring Program

This development does propose the use of water sensitive practices and the associated stormwater quality management practices at the outlet areas. The stormwater runoff will eventually discharge into sensitive waterways, but there is no proposal for water quality monitoring within the drainage infrastructure downstream of the site to be undertaken. The stormwater treatment devices used in this plan are based upon the Healthy Waterways Technical Design Guidelines for South East Queensland and represent best mangment practices.

A form for release of sediment-laden stormwater from the site and an inspection record of stormwater quality improvement devices will be developed. It is intended that each release resulting from a storm event generating more than 100mm in a twenty-four hour period be recorded on the form to ensure ongoing monitoring, management and reporting of releases from the site.

6

MAINTENANCE

All the stormwater quantity and quality controls detailed in this document shall be handed over to Gold Coast City Council.

The coarse sediment forebays have been designed to reduce the maintenance requirements and cleaning frequency as much as possible. Instead of desilting occurring every year the forebays have been designed that desilting should take place once every two years.

The Gross Pollutant traps additionally have been allocated adequate sump storage volume to allow for two average years of accumulation before requiring clean-out.

Particular care has been taken in the design of the proposed stormwater treatment train to reduce the maintenance requirements as much as possible.

It is strongly recommended that inspections are performed on the bio-retention areas upon completion of construction and at regular maintenance intervals of a maximum of 6 months. Regular maintenance of the bio-retention areas should be completed to ensure that the bio-retention media and under-drainage, outlet structures, landscaping and associated infrastructure is operating at full design specification. Any construction amendments that are required should be completed in accordance with the Healthy Waterways WSUD Technical Guidelines (2006) Chapter 5.

Mandatory inspections will be required to be undertaken for commencement of the On-Maintenance and Off-Maintenance phases.

It is generally understood that On-Maintenance acceptance of bio-retention basins will only occur upon 80% completion of development of the upstream catchment area. Therefore, if staged construction is proposed the developer is advised to protect the bio-retention filter media with geo-fabric covering, silt fences and regular maintenance of the coarse sediment forebays.

Example Inspection checklists are presented as an appendix to this report.

CONCLUSION

This Stormwater Management Plan (SWMP) has been prepared for submission Gold Coast city Council in support of a development application for the proposed "Generations Industrial Park" development at Stapylton, Queensland, Australia.

This SWMP has been prepared to demonstrate suitable compliance with local, state and national requirements as required satisfying the requirements of each stakeholder.

This SWPM has covered the two primary objectives,

3. Hydrologic/Hydraulic assessment of the site.

Five lawful points of discharge have been identified for the site. For each lawful point of discharge the contributing catchment areas have been assessed and the existing case runoff characteristics have been presented.

The impact of the proposed development on the existing case runoff characteristics has been presented.

To mitigate the potential increase in peak discharge runoff from the site and local storm event flooding levels on the adjoining properties stormwater detention structures have been designed and assessed for performance

It have been demonstrated that the proposed stormwater detention devices are effective in restoring the existing case runoff characteristics to the developed site and no-worsening of infrastructure capacity or flooding levels to any downstream properties are expected.

4. Water Sensitive Urban Design.

To achieve operational phase stormwater quality objectives a number of stormwater treatment devices have been proposed. The effectiveness of the proposed stormwater treatment train has been modelled and assessed for compliance with local, state and national requirements.

It has been demonstrated that the proposed development of the site has adequate stormwater quality controls to achieve all necessary compliance.

Specific construction phase stormwater quality objectives and control measures have been presented which are to be complied with during the preparation and implementation of future construction phase erosion and sediment control plans.

8

CERTIFICATION

Hyder Consulting as professional Civil & Environmental Engineers certify that the proposed stormwater treatment train contained within this report and associated design drawings is a true and accurate reflection of the proposed measures to be incorporated into the development.

Travis Seresheff

RPEQ 8677

Date

Travis Seresheff
25/8/2011

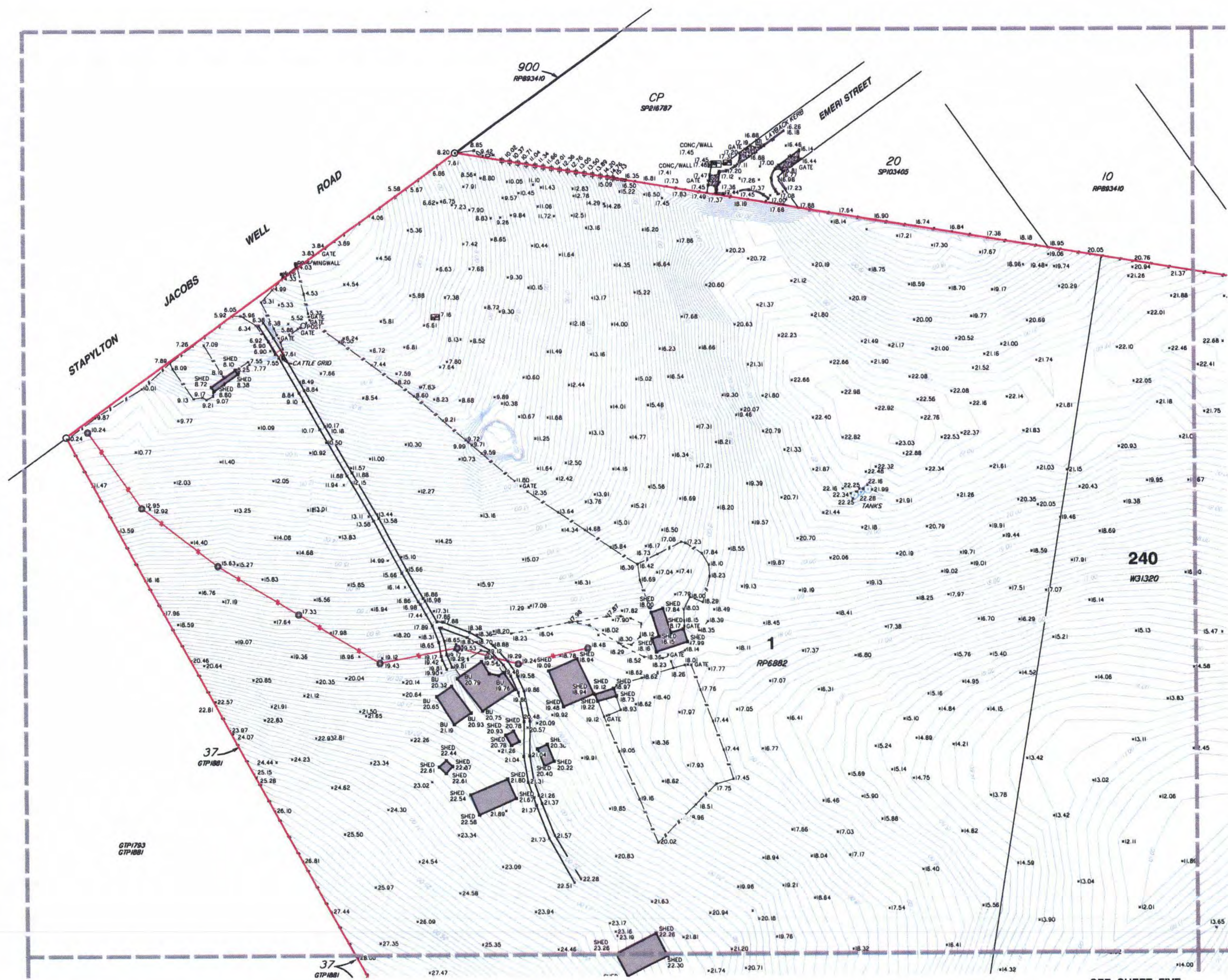
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- Water By Design (2010), MUSIC Modelling Guidelines Vol 1.0

APPENDIX A

SITE SURVEY DATA





- LEGEND**
- PERMANENT MARK
 - SEWER MANHOLE
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
 - ELECTRICITY POLE
 - ELECTRICITY POLE WITH LIGHT
 - TELSTRA PIT
 - MANHOLE
 - STORMWATER MANHOLE
 - GULLY TRAP
 - WATER METER
 - FIRE HYDRANT
 - VALVE
 - GATE
 - BOLLARD
 - CONCRETE
 - EDGE OF BITUMEN
 - FENCE
 - OVERHEAD ELECTRICITY
 - OPEN DRAIN
 - RETAINING WALL
 - EDGE OF GARDEN
 - CONTOUR LEVEL

Notes

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Project		CONTOUR AND DETAIL PLAN	
		Over Lot 1 on RP6882 and Lot 240 on WD31320	
Parish of		ALBERT	
County of		Gold	
Local Govt		GOLD COAST CITY COUNCIL	
Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	IS133471	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.169		
Scale (on A1 original)		Designed	
1:1000		Drawn	
		Date Designed	

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REFERENCE No. **5093-10**
PLAN No. **5093 S CD 01**

Scale 1:1000 - Lengths are in Metres.

0 10 20 30 40 50 60 70 80

SEE SHEET THREE

SEE SHEET FIVE



- LEGEND**
- PERMANENT MARK
 - SEWER MANHOLE
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
 - ELECTRICITY POLE
 - ELECTRICITY POLE WITH LIGHT
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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

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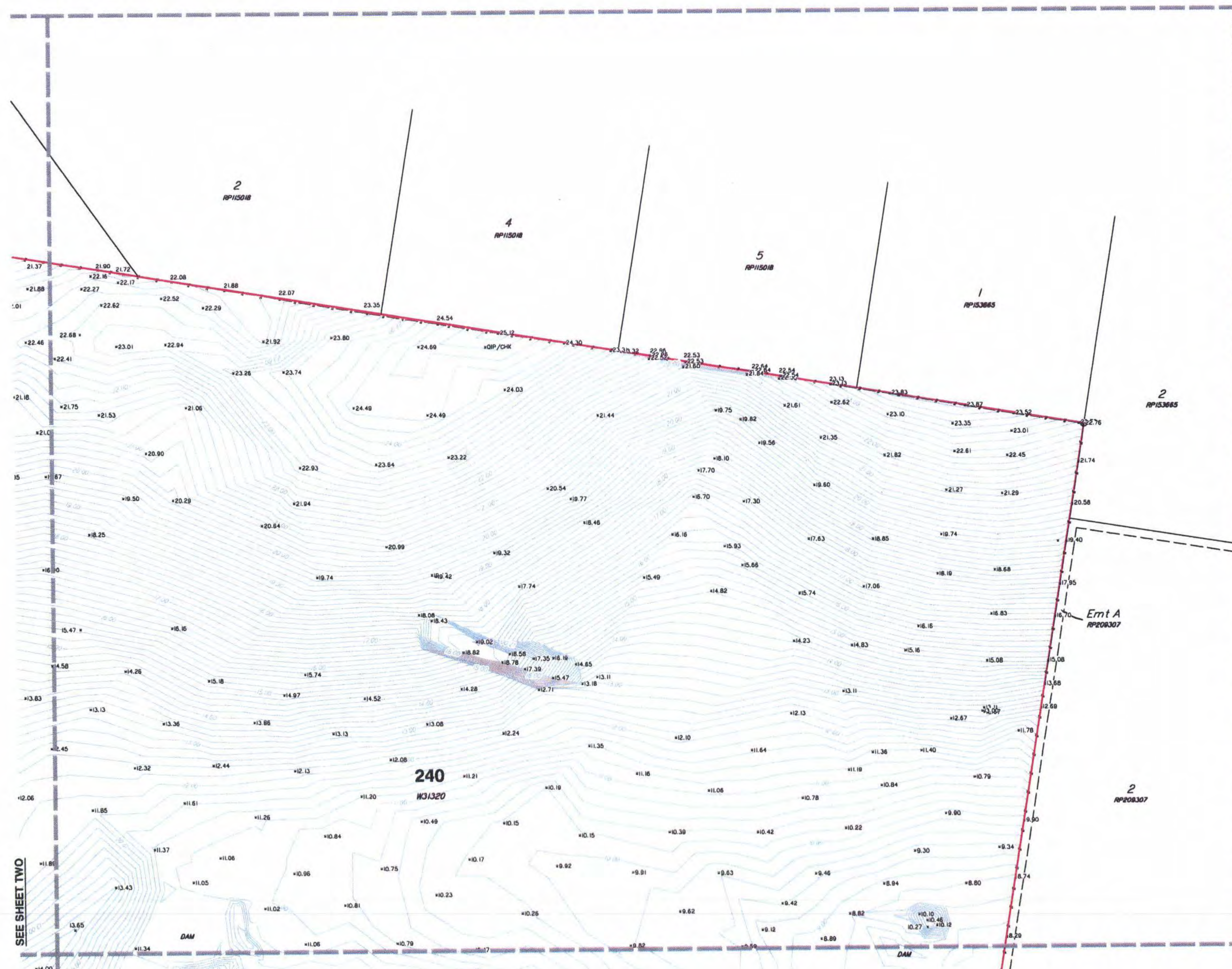
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PLAN No. **5093 S CD 01**



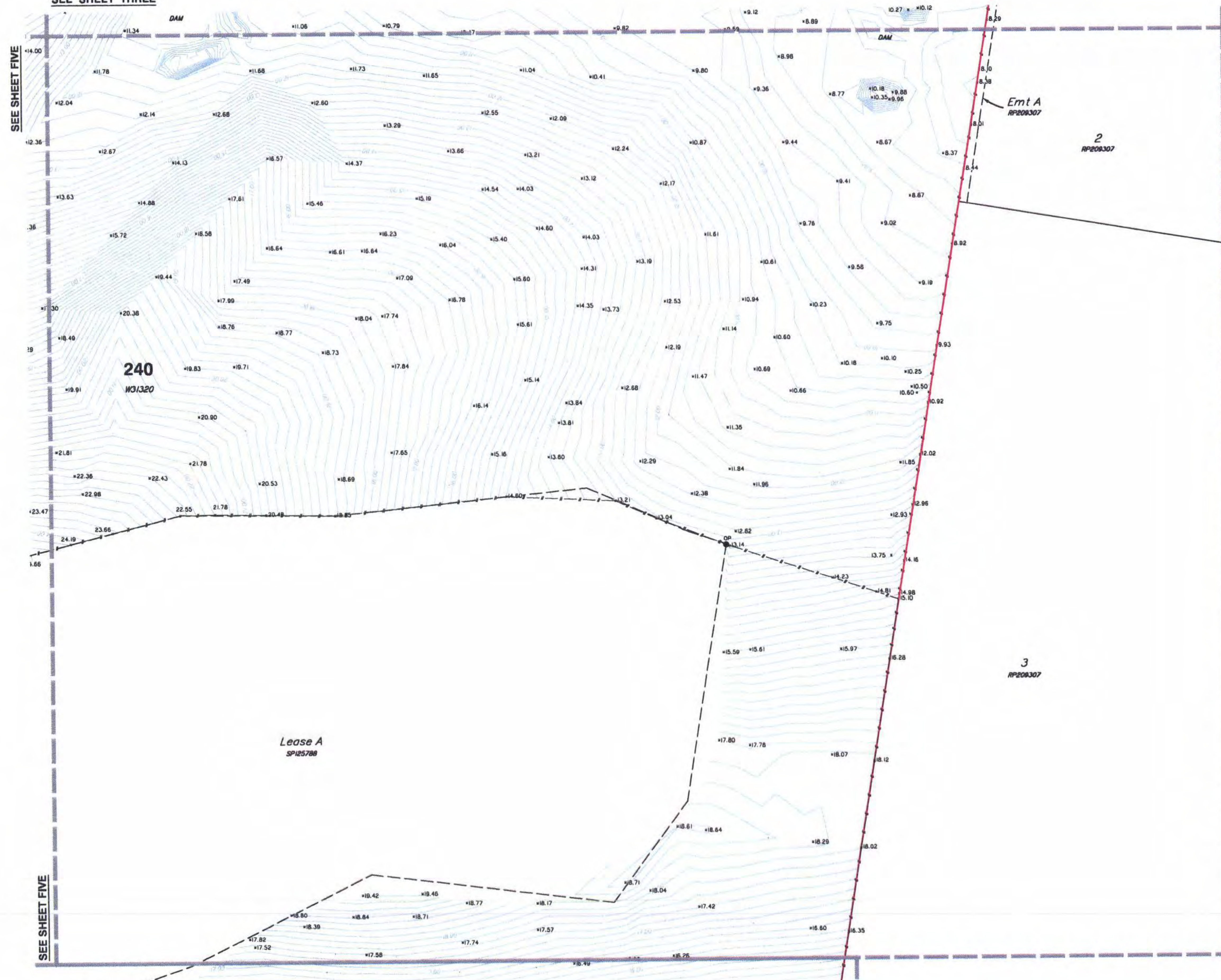
SEE SHEET TWO

SEE SHEET FOUR

Scale 1:1000 - Lengths are in Metres.



SEE SHEET THREE



SEE SHEET SIX

Scale 1:1000 - Lengths are in Metres.

LEGEND

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HESTER

Project

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County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

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	RL 22.169		

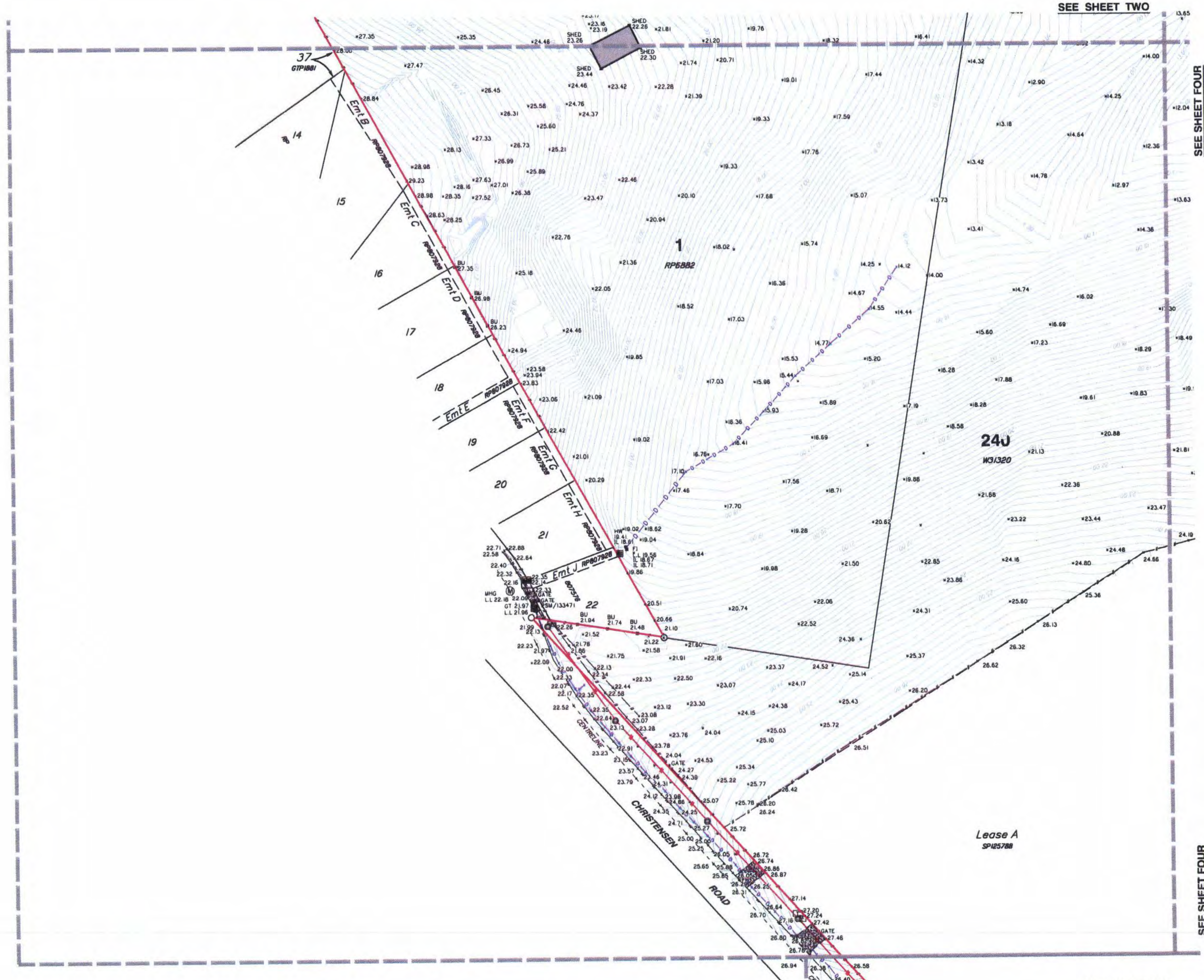
Scale (on A1 original)	Designed
1:1000	Drawn
	Date Designed



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www.developmentperspectives.com.au

REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**



SEE SHEET FOUR

SEE SHEET FOUR

- ① PERMANENT MARK
- ② SEWER MANHOLE
- ③ SEWER INSPECTION OUTLET
- ④ ELECTRICITY PILLAR
- ⑤ ELECTRICITY POLE
- ⑥ ELECTRICITY POLE WITH LIGHT
- ⑦ TELSTRA PIT
- ⑧ MANHOLE
- ⑨ STORMWATER MANHOLE
- ⑩ GULLY TRAP
- ⑪ WATER METER
- ⑫ FIRE HYDRANT
- ⑬ VALVE
- ⑭ DATE
- ⑮ BOLLARD
- ⑯ CONCRETE
- ⑰ EDGE OF BITUMEN
- ⑱ FENCE
- ⑲ OVERHEAD ELECTRICITY
- ⑳ OPEN DRAIN
- ㉑ RETAINING WALL
- ㉒ EDGE OF GARDEN
- ㉓ CONTOUR LEVEL

This plan has been prepared for the exclusive use and purposes of the client as stated on this plan and should not be used by any other person or corporation and for any other purpose.

Property boundaries have not been defined by this survey and have been compiled from IS216B53.

Only those underground features and services as shown on this plan have been located by this survey. Prior to any construction, demolition or excavation on the site, the relevant authority should be contacted for the location of any further underground services and detailed location of all services.

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HESTER

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**
County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	1S216853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.169		
Scale (on A1 original)		Designed	
1:1000		Drawn	
		Date Designed	



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f: (07) 32675461
e: mail@garmin.com.au
www.garmin.com.au

REFERENCE No. 5093-10

PLAN No. 5093 S CD 01

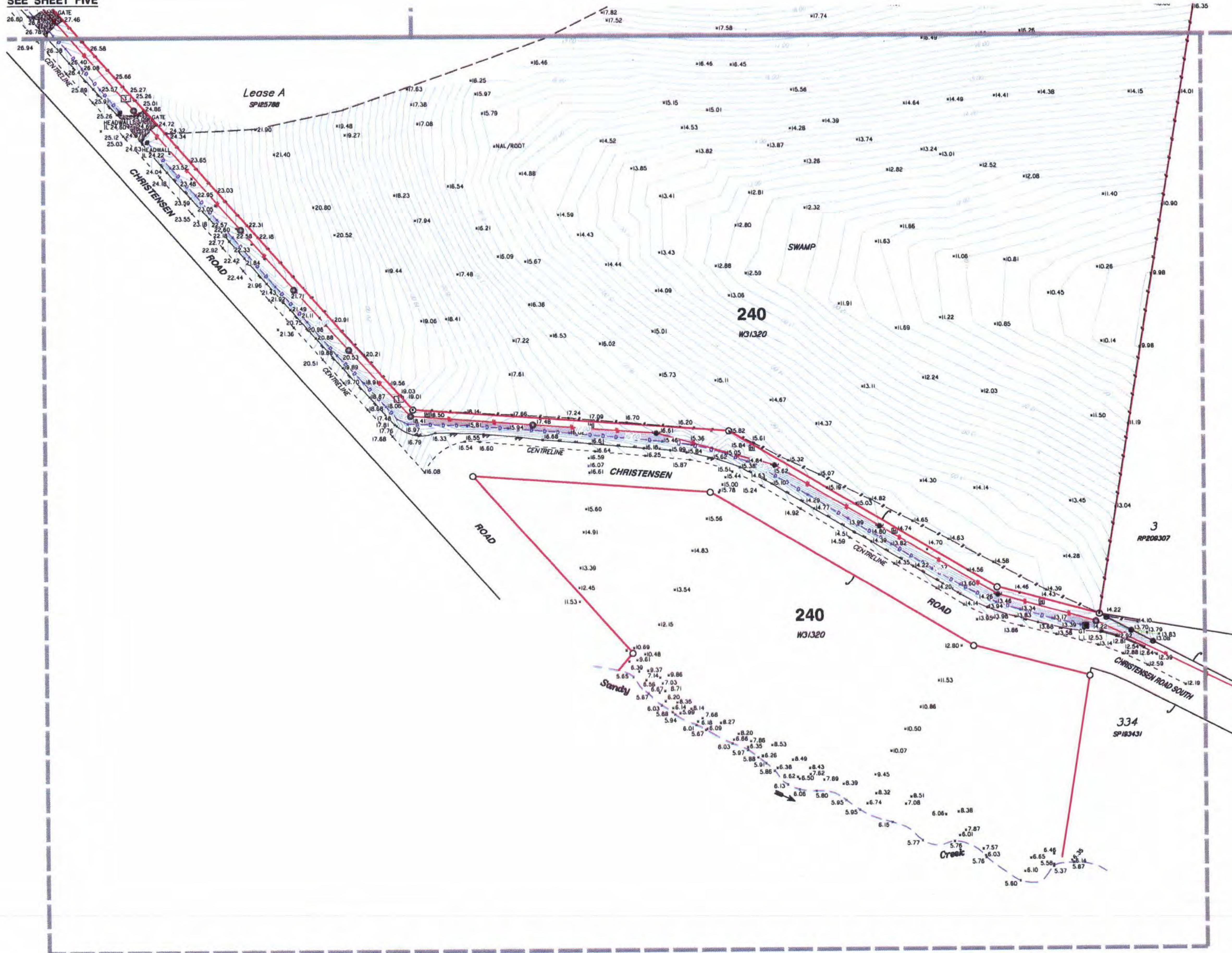
Scale 1:1000 - Lengths are in Metres.

0 10 20 30 40 50 60 70 80



SEE SHEET FIVE

SEE SHEET FOUR



LEGEND

- PERMANENT MARK
- SEWER MANHOLE
- SEWER INSPECTION OUTLET
- ELECTRICITY PILLAR
- ELECTRICITY POLE
- ELECTRICITY POLE WITH LIGHT
- TELSTRA PIT
- MANHOLE
- STORMWATER MANHOLE
- GULLY TRAP
- WATER METER
- FIRE HYDRANT
- VALVE
- GATE
- BOLLARD
- CONCRETE
- EDGE OF BITUMEN
- FENCE
- OVERHEAD ELECTRICITY
- OPEN DRAIN
- RETAINING WALL
- EDGE OF GARDEN
- CONTOUR LEVEL

Notes

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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**
County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	IS216853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.169		

Scale (on A1 original)	Designed
1:1000	Date Designed



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REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**

Scale 1:1000 - Lengths are in Metres.

0 10 20 30 40 50 60 70 80

APPENDIX B

ENGINEERING DRAWINGS



LEGEND

--- CATCHMENT BOUNDARY

A CATCHMENT NUMBER

1 SWD STORMWATER LINE & STRUCTURE LABEL

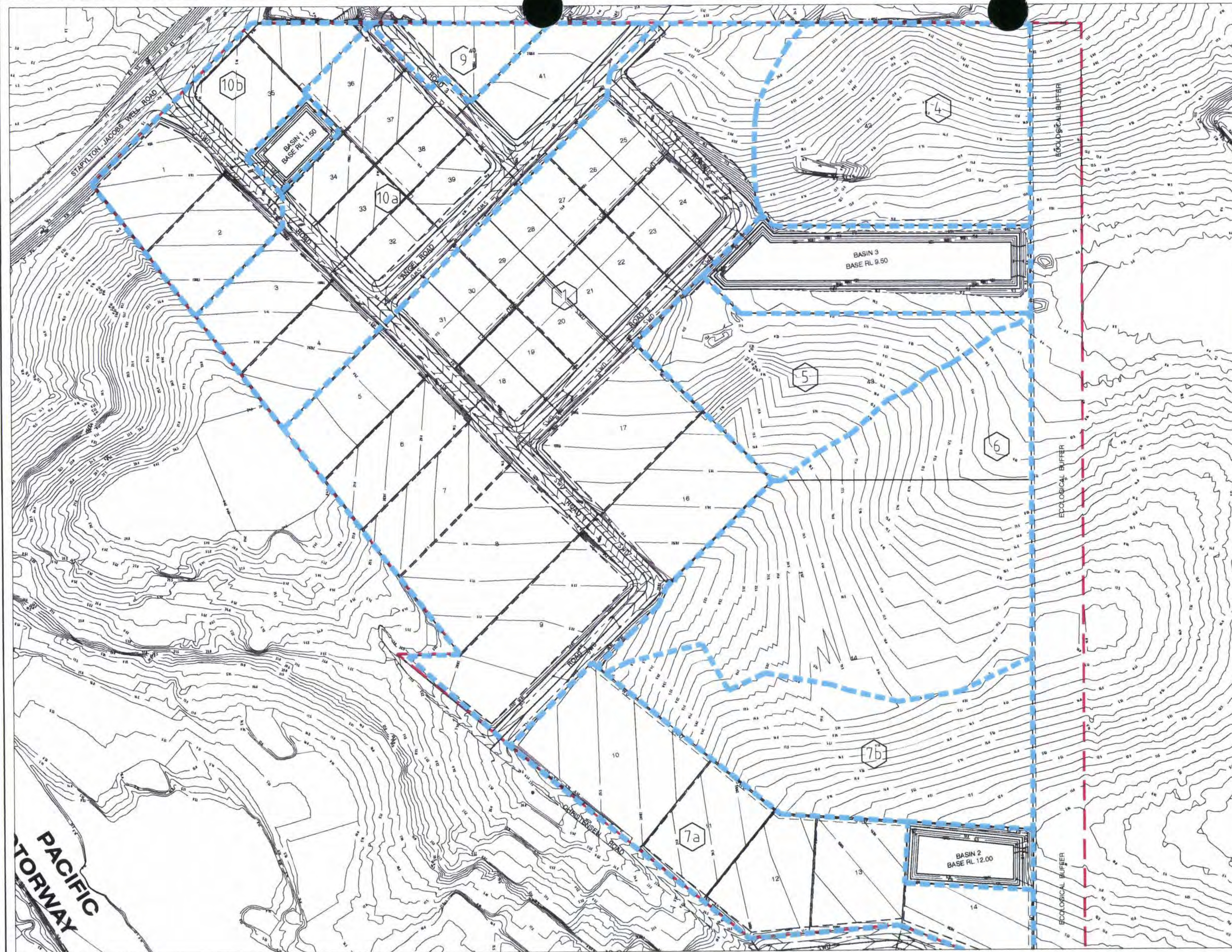
CATCHMENT TABLE	
CATCHMENT	AREA (Ha)
1	12.64
2	7.11
3	3.01
4	7.31
5	4.06
6	9.46
7	8.25
8	0.76
9	2.20
10	8.60
X1	1.49
X2	2.15

CRITICAL STORM	
CATCHMENT	DURATION (mins)
1 - 6	120
7	90
8	25
9	60
10	25

01 ORIGINAL ISSUE ND 06.01.11		Scale 0 50 100 150 200 250m 1:2500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com			
Issue Description Date		Architect		Approved R.E.P.D. No.		Title STORMWATER CATCHMENT PLAN									
Filename: K009-AA003837-01-EXISTING SWD CATCHMENT.DWG		Scales 1:2500		Original Size A1		Grid GDA94 -MGA56		Drawing No K009		Project No AA003837					
								Issue 01							

When on Original

74/Aug/2011 5:20 PM \\hc-aus-gc-1s-01\jobs\AA003837\E-CAD\1-B-Sketches\K009-AA003837-01-Existing SWD Catchment.dwg



LEGEND	
	CATCHMENT BOUNDARY
	CATCHMENT NUMBER

CATCHMENT	AREA (Ha)
1	19.37
4	5.630
5	3.777
6	9.590
7a	6.097
7b	5.055
8	0.639
9	0.800
10a	7.701
10b	3.860

BASIN	AREA (m2)
1	2,700 (2.5%)
2	5,190 (4.3%)
3	19,850 (4.8%)
4	890 (4.6%)
5	700 (9.1%)

01 ORIGINAL ISSUE		ND 06.01.11	Scale 0 50 100 150 200 250m 1 2500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5592 3633 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com		
Issue		Description	Date	Filename: K010-AA003837-01- DEVELOPED SWD CATCHMENTS.DWG	Architect		Architect		Scales 1:2500		Title STORMWATER CATCHMENT POST DEVELOPMENT				
										Approved REP Q No		Current Issue Signatures		Drawing No K010	
										Original Size A1		Author NDREISE		Project No AA003837	
										Height Datum DATUM		Designer R.RONALDS		Issue 01	
										Grid GRID		Reviewer M.BRAY		Date 24/AUG/2015 22 PM	
										Copyright reserved				\\hc-aus-gc-1s-01\jobs\AA003837\E-CAD\C-Civil\B-Sketches\K010-AA003837-01- Developed SWD Catchments.dwg	

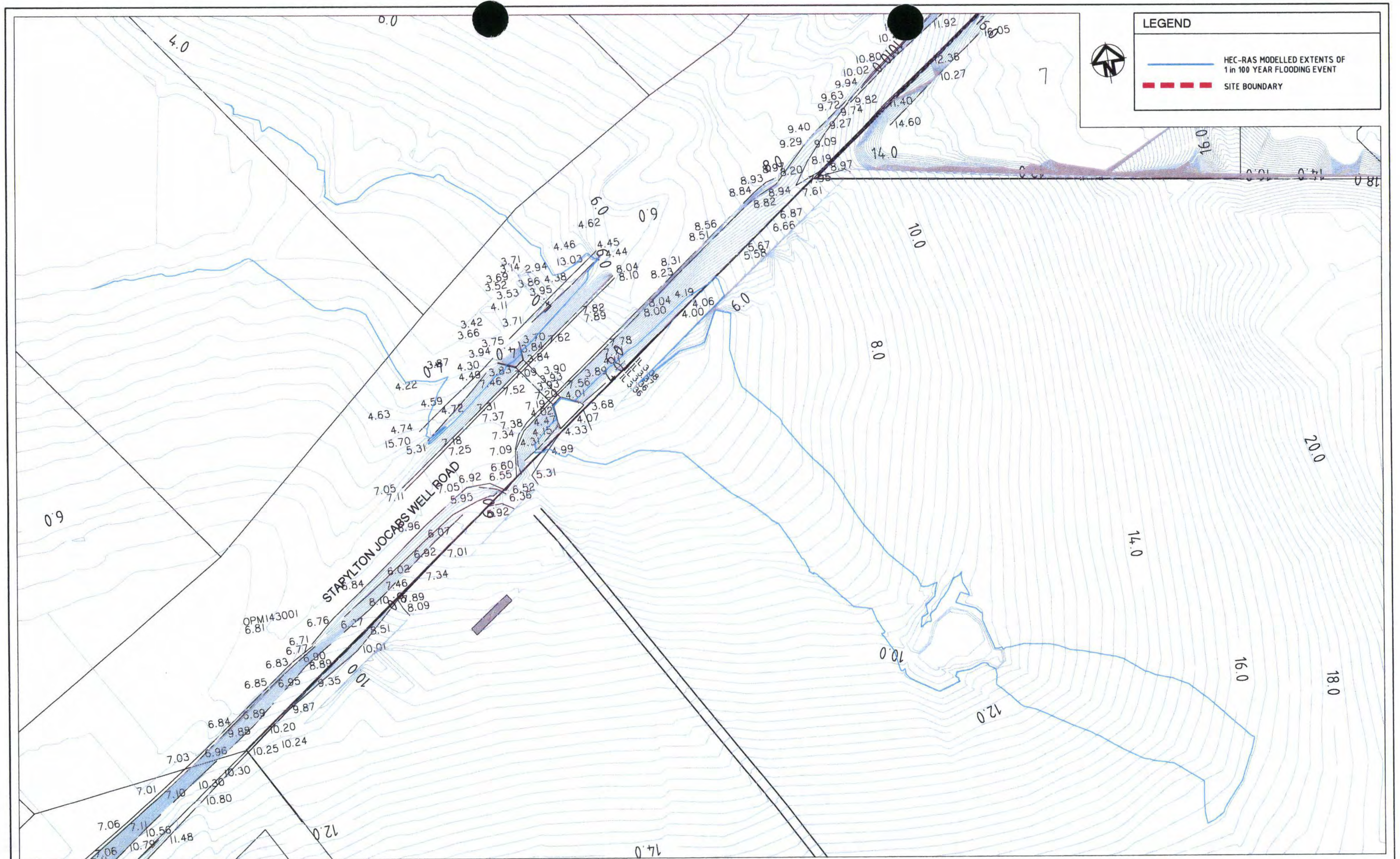


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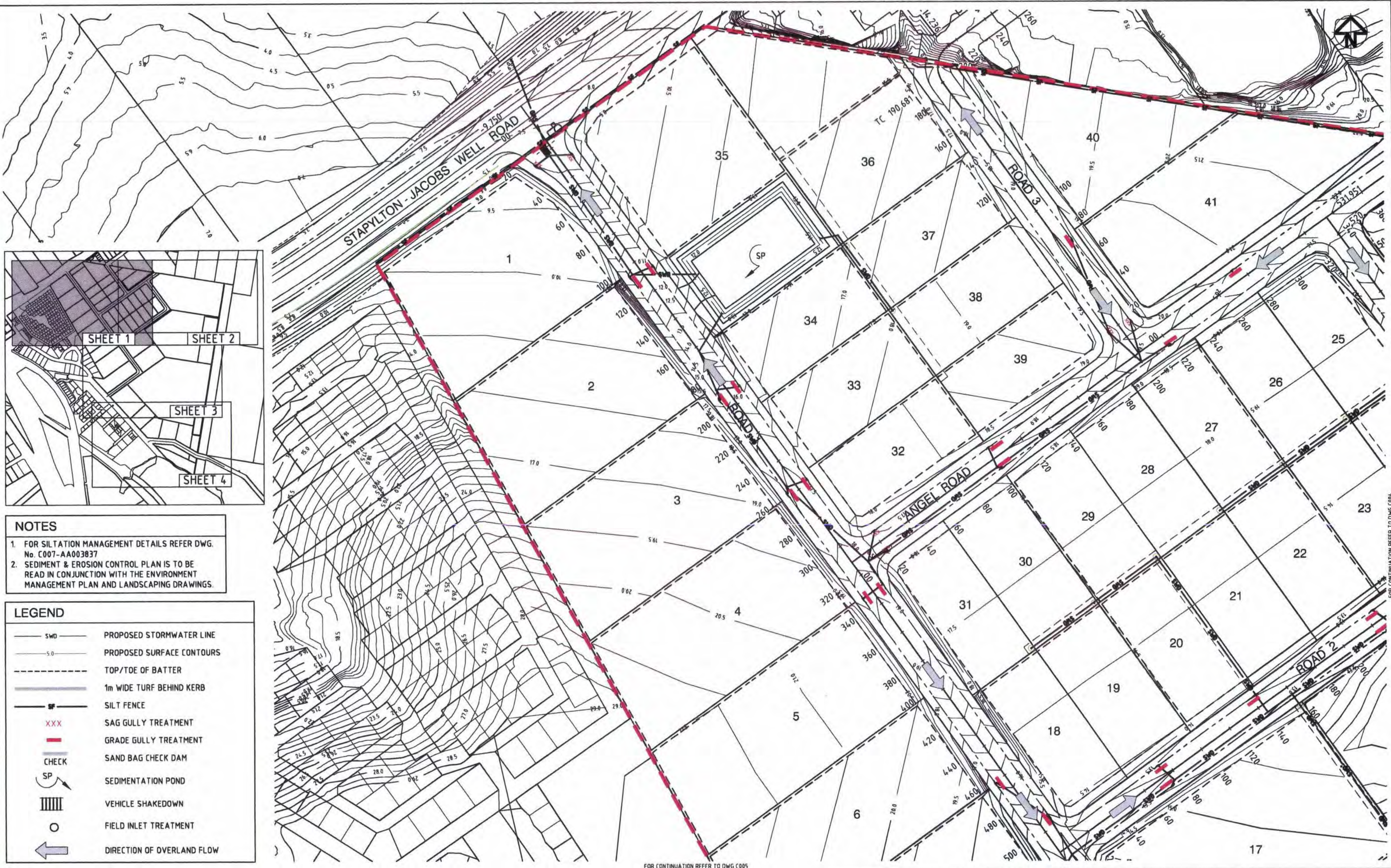
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- HEC-RAS MODELLED EXTENTS OF 1 in 100 YEAR FLOODING EVENT (REGIONAL)
- HEC-RAS MODELLED EXTENTS OF 1 in 100 YEAR FLOODING EVENT (LOCAL)
- SITE BOUNDARY

01 FOR DISCUSSION		RR 09.03.11		Scale 0 50 100 150 200 250m 1 : 2500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		 HYDER CONSULTING PTY. LTD ABN 48 010 924 856 P O Box 1653, Southport, Queensland 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue		Date		Architect		Filename: K012-AA003837-01-FLOOD EXTENT.DWG		Current Issue Signatures		Revised		Title OVERALL EXISTING Q100 FLOODING EXTENTS			
								Author R. RONALDS		Designer R. RONALDS		Reviewer M. BRAY			
										Grid GRID		Copyright reserved			

24/Aug/2011 5:18 PM \\hc-aus-gc-fs-01\jobs\AA003837\E-CAD\C-Civil\B-Sketches\K012-AA003837-01-Flood Extent.dwg



01 FOR DISCUSSION Issue: _____ Description: _____ Date: 09.03.11		Scale: 1:500 0 5 10 20 30 40 50m		Surveyor: _____ GASSMAN DEVELOPMENT PERSPECTIVES Architect: _____ Filename: K012-AA003837-01-FLOOD EXTENT.DWG		Client: _____ MRS PARTRICIA & MR WILLIAM HESTER		Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION Approved: _____ R.E.P.Q. No. _____ Scales: 1:2500 Original Size: A1 Height Datum: DATUM Grid: GRID		Project: STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE Title: LOCAL EXISTING Q100 FLOODING EXTENTS Drawing No: K012d Project No: AA003837 Issue: 01		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653 Southport, Queensland, 4215 Australia Tel: (+617) 5592 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
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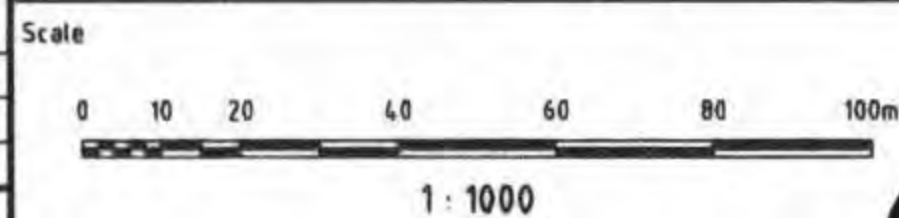
NOTES

1. FOR SILTATION MANAGEMENT DETAILS REFER DWG. No. C007-AA003837
2. SEDIMENT & EROSION CONTROL PLAN IS TO BE READ IN CONJUNCTION WITH THE ENVIRONMENT MANAGEMENT PLAN AND LANDSCAPING DRAWINGS.

LEGEND

- SWD PROPOSED STORMWATER LINE
- 5.0 PROPOSED SURFACE CONTOURS
- TOP/TOE OF BATTER
- 1m WIDE TURF BEHIND KERB
- SP SILT FENCE
- XXX SAG GULLY TREATMENT
- GRADE GULLY TREATMENT
- CHECK SAND BAG CHECK DAM
- SP SEDIMENTATION POND
- VEHICLE SHAKEDOWN
- O FIELD INLET TREATMENT
- ← DIRECTION OF OVERLAND FLOW

Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



GASSMAN DEVELOPMENT
PERSPECTIVES

Architect

MRS PARTRICIA &
MR WILLIAM HESTER

Client

Status
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Approved REP.Q No

Scales 1:1000

Original Size A1

Height Datum

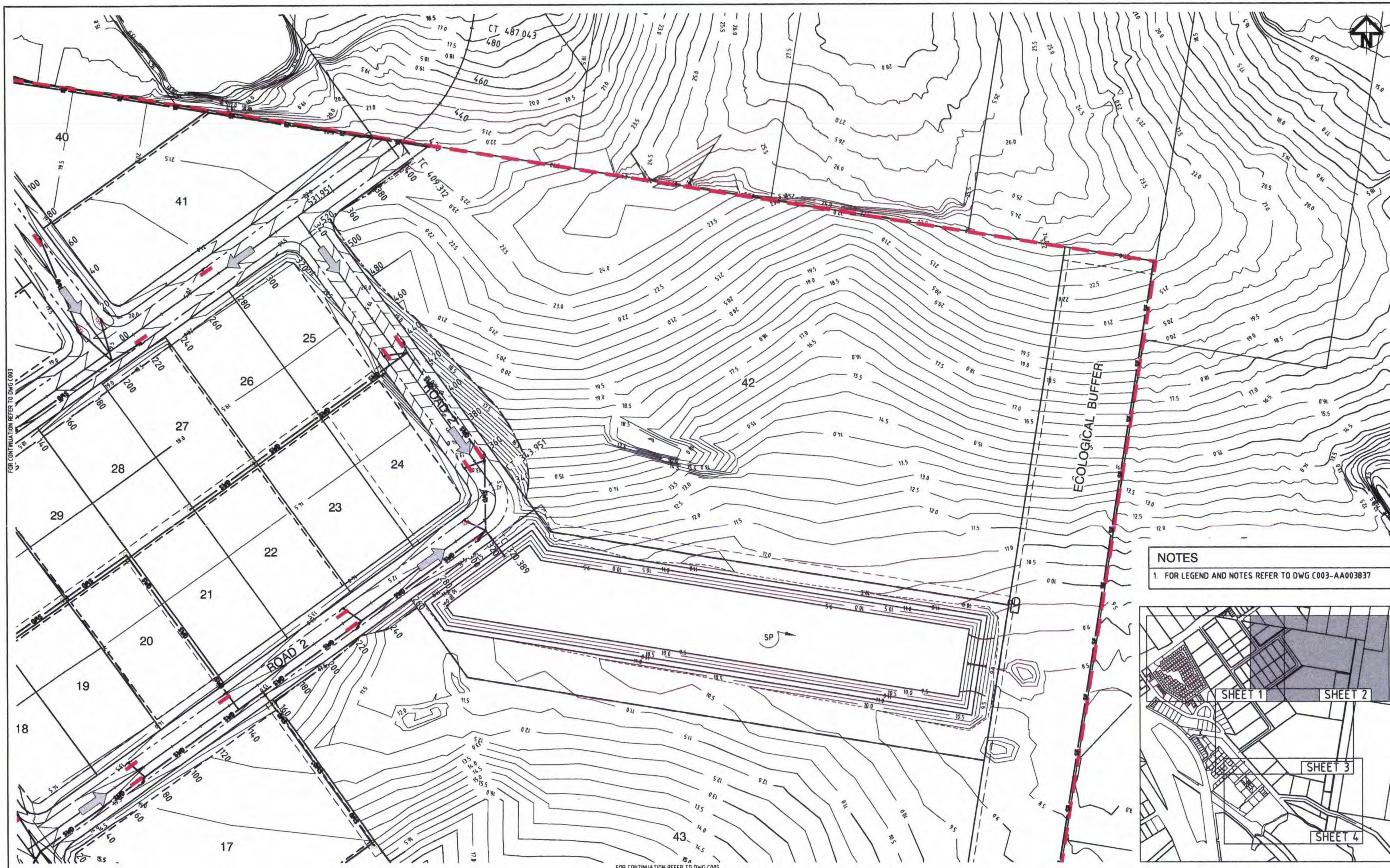
Grid

Project
STAPYLTON,
JACOBS WELL
HESTER DEVELOPMENT SITE

Title
SEDIMENT AND EROSION
CONTROL PLAN
SHEET 1 OF 4

Hyder Consulting
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E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com

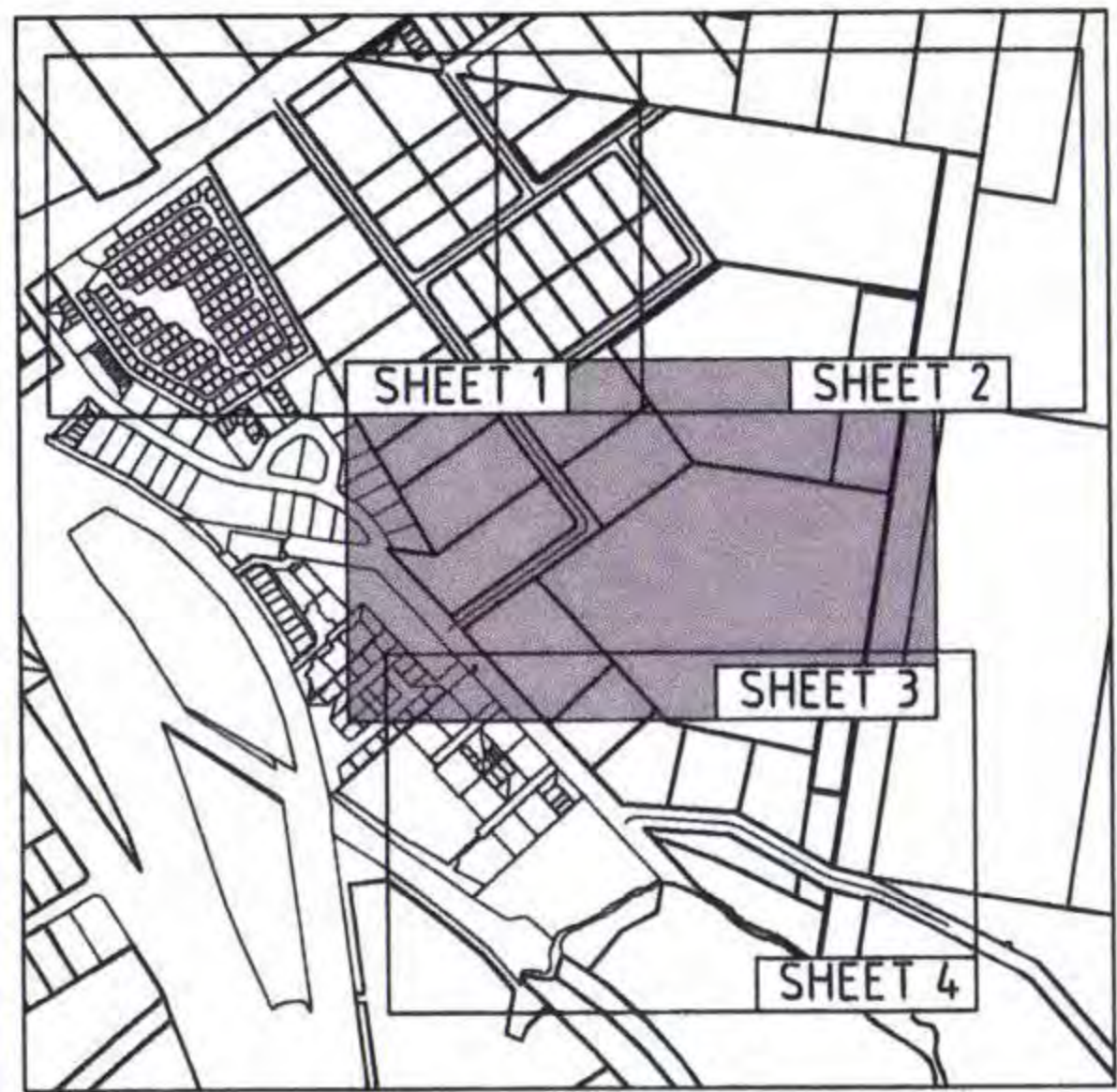
Drawing No. C003 - AA003837 - 03
Project No.
Issue



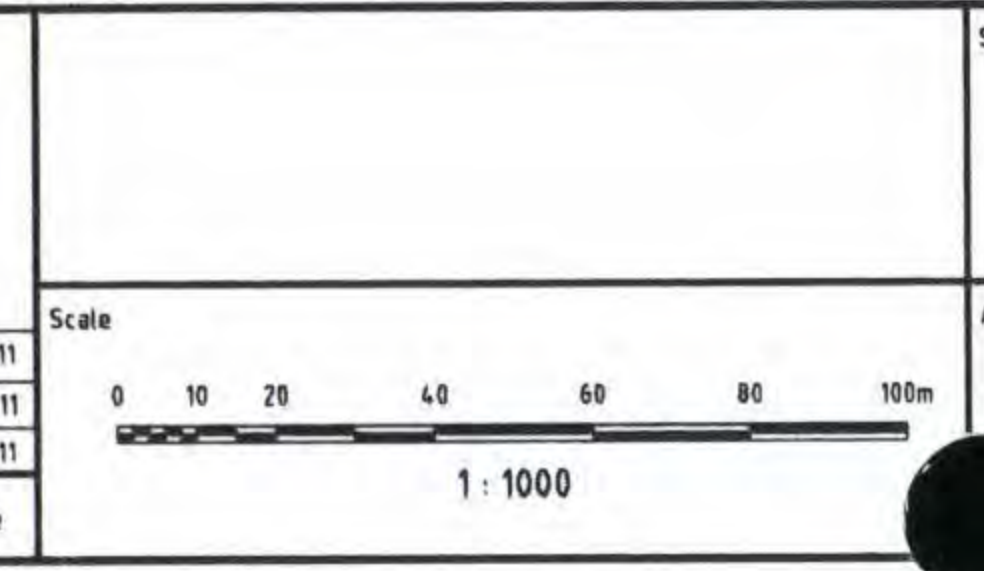
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Scale  1 : 1000			Architect		Title SEDIMENT AND EROSION CONTROL PLAN SHEET 2 OF 4		Drawing No. C004		Project No. AA003837		Issue No. 01	
Issue Description Date			Filename: C003-C006-AA003837-01-SED & EROS.DWG		Original Size A1		Height DATUM		Grid GRID		7/3/June/2011 R6.63 AM E:\AA003837\NE-CAD\VC-Final\VC-Final\C003-C006-AA003837-01-SED & EROS.dwg	
03 ISSUE FOR SUBMISSION TO G.C.C.C. NO 19.08.11 02 DESIGN AMENDED NO 20.07.11 01 ORIGINAL ISSUE NO 06.01.11					Scales 1:1000 Current Issue Signatures Author N.DREISE Designer T.DINGLE Reviewer M.BRAY © Copyright reserved							



NOTES
1. FOR LEGEND AND NOTES REFER TO DWG C003-AA003837



Issue	Description	Date
01	ISSUE FOR SUBMISSION TO G.C.C.C.	19.08.11
02	DESIGN AMENDED	20.07.11
03	ORIGINAL ISSUE	06.01.11



Surveyor
GASSMAN DEVELOPMENT PERSPECTIVES
Architect
MRS PARTRICIA & MR WILLIAM HESTER
Filename: C003-C006-AA003837-01-SED & EROS.DWG

Client
MRS PARTRICIA & MR WILLIAM HESTER

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
Approved	RE.P.Q. No:
Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID

Project
**STAPYLTON, JACOBS WELL
HESTER DEVELOPMENT SITE**
Title
**SEDIMENT AND EROSION
CONTROL PLAN
SHEET 3 OF 4**

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HYDER CONSULTING PTY. LTD
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E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com
Drawing No: C005
Project No: AA003837
Issue: 03

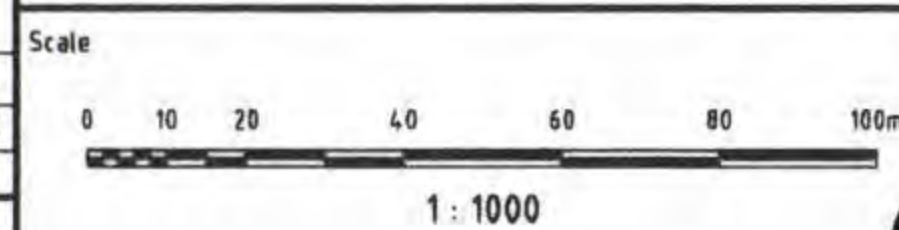


NOTES

1. FOR LEGEND AND NOTES REFER TO DWG C003-AA003837



Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 28.07.11
01	ORIGINAL ISSUE	ND 06.01.11



Surveyor	GASSMAN DEVELOPMENT PERSPECTIVES
Architect	
Filename	C003-C006-AA003837-01-SED & EROS.DWG

Client

MRS PATRICIA & MR WILLIAM HESTER

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
Approved	R.E.P.Q No
Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID
Current Issue Signatures	Author: NDREISE Designer: T.DINGLE Reviewer: MBRAY © Copyright reserved

Project	STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE
Title	SEDIMENT AND EROSION CONTROL PLAN SHEET 4 OF 4

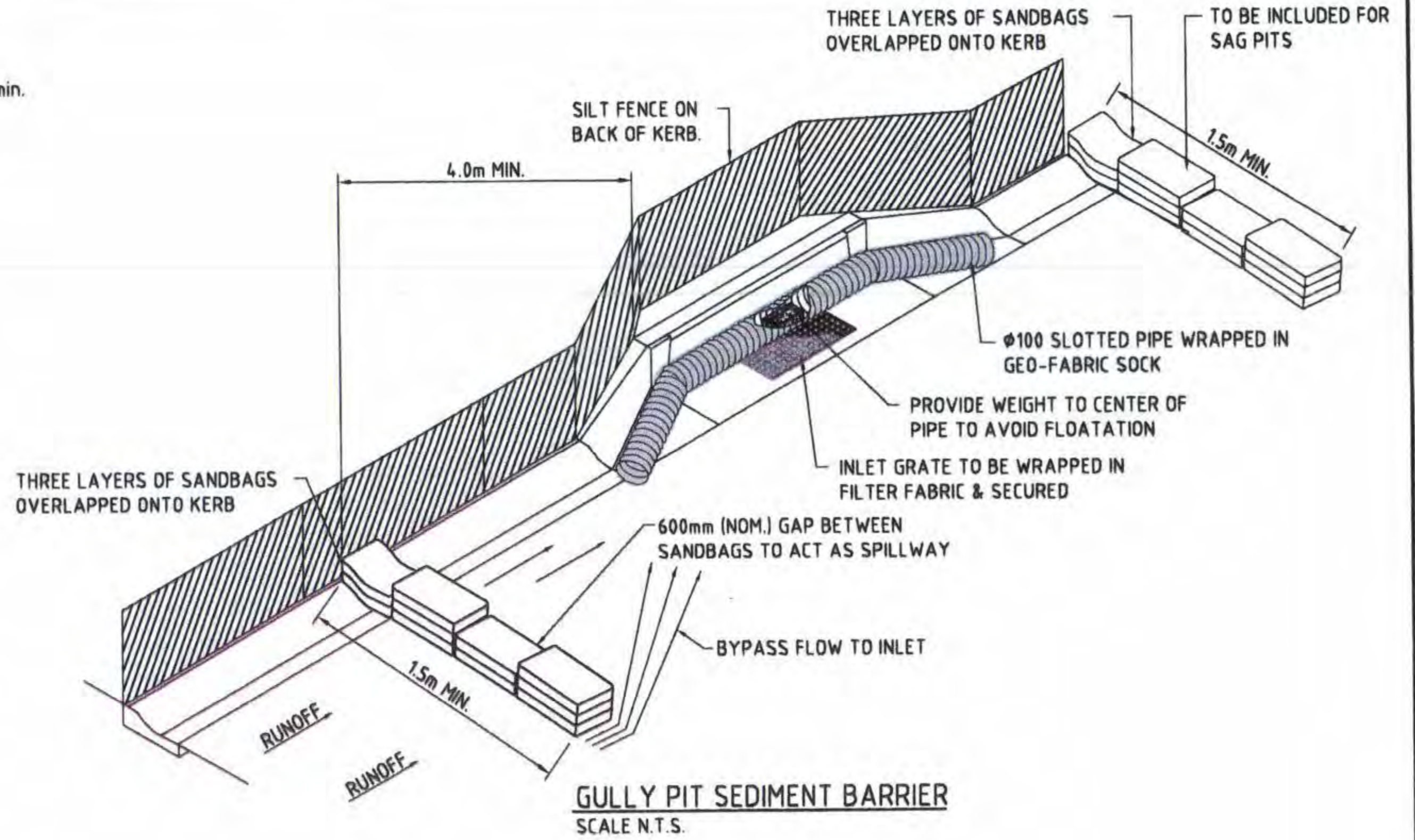
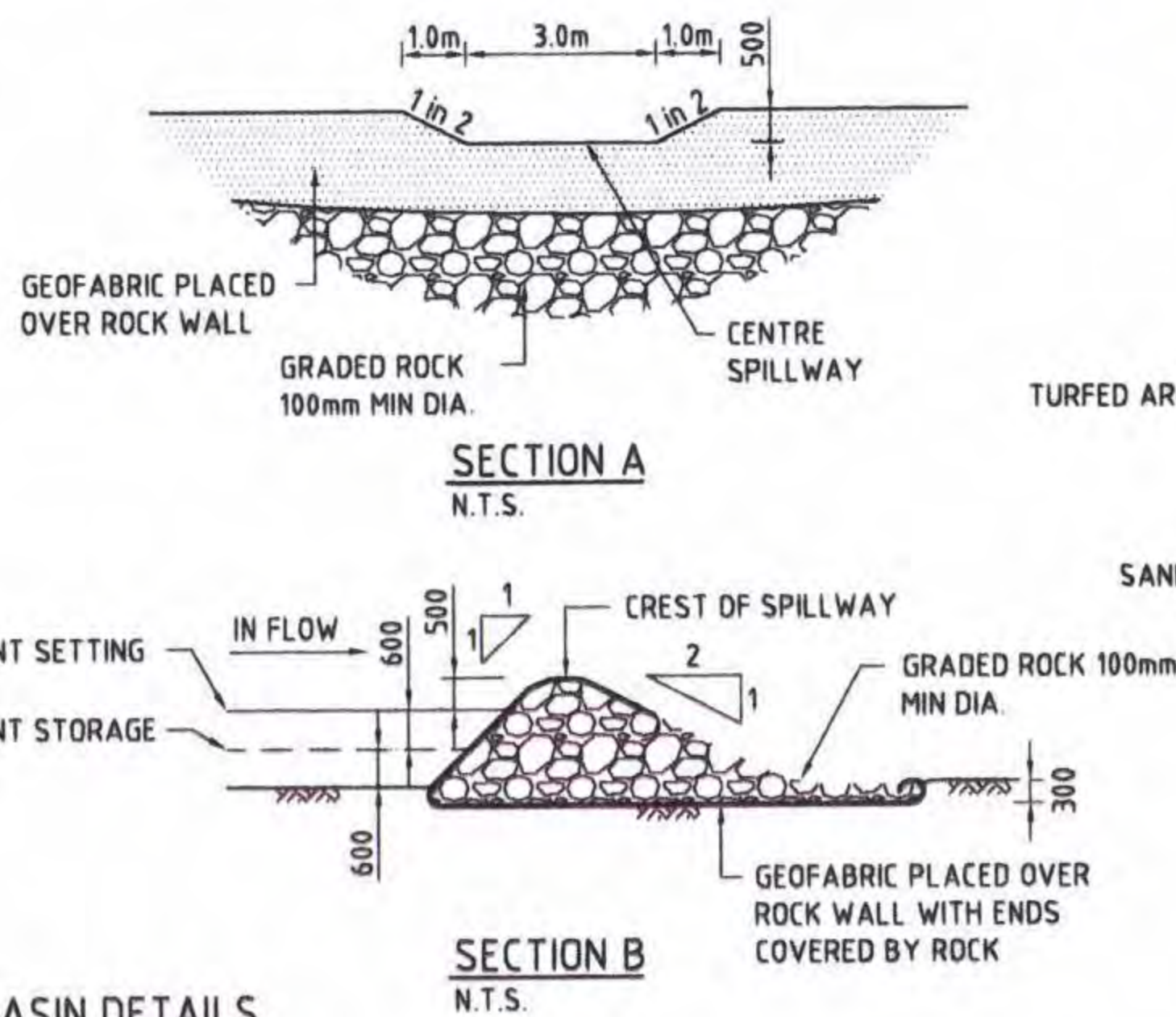
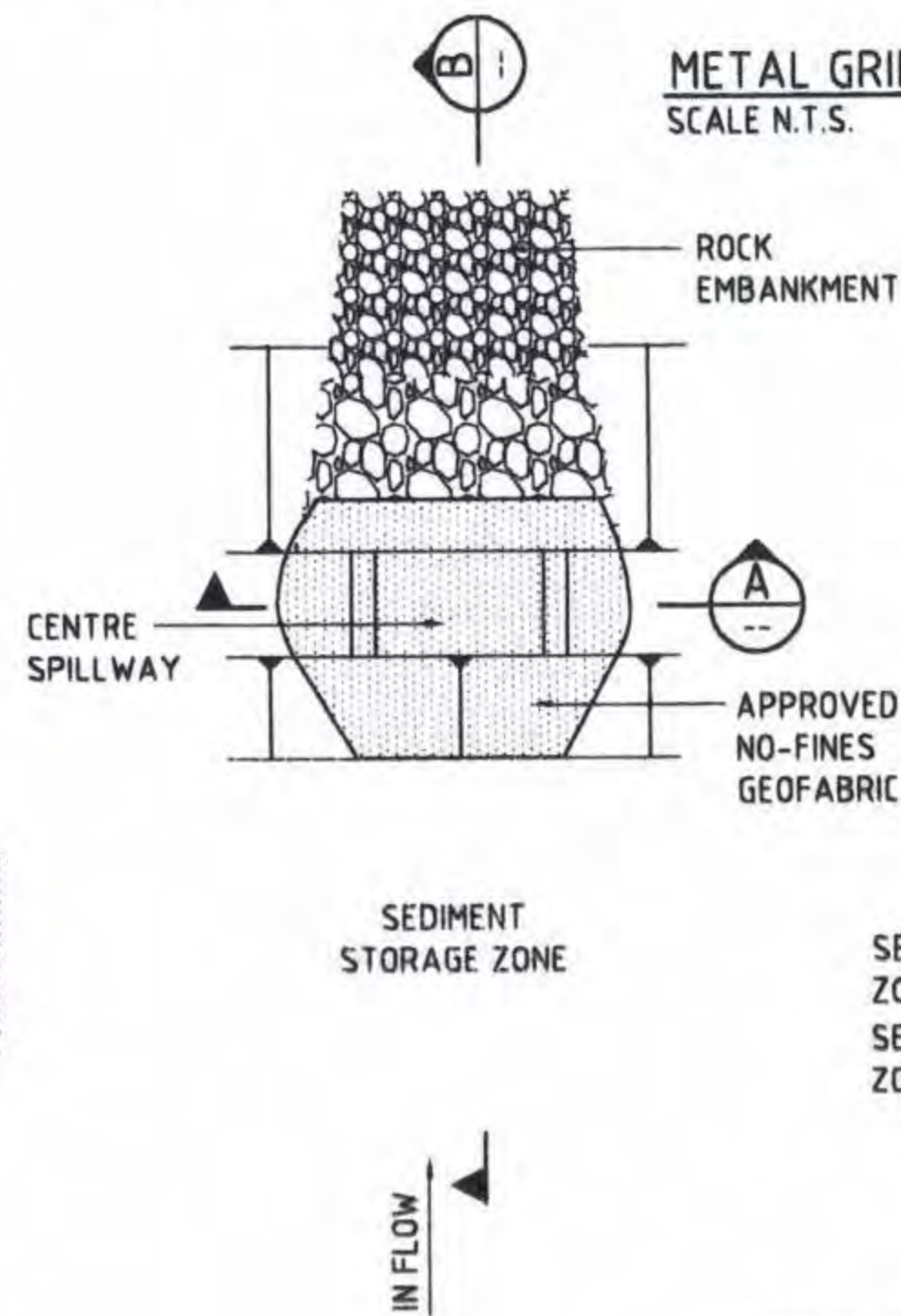
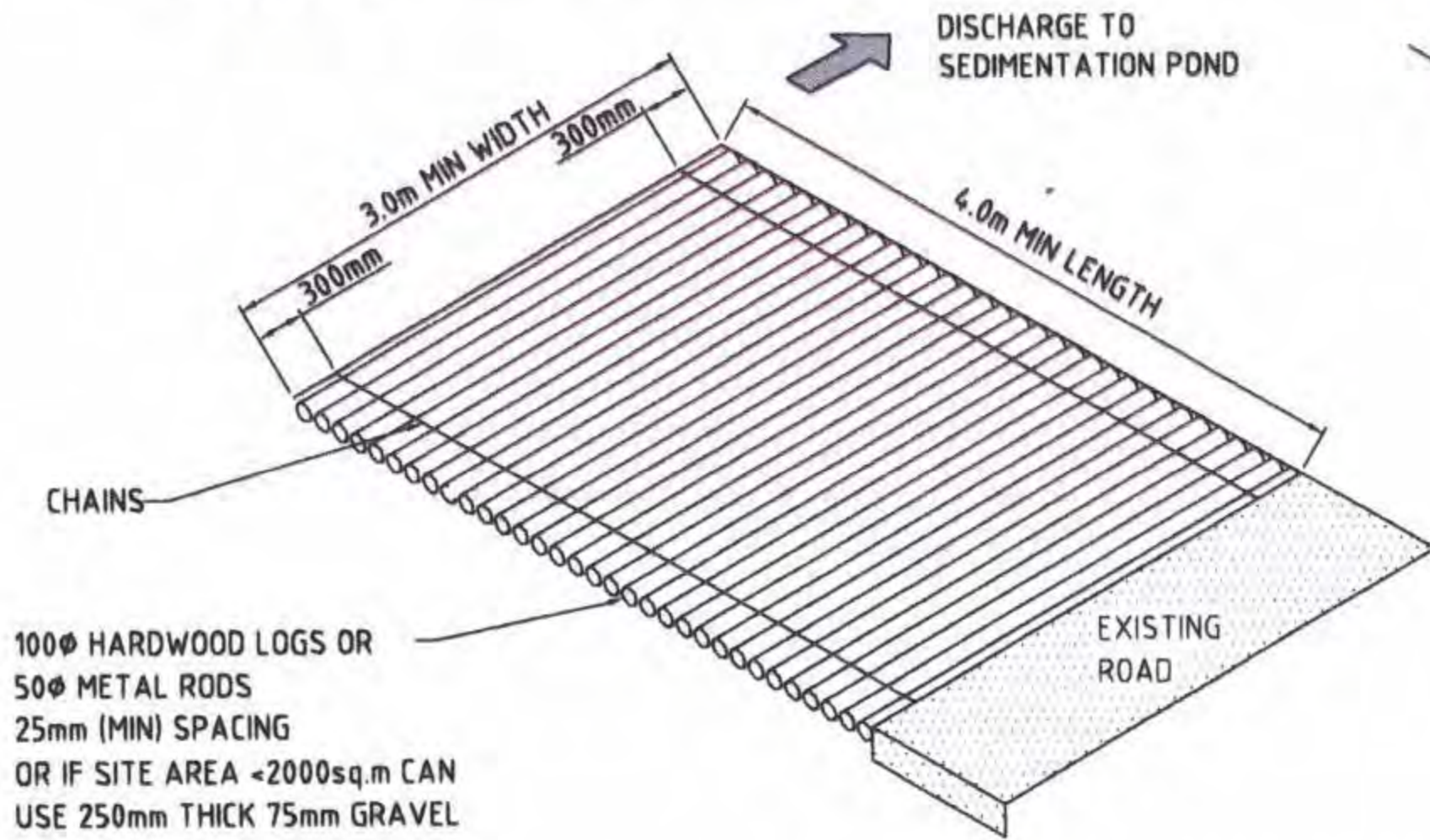
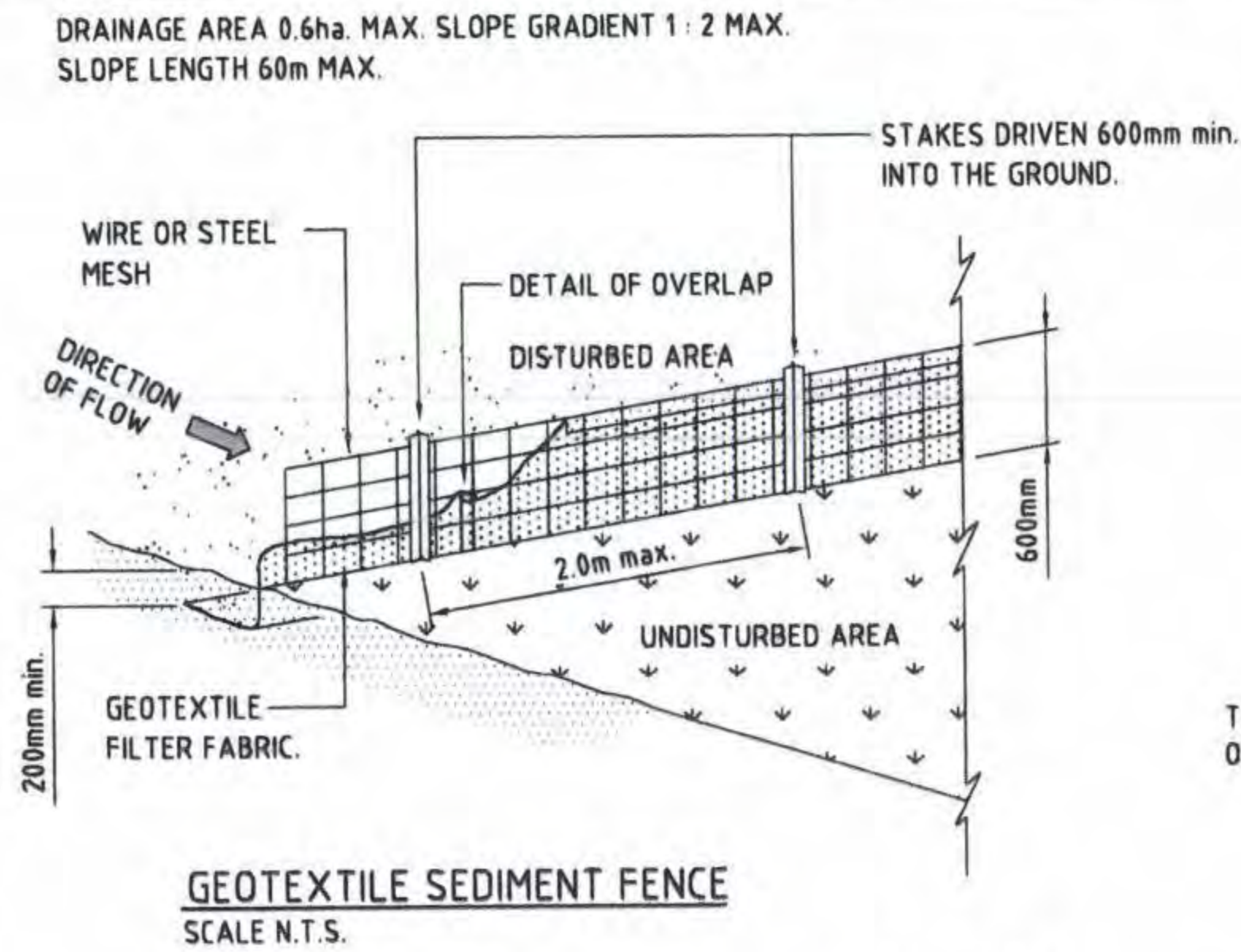
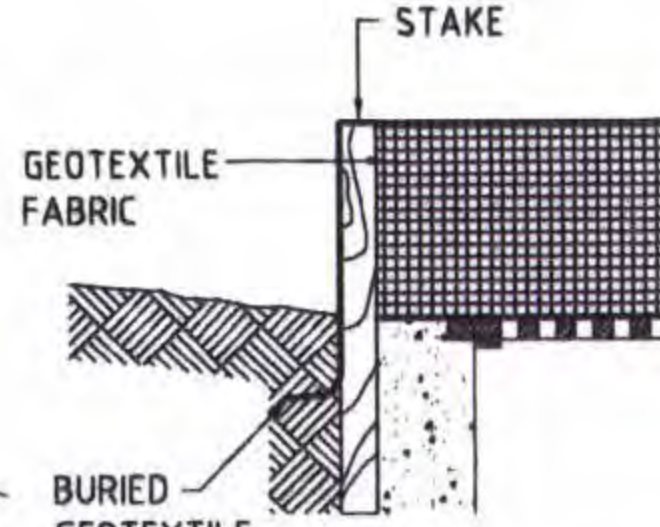
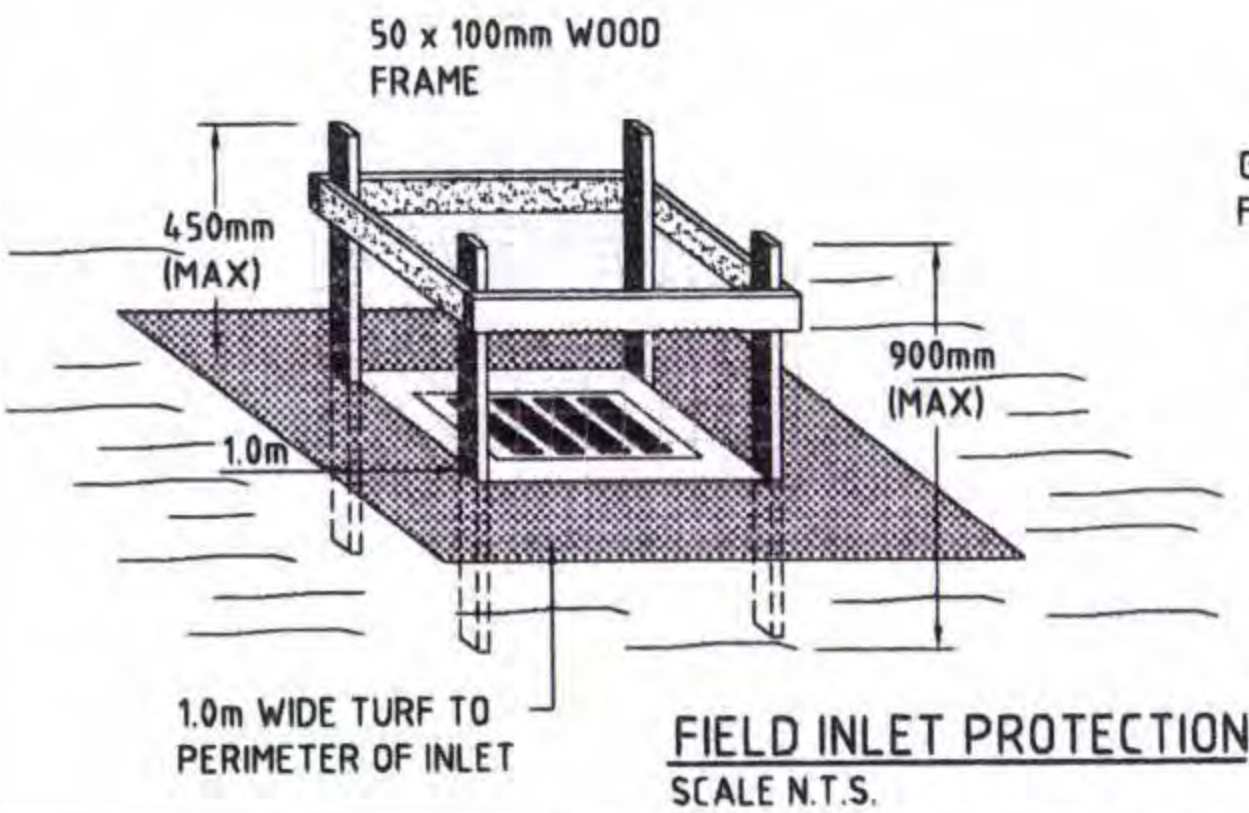
 Hyder Consulting	HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Drawing No.	Project No.	Issue
C006	— AA003837 —	03

SILT MANAGEMENT PROGRAM

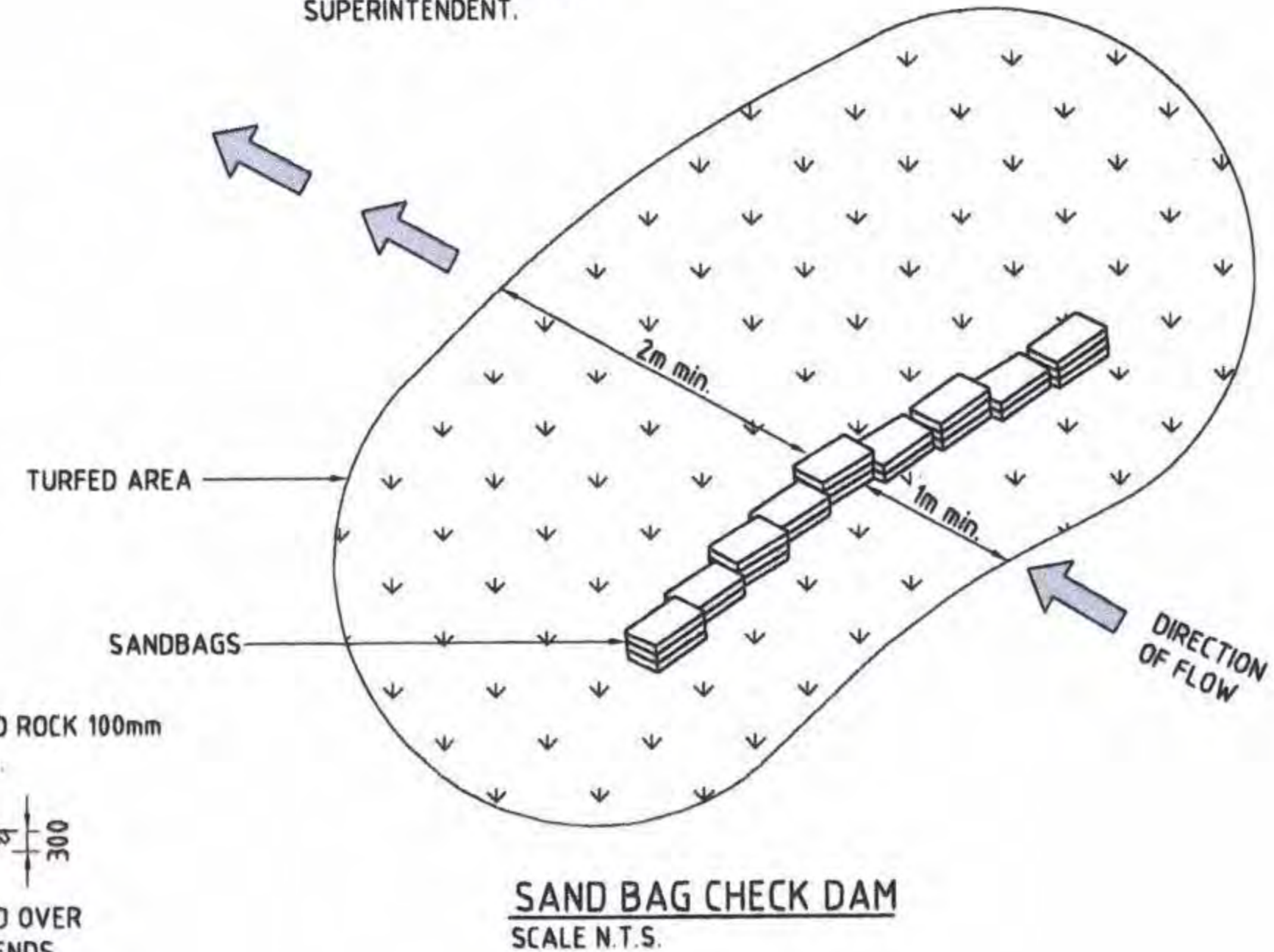
PHASE	DESCRIPTION
ALL WORKS	• SILT FENCES TO BE ERECTED ALONG TOE OF FILL BATTERS OR AS DIRECTED BY SUPERINTENDENT.
SEWER/WATER STORMWATER/SERVICES,	• EXCAVATED MATERIAL TO BE PLACED ON HIGH SIDE OF TRENCH IN ORDER TO PROTECT PIPE WORK AND DIRECT SURFACE FLOW AWAY FROM EXCAVATIONS.
ROADWORKS	• MEASURES ARE TO BE TAKEN TO PREVENT SILT INGRESS TO STORMWATER SYSTEM.
MAINTENANCE PERIOD	• EROSION CONTROL MEASURES ARE TO BE INSPECTED AFTER MAJOR EVENTS (> 25mm). ANY REPAIRS REQUIRED ARE TO BE EFFECTED IMMEDIATELY.

GENERAL NOTES

1. THE CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS TO CONTROL EROSION AND DOWNSTREAM SEDIMENTATION DURING ALL STAGES OF CONSTRUCTION INCLUDING THE MAINTENANCE PERIOD.
2. ALL SEDIMENT CONTROL DEVICES SHALL BE MONITORED, CLEANED AND/OR REPAIRED WHENEVER THE ACCUMULATED SEDIMENT REDUCES THE CAPACITY BY 50%.
3. ALL PERIMETER BANK/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
4. THE EXTENT OF GRASSING SHALL BE DETERMINED BY THE SUPERINTENDENT AND SHALL BE SEEDED, AS SPECIFIED, WITHIN SEVEN DAYS OF FINAL TRIMMING.
5. EXTENT AND POSITION OF SILT FENCE CONTROL MEASURES TO BE DETERMINED ON SITE BY SUPERINTENDENT. MEASURES SHOWN ON THIS DRAWING ARE MINIMUM REQUIREMENTS ONLY.
6. SCOUR PROTECTION AND SILT MANAGEMENT MEASURES TO BE PROVIDED AT STORMWATER OUTLET HEADWALLS.
7. PROVISION TO BE MADE FOR DIRT/SAND REMOVAL FROM CONSTRUCTION VEHICLES PRIOR TO TRAVEL ON PUBLIC ROADS. METHOD TO BE APPROVED BY SUPERINTENDENT PRIOR TO COMMENCEMENT OF WORK.
8. ANY SILT OR SEDIMENT CAUSED BY THE MOVEMENT OF CONSTRUCTION TRAFFIC ON EXISTING ROADS IS TO BE REMOVED DAILY.
9. THE APPLICANT SHALL IMPLEMENT EROSION AND SEDIMENT CONTROL PROCEDURES DURING CONSTRUCTION AND MAINTENANCE STAGES OF THE DEVELOPMENT AND SHALL TAKE ALL NECESSARY ACTIONS TO COMPLY WITH THE POLICY OBJECTIVES OF THE GOLD COAST CITY COUNCIL LOCAL PLANNING POLICY - EROSION AND SEDIMENT CONTROL.
10. THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE DAILY REMOVAL OF SILT FOR THE DURATION OF THE CONSTRUCTION AND MAINTENANCE PERIOD, THAT HAS BEEN BLOWN, WASHED OR TRACKED FROM THE SITE ONTO COUNCIL ROADS OR INTO COUNCIL DRAINAGE SYSTEMS, WATERCOURSES AND ANY PRIVATE PROPERTY.
11. THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE CONTROL OF DUST EMANATING FROM THE SITE AT ALL TIMES, INCLUDING ON WEEKENDS AND PUBLIC HOLIDAYS, FOR THE DURATION OF THE CONSTRUCTION AND MAINTENANCE PERIOD.
12. ALL RUBBISH, WASTE MATERIALS, OILS AND FUELS ARE TO BE CONTAINED APPROPRIATELY. OIL AND FUEL SPILLS ARE NOT TO ENTER ANY DRAINAGE SYSTEM OR WATERCOURSE.
13. THE CONTRACTOR IS TO ENSURE THAT NO SILT REACHES THE DOWNSTREAM WATER COURSE AND IS TO PROVIDE ADEQUATE PROTECTION TO PREVENT THIS OCCURRING.
14. WHERE TOPSOIL STOCKPILES ARE TO REMAIN IN PLACE FOR A PERIOD OF MORE THAN 14 DAYS, THE STOCKPILE SHALL BE GRASSED WITH A SUITABLE QUICK STRIKING CEREAL GRASS. PROVIDE A DIVERSION DRAIN OR BUND ON THE UPHILL SIDE AND A SEDIMENT FENCE ON THE DOWNHILL SIDE OF ALL STOCKPILES.

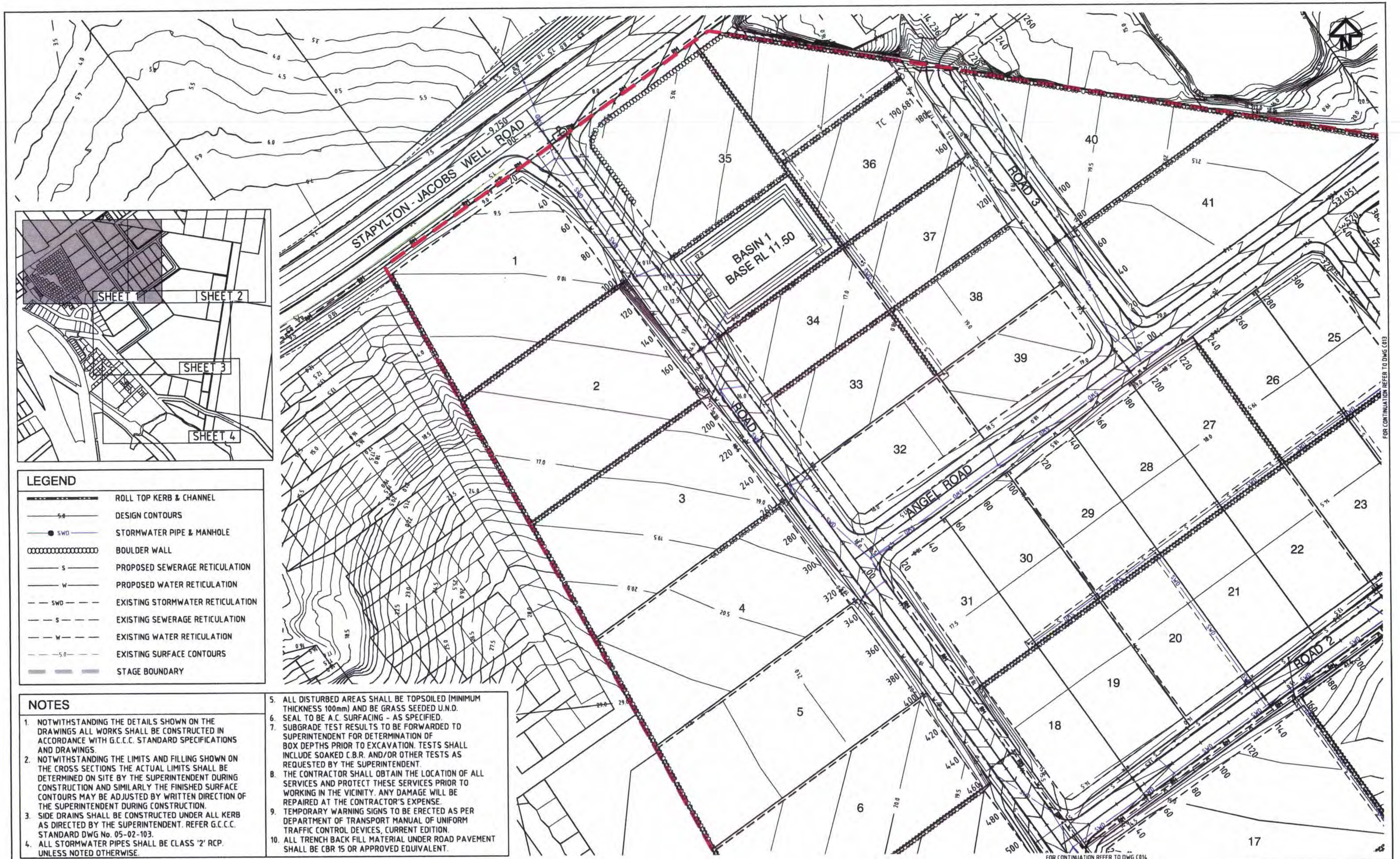


PROVIDE SAND BAGS ACROSS FLOW PATH. PROVIDE TURF AROUND SAND BAGS, TO A MINIMUM OF 1m IN FRONT AND 2m BEHIND. EXTENT TO BE DETERMINED ON SITE BY SUPERINTENDENT.



			Surveyor		Project		Status		Project		HYDER CONSULTING PTY. LTD	
			GASSMAN DEVELOPMENT PERSPECTIVES		MRS PARTRICIA & MR WILLIAM HESTER		PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia	
			Architect				Approved R.E.P.Q. No:		Title		Hyder Consulting	
			Scale				Scales		N.T.S.		Current Issue Signatures	
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			1: 2500				Height Datum		DATUM		Designer R.RONALDOS	
							Grid		GRID		Reviewer M.BRAY	
											E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
											Drawing No. Project No. Issue	
											C007 — AA003837 — 02	

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LEGEND	
	ROLL TOP KERB & CHANNEL
	DESIGN CONTOURS
	STORMWATER PIPE & MANHOLE
	BOULDER WALL
	PROPOSED SEWERAGE RETICULATION
	PROPOSED WATER RETICULATION
	EXISTING STORMWATER RETICULATION
	EXISTING SEWERAGE RETICULATION
	EXISTING WATER RETICULATION
	EXISTING SURFACE CONTOURS
	STAGE BOUNDARY

- NOTES**
- NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS AND DRAWINGS.
 - NOTWITHSTANDING THE LIMITS AND FILLING SHOWN ON THE CROSS SECTIONS THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE SUPERINTENDENT DURING CONSTRUCTION.
 - SIDE DRAINS SHALL BE CONSTRUCTED UNDER ALL KERB AS DIRECTED BY THE SUPERINTENDENT. REFER G.C.C.C. STANDARD DWG No. 05-02-103.
 - ALL STORMWATER PIPES SHALL BE CLASS '2' RCP, UNLESS NOTED OTHERWISE.
 - ALL DISTURBED AREAS SHALL BE TOPSOILED (MINIMUM THICKNESS 100mm) AND BE GRASS SEEDED U.N.D.
 - SEAL TO BE A.C. SURFACING - AS SPECIFIED.
 - SUBGRADE TEST RESULTS TO BE FORWARDED TO SUPERINTENDENT FOR DETERMINATION OF BOX DEPTHS PRIOR TO EXCAVATION. TESTS SHALL INCLUDE SOAKED C.B.R. AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT.
 - THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 - TEMPORARY WARNING SIGNS TO BE ERECTED AS PER DEPARTMENT OF TRANSPORT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
 - ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.

ISSUE FOR SUBMISSION TO G.C.C.C.		NO	19.08.11
DESIGN AMENDED		NO	20.07.11
ORIGINAL ISSUE		NO	06.01.11
Issue	Description	Date	

Scale: 1:1000

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Surveyor: **GASSMAN DEVELOPMENT PERSPECTIVES**

Client: **MRS PARTRICIA & MR WILLIAM HESTER**

Architect:

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved: **REP.Q. No.**

Scales: **1:1000**

Original Size: **A1**

Height Datum: **DATUM**

Grid: **GRID**

Author: **NDREISE**

Designer: **T.DINGLE**

Reviewer: **MBRAY**

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Project: **STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE**

Title: **ROADWORKS & DRAINAGE LAYOUT PLAN SHEET 1 OF 4**

Hyder Consulting

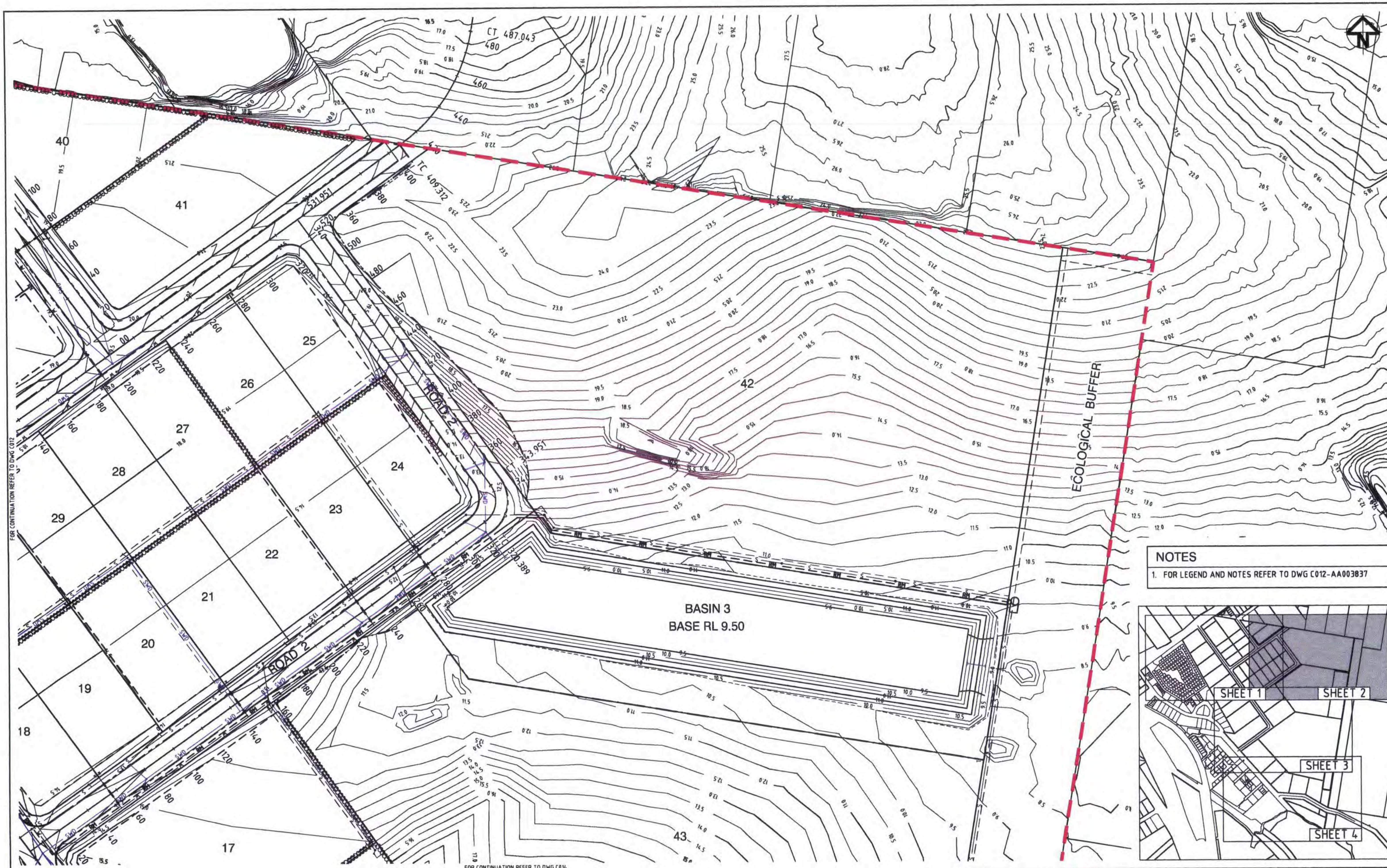
HYDER CONSULTING PTY. LTD.
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Drawing No: **C012** Project No: **AA003837** Issue: **03**

Filename: C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG

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NOTES
1. FOR LEGEND AND NOTES REFER TO DWG C012-AA003837



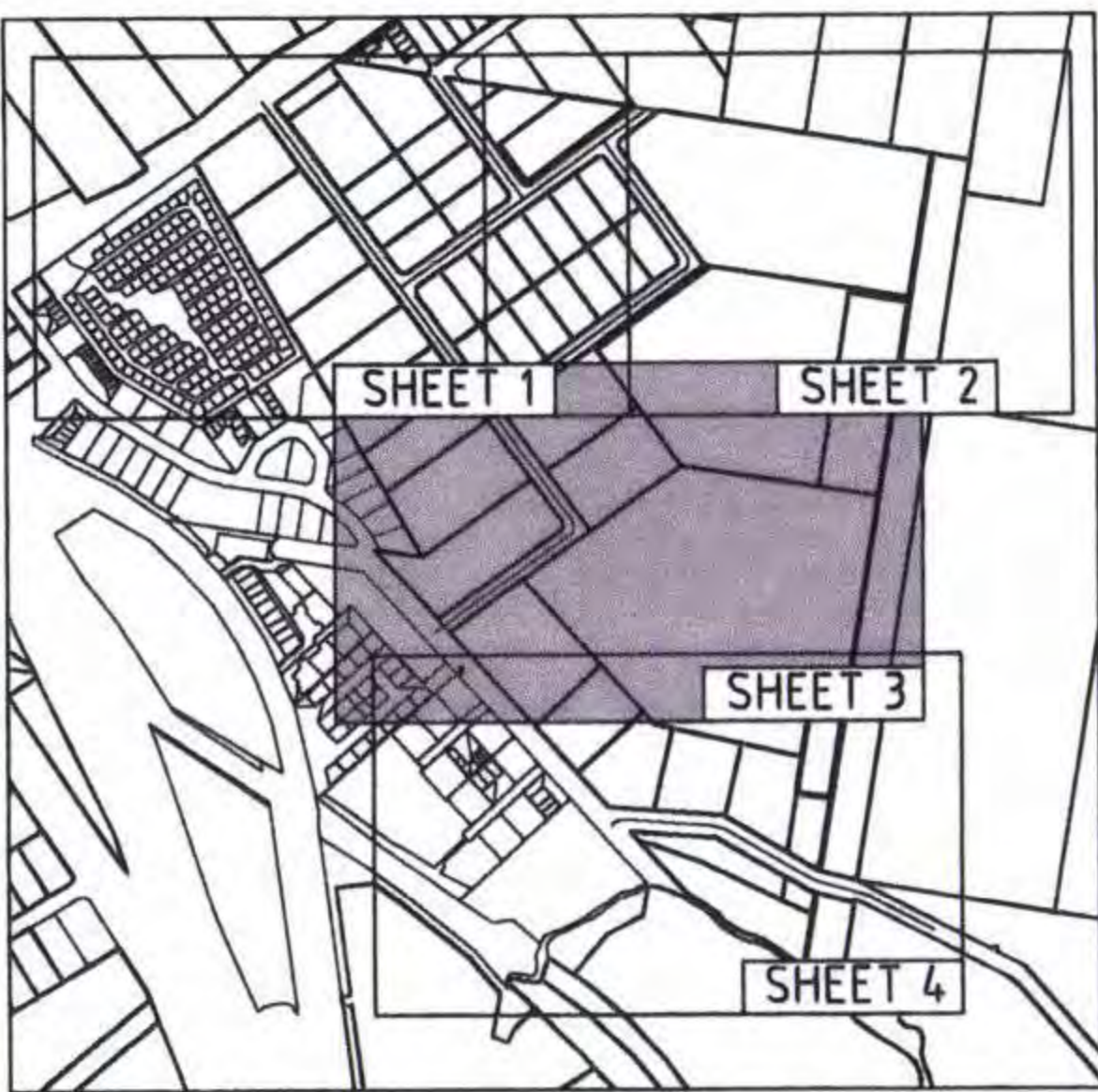
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03		ISSUE FOR SUBMISSION TO G.C.C.C.		ND		19.08.11						Approved R.E.P.Q. No.		Current Issue Signatures		Title ROADWORKS & DRAINAGE LAYOUT PLAN SHEET 2 OF 4					
02		DESIGN AMENDED		ND		20.07.11						Scales 1:1000		Author N DREISE							
01		ORIGINAL ISSUE		ND		06.01.11						Original Size A1		Designer T DINGLE							
Issue		Description		Date				Architect				Height Datum DATUM		Reviewer M BRAY							
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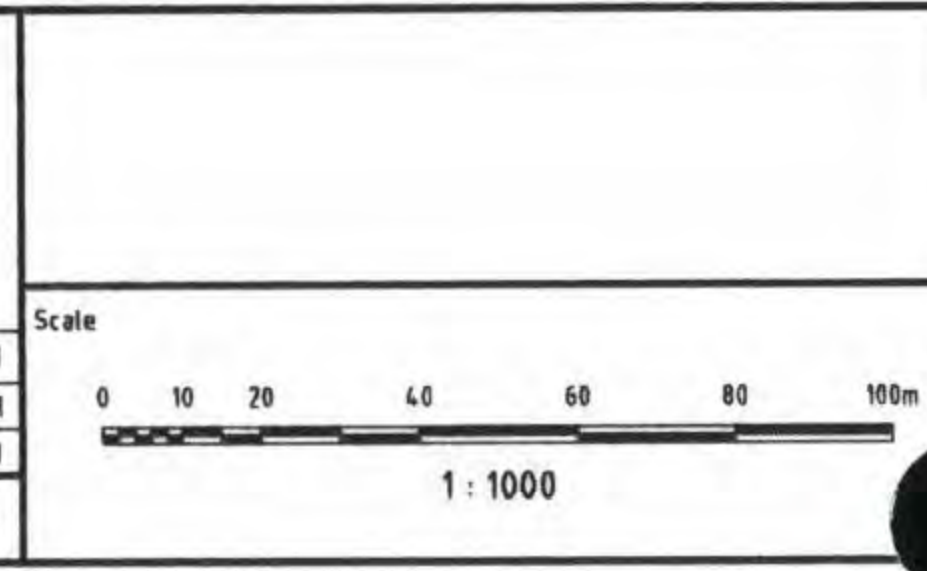
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1. FOR LEGEND AND NOTES REFER TO DWG C012-AA003837



Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



Surveyor
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Architect
MRS PARTRICIA & MR WILLIAM HESTER
Filename: C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG

Client
MRS PARTRICIA & MR WILLIAM HESTER

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
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Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID
Current Issue Signatures	Author N.DREISE Designer T.DINGLE Reviewer M.BRAY Copyright reserved

Project
**STAPYLTON, JACOBS WELL
HESTER DEVELOPMENT SITE**
Title
**ROADWORKS & DRAINAGE
LAYOUT PLAN
SHEET 3 OF 4**

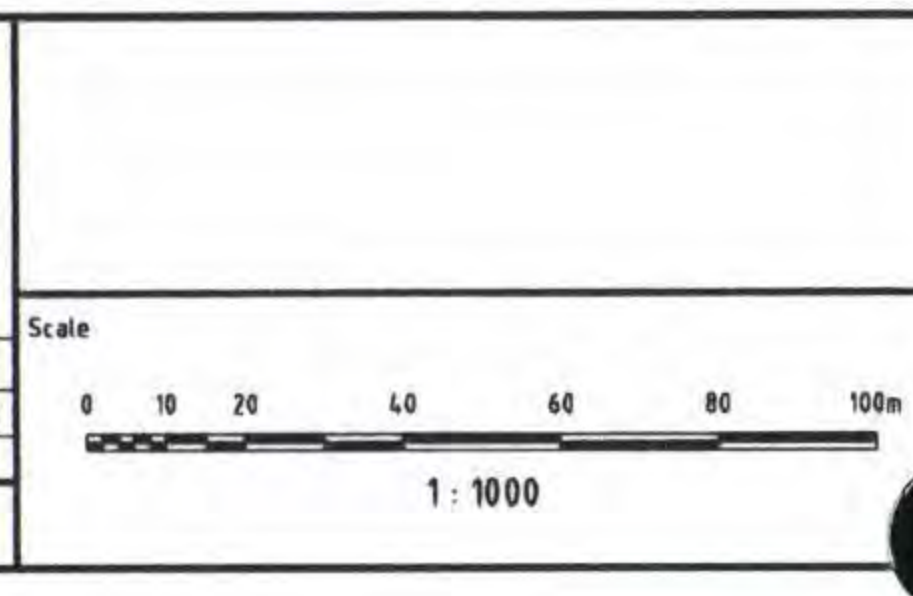
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Drawing No. C014 Project No. AA003837 Issue 03



NOTES
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Issue	Description	Date
03	ISSUE FOR SUBMISSION TO G.C.C.C.	ND 19.08.11
02	DESIGN AMENDED	ND 20.07.11
01	ORIGINAL ISSUE	ND 06.01.11



Surveyor
GASSMAN DEVELOPMENT PERSPECTIVES
Architect
Filename: C012-C015-AA003837-01-ROAD WRKS & DRAINAGE.DWG

Client
MRS PARTRICIA & MR WILLIAM HESTER

Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION
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Scales	1:1000
Original Size	A1
Height Datum	DATUM
Grid	GRID
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Project
**STAPYLTON, JACOBS WELL
HESTER DEVELOPMENT SITE**
Title
**ROADWORKS & DRAINAGE
LAYOUT PLAN
SHEET 4 OF 4**

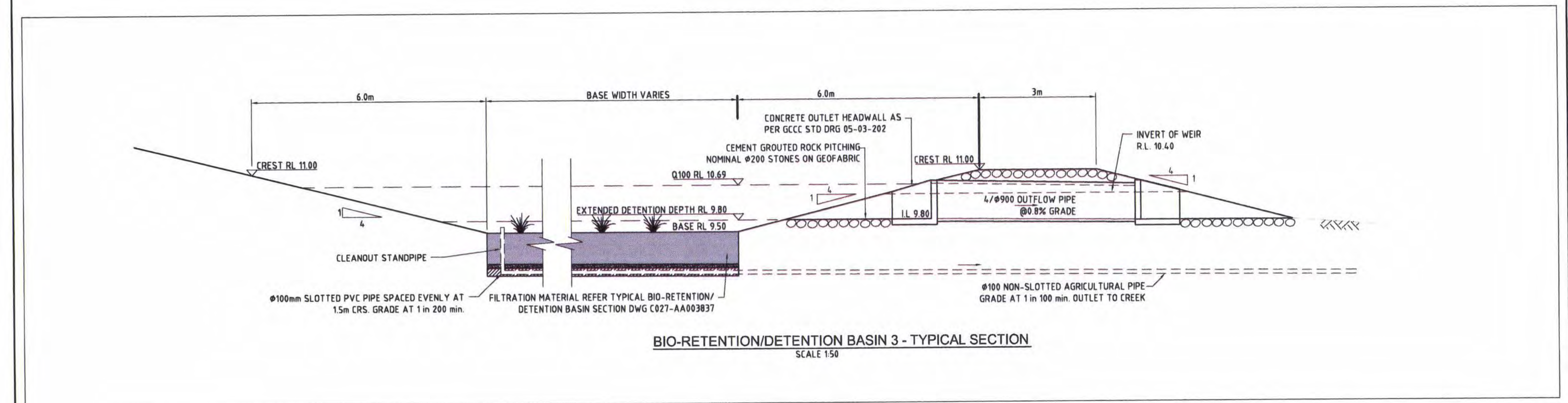
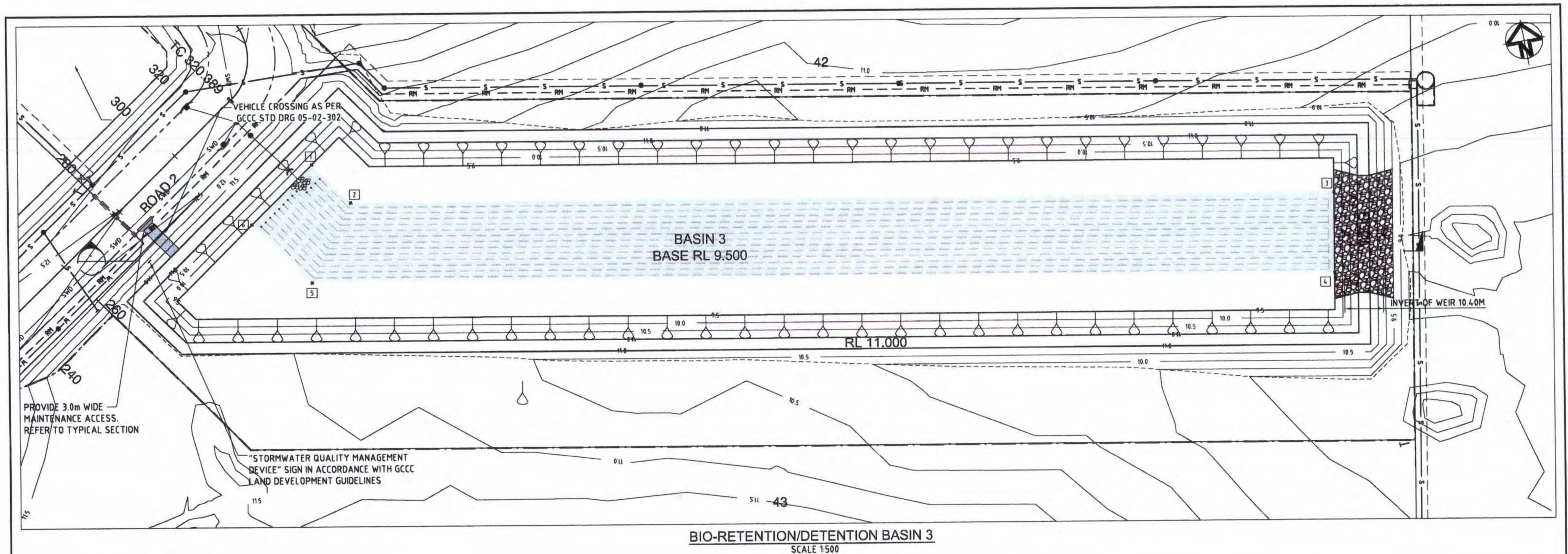
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Drawing No. **C015** Project No. **AA003837** Issue **03**

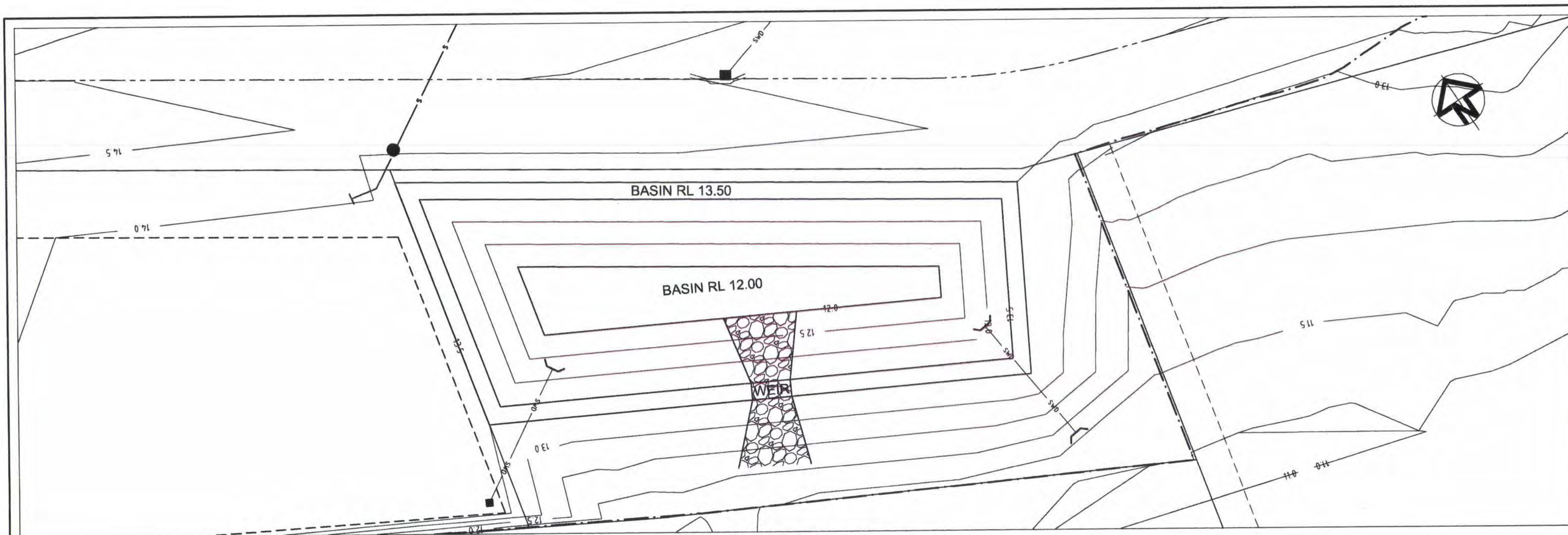
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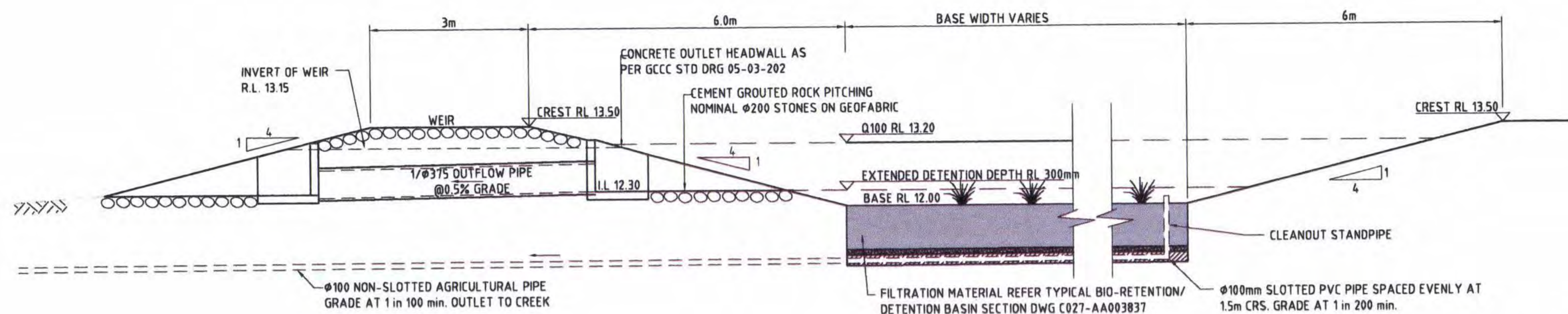
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Issue Description Date			Scale 5 10 20 30 40 50m 0 0.5 1 2 3 4 5m 1:500 1:50		Architect GASSMAN DEVELOPMENT PERSPECTIVES	Client MRS PARTRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	Hyder Consulting HYDER CONSULTING PTY. LTD ABN 49 010 924 966 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com
Issue Description Date			Scale 5 10 20 30 40 50m 0 0.5 1 2 3 4 5m 1:500 1:50		Architect GASSMAN DEVELOPMENT PERSPECTIVES	Client MRS PARTRICIA & MR WILLIAM HESTER	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	Hyder Consulting HYDER CONSULTING PTY. LTD ABN 49 010 924 966 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com



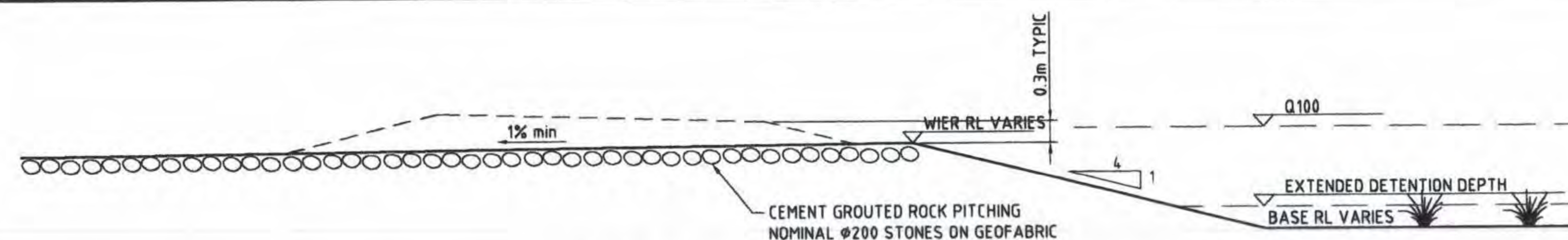
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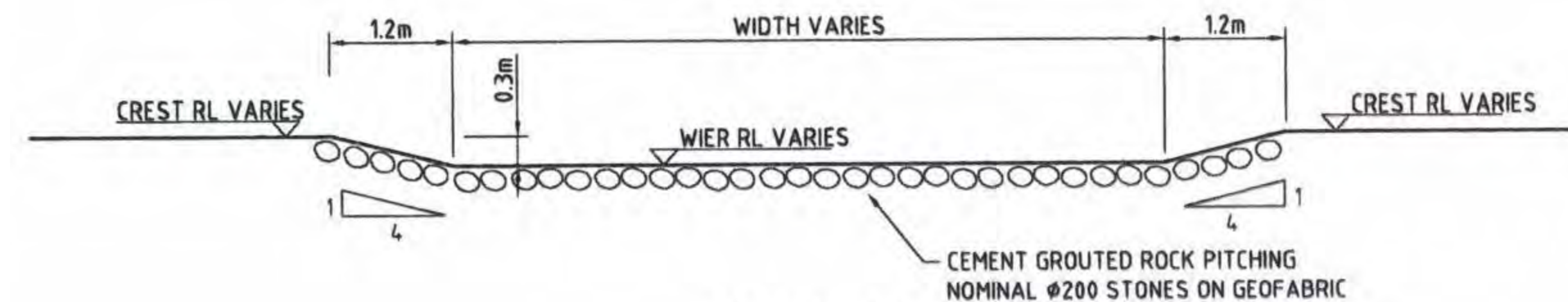
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02 DESIGN AMENDED ND 20.07.11								
01 ORIGINAL ISSUE ND 06.01.11								
Issue Description Date			Title BIO RETENTION / DETENTION BASIN 4 LAYOUT PLAN					
			Drawing No. C026 — Project No. AA003837 — Issue 03					

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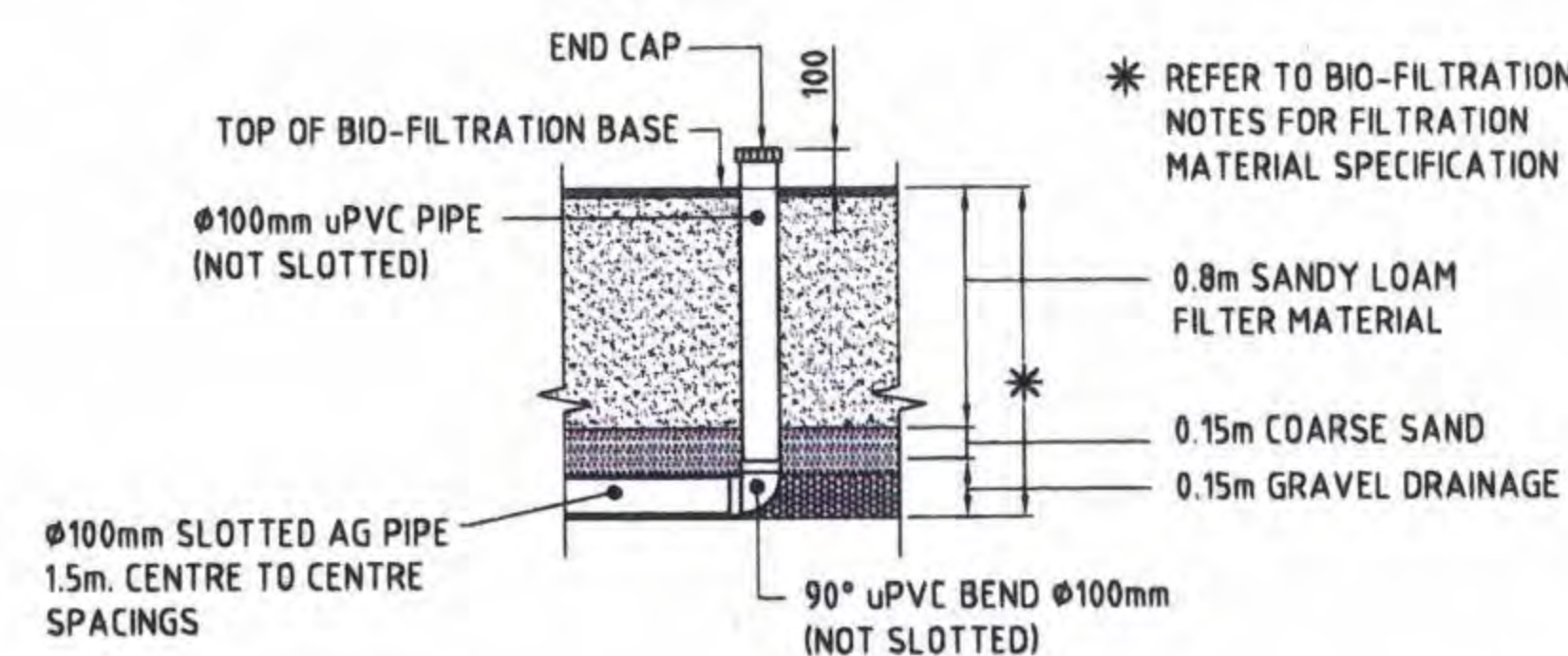


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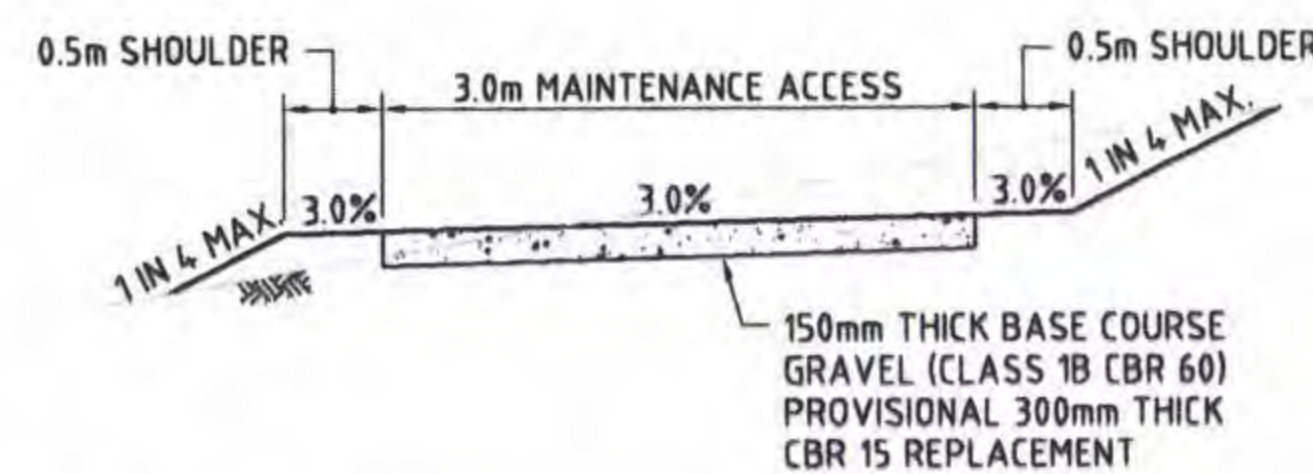


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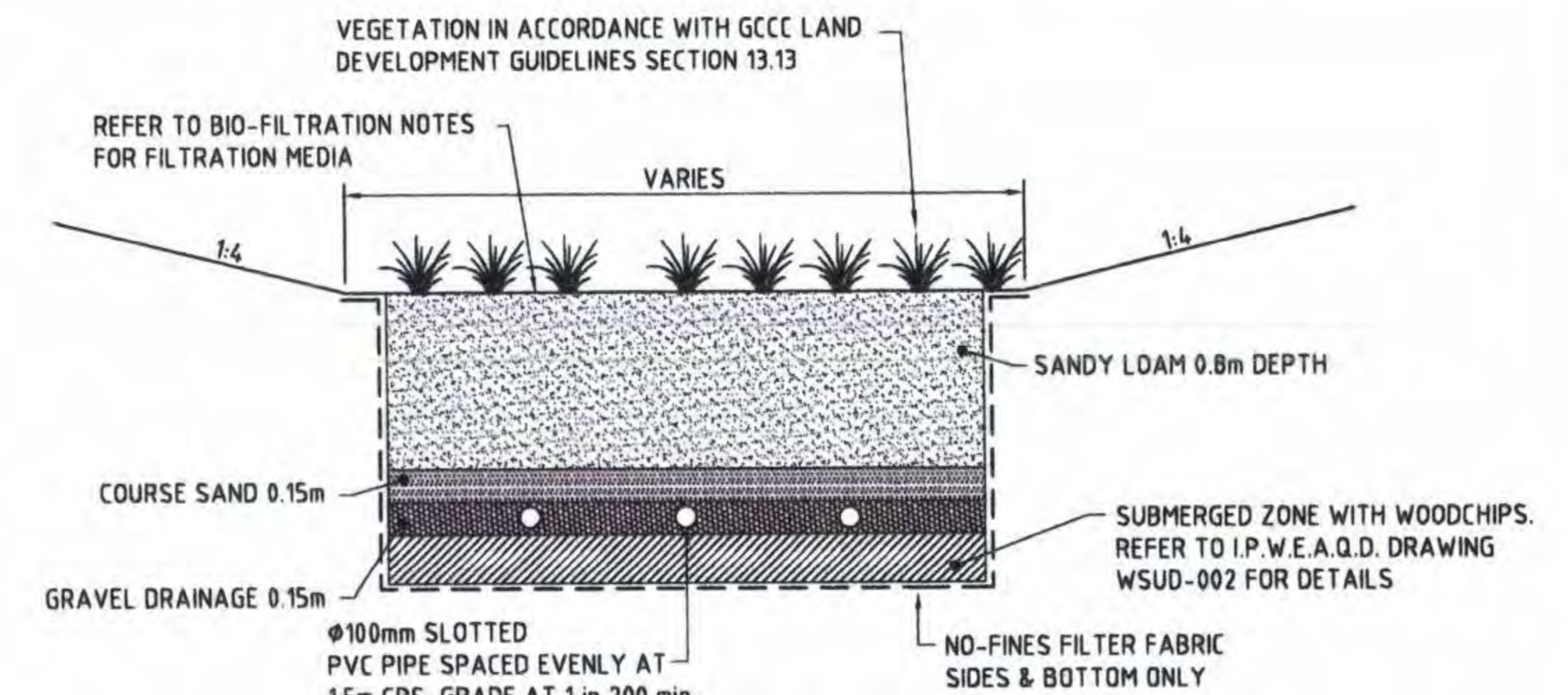
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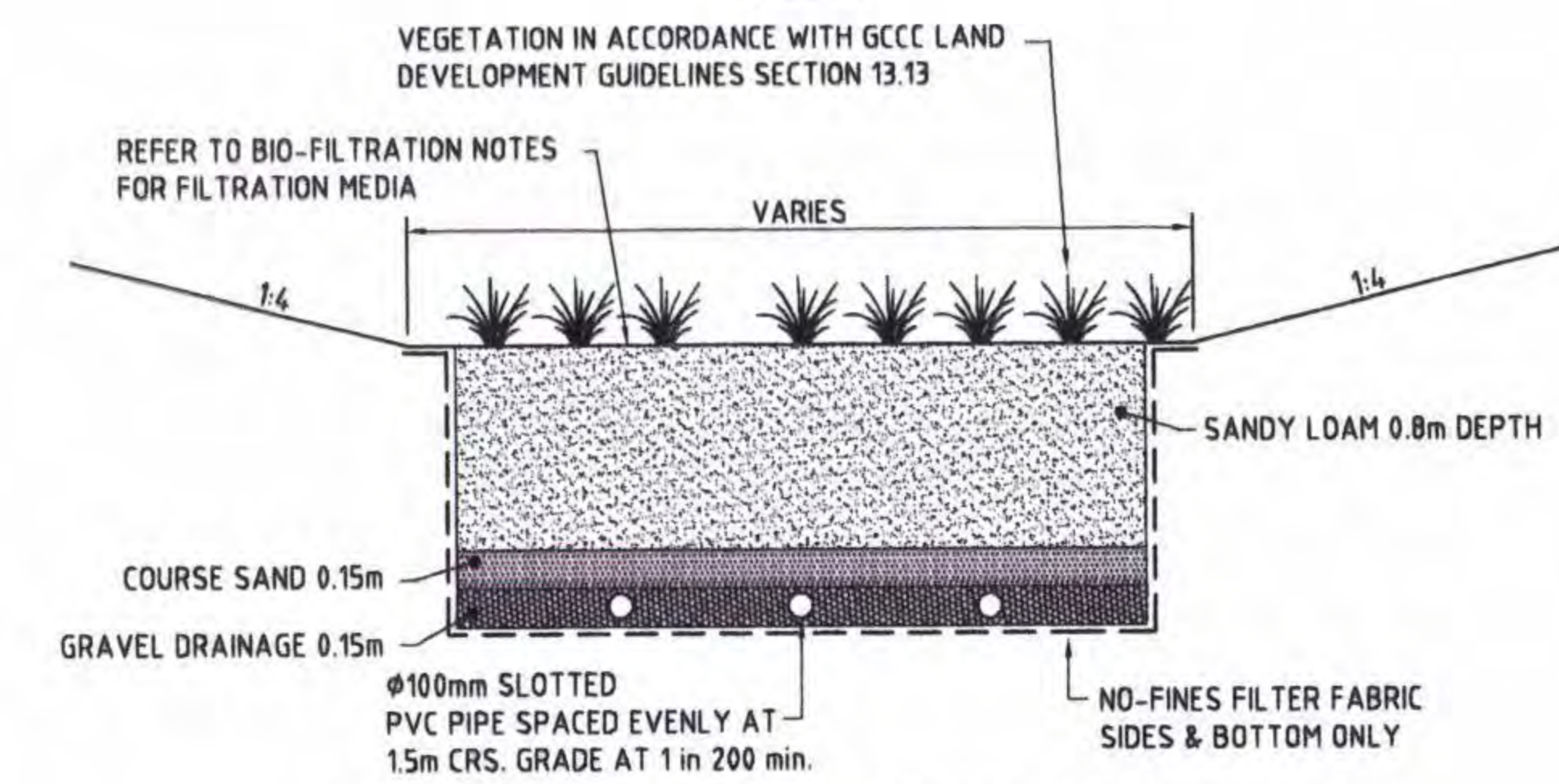
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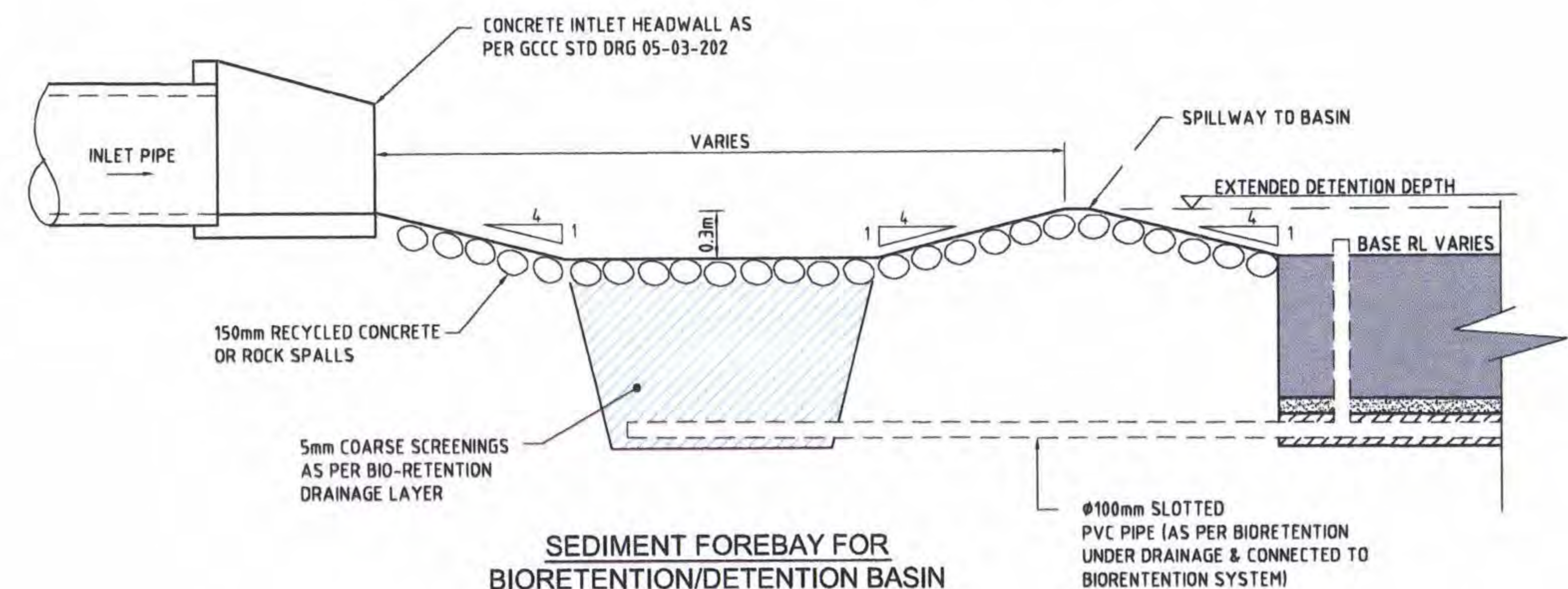
TYPICAL SECTION - MAINTENANCE ACCESS
N.T.S.



TYPICAL BIO-RETENTION FILTER SECTION
BASIN 1
SCALE 1:25



TYPICAL BIO-RETENTION FILTER SECTION
BASIN 2 & 3
SCALE 1:25



SEDIMENT FOREBAY FOR
BIORETENTION/DETENTION BASIN
SCALE 1:25

SURFACE TREATMENT DETAILS

TURFING TO ALL AREAS 1:4 SLOPE OR FLATTER.
VEGETATION TO ALL AREAS STEEPER THAN 1:4. REFER
TO LANDSCAPE ARCHITECT DRAWINGS AND WETLAND
SPECIFICATION FOR DETAILS

BIO-FILTRATION NOTES

MINIMUM FILTER DEPTH IS TO BE 1.2m AND IS TO CONSIST
OF THE FOLLOWING MEDIA:

× 0.8m OF SANDY LOAM MATERIAL WITH A HYDRAULIC
CONDUCTIVITY OF 50-200mm/h AND A PARTICLE SIZE OF
0.45-0.5mm.

× 0.15m OF COURSE SAND. PARTICLE SIZE TYPICALLY 1mm.

× 0.15m OF GRAVEL DRAINAGE. PARTICLE SIZE 5-10mm
SCREENING.

× CONTRACTOR TO ERECT SIGNAGE IDENTIFYING THE
PURPOSE OF THE BIO-RETENTION / DETENTION BASIN AS
PER COUNCIL REQUIREMENTS.

			Surveyor		Client		Status		Project		 HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com Drawing No. Project No. Issue C027 — AA003837 — 03		
			GASSMAN DEVELOPMENT PERSPECTIVES		MRS PARTRICIA & MR WILLIAM HESTER		PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE				
			Architect				Approved		Title				
							Scales		BIO RETENTION / DETENTION DETAILS				
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									03				

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APPENDIX C

GCCC DEVELOPMENT CODES



Part 7 Codes

Division 3 Constraint Codes

Chapter 8 Flood Affected Areas

1.0 Purpose

To ensure that, where premises within flood affected areas are to be developed, adequate measures are taken to:

- ensure that the development does not cause, or have the cumulative potential to cause, real damage (as defined below);
- provide standards for development in these areas that will ensure that the runoff from land and/or premises does not create any adverse environmental impacts.

Key objectives include:

- a) avoiding, if practicable, or otherwise lessening, the adverse impacts of flooding;
- b) maintaining or improving the City's counter disaster response efforts during a flood emergency;
- c) equitably sharing development constraints and development potential within a single river catchment and its sub catchments;
- d) equitably sharing the costs and benefits of flood mitigation infrastructure within a river catchment and its sub-catchments;
- e) protecting the flood storage function of the City's flood plains;
- f) protecting the flood discharge capacity of the City's rivers, streams and canals;
- g) achieving and maintaining a best practice approach to flood plain management;
- h) protecting ocean beaches and the shores and banks of estuaries, lakes, canals, rivers, streams and other waterbodies from erosion.

This code seeks to manage the effects of flooding on flood prone land, where it relates to new and existing development, infrastructure and ecosystems, by requiring:

- certified engineering hydraulic management plans or studies;
- specific design criteria for certain types of land uses.

All such proposals for development will be fully evaluated against the following criteria:

- real damage: whether the development is likely to cause damage that would adversely affect land and/or premises to an extent likely to be actionable;
- cumulative impact: whether the cumulative impact of development is likely to cause real damage;
- flood hazard: whether the development is likely to cause or worsen flood hazard;
- risks: whether the risks associated with the development are fully known, quantifiable and capable of being dealt with to Council's satisfaction, without any uncertainties; and
- flood mitigation: whether flood mitigation works, intended to reduce flood risk, hazard and damage, do so without adversely impacting upon other land and/or premises.



2.0 Application

2.1 This code applies to development that is indicated as self, code or impact assessable in the Table of Development to the domain or Local Area Plan (LAP) within which the development is proposed. In particular, this code applies to any site that is located within a Flood Affected Area*, defined as follows:

- flood prone land; or
- premises where access would be adversely affected during a range of floods, up to and including the designated flood.

*Refer to **Overlay Map OM17 – Natural Hazard (Flood) Management Areas** sheets 1-35.

2.2 This code does not apply to Class 1 or Class 10 buildings as defined in the **Building Code of Australia**, except where Council has declared an area to be flood liable under **Section 53** of the **Queensland Building Regulations**. However, this code provides recommendations for minimum floor levels for Class 1 and Class 10 buildings within flood prone land.

2.3 Note that where Operational Work is being undertaken within flood affected areas that results in a disturbance to the surface of the land, **Specific Development Code 11 – Changes to Ground Level and Creation of New Waterbodies** and **Constraint Code 14 – Sediment and Erosion Control** are also relevant.

2.4 Performance Criteria PC1-PC14 apply to all code and impact assessable development subject to this code. For development identified as self assessable in the relevant domain or LAP, only the acceptable solutions to Performance Criteria PC1-PC4 apply.

3.0 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Self Assessable, Code Assessable or Impact Assessable			
Flood Storage			
PC1 All development activity conducted on land below the designated flood level must not detrimentally affect the flood storage capacity of the catchment and the drainage regime.	AS1 The flood storage volume on the site is maintained up to the Designated Flood Level. Note: <i>The Designated Flood Level can be obtained from Council's Flood Search.</i>	AS1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood storage requirements for the proposed development.	
Building Floor Levels			
PC2 Building floor levels of habitable rooms must be raised to provide an allowance for the hydraulic gradient above the main floodway, so as to meet the requirements of the Standard Building Regulation and Building Code of Australia .	AS2.1.1 An allowance of at least 300mm is added to the Designated Flood Level for habitable rooms, or other allowance amount specified in a Local Area Plan. OR AS2.1.2	AS2.1.1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the 300mm Freeboard requirements for the proposed development.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Note: <i>Performance criteria for setting building floor levels are set out in the Standard Building Regulation and Building Code of Australia. However, it should be noted that Designated Flood Levels provided by Council relate to mainstream flood flow paths and do not include allowances for the hydraulic gradients from residential areas to the main floodway.</i>	Damaged residential buildings are reconstructed to have a Design Floor Level at or above the level that existed prior to the building's damage, provided that the building work is limited to reinstatement. AS2.2 Where the building has been destroyed by flood, the reconstructed floor level accords with AS2.1.1.	AS2.2 – Not Applicable No onsite existing buildings exist that have being destroyed by floods therefore AS2.2 is not applicable.	
PC3 Building floor levels of garages and non habitable rooms must be constructed at a height that reflects an acceptable flood risk for their purpose. Note: <i>PC3 does not apply to:</i> a) <i>extensions to existing buildings;</i> b) <i>structures detached from a dwelling, for which the use is ancillary to that of a dwelling, provided that use is not listed in column 1 of Table to Acceptable Solution AS7.1.</i>	AS3.1 Building floor levels of garages and non habitable rooms, constructed at approximately the same level as, and attached to, the main dwelling, is constructed at a height above the Designated Flood Level, except where the dwelling has a suspended floor, constructed one metre or more above ground, or where the building is to be constructed within a Rural Domain. AS3.2 Non-habitable rooms and garages, detached from the fabric but within the curtilage of a building, that are not for the storage of goods are constructed above or below the Designated Flood Level.	AS3.1 & AS3.2 – Complies Hyder Consulting drawings C008-C011 – AA003837 illustrate a minimum lot pad level of RL9.20 AHD metres which is above Council's Recommended Q100 Flood Level of RL8.6 AHD. All structures built within the site will therefore be above the designated flood level demonstrating compliance to AS3.1 and AS3.2.	
Overland Flow			
PC4 Building work must not provide obstructions to the free passage of stormwater through a property.	AS4 Overland flowing stormwater is allowed free passage between the street and any waterway at the rear of the property, in accordance with the provisions of the Building Code of Australia.	AS4 – Complies As per Hyder drawings C012-C015 – AA003837 overland flow is permissible through the provision of easements, stormwater infrastructure and basins which are in accordance with the Building Code of Australia.	

Development that is Code Assessable or Impact Assessable

Flooding Risk



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC5 Development in flood affected areas must not cause, or have the cumulative potential to cause, real damage, must not increase the level of risk to life, or be to the detriment of flood evacuation procedures.	AS5 Development does not: a) increase the number of people calculated to be at risk from flooding; b) increase the number of people likely to need evacuation; c) shorten flood warning times; d) impact on the ability of traffic to use evacuation routes, or unreasonably increase traffic volumes on evacuation routes, or as identified within Council's Counter Disaster Plan (flooding); e) place additional burdens on Council's resources or emergency services; f) increase the duration of flooding, unless that increase is part of a Council approved flood mitigation strategy.	AS5 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the effects of flooding as well as associated requirements of safety, mitigation and preservation of existing flood characteristics for the proposed development.	
Flood Storage and Conveyance			
PC6 Development with plans for earthworks in a floodplain on or over a water body or within a flood affected area below the Designated Flood Level must allow for the maintenance of flood storage, and flood conveyance of flood and drainage channels and overland flow paths.	AS6.1 Provide flood storage calculations that demonstrate that flood storage volume, over the site below the Designated Flood Level, is maintained or increased. AS6.2 A certified hydraulic study (and, if necessary, a hydrologic study) is prepared by a suitably qualified and experienced engineer to investigate the hydraulic characteristics of both the undeveloped and developed site and make comparisons between them. Proposed developments in, on or over a water body, or within a flood affected area, must be tested for: a) the 50%, 20%, 10%, 5%, 2% and 1% Annual Exceedance Probability (AEP) for local flood events; b) the 5%, 2%, and 1% AEP floods and the designated flood and design flood AEP	AS6.1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood storage requirements for the proposed development. AS6.2 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the existing and developed cases of the site with regards to hydraulic/hydrologic characteristics and impacts of the site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	(as specified in Table to Acceptable Solution AS7.1) for riverine flood events, c) any resultant afflux or increase in flood velocities sufficient to cause real damage to premises. The Assessment Manager may also require the development to be assessed against rarer floods. AS6.3 The Assessment Manager may decide that a hydraulic and/or hydrological study is not necessary if in the Assessment Manager's opinion: a) a relevant study, that is not outdated, demonstrates there are no significant flooding impacts that were not covered in the relevant study; or b) the flooding impact of the approval, in relation to the development, is minor, c) in which event the Assessment Manager must provide a written notice to that effect to the applicant.		

Development for Certain Purposes

PC7 Development listed in Table to Acceptable Solution AS7.1 must allow for flood events and be constructed at a level above most floods.	AS7.1 Development is designed for the Design Flood AEP, as specified in Table to Acceptable Solution AS7.1. Note: <i>The designated flood level for residential buildings in general is a 1% flood level except for:</i> a) <i>Broadwater – the 1% AEP storm surge level, plus an allowance of 0.27 metres, to account for sea level rise resulting from climate change;</i> b) <i>Logan and Albert Rivers – the designated flood is based, in part, on rainfall that occurred during the January 1974 flood and assumptions made regarding the ultimate level of development, in accordance</i>	AS7.1 & AS7.2 – Complies The development as part of the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) has being designed for the designated flood level issued by Council and in accordance with Table to Acceptable Solution AS7.1, Light Industry/warehousing.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	<i>with the relevant local planning instruments; and</i> c) <i>Historical flood level is the only information available to be specified designated flood level.</i> AS7.2 Development is constructed at or above the Design Flood Reclamation Level, shown in the Table to Acceptable Solution AS7.1, where the Designated Flood is the 1% AEP flood event, except as follows: a) Broadwater: the 1% AEP storm surge level, plus an allowance of 0.27 metres, to account for sea level rise resulting from climate change; b) Logan and Albert Rivers: the designated flood is based, in part, on rainfall that occurred during the January 1974 flood and assumptions made regarding the ultimate level of development, in accordance with the relevant local planning instruments; and c) Coomera River: the designated flood is based on the modelled 1% AEP flood event or historic levels, whichever is the higher.		
PC8 Development must consider hydrologic and hydraulic impacts of development in flood affected areas with regard to future climate change.	AS8 No acceptable solution provided. Note: <i>As part of a Hydrologic and hydraulic impact assessment, investigation has been undertaken to determine the impacts of future climate change. The findings of the investigation may be used to modify modelling parameters and boundary conditions used in modelling the hydrologic and hydraulic impacts of development in flood affected areas.</i>	AS8 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the existing and developed cases of the site with regards to hydraulic/hydrologic characteristics and impacts of the site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
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Table to Acceptable Solution AS7.1

Land Use	Design Flood
Disaster management facilities	0.2% AEP
Hospitals	0.2% AEP
Major electrical switchyards, power stations, water treatment plants	0.2% AEP
Fire/police stations	0.5% AEP
Places of refuge	0.5% AEP
Electricity substations	0.5% AEP
Sewage treatment plants	0.5% AEP
Homes for the aged, hospice	0.5% AEP
Regional fuel storage	0.5% AEP
Food storage warehouses	0.5% AEP
Hotel residential	Designated flood
Educational facilities	Designated flood
Residential buildings	Designated flood
Camping grounds, caravan parks and relocatable homes reclamation levels	Designated flood
Commercial	Designated flood
Light industrial/warehousing	Designated flood
Theme parks	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Clubs/non-habitable buildings associated with enjoyment of public open space	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Car parking below buildings	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Open space	Not specified, but ancillary structures are subject to appropriate hazard conditions in the designated flood, as specified in AS10.1
Rural	Not specified

Hazard Considerations for Development

PC9	AS9	AS9 – Complies	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development listed in the Table to Acceptable Solution AS9 below must be designed and constructed to avoid causing exposure to undue flood hazard.	Development is to be designed and constructed so that users are not exposed to a greater degree of hazard than shown in Table to Acceptable Solution AS9 for the range of flows specified in AS7.1 .	A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the appropriate degree of hazard as per Table to Acceptable Solution AS9; Commercial/Industrial.	

Table to Acceptable Solution AS9

Land-Use	Appropriate Degree of Hazard				
	Nil	Low	Medium	High	Extreme
Public open space/recreation	✓	✓	✓	✓	✓
Theme parks	✓	✓	✓	✓	
Clubs/non-habitable buildings associated with enjoyment of public open space	✓	✓	✓	✓	
Commercial/industrial	✓	✓	✓		
Residential	✓	✓	✓		
Public institutions	✓	✓	✓		
Car parking below buildings	✓	✓	✓	✓	
Caravan parks	✓	✓	✓		
Council offices	✓	✓			
Schools	✓	✓			
Homes for the elderly	✓	✓			
Hospitals	✓	✓			
SES	✓	✓			
Police/fire stations	✓	✓			
Museums/libraries/archives/ infrastructure plan repositories	✓				
Telephone exchanges	✓				

Note: ✓ Indicates an appropriate land use.



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
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The above table examines the appropriateness of land use decisions from the aspect of flood hazard only. As such, it does not confer any land use rights or provide any indication that Council will reject or favourably consider various uses in particular areas. Such consideration will be dealt with appropriately, in the context of the Planning Scheme, and based upon full consideration of all relevant issues.

Access Criteria with Respect to Hazard

PC10 All proposed development must demonstrate that sufficient access or egress will be available to enable evacuation during a range of floods, up to and including the designated flood.	AS10.1 Development, not including underground car parks, must ensure that evacuation opportunities exist in accordance with the minimum levels of exposure outlined in Table to Acceptable Solution AS10.1, where means of access or egress may be: a) an access route that is below the level of the designated flood, provided that route is classed as a low hazard, as defined in Table to Acceptable Solution AS10.1; or b) an access route that is not the main access route. However, it must remain effective for the duration of a range of flood events, up to and including the designated flood; or c) a temporary access arrangement, provided that access can be gained without significant preparation time being required; The access or egress must: a) in the event of a designated flood: ▪ not expose users to undue risk; ▪ not cause, or have the cumulative potential to cause, real damage to land and/or premises; ▪ not interrupt or materially change the surface water drainage from or onto adjoining land; b) not create, in the event of a flood, a sudden change in flow distributions, flood level or velocity that could result in: ▪ the breaking of a levee; or	AS10.1 - Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the evacuation procedures and escape routes in the event of a Q100 flood event, in accordance with Table to Acceptable Solution AS10.1. The plan demonstrates that the entire site still has safe access to roadways and pedestrian routes as well as access to the adjacent traffic networks to the North-East and South-West during the event.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	- the establishment of blockage of a breakout; or - excessive scour; or - sedimentation; or - increased flood hazard.		

Table to Acceptable Solution AS10.1

Criteria	Degree of Flood Hazard			
	Low	Medium	High	Extreme
Wading ability	If necessary children and the elderly could wade. (Generally, safe wading velocity depth product is less than 0.25.)	Fit adults can wade. (Generally, safe wading velocity depth product is less than 0.4.)	Fit adults would have difficulty wading. (Generally, where wading velocity depth product is less than 0.6.)	Wading is not an option.
Evacuation distances	< 200 metres	200 – 400 metres	400 – 600 metres	> 600 metres
Maximum flood depths	< 0.3 metres	< 0.6 metres	< 1.2 metres	> 1.2 metres
Maximum flood velocity	< 0.4 metres per second	< 0.8 metres	< 1.5 metres	> 1.5 metres
Typical means of egress	Sedan	Sedan early, but 4WD or trucks later	4WD or trucks only in early stages, boats or helicopters	Large trucks, boats or helicopters
Timing Note: This category cannot be implemented until evacuation times have been established in the Counter Disaster Plan (flooding).	Ample for flood forecasting. Warning and evacuation routes remain passable for twice as long as evacuation time.	Evacuation routes remain trafficable for 1.5 times as long as the evacuation time.	Evacuation routes remain trafficable for only up to minimum evacuation time.	There is insufficient evacuation time.

Note: The evacuation times for various facilities or areas would (but not necessarily) be included in the Counter Disaster Plan (flooding).
Generally, safe wading conditions assume even walking surfaces with no obstructions, steps, soft underfoot, etc.

Filling, Excavation and Contouring

PC11 Any change to ground level, by way of filling, excavation or contouring, must not result in real damage, flood hazard or impediment to any Counter Disaster Plan, measure or create unreasonable change in the exposure to flood hazard.	AS11.1.1 Changes to ground level, by way of filling, excavating or contouring, comply with a hydraulic master plan approved by Council. OR AS11.1.2 A flood study is prepared in accordance with	AS11.12 Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood hazard issues associated with the developed characteristics of the site.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	the requirements set out in AS6.1 and AS6.2 , is approved by Council, and it is established that the development complies with, or does not impede, any Counter Disaster Plan measure.		
PC12 Filling, excavation or contouring must not cause sedimentation, erosion or adverse impact on the City's drainage network.	AS12 No acceptable solution provided. For guidance, please refer to Constraint Code 14 – Sediment and Erosion Control .	AS12 - Complies Sediment and Erosion Control measures are included as part of the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting. Constraint Code 14 – Sediment and Erosion Control also forms part of the site's DA submission.	
Landscaping			
PC13 Landscaping must not impede a natural watercourse, a flood channel or an overland flow path.	AS13.1.1 Landscaping complies with a hydraulics master plan approved by Council. OR AS13.1.2 A flood study, allowing for the landscaping, is prepared in accordance with the requirements of AS6.2 , and is approved by the Assessment Manager.	AS13.1.2 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the hydraulics and hydrology of the site in the development case (includes landscaping).	
Building Floor Levels			
PC14 Buildings that are to be constructed on flood prone land shall not be inundated by floodwaters during a designated flood event.	AS14.1 Development is constructed at or above the Specified Minimum Flood AEP plus the Minimum Design Freeboard, as set out in column 2 of the Table to Acceptable Solution AS14.1 . AS14.2 Where a proposed land use does not reasonably apply to any land use listed in the Table to Acceptable Solution AS14.1 , the	AS14.1 - Complies Hyder drawings C008-C011 – AA003837 as well as the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) illustrate that the proposed minimum site levels are in accordance with Table to Acceptable Solutions AS14.1; light industrial/warehousing.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	applicant is to submit: a) the proposed minimum flood AEP for building floor levels; b) the proposed design freeboard above the specified flood level; and c) a flood hazard and flood risk assessment for the proposed development, assessing the effects on costs, safety, access and potential losses. AS14.3 It is noted that PC14 does not apply to: a) garages below residential buildings; b) garages below commercial premises; and c) garages below industrial premises, provided there are suitable means to restrict motor vehicles being washed away during a flood event.		

Table to Acceptable Solution 14.1

Land Use	Specified Minimum Flood AEP Plus Minimum Design Freeboard
Disaster management facilities	0.2% AEP + 500mm
Hospitals	0.2% AEP + 500mm
Major electrical switchyards, Power stations, Water treatment plants ¹	0.2% AEP + 500mm
Fire and Police stations ²	0.5% AEP + 400mm
Places of refuge	0.5% AEP + 400mm
Electricity Substations ¹	0.5% AEP + 400mm
Sewage Treatment Plants ³	0.5% AEP + 400mm
Homes for the aged, Hospice ⁴	0.5% AEP + 400mm
Regional fuel storage	0.5% AEP + 400mm
Food storage warehouses	0.5% AEP + 400mm
Hotel residential	Designated flood + 300mm
Educational facilities ⁵	Designated flood + 300mm



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Residential buildings		Designated flood + 300mm	
Camping grounds, Caravan parks and Relocatable homes reclamation levels		Designated flood + 300mm	
Commercial ⁶		Designated flood	
Light Industrial / Warehousing ⁶		Designated flood	
Theme Parks		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Clubs/ Non-habitable buildings associated with enjoyment of public open space		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Car parking below buildings		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Open space		Not specified, but ancillary structures are subject to appropriate hazard considerations at the designated flood.	
Rural		Not specified	

Note: AEP is the Annual Accedence Probability

Notes for Table of AS14.1

1. Applies to switchyard components necessary for the operation of the facility during a flood emergency. This shall be determined by Powerlink.
2. Excludes 'shop front' facilities and those not likely to be utilised during a flood emergency.
3. Specifically, bunds, electrical and mechanical equipment necessary for the continued operation of a sewage treatment plant shall not be at risk of inundation during a flood emergency.
4. The flood immunity specified is to meet the objective of not adding to the burden of flood emergency services.
5. It is not necessary that all rooms within an education facility be above the 1% AEP level. However, there should be sufficient space to accommodate the whole of the school population for the continuation of education, immediately after a flood.
6. Freeboard is not specified, as it is considered that commercial risk provisions should apply. If such land is developed to a flood immunity less than 1% AEP (as may be permitted by any local planning instrument), Council may endorse rates notices accordingly.

APPENDIX D

STORMWATER TREATMENT DEVICE MAINTENANCE CHECKLISTS

BIORETENTION BASIN DESIGN ASSESSMENT CHECKLIST			
Asset I.D.		DA No.	
Basin Location:			
Hydraulics:	Minor Flood (m ³ /s):	Major Flood (m ³ /s):	
Area:	Catchment Area (ha):	Bioretention Area (ha):	
TREATMENT		Y	N
Treatment performance verified from curves?			
BIORETENTION MEDIA AND UNDER-DRAINAGE		Y	N
Design documents bioretention area and extended detention depth as defined by treatment performance requirements.			
Overall flow conveyance system sufficient for design flood event(s)?			
Where required, bypass sufficient for conveyance of design flood event?			
Where required scour protection provided at inflow point to bioretention?			
Bioretention media specification includes details of filter media, drainage layer and transition layer (if required)?			
Design saturated hydraulic conductivity included in specification?			
Transition layer provided where drainage layer consists of gravel (rather than coarse sand)?			
Perforated pipe capacity > infiltration capacity of filter media?			
Selected filter media hydraulic conductivity > 10 x hydraulic conductivity of surrounding soil?			
Liner provided if selected filter media hydraulic conductivity < 10 x hydraulic conductivity of surrounding soil?			
Maximum spacing of collection pipes < 1.5m?			
Collection pipes extended to surface to allow inspection and flushing?			
*Maximum upstream flood conveyance complies with QUDM?			
*Overflow pit has set down of at least 50mm below kerb invert? (where conventional gully/intel used downstream of bioretention then no overflow pit required)			
BASIN		Y	N
Bioretention area and extended detention depth documented to satisfy treatment requirements?			
Overflow pit crest set at top of extended detention?			
Maximum ponding depth will not impact on public safety?			
Maintenance access provided to surface of bioretention system (for larger systems)?			
Protection from coarse sediments provided (where required) with a sediment forebay?			
Protection from gross pollutants provided (where required)?			
LANDSCAPE		Y	N
Plant species selected can tolerate extended dry periods, periodic inundation and design velocities?			
Bioretention design and plant species selected integrate with surrounding landscape or built environment design?			
*Planting design conforms with acceptable sight line and safety requirements?			
COMMENTS			

*Streetscape application only

BIORETENTION BASIN CONSTRUCTION INSPECTION CHECKLIST											
Asset I.D.					Inspected By:						
Site:					Date:						
Constructed By:					Time:						
					Weather:						
					Contact During Visit:						
Items inspected		Checked		Satisfactory		Items inspected		Checked		Satisfactory	
		Y	N	Y	N			Y	N	Y	N
DURING CONSTRUCTION & ESTABLISHMENT											
A. FUNCTIONAL INSTALLATION						Structural components					
Preliminary Works						15. Location and configuration of inflow systems as designed					
1. Erosion and sediment control plan adopted						16. Location and levels of overflow pits as designed					
2. Temporary traffic/safety control measures						17. Under-drainage connected to overflow pits as designed					
3. Location same as plans						18. Concrete and reinforcement as designed					
4. Site protection from existing flows						19. Set down to correct level for flush kerbs (streetscape applications only)					
Earthworks and Filter Media						20. Kerb opening width as designed					
5. Bed of basin correct shape and slope											
6. Batter slopes as plans						B. SEDIMENT & EROSION CONTROL (IF REQUIRED)					
7. Dimensions of bioretention area as plans						21. Stabilisation immediately following earthworks and planting of terrestrial landscape around basin					
8. Confirm surrounding soil type with design						22. Silt fences and traffic control in place					
9. Confirm filter media specification in accordance with Step 4						23. Temporary protection layers in place					
9. Provision of liner (if required)											
10. Under-drainage installed as designed						C. OPERATIONAL ESTABLISHMENT					
11. Drainage layer media as designed						24. Temporary protection layers and associated silt removed					
12. Transition layer media as designed (if required)						Vegetation					
14. Extended detention depth as designed						25. Planting as designed (species and densities)					
						26. Weed removal and watering as required					
FINAL INSPECTION											
1. Confirm levels of inlets and outlets						6. Check for uneven settling of banks					
2. Confirm structural element sizes						7. Under-drainage working					
3. Check batter slopes						8. Inflow systems working					
4. Vegetation as designed						9. Maintenance access provided					
5. Bioretention filter media surface flat and free of clogging											
COMMENTS ON INSPECTION											
ACTIONS REQUIRED											
Inspection officer signature:											

BIORETENTION BASIN MAINTENANCE CHECKLIST			
Inspection Frequency:	1 to 6 monthly	Date of Visit:	
Location:			
Description:			
Asset I.D.			
Site Visit by:			
INSPECTION ITEMS:	Y	N	Action Required (details)
Sediment accumulation at inflow points?			
Litter within basin?			
Erosion at inlet or other key structures?			
Traffic damage present?			
Evidence of dumping (e.g. building waste)?			
Vegetation condition satisfactory (density, weeds etc)?			
Watering of vegetation required?			
Replanting required?			
Mowing/slashing required?			
Clogging of drainage points (sediment or debris)?			
Evidence of ponding?			
Damage/vandalism to structures present?			
Surface clogging visible?			
Drainage system inspected?			
Resetting of system required?			
COMMENTS			

BIORETENTION BASIN ASSET TRANSFER CHECKLIST		
Asset I.D.		
Asset Location:		
Construction by:		
'On-maintenance' Period:		
TREATMENT	Y	N
System appears to be working as designed visually?		
No obvious signs of under-performance?		
MAINTENANCE	Y	N
Maintenance plans and indicative maintenance costs provided for each asset?		
Vegetation establishment period completed (2 years)?		
Inspection and maintenance undertaken as per maintenance plan?		
Inspection and maintenance forms provided?		
ASSET INSPECTED FOR DEFECTS AND/OR MAINTENANCE ISSUES AT TIME OF ASSET TRANSFER	Y	N
Sediment accumulation at inflow points?		
Litter within basin?		
Erosion at inlet or other key structures?		
Traffic damage present?		
Evidence of dumping (e.g. building waste)?		
Vegetation condition satisfactory (density, weeds etc)?		
Watering of vegetation required?		
Replanting required?		
Mowing/slashing required?		
Clogging of drainage points (sediment or debris)?		
Evidence of ponding?		
Damage/vandalism to structures present?		
Surface clogging visible?		
Drainage system inspected?		
COMMENTS/ACTIONS REQUIRED FOR ASSET TRANSFER		
ASSET INFORMATION	Y	N
Design Assessment Checklist provided?		
As constructed plans provided?		
Copies of all required permits (both construction and operational) submitted?		
Proprietary information provided (if applicable)?		
Digital files (e.g. drawings, survey, models) provided?		
Asset listed on asset register or database?		

9 – ENGINEERING SERVICES REPORT (HYDER)



GENERATIONS INDUSTRIAL PARK

ENGINEERING SERVICES REPORT

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PATRICIA & WILLIAM HESTER

GENERATIONS INDUSTRIAL PARK

STAPYLTON-JACOBS WELL ROAD, STAPYLTON

ENGINEERING SERVICES REPORT

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Approver Mitchell Bray

Report No F0001-AA003837-AAR-01

Date 3rd November 2011

This report has been prepared for PATRICIA & WILLIAM HESTER in accordance with the terms and conditions of appointment for an STAPYLTON-JACOBS WELL ROAD, STAPYLTON dated 24th August 2011. Hyder Consulting Pty Ltd (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

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Appendices

Appendix A

Engineering Drawings

Appendix B

GCCC Priority Infrastructure Plan for Stormwater and As Constructed Data

Appendix C

GCCC Priority Infrastructure Plan for Water and As Constructed Data

Appendix D

GCCC Priority Infrastructure Plan for Wastewater and Sewerage As
Constructed Data

Appendix E

Gold Coast City Council Overlay Maps

Appendix F

GCCC Flood Search Report

Appendix G

GCCC Constraint Codes

1

EXECUTIVE SUMMARY

PATRICIA & WILLIAM HESTER have commissioned Hyder Consulting to provide supporting information for a Development Application over the following allotments at Stapylton, Jacobs Well;

- Lot 1 on RP6882,
- Lot 240 on W31320

This application is to be lodged with Gold Coast City Council under the provisions of the Integrated Planning Act (2009).

This report deals with the engineering services component of the development and the engineering planning issues associated with the development application for Material Change of Use and Operational Works (Change to Ground Level) permits.

This report demonstrates that the proposed development can be adequately serviced with potable water, sewerage reticulation, stormwater drainage and vehicle access.

Connection to Council's potable water supply is proposed from mains located within Christensen Road and Emeri Street. Sewerage reticulation is proposed to connect to three existing sewer mains located external to the site in Stapylton Jacobs Well Road, Emeri Street and Christensen Road. The increased development loading discharge to the Stapylton Jacobs Well Road proposed connection will likely require a trunk sewer upgrade by either the developer or Council, depending on the timing of construction.

Stormwater drainage shall be collected on site and discharged into the existing external stormwater drainage systems located at the sites proximity once treated with appropriate internal water quality infrastructure. Hydrology assessment suggests no increases to either peak discharges or pollutant loadings, through the use of on-site detention and stormwater quality improvement devices.

Access is proposed to be provided from the perimeter of the development site from on grade pedestrian pathways and vehicular crossovers. Vehicular and service access to the site is to be provided through the extension of Emeri Street and Angel road as well as signalized and non-signalized intersections on Stapylton Jacobs Well Road and Christensen Road respectively.

The site is subject to minor flood inundation in its existing state with mitigation measures provided in a separate report titled 'Flood Engineering Report' prepared by Hyder Consulting. The alteration to site landforms via bulk earthworks will prevent any property damage in a 100 Year ARI flood event whilst retaining access to the industrial development.

2 EXISTING SITE CHARACTERISTICS

2.1 Site Description

The development site is located in Stapylton, Jacobs Well and is bordered by Christensen Road to the South and Stapylton-Jacobs Well Road to the North. An environmental buffer is located along the eastern boundary with an industrial precinct directly to the north. Figure 2.1 below provides a site locality plan.



Figure 2-1 Site Locality Plan

2.1.1 Property Description

The development is proposed to be undertaken within the parcels of land designated as Lots;

- Lot 1 on RP6882,
- Lot 240 on W31320,

2.1.2 Total Area of Land

The total area of the site is 73.114Ha.

2.2 Existing Site Condition and Land Use

2.2.1 Built Form Elements

The proposed development location consists of a small scale industrial site consisting of two warehouses and associated soil stockpiles fronting Christensen Road. There are also smaller private residences with associated structures including 3 sheds with connecting gravel driveways that join to Stapylton Jacobs Well Road. The remainder of the site is undeveloped and consists of grassed areas and thick bushland consisting of shrubs and tall trees.

2.2.2 Existing Surface Levels

In its currently undeveloped state the site consists of medium to heavy bushland with small patches of clear, grassed areas with a number of ridges and gullies. The high point is located in the centre of the site with two significant ridgelines to the north east and the east. The North-Western portion of the site grades from RL 26.81 from the centre of the site to RL 3.83 in the gully on Stapylton Jacobs Well Road. The middle portion of the site grades to a central collection point from RL 28.98 to RL 8.10. The South-East portion of the site grades to a gully running from west to east.

3

PROPOSED DEVELOPMENT

It is proposed to develop the existing site into an industrial estate comprising facilities ranging from 4,000m² to 124,000m² for industrial use.

The proposed site will include 3.563Ha of biofiltration / detention basins, a 6.88Ha environment buffer, 4.719Ha of road reserve area and 59.95Ha of net developable area.

The proposed development will include an internal network of four (4) roads. The first road (Road 1) will traverse perpendicular to Stapylton Jacobs Well Road in a northwest-southeast alignment turning southwest midway through the development, connecting to Christensen Road. The extension of Emeri Street is directed in a south-easterly direction meeting with the future Angel Road extension which lies in an east-west direction until intersected by Road 1. Road 2 acts as an access route between Angel Road and Road 1, providing entrance to the eastern portion of the development. Road 1 will provide the main connection for road access between adjacent existing carriageways.

The proposed development will include dual purpose stormwater bio-retention and stormwater detention basins located at the eastern point of Road 2, adjacent to the south-eastern corner of the site. The provision of the existing water-course will be retained throughout construction and operation phases of the development allowing continued flood conveyance and stormwater discharge from the site.

An internal sewerage reticulation network is proposed to service the site which is split into three significant catchments. A gravity sewerage reticulation network is proposed for the western and south eastern catchments of the site which will connect into the adjoining Council infrastructure. It is proposed that the north eastern sewer catchment of the site will gravitate to a pump station located at the bottom of the catchment. It is then proposed the sewage will then be pumped through a rising main into the gravity system servicing the western catchment.

4 INFRASTRUCTURE SERVICES

4.1 Stormwater Drainage

A Stormwater Management Plan (SWMP) "F0002-AA003837-AAR-01-Generations Industrial Park – Stormwater Management Plan" which addresses the issue of stormwater quantity and quality for the developed condition has been prepared separately. The SWMP should be referred to for a more in depth analysis of prevailing stormwater issues.

4.1.1 Existing Stormwater Drainage Characteristics

The existing stormwater runoff from the proposed development site discharges into the existing stormwater infrastructure on Emeri Street, Stapylton Jacobs Well Road and the provided Environmental Corridor to the east. Stormwater runoff from the north-western catchment discharges under Stapylton Jacobs Well Road through a box culvert into a designated Q100 flood plain. Stormwater from the small northern extents of the site is discharged (either directly or via overland / channel flow) through existing industrial lots to Emeri Street. Runoff from the south portion of the site is conveyed to the designated environment corridor which feeds into neighbouring catchments and stormwater infrastructure. Refer to the Hyder Engineering Drawings K002-AA003837-01 and K0015-AA003837-01 in Appendix A for more details on the survey and existing features and external services to the site, respectively.

4.1.2 Post-Development Stormwater Drainage Objectives

It is proposed to incorporate appropriate stormwater drainage facilities within the development to meet the following stormwater objectives:-

- Maintain stormwater overland flow within roads and open space areas where possible.
- Ensure no increases in peak stormwater flows discharging from the site.
- Ensure pre-treatment minor trash / litter / trap / screens before allowing water to discharge to stormwater devices.
- Incorporate underground drainage with overland flow paths as a solution to collect and distribute stormwater.
- Separate clean roof water to discharge to open space areas where possible to reduce the load on the "treatment train" facilities.
- Provide rainwater tanks for the irrigation of landscaping components within the development.

4.1.3 Proposed Stormwater Drainage Infrastructure

The proposed stormwater drainage system internal to the site will collect runoff from within the site and direct it through the quality improvement devices and rainwater harvesting tanks before discharging to the existing trunk drainage systems.

The north most catchment will discharge into the proposed extension of Emeri Street and into existing stormwater infrastructure located on Emeri Street and Debortoli Road. The north-western section of the site defined by the crest at the intersection of Angel Road and Road 1 will drain through the existing box culverts under Stapylton Jacobs Well Road into the designated Q100 flood storage zone. Runoff captured on the sites south and east areas will be directed to the ecological barrier at designated locations before entering existing catchments

The internal stormwater drainage system is proposed to connect to the trunk drainage system being the existing lawful points of discharge. The full extent and size of the stormwater drainage system and connections to the existing trunk systems will be refined where necessary at the detailed design phase of the development.

4.1.4 GCCC Stormwater Priority Infrastructure Plan

Stormwater Network – Infrastructure Map – IM3-92 / 76 (refer to Appendix B) indicates that there are no planned upgrades in the vicinity of site.

4.2 Water Supply

4.2.1 Existing Water Supply Infrastructure

The following existing water mains have been identified adjacent to the development site in accordance with GCCC's Priority Infrastructure Map – Water Network IM7-2 and as constructed data attached in Appendix C:

Christensen Road	-	150mm diameter potable
Emeri Street	-	100mm diameter potable
Stapylton Jacobs Well Road	-	150mm diameter potable

Details of the locations and alignments of these services are provided on Hyder Engineering Drawing K015-AA003837-01 in Appendix A.

4.2.2 Proposed Water Supply Infrastructure

Connection for the proposed development to the GCCC water supply network will be provided via one connection to Emeri Street, one connection to Stapylton Jacobs Well Road and two connections along the southern site extents that lie along Christensen Road. Proposed connection points for water infrastructure are included in Hyder Engineering Drawings K018-AA003837-01 and K019-AA003837-01 included in Appendix A.

4.2.3 Projected Development Loadings

In its existing condition the development site is identified as being part of the 'Future Industry' component of the Yatala Local Area Plan (LAP 29.2). In accordance with the Local Area Plan (Section 5.3) the planning intent in this development category is for the area to be developed for industry purposes as an extension of the development that is contemplated for Precincts 1 and 2 (General Impact Business and Industry, Low Impact Business and Industry). No development type or density is specified so a density of I2 has been assumed.

In accordance with I2 maximum development density (GCCC Policy 3B – Sewerage/Temporary Local Planning Instrument), Table 4.1 below shows a calculation of the additional ET's from the proposed development on the existing potable water infrastructure. For the purposes of calculating expected loadings on the existing infrastructure it is estimated that the Gross Floor Area (GFA) within the general impact industry portions of the site will be approximately 40% of the overall area.

Table 4-1 Projected Development Loadings for Potable Water Reticulation

Catchment	Total lot Area (m2)	GFA (@40% lot area)	Conversion rate (per 100m2 GFA)	ET Loadings
1	65,635.00	26,254.00	0.36ET	95
2	324,991.00	129,996.40	0.36ET	468
3	162,222.00	64,888.80	0.36ET	234
4	28,936.00	11,574.40	0.36ET	42

4.2.4 Preliminary Water Network Analysis

Hyder has performed a preliminary analysis of the surrounding network and the capacity to accept the increased projected loading based on a first principle assessment of maximum hour flows and the capacity of the existing water mains.

Pipe Flows

In accordance with the GCCC Land Development Guidelines Section 4.2.3.3, the projected population estimates convert to peak pipe flow rates shown in Tables 4.2 and 4.3 where the average day demand is calculated as follows:

$$\text{Average Day Demand (AD)} = 880 \text{ L/ET/Day}$$

Table 4-2 Estimated Demand for Proposed Connection Points

Connection Point	ET Loading
1	95
2	468
3	234
4	42

Table 4-3 Pipe Flow Rates Required for Proposed Potable Water Connections

Connection Point	ET Demands	AD (=880L/ET/day x ET) (kL/Day)	MDMM (=AD x 1.11) (kL/Day)	MD (=AD x 1.16) (kL/Day)	MH (=AD x 1.51) (kL/Day)
1	95	83.60	92.80	96.98	126.24
2	468	411.84	457.14	477.73	621.88
3	234	205.92	228.57	238.87	310.94
4	42	36.96	40.66	42.87	55.81

* Assuming Industrial Case 1 as per GCCC Land Development Guidelines Table 4.2-A

A detailed water network analysis using appropriate modelling software will need to be undertaken to ascertain whether the existing water mains will be able to cater for the increased demands of the proposed development, while maintaining the minimum pressures and flows as required by GCCC.

4.2.5 Internal Water Network

The developer shall, as part of the development works, construct an internal water reticulation service for the proposed development in accordance with the relevant building code requirements.

A water network design will be undertaken by a qualified hydraulic engineer for the proposed development to determine adequate levels of services for all internal fire fighting flows and service demands.

4.2.6 Fire System Water Supply

A qualified hydraulic engineer shall design the internal fire sprinkler service (if necessary) to cater for the fire services of the proposed development.

4.3 Sewerage

4.3.1 Existing Sewerage Facilities

An existing main is located in Emeri Street which gravitates to a pump station and a 100mm diameter rising main in the southern verge of Stapylton Jacobs Well Road. It follows Stapylton Jacobs Well Road south-west to the Pacific Motorway. The rising sewer main then heads north to the Beenleigh Waste Water Treatment Plant.

The southern catchment of the proposed development site has an existing connection via an easement from Christensen Road. This 150mm diameter pipe follows Christensen Road north and connects to the sewer rising main in Stapylton Jacobs Well Road that borders the northern sewerage catchment.

For details of the surrounding sewerage infrastructure refer to Hyder Engineering Drawing K015-AA003837-01 in Appendix A.

4.3.2 Proposed Sewerage Reticulation

It is proposed that the existing sewer main located on Emeri Street be utilised to service lots along the extension of Emeri Street.

The western catchment will gravitate to the sewer rising main located on Stapylton Jacobs Well Road. To utilise this connection point, the construction of a pump station to intercept the existing rising main at this location will be required.

It is also proposed that an onsite pumping station will be used for the eastern catchment. This onsite pump station will connect to the gravity sewer in the western catchment.

The sewer rising main along Stapylton Jacobs Well Road may require an upgrade due to the increase in sewage waste from the contributing catchments. The sewer rising main may require duplication between the proposed connection and next pump station, located at the intersection between Stapylton Jacobs Well Road and Christensen Road (see GCCC Priority Infrastructure Maps IM6-2 and IM6-4, Appendix D). There may also be the opportunity to construct a gravity main from Road 1 along Stapylton Jacobs Well Road to gravitate sewage to the next existing downstream pump station.

The south eastern site catchment between Christensen Road and the proposed ecological barrier is planned to connect to the existing 150mm gravity sewer on Christensen Road to the east. It is possible that a rising main will be required to connect to this gravity sewer main.

4.3.3 Projected Development Loadings

In its existing condition the development site is identified as being part of the 'Future Industry' component of the Yatala Local Area Plan (LAP 29.2). In accordance with the Local Area Plan (Section 5.3) the planning intent in this development category is for the area to be developed for industry purposes as an extension of the development that is contemplated for Precincts 1 and 2 (General Impact Business and Industry, Low Impact Business and Industry). No development type or density is specified so a density of I2 has been assumed.

In accordance with I2 maximum development density (GCCC Policy 3B – Sewerage/Temporary Local Planning Instrument), table 4.4 below shows a calculation of the additional ET's from the proposed development on the existing sewer infrastructure. For the purposes of calculating expected loadings on the existing infrastructure it is estimated that the Gross Floor Area (GFA)

within the general impact industry area will be approximately 40% of the overall lot area. Please refer to Hyder Engineering Drawings K016-A003837-01 and K017-AA003837-01 in Appendix A for the proposed development sewer infrastructure and catchment boundaries.

Table 4-4 Projected Development Loadings for Sewage Reticulation

Catchment	Total lot Area (m2)	GFA (@40% area)	Conversion rate (per 100m2 GFA)	ET Loadings
1	37,570.00	15,028.00	0.36ET	55
2a	72,438.00	28,975.20	0.36ET	105
2b	404,748.00	161,899.20	0.36ET	583
2*	477,186.00	190,874.40	0.36ET	688
3	67,028.00	26,811.20	0.36ET	97

* Includes total loadings from catchments 2a and 2b.

4.3.4 Sewerage Network Strategy

Hyder has performed a preliminary analysis of the surrounding network and the capacity to accept the increased projected loading based on a first principle assessment of peak wet weather flow rates and the capacity of the existing 100/150mm diameter sewer gravity mains.

It is proposed to connect the internal sewerage infrastructure to GCCC's existing sewer infrastructure in three (3) separate locations as follows (refer to Hyder Engineering Drawings K016-A003837-01 and K017-AA003837-01 in Appendix A for proposed sewer infrastructure and catchment boundaries)

1. To the existing gravity main in Emeri Street to the north
2. To the existing rising main on Stapylton Jacobs Well Road to the north west
3. To the existing gravity main on Christiansen Road to the south of the site

An onsite pumping station is also proposed to move the waste collected in the eastern catchment to the existing rising main on Stapylton Jacobs Well Road to the north-west.

Table 4-5 Estimated Demand for Proposed Connection Points

Connection point	ET Loading
1	55
Onsite Pump Station	583
2*	688
3	97

* Includes ET loading from Onsite Pump Station

Connection point 1

Service to five of the industrial facilities will be provided by the existing gravity main on Emeri Street to the north. It is anticipated that the estimated 55 ET's produced by this area will be adequately catered by the existing gravity sewer.

Onsite Pump Station

To provide service for the facilities contained in the eastern catchment a pump station is proposed for construction at the catchment's lowest point. Surrounding areas will be gravitated to the pump station which is proposed to connect to the rising main located on Stapylton Jacobs Well Road. Sewerage infrastructure constructed for catchment 2a will provide a gravity feed link between Catchment 2b and its proposed discharge point.

Connection point 2

Major works will be required to service Catchments 2a and 2b, both of which are proposed to connect to the 100mm rising main located on Stapylton Jacobs Well Road. Due to the restrictions of current GCCC sewer infrastructure located on Stapylton Jacobs Well Road, it is anticipated that the total calculated development loading of 688 ET's may exceed the capacity of the current rising main proposed for connection point 2.

An upgrade to the trunk sewer may then be required to service the additional development loading between the intersection of connection point 2 and the rising main on Stapylton Jacobs Well Road. The following options for the upgrading of Council's infrastructure along Stapylton Jacobs Well Road may be viable;

1. Duplication of the rising main
2. Construct a gravity main from Road 1 to the rising main discharge manhole adjacent the Pacific Motorway

The timing of the construction of stages within the eastern and western catchments will be reliant on the planning and construction of future sewer infrastructure by the GCCC along Stapylton Jacobs Well Road as per GCCC's Sewage Network – Infrastructure Map IM6-2. Alternatively the future infrastructure required to facilitate this connection can be constructed by the developer of the site under headwork's credits.

Connection point 3

Service to the southern catchment will be provided by the existing sewer main on Christensen Road to the east. The existing sewer main will be required to be extended along Christensen Road to the property boundary. The estimated development loading of six of the industrial facilities is anticipated to be within the capabilities of the current sewer infrastructure on Christensen Road.

4.3.5 Sewerage Network Analysis

Hyder has performed a preliminary network analysis based on the sewage network strategy to quantify the expected peak discharge of the proposed development on surrounding sewage infrastructure.

Pipe Flows

In accordance with the GCCC Land Development Guidelines Section 5.2.9.2, the projected population estimates convert to peak pipe flow rates as follows:

Table 4-6 Pipe Flow Rates for Proposed Connections (RIGS)

Connection point	ET demands	ADWF** (825L/ET/d) (kL/day)	PWWF*** (5 x ADWF) (kL/day)	PDWF (2.2 x ADWF) (kL/day)
1	55	45	227	100
Onsite Pump Station	583	481	2,405	1,058
2*	688	568	2,838	1,249
3	97	80	400	176

* Includes ET loading from Onsite Pump Station

** Category 2 as per table 5.2 - A Policy 11: Land Development Guidelines

** Beenleigh catchment as per table 5.2 - A Policy 11: Land Development Guidelines

Internal Pump Station

In accordance with the GCCC Guidelines Section 5.2.11.2, the projected population estimates contributing to the internal pump station convert to the following capacities:

Table 4-7 Pump Station Capacity

Connection point	ET demands	Capacity ((ET x 825L/ET/day x 5)/ (24 x 3600)) L/sec	Wet well storage capacity (0.9 x pump rate / N) m3 * **
Onsite Pump Station	583	27.83	2.09

* Pump rate = 27.83L/sec

** N = 12 (assuming pump motor is less than 50kW)

4.3.6 GCCC Sewer Priority Infrastructure Plan

An investigation into the GCCC Priority Infrastructure Plan has revealed that Council has proposed augmentations to the existing trunk sewerage network in the vicinity of the proposed development site. These proposed upgrades are located under lot 240 on W31320 and are expected to take place between 2022 and 2056. The exact location of these upgrades can be seen in the GCCC Priority Infrastructure Maps IM6-4 and IM6-2 in Appendix D.

4.4 Electrical, Gas and Telecommunications Services

Connection to existing electrical reticulation is provided via existing services located under Emeri Street's northern verge and overhead lines positioned on the northern side of Stapyhton Jacobs Well Road. It is understood that the proposed development must incorporate an underground low-voltage electricity supply to all facilities within the development in order to comply with council legislation. In addition, it is understood that any existing overhead lines and poles within or bounding the site are required to be relocated underground.

No existing communications services are provided to the subject site. It is understood that prior to the issue of any approvals for operational works in the region, it is required that satisfactory arrangements are made to provide underground telecommunications services to all area within the development. Furthermore it is acknowledged that arrangements must also be made to move any existing overhead telecommunications cables within and bounding the site underground.

A gas supply main is located on the Southern Verge of Stapyhton Jacobs Well Road which borders the northern site perimeter.

Connection from the proposed development to the above mentioned services will be undertaken by a specialist consultant and form part of the future building works application to Council.

Appendix A

● Engineering Drawings

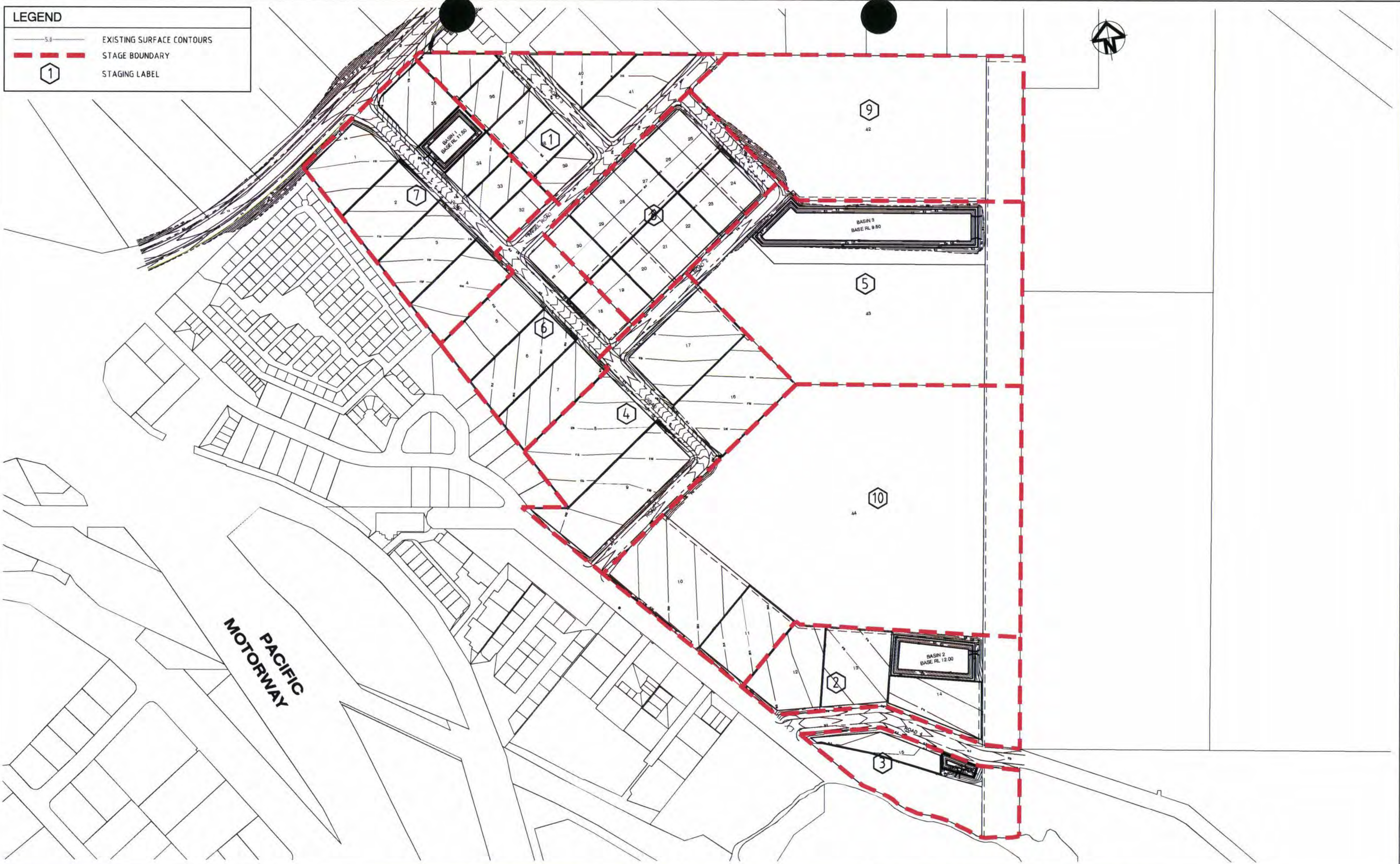


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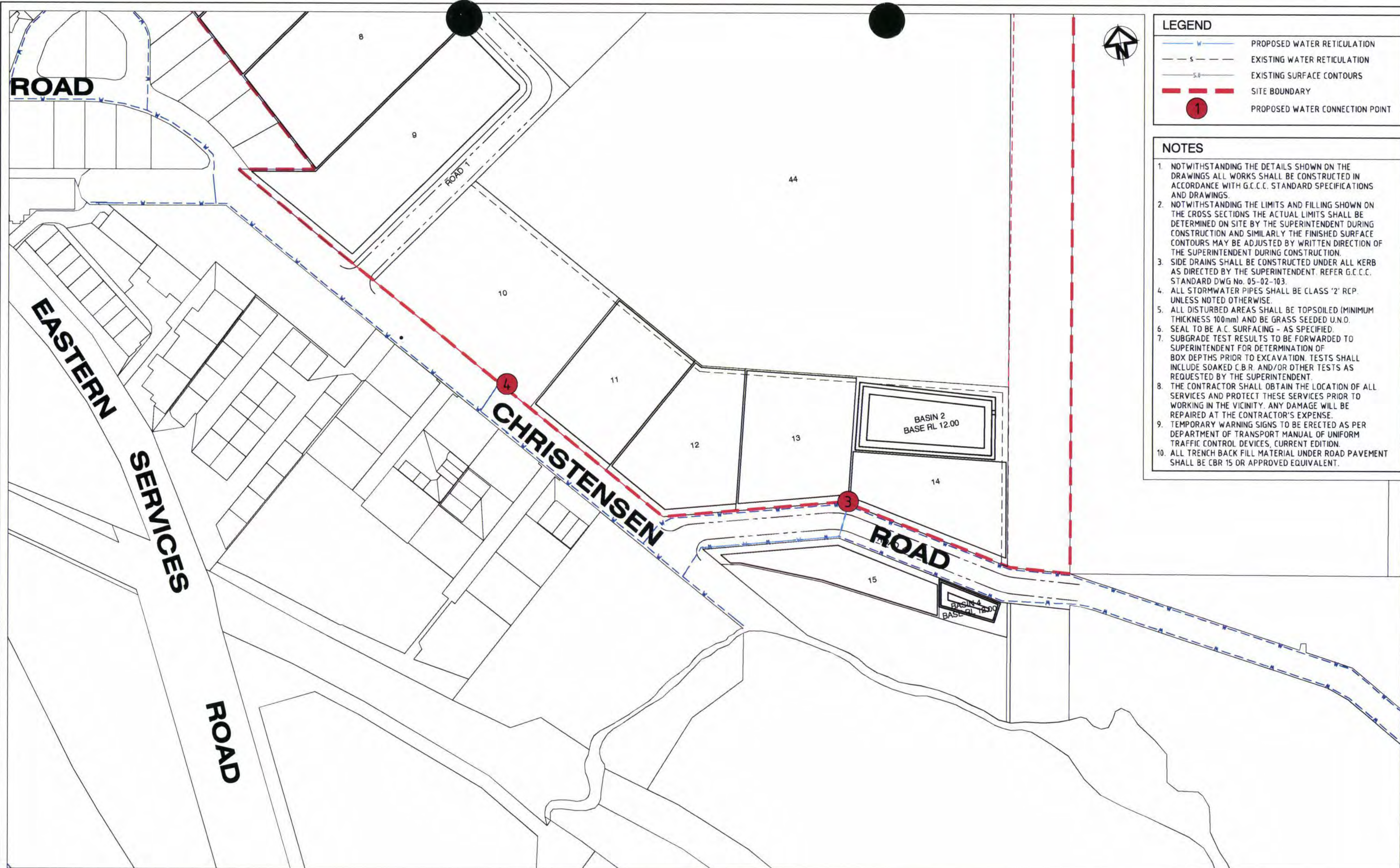
EXISTING SURFACE CONTOURS

STAGE BOUNDARY

STAGING LABEL



01 ORIGINAL ISSUE BF 06.07.11		Scale 0 250 500 750 1000 1250m 1 : 12500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PATRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE		HYDER CONSULTING PTY. LTD ABN 48 010 924 806 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
Issue Description Date		Architect		Current Issue Signatures Author B. FROST Designer R. RONALDS Reviewer M. BRAY		Title STAGING PLAN		Drawing No. K020		Project No. AA003837		Issue 01	
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LEGEND

- PROPOSED WATER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING SURFACE CONTOURS
- SITE BOUNDARY
- PROPOSED WATER CONNECTION POINT

- NOTES**
1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH G.C.C.C. STANDARD SPECIFICATIONS AND DRAWINGS.
 2. NOTWITHSTANDING THE LIMITS AND FILLING SHOWN ON THE CROSS SECTIONS THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE SUPERINTENDENT DURING CONSTRUCTION.
 3. SIDE DRAINS SHALL BE CONSTRUCTED UNDER ALL KERB AS DIRECTED BY THE SUPERINTENDENT. REFER G.C.C.C. STANDARD DWG No. 05-02-103.
 4. ALL STORMWATER PIPES SHALL BE CLASS '2' RCP, UNLESS NOTED OTHERWISE.
 5. ALL DISTURBED AREAS SHALL BE TOPSOILED (MINIMUM THICKNESS 100mm) AND BE GRASS SEEDED U.N.O.
 6. SEAL TO BE A.C. SURFACING - AS SPECIFIED.
 7. SUBGRADE TEST RESULTS TO BE FORWARDED TO SUPERINTENDENT FOR DETERMINATION OF BOX DEPTHS PRIOR TO EXCAVATION. TESTS SHALL INCLUDE SOAKED C.B.R. AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT.
 8. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
 9. TEMPORARY WARNING SIGNS TO BE ERECTED AS PER DEPARTMENT OF TRANSPORT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
 10. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.

01 ORIGINAL ISSUE		Scale 0 30 60 90 120 150m 1:1500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	
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								Height DATUM		Reviewer M. BRAY	
								Grid GRID		Copyright Copyright reserved	
										Title WATER CONNECTION POINTS SHEET 2 OF 2	
										Hyder Consulting	
										HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215 Australia Tel: (+617) 5532 3033 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
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										Project No. AA003837	
										Issue 01	

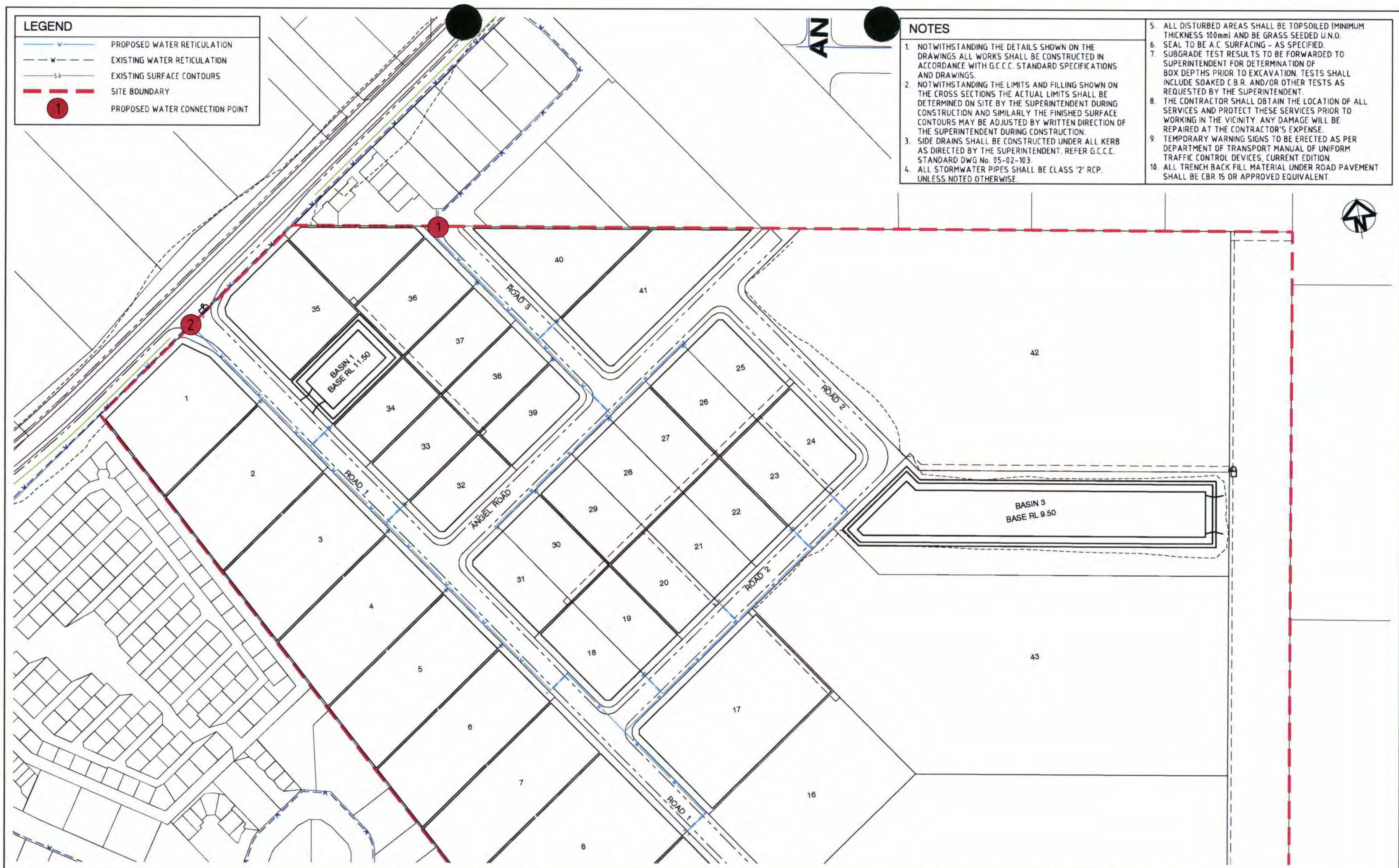
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LEGEND

- PROPOSED WATER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING SURFACE CONTOURS
- SITE BOUNDARY
- PROPOSED WATER CONNECTION POINT

NOTES

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Issue		Date	
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GASSMAN DEVELOPMENT PERSPECTIVES		MRS PARTRICIA & MR WILLIAM HESTER	
Surveyor		Client	
Architect		Status: PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	
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		Grid: GRID	
		Current Issue Signatures	
		Author: B.FROST	
		Designer: R.RONALDS	
		Reviewer: M.BRAY	
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		Project: STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE	
		Title: WATER CONNECTION POINTS SHEET 1 OF 2	
		Drawing No: K018	
		Project No: AA003837	
		Issue: 01	

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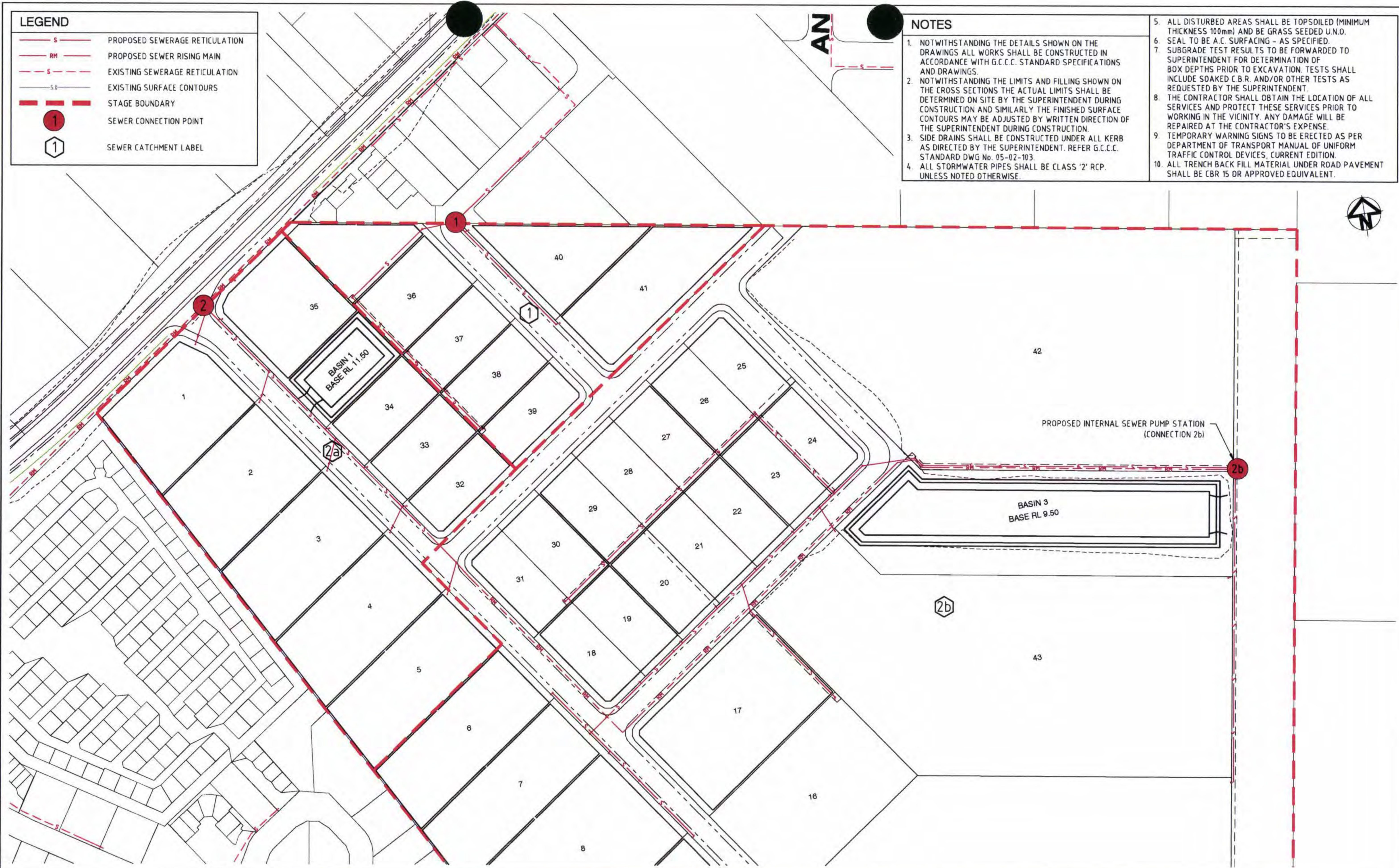
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LEGEND

- S PROPOSED SEWERAGE RETICULATION
- RM PROPOSED SEWER RISING MAIN
- S EXISTING SEWERAGE RETICULATION
- S.0 EXISTING SURFACE CONTOURS
- STAGE BOUNDARY
- 1 SEWER CONNECTION POINT
- 1 SEWER CATCHMENT LABEL

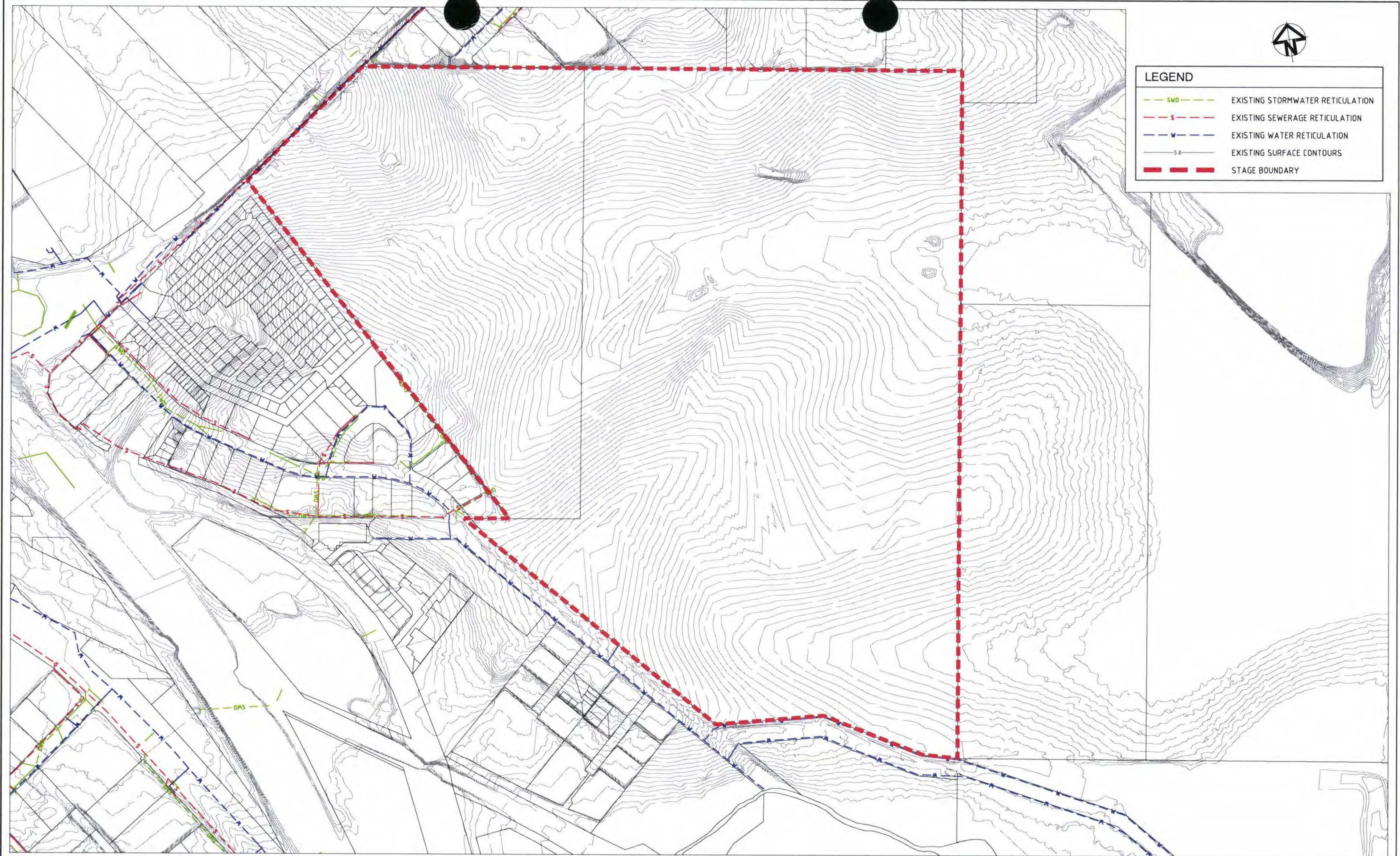
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4. ALL STORMWATER PIPES SHALL BE CLASS '2' RCP. UNLESS NOTED OTHERWISE.
5. ALL DISTURBED AREAS SHALL BE TOPSOILED (MINIMUM THICKNESS 100mm) AND BE GRASS SEEDD U.N.O.
6. SEAL TO BE A.C. SURFACING - AS SPECIFIED.
7. SUBGRADE TEST RESULTS TO BE FORWARDED TO SUPERINTENDENT FOR DETERMINATION OF BOX DEPTHS PRIOR TO EXCAVATION. TESTS SHALL INCLUDE SOAKED C.B.R. AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT.
8. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. TEMPORARY WARNING SIGNS TO BE ERECTED AS PER DEPARTMENT OF TRANSPORT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
10. ALL TRENCH BACK FILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.



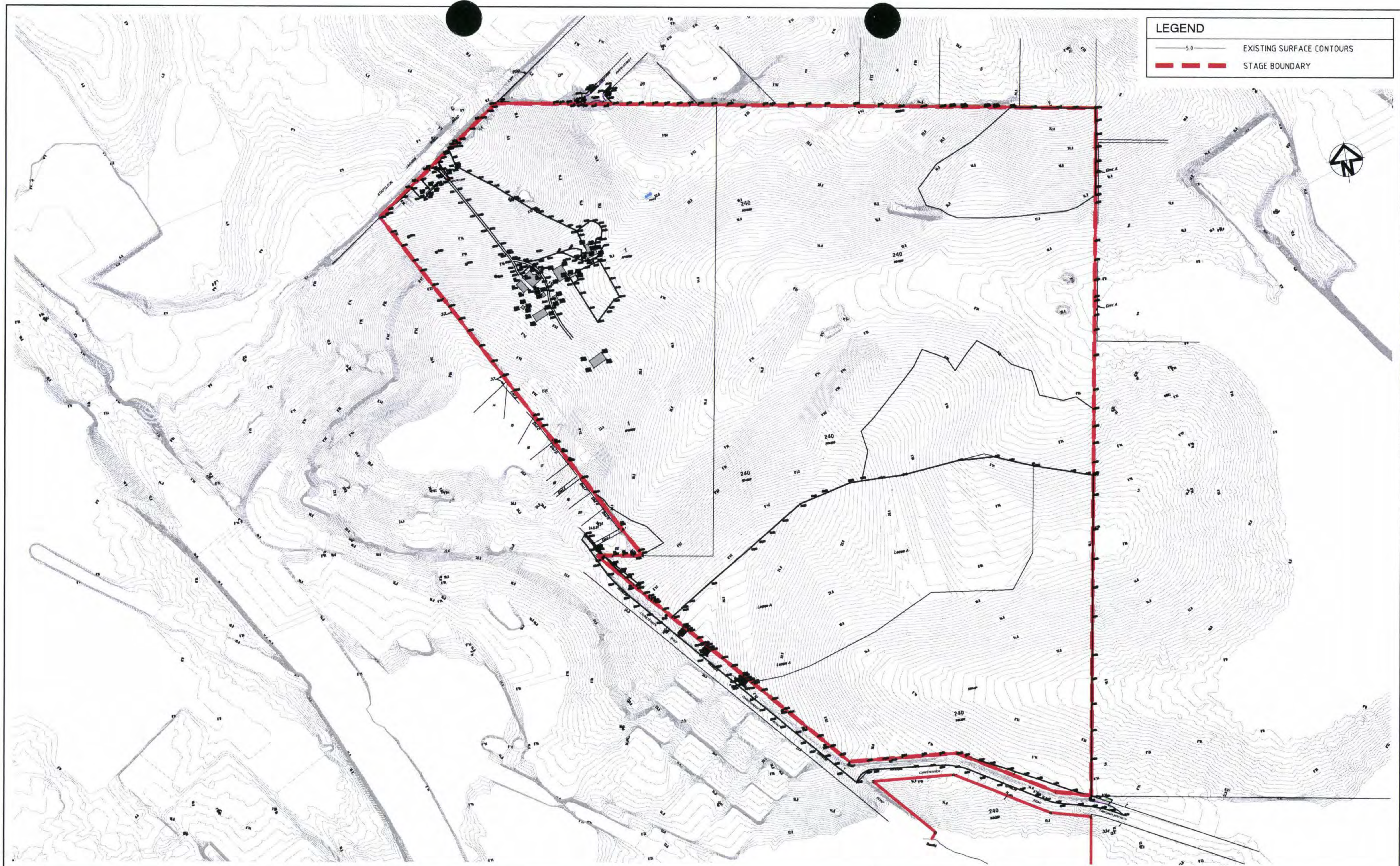
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				Architect				Approved R.E.P.Q. No.		Title SEWER CONNECTION POINTS SHEET 1 OF 2		Drawing No K016	
								Current Issue Signatures Author: B.FRDST Designer: R.RONALDS Reviewer: M.BRAY Grid: GRID © Copyright reserved				Project No AA003837	
												Issue 01	

24/AUG/2011 3:43 PM F:\AA003837\1-E-CAD\1-Civil\B-Sketches\K016-AA003837-01-Sewer Catchments And Connection Points.dwg



LEGEND	
	EXISTING STORMWATER RETICULATION
	EXISTING SEWERAGE RETICULATION
	EXISTING WATER RETICULATION
	EXISTING SURFACE CONTOURS
	STAGE BOUNDARY

01 ORIGINAL ISSUE		BF 05.07.11		Scale 1 : 2500		Surveyor GASSMAN DEVELOPMENT PERSPECTIVES		Client MRS PARTRICIA & MR WILLIAM HESTER		Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION		Project STAPYLTON, JACOBS WELL HESTER DEVELOPMENT SITE			
Issue		Date		Architect		Filename: K015-AA003837-01-EXTERNAL SERVICES.DWG		Grid GDA94 -MGA56		Current Issue Signatures		Title EXISTING SERVICES PLAN		Hyder Consulting HYDER CONSULTING PTY. LTD ABN 48 010 924 866 P O Box 1653, Southport, Queensland, 4215, Australia Tel: (+617) 5532 3933 Fax: (+617) 5591 4778 E-mail: goldcoast@hyderconsulting.com Web: www.hyderconsulting.com	
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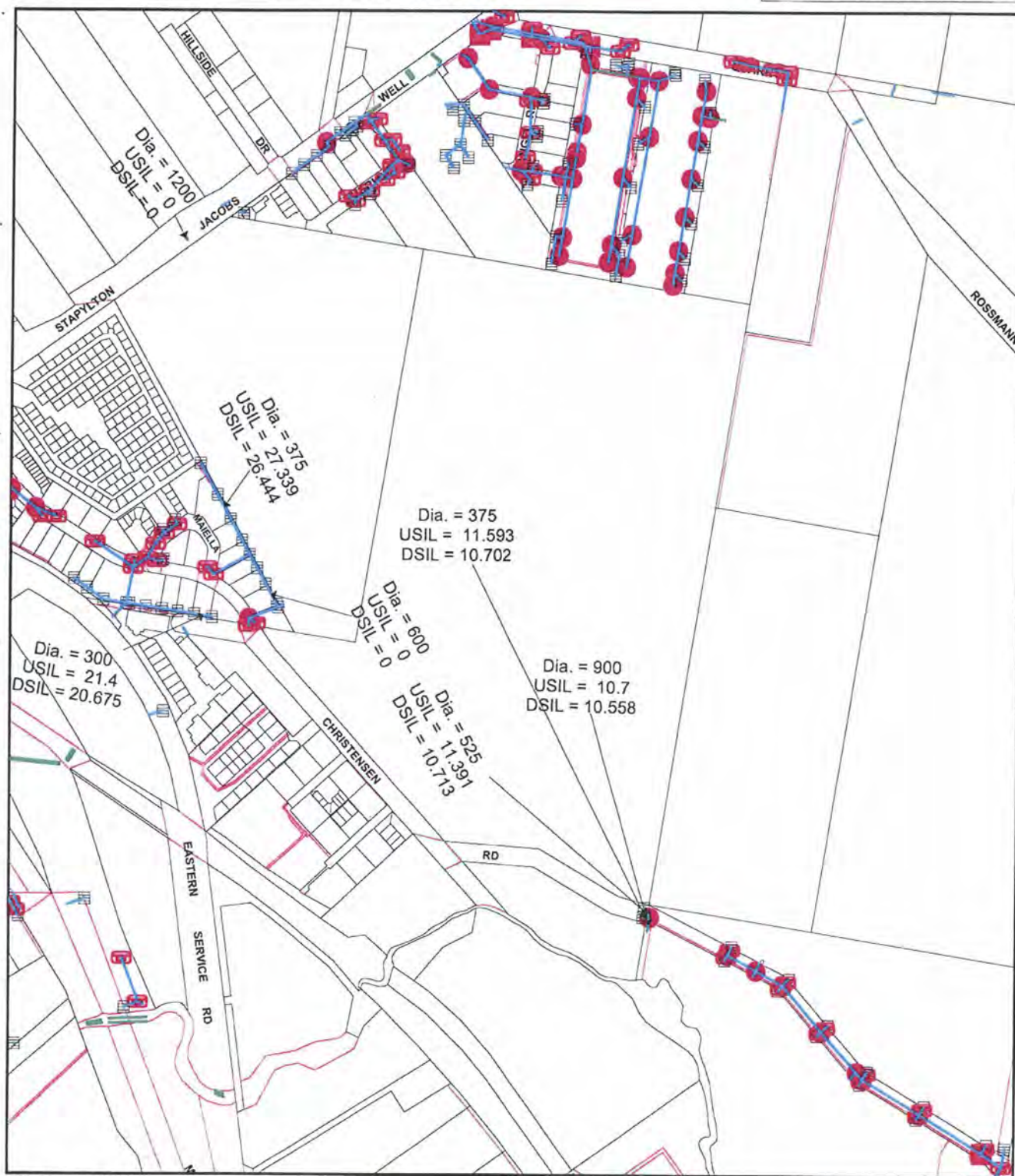


LEGEND	
	EXISTING SURFACE CONTOURS
	STAGE BOUNDARY

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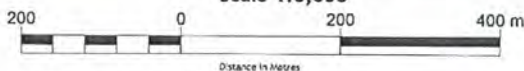
Appendix B

- **GCCC Priority Infrastructure Plan for Stormwater and As Constructed Data**



Public_Stormwater_A4P.WOR

Scale 1:8,858



Projection: Tran. Merc./MGA94 Zone 56/GDA94

Stormwater Assets Infrastructure

- Stormwater Pipe
- Stormwater Culvert
- Open Drain
- Manholes
- Inlet Gullies
- Inlet Structure
- Outlet Structure

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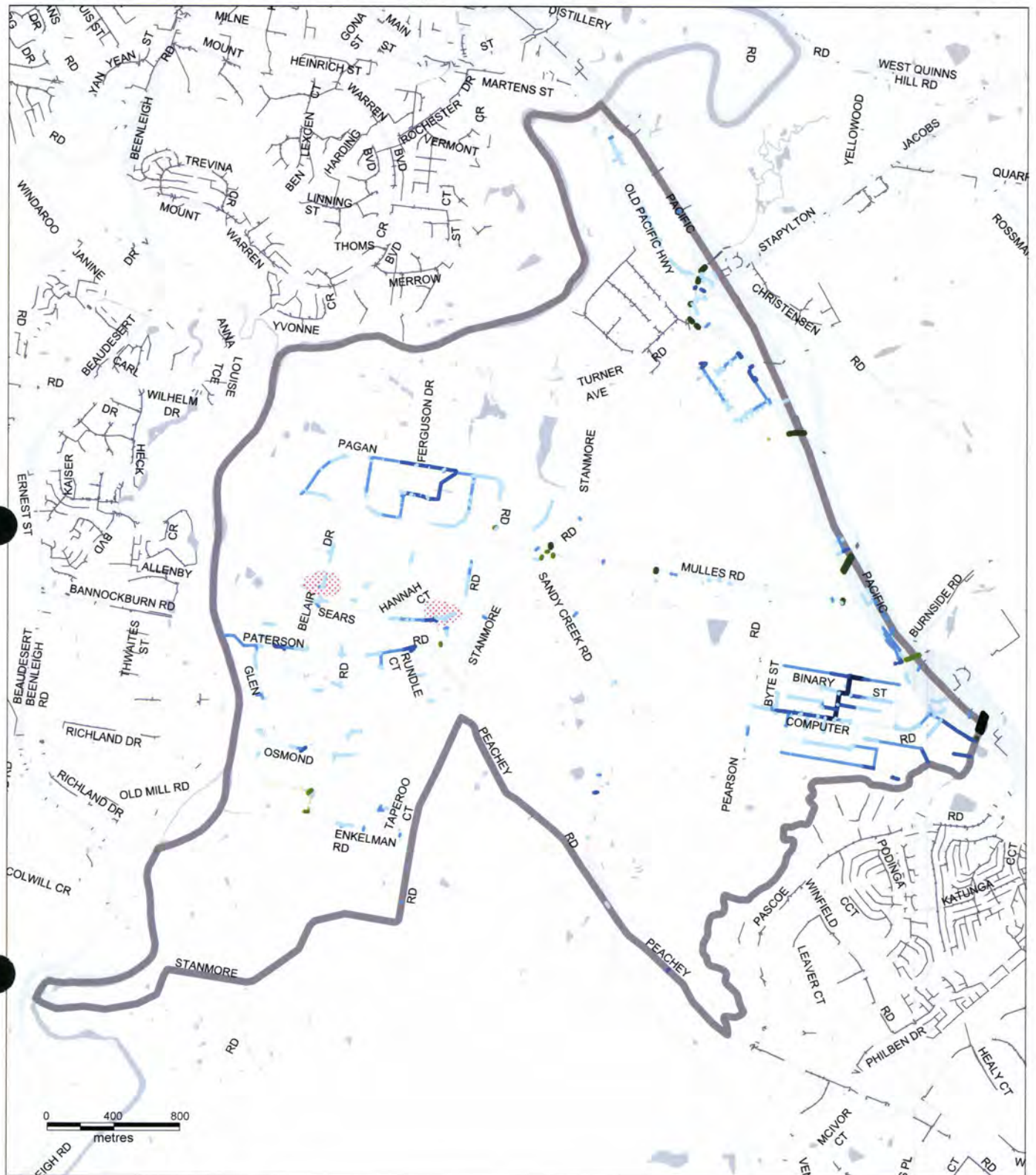
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Legend

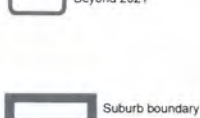
Box Culvert Widths



Pipe Diameters



Upgrade Program



Based on April 2005 Stormwater Drainage Network data

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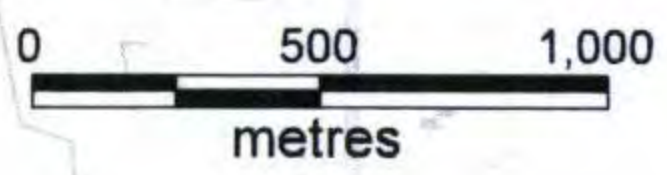
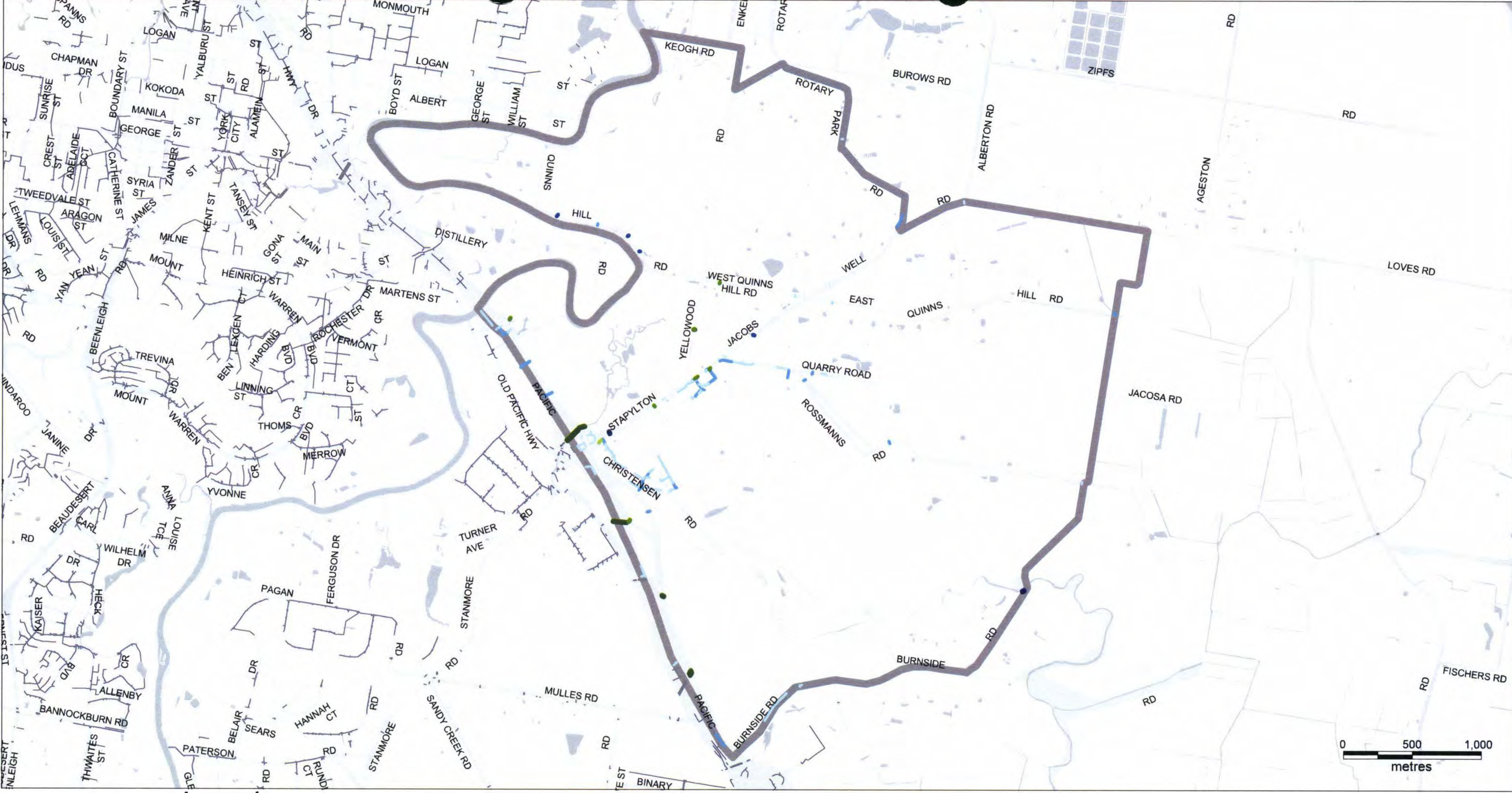
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November 2005



Stormwater Network - Infrastructure Map - IM3-Stapylton

Ver 1.2



Legend

Box Culvert Widths	Upgrade Program
2,400 to 3,600	2006 - 2011
1,200 to 2,400	2012 - 2016
900 to 1,200	2017 - 2021
0 to 900	Beyond 2021
Pipe Diameters	Suburb boundary
1,500 to 3,500	
900 to 1,500	
600 to 900	
0 to 600	
Stormwater drainage network	

Based on April 2005 Stormwater Drainage Network data.

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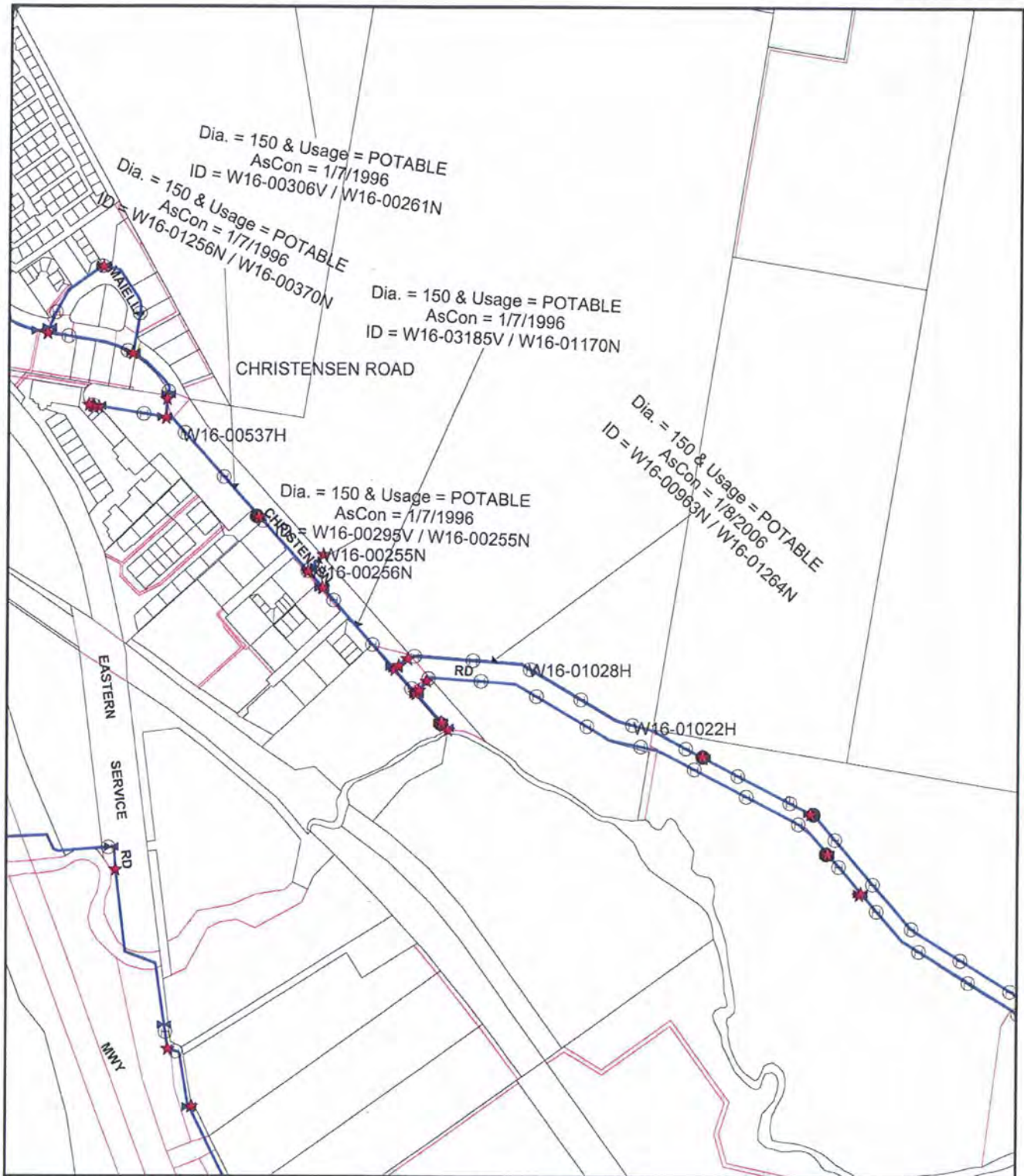
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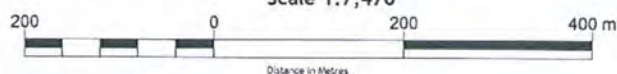
Appendix C

- GCCC Priority Infrastructure Plan for Water and As Constructed Data

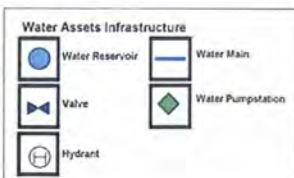


Public_Water_A4P.WOR

Scale 1:7,470



Projection: Tran. Merc./MGA94 Zone 56/GDA94

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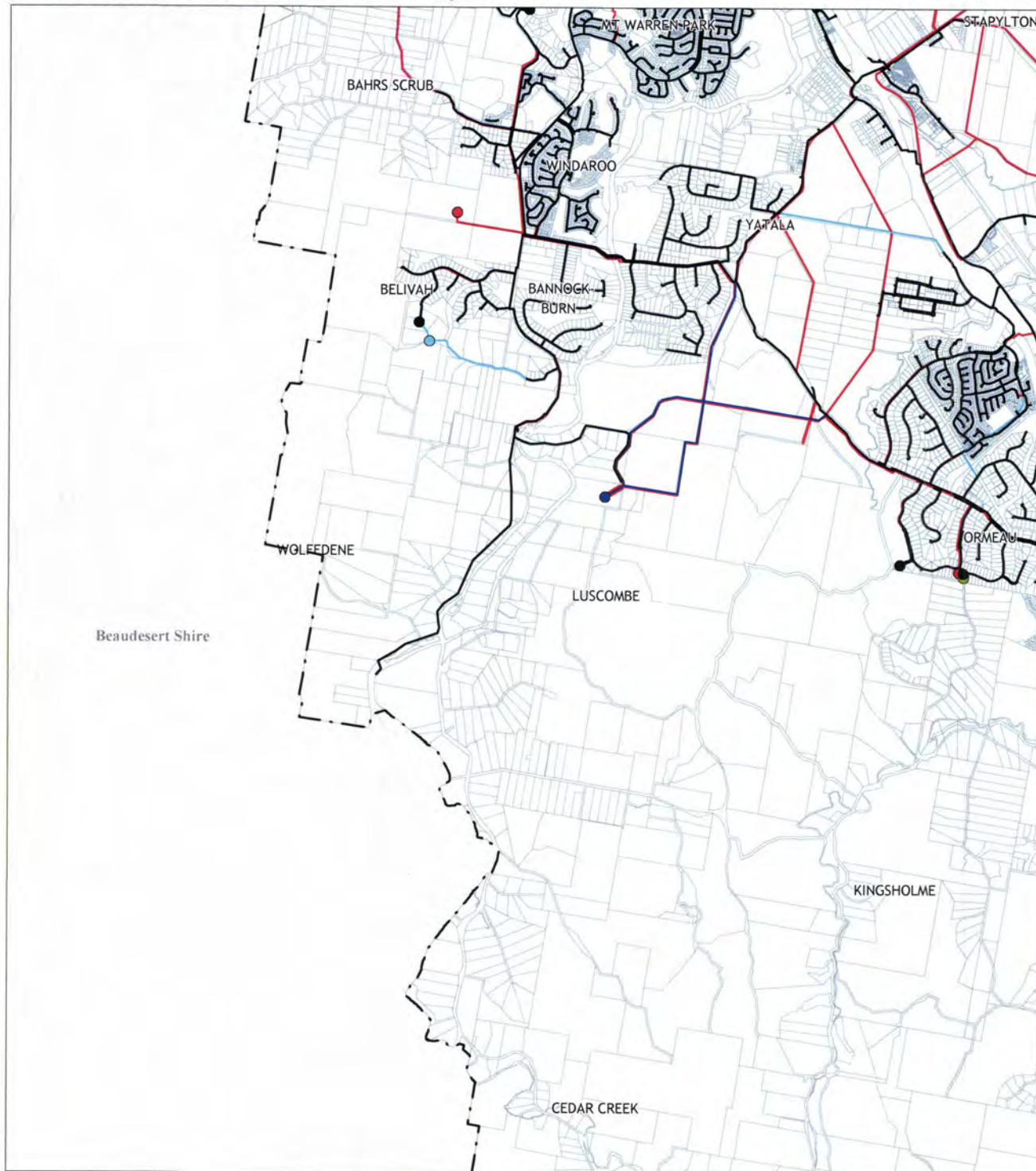


Gold Coast City Council



Water Supply Network - Infrastructure Map IM7-2

Dec 2007



Legend

EXISTING NETWORK

PROPOSED NETWORK

- 2002 - 06
- 2007 - 11
- 2012 - 21
- 2022 - 51

EXISTING RESERVIOR

PROPOSED RESERVOIR SITES

- 2002 - 06
- 2007 - 11
- 2012 - 21
- 2022 - 51



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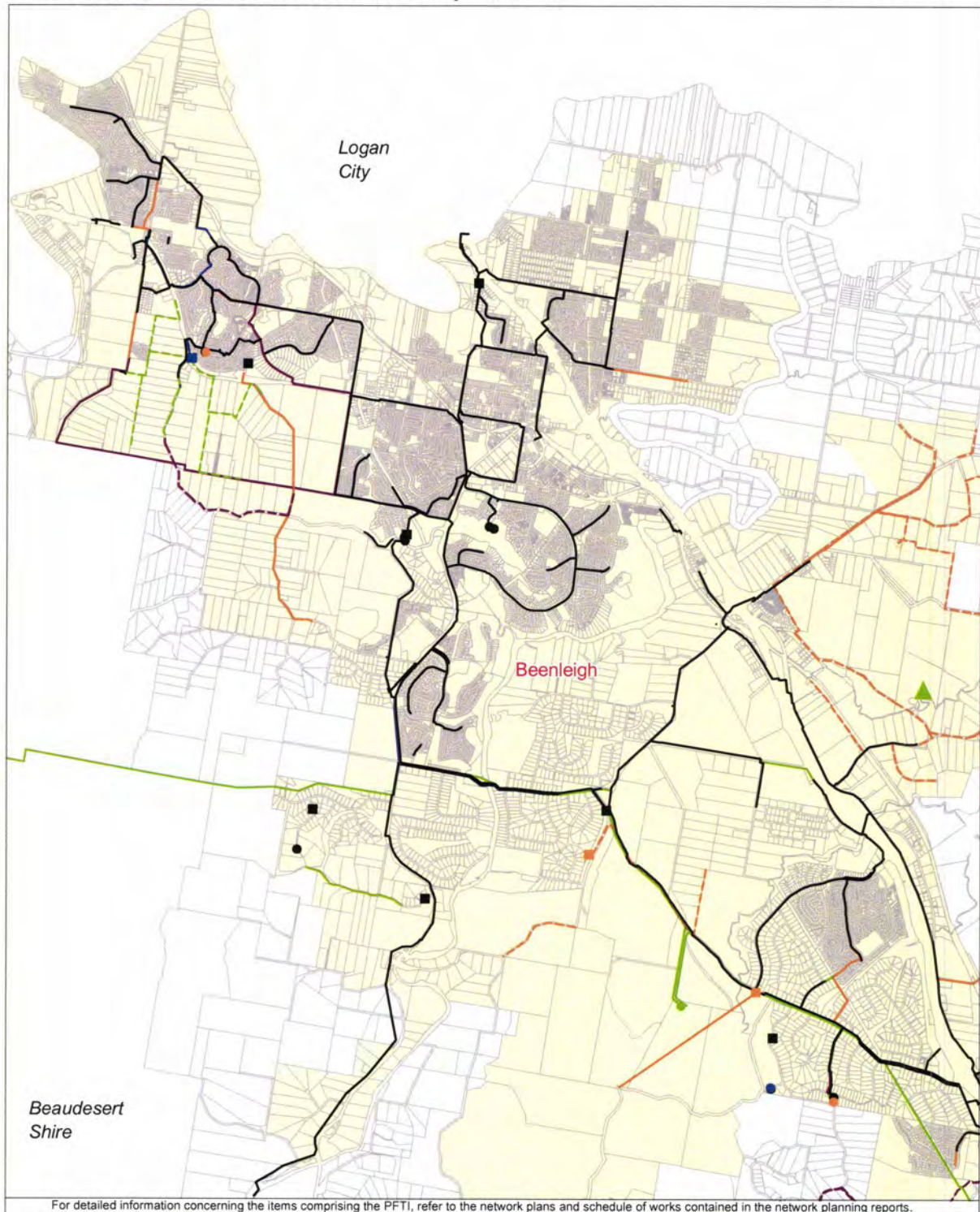
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Adjoining Maps Series

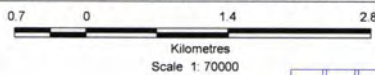




For detailed information concerning the items comprising the PFTI, refer to the network plans and schedule of works contained in the network planning reports.

Legend

	POTABLE WATER MAIN	RECYCLED WATER MAIN	WTP	PUMP STATION	POTABLE WATER RESERVOIR	RW RESERVOIR	BULK WATER STORAGE
Existing (2004)	—	- - -	▲	■	●	●	■
Proposed	—	- - -	▲	■	●	●	■
2005 - 2006	—	- - -	▲	■	●	●	■
2007 - 2011	—	- - -	▲	■	●	●	■
2012 - 2016	—	- - -	▲	■	●	●	■
2017 - 2021	—	- - -	▲	■	●	●	■
2022 - 2056	—	- - -	▲	■	●	●	■



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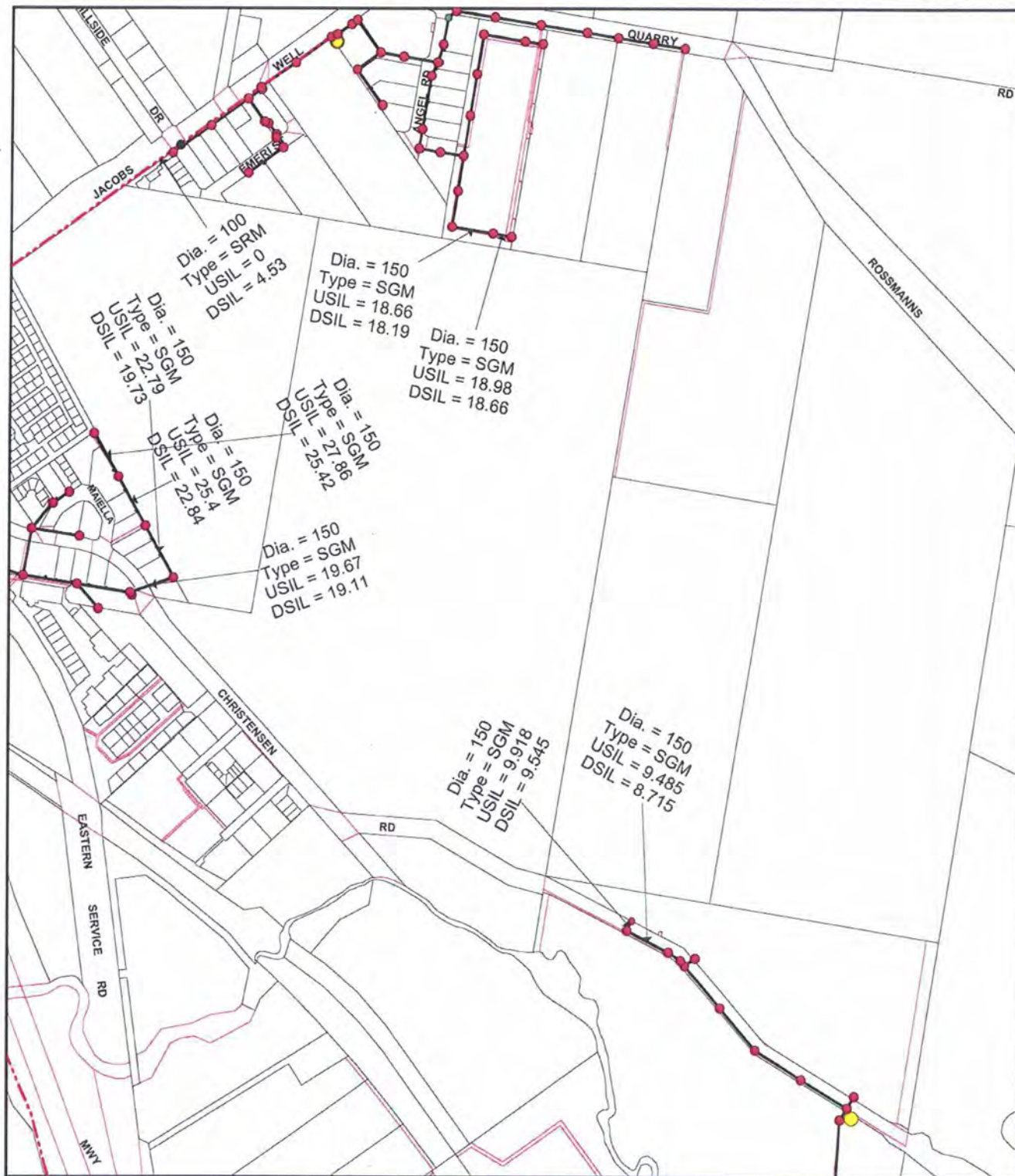
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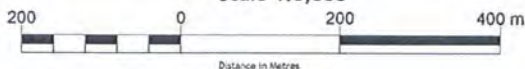


Appendix D

GCCC Priority Infrastructure Plan for Wastewater and Sewerage As Constructed Data



Scale 1:8,858



Projection: Tran. Merc./MGA94 Zone 56/GDA94

Sewer Assets Infrastructure	
	Sewer Pumpstation
	Sewer Pumpstation (oxygen injected)
	Sewer Lift Station
	Treatment Plant
	Sewer Access Pit
	Sewer Gravity Main
	Sewer Rising Main
	Sewer House Connection

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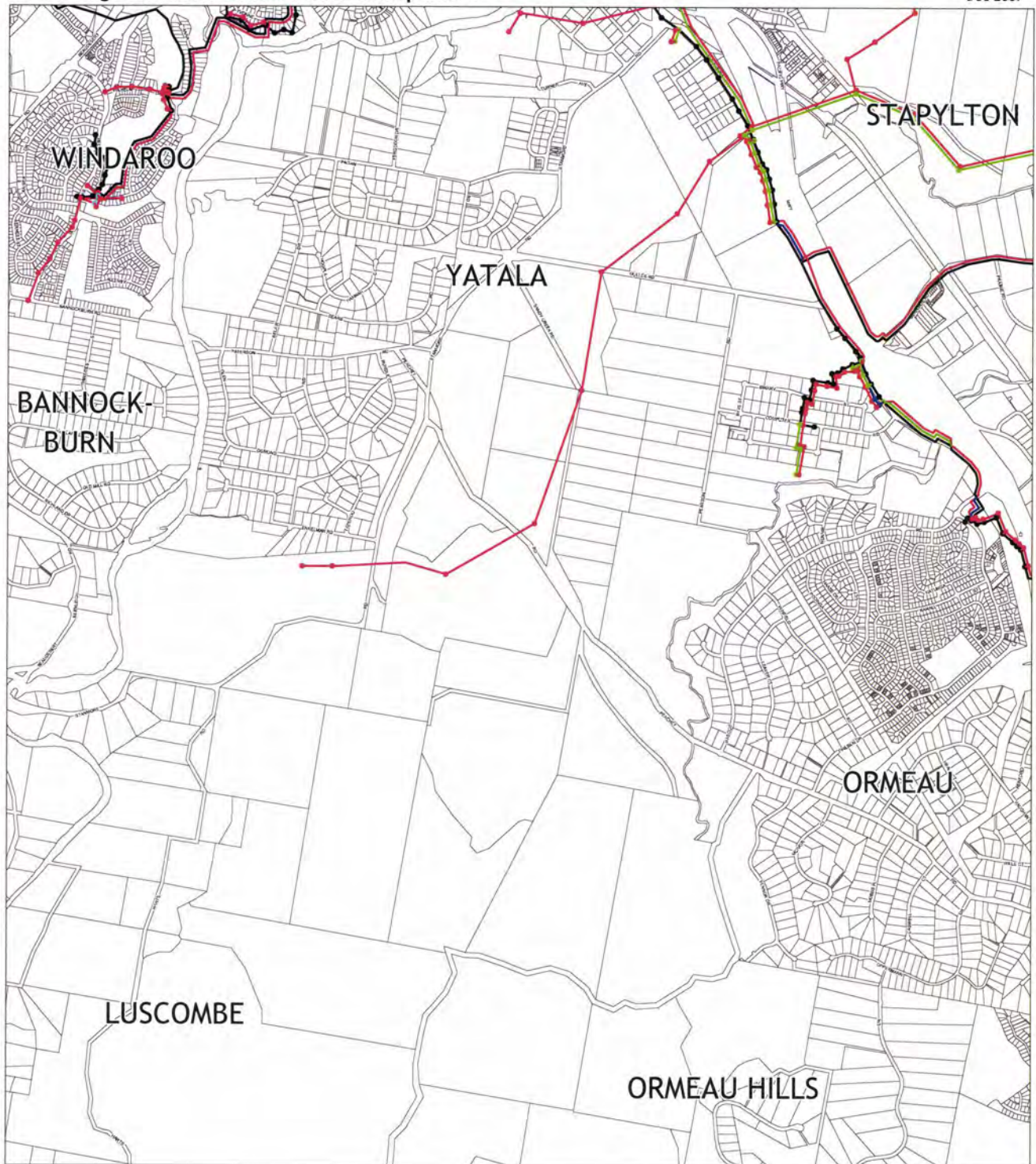
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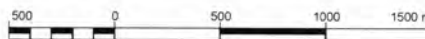


Gold Coast City Council





Legend



EXISTING NETWORK

PROPOSED NETWORK

- 2002 - 06
- 2007 - 11
- 2012 - 21
- 2022 - 56

EXISTING PUMP NETWORK

PROPOSED PUMP SITES

- 2002 - 06
- 2007 - 11
- 2012 - 21
- 2022 - 56

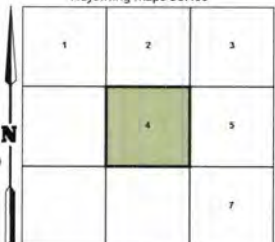
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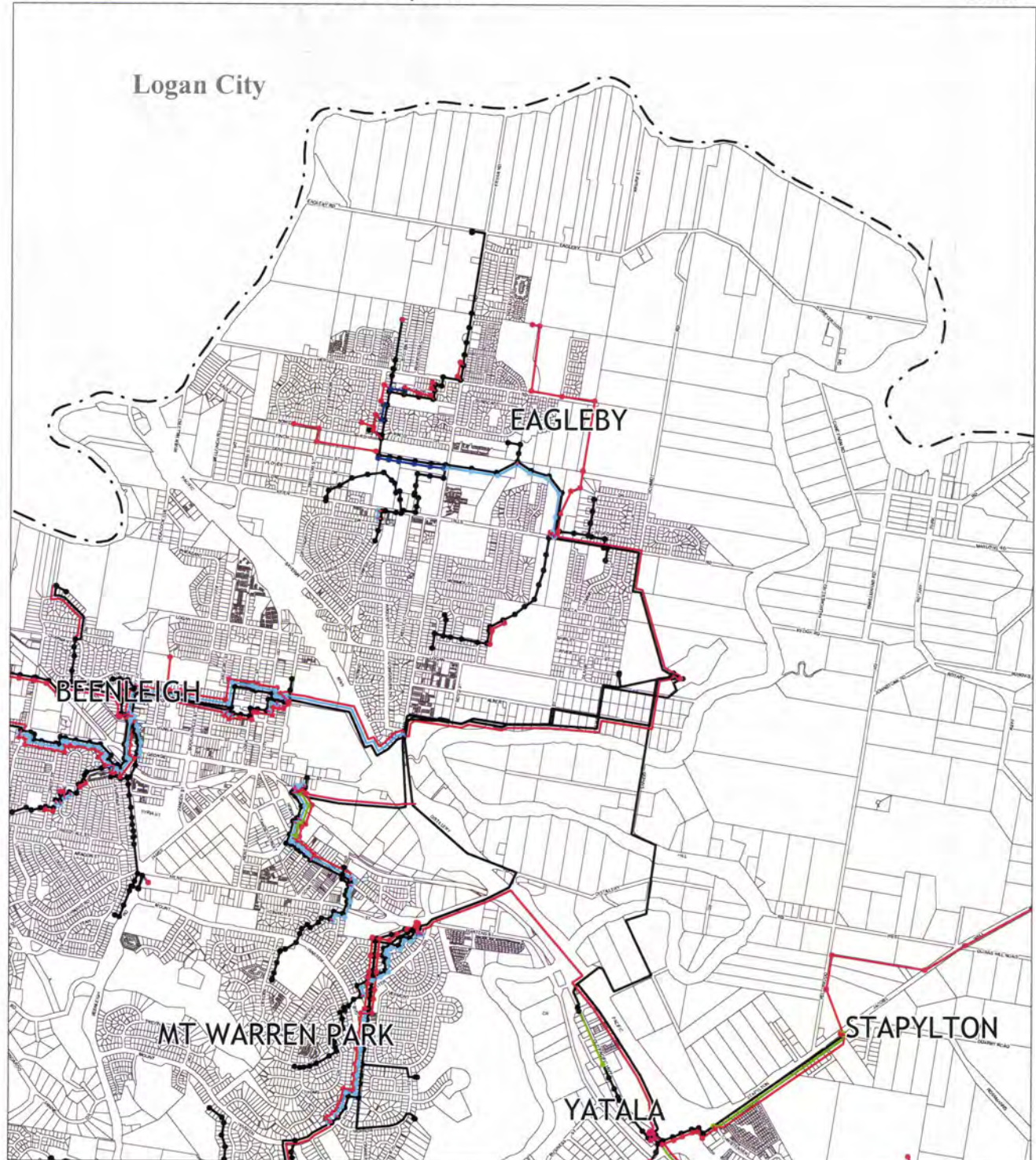
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Adjoining Maps Series





Legend

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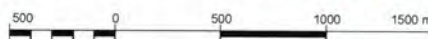
PROPOSED NETWORK

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 — 2007 - 11
 — 2012 - 21
 — 2022 - 56

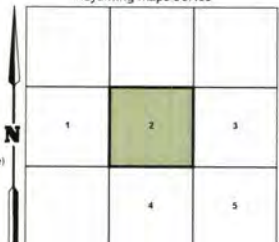
EXISTING PUMP NETWORK

PROPOSED PUMP SITES

● 2002 - 06
 ● 2007 - 11
 ● 2012 - 21
 ● 2022 - 56



Adjoining Maps Series

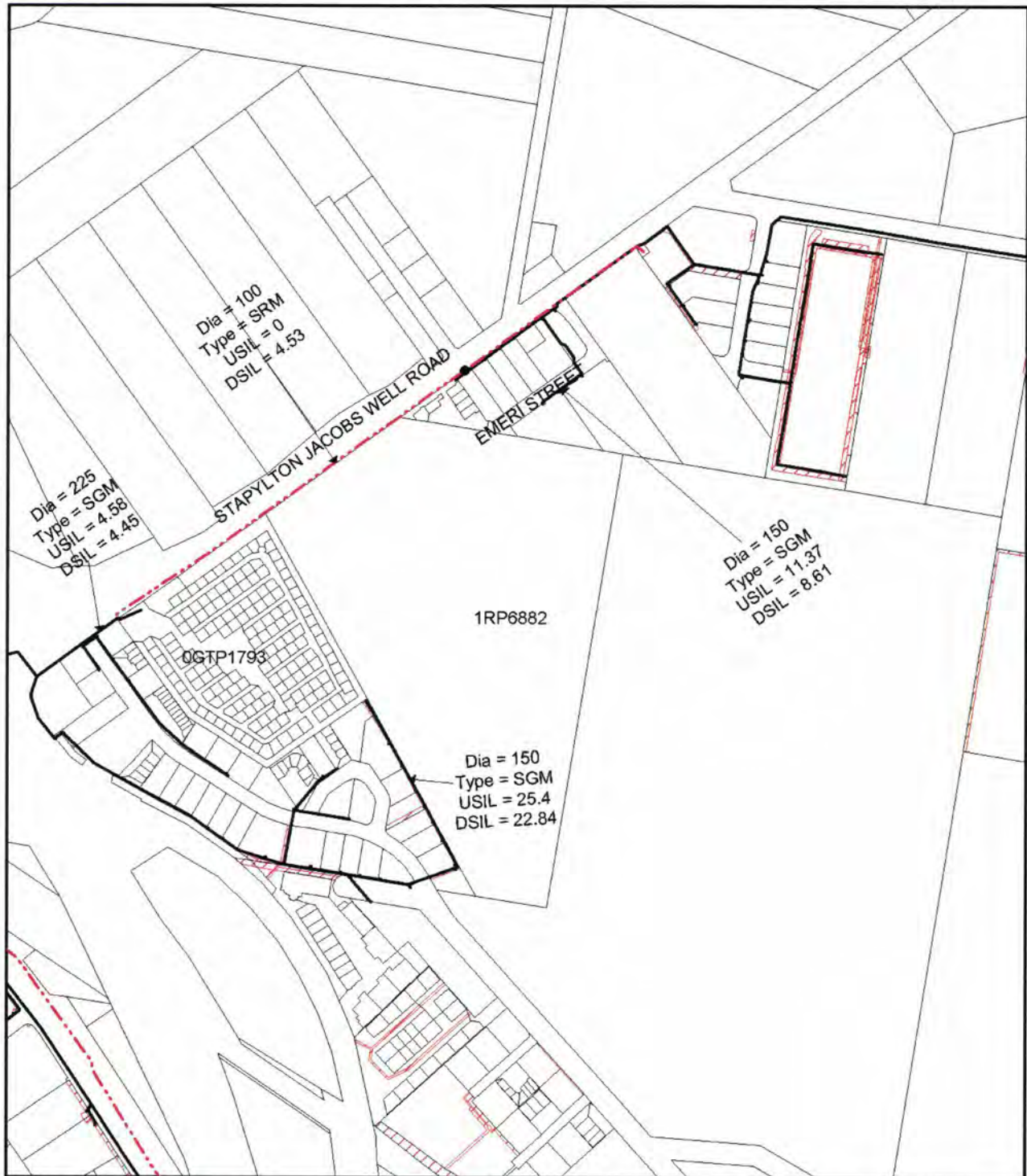


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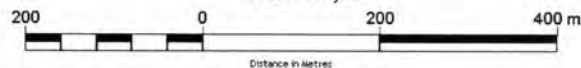
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Public_Sewer_A4P.WOR

Scale 1:7,736



Projection: Tran. Merc./MGA94 Zone 56/GDA94

Sewer Assets Infrastructure	
	Sewer Pumpstation
	Sewer Pumpstation (oxygen injected)
	Sewer Lift Station
	Treatment Plant
	Sewer Access Pit
	Sewer Gravity Main
	Sewer Rising Main
	Sewer House Connection

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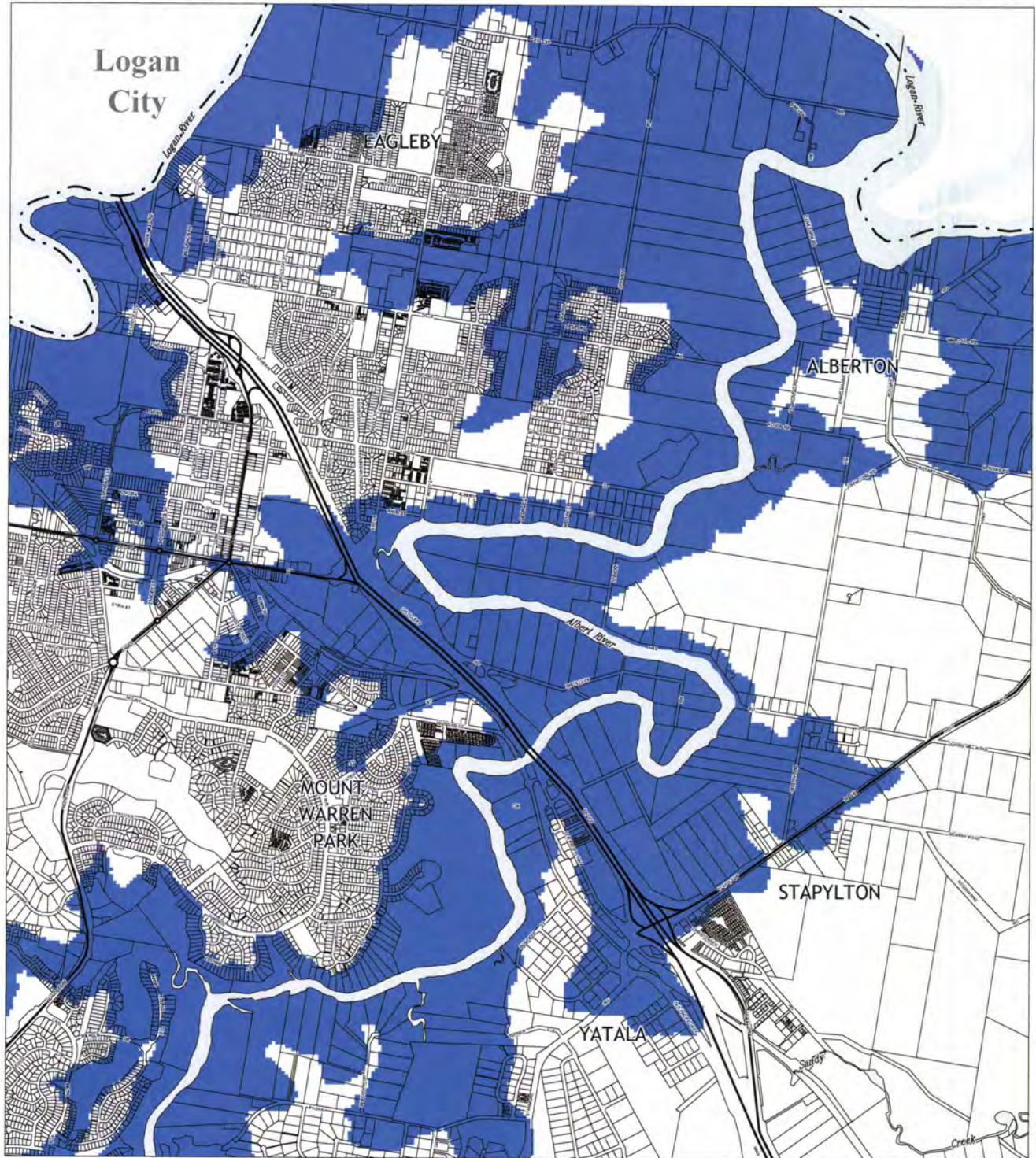


Gold Coast City Council



Appendix E

Gold Coast City Council Overlay Maps



Legend



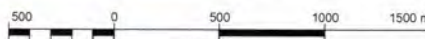
DESIGNATED FLOOD AFFECTED AREA



WATER BODY

This flood map does not in itself indicate whether any property has or has not been affected by floods. That conclusion requires separate interpretation or measurement.

Areas of potential flood inundation shown on this map have been compiled from various sources and hydraulic reports available at the date of issue. Whilst some of the inundation areas are based on computer hydraulic modelling of standard floods used for planning purposes, the information used to calibrate such models is usually based on reported flood marks which are often widely spaced and may not have been recorded at a particular flood's peak level.



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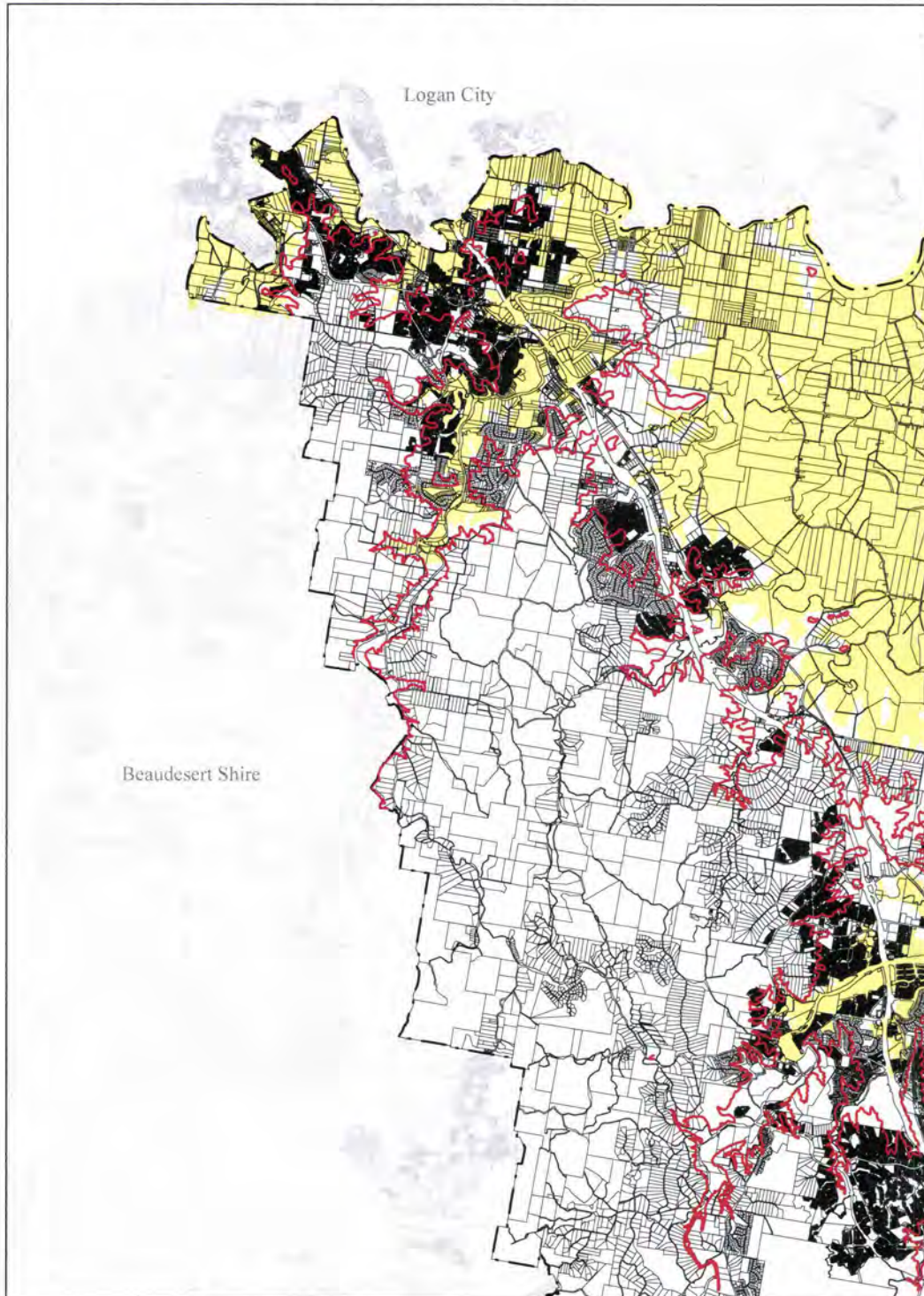
Adjoining Maps Series

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10	11	12

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Gold Coast City Council



Legend



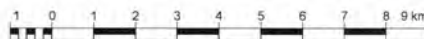
ACID SULFATE SOIL HAZARD AREA



20M CONTOUR LINE AHD

Any representation, statement, opinion or advice, expressed or implied in this map is made in good faith but on the basis that the City of the Gold Coast, its agents or employees are not liable (whether by reason of negligence, lack of care or otherwise), to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

The areas of potential Acid Sulfate Soils depicted on this map are indicative only and are based on AHD 5. The actual presence of Acid Sulfate Soils will need to be established through field tests done in conjunction with the "Policy for the management of activities to be located within areas of Acid Sulfate Soils in the City of the Gold Coast ASS" and relevant code in the Planning Scheme.



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Adjoining Maps Series



Appendix F

GCCC Flood Search Report

GOLD COAST CITY COUNCIL

POSTAL ADDRESS: P.O. BOX 5042 GOLD COAST MC QLD 9729
TELEPHONE: (07) 55816 490 FACSIMILE: (07) 55816 841



Rec'd: 16/2/11

TO: Clifton

Moana

Job No: AA003837

SEARCH NO: 3024199

CLIFTON MOANA HYPER CONSULTING PO BOX 1653 SOUTHPORT QLD 4215	Your Ref:	
	Client Account No	
	Posted Date	14/02/2011
	Received Date	10/02/2011
	PN	163842
	Vendor	HESTER
	Purchaser	

Property Situation	60 STAPYLTON JACOBS WELL ROAD STAPYLTON
Property Description	L1 RP6882

SEARCH TYPES	CERT REQUESTED	CERT ENCLOSED	SEARCH FEE	FEE PAID
Rates Search with Water Connected				
Special Water Meter Reading				
Limited Town Planning Certificate				
Standard Town Planning Certificate				
Full Town Planning Certificate				
Health Inspection of Premises				
Extract of Building Details – Residential				
Compliance Inspection				
Extract of Building Details - Commercial				
Swimming Pool/Spa Fencing Check				
Copy of Certificate of Classification				
Flood Level	Y	Y	50.00	50.00
Trade Waste Compliance				
Council Sewer, Water and Stormwater				
Waterfront Setbacks				
Boulder Wall				
Individual Property Landslip Map				

SEARCH FEE:	\$ 50.00	BALANCE OWING:	\$ 0.00
TOTAL PAID:	\$50.00	RECEIPT NO:	
		14450593	
REMARKS:			

The information requested by you has been extracted from Council's records in response to your request. The Council's records do not necessarily reflect the actual state of the property or matters relating to the property or the degree of compliance with relevant requirements. Persons making decisions with financial or legal implications must not rely upon the information supplied for the purpose of determining whether any particular facts or circumstances exist and the Council expressly disclaims any invitation to place such reliance on the information. Persons must obtain their own professional advice on these matters. The Council (and its officers and agents) contract to supply information only on this basis. See over for further information on the limits of the information supplied.

Desiree Della-Mura
A/- Coordinator Customer Contact
For the CHIEF EXECUTIVE OFFICER

GOLD COAST CITY COUNCIL

POSTAL ADDRESS: P.O. BOX 5042 GOLD COAST MC QLD 9729
TELEPHONE: (07) 55816 490 FACSIMILE: (07) 55816 841



ADDITIONAL INFORMATION

Please note that information pertinent to this search will only be supplied for a period of four weeks from the settlement date. After this period, application must be made for the issue of a new rate search.

The property search does not contain information about infrastructure charges. Persons requiring information about whether or not any outstanding infrastructure charges apply to the land, should submit an application for a standard or full town planning and development certificate under s 5.7.9 of the Integrated Planning Act.

The responsibility for the eradication of noxious plants and clearance of long grass, weeds and undergrowth from any land devolves on any purchase thereof. If Council exercises its powers in respect of any such eradication or clearance, all costs so incurred become an immediate charge upon the land concerned.

Access holes situated within this property shall be finished to surface level so as not to impede access by Council. If an access hole has been covered and it is necessary for Council to raise the access hole to surface level in order to obtain access, all costs associated with that work will be borne by the owner of the property at the time the work is done. You should check the location of any access holes on the property to ensure that they are readily accessible at the current surface level.

Council reserves the right to amend the amount of rates shown as outstanding on the rates search certificate if any payment has been made by cheque and the cheque subsequently is dishonoured by the Bank.

PLEASE NOTE: If your clients are in receipt of a pension, they should register with Council as soon as possible.

Acid sulphate soils exist within the City. Purchasers should obtain their own professional advice as to the impact or otherwise of acid sulphate soils.

To establish the location of Council reticulated services (sewer, stormwater, water main) or for as-constructed sewer diagrams relative to the property please complete a search request form located on Council's website: <http://www.gccc.com.au>. Prescribed fees apply. Reticulated sewer lines are not necessarily required to be contained within easements.

FLOOD SEARCH REPORT



Gold Coast City Council

DATE : 11/2/2011
SEARCH NO. : 3024199
LOT and PLAN : 1RP6882
PROPERTY : 60 STAPYLTON JACOBS WELL ROAD, STAPYLTON, Q4207

Thank you for your flood search enquiry dated 10/02/2011
Council has the following information available for the above property:

Designated Flood Level :	8.6 m AHD	(Australian Height Datum)
Source of Information:	SouthRoc Flood Study 1997	
Ground Level :	21.76 m AHD	(Australian Height Datum)
Not Available: If the flood search report shows 'Not Available' in lieu of a Designated Flood Level this indicates one of the following: 1) Council does not hold any regional flooding information for the property in question i.e. there are no historical records or computer modelled results available. This <u>does not</u> mean the property is not potentially flood affected. 2) The property in question is situated beyond the boundary of the Designated Flood Level i.e. the property may be on higher ground. This does not guarantee that the property will not be affected by a flood that is more extreme than a Q100 event i.e. a Q200 event.		
Surveyed Floor Level :	Not Available	(Australian Height Datum)
The Council has floor levels recorded for some properties within the city. If this information is available it is provided. The accuracy of this level is in the range of plus or minus 100mm. If an accurate and up to date floor level is required a Surveyor should be engaged. <i>Building floor levels of habitable rooms must be raised above the Designated Flood Level by 300mm as required by the Gold Coast City Council Planning Scheme - Constraint Codes - Flood Affected Areas (Division 3, Chapter 7).</i>		

IMPORTANT

This information relates ONLY to regional flooding and NOT to local runoff or local flooding, which may or may not affect the above property. The historical flood level (if given) is the highest flood level recorded by Council near your property, but no guarantee can be given that it will never be exceeded. Similarly there is no guarantee that the Designated Flood Level will never be exceeded. To determine the exact floor level (if not provided above) and other levels of the property, a property survey is necessary and a licensed surveyor should be engaged to provide this information. This flooding information is valid for 6 months only from the date of this report..

WARNING

THIS FLOOD SEARCH DOES NOT IN ITSELF INDICATE WHETHER THE SUBJECT PROPERTY HAS OR HAS NOT BEEN AFFECTED BY FLOODS.

The information in this search is supplied from Council's records in the belief that it is accurate but no warranty is given in that regard. The Gold Coast City Council expressly disclaims liability for any error or omission in the information and expressly disclaims responsibility for any loss or damage suffered as a result of placing reliance upon this information (including reliance on the accuracy or completeness of the information). Persons making any decisions (including decisions with financial or legal implications) must not rely upon this information for the purpose of determining whether any particular facts or circumstances exist and must obtain their own professional advice on these matters.

FLOOD SEARCH REPORT

GLOSSARY OF TERMS

Designated Flood Level:

The flood level (AHD) adopted by Gold Coast City Council for planning and administration purposes. The Designated Flood Level is normally based on a modelled 100 year ARI flood event or on a recorded historical flood level. Historical levels are only provided if no modelled levels are available.

Council believes that modelled data is preferable to historical data due to local and regional land use variations that may have occurred since the historical data was recorded. For example the construction of Hinze Dam, the opening of the Gold Coast Sea Way or any other development that may impact on historical flood levels.

ARI (Average Recurrence Interval):

Refers to the statistical probability of a flood of a particular size or larger occurring. For example, a 100 year ARI flood event means that a flood of that size or larger has 1 chance in 100 of occurring in any one year, or it is likely to occur on average once in 100 years. However, this does not guarantee when it will occur, that it will only happen once in 100 years, or that it will not be larger than a 1 in 100 year flood.

AHD (Australian Height Datum):

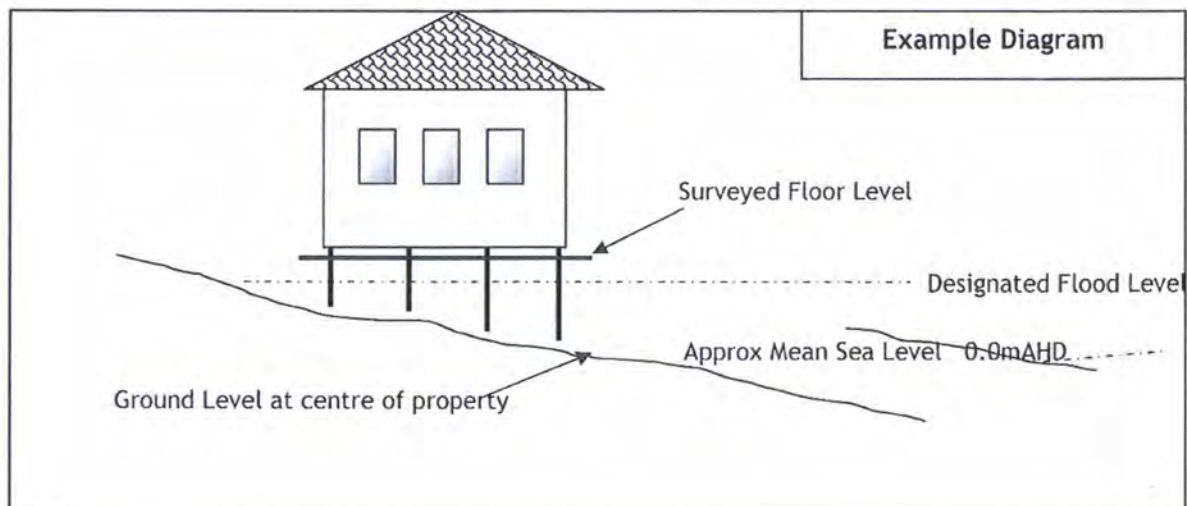
This is the standard elevation reference adopted by the National Mapping Council. As a general guide 0.0m AHD is approximately equal to the Mean Sea Level.

Source of Flood Level Information:

- **Modelled information** is a flood level derived from a computer model that predicts flood levels based on historical patterns, climate, geography, development and future global warming.
- **Historical information** has been recorded on an ad hoc basis, perhaps from debris marks, during or after a major flood. This information may be available for a small portion of properties relating to the flood events of 1954, 1967, 1974 and 1999.
- **Storm Surge information** refers to the increase in coastal water levels caused by low-pressure systems, waves and wind. This data is generally available for properties close to the coastline, east of the Gold Coast Highway, including those close to the Broadwater.

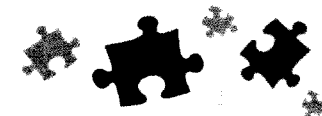
Ground Level:

The ground level shown is the level at the centre of the property. This ground level has been derived from an Aerial Laser Scan conducted in May 2009. This level has inherent levels of uncertainty due to the limitations of an Aerial Laser Scan. The level provided is not accurate and is only useful as a guide. Its accuracy is at best plus or minus 0.15 metres and in areas of dense vegetation it could be much worse than this. It should not be used for any design work or purpose that requires accurate ground levels. Also note that any earthworks that have occurred since May 2009 will not be accounted for in this level. If an accurate and up to date ground level is required a Surveyor should be engaged.



Appendix G

● GCCC Constraint Codes



Part 7 Codes
Division 3 Constraint Codes
Chapter 14 Sediment and Erosion Control

1.0 Purpose

This code seeks to minimise environmental harm caused by the effects of erosion and sedimentation, associated with the development of land. This code also seeks to ensure that ecologically sustainable management practices are undertaken during and following the development of land by:

- requiring the conservation of existing vegetation, including ground cover, on the land or, if cleaning is essential, replanting of vegetation and grass;
- ensuring that soil and other debris (whether transported by water or wind) do not leave the development site;
- minimising water flow paths and water volumes which traverse development sites, and avoiding where possible sediments leaving the site;
- ensuring the prompt and effective stabilisation and restoration of disturbed lands;
- requiring, when appropriate, an Erosion and Sedimentation Control Program;
- minimising the area and exposure time of disturbed land;
- minimising stormwater runoff events from disturbed areas;
- requiring the monitoring of impacts on receiving water bodies, as a measure of the effectiveness of the control devices.

2.0 Application

2.1 This code applies to development that is indicated as code or impact assessable by the Table of Development of the domain or Local Area Plan (LAP) within which the development is proposed.

2.2 Performance Criteria PC1-PC3 apply to all development referred to in this code.

3.0 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Code Assessable or Impact Assessable			
Erosion Risk			
PC1 All development must not cause erosion or allow sediments to leave the site.	AS1 An Erosion and Sedimentation Hazard Assessment has been undertaken in accordance with the criteria listed in Table 14-1 – Erosion Hazard Assessment Form, and the total score does not exceed 11 points.	AS1 – complies An Erosion and Sedimentation Hazard Assessment has been undertaken. The score exceeds 11 points. A sediment & erosion control plan will be provided as part of the Development	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
		Application and Operational Works Application which will address this issue. Refer to Drawings C003-C006 - AA003837 & C007-AA002702 and Site based Stormwater Management plan (Report No. F0002-AA003837-AAR) for further details.	
Erosion Control			
PC2 All development must not cause erosion or allow sediments to leave the site.	AS2 An Erosion and Sedimentation Control Program has been prepared by a competent person, in accordance with Soil Erosion and Sediment Control Engineering Guidelines for Queensland Construction Sites, and demonstrates that: a) the environmental effects of sedimentation and erosion are controlled by best practice management measures; b) sediments resulting from the development are contained within the site; and c) development adjacent to the bank or the bed of a stream or watercourse, addresses environmental impact on waterbodies.	AS2 - Compliance A site based Stormwater Management Plan (Report No. F0002-AA003837-AAR) has been prepared which incorporates erosion and sediment control management strategies in accordance with the Soil Erosion and Sediment Control Engineering Guidelines for Queensland Construction Sites. Hyder drawings C003-C006 - AA003837 & C007-AA002702 illustrate sediment and erosion control measures.	
Upslope Runoff			
PC3 All up-slope runoff must be diverted around areas to be disturbed.	AS3.1.1 Catch drains are utilised to divert the upstream runoff to a legal point of discharge. OR AS3.1.2 Alternative methods are used to divert upstream water from exposed or disturbed land.	AS3.1.1 – Complies Diversion channels will divert upstream flows away from construction areas. Refer to Drawings C003-C006 - AA003837 & C007-AA002702 and the Site based Stormwater Management plan (Report No. F0002-AA003837-AAR) for further details. AS3.1.2 – Not Applicable	



Table 14-1 – Erosion Hazard Assessment Form

Controlling Factors	Points	Score	Checking
Average slope of the whole site, prior to building works: - Slope < 3% 3% Slope < 5% 5% Slope < 10% 10% Slope < 15% - Slope is greater than 15%	0 1 2 4 5	2	
Soil type¹: - Sandy soil/gravel - Sandy loam - Clay loam - Clay soil	0 1 2 2	2	
Anticipated duration of site disturbance^{2,3}: - Duration < 2 weeks 2 weeks Duration < 3 months 3 months Duration < 6 months - Duration > 6 months	0 2 4 5	5	
Month that works are undertaken: - August, September - April, May, June, July, November, October - March, December - January, February	0 1 2 3	1	
Offsite sediment control (ie. down slope of the soil disturbance): Score 1 point if there is no purpose built, operational and well maintained sediment trap (eg. sediment basin, gross pollutant trap or purpose built wetland) to catch sediment before it enters a waterbody with environmental values (eg. creek, natural wetland, river or bay)⁴.	1	0	
Runoff entering the site: Score 1 point if stormwater runoff entering the site is not diverted away from the soil disturbance.	1	0	
Extent of site disturbance: - Score 2 points if building work requires reshaping of the ground surface (eg. 'cut and fill' works)⁵; - Score 5 points if the area to be disturbed is greater than 600m²;	2 5	5	
Works within environmentally sensitive areas: - Score 11 points if the disturbance is within the banks of a watercourse⁶; - Score 5 points if the disturbance is within 50 metres of the top of bank of a watercourse;	11 5	0	



Controlling Factors	Points	Score	Checking
▪ Score 2 points if the disturbance is between 50 and 100 metres of the top of bank of a watercourse.	2		
Total Score⁶⁷			

Notes:

1. **Where there is more than one type of soil on the site, select the category with the highest point value;**
2. **The time from when the building site will first become vulnerable to erosion to the time the soil will be fully stabilised (eg. grassing);**
3. **If this time span covers more than one category, select the category with the highest point value. Note that if there is no grass/vegetation cover on the site before building work has started, the time span starts from the time this form is completed;**
4. **If you are not sure, score 1 point;**
5. **For the purpose of this form, 'cut and fill' works are those that will result in a steep batter or retaining wall above and/or below the building slab, greater than 1 metre in height. If the building slab has already been fully cut and stabilised (eg. grassed) during the subdivision stage, score 0 points;**
6. **For a high risk site, the total score is $\geq$ critical score;**
7. **For a low risk site, the total score is $<$ critical score;**
8. **Watercourse means any clearly identifiable creek, stream or river, whether flowing permanently or intermittently.**



Part 7 Codes

Division 2 Specific Development Codes

Chapter 11 Changes to Ground Level and Creation of New Waterbodies

1.0 Purpose

This code seeks to ensure that changes to existing ground levels, including the creation of new waterbodies, do not adversely affect other properties or the general amenity of the locality in which the works are occurring. Ground level changes must be geotechnically and ecologically sound and, where a flood affected site is proposed to be developed, adequate measures will be taken to ensure that the development achieves no increase in risk of flood damage to life or to property for existing and proposed residential dwellings. The code also seeks to prevent any increase in runoff that might occur from development that would increase the rate of runoff or the magnitude of the flood volume that would run off during a flood emergency.

Best land management development practices, consistent with the principles of ecologically sustainable development, shall be employed.

This code also seeks to regulate development of land containing potential and actual acid sulfate soils so as to minimise the potential for environmental harm that may arise as a result of disturbances to these soils. In turn, this will minimise short and long term damage to corrodible infrastructure and natural ecosystems.

2.0 Application

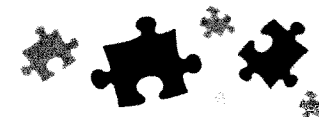
- 2.1 This code applies to development indicated as code or impact assessable in the Table of Development in the domain or Local Area Plan (LAP) within which the development is proposed.
- 2.2 The provisions of this code apply to the life of any development, as well as to the construction period of the development. All information required to support an application, including engineering analyses, calculations, reports and drawings, shall be in accordance with **Planning Scheme Policy 11 – Land Development Guidelines**.
- 2.3 Performance Criteria PC1-PC20 apply to all code and impact assessable development subject to this code.

3.0 Development Provisions

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Code Assessable or Impact Assessable			
Acid Sulfate Soils			
PC1 Development on land containing acid sulfate soils must not result in environmental harm or damage.	AS1.1.1 The land is at or below AHD 5 and is assessed for acid sulfate soil, in accordance with Planning Scheme Policy 14 – Management of Activities Located Within Areas of Acid Sulfate Soils .	AS1.1.1 & AS1.1.2 –Applicable It is acknowledged that the ground elevations range from AHD 3.5 to AHD 29 and an acid sulphate soil assessment will be conducted prior to any relevant works on site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS1.1.2 The land is at or below AHD 20 and excavation is proposed to levels below AHD 5 and the development is assessed for acid sulfate soil, in accordance with Planning Scheme Policy 14 – Management of Activities Located Within Areas of Acid Sulfate Soils.		
Stormwater Drainage Considerations			
PC2 Development must not cause adverse stormwater drainage impacts on areas external and internal to the site.	AS2.1 The change to ground level maintains flood storage volume over the site for the 20 year ARI storm event. AS2.2 The change in ground level does not involve filling below Q100. AS2.3 The change in ground level does not impound or divert rainfall runoff.	AS2.1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood storage requirements for the proposed development. AS2.3 – Complies It is acknowledged that there will be filling below the 100 year ARI flood level and all issues associated with maintaining appropriate storage volumes are addressed in the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01). AS2.3 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) has been prepared by Hyder Consulting and demonstrates that the proposed development does not impede or divert rainfall runoff or cause adverse stormwater drainage impacts on areas external and internal to the site.	
Geotechnical Site Requirements			
PC3 All earthworks must be carried out in a location which is not at risk from:	AS3.1 The site is: a) located in areas free of compressible	AS3.1 – Complies GCCC Planning Scheme Overlay Map OM16-2 shows that the site is designated as having very low slope instability risk.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
a) geotechnical instability at a nearby location; or b) geotechnical instability on the subject site.	soils; b) designated as having very low to low slope instability. AS3.2 The site is not identified on Overlay Map OM16 – Areas of Unstable Soils and Areas of Potential Land Slip Hazard as an area with moderate, high and very high risk of instability.	AS3.2 – Complies The site is not identified on GCCC Planning Scheme Overlay Map OM16 as an area of moderate, high or very high risk of instability.	
PC4 All earthworks must be geotechnically stable, and must not decrease the geotechnical stability of the subject or adjacent sites.	AS4 The earthworks are undertaken in a manner which: a) involves a maximum cut and/or fill of less than 1 metre in height; b) involves batters no steeper than one in two.	AS4 - Complies The earthworks will be undertaken in a manner which involves batters no steeper than one in two.	
Local Amenity, Noise and Emissions			
PC5 All activities carried out for or associated with changes to ground level must be conducted in a manner which ensures minimal disturbance to the amenity of the built environment.	AS5.1 The development involves work which has the potential to generate dust, and the following control measures are implemented: a) daily water spraying of exposed areas; b) provision of sealed roads; c) protective covering of exposed areas; d) the installation of wind barriers. AS5.2 All earthworks on the property are undertaken only during the hours of 6am to 6pm, Monday to Friday, and 7am to 6pm on Saturday. No work is undertaken on Sunday.	AS5.1 Complies Dust control measures will be put in place to ensure minimal disturbance. AS5.2 – Complies All earthworks on the property will be undertaken within the specified hours	
PC6 All work associated with any development must not create a negative impact upon the amenity of surrounding properties.	AS6.1 The cut and/or fill is retained, and the retaining wall is set back from any boundary at least one quarter of its height, with a minimum distance of 300mm, and: a) the site is located within a residential	AS6.1 & AS6.2 - Complies Where changes to ground levels are proposed at the property boundary (at street level), all retaining walls, terraces and batters will be designed in accordance with AS6.1 & AS6.2.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	domain or adjacent to a site in a residential domain, and the retaining wall is stepped 1.5 metres for every 1.5 metres in height, and the terraces are landscaped; or b) the site is located within a non-residential domain, and the retaining wall is stepped 1.5 metres for every three metres in height, and the terraces are landscaped. AS6.2 The cut and/or fill is not retained, and the toe of any batter is no closer than 300mm from a boundary, and: a) the site is located within a residential domain or adjacent to a site in a residential domain, and batters along boundaries are no steeper than one in four and landscaped; or b) the site is located within a non-residential domain, and batters along boundaries are no steeper than 1 in 2 and landscaped.		
Managing Contamination Risk			
PC7 Any filling or excavation must not result in the contamination of land.	AS7 The fill material is solid clean earth or clean inert material, free of organic, putrescible or refuse matter.	AS7 – Complies Fill material will be sourced onsite or from an adjacent development site. All imported fill materials will be solid clean earth or clean inert material, free of organic, putrescible or refuse matter.	
Geotechnical Fill Considerations			
PC8 Any materials used as fill must be able to adequately support future development of the land.	AS8 The proposed type, composition and source of fill material is geotechnically suitable, and is adequately compacted to support future development, in accordance with the requirements of Planning Scheme Policy 11 – Land Development Guidelines.	Fill material will be sourced onsite or from an adjacent development site. The proposed type, composition and source of fill material will be geotechnically suitable, and adequately compacted in accordance with Council's Land Development Guidelines.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Hydraulic Considerations			
PC9 Any change to the level of the land must not have an adverse flooding impact on the flooding and drainage characteristics of external sites and/or premises.	AS9 As demonstrated by a hydraulic report prepared in accordance with Council's Hydraulic Report Requirements, the filling or excavation does not: a) cause ponding on the site or nearby land; b) increase flooding which adversely affects the safety or use of any land upstream and downstream; c) adversely affect the flow of water in any overland flow path; or otherwise d) contravene the intent of Constraint Code 8 - Flood Affected Areas.	AS9 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting demonstrates that the proposed development does not have an adverse impact on the flooding characteristics of the premises and external sites. The Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) by Hyder Consulting demonstrates that the proposed development complies with AS9 and does not have an adverse impact on the drainage characteristics of the premises and external sites	
PC10 Development upstream of areas with over floor flooding shall not increase the contribution of floodwater from the catchment. Over floor flooding occurs adjacent to: a) Currumbin Creek, downstream of weir near Stackpole Street; b) Tallebudgera Creek, downstream of Benardon Court; c) Mudgeeraba Creek, downstream of Berrigans Road; d) Nerang River, east of the Pacific Motorway; e) Coomera River, east of the Oxenford - Tamborine Road; f) Coombabah Creek, downstream of the Pacific Highway; g) Saltwater Creek, downstream of its crossing by Kopps Road.	AS10.1 Flood storage detention facilities are provided, where possible, on public land, of sufficient capacity to retain runoff such that the total peak runoff rate and volume released during the flood is not greater than would have been the case prior to development. AS10.2 A certified hydraulic study (and, if necessary, a hydrologic study) is prepared by a suitably qualified and experienced engineer to investigate the characteristics of both the undeveloped and developed site, and determines to the satisfaction of the Assessment Manager that a detention storage is not required, and a contribution is made by the developer to a Council sponsored community flood detention facility.	AS10.1 – Complies The Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) by Hyder Consulting demonstrates that the proposed development complies with AS10.1 and calculates that the stormwater runoff rates from the proposed development will be no higher than the runoff from the existing development. No increase in peak flows from the site will occur.	
PC11 All development must ensure that there is no	AS11 Stormwater drainage is provided in	AS11- Complies The Site Based Stormwater Management	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
impact to local drainage regimes, such that no real damage is caused to any properties upstream or downstream of the site.	accordance with Planning Scheme Policy 11 – Land Development Guidelines .	Plan (Report No F0002-AA003837-AAR-01) by Hyder Consulting describes the proposed stormwater infrastructure for the site. The report demonstrates that there is no impact to local drainage regimes. The existing legal points of discharge are maintained and no increase in peak flows from the site will occur.	
Haulage Activity and Amenity			
PC12 All activities carried out for or associated with changes to ground level, including haulage activity, must be conducted in a manner which ensures minimal disturbance to the amenity of the built environment.	AS12.1 The development involves the transportation of fill material to and/or from the site, and the following measures are taken: a) loads are covered; b) spilled or wheel tracked material is immediately cleaned up from external roads; and c) heavy vehicle traffic is controlled. AS12.2 All waste material, including vegetation, is transported from the site and disposed of in an approved location. AS12.3 All haulage routes are approved by the Department of Transport for declared main roads, and by Council for all other roads. AS12.4 All haulage to and from the site is to be undertaken only during the hours of 6am to 6pm Monday to Friday and 7am to 6pm on Saturdays.	AS12.1 – Complies During Construction the provision of a construction exit to prevent the tracking of debris from tyres of vehicles onto public roads will be maintained. Only one construction exit will be nominated to limit the movement of construction equipment. AS12.2 – Complies All waste material, including vegetation, is to be transported from the site and disposed of in an approved location to be nominated. AS12.3 & AS12.4 – Condition The Contractor shall submit a Construction Traffic Management Plan (as required by the Site Based Management Plan) to comply with AS12.2 – AS12.4 as a condition of approval.	
Treatment of Fill and Retaining Walls			
PC13 All work associated with any development must not create a negative impact upon the amenity of surrounding properties.	AS13.1 Filling material is placed on the development site and is maintained within the subject property, unless alternative arrangements are agreed by the affected neighbouring property owner.	AS13.1 – Complies All fill materials will be placed and maintained within the subject property, unless alternative arrangements are agreed.	



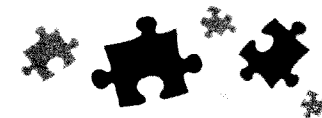
Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS13.2 Any retaining walls which present to the street or adjoining land, have a finish that is compatible with surrounding development.	AS13.2 – Complies The site has been designed such that only minimal earthworks and retaining structures address neighbouring properties. All retaining walls which present to the street or adjoining land will be designed to be compatible with the surrounding developments as per Hyder Drawing C016-AA003837-02.	
Water Quality			
PC14 Development must not have an adverse impact upon the City's ground water, waterways and wetlands.	AS14 Sediment and erosion control measures are implemented with the filling/excavation work.	AS14 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) has been prepared by Hyder Consulting. This report defines the relevant construction phase performance objectives, monitoring and control measures relating to sediment and erosion control to prevent adverse impact upon the City's ground water, waterways and wetlands.	
PC15 The natural hydrological regimes of the site, including natural water quality, quantity and groundwater conditions, must be maintained and enhanced.	AS15.1 Sediment and erosion control measures are implemented with the filling/excavation work, in accordance with an approved Erosion and Sedimentation Control Program. AS15.2 The methods of stormwater run-off control and the design of the stormwater system does not create a point source discharge to waterbodies. AS15.3 A Stormwater Management Intent is prepared for the site which demonstrates that: a) stormwater is treated prior to discharge into any waterways; b) the velocity and quality of stormwater to be discharged into the waterways does not degrade the environmental values of	AS15.1 – Complies A sediment & erosion control plan will be provided as part of the Development Application and Operational Works Application which will address this issue. Refer to Drawings C003-C006-AA003837 & C007-AA003837 and Site based Stormwater Management plan for further details. AS 15.2 & AS15.3 – Complies Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) by Hyder Consulting demonstrates that the natural hydrological regimes of the site are maintained. The existing legal points of discharge are maintained and no increase in peak flows from the site will occur. The Stormwater Management Plan	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	the adjoining site.	also demonstrates that all runoff will be treated prior to discharge from the site.	
Finished Surface Levels			
PC16 All development must have a finished surface level which is free draining and free from flooding.	AS16.1.1 The development is free draining and the surface gradient of the fill and/or excavated area is within the range 0.5% to 1.5%. OR AS16.1.2 The development includes steep surface gradients, which achieve integration with the surrounding topography, and the finished profile does not interrupt or materially change the surface water drainage, from or onto adjoining land.	AS16.1 & AS16.2 – Complies The Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting demonstrates that the surface level of the proposed development will be free draining and free from flooding.	
Construction of New Waterbodies			
PC17 The new waterbodies must be suitable for their intended uses, and must maintain and enhance the water quality of existing waterbodies connecting to them.	AS17.1 A Water Quality Management Plan, which is prepared by a competent person, demonstrates that: a) the water quality of the new waterbodies is of the same or higher standard as the existing water quality; b) long term maintenance of the desired water quality is achieved; c) breeding potential of biting insects is minimised. AS17.2 The water body does not have deep, isolated holes that stratify and increase the possibility of algal blooms occurring, if that stratification breaks down. AS17.3 Pumping for the purposes of maintaining water quality is avoided. AS17.4	PC17 – Not Applicable No new waterbodies are proposed. PC17 is not applicable.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	The water body is designed with a suitable outlet to ensure that flushing, if required, is possible.		
PC18 Operational work must not cause geotechnical bank instability, erosion, bed scour or revetment wall collapse to adjacent waterbodies or to newly constructed waterbodies.	AS18 Edge treatment to the embankments of the waterbodies is in place during and after construction, in a manner certified by a competent person.	PC18 – Not Applicable No works are to take place adjacent waterbodies.	
PC19 New waterbodies to be transferred to public ownership must have regard to public safety.	AS19 The water body includes: a) warning signs; b) fencing of areas where access is restricted, such as steep sided embankments or large drops.	PC19 – Not Applicable No new waterbodies are proposed. PC19 is not applicable.	
Access to New Waterbodies			
PC20 Development incorporating new waterbodies must be designed to provide suitable access for maintenance of revetment walls and cleaning of the water body, including the removal of rubbish, reeds and surplus aquatic flora.	AS20 Access is provided to the owner/s of the waterbodies, by: a) dedication of land to the Crown, for this purpose; or b) existing access arrangements.	PC20 – Not Applicable No new waterbodies are proposed. PC20 is not applicable.	



Part 7 Codes

Division 3 Constraint Codes

Chapter 8 Flood Affected Areas

1.0 Purpose

To ensure that, where premises within flood affected areas are to be developed, adequate measures are taken to:

- ensure that the development does not cause, or have the cumulative potential to cause, real damage (as defined below);
- provide standards for development in these areas that will ensure that the runoff from land and/or premises does not create any adverse environmental impacts.

Key objectives include:

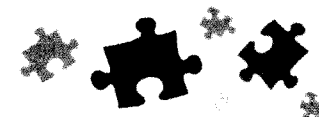
- a) avoiding, if practicable, or otherwise lessening, the adverse impacts of flooding;
- b) maintaining or improving the City's counter disaster response efforts during a flood emergency;
- c) equitably sharing development constraints and development potential within a single river catchment and its sub catchments;
- d) equitably sharing the costs and benefits of flood mitigation infrastructure within a river catchment and its sub-catchments;
- e) protecting the flood storage function of the City's flood plains;
- f) protecting the flood discharge capacity of the City's rivers, streams and canals;
- g) achieving and maintaining a best practice approach to flood plain management;
- h) protecting ocean beaches and the shores and banks of estuaries, lakes, canals, rivers, streams and other waterbodies from erosion.

This code seeks to manage the effects of flooding on flood prone land, where it relates to new and existing development, infrastructure and ecosystems, by requiring:

- certified engineering hydraulic management plans or studies;
- specific design criteria for certain types of land uses.

All such proposals for development will be fully evaluated against the following criteria:

- real damage: whether the development is likely to cause damage that would adversely affect land and/or premises to an extent likely to be actionable;
- cumulative impact: whether the cumulative impact of development is likely to cause real damage;
- flood hazard: whether the development is likely to cause or worsen flood hazard;
- risks: whether the risks associated with the development are fully known, quantifiable and capable of being dealt with to Council's satisfaction, without any uncertainties; and
- flood mitigation: whether flood mitigation works, intended to reduce flood risk, hazard and damage, do so without adversely impacting upon other land and/or premises.



2.0 Application

2.1 This code applies to development that is indicated as self, code or impact assessable in the Table of Development to the domain or Local Area Plan (LAP) within which the development is proposed. In particular, this code applies to any site that is located within a Flood Affected Area*, defined as follows:

- flood prone land; or
- premises where access would be adversely affected during a range of floods, up to and including the designated flood.

*Refer to **Overlay Map OM17 – Natural Hazard (Flood) Management Areas** sheets 1-35.

2.2 This code does not apply to Class 1 or Class 10 buildings as defined in the **Building Code of Australia**, except where Council has declared an area to be flood liable under **Section 53** of the **Queensland Building Regulations**. However, this code provides recommendations for minimum floor levels for Class 1 and Class 10 buildings within flood prone land.

2.3 Note that where Operational Work is being undertaken within flood affected areas that results in a disturbance to the surface of the land, **Specific Development Code 11 – Changes to Ground Level and Creation of New Waterbodies** and **Constraint Code 14 – Sediment and Erosion Control** are also relevant.

2.4 Performance Criteria PC1-PC14 apply to all code and impact assessable development subject to this code. For development identified as self assessable in the relevant domain or LAP, only the acceptable solutions to Performance Criteria PC1-PC4 apply.

3.0 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Self Assessable, Code Assessable or Impact Assessable			
Flood Storage			
PC1 All development activity conducted on land below the designated flood level must not detrimentally affect the flood storage capacity of the catchment and the drainage regime.	AS1 The flood storage volume on the site is maintained up to the Designated Flood Level. <i>Note: The Designated Flood Level can be obtained from Council's Flood Search.</i>	AS1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood storage requirements for the proposed development.	
Building Floor Levels			
PC2 Building floor levels of habitable rooms must be raised to provide an allowance for the hydraulic gradient above the main floodway, so as to meet the requirements of the Standard Building Regulation and Building Code of Australia .	AS2.1.1 An allowance of at least 300mm is added to the Designated Flood Level for habitable rooms, or other allowance amount specified in a Local Area Plan. OR AS2.1.2	AS2.1.1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the 300mm Freeboard requirements for the proposed development.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Note: <i>Performance criteria for setting building floor levels are set out in the Standard Building Regulation and Building Code of Australia. However, it should be noted that Designated Flood Levels provided by Council relate to mainstream flood flow paths and do not include allowances for the hydraulic gradients from residential areas to the main floodway.</i>	Damaged residential buildings are reconstructed to have a Design Floor Level at or above the level that existed prior to the building's damage, provided that the building work is limited to reinstatement. AS2.2 Where the building has been destroyed by flood, the reconstructed floor level accords with AS2.1.1.	AS2.2 – Not Applicable No onsite existing buildings exist that have being destroyed by floods therefore AS2.2 is not applicable.	
PC3 Building floor levels of garages and non habitable rooms must be constructed at a height that reflects an acceptable flood risk for their purpose. Note: <i>PC3 does not apply to:</i> a) <i>extensions to existing buildings;</i> b) <i>structures detached from a dwelling, for which the use is ancillary to that of a dwelling, provided that use is not listed in column 1 of Table to Acceptable Solution AS7.1.</i>	AS3.1 Building floor levels of garages and non habitable rooms, constructed at approximately the same level as, and attached to, the main dwelling, is constructed at a height above the Designated Flood Level, except where the dwelling has a suspended floor, constructed one metre or more above ground, or where the building is to be constructed within a Rural Domain. AS3.2 Non-habitable rooms and garages, detached from the fabric but within the curtilage of a building, that are not for the storage of goods are constructed above or below the Designated Flood Level.	AS3.1 & AS3.2 – Complies Hyder Consulting drawings C008-C011 – AA003837 illustrate a minimum lot pad level of RL9.20 AHD metres which is above Council's Recommended Q100 Flood Level of RL8.6 AHD. All structures built within the site will therefore be above the designated flood level demonstrating compliance to AS3.1 and AS3.2.	
Overland Flow			
PC4 Building work must not provide obstructions to the free passage of stormwater through a property.	AS4 Overland flowing stormwater is allowed free passage between the street and any waterway at the rear of the property, in accordance with the provisions of the Building Code of Australia.	AS4 – Complies As per Hyder drawings C012-C015 – AA003837 overland flow is permissible through the provision of easements, stormwater infrastructure and basins which are in accordance with the Building Code of Australia.	

Development that is Code Assessable or Impact Assessable

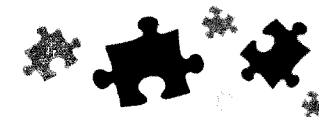
Flooding Risk



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC5 Development in flood affected areas must not cause, or have the cumulative potential to cause, real damage, must not increase the level of risk to life, or be to the detriment of flood evacuation procedures.	AS5 Development does not: a) increase the number of people calculated to be at risk from flooding; b) increase the number of people likely to need evacuation; c) shorten flood warning times; d) impact on the ability of traffic to use evacuation routes, or unreasonably increase traffic volumes on evacuation routes, or as identified within Council's Counter Disaster Plan (flooding); e) place additional burdens on Council's resources or emergency services; f) increase the duration of flooding, unless that increase is part of a Council approved flood mitigation strategy.	AS5 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the effects of flooding as well as associated requirements of safety, mitigation and preservation of existing flood characteristics for the proposed development.	
Flood Storage and Conveyance			
PC6 Development with plans for earthworks in a floodplain on or over a water body or within a flood affected area below the Designated Flood Level must allow for the maintenance of flood storage, and flood conveyance of flood and drainage channels and overland flow paths.	AS6.1 Provide flood storage calculations that demonstrate that flood storage volume, over the site below the Designated Flood Level, is maintained or increased. AS6.2 A certified hydraulic study (and, if necessary, a hydrologic study) is prepared by a suitably qualified and experienced engineer to investigate the hydraulic characteristics of both the undeveloped and developed site and make comparisons between them. Proposed developments in, on or over a water body, or within a flood affected area, must be tested for: a) the 50%, 20%, 10%, 5%, 2% and 1% Annual Exceedance Probability (AEP) for local flood events; b) the 5%, 2%, and 1% AEP floods and the designated flood and design flood AEP	AS6.1 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood storage requirements for the proposed development. AS6.2 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the existing and developed cases of the site with regards to hydraulic/hydrologic characteristics and impacts of the site.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	(as specified in Table to Acceptable Solution AS7.1) for riverine flood events, c) any resultant afflux or increase in flood velocities sufficient to cause real damage to premises. The Assessment Manager may also require the development to be assessed against rarer floods. AS6.3 The Assessment Manager may decide that a hydraulic and/or hydrological study is not necessary if in the Assessment Manager's opinion: a) a relevant study, that is not outdated, demonstrates there are no significant flooding impacts that were not covered in the relevant study; or b) the flooding impact of the approval, in relation to the development, is minor, c) in which event the Assessment Manager must provide a written notice to that effect to the applicant.		
Development for Certain Purposes			
PC7 Development listed in Table to Acceptable Solution AS7.1 must allow for flood events and be constructed at a level above most floods.	AS7.1 Development is designed for the Design Flood AEP, as specified in Table to Acceptable Solution AS7.1. Note: <i>The designated flood level for residential buildings in general is a 1% flood level except for:</i> a) <i>Broadwater – the 1% AEP storm surge level, plus an allowance of 0.27 metres, to account for sea level rise resulting from climate change;</i> b) <i>Logan and Albert Rivers – the designated flood is based, in part, on rainfall that occurred during the January 1974 flood and assumptions made regarding the ultimate level of development, in accordance</i>	AS7.1 & AS7.2 – Complies The development as part of the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) has being designed for the designated flood level issued by Council and in accordance with Table to Acceptable Solution AS7.1, Light Industry/warehousing.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	<i>with the relevant local planning instruments; and</i> c) <i>Historical flood level is the only information available to be specified designated flood level.</i> AS7.2 Development is constructed at or above the Design Flood Reclamation Level, shown in the Table to Acceptable Solution AS7.1, where the Designated Flood is the 1% AEP flood event, except as follows: a) Broadwater: the 1% AEP storm surge level, plus an allowance of 0.27 metres, to account for sea level rise resulting from climate change; b) Logan and Albert Rivers: the designated flood is based, in part, on rainfall that occurred during the January 1974 flood and assumptions made regarding the ultimate level of development, in accordance with the relevant local planning instruments; and c) Coomera River: the designated flood is based on the modelled 1% AEP flood event or historic levels, whichever is the higher.		
PC8 Development must consider hydrologic and hydraulic impacts of development in flood affected areas with regard to future climate change.	AS8 No acceptable solution provided. Note: <i>As part of a Hydrologic and hydraulic impact assessment, investigation has been undertaken to determine the impacts of future climate change. The findings of the investigation may be used to modify modelling parameters and boundary conditions used in modelling the hydrologic and hydraulic impacts of development in flood affected areas.</i>	AS8 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the existing and developed cases of the site with regards to hydraulic/hydrologic characteristics and impacts of the site.	



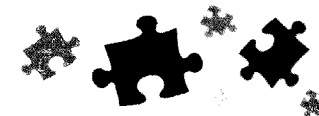
Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
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Table to Acceptable Solution AS7.1

Land Use	Design Flood
Disaster management facilities	0.2% AEP
Hospitals	0.2% AEP
Major electrical switchyards, power stations, water treatment plants	0.2% AEP
Fire/police stations	0.5% AEP
Places of refuge	0.5% AEP
Electricity substations	0.5% AEP
Sewage treatment plants	0.5% AEP
Homes for the aged, hospice	0.5% AEP
Regional fuel storage	0.5% AEP
Food storage warehouses	0.5% AEP
Hotel residential	Designated flood
Educational facilities	Designated flood
Residential buildings	Designated flood
Camping grounds, caravan parks and relocatable homes reclamation levels	Designated flood
Commercial	Designated flood
Light industrial/warehousing	Designated flood
Theme parks	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Clubs/non-habitable buildings associated with enjoyment of public open space	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Car parking below buildings	Not specified, but users should not be subjected to any more than high hazard conditions in the designated flood, as specified in AS10.1
Open space	Not specified, but ancillary structures are subject to appropriate hazard conditions in the designated flood, as specified in AS10.1
Rural	Not specified

Hazard Considerations for Development

PC9	AS9	AS9 – Complies	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development listed in the Table to Acceptable Solution AS9 below must be designed and constructed to avoid causing exposure to undue flood hazard.	Development is to be designed and constructed so that users are not exposed to a greater degree of hazard than shown in Table to Acceptable Solution AS9 for the range of flows specified in AS7.1 .	A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the appropriate degree of hazard as per Table to Acceptable Solution AS9; Commercial/Industrial.	

Table to Acceptable Solution AS9

Land-Use	Appropriate Degree of Hazard				
	Nil	Low	Medium	High	Extreme
Public open space/recreation	✓	✓	✓	✓	✓
Theme parks	✓	✓	✓	✓	
Clubs/non-habitable buildings associated with enjoyment of public open space	✓	✓	✓	✓	
Commercial/Industrial	✓	✓	✓		
Residential	✓	✓	✓		
Public institutions	✓	✓	✓		
Car parking below buildings	✓	✓	✓	✓	
Caravan parks	✓	✓	✓		
Council offices	✓	✓			
Schools	✓	✓			
Homes for the elderly	✓	✓			
Hospitals	✓	✓			
SES	✓	✓			
Police/fire stations	✓	✓			
Museums/libraries/archives/ infrastructure plan repositories	✓				
Telephone exchanges	✓				

Note: ✓ Indicates an appropriate land use.

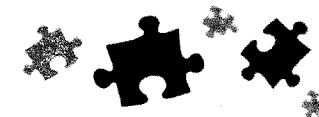


Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
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The above table examines the appropriateness of land use decisions from the aspect of flood hazard only. As such, it does not confer any land use rights or provide any indication that Council will reject or favourably consider various uses in particular areas. Such consideration will be dealt with appropriately, in the context of the Planning Scheme, and based upon full consideration of all relevant issues.

Access Criteria with Respect to Hazard

PC10 All proposed development must demonstrate that sufficient access or egress will be available to enable evacuation during a range of floods, up to and including the designated flood.	AS10.1 Development, not including underground car parks, must ensure that evacuation opportunities exist in accordance with the minimum levels of exposure outlined in Table to Acceptable Solution AS10.1, where means of access or egress may be: a) an access route that is below the level of the designated flood, provided that route is classed as a low hazard, as defined in Table to Acceptable Solution AS10.1; or b) an access route that is not the main access route. However, it must remain effective for the duration of a range of flood events, up to and including the designated flood; or c) a temporary access arrangement, provided that access can be gained without significant preparation time being required; The access or egress must: a) in the event of a designated flood: ▪ not expose users to undue risk; ▪ not cause, or have the cumulative potential to cause, real damage to land and/or premises; ▪ not interrupt or materially change the surface water drainage from or onto adjoining land; b) not create, in the event of a flood, a sudden change in flow distributions, flood level or velocity that could result in: ▪ the breaking of a levee; or	AS10.1 - Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the evacuation procedures and escape routes in the event of a Q100 flood event, in accordance with Table to Acceptable Solution AS10.1. The plan demonstrates that the entire site still has safe access to roadways and pedestrian routes as well as access to the adjacent traffic networks to the North-East and South-West during the event.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	- the establishment of blockage of a breakout; or - excessive scour; or - sedimentation; or - increased flood hazard.		

Table to Acceptable Solution AS10.1

Criteria	Degree of Flood Hazard			
	Low	Medium	High	Extreme
Wading ability	If necessary children and the elderly could wade. (Generally, safe wading velocity depth product is less than 0.25.)	Fit adults can wade. (Generally, safe wading velocity depth product is less than 0.4.)	Fit adults would have difficulty wading. (Generally, where wading velocity depth product is less than 0.6.)	Wading is not an option.
Evacuation distances	< 200 metres	200 – 400 metres	400 – 600 metres	> 600 metres
Maximum flood depths	< 0.3 metres	< 0.6 metres	< 1.2 metres	> 1.2 metres
Maximum flood velocity	< 0.4 metres per second	< 0.8 metres	< 1.5 metres	> 1.5 metres
Typical means of egress	Sedan	Sedan early, but 4WD or trucks later	4WD or trucks only in early stages, boats or helicopters	Large trucks, boats or helicopters
Timing Note: This category cannot be implemented until evacuation times have been established in the Counter Disaster Plan (flooding).	Ample for flood forecasting. Warning and evacuation routes remain passable for twice as long as evacuation time.	Evacuation routes remain trafficable for 1.5 times as long as the evacuation time.	Evacuation routes remain trafficable for only up to minimum evacuation time.	There is insufficient evacuation time.

Note: *The evacuation times for various facilities or areas would (but not necessarily) be included in the Counter Disaster Plan (flooding).
Generally, safe wading conditions assume even walking surfaces with no obstructions, steps, soft underfoot, etc.*

Filling, Excavation and Contouring

PC11 Any change to ground level, by way of filling, excavation or contouring, must not result in real damage, flood hazard or impediment to any Counter Disaster Plan, measure or create unreasonable change in the exposure to flood hazard.	AS11.1.1 Changes to ground level, by way of filling, excavating or contouring, comply with a hydraulic master plan approved by Council. OR AS11.1.2 A flood study is prepared in accordance with	AS11.12 Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the flood hazard issues associated with the developed characteristics of the site.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	the requirements set out in AS6.1 and AS6.2 , is approved by Council, and it is established that the development complies with, or does not impede, any Counter Disaster Plan measure.		
PC12 Filling, excavation or contouring must not cause sedimentation, erosion or adverse impact on the City's drainage network.	AS12 No acceptable solution provided. For guidance, please refer to Constraint Code 14 – Sediment and Erosion Control .	AS12 - Complies Sediment and Erosion Control measures are included as part of the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting. Constraint Code 14 – Sediment and Erosion Control also forms part of the site's DA submission.	
Landscaping			
PC13 Landscaping must not impede a natural watercourse, a flood channel or an overland flow path.	AS13.1.1 Landscaping complies with a hydraulics master plan approved by Council. OR AS13.1.2 A flood study, allowing for the landscaping, is prepared in accordance with the requirements of AS6.2 , and is approved by the Assessment Manager.	AS13.1.2 – Complies A Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) incorporating Flood Management has been prepared by Hyder Consulting and addresses the hydraulics and hydrology of the site in the development case (includes landscaping).	
Building Floor Levels			
PC14 Buildings that are to be constructed on flood prone land shall not be inundated by floodwaters during a designated flood event.	AS14.1 Development is constructed at or above the Specified Minimum Flood AEP plus the Minimum Design Freeboard, as set out in column 2 of the Table to Acceptable Solution AS14.1 . AS14.2 Where a proposed land use does not reasonably apply to any land use listed in the Table to Acceptable Solution AS14.1 , the	AS14.1 - Complies Hyder drawings C008-C011 – AA003837 as well as the Site Based Stormwater Management Plan (Report No F0002-AA003837-AAR-01) illustrate that the proposed minimum site levels are in accordance with Table to Acceptable Solutions AS14.1; light industrial/warehousing.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	applicant is to submit: a) the proposed minimum flood AEP for building floor levels; b) the proposed design freeboard above the specified flood level; and c) a flood hazard and flood risk assessment for the proposed development, assessing the effects on costs, safety, access and potential losses. AS14.3 It is noted that PC14 does not apply to: a) garages below residential buildings; b) garages below commercial premises; and c) garages below industrial premises, provided there are suitable means to restrict motor vehicles being washed away during a flood event.		

Table to Acceptable Solution 14.1

Land Use	Specified Minimum Flood AEP Plus Minimum Design Freeboard
Disaster management facilities	0.2% AEP + 500mm
Hospitals	0.2% AEP + 500mm
Major electrical switchyards, Power stations, Water treatment plants ¹	0.2% AEP + 500mm
Fire and Police stations ²	0.5% AEP + 400mm
Places of refuge	0.5% AEP + 400mm
Electricity Substations ¹	0.5% AEP + 400mm
Sewage Treatment Plants ³	0.5% AEP + 400mm
Homes for the aged, Hospice ⁴	0.5% AEP + 400mm
Regional fuel storage	0.5% AEP + 400mm
Food storage warehouses	0.5% AEP + 400mm
Hotel residential	Designated flood + 300mm
Educational facilities ⁵	Designated flood + 300mm



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Residential buildings		Designated flood + 300mm	
Camping grounds, Caravan parks and Relocatable homes reclamation levels		Designated flood + 300mm	
Commercial ⁶		Designated flood	
Light Industrial / Warehousing ⁶		Designated flood	
Theme Parks		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Clubs/ Non-habitable buildings associated with enjoyment of public open space		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Car parking below buildings		Not specified, but ancillary structures are subject to medium hazard considerations at the designated flood.	
Open space		Not specified, but ancillary structures are subject to appropriate hazard considerations at the designated flood.	
Rural		Not specified	

Note: AEP is the Annual Accedence Probability

Notes for Table of AS14.1

1. Applies to switchyard components necessary for the operation of the facility during a flood emergency. This shall be determined by Powerlink.
2. Excludes 'shop front' facilities and those not likely to be utilised during a flood emergency.
3. Specifically, bunds, electrical and mechanical equipment necessary for the continued operation of a sewage treatment plant shall not be at risk of inundation during a flood emergency.
4. The flood immunity specified is to meet the objective of not adding to the burden of flood emergency services.
5. It is not necessary that all rooms within an education facility be above the 1% AEP level. However, there should be sufficient space to accommodate the whole of the school population for the continuation of education, immediately after a flood.
6. Freeboard is not specified, as it is considered that commercial risk provisions should apply. If such land is developed to a flood immunity less than 1% AEP (as may be permitted by any local planning instrument), Council may endorse rates notices accordingly.



Part 7 Codes

Division 3 Constraint Codes

Chapter 4 Car Parking, Access and Transport Integration

1.0 Purpose

To ensure that transport needs, including car parking and service vehicle requirements, associated with the development of land are met by:

- supply of car and bicycle parking facilities;
- provision of loading and service facilities; and
- integration of public transport with private and public development in the City.

Key objectives include:

- a) the availability of car park opportunities that are easy to locate and use, in close proximity to all major developments and uses within the City, with on-site provision available for occupants and on-street provision and/or public car parks available for visitors;
- b) the effective use of all car park infrastructure provided in the City; and
- c) streets that are pedestrian and cyclist friendly.

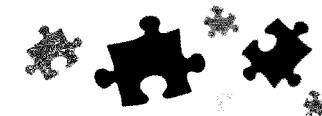
2.0 Application

- 2.1 This code applies to development indicated as self, code or impact assessable in the Table of Development in the domain or Local Area Plan (LAP) within which the development is proposed.
- 2.2 This code specifically applies to development (whether on private or public land) that requires one or more of the following:
 - private or public car parking;
 - bicycle parking and associated facilities;
 - goods loading and circulation in public or private places; and
 - integration of public transport with private or public development in the City.
- 2.3 This code also applies to any development that is proposed for sites identified on Domain Maps or the Priority Infrastructure Plan Maps as being affected by Future Road Requirements, including areas required for future road corridor development.
- 2.4 Where a domain or LAP Place Code contains car parking requirements that differ from this code, the LAP requirements take precedence.
- 2.5 Performance Criteria PC1-PC24 apply to all code and impact assessable development referred to in this code. For development identified as self assessable, in the relevant domain or LAP, only the acceptable solutions to Performance Criteria PC1-PC16 apply.



3.0 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Self Assessable, Code Assessable or Impact Assessable			
Protection and Preservation of Areas Required for Road Widening, the Provision of Public Transport Facilities or New Transport Corridors			
PC1 Land affected by any proposed road realignment or widening must not have development constructed over that part of the land required for road realignment or road widening.	AS1 All sites that are affected by Future Road Requirement as shown on the Domain Maps, do not have buildings or structures erected forward of the indicated building setback line. This requirement does not apply to a fence with a height not exceeding 1.8 metres and a width not exceeding 0.5 metres.	PC1 – Not Applicable The development is not affected by any Future Road Requirements as per Domain Map – Beenleigh. Therefore PC1 does not apply	
Port Cocheres			
PC2 Where provision is made for a <i>porte cochere</i> , it must be designed to enable vertical clearance, manoeuvring, access and queuing of vehicles. The capacity of the <i>porte cochere</i> and associated access and manoeuvring must accommodate vehicles entirely within the site, including the queuing of vehicles.	AS2 The <i>porte cochere</i> has a minimum vertical clearance of 4.5 metres.	PC2 – Not Applicable The development does not feature a <i>porte cochere</i> therefore PC2 does not apply.	
Design of Car Parking Areas and Car Park Spaces			
PC3 All car parking spaces must be constructed and line marked to the correct size and standard.	AS3.1 All car parking spaces and facilities are constructed, sealed, line marked and maintained in accordance with the layout requirements of AS2890.1 – Parking Facilities Part 1: Off Street Car Parking and AS2890.2 – Off Street Parking Part 2: Commercial Vehicles . AS3.2 Where the development includes a combination of low turnover and high turnover car spaces, the parking spaces and aisles are designed to the high turnover or Class 3 requirements in AS2980.1 – Parking Facilities Part 1: Off Street Car Parking .	AS3.1 & AS3.2 – Complies All car parking spaces and facilities shall be constructed, sealed, line marked and maintained in accordance with the layout requirements of AS2890.1 – Parking Facilities Part 1 and AS2890.2 Off Street parking Part 2 .	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC4 Car parking areas must be landscaped to reduce visual impact and to provide opportunities for shade.	AS4 In car parking areas exceeding 300m ² in site area: a) at least 5% of the area is landscaped; b) a landscaped buffer, with a minimum height of 600mm and width of 1500mm, is provided along any public street frontage and the common boundary to the adjoining property; and c) one landscaped tree bay is to be provided for every 21 car parking spaces.	AS4 – Complies All car parking areas exceeding a 300m ² foot print will contain a minimum landscaped area of 5% of the total car parking area, a landscaped buffer as outlined in AS4 and one landscaped tree bay for every 21 car parking spaces.	
Signs and Line Marking			
PC5 Signs and line marking must be provided to indicate the location of the car park and the position of the access points for all car parks used by the public where: a) a car park is located at the rear of the site; b) access to the car park is not located in the main frontage road; c) there are a number of access points serving different parts of the site.	AS5.1 Signs incorporate the standard Service Sign Series 'P' sign, as detailed under Guide Signs in the Manual of Uniform Traffic Control Devices, Queensland . (This does not apply to residential developments with less than 10 units) AS5.2 Signs are used to mark car parking bays which are provided for disabled drivers, motorcycles and special zones, such as bus zones.	AS5.1 – Complies The standard Services Sign Series 'P' sign will be incorporated as per the Manual of Uniform Traffic Control Devices, Queensland for all signs constructed as part of the development works. AS5.2 – Complies Special zones such as disabled parking bays, bus zones and motorcycle bays will be marked with the use of appropriate signs.	
Tandem Car Spaces			
PC6 Tandem car parking must only be used in circumstances where no inconvenience arises from its use.	AS6.1 Tandem car parking spaces (ie. two car parking spaces, nose to tail) are counted as one space, except in the following cases: a) the development is for residential purposes; b) the tandem spaces are to be used by the occupants of the site, in one tenancy; c) the car park area is to be operated as a public car park with on-site management. In this case, a tandem car park may be counted as no more than 1.5 car spaces.	PC6 – Not Applicable The development will not feature tandem car spaces therefore PC6 does not apply.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	AS6.2 The minimum length of the tandem car space is 10.4 metres. AS6.3 Tandem garages have a minimum internal length of 11 metres.		

Access to Car Park Areas

PC7 Car parking areas must not cause vehicle queues into the frontage road system or encourage drivers to reverse into the road system.	AS7.1 For developments in excess of 100 residential units with frontage to major roads, a turn round facility with a minimum diameter of 12.0m is provided between the gate and the road. AS7.2 All car parking facilities, except those associated with detached dwellings and duplex dwellings is designed so that all vehicles enter and exist the site in a forward gear. AS7.3 Provision is made for a defined queuing area, free of any parking manoeuvres or internal intersections in accordance with the provisions of the Table to Acceptable Solution AS7.3, for developments comprising of more than two dwelling units and where a security gate is proposed.	AS7.1 – Not Applicable The development is not classified as residential therefore AS7.1 is not applicable. AS7.2 – Complies All car parking facilities shall be designed to maintain forward gear entry and exit locations. AS7.3 – Complies A defined queuing area which is free of any parking manoeuvres or internal intersections shall be designed where a security gate is proposed. The queue length will be in accordance with Table to Acceptable Solutions AS7.3	
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Table to Acceptable Solution AS7.3

Car Park Capacity (Number of Spaces)	Minimum Queue Length (Vehicles) *
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6



201 to 250	7
More than 250	7 plus 1% of capacity over 250 spaces

*** Note:** Each vehicle shall be taken to occupy 6.0 metres in length.

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC8 Car parking areas providing more than 20 car parking spaces must allow for the separation of vehicles and pedestrians.	AS8 Sealed pedestrian footpaths, at a gradient not exceeding 1:12, are provided from the car parking area along the shortest possible route to the point of destination.	AS8 – Complies All car parking areas in excess of 20 bays will provide sealed pedestrian footpaths no steeper than a gradient of 1:12 for the alignment which will be the shortest possible route from car park to destination.	
PC9 Access to car parking spaces must be provided for employees and visitors.	AS9.1 Car park areas have no gateways, doors or similar devices which restrict vehicular access by employees or visitors.	AS9.1 – Complies Car parking areas will be designed with no gateways, doors, or similar devices which limit vehicular access by employees and visitors.	

Driveways and Crossovers

PC10 Driveways from car parks or developments into public roads must be minimised to reduce interference with public road traffic and pedestrians.	AS10.1 The maximum number of crossovers for residential developments is one for detached dwelling properties and two for multiple unit dwelling complexes. AS10.2 The maximum number of crossovers for non-residential developments is two crossovers per property. AS10.3 A vehicle crossover is separated from any other vehicle crossover by a minimum distance of three metres.	AS10.2 – Complies The industrial subdivision will not feature more than 2 vehicular crossovers per lot. AS10.3 – Complies The minimum design distance between any two vehicular crossovers within the development will be three metres.	
PC11 All development must make provision for safe access to roads or streets adjacent to the site. Crossovers must be constructed to a standard consistent with the vehicles using the site.	AS11.1 The geometric design of entry and exit driveways conforms with Standard Drawing No 59218 of Planning Scheme Policy 11 – Land Development Guidelines . AS11.2	AS11.1 – Complies Entry and exit driveway geometric design will conform to Standard Drawing No 59218 of Planning Scheme Policy 11 – Land Development Guidelines	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	Access to roads or streets adjacent to the site is consistent with AS2890.1 – Parking Facilities Part 1: Off Street Car Parking and AS2890.2 – Off Street Parking Part 2: Commercial Vehicles. AS11.3 Where separate entry and exit driveways are used, the first driveway reached from the kerbside land is clearly delineated and sign-posted. AS11.4.1 Access to developments on dual carriageway roads is left in/left out. OR AS11.4.2 A new intersection is provided between the access way and the dual carriageway. AS11.5 Developments with traffic signal controlled or roundabout access to the frontage road dedicate land as public road to accommodate all intersection infrastructure, including traffic signal loops. AS11.6 The boundaries of the frontage road are modified to accommodate all intersection infrastructure within the public road. AS11.7 Developments with new traffic signal controlled access, within network traffic systems, provide the necessary infrastructure to integrate the new signals.	AS11.2 – Complies Access to roads or streets adjacent to the site will be designed to AS28290.1 – Parking Facilities Part 1 and AS2890.2 Off Street parking Part 2. AS11.3 – Complies Driveways allocated as only entry or exit crossovers shall be clearly delineated and signed. AS11.4.1 – Not Applicable The development does not feature any internal dual carriageways as per Hyder Drawings C012-C015 – AA003837. AS11.5 – Complies The signalled traffic intersections proposed for Stapylton Jacobs Well Road and Christensen Road will be accommodated by appropriate room for all infrastructure and signal loops. AS11.6 – Complies Boundaries associated with the frontage road have being modified to accommodate all associated intersection infrastructure as per Hyder Drawings C012-C015 – AA003837. AS11.7 – Complies The signalled traffic intersections proposed for Stapylton Jacobs Well Road and Christensen Road will be accommodated by infrastructure and signal loops.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Internal Circulation			
PC12 All developments must provide internal circulation to avoid use of the public road system for movement between different car parking and vehicle service areas in the development.	AS12.1 The internal layout of the site is consistent with AS2890.1 – Parking Facilities Part 1: Off Street Car Parking and AS2890.2 – Off Street Parking Part 2: Commercial Vehicles. AS12.2 Parking and circulation aisles have a maximum length of 100 metres. AS12.3 Dead end aisles do not exceed 20 metres in length. AS12.4 Aisle design does not include cross intersections. AS12.5 Car parking space/s is/are not located in areas used for manoeuvring of heavy vehicles. AS12.6 Car parks are designed so that vehicles do not reverse across pedestrian crossings. AS12.7 Speed humps are not provided in entry or exit queuing areas.	AS12.1 – Complies The internal layout of the development is consistent with AS2890.1 – Parking Facilities Part 1 and AS2890.2 Off Street parking Part 2 as illustrated by a Traffic Impact Assessment (Report Ref: Hester Industrial Development TIA RevB) undertaken by Hyder Consulting. AS12.2 to 12.7 – Complies The design of all car parking and internal circulation will incorporate the guidelines outlined in AS2890.1 – Parking Facilities Part 1 and AS2890.2 Off Street parking Part 2 as well as PC12 acceptable solutions 12.2 to 12.7.	
Loading Bay and Set Down Area Requirements			
PC13 Development must make provision for loading bays and set down areas for the: a) collection and set down of passengers; b) parking of trailers; c) service vehicle parking; and d) loading and unloading of goods.	AS13 Loading and set down areas are provided consistent with the AS2890.2 – Off Street Parking Part 2: Commercial Vehicles.	AS13 – Complies All loading bays and set down areas within the development will be designed to comply with the guidelines outlined in AS2890.2 Off Street parking Part 2.	
Design Service Vehicle Requirements			



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
PC14 Development must provide for the required 'design service vehicle' to service the development.	AS14.1 Provision is made for service vehicles, in accordance with the Table to Acceptable Solution AS14.1. AS14.2 Provision is made for service vehicles, in accordance with the Table to Acceptable Solution AS14.2, for sites less than 4,000m² in area that require access by service vehicles. AS14.3 Provision is made for height clearance of 4.5 metres for service station canopies and access clearance height associated with the appropriate design vehicle in other applicable developments. AS14.4 A driveway which caters for heavy vehicles is designed in accordance with AS2890.2 – Off Street Parking Part 2: Commercial Vehicles and Standard Drawing No 59218 Section 7.4 of Planning Scheme Policy 11 – Land Development Guidelines.	AS14.1 – Complies Provision will be made for service vehicles, classified as 'AV' for industrial use as per Table to Acceptable Solution AS14.1. AS14.2 – Not applicable The site and all internal allotments have an individual area that is greater than 4,000m² therefore AS14.2 does not apply. AS14.3 – Complies Any proposed service station canopies proposed for construction within the development must provide a minimum height clearance of 4.5 metres. AS14.4 – Complies All driveways and vehicular cross overs shall be designed in accordance with AS2890.2 Off Street parking Part 2 and standard drawing No 59218 section 7.4, Planning Scheme Policy 11 – Land Development Guidelines due to the industrial classification of the development.	

Table to Acceptable Solution AS14.1

Use or Development	Service Vehicle Provisions
Aged Persons Accommodation	HRV
Animal Husbandry	AV
Aquaculture	HRV
Bulk Garden Supplies	HRV
Cafe	SRV



Table to Acceptable Solution AS14.1

Use or Development	Service Vehicle Provisions
Cinema	SRV
Commercial Services	SRV
Community Care Centre	SRV
Community Purposes	SRV
Convenience Shop	SRV
Educational Establishment	SRV
Fast Food Premises	HRV
Freight Depot	AV
Fuel Depot	AV
Funeral Parlour	SRV
Hospital	HRV
Industry	AV
Indoor Recreation including: a) squash court or any other court game; b) meeting place, public hall, pinball parlour, amusement arcade; c) theatre, cinema; d) licensed club; e) skating rink, swimming pool; f) gymnasium; and g) public library, public lecture hall, art gallery, museum, any other indoor recreation.	SRV
Kennel	SRV
Manufacturers Shop	HRV
Marina	AV
Marina Shop	SRV
Market	SRV
Medical Centre	SRV
Milk Depot	AV
Mini-Storage Warehousing	HRV



Table to Acceptable Solution AS14.1

Use or Development	Service Vehicle Provisions
Minor Tourist Facility	SRV
Motel	SRV
Motor Vehicle Repairs	HRV
Night Club	SRV
Outdoor Sport and Recreation: a) tennis court or other court game (where not ancillary to other development); b) lawn bowls; c) skating rinks, swimming pools; d) golf course.	SRV
Office	SRV
Place of Worship	SRV
Reception Room	SRV
Resort Hotel	HRV
Restaurant	SRV
Restricted Club	HRV
Retail Plant Nursery	HRV
Rural Industry	AV
Salvage Yard	HRV
Service Industry	SRV
Service Station	AV
Shop	SRV
Shop with GFA of less than 400m ²	SRV
Shop with GFA 400m ² – 1500m ²	HRV
Shop with GFA larger than 1500m ²	AV
Shopping Centre Development	AV
Showroom	HRV
Storage	SRV
Take-Away Food Premises	SRV



Table to Acceptable Solution AS14.1

Use or Development	Service Vehicle Provisions
Tavern	HRV
Temporary Use	AV
Theatre	SRV
Tourist Shop	SRV
Transit Centre	HRV
Transport Terminal	AV
Vehicle Hire Premises	AV
Vehicle Sales Premises	AV
Warehouse	AV
Waterfront Industry	HRV

Note: *SRV: Small Rigid Vehicle as defined in AS2890.2 – Off Street Parking Part 2: Commercial Vehicles.*
HRV: Heavy Rigid Vehicle as defined in AS2890.2 – Off Street Parking Part 2: Commercial Vehicles.
AV: Articulated Vehicle as defined in AS2890.2 – Off Street Parking Part 2: Commercial Vehicles.

Table to Acceptable Solution AS14.2

HRV and AV Requirements	
Site Area (m ²)	Requirement
Less than 1000m ²	Demonstrate that the development can accommodate the particular design vehicle but a separate service bay and associated manoeuvring are not required. Where it can be demonstrated that loading and unloading can take place within the road reserve, without impacting on the safe and efficient operation of traffic and with no detrimental impact on amenity, Council or its delegate may determine that HRV and AV access is not required.
1000m ² – 2000m ²	a) service bay for HRV is required. b) restricted manoeuvring on site for HRV or AV (as required). c) full on-site manoeuvring for other classes of service vehicle is required.
2000m ² – 4000m ²	a) service bay to be provided for HRV or AV (as required). b) restricted manoeuvring on site for AV (as required). c) full on-site manoeuvring for HRV and other classes of service vehicle is required.



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Provision of Bicycle Parking Spaces			
PC15 Bicycle parking must be provided for all non-residential developments where the required car parking provision exceeds 20 parking spaces.	AS15.1 Where non-residential development requires the provision of more than 20 car parking spaces, bicycle parking is provided in accordance with the Austroads Guide to Traffic Engineering Practice: Part 14: Table 10.1. AS15.2 Where bicycle parking is to be provided, additional facilities for bicycle users are designed and constructed in accordance with AS2890.3 – Parking Facilities Part 3: Bicycle Parking Facilities.	AS15.1 & AS15.2 – Complies For car parking areas in excess of 20 bays, bicycle facilities (i.e. parking) for cyclists shall be provided in accordance with Austroads Guide to Traffic Engineering Practice: Part 14: Table 10.1 and AS2890.3 – Parking Facilities Part 3: Bicycle Parking Facilities.	
Provision of Car Parking Spaces			
PC16 Sufficient car parking spaces must be provided to meet the car parking needs of the development. The number of car parking spaces provided must be consistent with the practical opportunities available for shared car parking provision and the operation of alternative transport modes to private motor vehicles. Car parking design contributes to delivering development with a built form that is robust and flexible, allowing adaptation or redevelopment over time to a variety of uses, increased densities or increased employment intensity.	AS16.1 Car parking is provided in accordance with the number of spaces required for the specific use listed in the Table to Acceptable Solution AS16.1. AS16.2 If an additional building is constructed, or an existing building is extended, the car space requirements determined from Table to Acceptable Solution AS16.1 accrue only for the additional building or extension, provided that the use of the land remains the same and any existing area for car parking is not reduced or, if disturbed, any existing car spaces are replaced in the new development.	AS16.1 – Complies All internal allotments are to provide an adequate number of car parking bays in accordance with Table to Acceptable Solution AS16.1 – Industrial. AS16.2 – Not Applicable The development does not feature any extensions onto existing built forms such as industrial buildings or car parks therefore AS16.2 does not apply.	



Table to Acceptable Solution AS16.1

This table sets out the minimum number of car parking spaces required according to the use of the land.

Where the calculated number of car spaces is not a whole number, the number of car parking spaces required must be the next higher whole number.

Material Change of Use	Minimum Number of Car Parking Spaces to be Provided																												
Aged Persons Accommodation	a) one (1) space per self-contained dwelling, plus one (1) visitor space per 10 self-contained dwellings; b) one (1) space per two hostel units; c) one (1) space per four nursing home beds; d) 50% of the total number of car parking spaces required should be provided for visitor parking in a central location.																												
Amusement Parlour	5 spaces per 100m ² of GFA – one (1) space per 20m ² .																												
Apartments	a) for developments with up to 20 apartments, one (1) space per one (1) bedroom apartment, and 2 spaces per 2 bedroom and larger apartments, plus one (1) space per four apartments for visitor parking. b) for developments with more than 20 apartments, requirements for first 20 apartments as in a) plus, one (1) space per apartment and one (1) space per 10 apartments for visitor parking for subsequent units. c) for developments in excess of 20 apartments, the units with 2, 3 or 4 bedrooms shall be considered first in the determination of total parking spaces. d) for mixed-use development with a single apartment, visitor parking for the apartment is not required. e) where development: ▪ is on a site that only has frontage to a road listed below; or ▪ the access to the proposed development is to a road listed below; and ▪ where the frontage is included in that part of the road listed below; additional visitor car parking shall be provided at a rate of one (1) car parking space for every two (2) visitor car parking spaces required. <table border="1"> <thead> <tr> <th>Road</th><th>Part of Road</th></tr> </thead> <tbody> <tr> <td>Aloha Lane</td><td>The whole</td></tr> <tr> <td>Cooinda Avenue</td><td>Northern alignment</td></tr> <tr> <td>Beulah Lane</td><td>The whole</td></tr> <tr> <td>Cronin Avenue</td><td>The whole</td></tr> <tr> <td>Darwalla Avenue</td><td>The whole</td></tr> <tr> <td>Eden Avenue</td><td>Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot 1 RP 188138), and to and including Lot 6 RP154810</td></tr> <tr> <td>Fenton Place</td><td>The whole</td></tr> <tr> <td>Garfield Terrace</td><td>The whole</td></tr> <tr> <td>Hedges Avenue</td><td>The whole</td></tr> <tr> <td>Jefferson Lane</td><td>North of Third Avenue</td></tr> <tr> <td>Lennie Avenue</td><td>The whole</td></tr> <tr> <td>Little Norman Street</td><td>The whole</td></tr> <tr> <td>Montgomery Avenue</td><td>The whole</td></tr> </tbody> </table>	Road	Part of Road	Aloha Lane	The whole	Cooinda Avenue	Northern alignment	Beulah Lane	The whole	Cronin Avenue	The whole	Darwalla Avenue	The whole	Eden Avenue	Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot 1 RP 188138), and to and including Lot 6 RP154810	Fenton Place	The whole	Garfield Terrace	The whole	Hedges Avenue	The whole	Jefferson Lane	North of Third Avenue	Lennie Avenue	The whole	Little Norman Street	The whole	Montgomery Avenue	The whole
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Attached Dwelling	a) 2 spaces per dwelling, of which one (1) is to be covered, plus one (1) space per two dwellings for visitor parking. b) where development: ▪ is on a site that only has frontage to a road listed below; or ▪ the access to the proposed development is to a road listed below; and ▪ where the frontage is included in that part of the road listed below; additional visitor car parking shall be provided at a rate of one (1) car parking space for every two (2) visitor car parking spaces required. <table> <tr> <th>Road</th><th>Part of Road</th></tr> <tr> <td>Aloha Lane</td><td>The whole</td></tr> <tr> <td>Cooinda Avenue</td><td>Northern alignment</td></tr> <tr> <td>Beulah Lane</td><td>The whole</td></tr> <tr> <td>Cronin Avenue</td><td>The whole</td></tr> <tr> <td>Darwalla Avenue</td><td>The whole</td></tr> <tr> <td>Eden Avenue</td><td>Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810</td></tr> <tr> <td>Fenton Place</td><td>The whole</td></tr> <tr> <td>Garfield Terrace</td><td>The whole</td></tr> <tr> <td>Hedges Avenue</td><td>The whole</td></tr> <tr> <td>Jefferson Lane</td><td>North of Third Avenue</td></tr> <tr> <td>Lennie Avenue</td><td>The whole</td></tr> <tr> <td>Little Norman Street</td><td>The whole</td></tr> <tr> <td>Montgomery Avenue</td><td>The whole</td></tr> <tr> <td>Mountbatten Avenue</td><td>The whole</td></tr> <tr> <td>Northcliffe Terrace</td><td>The whole</td></tr> <tr> <td>Nagel Avenue</td><td>Western alignment from including Lot 12 RP 46948 to and including Lot 1 RP 46948</td></tr> <tr> <td>O'Connor Street</td><td>Western alignment from Wybera Street to and including Lot 26 RP 49999</td></tr> <tr> <td>Owens Lane</td><td>The whole</td></tr> <tr> <td>Pacific Parade</td><td>The whole</td></tr> <tr> <td>Park Lane</td><td>The whole</td></tr> </table>	Road	Part of Road	Aloha Lane	The whole	Cooinda Avenue	Northern alignment	Beulah Lane	The whole	Cronin Avenue	The whole	Darwalla Avenue	The whole	Eden Avenue	Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810	Fenton Place	The whole	Garfield Terrace	The whole	Hedges Avenue	The whole	Jefferson Lane	North of Third Avenue	Lennie Avenue	The whole	Little Norman Street	The whole	Montgomery Avenue	The whole	Mountbatten Avenue	The whole	Northcliffe Terrace	The whole	Nagel Avenue	Western alignment from including Lot 12 RP 46948 to and including Lot 1 RP 46948	O'Connor Street	Western alignment from Wybera Street to and including Lot 26 RP 49999	Owens Lane	The whole	Pacific Parade	The whole	Park Lane	The whole
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Bed and Breakfast	one (1) space per guest room (in addition to the requirement of 2 spaces per dwelling, of which one (1) is to be covered).
Bulk Garden Supplies	2 spaces per 100m ² of Total Use Area (one (1) space per 50m ² of Total Use Area).
Cafe	6.7 spaces per 100m ² of GFA (including any outdoor dining areas) (one (1) space per 15m ² of GFA).
Caravan Park	one (1) space per site, plus visitor parking of one (1) space per ten sites.
Caretaker's Residence	2 spaces, of which one (1) is to be covered.
Child Care Centre	one (1) space per employee, plus on-site passenger set down area of one (1) space for every five children enrolled.
Cinema	as determined by Council, requiring a Traffic Impact Report.
Commercial Services	4 spaces per 100m ² of GFA (one (1) space per 25m ² of GFA).
Community Care Centre	one (1) space per employee, based on the maximum number of employees on the premises at any one time, plus one (1) space per ten residents or other occupants of the premises.
Community Purposes	as determined by Council.
Convenience Shop	6.7 spaces per 100m ² of GFA (one (1) space per 15m ² of GFA).
Detached Dwelling	2 spaces per dwelling, of which one (1) is to be covered.
Display Home	as determined by Council.
Ecotourism Facility	as determined by Council, requiring Traffic Impact Report.
Educational Establishment: a) primary school b) secondary school c) tertiary and further education d) other	a) one (1) space per staff member; b) one (1) space per staff member, plus one (1) space per each ten Year 12 students enrolled; c) as determined by Council, requiring Traffic Impact Report; and d) as determined by Council, requiring Traffic Impact Report.
Estate Sales Office	5 spaces.
Family Accommodation	one (1) space, in addition to the spaces required for the main dwelling.



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Family Day Care Home	no on-site spaces required.																												
Farm Stay	one (1) space for each guest bedroom (in addition to the requirement of 2 spaces per dwelling, of which one (1) is to be covered).																												
Fast Food Premises	a) 0.4 spaces per seat, plus one (1) space per 100m ² of GFA; OR b) 10 spaces per 100m ² of GFA, plus 20 spaces per 100m ² of GFA outdoor seating areas, whichever is the greater, plus queuing area for 10 vehicles associated with any drive through sales facility.																												
Freight Depot	one (1) space per employee, plus one (1) visitor parking space.																												
Fuel Depot	one (1) space per employee, plus one (1) visitor parking space.																												
Funeral Parlour	10 spaces per 100m ² of GFA (one (1) space per 10m ² of GFA).																												
Home Occupation	2 spaces for the purposes of the Home Occupation, in addition to the spaces required for the dwelling.																												
Home Office	one (1) space for the purpose of the Home Office, in addition to the spaces required for the dwelling.																												
Hospital	as determined by Council, requiring a Traffic Impact Report.																												
Hostel Accommodation	a) one (1) car space per 15m² of the total sleeping accommodation area, plus one (1) car space for any manager's or caretakers unit. b) where development: ▪ is on a site that only has frontage to a road listed below; or ▪ the access to the proposed development is to a road listed below; and ▪ where the frontage is included in that part of the road listed below. additional visitor car parking shall be provided at a rate of one (1) car parking space for every two (2) visitor car parking spaces required. <table border="1"> <thead> <tr> <th>Road</th><th>Part of Road</th></tr> </thead> <tbody> <tr> <td>Aloha Lane</td><td>The whole</td></tr> <tr> <td>Cooinda Avenue</td><td>Northern alignment</td></tr> <tr> <td>Beulah Lane</td><td>The whole</td></tr> <tr> <td>Cronin Avenue</td><td>The whole</td></tr> <tr> <td>Darwalla Avenue</td><td>The whole</td></tr> <tr> <td>Eden Avenue</td><td>Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810</td></tr> <tr> <td>Fenton Place</td><td>The whole</td></tr> <tr> <td>Garfield Terrace</td><td>The whole</td></tr> <tr> <td>Hedges Avenue</td><td>The whole</td></tr> <tr> <td>Jefferson Lane</td><td>North of Third Avenue</td></tr> <tr> <td>Lennie Avenue</td><td>The whole</td></tr> <tr> <td>Little Norman Street</td><td>The whole</td></tr> <tr> <td>Montgomery Avenue</td><td>The whole</td></tr> </tbody> </table>	Road	Part of Road	Aloha Lane	The whole	Cooinda Avenue	Northern alignment	Beulah Lane	The whole	Cronin Avenue	The whole	Darwalla Avenue	The whole	Eden Avenue	Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810	Fenton Place	The whole	Garfield Terrace	The whole	Hedges Avenue	The whole	Jefferson Lane	North of Third Avenue	Lennie Avenue	The whole	Little Norman Street	The whole	Montgomery Avenue	The whole
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Indoor Recreation Facility: a) squash court or any other court game b) meeting place, public hall c) pinball parlour, amusement arcade d) theatre, cinema e) licensed club f) skating rink or swimming pool g) gymnasium h) public library, public lecture hall, art gallery, museum, any other indoor recreation	a) 4 spaces per court; b) 10 spaces per 100m² of GFA (one (1) space per 10m² of GFA); c) 5 spaces per 100m² of GFA (one (1) space per 20m² of GFA); d) as determined by Council, requiring Traffic Impact Report; e) 6 spaces per 100m² of GFA (one (1) space per 17m² of GFA), additional parking for gaming machines at the rate of one (1) space per 3 gaming machines; f) 15 spaces, plus one (1) space per 100m² of GFA; g) 10 spaces per 100m² of GFA; h) as determined by Council or its delegate.
Industry	2 spaces per tenancy plus 1 space per 50m ² of GFA up to 500m ² plus 1 space per 100m ² of GFA over 500m ² .
Integrated Housing	2 spaces per dwelling, of which one (1) must be covered, plus 0.5 spaces per dwelling visitor parking, distributed throughout the site in accessible locations.
Kennel	one (1) space per employee, with a minimum of two spaces plus one (1) visitor parking space.
Laundromat	5 spaces per 100m ² of GFA (one (1) space per 20m ² of GFA).
Manufacturers Shop	a) 6.7 spaces per 100m² of area used for retail (one (1) space per 15m² of area used for retail); b) 2.5 spaces per 100m² of area used for manufacturing (one (1) space per 40m² of area used for industry).
Marina	a) 0.6 spaces for each wet berth designed for boats ten metres and under; b) 0.8 spaces for each wet berth designed for boats between ten metres and 15 metres; c) one (1) space for each wet berth designed for boats greater than 15 metres; d) 0.2 spaces for each dry berth or swing mooring; plus e) 0.5 spaces for each employee;



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	f) one (1) space per 50m² of GFA of ancillary activities associated with the marina; g) one (1) space for each wet berth designed for boats greater than 15 metres.																																				
Marina Shop	6.7 spaces per 100m ² of GFA (one (1) space per 15m ² of GFA).																																				
Market	as determined by Council, requiring Traffic Impact Report.																																				
Medical Centre	5 spaces per 100m ² of GFA (one (1) space per 20m ² of GFA).																																				
Mini-Storage Warehousing	a) one (1) space per ten (10) storage sheds; plus b) one (1) space per 30m² GFA administration office area; plus c) a minimum traffic circulation aisle width of 6.5 metres.																																				
Minor Tourist Facility	as determined by Council, requiring Traffic Impact Report.																																				
Motel	a) one (1) space per room, plus one (1) space for the manager's residence. b) where a restaurant is included, 0.15 spaces per seat or 3.5 spaces per 100m² of the restaurant GFA, whichever is the greater. c) where development: ▪ is on a site that only has frontage to a road listed below; or ▪ the access to the proposed development is to a road listed below; and ▪ where the frontage is included in that part of the road listed below. additional visitor car parking shall be provided at a rate of one (1) car parking space for every two (2) visitor car parking spaces required. <table border="1"> <thead> <tr> <th>Road</th><th>Part of Road</th></tr> </thead> <tbody> <tr> <td>Aloha Lane</td><td>The whole</td></tr> <tr> <td>Cooinda Avenue</td><td>Northern alignment</td></tr> <tr> <td>Beulah Lane</td><td>The whole</td></tr> <tr> <td>Cronin Avenue</td><td>The whole</td></tr> <tr> <td>Darwalla Avenue</td><td>The whole</td></tr> <tr> <td>Eden Avenue</td><td>Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810</td></tr> <tr> <td>Fenton Place</td><td>The whole</td></tr> <tr> <td>Garfield Terrace</td><td>The whole</td></tr> <tr> <td>Hedges Avenue</td><td>The whole</td></tr> <tr> <td>Jefferson Lane</td><td>North of Third Avenue</td></tr> <tr> <td>Lennie Avenue</td><td>The whole</td></tr> <tr> <td>Little Norman Street</td><td>The whole</td></tr> <tr> <td>Montgomery Avenue</td><td>The whole</td></tr> <tr> <td>Mountbatten Avenue</td><td>The whole</td></tr> <tr> <td>Northcliffe Terrace</td><td>The whole</td></tr> <tr> <td>Nagel Avenue</td><td>Western alignment from including Lot 12 RP 46948 to and including Lot 1 RP 46948</td></tr> <tr> <td>O'Connor Street</td><td>Western alignment from Wybera Street to and including Lot 26 RP 49999</td></tr> </tbody> </table>	Road	Part of Road	Aloha Lane	The whole	Cooinda Avenue	Northern alignment	Beulah Lane	The whole	Cronin Avenue	The whole	Darwalla Avenue	The whole	Eden Avenue	Both alignments from Hill Street to Ward Street and from Ward Street to and including BUP 5455 (Lot RP 1881138), and to and including Lot 6 RP154810	Fenton Place	The whole	Garfield Terrace	The whole	Hedges Avenue	The whole	Jefferson Lane	North of Third Avenue	Lennie Avenue	The whole	Little Norman Street	The whole	Montgomery Avenue	The whole	Mountbatten Avenue	The whole	Northcliffe Terrace	The whole	Nagel Avenue	Western alignment from including Lot 12 RP 46948 to and including Lot 1 RP 46948	O'Connor Street	Western alignment from Wybera Street to and including Lot 26 RP 49999
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Motor Vehicle Workshop	6.7 spaces per 100m ² of GFA (one(1) space per 15m ² of GFA).
Night Club	6 spaces per 100m ² of GFA (one (1)space per 17m ² of GFA).
Office	3 spaces per 100m ² of GFA (one (1) space per 33m ² of GFA).
Outdoor Sport and Recreation: a) tennis court or other court game (where not ancillary to other development) b) lawn bowls c) skating rinks, swimming pools d) golf course e) racecourse f) sporting arena g) clubhouse	a) 4 spaces per court; b) 20 spaces per green; c) 15 spaces, plus one (1) space per 100m² of Total Use Area; d) the greater of: ▪ 4 spaces per hole, plus 3 spaces per 100m² of GFA of club house area; or ▪ 6 spaces per 100m² of GFA of club house area; e) as determined by Council, requiring Traffic Impact Report; f) as determined by Council, requiring Traffic Impact Report; g) 6 spaces per 100m² of GFA (one (1) space per 17m² of GFA).
Place of Worship	10 spaces per 100m ² of GFA (one (1) space per 10m ² of GFA).
Reception Room	6 spaces per 100m ² of GFA (one (1) space per 17m ² of GFA).
Relocatable Home Park	one (1) space per Relocatable Home plus visitor parking of one (1) space per 5 dwellings.
Residential Hotel	a) one (1) space per residential unit plus 10 spaces per 100m² of GFA lounge, bar and beer garden area; plus b) 10 spaces per 100m² of GFA retail floor area for liquor barns or bulk liquor sales; plus c) a reservoir space for 12 cars for a drive-in bottle shop.
Resort Hotel	a) one (1) space for each guest room or suite, for the first 75 guest rooms or suites, plus 0.1 space for each additional guest room or suite. b) where the development includes commercial facilities that are available for use by the general public, car parking for such facilities shall be provided at 75% of the standard requirements of this table. c) where development: ▪ is on a site that only has frontage to a road listed below; or ▪ the access to the proposed development is to a road listed below; and ▪ where the frontage is included in that part of the road listed below;



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Restricted Club	6 spaces per 100m ² of GFA (one (1) space per 17m ² of GFA).																																																		
Restaurant	6.7 spaces per 100m ² of GFA (including any outdoor dining areas) (one (1) space per 15 m ² of GFA).																																																		
Retail Plant Nursery	10 spaces, plus one (1) space per 100m ² of Total Use Area in excess of 3,000 metres.																																																		
Rural Industry	one (1) space for each employee who does not reside on-site, plus one (1) visitor parking space.																																																		
Salvage Yard	0.7 space per 100m ² of Total Use Area, with a minimum of five spaces.																																																		
Serviced Apartment	a) one (1) space per apartment, plus 0.25 per apartment for visitor parking, where parking is contained in a single parking garage and spaces are not dedicated to particular units; OR b) one (1) space per one (1) bedroom apartment and 2 spaces per 2 bedroom and larger apartments, where spaces are dedicated to each apartment, plus 0.25 visitor spaces per apartment.																																																		
Service Industry	2.5 spaces per 100m ² of GFA (one (1) space per 40m ² of GFA).																																																		



Table to Acceptable Solution AS16.1

Service Station	a) 2 spaces, plus 5 spaces per service bay; plus b) 4 spaces per 100m² of GFA of shop sales area of less than 150m²; plus c) 5 spaces per 100m² of GFA of shop sales area exceeding 150m²; plus d) 10 spaces per 100m² of GFA of restaurant or café, or 0.4 spaces per seat, whichever is the greater.
Shop	6.7 spaces per 100m ² of GFA (one (1) space per 15m ² of GFA).
Shopping Centre Development: a) initial 2000m ² of EGFA; then b) 2,001m ² – 10,000m ² of EGFA; then c) 10,001m ² – 20,000m ² of EGFA; then d) 20,001m ² – 30,000m ² of EGFA; then e) >30,000m ² of EGFA.	a) 6.7 spaces per 100m² of EGFA; b) 6.1 spaces per 100m² of EGFA; c) 5.6 spaces per 100m² of EGFA; d) 4.3 spaces per 100m² of EGFA; e) 4.1 spaces per 100m² of EGFA. Note: Multiple car parking rates may be applicable to a Shopping Centre Development depending on the scale of the existing and/or new development. For example, the car parking rate for a new shopping centre development with 15,000m² of EGFA would equate to $(6.7/100 \times 2000) + (6.1/100 \times 8000) + (5.6/100 \times 5000) = 902$ car parking spaces. An 8,000m² EGFA extension to this centre would require $(5.6/100 \times 5000) + (4.3/100 \times 3000) = 409$ additional car parking spaces.
Showroom	2 spaces per 100m ² of GFA (one (1) space per 50m ² of GFA).
Special Accommodation	2 spaces.
Stall	4 spaces.
Storage	a) one (1) space per ten (10) storage sheds; plus b) one (1) space per 30m² GFA administration office area; plus c) a minimum traffic circulation aisle width of 6.5 metres.
Take-Away Food Premises	6.7 spaces per 100m ² of GFA (one (1) space per 15m ² of GFA).
Tavern	a) 10 spaces per 100m² of GFA lounge, bar and beer garden area, (excluding 'staff only' areas); plus b) 10 spaces per 100m² of GFA retail floor area for liquor barns or bulk liquor sales; plus c) a reservoir space for 12 cars for a drive in bottle shop; d) additional parking for gaming machines, at the rate of one (1) space per 3 gaming machines.
Theme Park	at the rate of $(\text{number of 'design day' visitors} \times 0.2347) + 87$, where the design day corresponds to the existing 85 percentile day, subject to confirmation of this approach from Council's Manager of Transport Planning.
Tourist Cabins	as determined by Council, requiring Traffic Impact Report.
Tourist Facility	as determined by Council, requiring Traffic Impact Report.

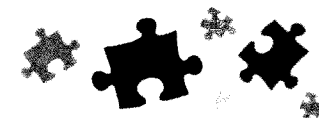


Table to Acceptable Solution AS16.1

Tourist Shop	5 spaces per 100m ² of GFA (one (1) space per 20m ² of GFA).
Transit Centre	as determined by Council, requiring Traffic Impact Report.
Transport Terminal	as determined by Council, requiring Traffic Impact Report.
Vehicle Hire Office	one (1) car space per employee, or one (1) car space per 30m ² , whichever is the greater.
Vehicle Hire Premises	one (1) car space per employee, or one (1) car space per 30m ² , whichever is the greater, plus a minimum of one (1) on-site wash bay, plus a minimum of one(1) car space per every 1.5 vehicles (or part thereof) in the hire vehicle fleet, provided that such spaces may be located in tandem.
Vehicle Sales Premises	3.3 spaces per 100m ² of GFA plus 0.5 spaces per 100m ² of display area.
Veterinary Clinic or Veterinary Hospital	3 spaces per practitioner.
Warehouse	2 spaces per tenancy plus 1 space per 50m ² of GFA up to 500m ² plus 1 space per 100m ² of GFA over 500m ² .
Waterfront (or Marine) Industry	2 spaces per 100m ² of GFA (one (1) space per 50m ² of GFA).
Any Other Use	as determined by Council, requiring a Car Parking Assessment Report.

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
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Development that is Code Assessable or Impact Assessable

PC17 New development must not result in any adverse impact, through the reduction in the car parking capacity of the site and/or the local area.	AS17.1.1 Any car parking spaces lost are replaced elsewhere on the site. OR AS17.1.2 A monetary contribution is provided to Council for those car parking spaces lost, consistent with AS16.2. OR AS17.1.3 The Building Work is associated with a Material Change of Use that requires a lesser number of parking spaces than the existing	AS17.1.1 – Complies As part of the development layout any car parking spaces lost as a result of existing built form augmentation shall be replaced internal to the site.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	use.		
Driveways and Crossovers			
PC18 Vehicle crossovers must be constructed to minimise conflict with passing traffic and pedestrians.	AS18 Access to developments with more than one frontage road is via minor roads. Impacts of driveway traffic are concentrated on less busy roads, with traffic distributed to major roads via existing intersections.	AS18 – Complies The design of vehicle crossovers for internal allotments shall favour access from the minor road if more than one road is available for potential driveway access. Traffic from minor roads shall be distributed to major roads via non signalised and signalised intersections.	
Safe Pedestrian Access			
PC19 All development must make provision for safe pedestrian access to the building from the street and from any car parking or set down area to the building's main entrance.	AS19.1 The design of the development ensures that priority is given to pedestrians for direct links to the building's main entrance and to any adjoining local activities or public transport services. AS19.2 Landscaping surrounding the pedestrian walkways and shelters is no higher than 600mm and incorporates trees with branching not lower than 2m (clear stem trees). AS19.3 Solid walls and fences are avoided adjacent to pedestrian walkways to improve actual and perceived safety. AS19.4 Security is to be enhanced by passive surveillance over the car parking area from nearby residences or other activities, where practicable.	AS19.1 – Complies Pedestrians shall be provided with safe and direct links to any given building's main entrance or public transport service. AS19.2 – Complies Pedestrian facilities will be landscaped no higher than 600mm and trees shall not extend any lower than 2 metres. AS19.3 – Complies Solid walls and fences will be minimized if adjacent to pedestrian walkways. AS19.4 – Complies All parking areas and pedestrian walkways shall be designed for passive surveillance from the nearby population.	
Safe Pedestrian and Cyclist Facilities			
PC20 The design of pedestrian and cyclist facilities must be safe, useable and readily accessible.	AS20 Pedestrian and cyclist facilities are designed to encourage the use of these modes by:	AS20 – Complies The design of pedestrian and cyclist infrastructure shall incorporate minimal	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
	a) minimising distances, and providing safe grading paths, separated from motorised traffic; b) using even, non-slippery pavement materials.	travel distances, safe grades, appropriate separation from motorised traffic and consistent, non-slippery pavement materials as described in the Engineering Services Report (Report No. F0001-AA003837-AAR)	

Integration of Development with Public Transport

PC21 Development that attracts a high proportion of people dependent on public transport must provide facilities to accommodate public transport servicing requirements.	AS21.1 Any development that includes activities listed in the Table to Acceptable Solution AS21.1 provides a bus set down facility on and off-site, in close proximity to the entrance of the development. AS21.2 Where a bus set down area is provided, it is integrated into the development, easily accessible, safe, secure, clearly identified, and attractive to use (in the case of major developments providing a covered walkway to the entry).	AS21.1 – Conditional The development may potentially fall within the parameters of Table to Acceptable Solution AS21.1 depending on the private use of the industrial allotments. If so the details provided in AS21.1 shall be followed under the recommendations of the Traffic Impact Assessment (Report Ref: Hester Industrial Development TIA RevB) undertaken by Hyder Consulting. AS21.2 – Complies All internal bus set down areas to the development are to be easily accessible, safe, secure, clearly identified and aesthetically pleasing for an enhanced user experience.	
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Table to Acceptable Solution AS21.1

- a) Educational Establishment
- b) International Hotel
- c) Resort Hotel
- d) Transit Centre
- e) Shopping Centre Development (more than 4,000m² of EGFA retail floor space)
- f) Public Events
- g) Spectator Sports



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
h) Convention Centre			
PC22 Development that attracts a reasonable proportion of people dependent on public transport must assist in supporting facilities for public transport servicing.	AS22.1 Any development that includes activities listed in the Table to Acceptable Solution AS22.1 provides a bus stop and/or a bus shelter, if the entry to the development is not within 400 metres of an existing bus stop or within 800 metres of a railway station. AS22.2 The bus shelter is located adjacent to the frontage of the site and is connected to the entry of the development by a sealed footpath.	AS22.1 – Conditional The development may potentially fall within the parameters of Table to Acceptable Solution AS22.1 depending on the private use of the industrial allotments. If so the details provided in AS22.1 shall be followed as per the recommendations of the Traffic Impact Assessment (Report Ref: Hester Industrial Development TIA RevB) undertaken by Hyder Consulting. AS22.2 – Complies If required all bus shelters within the development shall be located at the frontage of the site with a sealed footpath connection.	

Table to Acceptable Solution AS22.1

- a) Apartment Buildings with more than 60 units
- b) Townhouse Complexes with more than 60 units
- c) Active Recreation Facility
- d) Bulky Goods Retailers (more than 2,000m² of GFA retail floor space)
- e) Hospitals
- f) Community Centres
- g) Entertainment Venues
- h) Aged Persons Accommodation

Cash In Lieu of Car Park Spaces Required

PC23 Car parking must be provided to meet the car parking needs of the development. If it cannot be provided on site, alternative arrangements	AS23.1.1 The car parking spaces required by Table to Acceptable Solution AS16.1 are provided on the subject site.	AS23.1.1 – Complies The development shall as part of Table to Acceptable Solution AS16.1, provide adequate car parking facilities.	
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Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
may be proposed.	OR AS23.1.2 A monetary contribution for all or part of the required car parking may be made towards one or more of the following: a) provision of off-street car parking in the vicinity of the development; b) provision of improved on street car parking and streetscape improvement works, in the vicinity of the development; and/or c) provision of improved public transport facilities and services in the vicinity of the development.		
Traffic Impact			
PC24 Where appropriate, specific measures must be taken in the provision of car parking spaces and access to these, to ensure that the traffic impacts of the car park area's use does not have a negative impact on the local amenity and the operation of the local street network.	AS24 A Traffic Impact Report is prepared and implemented, unless: a) the development has less than 250 high turnover or 500 low turnover parking spaces; or b) it has less than 100 parking spaces with direct access to a major road; or c) the Assessment Manager advises a Traffic Impact Report is not required. This Traffic Impact Report shows how the proposed development is able to comply with the provisions of this code and Section 7.4 of Planning Scheme Policy 11 – Land Development Guidelines.	AS24 – Complies The size of the site suggests that all criteria for disregarding a traffic impact report are exceeded. A Traffic Impact Assessment (Report Ref: Hester Industrial Development TIA RevB) has been undertaken by Hyder Consulting in accordance with section 7.4 of the Planning Scheme Policy 11 – Land Development Guidelines.	



Part 7 Codes

Division 2 Specific Development Codes

Chapter 39 Works for Infrastructure

1.0 Purpose

This code seeks to ensure that all works for infrastructure, including roads, stormwater drainage and the provision of public utilities and services including sewerage reticulation, water supply reticulation, electricity and street lighting, reticulated gas and ancillary works are provided with best management land development practices in accordance with **Planning Scheme Policy 11 – Land Development Guidelines**.

This code also seeks to promote development that is more sustainable. This is to be facilitated through the design and provision of water and sewerage infrastructure to and within allotments that:

- reduces consumption of potable water by implementing measures that enable the sustainable use of recyclable water for non-potable uses;
- is cost effective over its life cycle; and
- minimises the potential for stormwater and ground water to enter the City's wastewater system.

2.0 Application

- 2.1 This code applies to development indicated as code assessable by the Table of Development in the domain or Local Area Plan (LAP), within which the development is proposed.
- 2.2 The provisions of this code apply to the life of any development, as well as to the construction period of the development. All information required to support an application, including engineering analyses, calculations, reports and drawings, shall be in accordance with **Planning Scheme Policy 11 – Land Development Guidelines**.
- 2.3 Performance Criteria PC1-PC11 apply to all code and impact assessable development subject to this code.

3.0 Development Requirements

Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Development that is Code Assessable or Impact Assessable			
Road Design and Construction			
PC1 All roads must be designed and constructed to address connectivity, functionality, safety and serviceability of the road network and to ensure a functional road hierarchy.	AS1 The road is designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS1 - Complies All roads are designed in accordance with GCCC Land Development Guidelines, Volume6 - Standard Specifications and Drawings for Roadwork's.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Stormwater Drainage Design and Management			
PC2 Stormwater drainage design and construction must: a) integrate hydrologic and hydraulic elements; b) demonstrate a feasible and functional drainage system; and c) not cause adverse stormwater drainage impacts on areas external and internal to the site.	AS2.1 Stormwater drainage system is designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines . AS2.2 The stormwater drainage system connects to a legal point of discharge.	AS2.1 - Complies A Site Based Stormwater Management Plan (Report No. F0002-AA003837-AAR) has been prepared by Hyder Consulting. Stormwater drainage for the proposed development will be designed in accordance with GCCC Guidelines including the utilisation of stormwater quality improvement devices. AS2.2 - Complies The Site Based Stormwater Management Plan (Report No. F0002-AA003837-AAR) demonstrates that the proposed stormwater drainage will maintain the existing discharge points of the development site as the legal point of discharge.	
Street Lighting			
PC3 Street lighting must be provided to enhance safety and amenity of pedestrians and to improve traffic operations at intersections and hazardous locations.	AS3 Street lighting is designed and located in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS3 – Complies Street Lighting will be provided in accordance with the Land Development Guidelines	
Water Supply Reticulation Design			
PC4 Water supply reticulation must be provided to convey potable water to all properties with adequate quality, pressure and volume of flow for household and fire fighting purposes. (Except properties in the Rural and Conservation Domain).	AS4 Water supply reticulation is designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS4 - Complies Water will be supplied from an extension of mains along Emeri Street, Christensen Road and Stapylton Jacobs Well Road. Refer to the Engineering Services Report (Report No. F001-AA003837-AAR) for further details.	
Sewerage Reticulation Design			
PC5 Sewerage reticulation must be provided to	AS5 Sewerage reticulation is designed and	AS5 - Complies Sewerage will be serviced by multiple	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
ensure adequate quality, having regard to health and environmental issues relating to the provision of sewer infrastructure.	constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	external trunk sewer lines connecting to the approved internal trunk system. Refer to the Engineering Services Report (Report No. F001-AA003837-AAR) for further details.	
Open Space Design			
PC6 Open space areas must be designed to an appropriate standard, having regard to their intended recreational and environmental values	AS6 Open space areas are designed and embellished in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS6 – Complies Open Space areas will be designed and embellished in accordance with the Land Development Guidelines.	
Off Street Vehicle Parking			
PC7 Car parking areas must be located and designed to encourage their use in preference to on street parking, having regard to relative walking distances and visibility from the road.	AS7 Car parking areas area located and designed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS7 - Not Applicable It is not proposed to construct off street vehicle parking that will be a Council asset as part of this development. Therefore PC7 does not apply.	
Driveways			
PC8 Driveways must be designed to ensure convenient access of vehicle to road, including manoeuvring of heavy vehicles and service vehicles.	AS8 Driveways are designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 – Land Development Guidelines .	AS8 - Complies Driveways within the development will be designed to comply with Council's Planning Scheme – Policy 11 "Land Development Guidelines".	
Developer Infrastructure Contributions			
PC9 Infrastructure developer contributions must be provided in accordance with the Priority Infrastructure Plan.	AS9 No Acceptable Solution provided.	AS9 - Complies It is accepted that Council will levy the appropriate infrastructure developer contributions at the time of issuing the development permit conditions.	
PC10 For premises identified on Overlay Map OM25 – Future Water Innovations as being within the Pimpama-Coomera Water Future	AS10.1 A dual water reticulation system is designed and constructed in accordance with relevant sections of Planning Scheme Policy 11 –	PC10 – Not Applicable The development site is not identified as being part of the Future Water Innovations zone as per Overlay Map OM25.	



Performance Criteria	Acceptable Solutions	How does the proposal comply with the Acceptable Solution or Performance Criteria?	Internal Use: Has compliance with the Acceptable Solution/ Performance Criteria been demonstrated? Is a request for further information required?
Master Plan Area, a dual water reticulation system must be provided to enable future conveyance to the development of recycled water for non-potable uses in addition to the conveyance of potable water.	Land Development Guidelines. AS10.2 The development is connected to Council's potable water and recycled water supply reticulation systems at any points nominated by Council.	Therefore PC10 does not apply	
PC11 For premises identified on Overlay Map OM25 – Future Water Innovations as being within the Pimpama-Coomera Water Future Master Plan Area, sewerage infrastructure must be designed to minimise inflow and infiltration.	AS11 Reduced infiltration gravity sewers are designed and constructed in accordance with the relevant sections of Planning Scheme Policy 11 – Land Development Guidelines.	PC11 – Not Applicable The development site is not identified as being part of the Future Water Innovations zone as per Overlay Map OM25. Therefore PC11 does not apply	

DEVELOPMENT APPLICATION

- A PRELIMINARY APPROVAL FOR A MATERIAL CHANGE OF USE FOR INDUSTRY (S.242 OF THE SUSTAINABLE PLANNING ACT 2009); AND
- A PRELIMINARY APPROVAL FOR OPERATIONAL WORKS (CHANGES TO GROUND LEVEL - EARTHWORKS)

ADDRESS

60 STAPYLTON-JACOBS WELL ROAD & 82 CHRISTENSEN ROAD,
STAPYLTON Q 4207 (LOTS 1 ON RP6882, 240 ON W31320 AND
4 ON RP6843)

PREPARED FOR:

PATRICIA AND WILLIAM HESTER

NOVEMBER 2011

FOLDER 2 of 2



GENERATIONS
INDUSTRIAL PARK



gassman
development
perspectives

project coordination
urban + regional planning
landscape + urban design
environmental management
visualisation + spatial services
surveying services
advisory services

10 – TRAFFIC IMPACT ASSESSMENT (HYDER)



GASSMAN DEVELOPMENT PERSPECTIVES
STAPYLTON-JACOBS WELL ROAD,
STAPYLTON, GENERATIONS INDUSTRIAL
PARK

TRAFFIC IMPACT ASSESSMENT

TO SUPPORT DA FOR MATERIAL CHANGE OF USE

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GASSMAN DEVELOPMENT PERSPECTIVES

STAPYLTON-JACOBS WELL ROAD, STAPYLTON, GENERATIONS INDUSTRIAL PARK

TRAFFIC IMPACT ASSESSMENT

TO SUPPORT DA FOR MATERIAL CHANGE OF USE

Author Tom Evans

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Checker Nick Cottman

A handwritten signature in blue ink, appearing to be "N. J. Cottman", written over a horizontal line.

Approver Nick Cottman

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Report No D

Date 3 November 2011

This report has been prepared for Mr. William Hester and Mrs. Patricia Hester C/- Gassman Development Perspectives in accordance with the terms and conditions of appointment for Traffic Impact Assessment. Hyder Consulting Pty Ltd (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

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APPENDICES

- Appendix A
- TMR Reference Drawings
- Appendix B
- Correspondence
- Appendix C
- Detailed SIDRA Output
- Appendix D
- Assumptions for Nearby Industrial Development

BACKGROUND

Gassman Development Perspectives has requested Hyder Consulting to prepare a Traffic Impact Assessment (TIA) for the proposed conversion of the industrial estate located on Stapylton-Jacobs Well Road in Stapylton. The TIA will form part of an application to the Gold Coast City Council (GCCC) for preliminary approval for a material change of use changing the existing land use designation (Future business and Industry) to various preferred industrial uses pursuant to s.242 of the *Sustainable Planning Act 2009*.

This TIA will quantify and assess the impact of the proposed land use changes on the surrounding road network for the opening and future assessment years.

The existing site comprises of two semi-rural allotments with a dwelling and some ancillary farming buildings. The site contains several dams and a disused dip site. The site was previously used for more intensive dairy farming purposes although such uses have significantly declined. Currently Lot 240 is a leasehold tenant to a site known as 'Amgrow' which is a soil conditioning and fertilizer distribution enterprise, this use will continue to be a tenant on the redeveloped site. Currently, access to the site is from Stapylton-Jacobs Well Road for the rural dwelling and Christenson Road for the commercial tenancy.

Hyder Consulting approached the Assets and Operations Division of Department of Transport and Main Roads (TMR) to determine the planned future works for Stapylton-Jacobs Well Road. TMR have indicated that the White Book Planning and the 2006 Statement of Intent indicate that widening works on Stapylton-Jacobs Well Road in the vicinity of the site are projected for a 5-20 year horizon; however, there is no mention of these works in the Queensland Transport and Roads Investment Program (QTRIP) which would indicate that these works are planned beyond a 5 year design horizon.

TMR have provided two separate plans (refer to Drawing 387557[A] and 387553(1) in Appendix A) which indicate the proposed upgrade of Stapylton Jacobs Well Road to a dual carriageway. These TMR plans indicate the following upgrades for Stapylton Jacobs Well Road in the vicinity of the proposed development:

- Upgrading Stapylton-Jacobs Well Road from a two-way undivided road to a dual carriageway divided by a central median.
- New four-leg signalised intersection connecting the internal road of the proposed development (indicated as Christensen Road Connection on Drawing 387557[A]) to Stapylton-Jacobs Well Road. The north-west leg of this intersection is expected to be a future industrial link as indicated on Drawing 387553(1).
- Due to the inclusion of a central median on Stapylton-Jacobs Well Road, the intersection with De Bortoli road will be converted to a left in / left out arrangement.

Each of the above mentioned intersections are illustrated on attached Drawing 387557[A] in Appendix A.

2 DEVELOPMENT DETAILS

Gassman Development Perspectives intends to gain approval for a material change of use changing the existing land use designation (Future business and Industry) to various preferred industrial uses pursuant to s.242 of the *Sustainable Planning Act 2009*. The site is located directly adjacent to Stapylton-Jacobs Well Road and Christensen Road. The Pacific Motorway is located approximately 450m to the west of the site. The site location is illustrated below in Figure 2-1.



Figure 2-1 Site Locality Plan – Image Sourced from 'Open Street Map.'

The intention is to develop the land for primarily industrial warehouse and industrial usage. The Discussion Plan (DP) for the site indicates a development scheme consisting of approximately 591,000m² with an assumed 45% of this area equating to gross floor area (GFA), hence a total building footprint area of approximately 266,000 m². A detailed breakdown for the proposed development is outlined in Table 2-1.

Table 2-1 Development Breakdown

Estimated Year of Completion	GFA	
	Warehouse	Industrial Park
2016	-	36,999
2019	199,409	29,514
Total	199,409	66,513

3 EXISTING CONDITIONS

3.1 Surrounding Road Network

The road network surrounding the site consists of the following roads:

- Stapylton-Jacobs Well Road;
- Christensen Road; and
- De Bortoli Street.

Stapylton-Jacobs Wells Road is a two-lane undivided road with a posted speed of 60km/hr within the section adjacent to the proposed development. This road is defined as an Arterial - Major Industrial Road in the Yatala Enterprise Area Local Area Plan (LAP). It runs on a NE-SW orientation and links vehicles to/from the Pacific Motorway to/from numerous industrial and residential developments, and ultimately links to the town of Jacobs Well.

Christensen Road is a two-lane undivided road with a posted speed of 60km/hr. and is defined as a Major Industrial road in Yatala Enterprise Area LAP. This road is a no-through road and services industrial developments within the area, linking to a major roundabout adjacent to the Pacific Motorway.

De Bortoli Street is two-lane unmarked road. It provides access to a small industrial area and is a no-through road.

The local proposed road hierarchy, taken from the Yatala Enterprise Area LAP is shown in Figure 3-2.

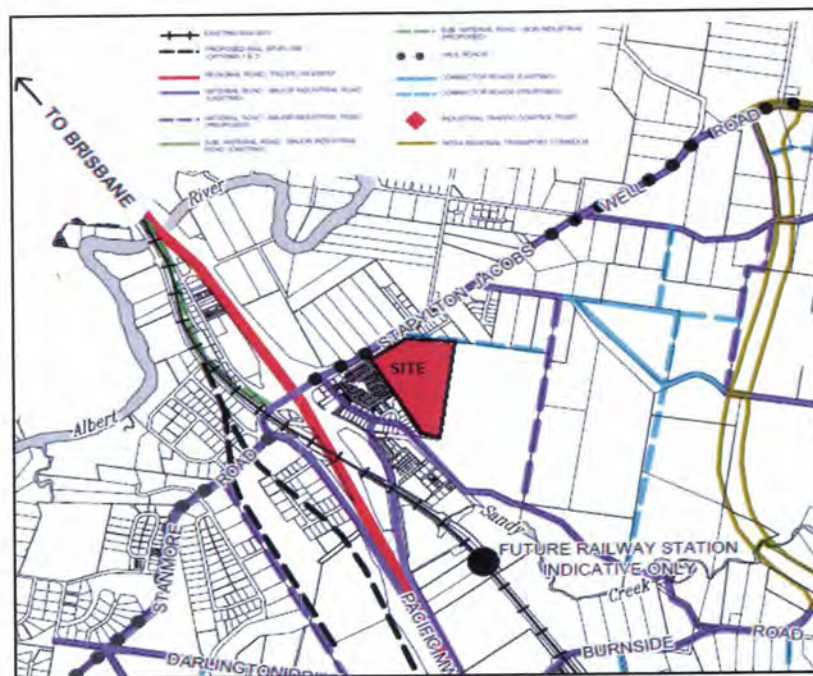


Figure 3-2 Road Hierarchy from Yatala Enterprise Area - Local Area Plan

3.2 Existing Traffic Volumes

Traffic volumes on Stapylton-Jacobs Well Road were obtained from the Queensland Government 'Traffic and Travel Information' website. This information was supplied by the Department of Main Roads and consists of 2009 tube counts 50m west of Hillside Drive, which is adjacent to the proposed development access. Traffic data revealed that heavy vehicles account for 17.6% of all vehicle movements along this section of road. The data also indicated that the peak period along Stapylton Jacobs Well Road occurs between 8:00am-9:00am and 3:00pm-4:00pm.

For the purposes of this traffic analysis a 5% linear growth rate per annum was applied to represent 2011 'existing' volumes as well as future projected volumes.

Traffic volumes for Christensen Road were supplied by the Gold Coast City Council (GCCC). The traffic data was obtained from 2004 tube counts and the Traffic Branch of GCCC advised that the yearly growth rate is 4%. The GCCC supplied AADT volumes only, Hyder requested hourly peak flow information however at the time of issuing this report this information had not yet been supplied, and on this basis it was estimated that the peak period equates to 10% of the daily volumes. Traffic data for nearby Stapylton Jacobs Well Road indicates that the peak period accounts for approximately 8% of the daily traffic flow and therefore it would appear that a 10% peak flow is conservative.

The volumes on De Bortoli Street were estimated by calculating the GFA of the existing buildings via aerial photography and applying GCCC trip generation rates for warehouse usage.

3.3 Study Area

It is envisaged that there will be three new accesses to the development and on this basis these three intersections have been included in this TIA:

- Stapylton-Jacobs Well Road / De Bortoli Street;
- Stapylton-Jacobs Well Road / Road 1; and
- Christensen Road / Road 1.

3.4 Public Transport

The closest bus stop to the proposed development is located on Christensen Road which is approximately 1km from the Christensen Road access and is serviced by route 567. Route 567 travels between Beenleigh Railway Station and Ormeau Railway Station and operates in approximate one hour intervals. This bus service operates from 5:40am to 7:30pm on weekdays.

There is a proposed railway station located south of the development which may generate more public transport routes in the area; however, it is still in preliminary stages so no further information can be provided regarding the timing of this project.

3.5 Active Transport

The surrounding road networks contain few bikeways; the closest is located on the Eastern Service Road approximately 400m from the proposed development. The bikeway runs north to Beenleigh and south to Ormeau.

Both Christensen Road and Stapylton-Jacobs Well Road have no provisions for pedestrians. There is a small residential area located south west of the proposed development; however due to the fact that the surrounding area is industrial and has limited access to public transport, it is assumed that it does not generate considerable pedestrian traffic.

The proposed railway station would be expected to generate pedestrian traffic and hence the footpath network in this area would need to be re-evaluated if the railway station is commissioned.

4

TRAFFIC OPERATION ASSESSMENT

This section presents a summary of critical intersection operations from the completion of the development (2019 estimated) through to the 10 year design horizon (2029). Stapylton-Jacobs Well Road / Road 1 intersection and Christensen Road / Road 1 intersection are considered as 'future' intersections and therefore cannot be analysed as an 'existing' case. It was also determined that it would not be appropriate to model the 'existing' intersection of Stapylton-Jacobs Well Road / De Bortoli Street with existing volumes as it is anticipated that this intersection will be converted to left in / left out arrangement following the upgrade of Stapylton-Jacobs Well Road.

The Gold Coast Planning Scheme has been used as a guide for the assessment. Where required other State and national guidance has been used (e.g. Complete Streets, Austroads Guide to Traffic Management and Guide to Road Design, TMR Road planning and Design Manual, TMR GARID).

It is envisaged that the development may likely be completed in its entirety by 2019, the traffic analysis will therefore be based on the scenarios outlined below:

- 2019 with background volumes;
- 2019 with background volumes plus volumes generated by the development;
- 2029 with background volumes; and
- 2029 with background volumes plus volumes generated by the development.

A 5% growth rate per annum was applied to all future traffic volumes on Stapylton Jacobs Well Road, and a 4% growth rate per annum was applied to Christensen Road as per advice issued by the GCCC.

4.1 Traffic Generation

The peak hour traffic generation for the industrial warehouse section has been determined using the generation rate as specified in Table 7.1 of Policy 19 "Policy for Infrastructure" from the Gold Coast Planning Scheme Policies. This document provides a value for vehicle trips/day. An assumption of 10% peak hour trips has been assumed and therefore the peak hour generation rate is the same as that specified in the RTA Guide to Traffic Generating Developments and exceeds that rate specified in the ITE Trip Generation Guide.

The peak hour traffic generation for Industrial Park was adopted from the ITE Trip Generation Guide due to the fact that neither the RTA guide, nor the Gold Coast Planning Policy has a directly relevant Development Type for an Industrial Park development.

The ITE Trip Generation Guide was used to determine an appropriate in/out split for each development type.

The trip generation rates used for this development based on the above sources are outlined below:

Warehouse:

- Daily vehicle trips – 5 per 100m² GFA
- Peak hour vehicle trips – 0.5 per 100m² GFA

Industrial Park:

- Daily vehicle trips – 7.5 per 100m² GFA
- AM Peak hour vehicle trips – 0.88 per 100m² GFA
- PM Peak hour vehicle trips – 0.93 per 100m² GFA

The anticipated traffic volumes determined by applying the above trip generations are summarised below in Table 4-2 and Table 4-3.

Table 4-2 Anticipated Trip Generation - Warehouse

GFA(m2)	Peak Hour	Trips/100m2 GFA	IN/Out Split	%	Total
199,409	AM^	0.5	IN	65	648
			OUT	35	349
	PM^	0.5	IN	20	199
			OUT	80	798

^ It is conservatively assumed that the peak period of traffic generated by the proposed development will coincide with the peak traffic peak of the surrounding roads.

Table 4-3 Anticipated Trip Generation – Industrial Park

GFA(m2)	Peak Hour	Trips/100m2 GFA	IN/Out Split	%	Total
66,513	AM^	0.88	IN	86	503
			OUT	14	82
	PM^	0.93	IN	21	130
			OUT	79	489

^ It is conservatively assumed that the peak period of traffic generated by the proposed development will coincide with the peak traffic peak of the surrounding roads.

4.2 Traffic Distribution

The two main roads that are located near the proposed development are the Pacific Motorway and Stapylton-Jacobs Well Road. Stapylton Jacobs Well Road services the town of Jacobs Well in addition to numerous industrial and residential developments situated along its length. Whilst Stapylton-Jacobs Well Road provides an indirect route south via Norwell Road, it is considered that the Pacific Motorway would be the preferred route of travel for both southbound and northbound traffic. On this basis and for the purpose of the analysis the following traffic distribution has been assumed:

- 80% entering and exiting via the Pacific Motorway
- 20% entering and exiting via Stapylton-Jacobs Well Road NE approach.

As previously stated it is anticipated that vehicles will enter and exit the site via three separate routes as detailed below:

- The existing intersection of Stapylton-Jacobs Well Road / De Bortoli Street;
- The proposed intersection of Stapylton-Jacobs Well Road / Road 1; and
- The proposed intersection of Christensen Road / Road 1.

4.3 Performance Criteria

The Austroads Guide to Traffic Management sets out the intersection performance criteria that must be met on the state-controlled road network; these were adopted for this assessment to determine intersection performance on GCCC roads.

The TMR GARID sets out performance criteria for road link Level of Service; these criteria were used here to assess link capacity.

4.3.1 Intersection Degree of Saturation

The performance of intersections was evaluated using a measure of capacity utilisation called Degree of Saturation (DOS). The DOS defines the ratio between the traffic volume entering the intersection and the ultimate capacity, also known as the volume to capacity ratio. According to Austroads the desirable upper limits prescribed for each intersection type are as follows: 0.80 for unsignalised (priority control) intersections; 0.85 for roundabouts; 0.90 for signalised intersections.

These limits can be thought of as a practical capacity limit, above which delays and queues increase quickly. Also, above these limits delays and queues at the intersection also become more unpredictable.

It is important to note that once intersection capacity has been exceeded, i.e. DOS greater than the limits described above, SIDRA output becomes very unreliable and should be used with caution. The software is based on empirical data, and results from scenarios where capacity is exceeded, i.e. not realistic, cannot be predicted reliably. It is reasonable to conclude however that in these circumstances drivers will experience considerable delay and queues.

4.3.2 Intersection Queue Lengths

The back of queue defines the number of vehicles that are queued and depends on the arrival pattern of vehicles along with the number of vehicles that do not clear the intersection during a given green phase. The 95th percentile queue length is the value within which 95% of all observed cycle queue lengths fall (i.e. 5% of queues greater than 95% queue value). Queue reports are therefore checked to ensure that they can be contained within available queue storage space, and that queues do not adversely affect the operation of adjacent intersections.

4.3.3 Level of Service

Level of service (LOS) is a qualitative performance measure for road links away from the influence of intersections. The six LOS categories defined within Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis:

- LOS A – condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream.
- LOS B – zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream.
- LOS C – most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream.
- LOS D – close to the limit of stable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream.

- LOS E – occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream may lead to a traffic jam.
- LOS F – in the zone of forced flow. Flow breakdowns occur and queuing and delays result. Due to the breakdown in flow at this service level, service flow rates may be less than in LOS E.

Generally, LOS E is considered the limit of acceptable urban area operation. Remedial works would be required if LOS F is reached. On rural roads, LOS C can be considered the minimum standard, although LOS D may be acceptable where weekend peaks occur.

4.3.4 Road Link Analysis

LOS has been determined for critical links within the study area based on two-way peak hour flows. LOS characteristics are defined for two-lane roads according to two-way peak hour flows in the TMR Road Planning and Design Manual (RPDM) – Chapter 5: Traffic Parameters and Human Factors - Figure 5.12. These categories have been used to determine the LOS for each link shown in Table 4-4.

Table 4-4 Link Level of Service Summary

Link Description	Peak	Existing	Background		With Development	
		2011	2019	2029	2019	2029
Christensen Road between N-W of new access	AM	A	A	A	B	B
	PM	A	A	A	A	B
Stapylton-Jacobs Well Road S-W of new access	AM	A	A	A	A	B
	PM	A	A	A	B	C
Stapylton-Jacobs Well Road N-E of new access	AM	A	A	A	A	A
	PM	A	A	A	A	A

The LOS analysis shows that Christensen Road in its current form will achieve a LOS B or better within the design horizon. Stapylton-Jacobs Well Road will achieve a LOS C or better under the assumption that this road will have been upgraded to dual carriageway prior to the completion of the development.

4.4 Intersection Capacity Analysis

This section summarises the capacity analysis undertaken for key intersections within the study area, it is anticipated that each intersection will provide direct access for the proposed development.

These intersections are:

- Stapylton-Jacobs Well Road / De Bortoli Street;
- Stapylton-Jacobs Well Road / Road 1; and
- Christensen Road / Road 1.

4.4.1 Christensen Road / Road 1

It is anticipated that the Christensen Road / Road 1 intersection will be a basic T-intersection. This intersection has therefore been modelled with no auxiliary turn lanes for any movements. The intersection will serve vehicles entering and exiting the development and also provide a through movement for a small section of the southern part of the development. This intersection was analysed for two scenarios, namely 2019 with development and 2029 with development. It is not necessary to analyse this intersection for a scenario that excludes developmental traffic as this intersection will be constructed for the proposed development.

The results for the SIDRA assessment are summarised in Table 4-5 below and the detailed results are provided in Appendix C. The intersection layout is included in Figure 4-3.

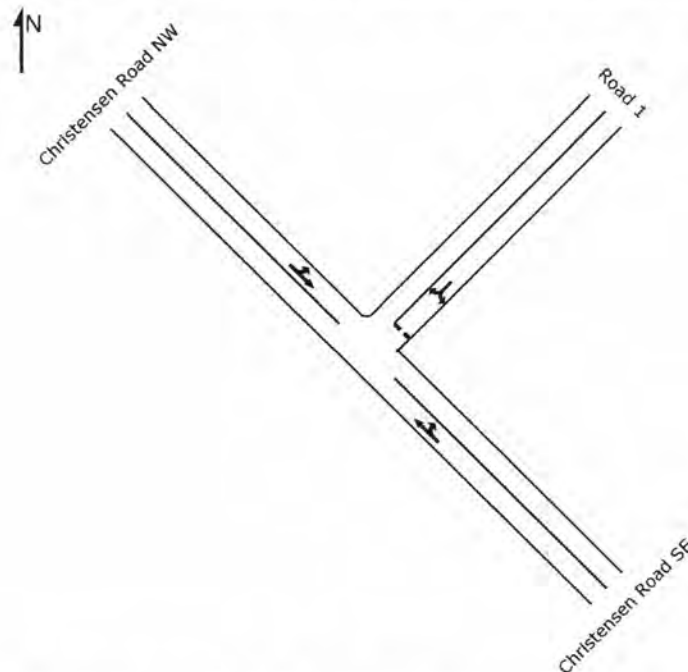


Figure 4-3 Christensen Road / Road 1 Intersection Layout.

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2019 With Development	0.42	5.7s	16m	0.27	4.4s	16m
2029 With Development	0.45	6.1s	23m	0.34	4.8s	21m

Table 4-5 Christensen Road / Road 1 – SIDRA Analysis Results

The analysis results presented in Table 4-5 indicate that the Christensen Road / Road 1 intersection will operate within the industry standard performance threshold (i.e. DOS less than or equal to 0.8) at the 2029 design horizon with the inclusion of the anticipated traffic volumes generated by the proposed development.

4.4.2 Staplyton-Jacobs Well Road / De Bortoli Street

The existing intersection of Staplyton-Jacobs Well Road / De Bortoli Street currently facilitates all movements. As stated previously, TMR Drawing 387557(A) indicates that this intersection will be a left in / left out arrangement when Staplyton-Jacobs Well Road is upgraded.

This intersection was analysed for four scenarios, namely 2019 with and without development and 2029 with and without development.

The results for the SIDRA assessment are summarised in Table 4-6 below and the detailed results are provided in Appendix C. The intersection layout is included in Figure 4-4.

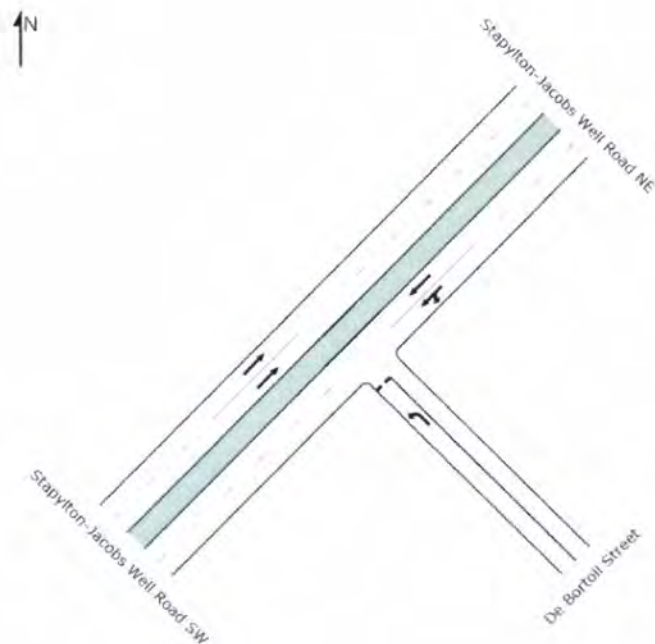


Figure 4-4 Stapylton-Jacobs Well Road / De Bortoli Street Intersection Layout

Scenarios	AM Peak			PM Peak		
	DOS	Delay	95th %ile Queue	DOS	Delay	95th %ile Queue
2019 Without Development	0.18	0.3s	2m	0.22	0.7s	4m
2019 With Development	0.26	0.6s	3m	0.34	1.3s	11m
2029 Without Development	0.24	0.4s	3m	0.36	1.2s	11m
2029 With Development	0.32	0.7s	6m	0.69	2.4s	27m

Table 4-6 Stapylton-Jacobs Well Road / De Bortoli Street – SIDRA Analysis Results

The analysis results presented in Table 4-6 indicate that the Stapylton Jacobs Well Road / De Bortoli Street intersection will operate within the industry standard performance threshold (i.e. DOS less than or equal to 0.8) at the 2029 design horizon with the inclusion of the anticipated traffic volumes generated by the proposed development.

4.4.3 Stapylton-Jacobs Well Road / Road 1

The layout for the proposed intersection of Stapylton Jacobs Well Road / Road 1 has been modelled as per TMR drawing 387557(A) in Appendix A. This intersection was analysed for four scenarios, namely 2019 with and without development and 2029 with and without development.

Hyder contacted the Assets and Operations Division of TMR to enquire about forecasted traffic volumes for the Yellowwood Road West Connection (refer to Figure 4-5). TMR were unable to provide Hyder with any such information and therefore the following assumptions have been made for the traffic generated by the future development of land to the north-west of this intersection:

- An industrial development area of approximately 153,000m² will be serviced by this intersection;
- 45% of the development area will become industrial GFA;
- Development will include industrial warehouse type usage;
- Traffic volumes splits as outlined in Section 4.2 of this report:
 - 80% entering and exiting via the Pacific Motorway;
 - 20% entering and exiting via Stapylton Jacobs Well Road NE approach.

The above assumptions are illustrated graphically in Appendix D.

The results for the SIDRA assessment are summarised in Table 4-7 below and the detailed results are provided in Appendix C. The intersection layout is included in Figure 4-5.

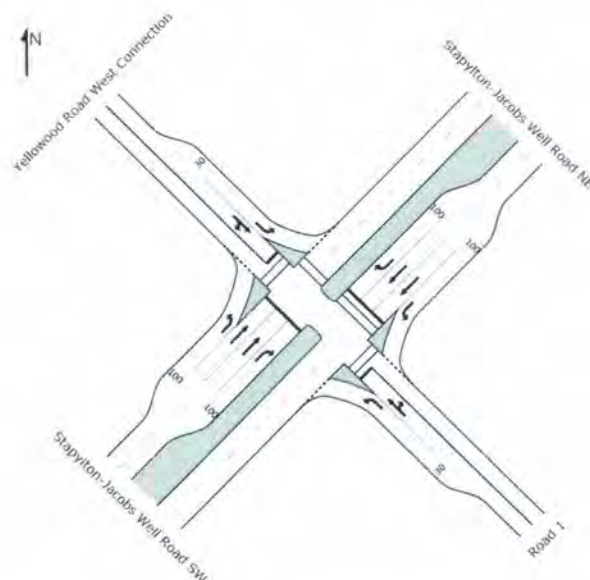


Figure 4-5 Stapylton-Jacobs Well Road / Road 1 Intersection Layout

Scenario	AM				PM			
	DOS	Delay	95% Queue	Cycle Time	DOS	Delay	95% Queue	Cycle Time
2019 Without Development	0.32	15.0s	95m	150.0s	0.41	16.0s	131m	150.0s
2019 With Development	1.00	41.0s	198m	100.0s	1.15	228.0s	1214m	150.0s
2029 Without Development	0.43	16.0s	141m	150.0s	0.55	17.0s	200m	150.0s
2029 With Development	1.06	46.0s	265m	110.0s	1.3	372.0s	1732m	150.0s

Table 4-7 Stapylton-Jacobs Well Road / Road 1 Intersection – SIDRA Analysis Results

The results in Table 4-7 indicate that the intersection in its proposed form (TMR Drawing 387557[A]) will operate outside tolerated limits (i.e. DOS greater than 0.9) at the 2019 peak period with the development proceeding.

The proposed development will generate a considerable left turn movement from Road 1 onto Stapylton-Jacobs Well Road and also a considerable right turn movement from Stapylton-Jacobs Well Road into Road 1. A revised intersection layout was modelled with increased storage capacity for the right turn lane from Stapylton-Jacobs Well Road into Road 1 (increased from 100m to 120m). The revised intersection layout also includes a continuous left turn lane for vehicles exiting the development onto Stapylton-Jacobs Well Road. These changes to the layout of this intersection result in an improved overall performance for the intersection. The mitigated intersection layout is shown in Figure 4-6 below with results shown in Table 4-8.

TMR Drawing 387557[A] indicates that there is sufficient width within the road reserve to cater for a continuous left turn lane from Road 1 into Stapylton-Jacobs Well Road.

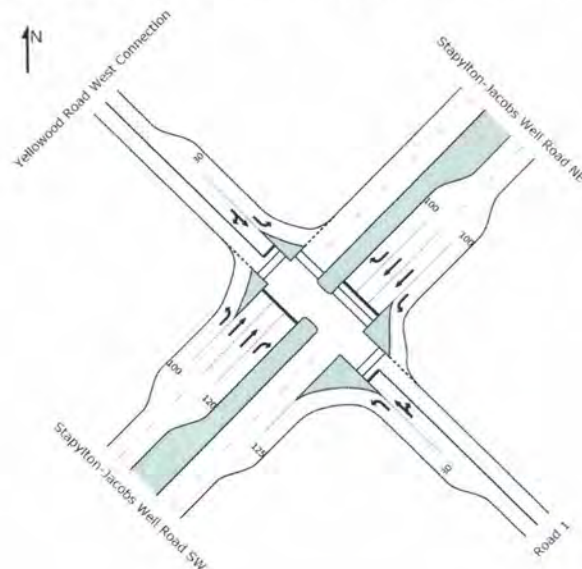


Figure 4-6 Stapylton Jacobs Well Road / Road 1 Mitigation Intersection – SIDRA Analysis Results

Scenario	AM				PM			
	DOS	Delay	95% Queue	Cycle Time	DOS	Delay	95% Queue	Cycle Time
2019 With Development	0.83	25.0s	165m	90.0s	0.7	19.0s	120m	80.0s
2029 With Development	0.87	29.0s	192m	100.0s	0.79	21.0s	185m	90.0s

Table 4-8 Stapylton-Jacobs Well Road / Road 1 Mitigated Intersection – SIDRA Analysis Results

The proposed intersection upgrades would provide sufficient capacity at the intersection beyond the study period with the anticipated development yield. The performance of the intersection is likely to be inside the industry standard performance threshold (i.e. DOS less than 0.90) at the assessed 2019 and 2029 design horizon.

5

CONCLUSION AND RECOMMENDATIONS

The likely traffic impact of the proposed development has been assessed. The main points to note from this assessment are as follows:

Summary:

- It is anticipated that the development will generate approximately 1,600 vehicle trips per hour in the AM and PM peak periods.
- Recent traffic data supplied by TMR indicates that heavy vehicles equate to 17% of vehicles travelling on Stapylton-Jacobs Well Road, and this value was therefore adopted for this traffic analysis.

Intersections:

- It is anticipated that the proposed intersection of Christenson Road / Road 1 will provide sufficient capacity beyond the study period with the anticipated development yield.
- The left in / left out arrangement proposed on attached TMR Drawing 387557[A] is expected to have sufficient capacity beyond the study period with the anticipated development yield.
- The layout proposed on attached TMR Drawing 387557[A] for the intersection of Stapylton-Jacobs Well Road / Road 1 is expected to have insufficient capacity to cater for the anticipated future traffic which includes traffic generated by the proposed development and the development of land to the north west of the intersection. It is recommended the additional works be included on the intersection layout in order to accommodate the proposed development over and above the requirements of the background traffic growth:
 - Inclusion of a continuous lane for the left turn movement from Road 1 into Stapylton-Jacobs Well Road.
 - Increased storage capacity (to approximately 120m) for the right turn lane from Stapylton-Jacobs Well Road into Road 1.

TMR Drawing 387557[A] indicates that there is sufficient width within the road reserve to cater for a continuous left turn lane from Road 1 into Stapylton-Jacobs Well Road. It is planned that the proposed construction of the Stapylton-Jacobs Well Road / Road 1 intersection will coincide with the development of Stage 7 (Appendix B).

With the construction of the new site accesses and works equivalent to the additional upgrades described at the intersection of Stapylton-Jacobs Well Road / Road 1, there are no traffic related reasons to preclude this development.

APPENDIX A

TMR REFERENCE DRAWINGS

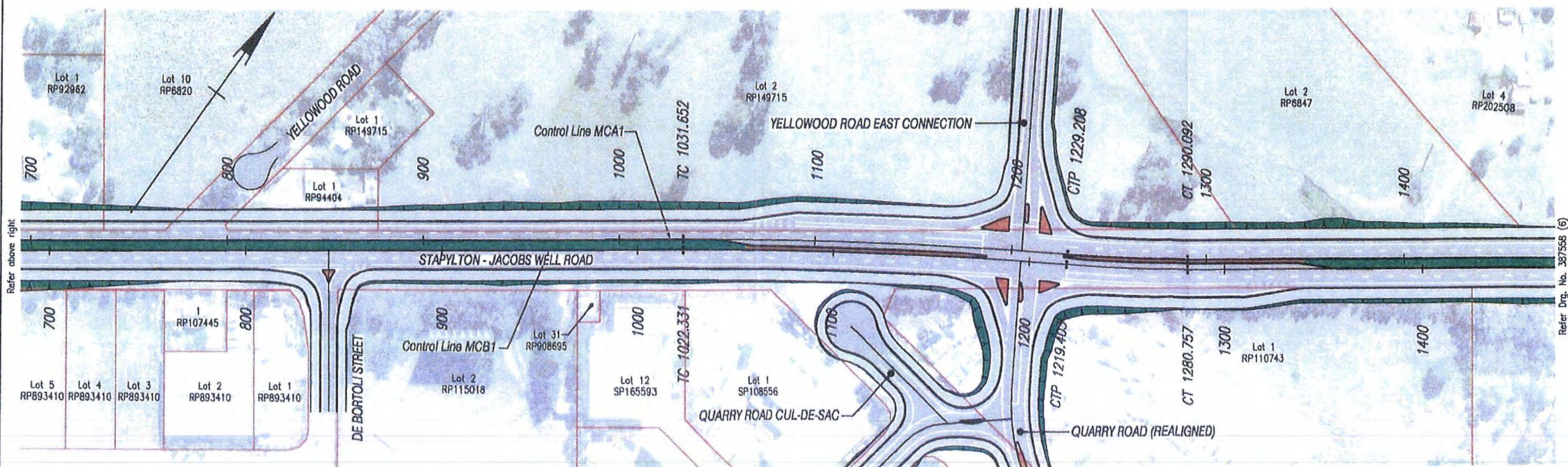
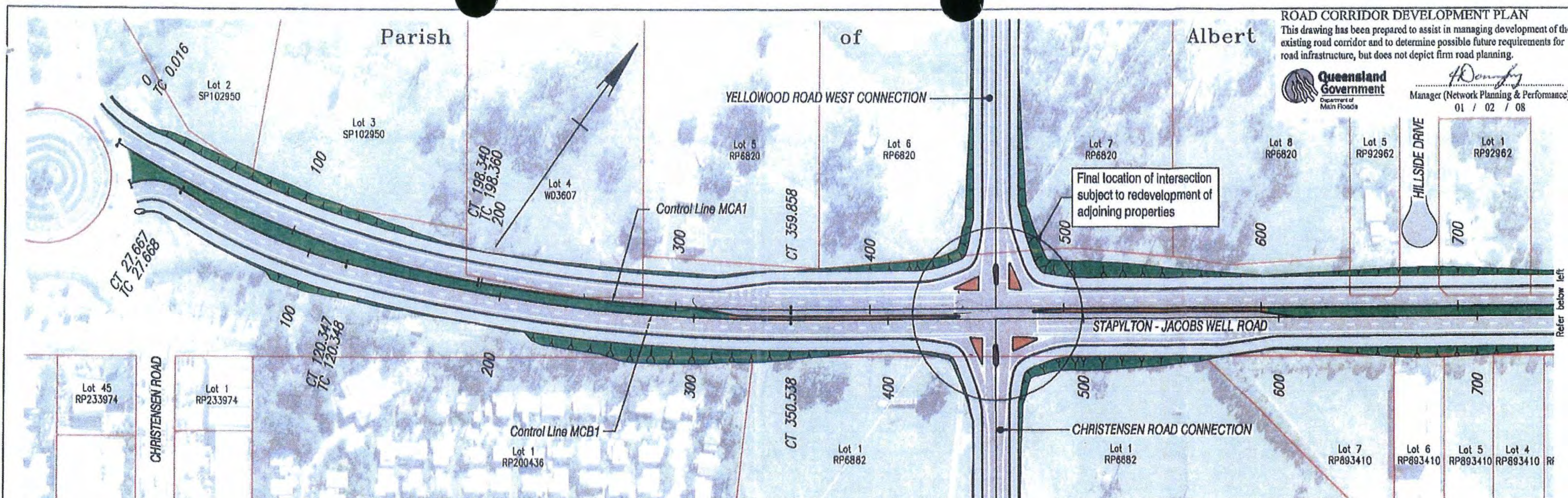


Revisions				Verified	Date	Microfiled	Associated Job Nos	Survey Data			Scales Not to Scale (Full size A3) Dimensions shown in metres except where shown otherwise	CTL CHGE Proceeding (R) NG224/11/01/1A Through Channel
						Auxiliary Drg Nos		Horiz. Datum	GDA94 Zone 56			
						Refer Drawing Index	Azimuth Datum	GDA94 Zone 56				
						Drg. No. 387553 (1)	Height Datum	PM53854; Height 12.142 AHD				
A	Original Issue						Survey Books	MR81683, 1003-50, & 1003-44				
CAD FILES												

ROAD CORRIDOR DEVELOPMENT PLAN
This drawing has been prepared to assist in managing development of the existing road corridor and to determine possible future requirements for road infrastructure, but does not depict firm road planning.



Manager (Network Planning & Performance)
01 / 02 / 08



Revisions				Associated Job Nos	Survey Data		Scale	CITY OF GOLD COAST					PLAN (WITH AERIAL)				Queensland Government	
Revised	Verified	Date	Microfied		Horiz. Datum	GA94 Zone 56		STAPYLTON - JACOBS WELL ROAD					CHGE 0 - 1400 C.L. MCA1				Department of Main Roads	
				Auxiliary Drg Nos	Altitude Datum	GA94 Zone 56	1 : 2000	CTL CHGE 0.000 - 4910.112 C.L. MCA1					SHEET 1 OF 5				Job No.	160/1003/901
				Refer Drawing Index	Height Datum	PN63854; Height 12.142 AHD		Reference Points					Drawing SPR				Contract No.	387557 1A
				Drg. No. 387553 (1)	Survey Books	MR81683, 1003-50, & 1003-44	(Full size A3)		Preceding RP	Dist. to start of job (km)	From start to end of job	From end to following RP	Following RP	Design SAH	Design Review GEL	Recommended	Series Number	5 of 77
A				Original Issue			Dimensions shown in metres except where shown otherwise		NQ2243190/1A	0.00	4.90	2.94	NQ2823134/2	Checked KMS	Verified PJD	Principal Engineer (Network Planning)	MR81683 1A (11/95)	

APPENDIX B

CORRESPONDENCE

Tom Evans

From: Melissa.M.Royce@tmr.qld.gov.au
Sent: 30 June 2011 11:02 AM
To: Tom Evans
Subject: Re: Stapylton Industrial Development

Hi Tom,

I checked our White Book Planning and the 2006 Statement of Intent indicates the widening works in the vicinity of the site are projected for a 5 - 20 year horizon but there's nothing in QTRIP with respect to the work, so they are beyond a 5 year horizon at this stage.

I will get you the future traffic volumes/ future development information to you by tomorrow morning.

Kind regards,

Melissa Royce
Town Planner | South Coast Region / Gold Coast Office
Assets & Operations Division | Department of Transport and Main Roads

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PO Box 442 | Nerang Qld 4211
P: (07) 55969579 | F: (07) 55969511
E: melissa.m.royce@tmr.qld.gov.au
W: www.tmr.qld.gov.au
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☺ "Tom Evans" ---29/06/2011 05:15:16 PM---Hi Melissa,

From: "Tom Evans" <Tom.Evans@hyderconsulting.com>
To: <Melissa.M.Royce@tmr.qld.gov.au>
Cc: "Haider Yousif" <Haider.Yousif@hyderconsulting.com>, "Gary Wood" <Gary.Wood@hyderconsulting.com>, "Brenton Mottershead" <Brenton.Mottershead@hyderconsulting.com>
Date: 29/06/2011 05:15 PM
Subject: Stapylton Industrial Development

Hi Melissa,

We are currently working on a Traffic impact assessment for a proposed industrial development on Stapylton Jacobs Well Road. I understand that TMR intend to upgrade the intersection and I have attached the layout for your reference.

In modelling this intersection into the future cases we need to have an understanding of the development/future traffic volumes that the future development (to the north of Stapylton Jacobs Well Road) will generate. Are you able to give an indication of what this future development will comprise, the timeframe and also any future volumes that you may have so that we can accurately model our development into the future?

Thanks in advance for your time.

Regards

Tom Evans
Traffic Engineer
Hyder Consulting Pty Ltd

Level 7, 199 Grey Street, South Brisbane 4101 Australia
Direct: +61 (0) 7 3337 0073 Fax: +61 (0) 7 3337 0050
Web: www.hyderconsulting.com
Email: tom.evans@hyderconsulting.com

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[attachment "20110629170517185.pdf" deleted by Melissa M Royce/SouthEast/QMR/Au] [attachment "20110629170822009.pdf" deleted by Melissa M Royce/SouthEast/QMR/Au]

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APPENDIX C

DETAILED SIDRA OUTPUT

MOVEMENT SUMMARY

Site: 2029PM Christensen/Road 1
WD

2029PM Christensen/Road 1 WD
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Christensen Road SE											
2	T	451	17.6	0.269	3.1	LOS A	2.6	20.6	0.65	0.00	49.2
3	R	11	17.6	0.269	12.2	LOS B	2.6	20.6	0.65	1.02	48.6
Approach		462	17.6	0.269	3.3	NA	2.6	20.6	0.65	0.02	49.2
North East: Road 1											
4	L	12	17.6	0.339	21.8	LOS C	1.3	10.8	0.77	0.98	37.6
6	R	92	17.6	0.339	22.1	LOS C	1.3	10.8	0.77	0.99	37.6
Approach		103	17.6	0.339	22.1	LOS C	1.3	10.8	0.77	0.99	37.6
North West: Christensen Road NW											
7	L	95	17.6	0.232	8.7	LOS A	0.0	0.0	0.00	0.96	49.0
8	T	306	17.6	0.232	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		401	17.6	0.232	2.1	NA	0.0	0.0	0.00	0.23	57.0
All Vehicles		966	17.6	0.339	4.8	NA	2.6	20.6	0.39	0.21	50.4

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: 18 August 2011 2:48:28 PM

SIDRA INTERSECTION 5.1.5.2006

Project: F:\AA003837\Transport\SIDRA\RevC\ChristensenRoad1.sip
8000014, HYDER CONSULTING, FLOATING

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 2029AM Christensen/Road 1
WD

2029AM Christensen/Road 1 WD
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Christensen Road SE											
2	T	297	17.6	0.192	9.0	LOS A	2.8	22.6	0.87	0.00	44.9
3	R	11	17.6	0.192	18.0	LOS C	2.8	22.6	0.87	1.03	43.8
Approach		308	17.6	0.192	9.3	NA	2.8	22.6	0.87	0.04	44.9
North East: Road 1											
4	L	41	17.6	0.175	18.4	LOS C	0.6	4.7	0.73	0.91	40.1
6	R	16	17.6	0.175	18.8	LOS C	0.6	4.7	0.73	0.92	40.1
Approach		57	17.6	0.175	18.5	LOS C	0.6	4.7	0.73	0.91	40.1
North West: Christensen Road NW											
7	L	340	17.6	0.450	8.7	LOS A	0.0	0.0	0.00	0.86	49.0
8	T	427	17.6	0.450	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		767	17.6	0.450	3.9	NA	0.0	0.0	0.00	0.38	54.6
All Vehicles		1132	17.6	0.450	6.1	NA	2.8	22.6	0.27	0.31	50.7

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019PM Christensen/Road 1
WD

2019PM Christensen/Road 1 WD
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Christensen Road SE											
2	T	393	17.6	0.235	2.4	LOS A	2.0	16.1	0.58	0.00	50.3
3	R	11	17.6	0.235	11.4	LOS B	2.0	16.1	0.58	1.00	49.0
Approach		404	17.6	0.235	2.6	NA	2.0	16.1	0.58	0.03	50.2
North East: Road 1											
4	L	12	17.6	0.269	17.7	LOS C	1.0	8.4	0.69	0.85	40.5
6	R	92	17.6	0.269	18.0	LOS C	1.0	8.4	0.69	0.94	40.5
Approach		103	17.6	0.269	18.0	LOS C	1.0	8.4	0.69	0.93	40.5
North West: Christensen Road NW											
7	L	95	17.6	0.198	8.7	LOS A	0.0	0.0	0.00	0.94	49.0
8	T	245	17.6	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		340	17.6	0.198	2.4	NA	0.0	0.0	0.00	0.26	56.5
All Vehicles		847	17.6	0.269	4.4	NA	2.0	16.1	0.36	0.23	51.0

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019AM Christensen/Road 1
WD

2019AM Christensen/Road 1 WD
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Christensen Road SE											
2	T	240	17.6	0.156	7.1	LOS A	1.9	15.7	0.78	0.00	47.0
3	R	11	17.6	0.156	16.1	LOS C	1.9	15.7	0.78	1.05	45.1
Approach		251	17.6	0.156	7.4	NA	1.9	15.7	0.78	0.04	47.0
North East: Road 1											
4	L	41	17.6	0.146	16.3	LOS C	0.5	4.0	0.66	0.88	41.8
6	R	16	17.6	0.146	16.6	LOS C	0.5	4.0	0.66	0.91	41.7
Approach		57	17.6	0.146	16.4	LOS C	0.5	4.0	0.66	0.89	41.7
North West: Christensen Road NW											
7	L	340	17.6	0.415	8.7	LOS A	0.0	0.0	0.00	0.84	49.0
8	T	366	17.6	0.415	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		706	17.6	0.415	4.2	NA	0.0	0.0	0.00	0.40	54.1
All Vehicles		1014	17.6	0.415	5.7	NA	1.9	15.7	0.23	0.34	51.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2029PM Stapylton/DeBortoli
WD

2029PM Stapylton/DeBortoli WD
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	129	17.6	0.685	43.8	LOS E	3.3	26.7	0.94	1.18	27.4
Approach		129	17.6	0.685	43.8	LOS E	3.3	26.7	0.94	1.18	27.4
North East: Stapylton-Jacobs Well Road NE											
7	L	11	17.6	0.323	8.7	LOS A	0.0	0.0	0.00	1.12	49.0
8	T	1118	17.6	0.323	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1129	17.6	0.323	0.1	NA	0.0	0.0	0.00	0.01	59.9
South West: Stapylton-Jacobs Well Road SW											
2	T	1149	17.6	0.328	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1149	17.6	0.328	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		2407	17.6	0.685	2.4	NA	3.3	26.7	0.05	0.07	56.4

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2029AM Stapylton/DeBortoli
WD

2029AM Stapylton/DeBortoli WD
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	43	17.6	0.222	28.1	LOS D	0.7	6.0	0.85	0.97	34.1
Approach		43	17.6	0.222	28.1	LOS D	0.7	6.0	0.85	0.97	34.1
North East: Stapylton-Jacobs Well Road NE											
7	L	38	17.6	0.324	8.7	LOS A	0.0	0.0	0.00	1.08	49.0
8	T	1092	17.6	0.324	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1130	17.6	0.324	0.3	NA	0.0	0.0	0.00	0.04	59.5
South West: Stapylton-Jacobs Well Road SW											
2	T	944	17.6	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		944	17.6	0.270	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		2117	17.6	0.324	0.7	NA	0.7	6.0	0.02	0.04	58.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019PM Stapylton/DeBortoli
WD

2019PM Stapylton/DeBortoli WD
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	108	17.6	0.335	21.1	LOS C	1.4	11.1	0.78	0.98	38.2
Approach		108	17.6	0.335	21.1	LOS C	1.4	11.1	0.78	0.98	38.2
North East: Stapylton-Jacobs Well Road NE											
7	L	10	17.6	0.244	8.7	LOS A	0.0	0.0	0.00	1.12	49.0
8	T	844	17.6	0.244	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		854	17.6	0.244	0.1	NA	0.0	0.0	0.00	0.01	59.8
South West: Stapylton-Jacobs Well Road SW											
2	T	920	17.6	0.263	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		920	17.6	0.263	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1882	17.6	0.335	1.3	NA	1.4	11.1	0.04	0.06	58.0

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019AM Stapylton/DeBortoli
WD

2019AM Stapylton/DeBortoli WD
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	34	17.6	0.114	19.5	LOS C	0.4	3.1	0.74	0.91	39.4
Approach		34	17.6	0.114	19.5	LOS C	0.4	3.1	0.74	0.91	39.4
North East: Stapylton-Jacobs Well Road NE											
7	L	35	17.6	0.260	8.7	LOS A	0.0	0.0	0.00	1.07	49.0
8	T	872	17.6	0.260	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		907	17.6	0.260	0.3	NA	0.0	0.0	0.00	0.04	59.5
South West: Stapylton-Jacobs Well Road SW											
2	T	723	17.6	0.207	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		723	17.6	0.207	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1664	17.6	0.260	0.6	NA	0.4	3.1	0.02	0.04	59.1

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2029PM Stapylton/DeBortoli
WO

2029PM Stapylton/DeBortoli WO
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	79	17.6	0.359	28.3	LOS D	1.4	10.9	0.86	1.01	34.0
Approach		79	17.6	0.359	28.3	LOS D	1.4	10.9	0.86	1.01	34.0
North East: Stapylton-Jacobs Well Road NE											
7	L	10	17.6	0.301	8.7	LOS A	0.0	0.0	0.00	1.12	49.0
8	T	1043	17.6	0.301	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1053	17.6	0.301	0.1	NA	0.0	0.0	0.00	0.01	59.9
South West: Stapylton-Jacobs Well Road SW											
2	T	869	17.6	0.248	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		869	17.6	0.248	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		2001	17.6	0.359	1.2	NA	1.4	10.9	0.03	0.05	58.2

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2029AM Stapylton/DeBortoli
WO

2029AM Stapylton/DeBortoli WO
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South East: De Bortoli Street												
4	L	35	17.6	0.107	18.4	LOS C	0.4	2.9	0.72	0.91	40.2	
Approach		35	17.6	0.107	18.4	LOS C	0.4	2.9	0.72	0.91	40.2	
North East: Stapylton-Jacobs Well Road North												
7	L	13	17.6	0.243	8.7	LOS A	0.0	0.0	0.00	1.11	49.0	
8	T	836	17.6	0.243	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		849	17.6	0.243	0.1	NA	0.0	0.0	0.00	0.02	59.8	
South West: Stapylton-Jacobs Well Road South												
2	T	840	17.6	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		840	17.6	0.240	0.0	NA	0.0	0.0	0.00	0.00	60.0	
All Vehicles		1724	17.6	0.243	0.4	NA	0.4	2.9	0.01	0.03	59.3	

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019PM Stapylton/DeBortoli
WO

2019PM Stapylton/DeBortoli WO
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	58	17.6	0.158	17.2	LOS C	0.6	4.4	0.69	0.90	41.1
Approach		58	17.6	0.158	17.2	LOS C	0.6	4.4	0.69	0.90	41.1
North East: Stapylton-Jacobs Well Road NE											
7	L	10	17.6	0.223	8.7	LOS A	0.0	0.0	0.00	1.11	49.0
8	T	769	17.6	0.223	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		779	17.6	0.223	0.1	NA	0.0	0.0	0.00	0.01	59.8
South West: Stapylton-Jacobs Well Road SW											
2	T	641	17.6	0.183	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		641	17.6	0.183	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1478	17.6	0.223	0.7	NA	0.6	4.4	0.03	0.04	58.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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MOVEMENT SUMMARY

Site: 2019AM Stapylton/DeBortoli
WO

2019AM Stapylton/DeBortoli WO
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: De Bortoli Street											
4	L	25	17.6	0.053	14.2	LOS B	0.2	1.5	0.57	0.81	43.6
Approach		25	17.6	0.053	14.2	LOS B	0.2	1.5	0.57	0.81	43.6
North East: Stapylton-Jacobs Well Road NE											
7	L	10	17.6	0.179	8.7	LOS A	0.0	0.0	0.00	1.11	49.0
8	T	616	17.6	0.179	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		626	17.6	0.179	0.1	NA	0.0	0.0	0.00	0.02	59.8
South West: Stapylton-Jacobs Well Road SW											
2	T	619	17.6	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		619	17.6	0.177	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		1270	17.6	0.179	0.3	NA	0.2	1.5	0.01	0.02	59.5

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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PHASING SUMMARY

Site: 2029PM Stapylton/Road 1 WD
- Mitigated

2029PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 90 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

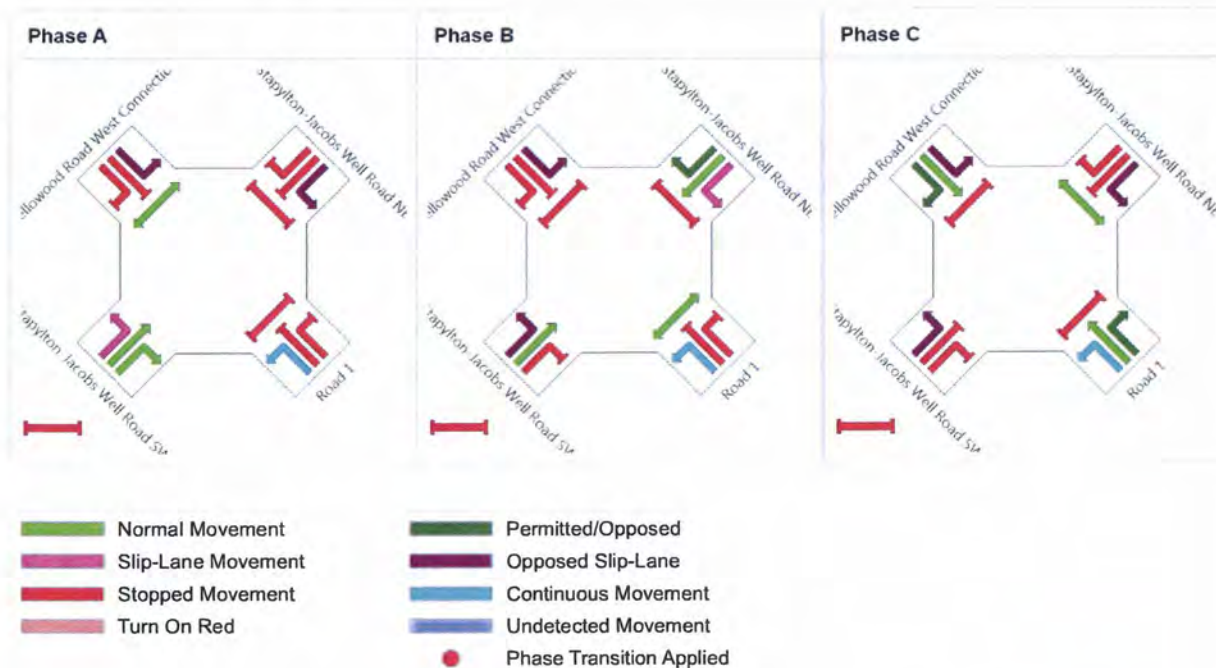
Sequence: Two-Phase

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	11	39	22
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	17	45	28
Phase Split	19 %	50 %	31 %



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SIDRA INTERSECTION 5.1.5.2006

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 2029PM Stapylton/Road 1 WD
- Mitigated

2029PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 90 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	730	17.6	0.442	8.0	X	X	X	X	0.59	49.7
2	T	10	17.6	0.687	35.7	LOS D	9.6	77.6	0.96	0.84	27.6
3	R	217	17.6	0.687	43.9	LOS D	9.6	77.6	0.96	0.87	27.5
Approach		957	17.6	0.687	16.4	LOS B	9.6	77.6	0.23	0.66	41.7
North East: Stapylton-Jacobs Well Road NE											
4	L	59	17.6	0.058	9.0	LOS A	0.4	2.9	0.22	0.63	48.4
5	T	1172	17.6	0.773	25.3	LOS C	23.0	185.4	0.92	0.85	33.6
6	R	16	17.6	0.075	25.3	LOS C	0.4	3.5	0.61	0.71	35.7
Approach		1247	17.6	0.773	24.6	LOS C	23.0	185.4	0.88	0.84	34.1
North West: Yellowwood Road West Connection											
7	L	62	17.6	0.195	10.7	LOS B	0.6	4.8	0.36	0.67	46.8
8	T	10	17.6	0.787	40.2	LOS D	12.0	97.0	0.99	0.94	26.0
9	R	250	17.6	0.787	48.5	LOS D	12.0	97.0	0.99	0.94	26.0
Approach		322	17.6	0.787	40.9	LOS D	12.0	97.0	0.87	0.89	28.4
South West: Stapylton-Jacobs Well Road SW											
10	L	62	17.6	0.052	8.4	LOS A	0.2	1.6	0.15	0.62	49.0
11	T	869	17.6	0.399	9.1	LOS A	9.5	76.6	0.54	0.48	46.0
12	R	131	17.6	0.650	51.9	LOS D	5.9	47.4	1.00	0.83	24.9
Approach		1062	17.6	0.650	14.4	LOS B	9.5	76.6	0.57	0.53	41.8
All Vehicles		3588	17.6	0.787	20.8	LOS C	23.0	185.4	0.61	0.70	37.3

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	11	17.4	LOS B	0.0	0.0	0.62	0.62
P3	Across NE approach	11	39.2	LOS D	0.0	0.0	0.93	0.93
P5	Across NW approach	11	39.2	LOS D	0.0	0.0	0.93	0.93
All Pedestrians		33	31.9	LOS D			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2029AM Stapylton/Road 1 WD
- Mitigated

2029AM Stapylton/Road 1 WD
Signals - Fixed Time Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

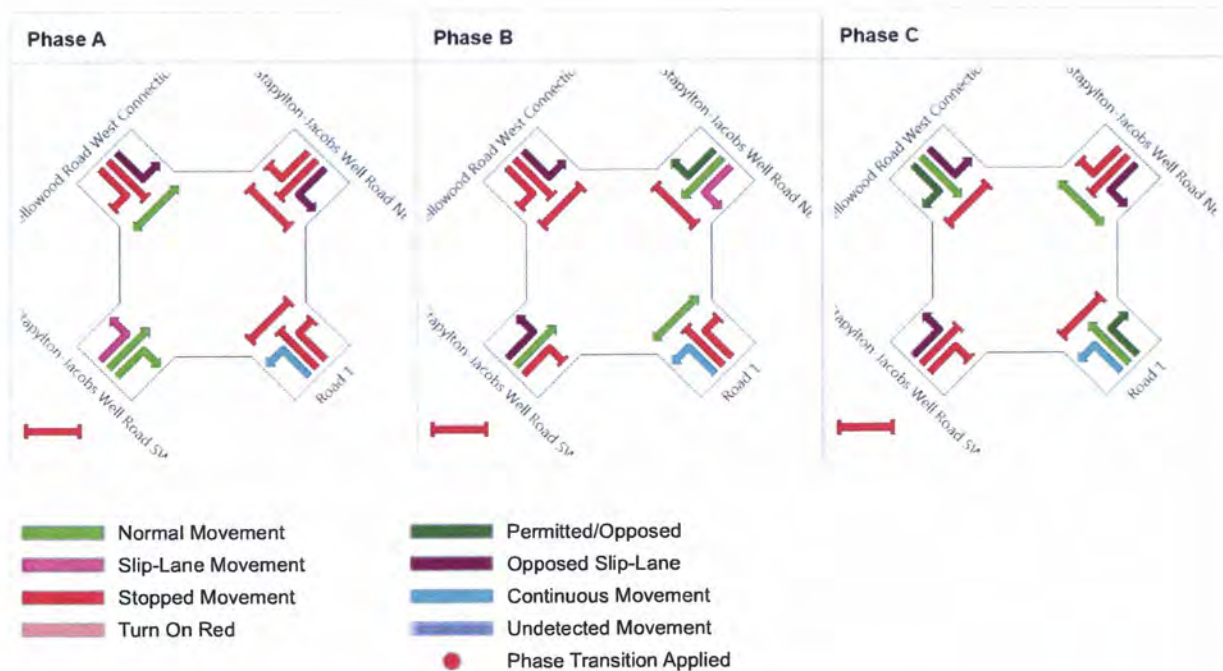
Sequence: Two-Phase

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	31	29	22
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	37	35	28
Phase Split	37 %	35 %	28 %



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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 2029AM Stapylton/Road 1 WD
- Mitigated

2029AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	283	17.6	0.172	7.9	X	X	X	X	0.59	49.8
2	T	10	17.6	0.286	35.9	LOS D	3.6	28.9	0.87	0.70	27.9
3	R	76	17.6	0.286	44.1	LOS D	3.6	28.9	0.87	0.78	27.5
Approach		369	17.6	0.286	16.1	LOS B	3.6	28.9	0.20	0.63	41.9
North East: Stapylton-Jacobs Well Road NE											
4	L	205	17.6	0.299	14.3	LOS B	3.7	29.5	0.46	0.71	43.5
5	T	879	17.6	0.866	46.4	LOS D	23.9	192.2	1.00	1.05	25.3
6	R	51	17.6	0.312	40.3	LOS D	2.1	16.7	0.82	0.77	28.6
Approach		1135	17.6	0.866	40.3	LOS D	23.9	192.2	0.89	0.97	27.5
North West: Yellowwood Road West Connection											
7	L	27	17.6	0.083	9.7	LOS A	0.2	1.8	0.26	0.64	47.7
8	T	10	17.6	0.398	37.0	LOS D	5.1	41.2	0.90	0.73	27.4
9	R	109	17.6	0.398	45.2	LOS D	5.1	41.2	0.90	0.79	27.1
Approach		146	17.6	0.398	38.1	LOS D	5.1	41.2	0.78	0.76	29.5
South West: Stapylton-Jacobs Well Road SW											
10	L	203	17.6	0.170	8.4	LOS A	0.8	6.3	0.16	0.63	48.9
11	T	840	17.6	0.364	8.1	LOS A	9.0	72.8	0.48	0.43	47.3
12	R	441	17.6	0.862	53.5	LOS D	23.9	192.1	1.00	0.98	24.5
Approach		1484	17.6	0.862	21.6	LOS C	23.9	192.1	0.59	0.62	37.1
All Vehicles		3134	17.6	0.866	28.5	LOS C	23.9	192.2	0.66	0.76	33.0

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	28.9	LOS C	0.1	0.1	0.76	0.76
P3	Across NE approach	53	44.2	LOS E	0.1	0.1	0.94	0.94
P5	Across NW approach	53	27.4	LOS C	0.1	0.1	0.74	0.74
All Pedestrians		159	33.5	LOS D			0.81	0.81

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2019PM Stapylton/Road 1 WD
- Mitigated

2019PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 80 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

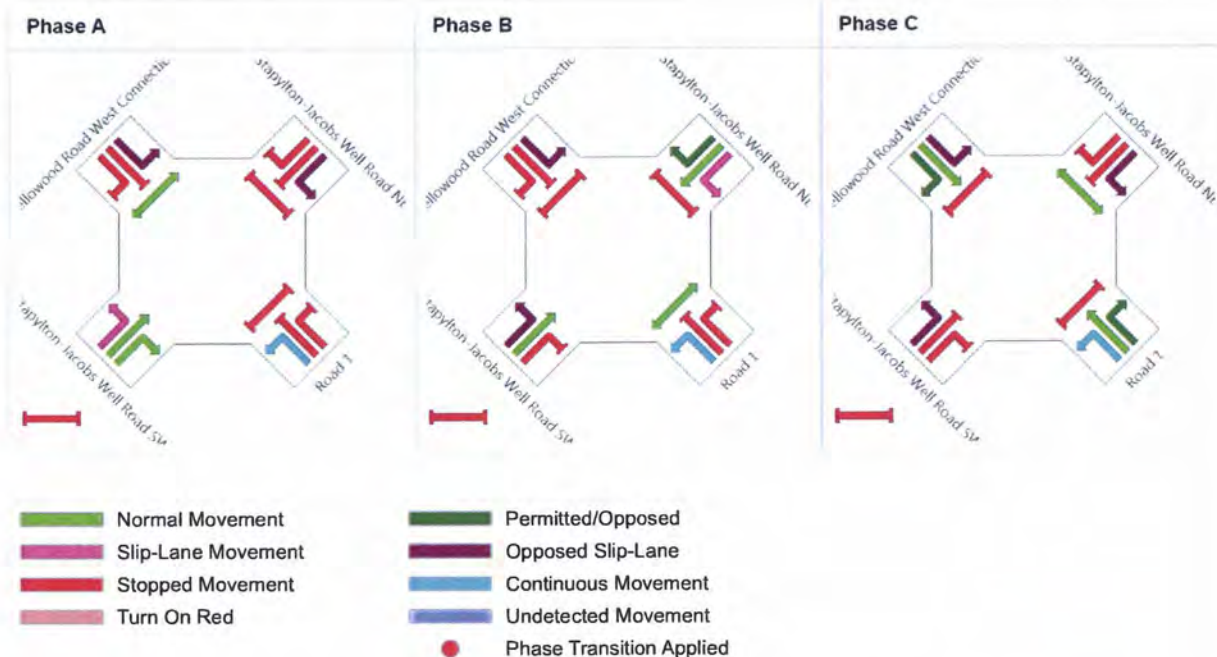
Sequence: Two-Phase

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	11	29	22
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	17	35	28
Phase Split	21 %	44 %	35 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2019PM Stapylton/Road 1 WD
- Mitigated

2019PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 80 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	730	17.6	0.442	8.0	X	X	X	X	0.59	49.7
2	T	10	17.6	0.609	28.2	LOS C	8.0	64.5	0.92	0.78	30.6
3	R	217	17.6	0.609	36.4	LOS D	8.0	64.5	0.92	0.83	30.3
Approach		957	17.6	0.609	14.6	LOS B	8.0	64.5	0.22	0.65	43.2
North East: Stapylton-Jacobs Well Road NE											
4	L	59	17.6	0.057	9.0	LOS A	0.3	2.7	0.23	0.64	48.4
5	T	877	17.6	0.691	23.9	LOS C	14.9	119.9	0.91	0.80	34.4
6	R	16	17.6	0.063	27.1	LOS C	0.4	3.4	0.68	0.71	34.7
Approach		952	17.6	0.691	23.1	LOS C	14.9	119.9	0.86	0.79	35.0
North West: Yellowwood Road West Connection											
7	L	62	17.6	0.148	9.9	LOS A	0.4	3.5	0.32	0.66	47.6
8	T	10	17.6	0.698	30.5	LOS C	9.8	78.9	0.95	0.85	29.6
9	R	250	17.6	0.698	38.8	LOS D	9.8	78.9	0.95	0.88	29.3
Approach		322	17.6	0.698	33.0	LOS C	9.8	78.9	0.83	0.83	31.7
South West: Stapylton-Jacobs Well Road SW											
10	L	62	17.6	0.051	8.4	LOS A	0.2	1.6	0.16	0.62	48.9
11	T	641	17.6	0.319	9.5	LOS A	6.5	52.2	0.56	0.48	45.6
12	R	131	17.6	0.577	45.3	LOS D	5.1	41.0	0.98	0.80	26.9
Approach		834	17.6	0.577	15.0	LOS B	6.5	52.2	0.59	0.54	41.3
All Vehicles		3065	17.6	0.698	19.3	LOS B	14.9	119.9	0.59	0.68	38.5

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	19.6	LOS B	0.1	0.1	0.70	0.70
P3	Across NE approach	53	34.2	LOS D	0.1	0.1	0.93	0.93
P5	Across NW approach	53	34.2	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		159	29.4	LOS C			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2019AM Stapylton/Road 1 WD
- Mitigated

2019AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 90 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

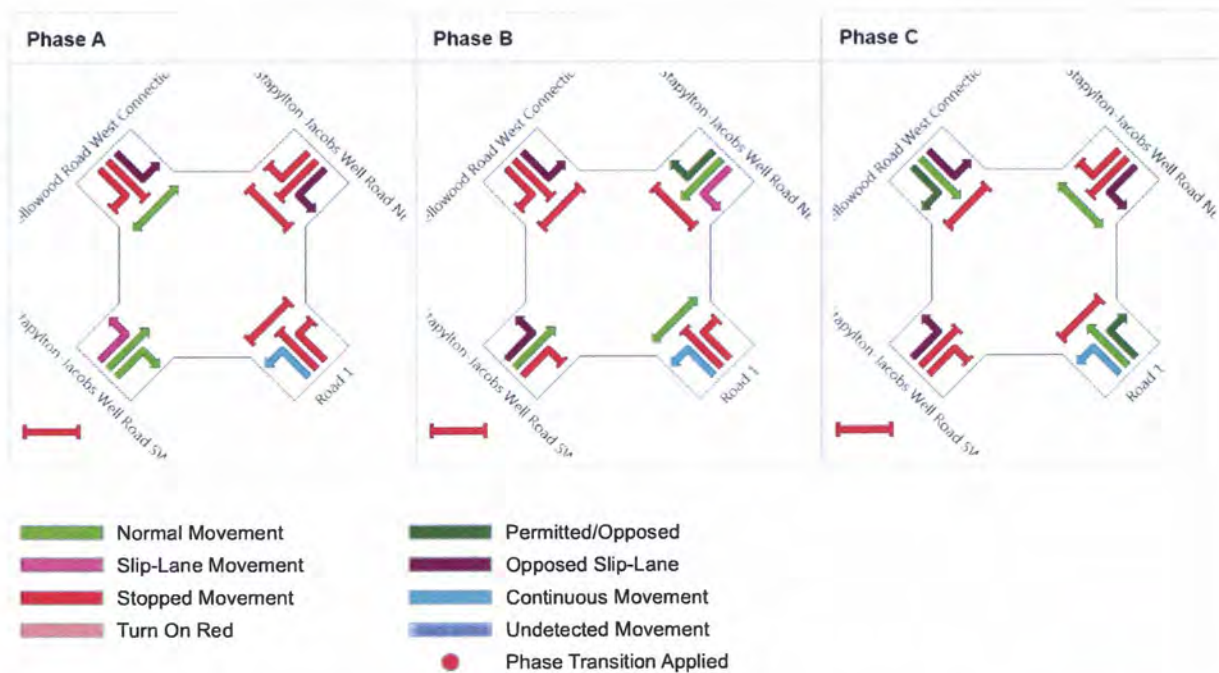
Sequence: Two-Phase

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	29	21	22
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	35	27	28
Phase Split	39 %	30 %	31 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2019AM Stapylton/Road 1 WD
- Mitigated

2019AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 90 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	283	17.6	0.172	7.9	X	X	X	X	0.59	49.8
2	T	10	17.6	0.257	30.3	LOS C	3.1	25.2	0.85	0.67	30.1
3	R	76	17.6	0.257	38.5	LOS D	3.1	25.2	0.85	0.77	29.5
Approach		369	17.6	0.257	14.8	LOS B	3.1	25.2	0.20	0.63	43.0
North East: Stapylton-Jacobs Well Road NE											
4	L	205	17.6	0.286	13.7	LOS B	3.3	26.7	0.47	0.71	43.9
5	T	650	17.6	0.796	39.9	LOS D	14.8	119.6	1.00	0.96	27.3
6	R	51	17.6	0.278	40.8	LOS D	1.9	15.7	0.86	0.77	28.5
Approach		906	17.6	0.796	34.0	LOS C	14.8	119.6	0.87	0.89	30.0
North West: Yellowwood Road West Connection											
7	L	27	17.6	0.064	9.3	LOS A	0.2	1.4	0.24	0.63	48.2
8	T	10	17.6	0.357	31.2	LOS C	4.5	35.9	0.87	0.71	29.6
9	R	109	17.6	0.357	39.5	LOS D	4.5	35.9	0.87	0.79	29.1
Approach		146	17.6	0.357	33.3	LOS C	4.5	35.9	0.75	0.75	31.5
South West: Stapylton-Jacobs Well Road SW											
10	L	203	17.6	0.168	8.5	LOS A	0.8	6.3	0.18	0.64	48.8
11	T	619	17.6	0.284	8.3	LOS A	6.2	49.7	0.49	0.43	47.0
12	R	441	17.6	0.830	45.6	LOS D	20.5	164.9	0.99	0.95	26.8
Approach		1263	17.6	0.830	21.4	LOS C	20.5	164.9	0.61	0.64	37.4
All Vehicles		2684	17.6	0.830	25.4	LOS C	20.5	164.9	0.65	0.73	34.8

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	30.4	LOS D	0.1	0.1	0.82	0.82
P3	Across NE approach	53	39.2	LOS D	0.1	0.1	0.93	0.93
P5	Across NW approach	53	24.2	LOS C	0.1	0.1	0.73	0.73
All Pedestrians		159	31.3	LOS D			0.83	0.83

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2029PM Stapylton/Road 1 WD

2029PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

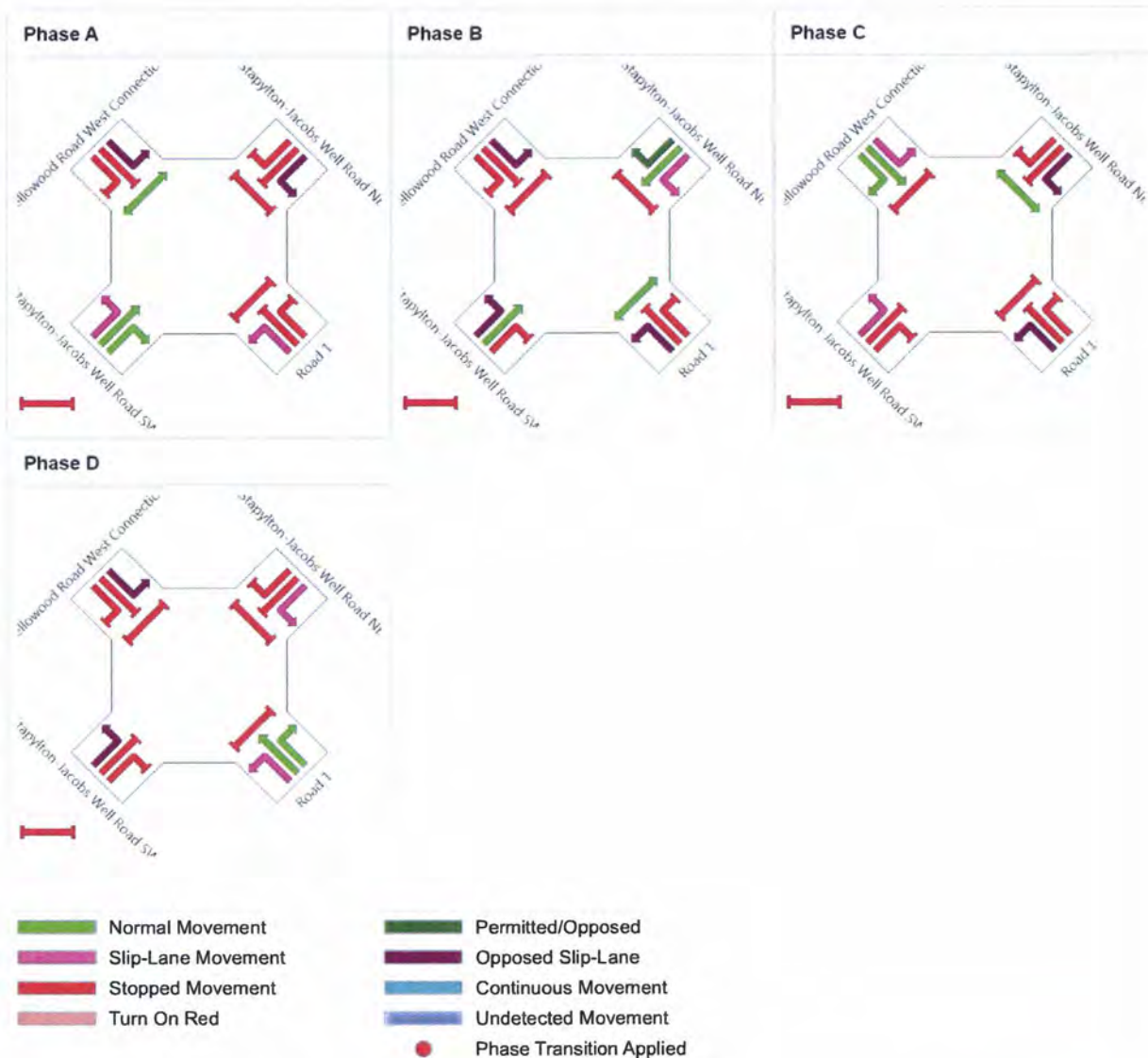
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	39	22	54
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	45	28	60
Phase Split	11 %	30 %	19 %	40 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2029PM Stapylton/Road 1 WD

2029PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	184	17.6	1.000 ³	29.3	LOS C	7.3	59.0	0.60	0.78	33.6
2	T	556	17.6	1.301	623.1	LOS F	215.0	1731.8	1.00	2.40	3.3
3	R	217	17.6	1.301	631.4	LOS F	215.0	1731.8	1.00	2.40	3.3
Approach		957	17.6	1.301	511.0	LOS F	215.0	1731.8	0.92	2.09	4.0
North East: Stapylton-Jacobs Well Road NE											
4	L	59	17.6	0.056	8.8	LOS A	0.4	3.3	0.15	0.62	48.8
5	T	1172	17.6	1.288	603.3	LOS F	157.8	1271.0	1.00	3.19	3.4
6	R	16	17.6	0.166	69.5	LOS E	1.1	8.6	0.89	0.74	20.7
Approach		1247	17.6	1.288	568.4	LOS F	157.8	1271.0	0.96	3.04	3.6
North West: Yellowwood Road West Connection											
7	L	62	17.6	0.321	18.3	LOS B	1.7	13.5	0.43	0.68	40.3
8	T	10	17.6	1.072	235.3	LOS F	38.9	313.0	1.00	1.50	7.8
9	R	250	17.6	1.072	243.6	LOS F	38.9	313.0	1.00	1.50	7.9
Approach		322	17.6	1.072	200.0	LOS F	38.9	313.0	0.89	1.34	9.3
South West: Stapylton-Jacobs Well Road SW											
10	L	62	17.6	0.054	8.2	LOS A	0.2	1.5	0.09	0.61	49.3
11	T	869	17.6	0.665	41.8	LOS D	26.3	211.7	0.90	0.79	26.8
12	R	131	17.6	1.083	260.7	LOS F	19.9	160.6	1.00	1.48	7.4
Approach		1062	17.6	1.083	66.8	LOS E	26.3	211.7	0.86	0.87	20.7
All Vehicles		3588	17.6	1.301	371.6	LOS F	215.0	1731.8	0.91	1.99	5.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	11	44.9	LOS E	0.0	0.0	0.77	0.77
P3	Across NE approach	11	69.1	LOS F	0.0	0.0	0.96	0.96
P5	Across NW approach	11	69.1	LOS F	0.0	0.0	0.96	0.96
All Pedestrians		33	61.0	LOS F			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2029AM Stapylton/Road 1 WD

2029AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

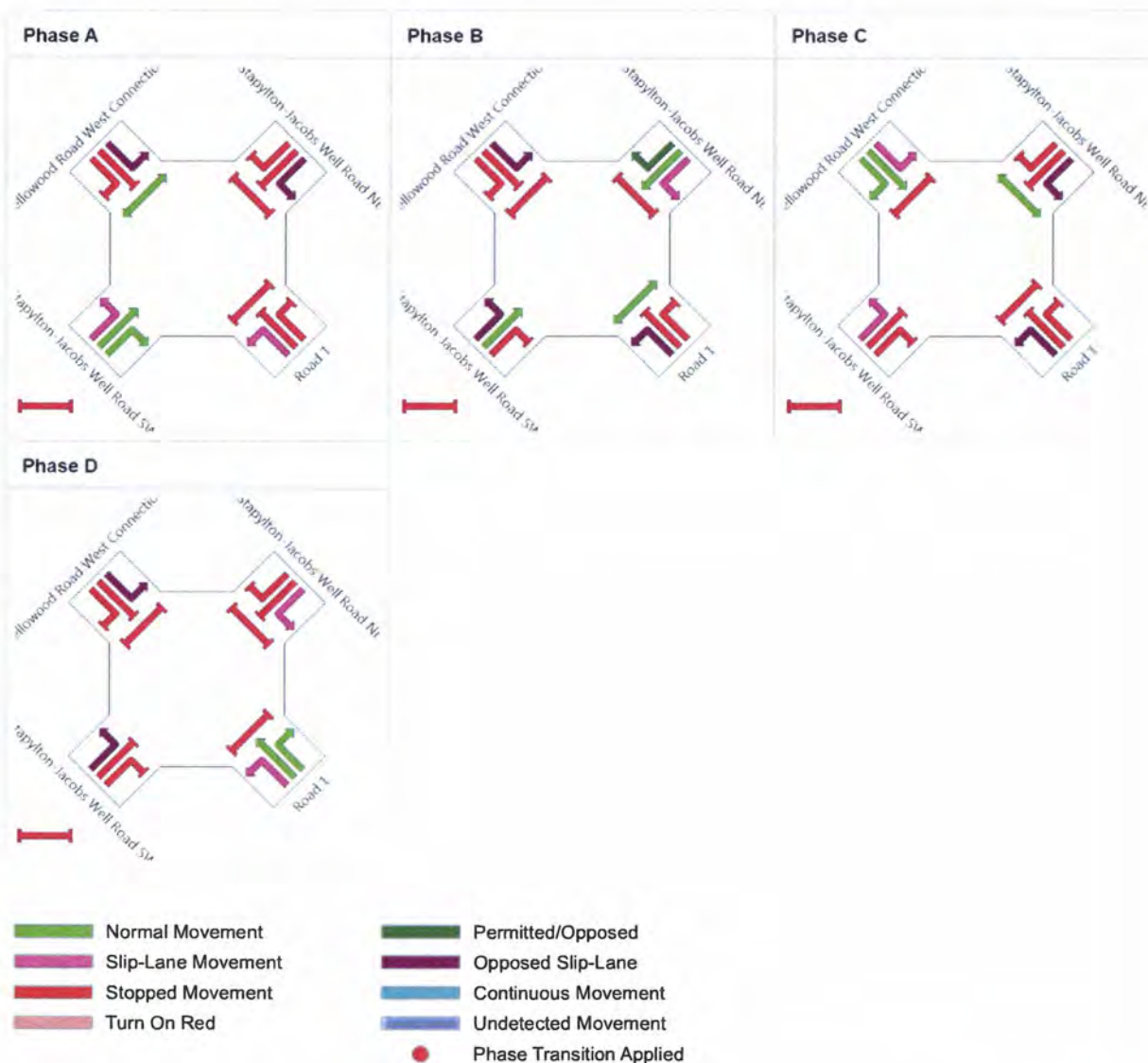
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	27	29	22	8
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	33	35	28	14
Phase Split	30 %	32 %	25 %	13 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2029AM Stapylton/Road 1 WD

2029AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	241	17.6	1.000 ³	18.1	LOS B	6.1	49.3	0.55	0.73	40.4
2	T	52	17.6	1.065	200.0	LOS F	15.4	123.7	1.00	1.59	9.0
3	R	76	17.6	1.065	208.2	LOS F	15.4	123.7	1.00	1.59	9.0
Approach		369	17.6	1.065	83.0	LOS F	15.4	123.7	0.71	1.03	18.3
North East: Stapylton-Jacobs Well Road NE											
4	L	205	17.6	0.281	13.2	LOS B	3.5	27.8	0.40	0.69	44.4
5	T	879	17.6	0.953	76.3	LOS E	32.8	264.5	1.00	1.29	18.8
6	R	51	17.6	0.343	46.1	LOS D	2.4	19.0	0.85	0.78	26.6
Approach		1135	17.6	0.953	63.5	LOS E	32.8	264.5	0.88	1.16	21.3
North West: Yellowwood Road West Connection											
7	L	27	17.6	0.093	11.6	LOS B	0.4	2.9	0.31	0.64	45.9
8	T	10	17.6	0.359	41.6	LOS D	5.6	45.2	0.91	0.73	25.9
9	R	109	17.6	0.359	49.8	LOS D	5.6	45.2	0.91	0.79	25.6
Approach		146	17.6	0.359	42.2	LOS D	5.6	45.2	0.80	0.76	27.9
South West: Stapylton-Jacobs Well Road SW											
10	L	203	17.6	0.174	8.4	LOS A	0.8	6.3	0.14	0.63	49.0
11	T	876	17.6	0.445	14.9	LOS B	13.6	109.3	0.63	0.56	40.7
12	R	405	17.6	1.000 ³	54.1	LOS D	22.2	178.7	1.00	0.87	24.3
Approach		1484	17.6	1.000	24.7	LOS C	22.2	178.7	0.66	0.65	35.1
All Vehicles		3134	17.6	1.065	46.4	LOS D	32.8	264.5	0.75	0.89	25.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	33.6	LOS D	0.1	0.1	0.78	0.78
P3	Across NE approach	53	49.2	LOS E	0.2	0.2	0.95	0.95
P5	Across NW approach	53	35.2	LOS D	0.1	0.1	0.80	0.80
All Pedestrians		159	39.3	LOS D			0.84	0.84

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2019PM Stapylton/Road 1 WD

2019PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

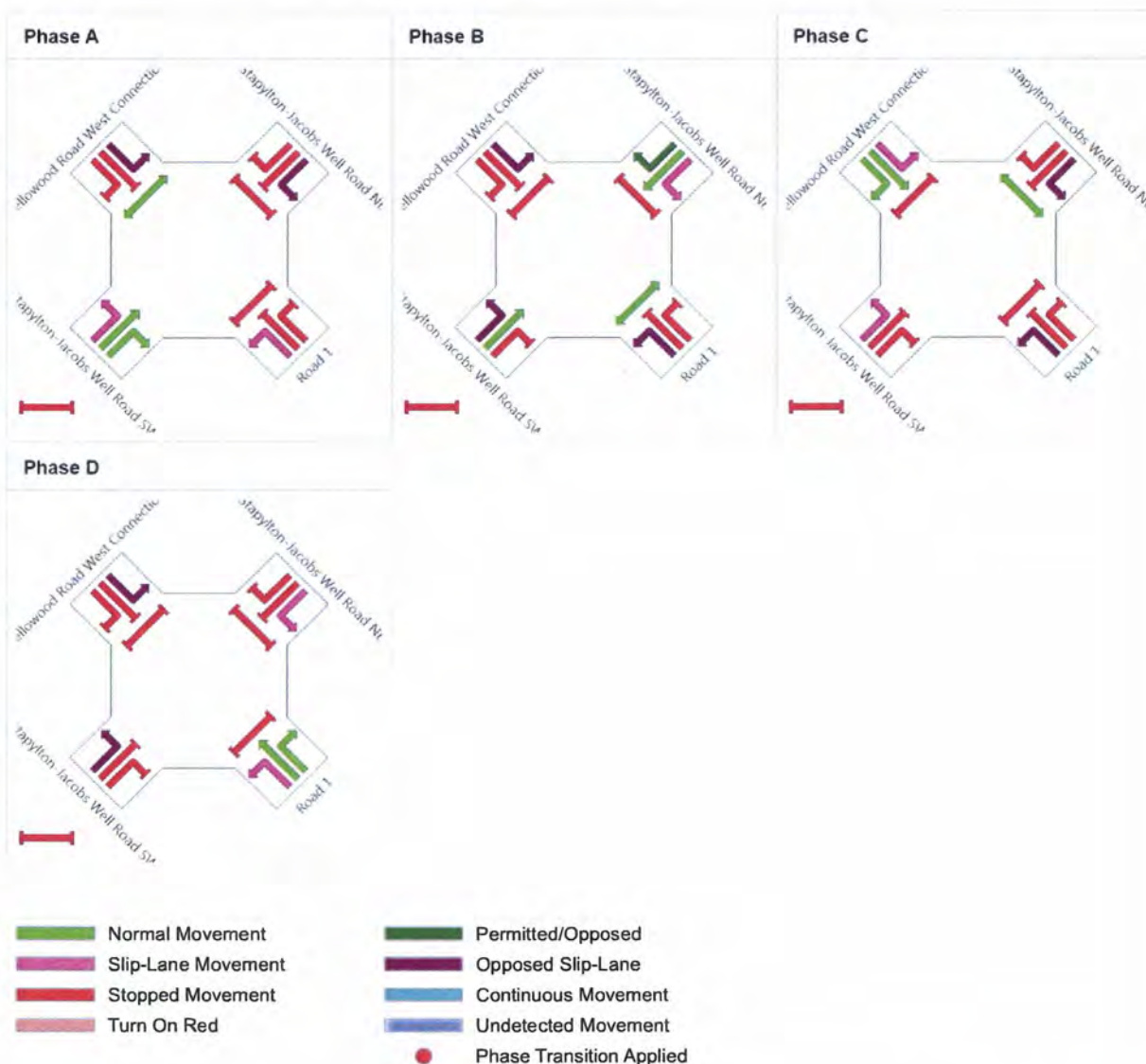
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	33	22	60
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	39	28	66
Phase Split	11 %	26 %	19 %	44 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2019PM Stapylton/Road 1 WD

2019PM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	200	17.6	1.000 ³	26.8	LOS C	7.3	58.5	0.60	0.77	35.0
2	T	540	17.6	1.146	347.9	LOS F	150.7	1214.3	1.00	1.81	5.6
3	R	217	17.6	1.146	356.1	LOS F	150.7	1214.3	1.00	1.81	5.6
Approach		957	17.6	1.146	282.6	LOS F	150.7	1214.3	0.92	1.60	6.8
North East: Stapylton-Jacobs Well Road NE											
4	L	59	17.6	0.056	8.8	LOS A	0.4	3.3	0.15	0.62	48.8
5	T	877	17.6	1.139	343.3	LOS F	83.5	672.6	1.00	2.29	5.7
6	R	16	17.6	0.123	65.3	LOS E	1.0	8.2	0.86	0.73	21.6
Approach		952	17.6	1.139	317.9	LOS F	83.5	672.6	0.94	2.16	6.1
North West: Yellowwood Road West Connection											
7	L	62	17.6	0.283	15.7	LOS B	1.4	11.6	0.38	0.67	42.3
8	T	10	17.6	1.072	235.3	LOS F	38.9	313.0	1.00	1.50	7.8
9	R	250	17.6	1.072	243.6	LOS F	38.9	313.0	1.00	1.50	7.9
Approach		322	17.6	1.072	199.4	LOS F	38.9	313.0	0.88	1.34	9.3
South West: Stapylton-Jacobs Well Road SW											
10	L	62	17.6	0.054	8.2	LOS A	0.2	1.5	0.09	0.61	49.3
11	T	641	17.6	0.549	43.6	LOS D	19.0	153.1	0.87	0.76	26.3
12	R	131	17.6	1.083	260.7	LOS F	19.9	160.6	1.00	1.48	7.4
Approach		834	17.6	1.083	75.1	LOS E	19.9	160.6	0.83	0.86	19.2
All Vehicles		3065	17.6	1.146	228.3	LOS F	150.7	1214.3	0.90	1.54	8.2

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	49.6	LOS E	0.2	0.2	0.81	0.81
P3	Across NE approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
P5	Across NW approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		159	62.6	LOS F			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2019AM Stapylton/Road 1 WD

2019AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

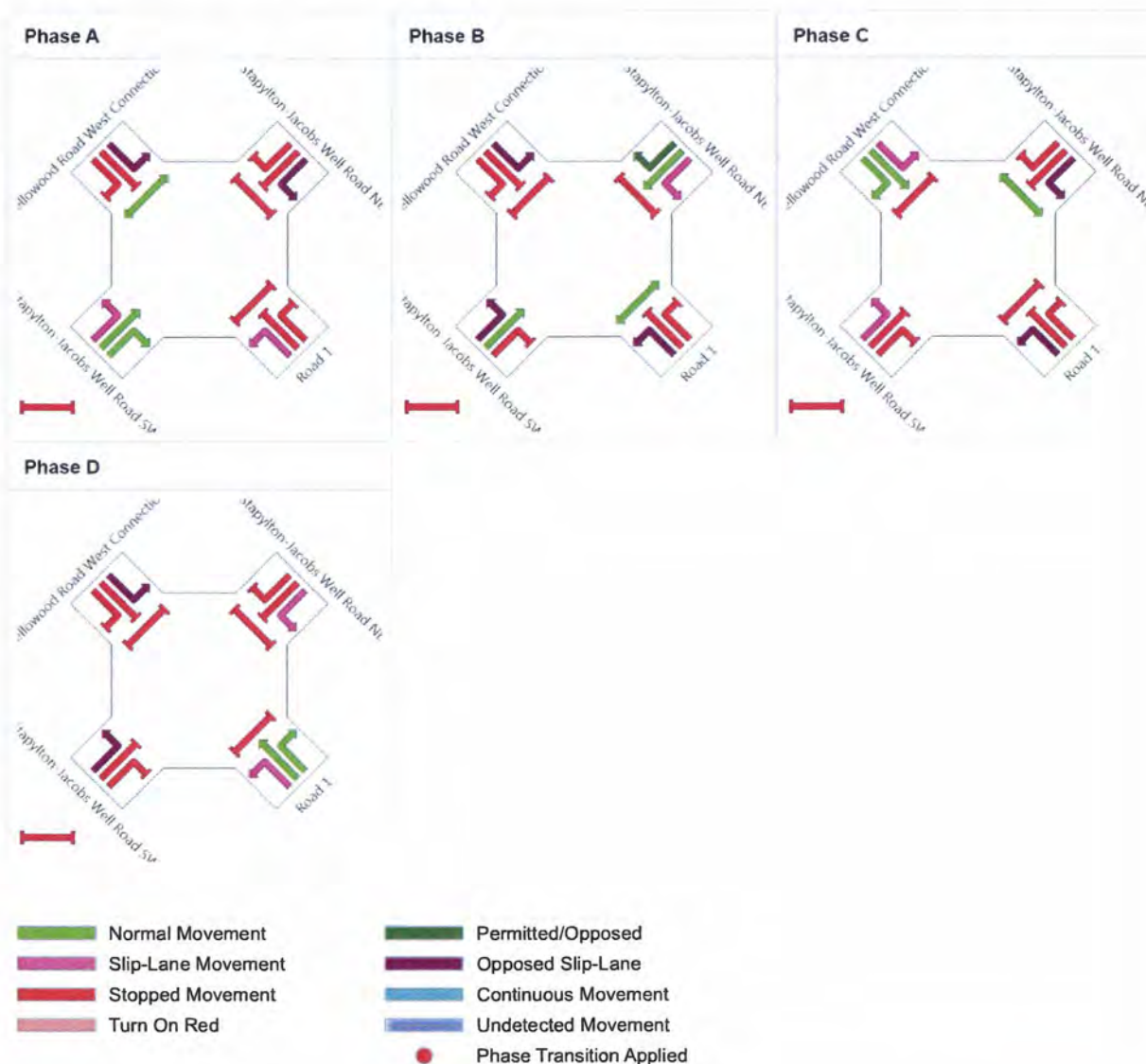
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	29	19	22	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	35	25	28	12
Phase Split	35 %	25 %	28 %	12 %



Processed: 18 August 2011 2:59:58 PM

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INTERSECTION

MOVEMENT SUMMARY

Site: 2019AM Stapylton/Road 1 WD

2019AM Stapylton/Road 1 WD

Signals - Fixed Time Cycle Time = 100 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	283	17.6	0.926	17.9	LOS B	6.1	49.0	0.51	0.74	40.6
2	T	10	17.6	0.863	60.8	LOS E	4.9	39.2	1.00	0.99	21.0
3	R	76	17.6	0.863	69.0	LOS E	4.9	39.2	1.00	0.99	20.9
Approach		369	17.6	0.926	29.6	LOS C	6.1	49.0	0.63	0.80	33.4
North East: Stapylton-Jacobs Well Road NE											
4	L	205	17.6	0.291	14.5	LOS B	3.7	29.8	0.46	0.71	43.2
5	T	650	17.6	0.978	88.9	LOS F	24.5	197.6	1.00	1.41	16.9
6	R	51	17.6	0.329	48.6	LOS D	2.3	18.4	0.90	0.77	25.8
Approach		906	17.6	0.978	69.8	LOS E	24.5	197.6	0.87	1.21	20.1
North West: Yellowwood Road West Connection											
7	L	27	17.6	0.076	10.3	LOS B	0.3	2.2	0.28	0.64	47.1
8	T	10	17.6	0.326	35.9	LOS D	5.0	40.0	0.88	0.71	27.8
9	R	109	17.6	0.326	44.2	LOS D	5.0	40.0	0.88	0.79	27.4
Approach		146	17.6	0.326	37.4	LOS D	5.0	40.0	0.77	0.75	29.7
South West: Stapylton-Jacobs Well Road SW											
10	L	203	17.6	0.173	8.4	LOS A	0.8	6.3	0.16	0.63	48.9
11	T	634	17.6	0.336	13.8	LOS B	8.6	69.4	0.60	0.52	41.7
12	R	426	17.6	1.000 ³	45.7	LOS D	20.3	163.2	1.00	0.87	26.7
Approach		1263	17.6	1.000	23.7	LOS C	20.3	163.2	0.66	0.66	35.8
All Vehicles		2684	17.6	1.000	40.8	LOS D	24.5	197.6	0.74	0.87	27.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	37.0	LOS D	0.1	0.1	0.86	0.86
P3	Across NE approach	53	44.2	LOS E	0.1	0.1	0.94	0.94
P5	Across NW approach	53	28.9	LOS C	0.1	0.1	0.76	0.76
All Pedestrians		159	36.7	LOS D			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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INTERSECTION

PHASING SUMMARY

Site: 2029PM Stapylton/Road 1 WO

2029PM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

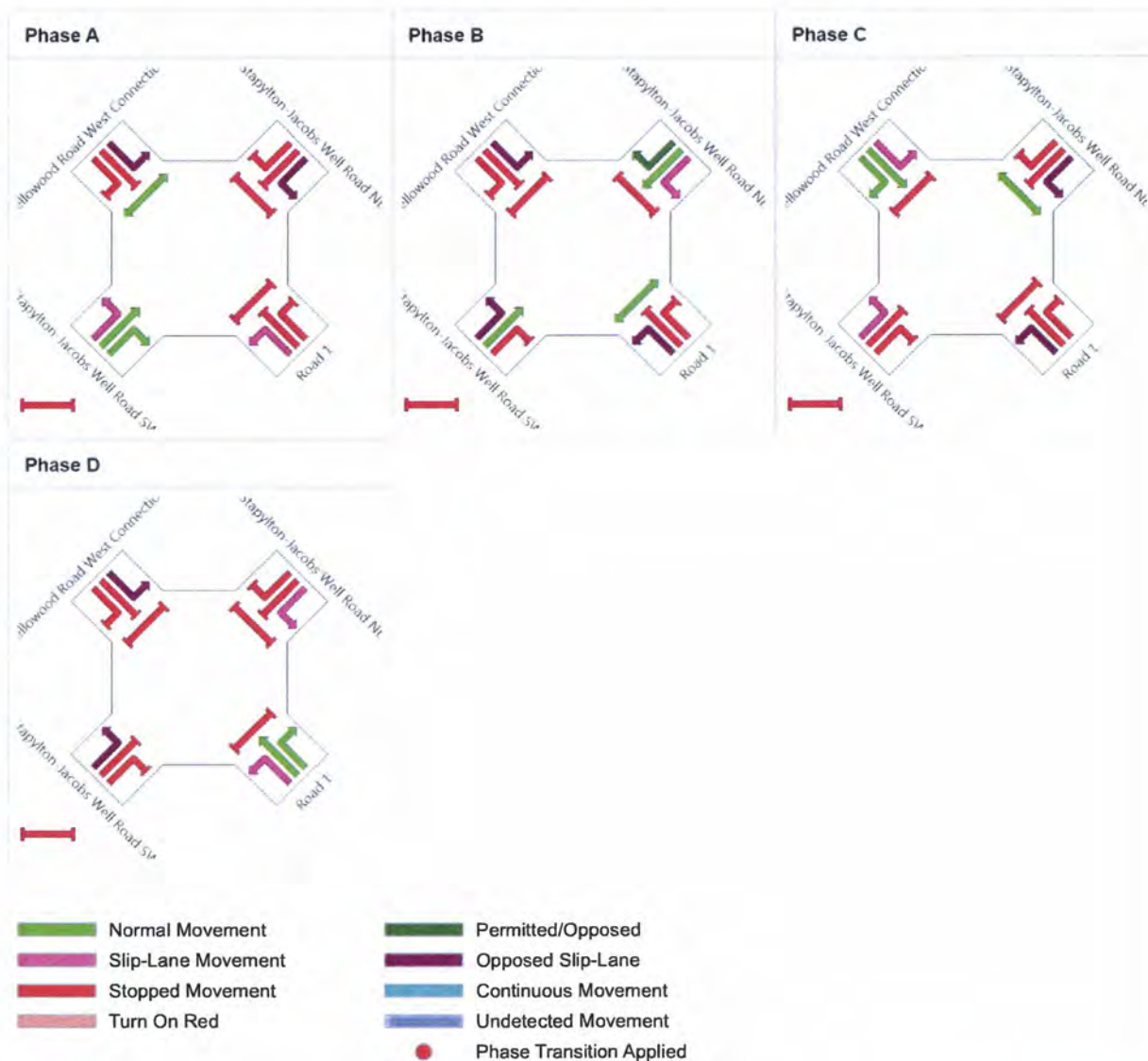
Sequence:

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	87	22	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	93	28	12
Phase Split	11 %	62 %	19 %	8 %



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INTERSECTION

MOVEMENT SUMMARY

Site: 2029PM Stapylton/Road 1 WO

2029PM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	10	17.6	0.042	12.5	LOS B	0.2	1.4	0.29	0.63	45.1
2	T	10	17.6	0.294	80.6	LOS F	1.5	12.3	1.00	0.70	17.8
3	R	10	17.6	0.294	88.9	LOS F	1.5	12.3	1.00	0.70	17.8
Approach		30	17.6	0.294	60.6	LOS E	1.5	12.3	0.76	0.68	22.4
North East: Stapylton-Jacobs Well Road NE											
4	L	10	17.6	0.008	8.2	LOS A	0.0	0.2	0.08	0.60	49.3
5	T	1122	17.6	0.553	20.5	LOS C	24.9	200.4	0.67	0.61	36.8
6	R	10	17.6	0.042	23.3	LOS C	0.3	2.6	0.45	0.69	36.9
Approach		1142	17.6	0.553	20.5	LOS C	24.9	200.4	0.66	0.61	36.9
North West: Yellowwood Road West Connection											
7	L	10	17.6	0.033	9.6	LOS A	0.1	0.8	0.19	0.62	47.8
8	T	10	17.6	0.080	59.7	LOS E	1.3	10.2	0.89	0.65	21.6
9	R	10	17.6	0.080	67.9	LOS E	1.3	10.2	0.89	0.73	21.4
Approach		30	17.6	0.080	45.7	LOS D	1.3	10.2	0.66	0.66	26.4
South West: Stapylton-Jacobs Well Road SW											
10	L	10	17.6	0.009	8.2	LOS A	0.0	0.3	0.08	0.60	49.3
11	T	869	17.6	0.358	9.8	LOS A	12.6	101.9	0.44	0.39	45.7
12	R	10	17.6	0.083	80.2	LOS F	0.7	5.7	0.96	0.68	18.8
Approach		889	17.6	0.358	10.6	LOS B	12.6	101.9	0.44	0.40	45.0
All Vehicles		2091	17.6	0.553	17.2	LOS B	24.9	200.4	0.57	0.52	39.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	15.4	LOS B	0.1	0.1	0.45	0.45
P3	Across NE approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
P5	Across NW approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		159	51.2	LOS E			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA
INTERSECTION

PHASING SUMMARY

Site: 2029AM Stapylton/Road 1 WO

2029AM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

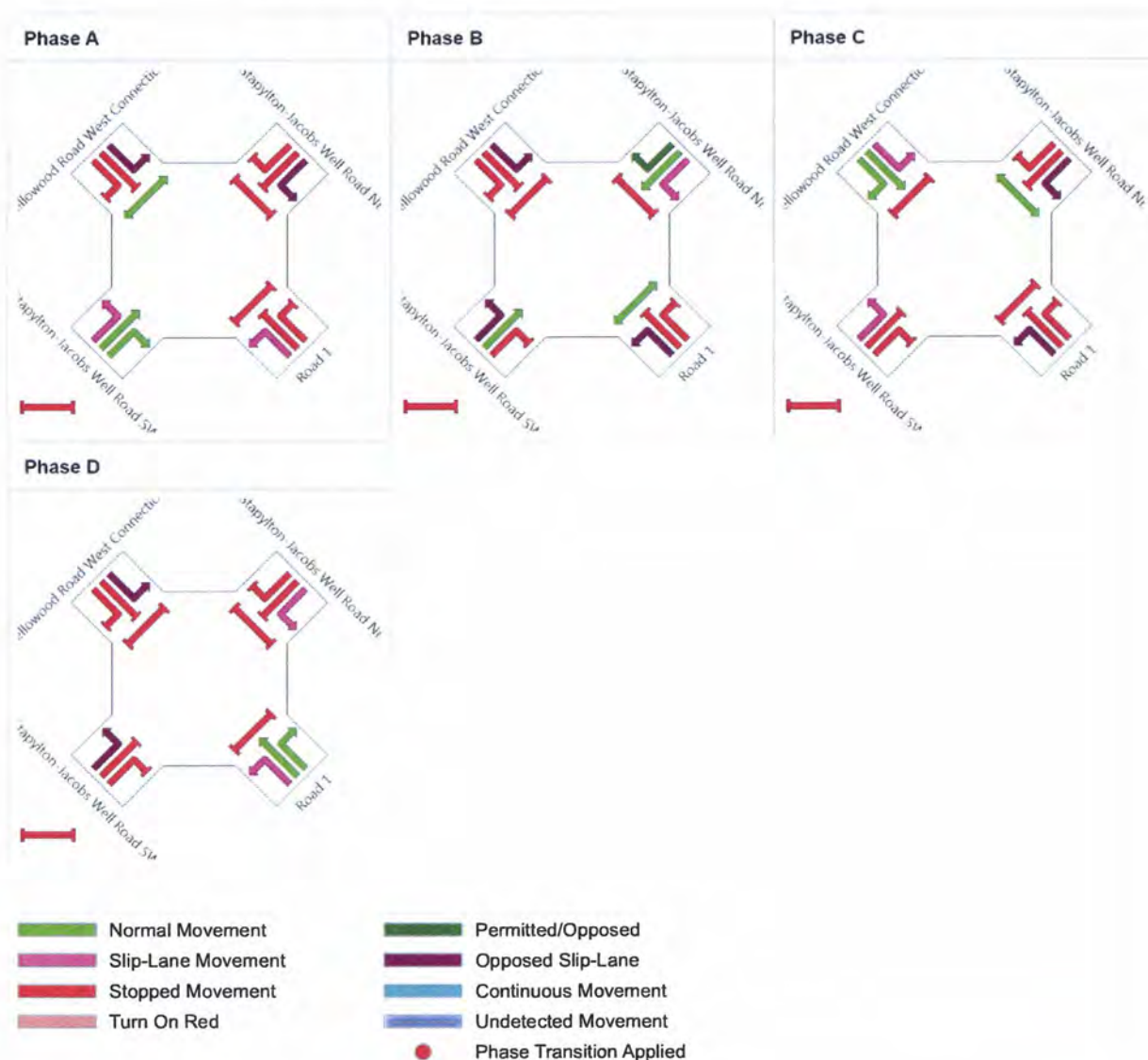
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	87	22	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	93	28	12
Phase Split	11 %	62 %	19 %	8 %



Processed: 11 July 2011 4:56:03 PM
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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: 2029AM Stapylton/Road 1 WO

2029AM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	10	17.6	0.034	10.5	LOS B	0.1	1.0	0.22	0.62	47.0
2	T	10	17.6	0.294	80.6	LOS F	1.5	12.3	1.00	0.70	17.8
3	R	10	17.6	0.294	88.9	LOS F	1.5	12.3	1.00	0.70	17.8
Approach		30	17.6	0.294	60.0	LOS E	1.5	12.3	0.74	0.68	22.5
North East: Stapylton-Jacobs Well Road NE											
4	L	10	17.6	0.008	8.2	LOS A	0.0	0.2	0.08	0.60	49.3
5	T	871	17.6	0.429	18.6	LOS B	17.4	140.5	0.60	0.54	38.2
6	R	10	17.6	0.040	23.2	LOS C	0.3	2.6	0.45	0.69	36.9
Approach		891	17.6	0.429	18.5	LOS B	17.4	140.5	0.59	0.54	38.3
North West: Yellowwood Road West Connection											
7	L	10	17.6	0.032	9.5	LOS A	0.1	0.8	0.18	0.62	48.0
8	T	10	17.6	0.080	59.7	LOS E	1.3	10.2	0.89	0.65	21.6
9	R	10	17.6	0.080	67.9	LOS E	1.3	10.2	0.89	0.73	21.4
Approach		30	17.6	0.080	45.7	LOS D	1.3	10.2	0.66	0.66	26.4
South West: Stapylton-Jacobs Well Road SW											
10	L	10	17.6	0.009	8.2	LOS A	0.0	0.3	0.08	0.60	49.3
11	T	840	17.6	0.346	9.7	LOS A	12.1	97.4	0.43	0.39	45.8
12	R	10	17.6	0.083	80.2	LOS F	0.7	5.7	0.96	0.68	18.8
Approach		860	17.6	0.346	10.5	LOS B	12.1	97.4	0.44	0.39	45.1
All Vehicles		1811	17.6	0.429	15.9	LOS B	17.4	140.5	0.52	0.48	40.4

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across SE approach	53	15.4	LOS B	0.1	0.1	0.45	0.45
P3	Across NE approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
P5	Across NW approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		159	51.2	LOS E			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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PHASING SUMMARY

Site: 2019PM Stapylton/Road 1 WO

2019PM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

Sequence: Two-Phase

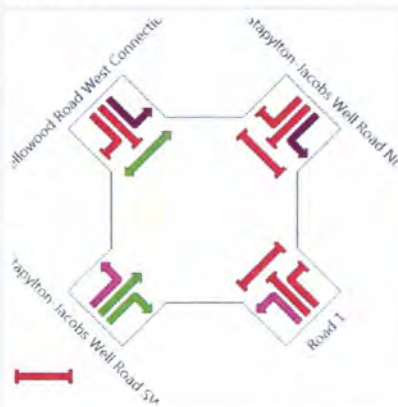
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Output Sequence: A, B, C, D

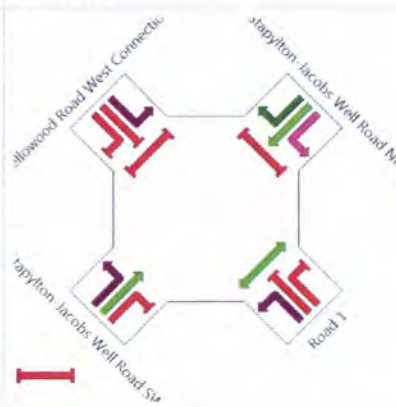
Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	87	22	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	93	28	12
Phase Split	11 %	62 %	19 %	8 %

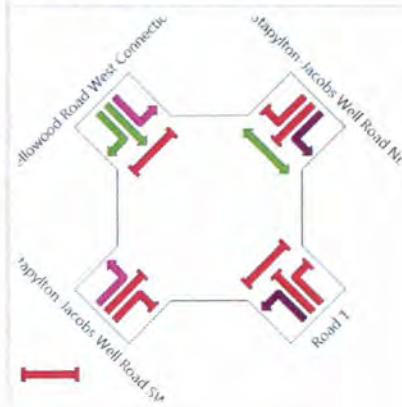
Phase A



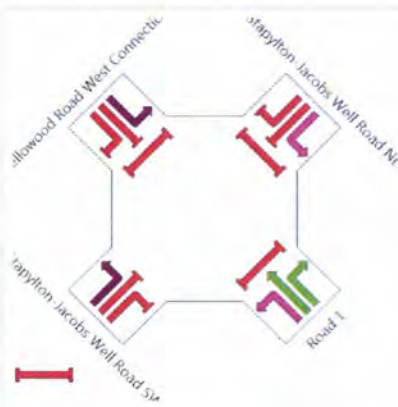
Phase B



Phase C



Phase D



- | | |
|--------------------|--------------------------|
| Normal Movement | Permitted/Opposed |
| Slip-Lane Movement | Opposed Slip-Lane |
| Stopped Movement | Continuous Movement |
| Turn On Red | Undetected Movement |
| | Phase Transition Applied |

MOVEMENT SUMMARY

Site: 2019PM Stapylton/Road 1 WO

2019PM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	10	17.6	0.033	10.3	LOS B	0.1	1.0	0.22	0.62	47.2
2	T	10	17.6	0.294	80.6	LOS F	1.5	12.3	1.00	0.70	17.8
3	R	10	17.6	0.294	88.9	LOS F	1.5	12.3	1.00	0.70	17.8
Approach		30	17.6	0.294	59.9	LOS E	1.5	12.3	0.74	0.68	22.5
North East: Stapylton-Jacobs Well Road NE											
4	L	10	17.6	0.008	8.2	LOS A	0.0	0.2	0.08	0.60	49.3
5	T	827	17.6	0.407	18.2	LOS B	16.3	131.2	0.59	0.53	38.5
6	R	10	17.6	0.033	22.9	LOS C	0.3	2.5	0.44	0.69	37.1
Approach		847	17.6	0.407	18.2	LOS B	16.3	131.2	0.58	0.53	38.6
North West: Yellowwood Road West Connection											
7	L	10	17.6	0.026	9.0	LOS A	0.1	0.6	0.15	0.61	48.6
8	T	10	17.6	0.080	59.7	LOS E	1.3	10.2	0.89	0.65	21.6
9	R	10	17.6	0.080	67.9	LOS E	1.3	10.2	0.89	0.73	21.4
Approach		30	17.6	0.080	45.5	LOS D	1.3	10.2	0.65	0.66	26.5
South West: Stapylton-Jacobs Well Road SW											
10	L	10	17.6	0.009	8.2	LOS A	0.0	0.3	0.08	0.60	49.3
11	T	641	17.6	0.264	9.0	LOS A	8.6	69.0	0.40	0.35	46.6
12	R	10	17.6	0.083	80.2	LOS F	0.7	5.7	0.96	0.68	18.8
Approach		661	17.6	0.264	10.1	LOS B	8.6	69.0	0.41	0.36	45.6
All Vehicles		1568	17.6	0.407	16.1	LOS B	16.3	131.2	0.51	0.46	40.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
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P5	Across NW approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		159	51.2	LOS E			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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PHASING SUMMARY

Site: 2019AM Stapylton/Road 1 WO

2019AM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

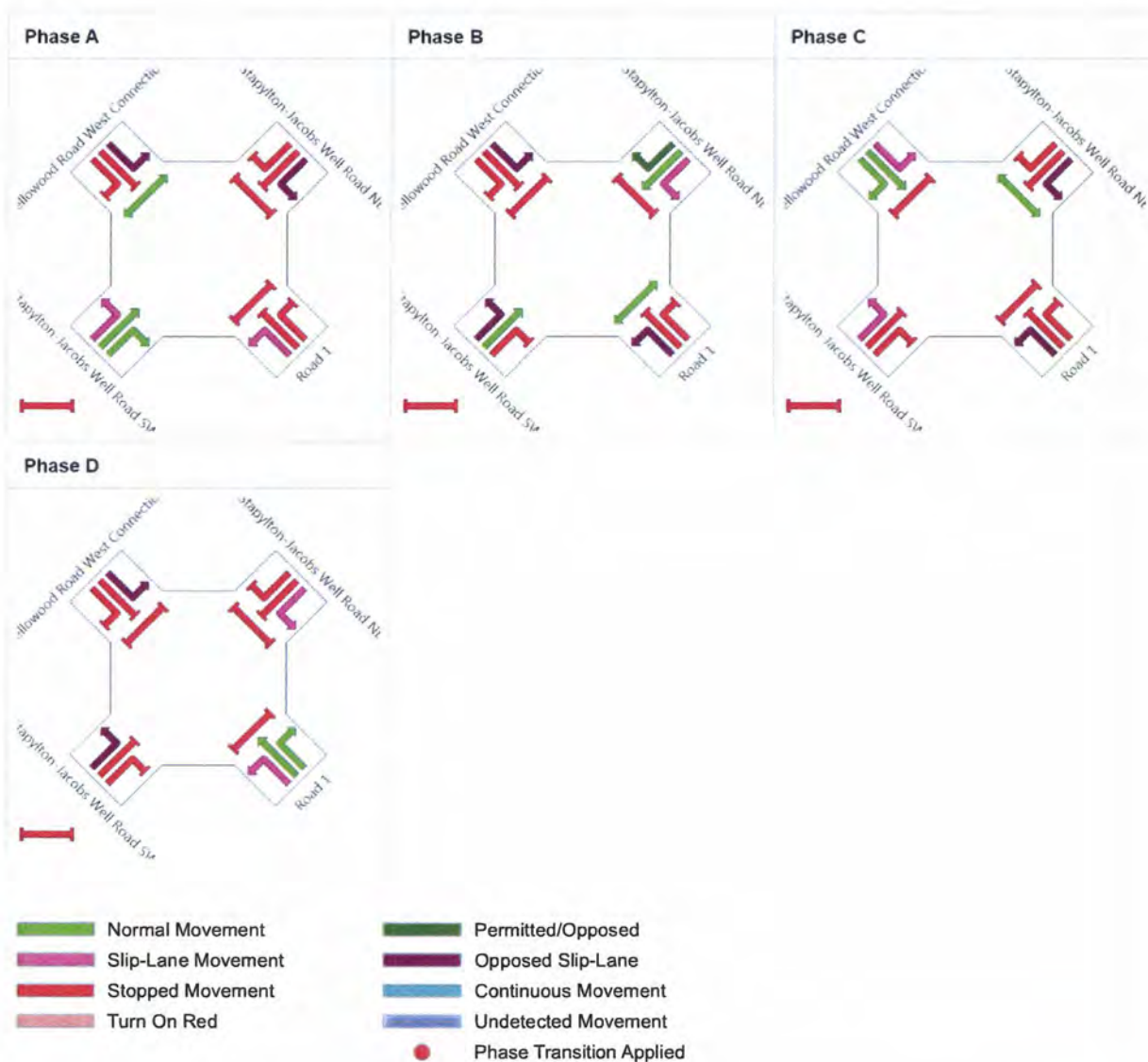
Sequence: Two-Phase

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	11	87	22	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	17	93	28	12
Phase Split	11 %	62 %	19 %	8 %



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MOVEMENT SUMMARY

Site: 2019AM Stapylton/Road 1
WO

2019AM Stapylton/Road 1 WO

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Road 1											
1	L	10	17.6	0.027	9.5	LOS A	0.1	0.8	0.18	0.62	48.0
2	T	10	17.6	0.294	80.6	LOS F	1.5	12.3	1.00	0.70	17.8
3	R	10	17.6	0.294	88.9	LOS F	1.5	12.3	1.00	0.70	17.8
Approach		30	17.6	0.294	59.6	LOS E	1.5	12.3	0.73	0.67	22.6
North East: Stapylton-Jacobs Well Road NE											
4	L	10	17.6	0.008	8.2	LOS A	0.0	0.2	0.08	0.60	49.3
5	T	642	17.6	0.316	17.0	LOS B	11.8	95.1	0.55	0.48	39.4
6	R	10	17.6	0.032	22.9	LOS C	0.3	2.5	0.44	0.69	37.1
Approach		662	17.6	0.316	17.0	LOS B	11.8	95.1	0.54	0.49	39.5
North West: Yellowwood Road West Connection											
7	L	10	17.6	0.025	8.8	LOS A	0.1	0.6	0.15	0.61	48.7
8	T	10	17.6	0.080	59.7	LOS E	1.3	10.2	0.89	0.65	21.6
9	R	10	17.6	0.080	67.9	LOS E	1.3	10.2	0.89	0.73	21.4
Approach		30	17.6	0.080	45.5	LOS D	1.3	10.2	0.65	0.66	26.5
South West: Stapylton-Jacobs Well Road SW											
10	L	10	17.6	0.009	8.2	LOS A	0.0	0.3	0.08	0.60	49.3
11	T	619	17.6	0.255	9.0	LOS A	8.2	66.2	0.40	0.35	46.7
12	R	10	17.6	0.083	80.2	LOS F	0.7	5.7	0.96	0.68	18.8
Approach		639	17.6	0.255	10.1	LOS B	8.2	66.2	0.40	0.36	45.6
All Vehicles		1361	17.6	0.316	15.3	LOS B	11.8	95.1	0.48	0.44	41.0

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
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P3	Across NE approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
P5	Across NW approach	53	69.1	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		159	51.2	LOS E			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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APPENDIX D

ASSUMPTIONS FOR NEARBY INDUSTRIAL DEVELOPMENT

- Area assumed to be warehouse
- 45% GFA for trip generation

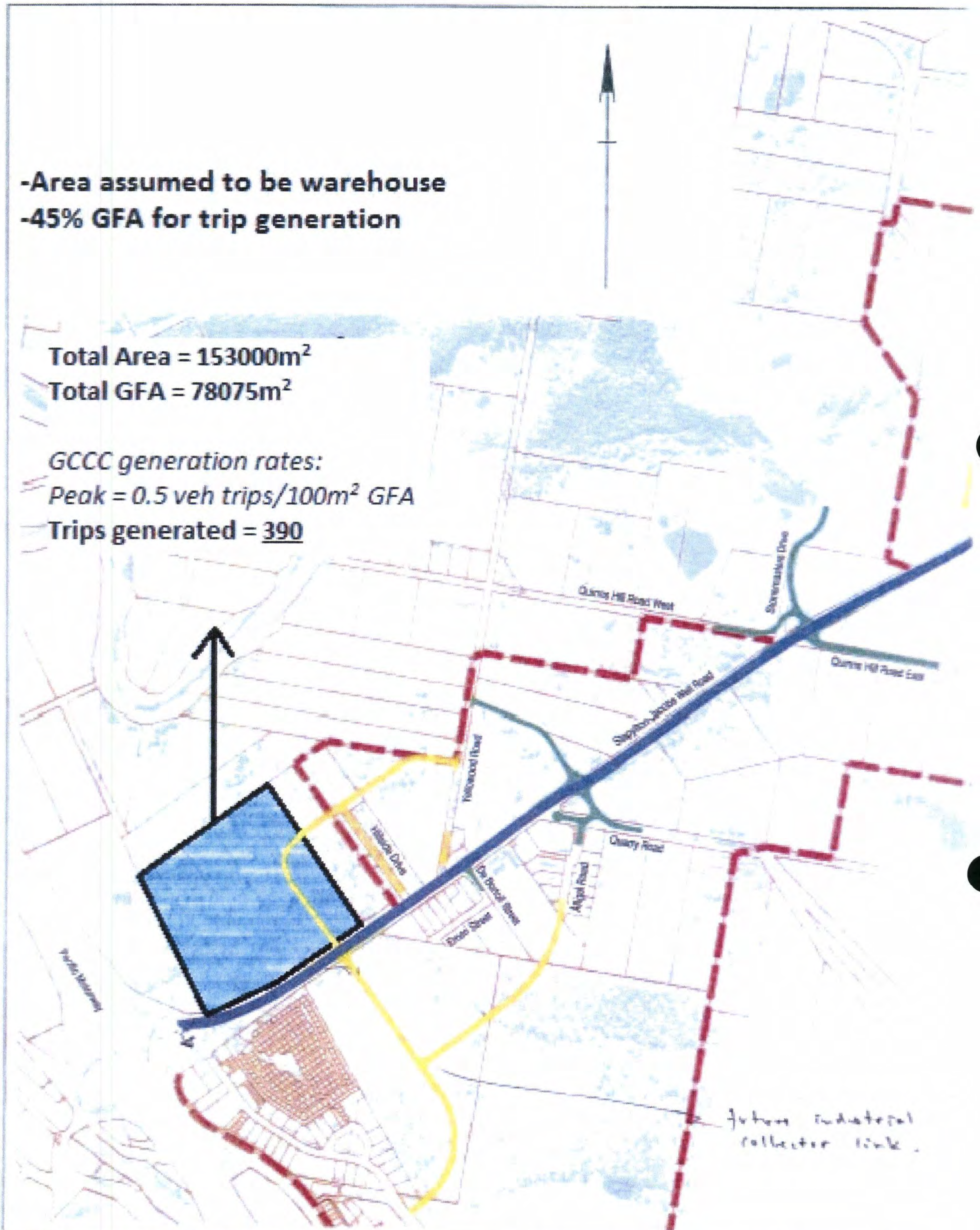
Total Area = 153000m²

Total GFA = 78075m²

GCCC generation rates:

Peak = 0.5 veh trips/100m² GFA

Trips generated = 390



Revisions	Verified	Date	Marked	Associated Job Refs	Survey Data	Scale	Notes
					North Datum	CD494 Zone 5B	
					Apex Datum	CD494 Zone 5B	
					Height Datum	PMB3854, Height 12.142 AHD	
					Survey Data	WRE1552 1003-50. & 1003-40	
Original Issue							

11 – ECOLOGICAL ASSESSMENT (GDP)

ECOLOGICAL ASSESSMENT

Lot 1 on RP6882 and Lot 240 on W31320

Stapylton-Jacob's Well Road and
Christensen Road, Stapylton

PREPARED FOR

PATRICIA AND WILLIAM HESTER

SEPTEMBER 2011



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perspectives**

project coordination
urban + regional planning
landscape + urban design
environmental management
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Telephone: (07) 38073333 Fax: (07) 32875461 Email mail@gassman.com.au		Job Number: 5093
		Original Date of Issue: September 2011

DOCUMENT DETAILS

Title:	Ecological Assessment
Principal Author(s):	Mark Spears
Project Manager:	Brian Gassman
Client:	W & P Hester
Site Description:	Currently cleared open paddock with vegetated areas present
Client Address:	60 Stapylton-Jacobs Well Road, Stapylton
Client Contact:	

REVISION/CHECKLIST HISTORY

Revision Number	Date	Checked by	Issued by
		MS	

DISTRIBUTION RECORD

Destination	0	1	2	3	4	5	6	7	8	9
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Client (unbound)										
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Gassman Environmental Library		X								
Environmental Protection Agency										
Department of Primary Industries										
Other		X								

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1 Introduction

Purpose

Gassman Development Perspectives Pty Ltd (GDP) has been engaged by William and Patricia Hester (the client) to prepare an Ecological Site Assessment Report on allotments identified as Lot 1 on RP6882 and Lot 240 on W31320 at Stapylton-Jacob's Well Road and Christensen Road, Stapylton.

This report has been provided to guide the client in development planning and to assist regulatory authorities in the assessment of the site's ecological value and potential impacts of the proposal on these values.

The report will provide the results of ecological surveys conducted on the subject site, and have been guided by the Ecological Assessment Guidelines provided by Gold Coast City Council.

The objectives of this report are:

- To identify ecological constraints relevant to future development of the site through desktop and field investigations;
- To provide evidence to the Assessment Manager of the proposed development's ecological impacts;
- To provide recommendations to the client regarding ecological considerations for the site.

Structure of Report

This report has been structured to provide information consistent with the requirements of the Gold Coast City Planning Scheme, *Vegetation Management Act* (1999), *Nature Conservation (Wildlife) Act* (1992) and the *Environmental Protection and Biodiversity Conservation Act* (1999). The report is structured as follows:

Part 1

1. *Introduce the site and proposed development;*
2. *Provide a desktop review of relevant ecological components of the site;*

Part 2

3. *Provide details of the methods implemented to gather onsite ecological data;*
4. *Summarise ecological assessment;*
5. *Provide an ecological impact analysis.*

2 Site Details

2.1 Location

The subject land (also referred to as 'the subject site') is within the Gold Coast City Council Local Area Plan – Yatala Enterprise Area and is bordered by Stapylton-Jacob's Well Road in the northwest, industrial development to the north, industrial and housing development to the west, a land fill site to the east and Sandy Creek to the south (Figure 1 and Figure 2).



Figure 1 – Aerial Photo of Subject Site (Source: NearMap.com)



Figure 2 - Locality Map

(Source: Google Maps)

Lot 1 RP6882 has an area of 205,050m² and is currently utilised as a private residence with in addition to agricultural uses. Lot 240 W31320 has an area of 532,558 m² with a portion being utilised as a light industrial enterprise with infrastructure associated with the manufacture and storage of soil and fertilisers by Amgrow Pty Ltd. The combined lots equate to a total land area of 737,608m².

Approximately half of the area of the combined subject site has been cleared and is used for pastoral purposes. The remainder contains remnant vegetation and some degraded wetland areas. The subject site is part of the Albert/Logan River Catchment area.

The subject site is further identified under the Gold Coast City Council Local Area Plan – Yatala Enterprise Area (YEA) as being designated Precinct 4 – Future Industry with a portion of Precinct 6 – Open Space (refer Figure 3). Precinct 4 is intended to be developed for industry purposes as an extension of the development that is contemplated for adjacent areas. Forms of development that are intended to be permitted are those that will neither compromise the capacity of these areas to develop intensively for industry in the future nor compromise the development of other parts of the plan area for intended purposes. Precinct 6

is intended to serve as an area of environmental conservation and natural landscape relief, with a minimal level of development.



Figure 3 - Yatala Enterprise Area Local Area Plan Map 29.2 - Precincts

The Performance Criteria and Acceptable Solutions relating to development within these precincts are addressed in Appendix 1.

The Local Area Plan – Yatala Enterprise Area also identifies conservation areas mapped as occurring over the subject site (Figure 4).



Figure 4 - Yatala Enterprise Area Local Area Plan - LAP Map 29.3 - Conservation Area and Priorities

Core ecological constraints inherently attached to the site are:

- Gold Coast City Council – Local Area Plan – Yatala Enterprise Area.
- Gold Coast City Council – Constraint Code – Bushfire Management Areas.
- Gold Coast City Council – Constraint Code - Natural Wetland Areas and Natural Waterways.
- Gold Coast City Council – Constraint Code – Nature Conservation.

These constraints will be discussed in further detail in Section 7.3

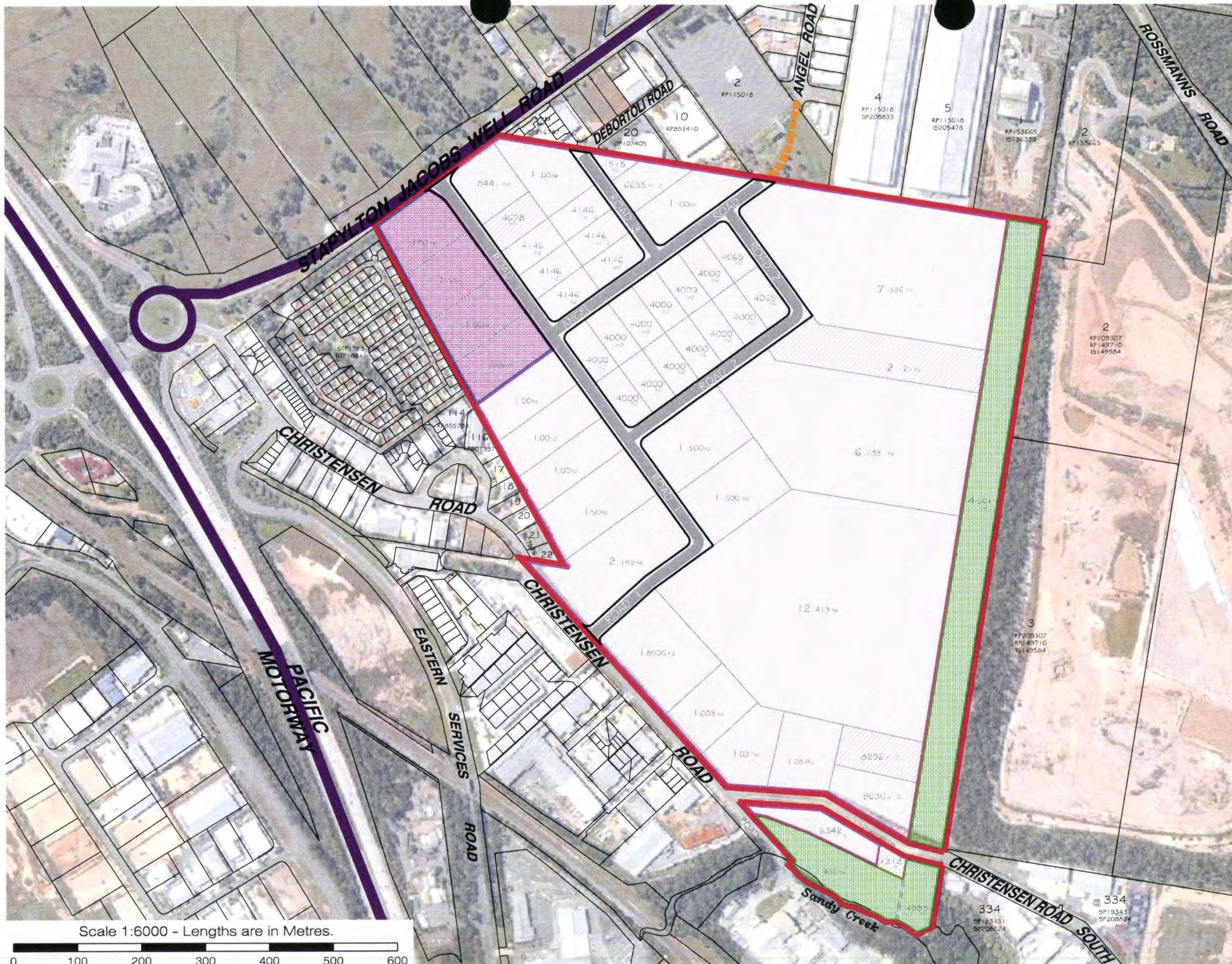
Local Legislation.

2.2 Proposed Development

The proposed development of the subject site involves the provision of a blend of industrial, recreational and conservation uses are envisaged for the subject site. The proposed development will offer necessary industrial sites to augment the expansion of Yatala Enterprise Area as endorsed in Gold Coast City Council's Local Area Plan.

Gold Coast City Council has stated that this Future Business and Industry Precinct, to the east of the Pacific Motorway is expected to become General Impact Business and Industry. This use is intended to accommodate a broad range of manufacturing industries, warehouses and distribution centres of a general industrial nature. The proposed lot sizes and configurations will provide opportunities for a variety of industrial enterprises whilst supplementing existing industrial areas adjacent to the north, west and south of the site. A concept plan of the proposed development is shown in Figure 5.

The proposed development will incorporate conservation strategies an open space dedication. A north-south orientated ecological buffer will be established along the entire length of the eastern boundary and also to the north of Sandy Creek between the creek and the proposed development, providing an effective conservation linkage to the south and north of the site. This buffer will be rehabilitated, where necessary, utilising local species.



LEGEND

Site Area: 73.114 Ha

- Limit of Application
- Major State controlled Roads
- Proposed northern link to site
- Indicative site north-south / east-west connectivity
- Indicative site lot layout only

	PRECINCT ONE DEVELOPMENT AREA (INDUSTRY)	59.049Ha
	DESIGN CONTROL AREA	4.0Ha
	STORMWATER DRAINAGE / DETENTION (INDUSTRY)	3.544Ha
	PRECINCT SIX (OPEN SPACE / RESERVE)	6.521 Ha

Scale 1:6000 - Lengths are in Metres.

0 100 200 300 400 500 600



planning
design
environment
surveying

Brisbane Office
Level 13
97 Creek Street Brisbane Q. 4000
t: (07) 32216732
f: (07) 32217308
Gold Coast and Logan Office
Access Business Park
76 Business Street Yatala Q. 4207
t: (07) 38073333
f: (07) 32875461
e: mail@gassman.com.au
w: www.gassman.com.au



land-use classification plan stapylton-jacobs well road, stapylton generations industrial park

date: 02-11-11
scale: 1:6000
design: BJW/SJH
plan: 5093 P 00 09C

3 Flora assessment

3.1 Introduction

This section outlines the methods used in flora surveys of the subject site and presents the results of the findings.

3.2 Methods

3.2.1 Database searches

A database search was conducted using the Department of Environment, Water, Heritage and Arts (DEWHA) Protected Matters Search feature which lists all recorded occurrences of Commonwealth listed species under the *Environmental Protection and Biodiversity Conservation Act 1999*. The search was conducted of species known to occur within a 5km radius of the subject site.

The Department of Environment and Resource Management (DERM) Wildlife Online Database was also searched for listed species known to occur within a 5km radius of the subject site as listed in the *Nature Conservation Act 1992*.

3.2.2 Regional ecosystem mapping

The Department of Environment and Resource Management (DERM) Regional Ecosystem (RE) mapping (version 6) was obtained from the DERM website using the lot and plan number of the subject site.

3.2.3 Site surveys

A site inspection was made of the vegetation and documentation was completed by a scientist from GDP on the 21st and 22nd of December 2010 for a total of approximately twelve (12) hours. The present vegetation on the subject site is discussed in the context of the Regional Ecosystem Description Database provided by DERM and the Queensland *Vegetation Management Act 1999* (VMA).

Prior to undertaking the site inspection, RE maps for the site were obtained to verify the accuracy of the mapping of vegetation on the subject site.

"Random Meander" searches were undertaken on the subject site to investigate present vegetation types and to search for Threatened Flora. This technique involves traversing the site in a non-methodical fashion until all areas have been surveyed.

3.3 Results

3.3.1 Database searches

The EPBC Protected Matters search indicated that fourteen (14) flora species, which are "Matters of National Environmental Significance" are known to occur within a 5km radius of the subject site. The DERM Wildlife Online search also indicated that three (3) rare or threatened flora species were also known to occur within a 5km radius of the subject site. A summary of these species is shown in Table 1.

Table 1 - Combined database records of threatened species within 5km of the subject site

Scientific Name	Common Name	Status	
		EPBCA	NCA
<i>Allocasuarina defungens</i>	Dwarf Heath Casuarina	E	
<i>Baloghia marmorata</i>	Marbled Baloghia, Jointed Baloghia	V	
<i>Bosistoa selwynii</i>	Heart-leaved Bosistoa	V	
<i>Bosistoa transversa</i>	Three leaved Bosistoa	V	
<i>Choricarpia subargentea</i>	Giant Ironwood		NT
<i>Corchorus cunninghamii</i>	Native Jute	E	
<i>Cryptocarya foetida</i>	Stinking Cryptocarya, Stinking Laurel	V	
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	
<i>Gossia gonoclada</i>	Angle-stemmed Myrtle	E	E
<i>Hydrocharis dubia</i>	Frogbit	V	
<i>Lepidium peregrinum</i>	Wandering Pepper-cress	E	
<i>Macadamia integrifolia</i>	Macadamia Nut	V	V
<i>Phebalium distans</i>	Mt Berryman Phebalium	CE	
<i>Planchonella eerwah</i>	Shiny Leaved Condoo	E	E
<i>Taeniophyllum muelleri</i>	Minute Orchid, Ribbon-root Orchid	V	

CE = critically endangered, E = endangered, V = vulnerable, NT = near threatened

During the site survey, no threatened flora was observed on the subject site.

3.3.2 Regional ecosystem mapping

Current (version 6.0) RE mapping provided by DERM indicates the presence of remnant 'least concern' vegetation, described as RE 12.11.5, covering three areas of the subject site (Figure 6) which is described as *Corymbia citriodora*, *Eucalyptus siderophloi*, *E. major* in an open-forest on metamorphic +/- interbedded volcanics.

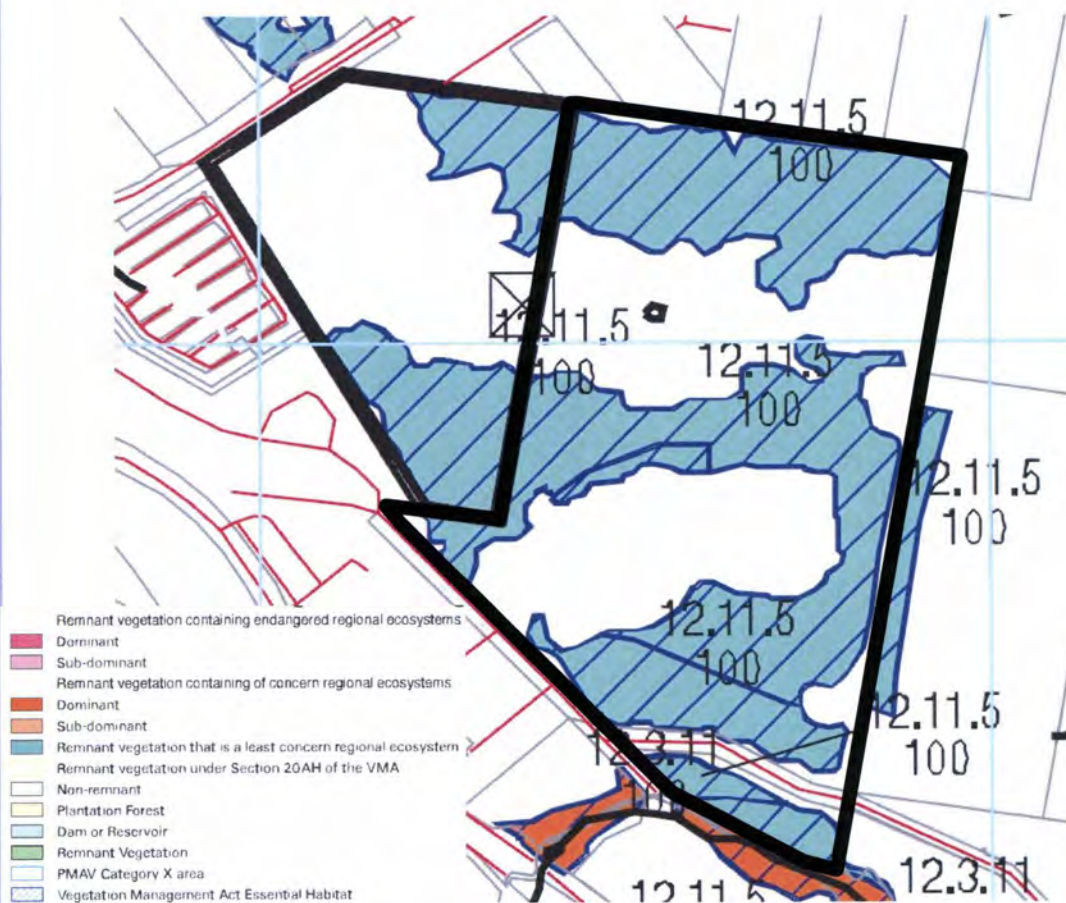


Figure 6- Regional Ecosystem Map of Remnant Vegetation – Version 6

Source: DERM

The site is also highlighted on the DERM Vegetation Management Act Essential Habitat Map (version 3) as an area of regrowth habitat containing species that are associated with *Phascolarctos cinereus* (Koala). Please refer Figure 6 and Figure 7.)

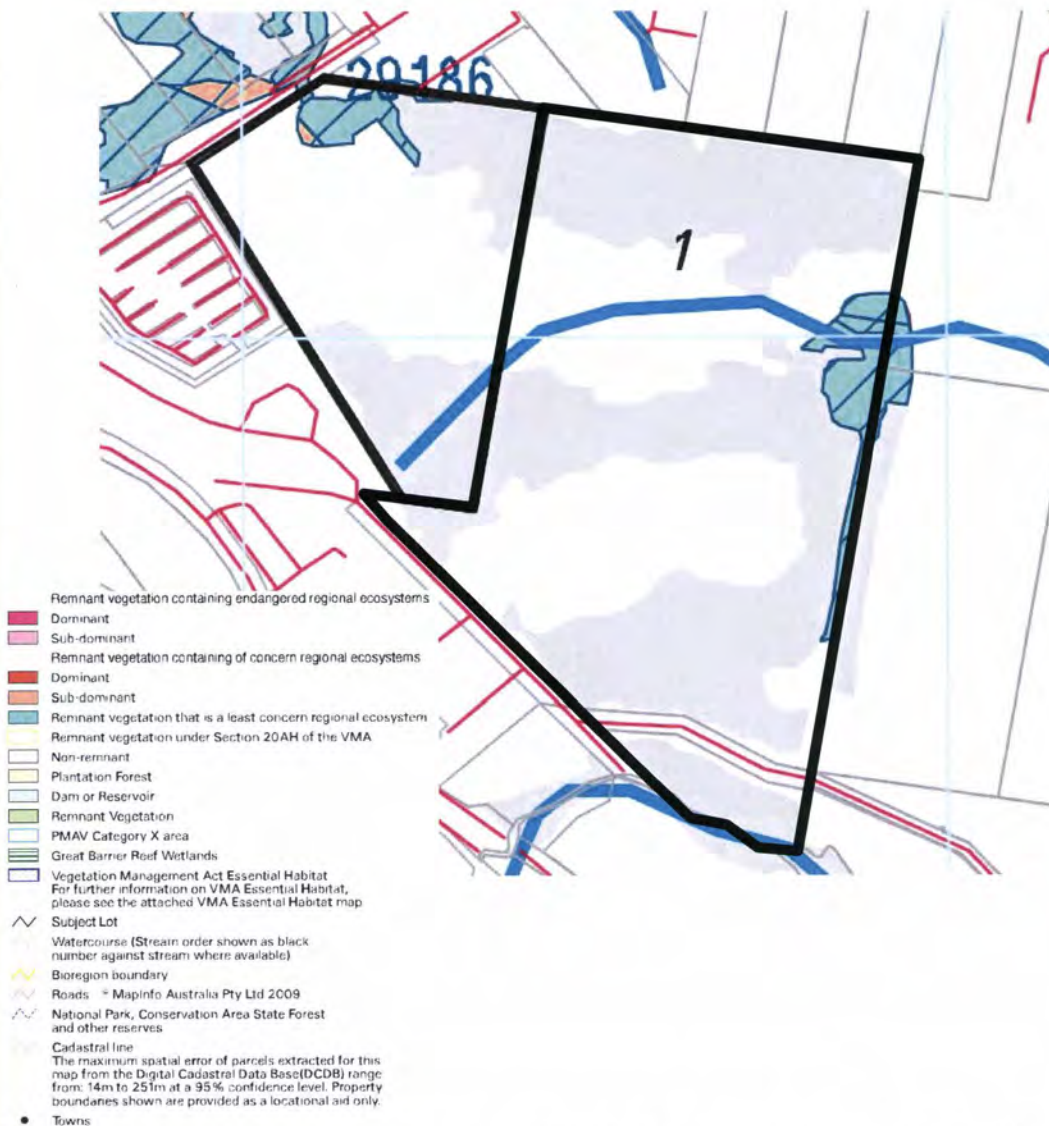


Figure 7 – Vegetation Management Act Essential Habitat Map - Version 3.0

Source: DERM

3.3.3 Vegetation communities

A detailed site inspection and ground truthing revealed that there are eight (8) vegetation communities occurring on the subject site (refer Figure 8). They are described as follows:

Community 1 – Open grassland with scattered trees (*Corymbia intermedia*, *Corymbia citriodora*, *Eucalyptus siderophloia* and *Eucalyptus tereticornis*)

Location

This community is found in the lower portion of the northern half of the site and continues in a narrow strip on the north-western boundary to the existing industrial enterprise. This community accounts for approximately one quarter of the site (refer Figure 8).

Composition

This community has scattered mature trees occurring in a pastoral paddock devoid of understorey except for pastoral weeds and grasses. The trees are large and mature and many contain hollows.

Significant species

No significant species were recorded within this community.

Conservation status

This community does not have any conservation status and is not analogous with any Regional Ecosystem.

Community 2 – Low open forest (*Corymbia citriodora*, *Corymbia intermedia* +/- *Eucalyptus crebra*, *Eucalyptus siderophloia*)

Location

This community occurs from the edge of the open grassland (Community 1) along the upper northern boundary to the sites eastern boundary, in a pocket centrally located on the site and in the lower southern half of the site from the existing industrial enterprise to Christensen Road (refer Figure 8).

Composition

This canopy of this community is dominated by the above species. An intact mid-storey is comprised of *Acacia leiocalyx*, *Lophostemon confertus* and in lower lying areas *Lophostemon suaveolens* and *Melaleuca quinquenervia*. The understorey is generally dominated by *Imperata cylindrica*. Various levels of weed infestations are found in the understorey including



LEGEND

Community One
Open grassland with scattered trees (Corymbia intermedia, Corymbia citriodora, Eucalyptus siderophloia and Eucalyptus tereticornis).

Community Two
Low open forest (Corymbia citriodora, Corymbia intermedia +/- Eucalyptus crebra, Eucalyptus siderophloia).

Community Three
Constructed dams / wetlands.

Community Four
Low open forest (Melaleuca nodosa +/- Eucalyptus crebra, Corymbia citriodora).

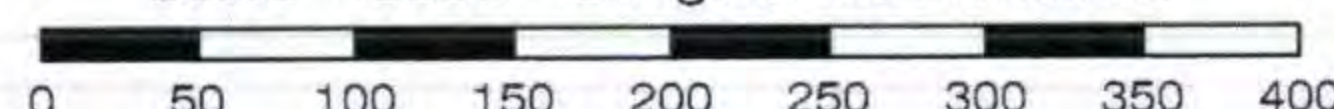
Community Five
Low open forest (Allocasuarina littoralis +/- C. citriodora, E. major).

Community Six
Tall open forest (Eucalyptus grandis +/- C. intermedia, E. major).

Community Seven
Degraded wetland (various weed species).

Community Eight
Industrial Uses.

Scale 1:5000 - Lengths are in Metres.



the presence of *Lantana camara*, *Pratia purpurascens* and *Commelina diffusa*.

Significant species

No significant species were recorded within this community.

Conservation status

This community is analogous to Regional Ecosystem 12.11.5e which is confirmed by vegetation mapping over the site.

Community 3 – Artificially constructed dams

Location

There are two dams on the subject site. One is located centrally in the lower northern half of the site and the other close to the eastern boundary of the site. There are a further two dams which are part of the currently operating soil and fertiliser plant which were not inspected due to access issues. An area of wetland was also located to the south of the second dam, along the eastern boundary (refer Figure 8).

Composition

This community is a wetland community dominated by emergent aquatic macrophytes, sedges and floating water weeds including *Cyperus exaltatus*, *Nymphoides* sp., *Cyperus polystachyos* and *Lemna minor*. Occurring in lower lying areas of the subject site, they have been artificially constructed and are utilised by cattle on site as a water source.

Significant species

No significant species were recorded within this community.

Conservation status

This community does not have any conservation status and is not analogous with any Regional Ecosystem.

Community 4 – Low open forest (*Melaleuca nodosa* +/- *Eucalyptus crebra*, *Corymbia citriodora*)

Location

This community is located in a pocket adjacent to the northern edge of the open grassland (Community 1). It is also located on either side of the central pocket of Community 2, the with western pocket continuing around the existing industrial enterprise to the western site boundary. This community is also located at the southern extreme of the subject site, adjacent to Sandy Creek in a central pocket on the southern side of Christensen (refer Figure 8).

Composition

This community occurs on lower slopes of the subject site and in a small pocket on the southern side of Christensen Road adjacent to Sandy Creek. Whilst dominated by low *Melaleuca nodosa*, occasional *Eucalyptus crebra*, *Corymbia citriodora* and *Eucalyptus propinqua* and *Eucalyptus major* comprise the canopy layer. In addition to *M. nodosa*, the mid-storey is comprised of *Allocasuarina littoralis*, *Acacia leiocalyx* and *L. suaveolens*. The understorey consists of juvenile *Alphitonia excelsa*, *Lepidosperma laterale* and *Ottochloa gracillima*.

Significant species

No significant species were recorded within this community.

Conservation status

This community is analogous to Regional Ecosystem 12.11.5e which is confirmed by vegetation mapping over the site.

Community 5 – Low open forest (*Allocasuarina littoralis* +/- *C. citriodora*, *E. major*)

Location

This vegetation community occurs in a small pocket in the vicinity of the eastern boundary.

Composition



This community occurs in a small pocket in the eastern portion of the site and is dominated by *A. littoralis*. Canopy species include *C. citriodora* and *E. major*. Occasional *E. crebra* and *C. intermedia* are also present. Understorey is largely absent due to inundation of needles from *A. littoralis*.

Significant species

No significant species were recorded within this community.

Conservation status

This community is analogous to Regional Ecosystem 12.11.5e which is confirmed by vegetation mapping over the site.

Community 6 – Tall open forest (*Eucalyptus grandis* +/- *C. intermedia*, *E. major*)

Location

This community is located in the lower southern extreme of the subject site, which is south of Christensen Road and adjacent to Sandy Creek. This community extends both east and west to the sites boundaries from the central pocket of Community 4.

Composition

This community occurs in the riparian zone of Sandy Creek on the southern side of Christiansen Road. It is densely forested and contains substantially taller vegetation than the rest of the subject site. In addition to the dominant species, this community features occasional *E. crebra*, *A. littoralis*, *L. suaveolens*, *L. confertus* as a mid-storey and a predominantly vine and bracken fern understorey. Some incursions of *L. camara* were observed.

Significant species

No significant species were recorded within this community.

Conservation status

Whilst this community is mapped as 12.11.5, it is more consistent with 12.3.11 which is mapped as occurring adjacent to this site on the southern side of Sandy Creek.

Community 7 – Degraded wetland (various weed species)

Location

This community transects the lower southern portion the subject site, as a thin strip, running almost parallel to Christensen Road from the industrial enterprise to the eastern boundary (bisecting the southern area of Community 2).

Composition

This community occurs as a thin strip in a low lying area in the southern portion of the subject site and appears to form an ephemeral waterway. It is highly degraded and dominated by various weed species including *L. camara*, *Tridens flavus*, *Solanum chrisotrichum*, *Senna pendula* var. *glabrata*, *Nephrolepis cordifolia*. Occasional *M. nodosa* were also observed.

Significant species

No significant species were recorded within this community.

Conservation status

This community does not have any conservation status and is not analogous with any Regional Ecosystem.

Community 8 – Industrial uses

Location

This community is contained within the existing industrial enterprise. Starting on the lower western boundary, this community transects the upper southern portion the subject site, stopping short of the eastern boundary.

Composition

This community occurs in the southern portion of the subject site and is currently occupied by a fertiliser and soil conditioning plant. Access to this area was not possible but observations from the fence lines and aerial photography indicated that no vegetation occurs on this section of the site. Two water bodies exist as mapped by Council, but they were observed to be intensively utilised by the industry and were therefore highly degraded and devoid of

aquatic vegetation.

Significant species

No significant species were recorded within this community.

Conservation status

This community does not have any conservation status and is not analogous with any Regional Ecosystem.

3.3.4 Conflicts/consistency with regional ecosystem mapping

The most recent RE mapping appears to be accurate reflecting the observed dominant species of *Corymbia citriodora*, *Eucalyptus siderophlois* and *E. major* in an open forest habitat. The identified communities provide further detail of vegetation groups found on the subject site. Ground-truthing also identified natural wetland areas which provide habitat for additional species.

Site investigation also revealed that Community 6 – Tall Open Forest conforms more closely to “of concern” RE 12.3.11 than that of 12.11.5. According to the most recent RE mapping (version 6), the mapping of ‘least concern’ RE 12.11.5 over the majority of the remainder of the subject site appears to be accurate. Adjacent to the subject sites’ southern boundary, mapping shows RE 12.3.11 occurring along the southern side of Sandy Creek. Site investigations indicated that this RE is also likely to be accurate for vegetation found on the northern side of Sandy Creek.

4 Fauna assessment

4.1 Introduction

This section describes methods utilised to investigate which fauna species use or are likely to use the subject site. It also discusses the results of the fauna assessment. This fauna assessment involved an opportunistic investigation of fauna that were present on the site during the site survey and a habitat assessment of the site which indicate likely fauna use.

4.2 Methods

4.2.1 Database searches

A database search was conducted using the Department of Environment, Water, Heritage and Arts (DEWHA) Protected Matters Search feature which lists all recorded occurrences of Commonwealth listed species under the *Environmental Protection and Biodiversity Conservation Act 1999*. The search was conducted of species known to occur within a 5km radius of the subject site.

The Department of Environment and Resource Management (DERM) Wildlife Online Database was also searched for listed species known to occur within a 5km radius of the subject site as listed in the *Nature Conservation Act 1992*.

Koala Conservation State Planning Regulatory Provision (SPRP) trigger maps were consulted to investigate whether the site falls within a mapped koala habitat area. The DERM South East Queensland Koala Planning Regulatory Provisions Map revealed that the subject site is outside of the Koala Assessable Development Area (refer Figure 9).

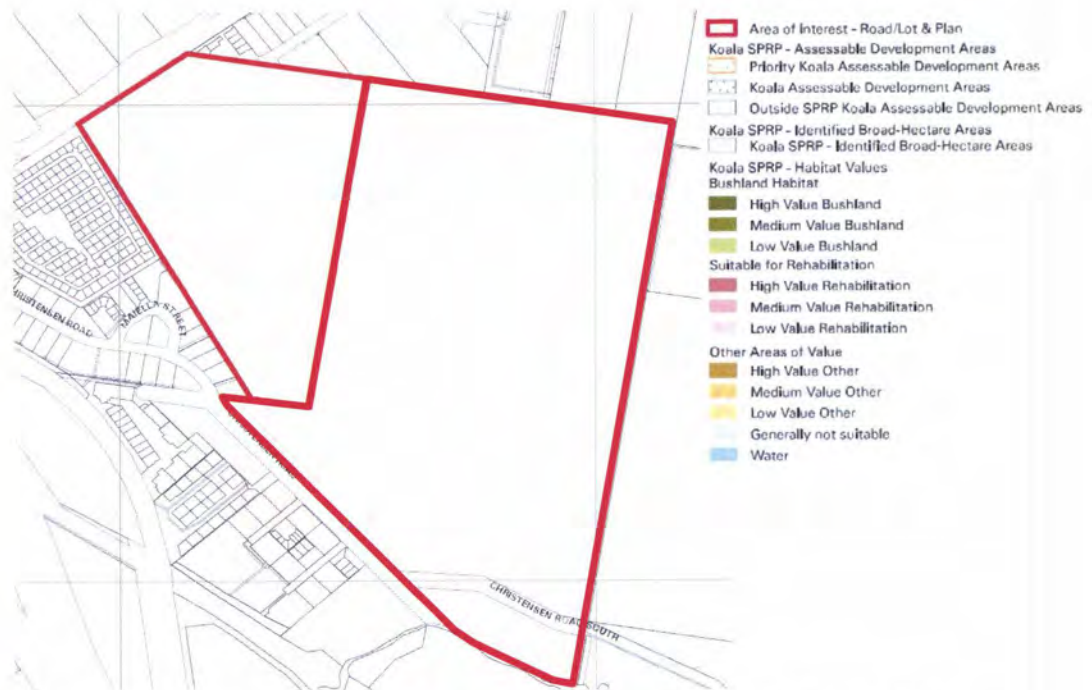


Figure 9 - Koala Conservation State Planning Regulatory Provision Map of subject site. (Source: DERM)

Further consultation with DERM Koala Habitat in South East Queensland Mapping shows the site as having "Koala SPP – Habitat Values" of Bushland Habitat of Medium Value and habitats Suitable for Rehabilitation of Medium and Low Value (see Figure 10.)

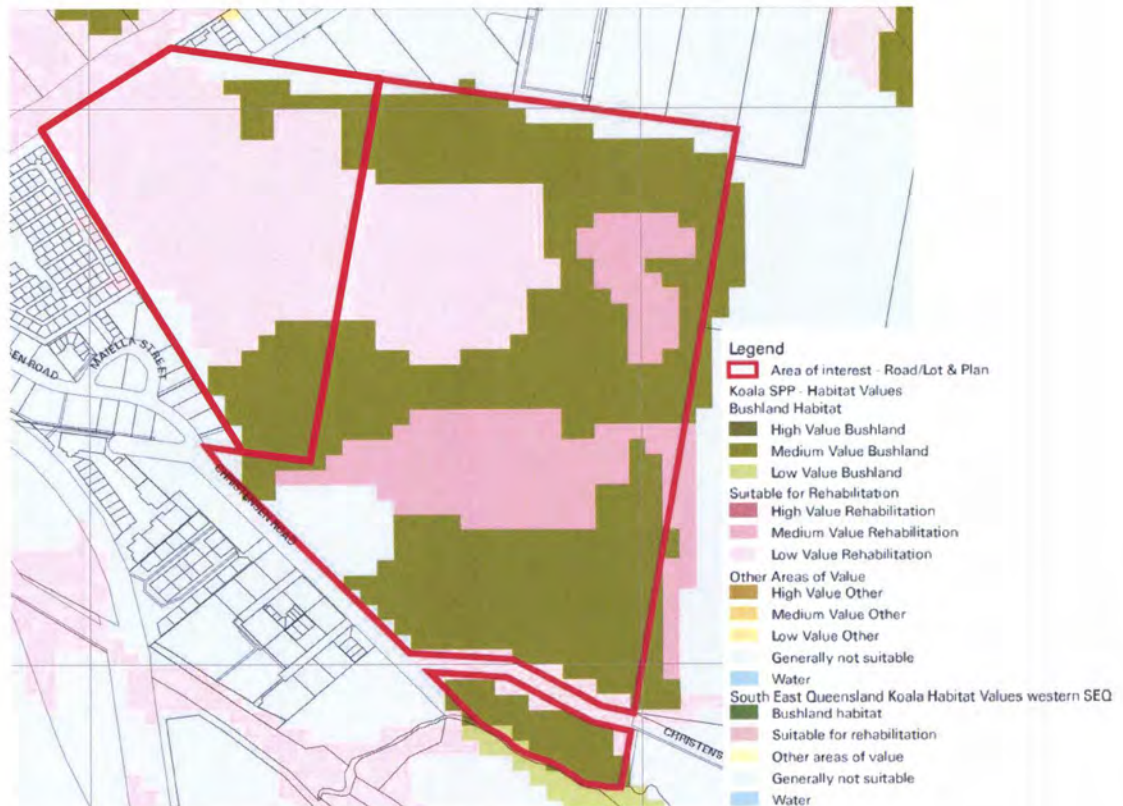


Figure 10 - Koala habitat in southeast Queensland Source: DERM

4.2.2 Habitat assessment

Habitat values of the ecological features were investigated on site. The assessment investigated a range of habitat features known to be utilised by both common and threatened species. Habitat features include examples such as:

- Tree hollows
- Nests
- Burrows
- Koala food trees
- Glossy black cockatoo preferred food trees (Forest oak and Black She-Oak)
- Habitat connectivity
- Dense vegetation

- Waterways and drainage lines
- Blossoming and fruiting tree species
- Scratches on tree trunks attributable to native fauna such as koalas and gliders

4.2.3 Fauna survey

A fauna survey was conducted on 21st and 22nd December 2010. Opportunistic sightings and active searches were utilised during this survey. Opportunistic sightings were made whilst traversing the site and active searches involved looking under fallen logs, sheets of tin and other refuse and leaf litter. Burrows and animal scats were searched for in addition to bones. Visual and aural bird observations were also made during the site visit.

4.3 Results

4.3.1 Database searches

The combined EPBC and DERM database searches revealed twenty-two (22) species of concern known to occur within 5km of the subject site (refer Table 2). The EPBC Protected Matters search indicated that sixteen (16) threatened fauna species were known to occur within a 5km radius of the subject site. An additional eighteen (18) migratory species were known to occur in the area according to the EPBC Protected Matters search. The DERM Wildlife Online search indicated that seven (7) fauna species were known to occur within a 5km radius of the subject site.

Table 2 - Database Records of Threatened Fauna Species with 5km of Site

Common name	Specific Name	EPBC	NCA
Amphibians			
Southern Barred Frog, Giant Barred Frog	<i>Mixophyes iteratus</i>	E	
Birds			
Grey Goshawk	<i>Accipiter novaehollandiae</i>		NT
Regent Honeyeater	<i>Anthochaera phrygia</i>	E	
Coxen's Fig-Parrot	<i>Cyclopsitta diophthalma coxeni</i>	E	
Black-Necked Stork	<i>Ephippiorhynchus asiaticus</i>		NT
Red Goshawk	<i>Erythrorhynchus radiatus</i>	V	
Grey Falcon	<i>Falco hypoleucos</i>		NT
Swift Parrot	<i>Lathamus discolor</i>	E	E



Common name	Specific Name	EPBC	NCA
Lewin's Rail	<i>Lewinia pectoralis</i>		NT
Australian Painted Snipe	<i>Rostratula australis</i>	V	
Radjah Shelduck	<i>Tadorna radjah</i>		NT
Black-Breasted Button-Quail	<i>Turnix melanogaster</i>	V	
Mammals			
Large-eared Pied Bat, Large Pied Bat	<i>Chalinolobus dwyeri</i>	V	
Northern Quoll	<i>Dasyurus hallucatus</i>	E	
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	<i>Dasyurus maculatus maculatus</i> (SE mainland population)	E	
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	V	
Long-nosed Potoroo	<i>Potorous tridactylus tridactylus</i>	V	
Koala (southeast Queensland V 15)	<i>Phascolarctos cinereus</i> (southeast Queensland bioregion)		V
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	
Water Mouse, False Water Rat	<i>Xeromys myoides</i>	V	
Reptiles			
Three-toed Snake-tooth Skink	<i>Coeranoscincus reticulatus</i>	V	
Collared Delma	<i>Delma torquata</i>	V	

E = endangered, V = Vulnerable, NT = near threatened, PE = presumed extinct, EX = extinct



Table 3 - Migratory species listed under the EPBC as likely to occur in the vicinity of the site

Common name	Specific Name	Status*
Terrestrial Bird Species		
Coxen's Fig-Parrot	<i>Cyclopsitta diophthalma coxeni</i>	M
White-Bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	M
White-Throated Needletail	<i>Hirundapus caudacutus</i>	M
Rainbow Bee-Eater	<i>Merops ornatus</i>	M
Black-Faced Monarch	<i>Monarcha melanopsis</i>	M
Spectacled Monarch	<i>Monarcha trivirgatus</i>	M
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	M
Rufous Fantail	<i>Rhipidura rufifrons</i>	M
Regent Honeyeater	<i>Xanthomyza phrygia</i>	M
Wetland Bird Species		
Great Egret, White Egret	<i>Ardea alba</i>	M
Cattle Egret	<i>Ardea ibis</i>	M
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	M
Latham's Snipe, Japanese Snipe	<i>Gallinago hardwickii</i>	M
Australian Cotton Pygmy-Goose	<i>Nettapus coromandelianus albipennis</i>	M
Pacific Golden Plover	<i>Pluvialis fulva</i>	M
Painted Snipe	<i>Rostratula benghalensis s. lat.</i>	M
Marsh Sandpiper, Little Greenshank	<i>Tringa stagnatilis</i>	M
Marine Bird Species		
Fork-tailed Swift	<i>Apus pacificus</i>	M
Great Egret, White Egret	<i>Ardea alba</i>	M
Cattle Egret	<i>Ardea ibis</i>	M

E = Endangered under the EPBC (1999)

M= Migratory under the EPBC (1999)

As previously discussed, Koala Conservation State Planning Regulatory Provision (SPRP) trigger maps revealed that the subject site does not fall within an assessable development area of koala habitat.

4.3.2 Habitat assessment

Amphibians

Amphibians are generally closely associated with moist, shaded habitats. Ephemeral or permanent water sources are required for forage and breeding resources for most native Australian amphibians. Amphibians are predominantly insectivorous and generally require free water for reproduction. The habitat requirements of most species are not usually determined by forest cover or floristics, but are more strongly influenced by factors such as climate, distance to water bodies, riparian vegetation, hydrological and morphological characteristics of water bodies and the availability of suitable micro-habitats.

Some amphibian habitat was observed in community. Amphibians were not detected during the site survey. Due to the degraded and artificial nature of the available habitat, it is likely that amphibian assemblages present would be restricted to commonly urbanised taxa and invasive species such as *Bufo marinus*.

Reptiles

Australia's environments support a wide range of reptile species which utilise a variety of micro-habitats (e.g. tree hollows, soil cracks) and sources of nutrition (e.g. succulent leaves, termites, grasshoppers, birds and other reptiles). This diversity includes species of vastly different body sizes (for example, skinks compared to goannas), and life history strategies (burrowing blind snakes compared to arboreal geckos).

There is a wide variety of habitat that supports reptile species on the subject site. Fallen logs, leaf litter and open areas are all likely to host a range of reptile species. Please refer to Table 4 for reptile species observed on site.

Birds

Avian assemblages are generally influenced by factors such as food (e.g. fruit, nectar, seeds and insects) and water sources, in addition to the mosaic of habitat structures such as grasses, thick understorey and canopy vegetation. Generally, the greater the food sources available and the more complex the structure of the available vegetation, the more diverse the avian assemblage will be.

The subject site provides suitable habitat for avifauna. Water sources, a variety of habitat mosaics and flowering trees are likely to support various species of avian fauna. A number of bird species were detected throughout the fauna survey (please refer Table 4).

Mammals

Habitats suitable for mammals include areas that provide a plentiful food source and suitable shelter in addition to adequate connectivity for mobile mammals. The highest density of small mammal species is usually associated with:

- Reliable rainfall which is reflected in a reliable source of food; and
- Dense ground vegetation, particularly shrubs and grasses.

The majority of arboreal mammals that occur in Australia utilise tree hollows for nesting and shelter. The presence of large mammals such as kangaroos, koalas and wallabies is influenced by factors such as habitat connectivity, and the presence of threats such as heavy road traffic and domestic animals such as dogs.

The subject site is supportive of a range of mammal species. Evidence of mammal fauna use including scats and scratch marks were observed on the subject site. Some hollow bearing trees are present and some connections with adjacent tracts of bushland are also present. Fauna observed on the subject site are summarised in the following section.

4.3.3 Fauna surveys

A summary of the fauna that was observed on site during site surveys is detailed in Table 4.

Table 4 - Fauna Survey

Scientific Name	Common Name	Notes
Birds		
<i>Acridotheres tristis</i>	Common Indian Myna	Visual observation
<i>Alectura lathami</i>	Australian Brush-turkey	Visual observation
<i>Ardea intermedia</i>	Intermediate Egret	Aural observation
<i>Chenonetta jubata</i>	Australian Wood Duck	Visual observation



<i>Cracticus nigrogularis</i>	Pied Butcherbird	Visual observation
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Visual observation
<i>Manorina melanocephala</i>	Noisy Myna	Visual observation
<i>Platycercus adscitus</i>	Pale Headed Rosella	Visual observation
<i>Rhipidura leucophrys</i>	Willy Wagtail	Visual observation
<i>Strepera graculina</i>	Pied Currawong	Visual observation
<i>Vanellus miles</i>	Masked Lapwing	Visual observation
Reptile species		
<i>Physignathus lesueurii lesueurii</i>	Water Dragon	Visual observation
<i>Cryptoblepharus virgatus</i>	Wall Skink	Visual observation
<i>Liasis olivaceus</i>	Olive python	Visual observation
<i>Lampropholis guichenoti</i>	Garden Skink	Visual observation
Mammal species		
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Visual observation
<i>Wallabia bicolor</i>	Swamp Wallaby	Visual observation

4.3.4 Possible occurrences of significant species on site

The following Table provides the likelihood of significant species occurring on the subject site.

Table 5 - Possible occurrences of significant fauna species on the subject site

Common name	Specific Name	Possibility of Occurrence on Subject Site
Amphibians		
Southern Barred Frog, Giant Barred Frog	Mixophyes iteratus	Possible. This species occurs in uplands and lowlands in rainforest and wet sclerophyll forest, including farmland. Populations have been found in disturbed areas with vegetated riparian strips on cattle farms and in regenerated logged areas. Many sites where the Southern Barred Frog is known to occur are the lower reaches of streams which have been affected by major disturbances such as clearing, timber harvesting and urban development in their headwaters.
Birds		
Grey Goshawk	Accipiter novaehollandiae	Possible. This species is found in most forest types, especially tall closed forests, including rainforests.
Regent Honeyeater	Anthochaera phrygia	Unlikely. This species is known to occur in dry open forest, woodlands and trees in farmlands. They spend much of their time feeding on the nectar from eucalypts such as the Mugga Ironbark, White Box and Yellow Box, and Blakeley's Red Gum on which they are reliant. Food trees are absent from this site.
Coxen's Fig-Parrot	Cyclopsitta diophthalma coxeni	Unlikely. This species is known to occur in highland and sparse remnant lowland rainforest.
Black-Necked Stork	Ephippiorhynchus asiaticus	Possible. This species is mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands. They mainly forage in shallow, still water, preferring open wetlands.



Common name	Specific Name	Possibility of Occurrence on Subject Site
Red Goshawk	<i>Erythrotriorchis radiatus</i>	Unlikely. This species occurs in open forests, woodlands specifically near rivers, wetlands and rainforest fringes. This is a very rare species.
Grey Falcon	<i>Falco hypoleucos</i>	Unlikely. This species is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. It may also occur near wetlands where surface water attracts prey. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse.
Swift Parrot	<i>Lathamus discolor</i>	Possible. This species is found in forests, woodlands, plantations, parks and gardens. This species has a distinct preference for the largest Blue gums (<i>Eucalyptus tereticornis</i>) primarily in Brisbane's western suburbs.
Lewin's Rail	<i>Lewinia pectoralis</i>	Unlikely. This species usually occupies the margins or adjacent banks of freshwater wetlands.
Australian Painted Snipe	<i>Rostratula australis</i>	Unlikely. This species is associated with dense vegetation cover in the vicinity of wetlands.
Radjah Shelduck	<i>Tadorna radjah</i>	Unlikely. This species occupies terrestrial wetlands, estuaries and the littoral zone of monsoonal regions. It nests in tree hollows in the wet season, forming flocks near the coast during the dry season. It feeds on small invertebrates and a few seeds, taken from shallow wetland edges.
Black-Breasted Button-Quail	<i>Turnix melanogaster</i>	Possible. This species is found in drier rainforests, vine thickets, scrubby eucalypt woodlands and Lantana thickets.
Mammals		
Large-eared Pied Bat, Large Pied Bat	<i>Chalinolobus dwyeri</i>	Unlikely. This species prefers dry sclerophyll forests and woodlands of western facing slopes and interiors.
Northern Quoll	<i>Dasyurus hallucatus</i>	Unlikely. This species is most abundant in rocky ranges and open eucalypt forest. It is uncommon close to urban areas.



Common name	Specific Name	Possibility of Occurrence on Subject Site
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Unlikely. This species is found in high altitude rainforests and wet sclerophyll forest.
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	Unlikely. This species prefers rocky escarpments, outcrops and cliffs. It particularly likes complex structures with fissures, caves and ledges that face north which are not available on this site.
Koala (southeast Queensland V 15)	<i>Phascolarctos cinereus</i> (southeast Queensland bioregion)	Possible. Koala food trees were observed within the site. However, no scratch marks or faecal pellets were detected.
Long-nosed Potoroo (SE mainland)	<i>Potorous tridactylus tridactylus</i>	Unlikely. This species prefers wet, high altitude forests with dense ground cover.
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Possible. Food resources for this species were observed on the site. No camps were observed. This site may be visited for feeding opportunities by this species.
Water Mouse, False Water Rat	<i>Xeromys myoides</i>	Unlikely. This species prefers to live in mangrove communities, adjacent freshwater lagoons, swamps and sedged lakes close to coastal fore-dunes.
Reptiles		
Three-toed Snake-tooth Skink	<i>Coeranoscincus reticulatus</i>	Unlikely. This species is known to occur in montane rainforest areas and sometimes low lying sandy areas.
Collared Delma	<i>Delma torquata</i>	Unlikely. This species preferred habitat is rocky sloped or ridge-top areas, often westerly-facing, in eucalypt and acacia dominated woodland with a 3 to 10cm depth of leaf litter and a sparse understorey of tussock grass and shrubs or semi-evergreen vine thicket.
Migratory Birds		
Fork-Tailed Swift	<i>Apus pacificus</i>	Possible. This species is sometimes found over cities and nearby forests. This species may fly over the subject site.



Common name	Specific Name	Possibility of Occurrence on Subject Site
Great Egret, White Egret	<i>Ardea alba</i>	Likely. This species is found in the association with rivers, estuaries, tidal and freshwater wetlands, sewage ponds, dams and irrigation areas. A sighting of this species occurred on adjacent property to subject site.
Cattle Egret	<i>Ardea ibis</i>	Possible. This species is found in stock paddocks, grasslands, wetlands and drains. Some habitat for this species occurs on the subject site.
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Unlikely. Found throughout Australia where there is wetland, this can be inland or along muddy foreshores. It may be found in waterways, saltworks and sewerage farms.
Latham's Snipe, Japanese Snipe	<i>Gallinago hardwickii</i>	Unlikely. This species usually inhabits open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies)
White-Bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	Unlikely. Mostly found of coastal Australia and inland along rivers and major dams, reservoirs and wetlands. This species is mostly associated with coastal vegetation types such as dune communities, mangroves, saltmarsh and heathland as well as riparian vegetation.
White-Throated Needletail	<i>Hirundapus caudacutus</i>	Possible. This species are found to occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest.
Rainbow Bee-Eater	<i>Merops ornatus</i>	Unlikely. This species occurs in areas containing sandy, loamy soil, including woodlands, mangroves, rainforests, golf courses and sand dunes.
Black-Faced Monarch	<i>Monarcha melanopsis</i>	Unlikely. This species is known to occur in rainforests and eucalypt woodlands. Woodlands are present within the Subject site.
Spectacled Monarch	<i>Monarcha trivirgatus</i>	Unlikely. This species is known to occur in the understorey of mountain and lowland rainforests and waterway vegetation.

Common name	Specific Name	Possibility of Occurrence on Subject Site
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	Unlikely. This species mainly inhabits eucalypt forests, often near wetlands or watercourses. They have been mainly recorded in eucalypt forests, especially wet sclerophyll forest, often dominated by eucalypts such as Brown Barrel, Eucalypt fastigata, Mountain Gum, E. dalrympleana, Mountain Grey Gum, Narrow-leaved Peppermint, Messmate or Manna Gum.
Australian Cotton Pygmy-Goose	<i>Nettapus coromandelianus albipennis</i>	Unlikely. This species prefers swamps, lagoons, dams, deep water, aquatic vegetation.
Pacific Golden Plover	<i>Pluvialis fulva</i>	Unlikely. This species usually inhabits coastal habitats. They are less often recorded in terrestrial habitats, usually wetlands such as fresh, brackish or saline lakes, billabongs, pools, swamps and wet claypans, especially those with muddy margins and often with submerged vegetation or short emergent grass.
Rufous Fantail	<i>Rhipidura rufifrons</i>	Unlikely. Most often observed in thickets and undergrowth close to the ground in rainforest and forests.
Painted Snipe	<i>Rostratula benghalensis s. lat.</i>	Unlikely. This species inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans
Marsh Sandpiper, Little Greenshank	<i>Tringa stagnatilis</i>	Unlikely. This species prefers permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes.

5 Ecological corridors

5.1.1 Gold Coast City Plan

Gold Coast City Council PD Online mapping does not show the subject site as containing any critical linkages. The subject site is highlighted as containing "existing 1994 remnant vegetation" the majority of which is designated as being a "major area of existing bushland committed to development" (refer Figure 11).



Figure 11 - GCCC Conservation Strategy Plan Map

Source: GCCC

5.1.2 Site assessment

Connections of the subject site to the north, east and south are limited to narrow corridors of bushland interrupted by infrastructure, fencing and roads. The existing vegetation on the subject site is considered to hold some corridor values in connection to adjacent bushland. Whilst the proposed development is likely to reduce the corridor values of the subject site, a 50m ecological corridor is proposed along the eastern boundary to compensate for the loss of vegetation.

6 Impacts and Amelioration

6.1 Impacts of Vegetation Clearing

Approximately half of the site has already been cleared of vegetation for pastoral purposes. Removal of further vegetation from the majority of the remainder of subject site is proposed to accommodate the proposed development with a north-south ecological open space area proposed along the eastern boundary of the subject site to retain some ecological value of the subject site.

Riparian vegetation on the lower southern side of Christensen Road will be retained to act as a buffer between the industrial land use and the waterway.

6.2 Impacts on Local Significant Flora

No significant flora was observed on the subject site. Therefore, no impacts on local significant flora are likely to result from the proposed development.

6.3 Impacts on Local Significant Fauna

No significant fauna was detected on the subject site. It is therefore unlikely that the proposed development.

6.4 Impacts on Corridors

Corridor values of the subject site will be reduced as a result of the proposed development. To offset the loss of corridor values on the subject site, a 50m wide ecological corridor to be dedicated as open space will be created in the eastern portion of the subject site.

6.5 Amelioration

6.5.1 Habitat loss/Vegetation Clearing

The proposed development will involve the removal of the majority of vegetation from the

subject site. A vegetated corridor will be embellished along the eastern boundary of the subject site to compensate for some of the vegetation loss in addition to establishing an ecological corridor.

Whilst some vegetation removal of the southern portion of the subject site (south of Christensen Road) is proposed, a 50m buffer will be retained between the proposed development and Sandy Creek.

Associated with the removal of vegetation from the site will be the management of weed species such as *Solanum mauritianum*, *Lantana camara* and *Solanum chrysotrichum*. The removal of these weeds is considered to represent an environmental improvement to the subject site.

6.5.2 Significant Flora

As no significant flora is present on the subject site, amelioration measures are not considered necessary.

6.5.3 Significant Fauna

Significant fauna were not detected on the subject site. There are several large trees (greater than 400mm girth) and some hollow bearing trees found within the existing vegetation which would likely provide nesting opportunities and habitat for local fauna. A suitably qualified fauna spotter/catcher will be engaged for the duration of vegetation removal from the subject site.

6.5.4 Corridors

Whilst some connectivity values currently represented by the vegetation found on the subject site will be lost as a result of the proposed development, the proposed north-south ecological corridor will partly compensate for this loss.

7 Relevant Legislation

7.1 Commonwealth Legislation

7.1.1 Introduction

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's primary article of environmental legislation.

The EPBC Act provides a legal structure that aims to safeguard and administer nationally and internationally significant flora, fauna, ecological communities and heritage places which are defined in the EPBC Act as 'matters of national environmental significance'.

The eight matters of national environmental importance to which the EPBC Act applies are:

- world heritage sites
- national heritage places
- wetlands of international importance (known as 'Ramsar' wetlands after the international treaty under which these wetlands are listed)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions.

A person must not take any actions that may have a significant effect on any of these eight categories without approval under the Act.

7.1.2 Matters relevant to the subject site

Matters from the EPBC Act that are relevant to the subject site are listed in bold below:

- a) Declared World Heritage Areas;
- b) **Declared Ramsar wetlands;**
- c) **Listed threatened species (NCA, EPBCA);**

- d) Listed ecological communities; and
- e) **Listed migratory species (JAMBA and CAMBA).**

7.1.3 Site assessment

The subject site is located within 10km of the Moreton Bay Ramsar wetlands which is considered an area of international significance. Due to the distance of the subject site from Moreton Bay, it is anticipated that the proposed development will not have any impact on these wetlands. However, a Stormwater Management Plan should be prepared and adhered to.

Sixteen (16) fauna species listed as threatened under the EPBCA (1999) were determined to be possible or likely occurrences within the site. These include the Regent Honeyeater, Coxen's Fig-Parrot, Red Goshawk, Swift Parrot, Australian Painted Snipe, Black-breasted Button-quail, Southern Barred Frog/Giant Barred Frog, Large-eared Pied Bat/Large Pied Bat, Northern Quoll, Spot-tailed Quoll/Tiger Quoll, Brush-tailed Rock-wallaby, Long-nosed Potoroo, Grey-headed Flying-fox, Water Mouse/False Water Rat, Three-toed Snake-tooth Skink and Collared Delma.

Nine (9) terrestrial fauna, eight (8) wetland fauna and three (3) marine fauna species listed as Migratory under the EPBCA (1999) were determined to be possible or likely occurrences within the site i.e.:

- Terrestrial - Coxen's Fig-Parrot, White-bellied Sea-Eagle, White-throated Needletail, Rainbow Bee-eater, Black-faced Monarch, Spectacled Monarch, Satin Flycatcher, Rufous Fantail and Regent Honeyeater.
- Wetland Species - Great Egret/White Egret, Cattle Egret, Sharp-tailed Sandpiper, Latham's Snipe/Japanese Snipe, Australian Cotton Pygmy-goose, Pacific Golden Plover, Painted Snipe and Marsh Sanpiper/Little Greenshank.
- Marine – Fork-tailed Swift, Great Egret/White Egret and Cattle Egret.

None of these species were observed on the subject site and it is not considered that an important population of any occurs within or adjacent to the Subject site. Commonwealth referral of this proposed development is therefore not considered necessary.

7.2 State Legislation

7.2.1 Koala Plan

The South East Queensland Koala Conservation State Planning Regulatory Provision (SPRP) and State Planning Policy 2/10: Koala Conservation in South East Queensland (SPP) are made under the Sustainable Planning Act 2009 (SPA).

An SPRP is an overarching planning tool which, in the case of any inconsistencies, prevails over any other planning instrument (such as local government planning schemes). It sets out certain requirements that local governments and others must assess development applications against in order to minimise the impact of new development on koalas.

An SPP articulates the State's interests—for example, economic, environmental, statutory interests for a particular activity, area or process. It provides direction to local governments when making or amending their planning schemes, as well as for other land allocation processes such as master planning/structure planning processes, and community infrastructure designations.

In December 2009, the Draft South East Queensland Koala Conservation State Planning Policy and the Draft South East Queensland Koala Conservation State Planning Regulatory Provisions were released for public consultation. The SPP and SPRP for Koala Conservation Consultation Report details the consultation undertaken on the draft planning instruments. The findings of this report have been incorporated into the final South East Queensland Koala Conservation State Planning Regulatory Provisions and the State Planning Policy 2/10: Koala Conservation in South East Queensland.

Koala Conservation State Planning Regulatory Provision (SPRP) trigger maps revealed that the subject site does not fall in a mapped assessable development area of Koala habitat.

7.2.2 Nature Conservation (Wildlife) Regulation 1994

The NCWR (1994) categorises flora and fauna that are considered to be presumed extinct, endangered, vulnerable, rare, common, international, and prohibited in Queensland. It outlines the reasons for their significance and details the declared management intent and the principles to be observed in any taking and use for each group.

Seven (7) species listed under the NCWR (1994), were determined to possibly occur within the site. These include Grey Goshawk listed as near threatened, Radjah Shelduck listed as near threatened, Black-necked Stork listed as near threatened, Grey Falcon listed as near threatened, Swift Parrot listed as endangered, Lewin's Rail listed as near threatened, Koala listed as vulnerable. However, no sightings or signs of Koala usage of the site (i.e. scats or scratches) were observed on or around preferred feed tree species and evidence of the other species were not detected on site. It is therefore considered that the proposed development will not cause a significant impact on populations of these species in the area.

7.2.3 Referable Wetlands

The subject site has been reviewed against the DERM database for 'Referable Wetlands' using the Referable Wetland Mapping system. Following this review, it has been noted that the lower southern portion of Lot 240 W31320, has mapped wetlands occurring as a trigger area of a Wetland Management Area (Figure). These wetlands consist of Sandy Creek and riparian vegetation.

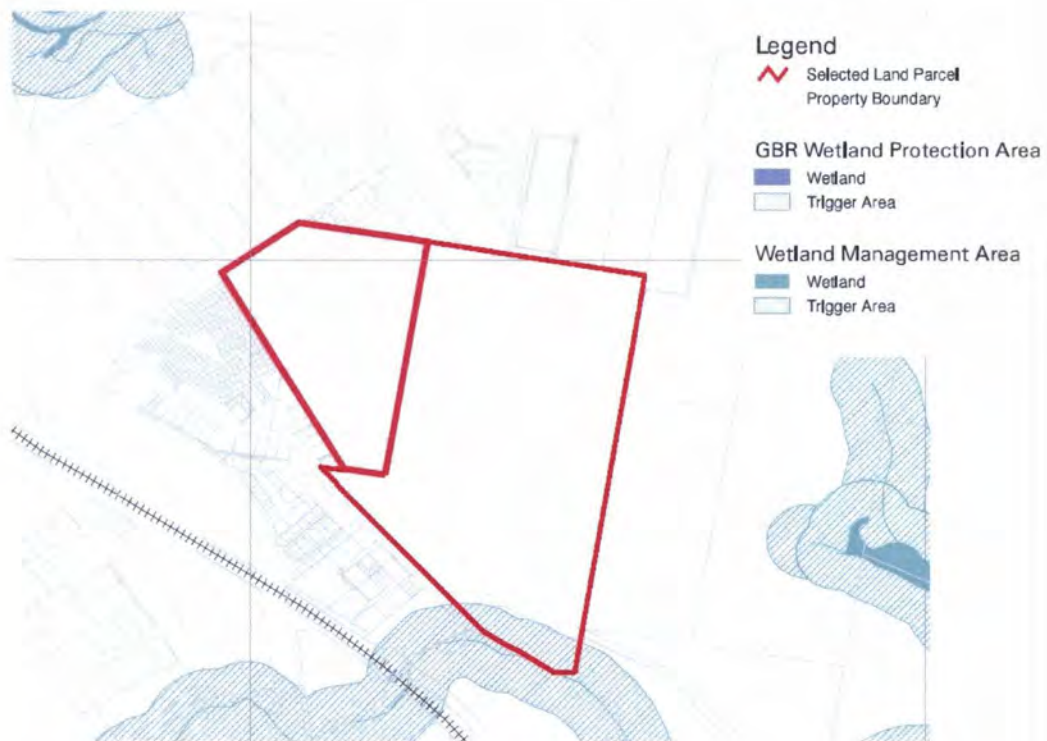


Figure 12 - DERM Referable Wetlands Map for subject site

Development triggers for wetlands as listed in Schedule 7 of the *Sustainable Planning Regulation 2009* include:

- *Reconfiguring a lot if:*
 - *any part of the lot is situated a wetland management area; and*
 - *the reconfiguration results in more than 6 lots being created, or any lot resulting from the reconfiguring is less than 5ha.*
- *Material change of use, other than for a domestic activity, if any part of the lot is situated within a wetland management area.*

Any development that occurs within the vicinity of this referable wetland will be adequately buffered consistent with adjacent land uses. As stated previously, development of part of the mapped wetlands will require referral to DERM as an advice agency.

7.2.4 Remnant Vegetation, Essential Habitat and Vegetation Management Act Compliance

The Vegetation Management Act, as amended by the Vegetation Management and Other Legislation Amendment Act (VMOLA), commenced on 21 May 2004. The VMOLA amended the VMA, the Integrated Planning Act 1997 (IPA) and the Land Act 1994 to provide a single regulatory framework for clearing of native vegetation on freehold land and most State land tenures.

7.2.5 Vegetation Clearing

Approximately half (found in three separate areas) of the subject site is mapped as containing vegetation of "least concern" - RE 12.11.5 and the remainder of the subject site is mapped as containing "non remnant" vegetation. Under the Sustainable Planning Regulation (Schedule 24, Part 2 Section 2(g)), clearing is not assessable under the administrators of the Vegetation Management Act (DERM) if the clearing is:

(g) for urban purposes in an urban area and the vegetation is regulated regrowth vegetation, or an of concern regional ecosystem or a least concern regional ecosystem

Whilst clearing of vegetation will occur within the proposed development, referral to DERM as a concurrence agency is not considered necessary as the vegetation is exempt from DERM referral.

7.2.6 State Legislation Summary

Although the site does not fall into a koala planning area, does not contain significant populations of NCWR listed species, does not contain state assessable vegetation but occurs in the vicinity of referable wetlands, referral to DERM is required for this development.

7.3 Local Legislation

7.3.1 Gold Coast City Council Planning Scheme

The Gold Coast City Council Planning Scheme (Planning Scheme) provides a framework for

managing development in the Gold Coast City, in accordance with the *Sustainable Planning Act 2009* (SPA).

The ecological aspects of the Planning Scheme relevant to the subject site are discussed in the following sections.

7.3.2 Environmental Constraint Overlays

The Planning Scheme Land Use Map and GCCC PD online mapping indicate that the subject site has several environmental constraint codes including:

- OM10 - Gold Coast City Council – Constraint Code – Bushfire Management Areas.
- OM11 – Gold Coast City Council - Natural Wetland and Waterways - Estuarine Complexes.
- OM13 – Gold Coast City Council - Canals and Waterways.
- OM14 – Gold Coast City Council - Acid Sulfate Soils Hazard.
- OM20 - Gold Coast City Council – Constraint Code – Nature Conservation

In relation to the subject site, following is an outline of each code's relevance.

Bushfire Management Areas

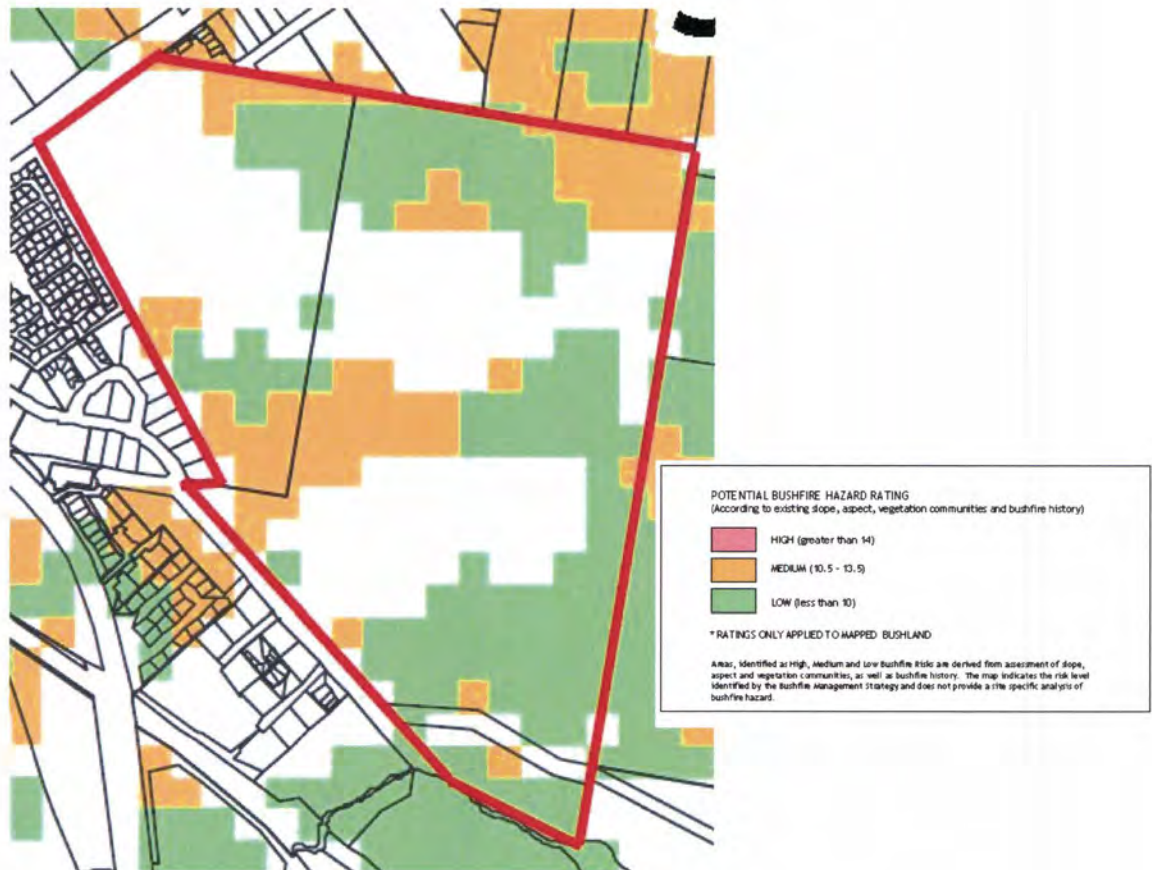


Figure 13 – GCCC Potential Bushfire Hazard Map of subject Site

GCCC PD Online states that the potential bushfire hazard rating for the subject site is Medium and Low. Review of the OM10 Bushfire Management Overlay Map (see Figure) revealed that the site should be classed as Medium to Low bushfire hazard potential. Examination of the site further confirmed the medium to low level of bushfire hazard potential, and in accordance with the Gold Coast City Council Constraint Code - Bushfire Management Area, the Performance Criteria, Acceptable Solutions and Proposed Solutions are provided in Appendix 2.

Natural Wetlands Areas and Natural Waterways

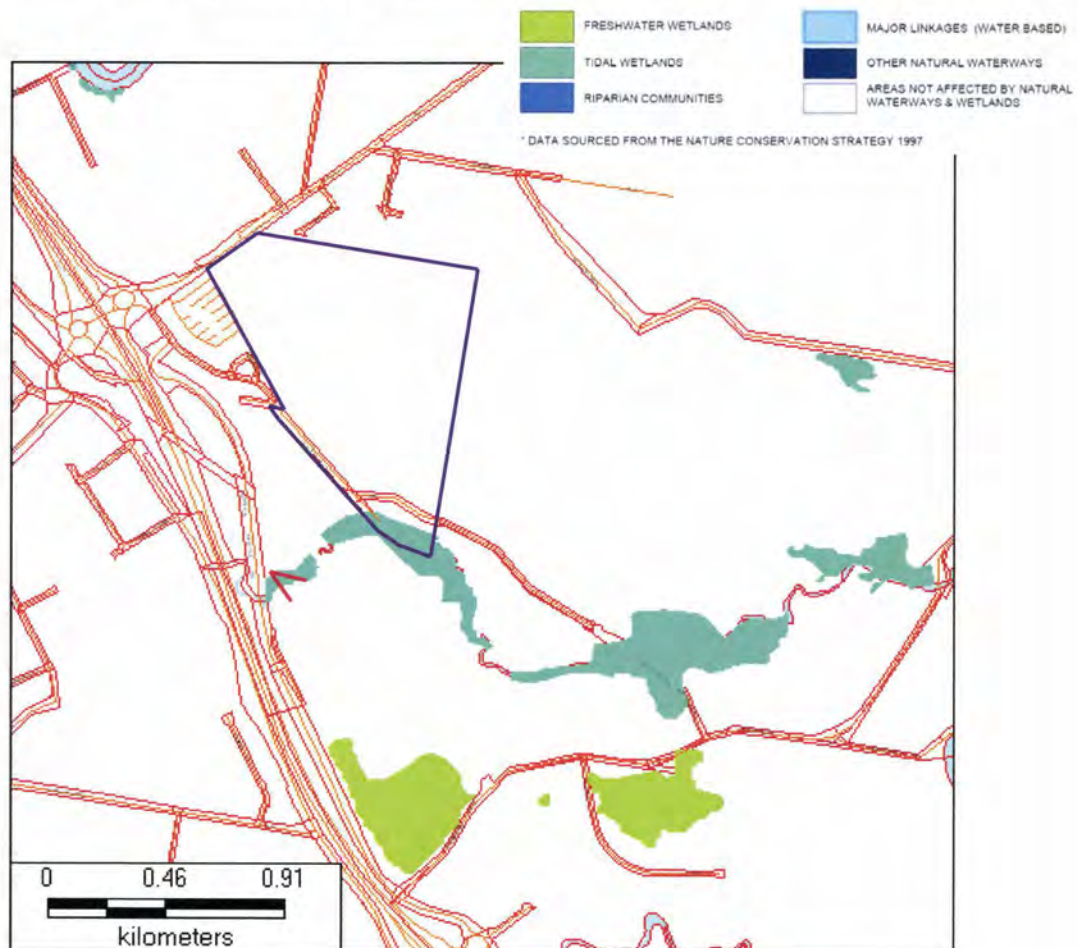


Figure 14 - GCCC Natural Wetlands and Waterways Map of subject site

Ground truthing of the subject site revealed that the Natural Wetland and Waterway Area mapping is accurate with Sandy Creek occurring along the northern boundary of the site. As shown in Figure , riparian vegetation occurs along the full extent of the northern boundary. Consequently, the Constraint Code - Natural Wetland Areas and Natural Waterways will be addressed in Appendix 3.

Acid Sulfate Soils Hazard

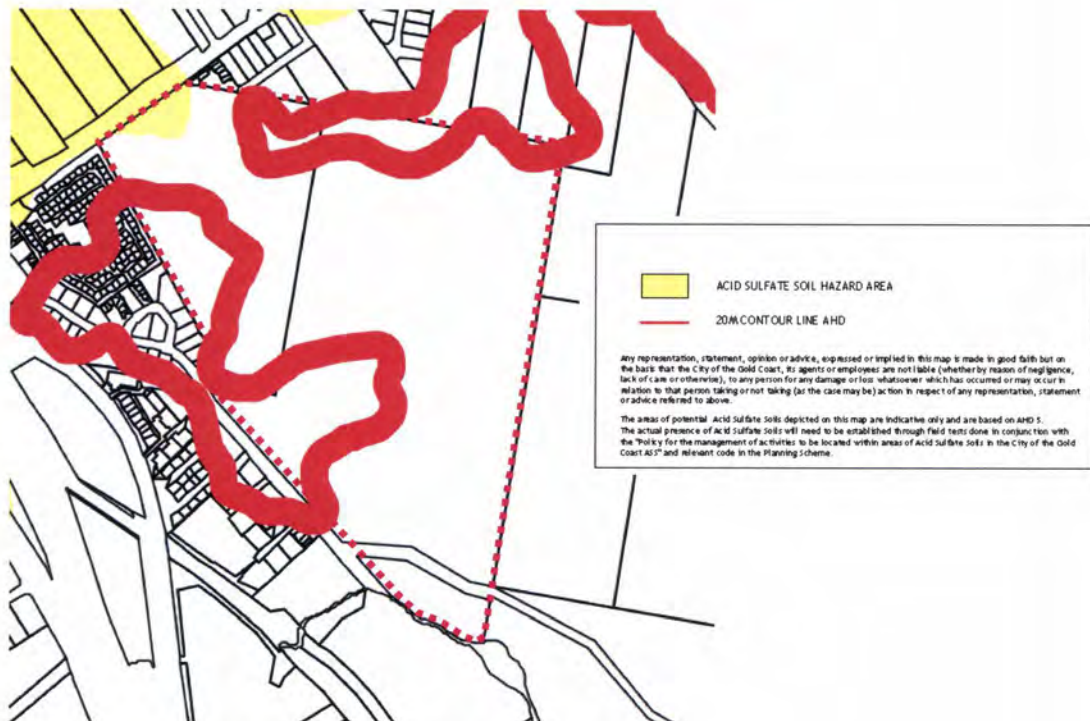


Figure 5 - GCCC Acid Sulfate Soil Map of subject Site

The proposed development will encroach upon the area highlighted (refer Figure 5) as possibly containing acid sulphate soils. To mitigate any potential hazards a site investigation should be undertaken and an Acid Sulfate Management Plan and should be implemented by a suitably qualified consultant.

Nature Conservation

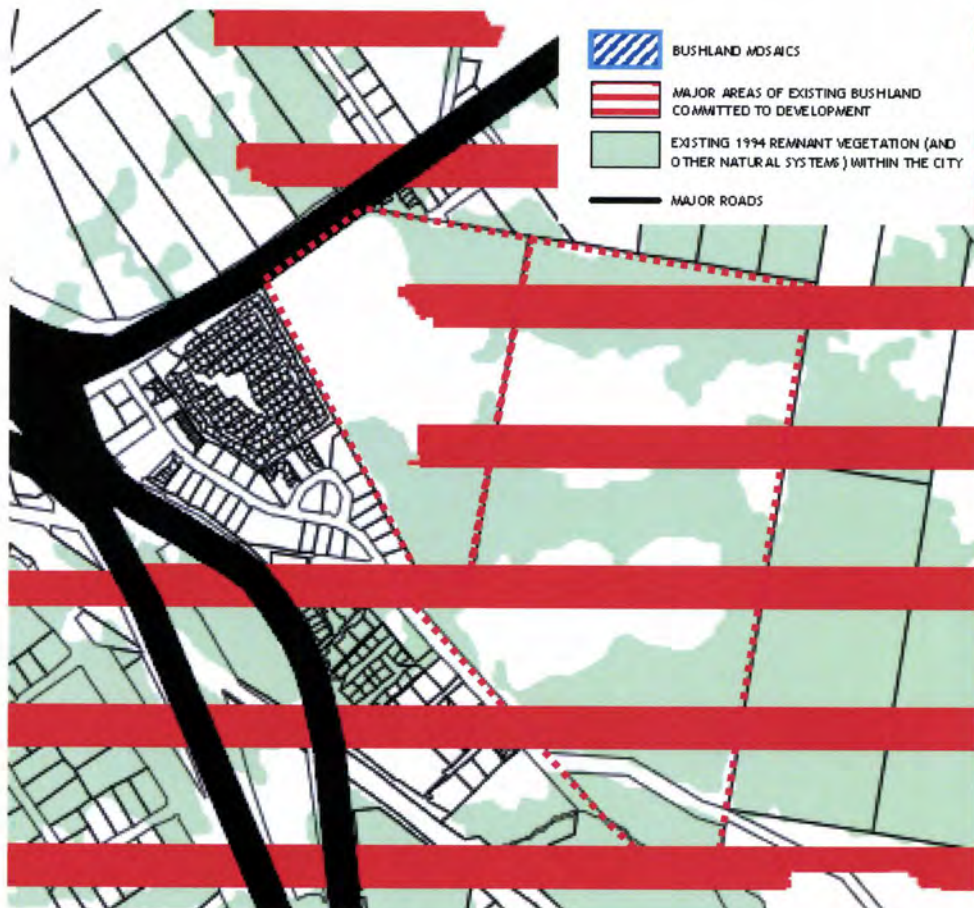


Figure 6 - GCCC Conservation Strategy map of subject site

The Conservation Strategy Plan Overlay Map highlights the subject site as being a “major area of existing bushland committed to development” (see Figure 6) and is recognised by GCCC as being an area in which some loss of ecological values is likely to occur.

As such, this constraint is consistent with the proposed development, being that it incorporates the extension of the neighbouring existing industrial business area. The site has cleared areas and along with the suggested additional rehabilitation/planting and weed removal recommendations, the overall ecological value of the site shall be maintained

wherever possible. The positive solutions and subsequent improvements of ecological value of the subject site will be highlighted in the Constraint Code – Nature Conservation contained in Appendix 4.

7.3.5 Desktop Review Summary

Desktop analysis of the site has revealed a number of possible ecological elements on which to focus 'ground truthing' investigations.

A number of state and commonwealth listed fauna were considered possible or likely occurrences on the subject site, however, none were recorded during site surveys. The subject site does not fall within a mapped assessable development area of Koala habitat, as such no referral to Commonwealth authorities is deemed necessary.

Mapped wetlands occur in the vicinity of the subject site and least concern regional ecosystem 12.11.5 is mapped as occurring on the subject site. As development is proposed within the wetland area referral to DERM is deemed necessary.

Relevant Gold Coast City Council Constraint Codes for the subject site include the Local Area Plan – Yatala Enterprise Area, the Bushfire Management Code, the Natural Wetland and Waterways Code and the Nature Conservation Code.

8 Conclusion

Gassman Development Perspectives have been engaged by William and Patricia Hester to prepare an ecological assessment in support of a development application at 60 Stapylton-Jacob Well's Road, Stapylton. This report has assessed the ecological values on the subject site, including the habitat values for flora and fauna and corridor values that represent movement opportunities for fauna within and adjacent to the subject site. The proposed development on the site is assessed in the context of relevant Commonwealth, State and Local laws and regulations.

Clearing of vegetation is intended as part of the proposed development. Retention of vegetation to form corridors to link other intact bushlands, along with existing riparian vegetation is recommended as part of the proposed development.

The site has large areas cleared of native vegetation. The site is mapped as containing Regional Ecosystem 12.11.5. Eight (8) vegetation communities have been identified as occurring within the site, one (1) of which corresponds with the mapped regional ecosystem. The dominant vegetation community is 'grasslands' with the next dominant vegetation community being 'woodlands'. The proposed development will involve vegetation loss over the majority of the currently vegetated areas on the subject site. The retention and enhancement of some of the existing vegetation, along with the riparian vegetation, will ensure that some corridor and fauna habitat values of the subject site are maintained in conjunction with the proposed development.

All threatened and significant flora and fauna species (i.e. those species that are listed as Vulnerable, Rare or Endangered under the NCWR [1994] and EPBCA [1999] considered to be likely or possible occurrences on the subject site have been identified. Sixteen (16) significant fauna species, and a further seventeen (17) migratory species, were determined as possible or likely occurrences on the site. The proposed development is not likely to impose some negative effects on habitat or refugia values critical to these species. Any negative effects incurred by native fauna will be mitigated by the establishment of a north-south orientated corridor along the eastern boundary of the subject site.

The subject site is designated by Gold Coast City Council as being an area committed to future development. Areas designated as 'being committed to development' have been recognised by GCCC as areas that will experience some loss of ecological values. The proposed development will retain an adequate ecological corridor to ensure minimisation of ecological value loss. Improvements to, and embellishment of, the open space area by rehabilitation, through additional plantings and weed removal, will also mitigate ecological losses of the subject site.

Appendix 1

YATALA ENTERPRISE AREA – LOCAL AREA PLAN

Conservation Areas and Open Space Linkages		
Performance Criteria	Acceptable Solutions	Proposed solution
PC18 Identified conservation areas remain in a substantially undeveloped condition, with vegetation retained to the fullest extent possible and, where necessary, rehabilitated using local native species	AS18.1 Areas identified as Conservation on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities are reserved for conservation purposes, through: a) transfer to Council; b) dedication of a conservation easement; or c) reservation of an area of the site as open space.	The area currently designated as conservation area within the subject site will not be retained as better sited conservation areas will be established and rehabilitated at an alternative location on the subject site. One of the proposed conservation areas traverses the length of the eastern boundary creating a corridor from the north to the south of the site. This buffer will provide a direct linkage to existing tracts of adjacent bushland to the north and south of the subject site. The area designated as Open Space within the subject site, will be retained and enhanced. This Open Space Area will be dedicated to Council.
	AS18.2 Reserved Conservation Areas are managed in the following manner: a) the land remains largely undisturbed by any buildings, clearing and earthworks; b) rehabilitation of natural features is undertaken, where necessary, particularly by way of revegetation of any previously cleared areas and stabilisation of any eroding banks of watercourses.	N/A
	AS18.3 In Conservation Areas associated with the Albert River and Sandy and Halfway Creeks, there is no discharge of waste water or contaminants or piped discharge of stormwater. Any development within the catchment of these waterways retains natural drainage patterns as far as possible, and utilises appropriate stormwater management techniques to minimise any increase in the volume, velocity or sedimentation of runoff into the river or creeks.	No discharge of waste water or contaminants or discharge of stormwater will occur due to the proposed development. Minimisation of any increase of stormwater flows will be addressed in a Stormwater Management Plan.



	AS18.4 For linear Conservation Areas, any parallel roads or services are grouped on one side of the corridor to minimise disturbance. Fencing through Conservation Areas is avoided, wherever possible. Any breaks in the vegetation canopy, necessary for roads or services, are minimised by cutting through perpendicular to the corridor at a point where damage and discontinuity are minimised, such as where the canopy is already broken or sparse. AS18.5 On land adjacent to Conservation Areas, buildings, clearing and earthworks are sited as far away as practicable from reserved Conservation Areas, with the greatest possible separation in the case of ridges, gullies and watercourses. AS18.6 Existing trees are retained, and additional trees planted within a 40 metre wide band, generally along the lines of the links identified on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities: a) the links may form part of the landscape open space areas, associated with individual development proposals. If so, they should generally remain free of building and earthworks; additional tree planting utilises species similar to those existing naturally in the area; b) any parallel roads or services are grouped on one side of the link, to minimise disturbance; c) any breaks in the vegetation canopy, necessary for roads or services, are minimised by cutting through perpendicular to the link at a point where damage and discontinuity are minimised, such as where the canopy is already broken or sparse.	N/A Water courses present on the subject site were observed to be artificial and are largely degraded, and therefore do not represent quality habitat. The subject does not feature any naturally occurring watercourses or gullies. Existing trees will be retained in a 50 metre wide band to form the proposed alternative linkage. This corridor will form a link to adjacent intact bushland along the eastern boundary of the subject site. This vegetation will continue the corridor from the designated open space to the south of the site to adjacent intact bushland to the north. An access track will run parallel to the western boundary of the corridor.
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PC19 In areas identified as Other Open Space on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities as having open space values, development is of a limited scale and intensity, compatible with retention of habitat, landscape and/or buffer values.	AS19 No acceptable solution provided.	No development is proposed in the area is designated as Open Space.
PC20 Other areas within sites (not identified on Yatala Enterprise Area LAP Map 29.3 – Conservation Areas and Priorities), with natural features, such as stands of remnant vegetation, gullies/ridges and watercourses, are to be incorporated in the open space/landscape areas associated with individual development proposals. Other features of ecological and/or landscape value are to be protected and enhanced, where practicable.	AS20 In these areas, existing vegetation and natural drainage patterns are retained and rehabilitated using local native species, as far as practical.	Some remnant vegetation is proposed to be retained within the north-south ecological corridor. This corridor will also be embellished with additional plantings where necessary to form a cohesive link.
PC21 Riparian areas include vegetated buffers of sufficient width to operate as wildlife corridors.	AS21 The following minimum buffer widths are provided: a) 50 metres from the top of the bank on either side of Sandy Creek; b) 50 metres from the top of the bank on the south side of Halfway Creek, west of the Pacific Motorway; c) 100 metres from the top of the bank on the north side of Halfway Creek, west of the Pacific Motorway, for fauna corridor purposes; d) ten metres from the top of the bank on either side of Halfway Creek, east of the Pacific Motorway.	A 50 metre buffer width between Sandy Creek and Christensen Road will be retained. No infrastructure is proposed within this corridor.

Appendix 2

CONSTRAINT CODES – BUSHFIRE MANAGEMENT AREAS

Development that is Self Assessable, Code Assessable or Impact Assessable		
Performance Criteria	Acceptable Solutions	Proposed solution
Bushfire Hazard		
PC1 The fire mitigation methods used at the site must be adequate for the Potential Bushfire Hazard rating of the individual site, having regard to: a) vegetation type; b) slope; c) aspect; d) on-site and off-site fire hazard implications of the development; e) bushfire history; f) conservation values of the site; g) ongoing maintenance.	AS1.1.1 A Fire Management Plan has been prepared in accordance with Planning Scheme Policy 9 – Guidelines for Preparing Fire Management Plans, and the development complies with the Fire Management Plan. OR AS1.1.2 The development is for a detached dwelling, located within a lot that has been created by a residential subdivision approval under one of the superseded Planning Schemes (ie. the lot is intended to be serviced by sewerage reticulation) and the development complies with the conditions of the subdivision approval. OR AS1.1.3. A written assessment by a competent person confirms that the subject site is of Low Potential Bushfire Hazard or has a lower rating; accordingly specific fire mitigation measures are not mandated for the development.	By virtue of the fact that the majority of the vegetation is proposed to be removed from the subject site, a fire management plan is not considered necessary for the subject site. The area of vegetation proposed to be retained and rehabilitated is considered to represent a low bushfire risk and access easements have been incorporated into the overall design of the open space area.
Siting		
PC2 Buildings must be sited to minimise the Potential Bushfire Hazard and maximise the protection of life and property from bushfire. <i>Note: This does not apply to sites where a written assessment by a competent person confirms that the subject site is of Low Potential Bushfire Hazard or has a lower rating.</i>	AS2.1 Houses are located away from the most likely direction of a fire front, or on a flat site at the base of the slope (refer Figure 2-1). AS2.2 The Fire Management Plan clearly identifies the preferred location of building sites, and the building is located within these areas.	As the vegetation retained as part of the proposed development is not considered to pose a high bushfire risk, the siting of buildings is not relevant in this case.



Building Design and Construction		
PC3 A building proposed in a designated Bushfire Prone Area (ie. in an area confirmed through site-based assessment to be subject to High or Medium Potential Bushfire Hazard) must be designed and constructed to maximise the protection of life and property from bushfire.	AS3 The building is constructed in accordance with the requirements of the Building Code of Australia and, where relevant, AS3959-1999 – Construction of Buildings in Bushfire-Prone Areas.	The proposed buildings are not located in a bushfire prone area.
Private Water Supply – In Areas with No Water Reticulation		
PC4 The development proposed in a High and/or Medium Potential Bushfire Hazard Area must provide an adequate water supply for fire fighting purposes.	AS4.1.1 The property contains one dwelling, and the water supply has a volume of water not less than 5,000 litres, and is either: a) a separate tank; and/or b) a reserve section in the bottom part of the main water supply tank; and/or c) a swimming pool installed immediately upon construction of the dwelling OR AS4.1.2 The property contains more than one dwelling and the water supply is provided to protect each individual dwelling, and has a volume of water not less than 10,000 litres, and is: a) a separate tank; and/or b) a reserve section in the bottom part of the mainwater supply tank; and/or c) a swimming pool installed immediately upon construction of the home.	N/A Whilst the remaining vegetation on the site does not represent a medium or high bushfire risk, the proposed development will be connected to GCCC water infrastructure.
PC5 In areas of High and/or Medium Potential Bushfire Hazard, all on-site water supply tanks, including domestic water supply tanks, must be fitted with the standard rural fire brigade fittings for emergency fire fighting purposes.	AS5 The water supply is fitted with a 50mm male camlock (standard rural fire brigade fitting).	The remaining vegetation on the subject site does not represent a medium or high bushfire risk.
PC6 Water supply provided for fire fighting purposes must be safely located and freely accessible for fire fighting purposes at all times.	AS6.1 The water supply outlet is located remote from any potential fire hazards, such as venting gas bottles, a burning house and burning sheds. AS6.2 The outlet pipe is 50mm in diameter and fitted with a 50mm male camlock (standard rural fire brigade fitting).	The remaining vegetation on the subject site does not represent a medium or high bushfire risk. N/A

	AS6.3 A hardstand area is provided not more than six metres from the water supply outlet or, where applicable, a swimming pool.	N/A
Private Water Supply – In Areas with Water Reticulation		
PC7 The water supply must be reliable, and have sufficient flow and pressure requirements for fire fighting purposes at all times.	AS7 The development is proposed in a High and/or Medium Potential Bushfire Hazard Area, and reticulated water is supplied in accordance with Planning Scheme Policy 11 – Land Development Guidelines	The remaining vegetation on the subject site does not represent a medium or high bushfire risk.
Public Water Supply – In Areas with No Water Reticulation		
PC8 The development proposed in a High and/or Medium Potential Bushfire Hazard Area must provide an adequate water supply which is readily accessible to fire brigades for fire fighting purposes.	AS8.1 Where public water supplies, fire hydrants, public water storage or permanent waterways do not exist, water tanks are provided on public land within the development. The water tanks: a) hold a volume of at least 22,500 litres; b) are of concrete construction; and c) fitted with a 50mm male camlock (standard rural fire brigade fitting). AS8.2 A hardstand area is provided not more than six metres from the water supply outlet.	The remaining vegetation on the subject site does not represent a medium or high bushfire risk. N/A
Clearing and Landscaping		
PC9 The development proposed in a High and/or Medium Potential Bushfire Hazard Area must undertake appropriate vegetation clearing and landscaping to mitigate fire hazard.	AS9 The Fire Management Plan addresses appropriate vegetation clearing and landscaping. <i>Note: Part 7, Chapter 36 – Vegetation Management specifies the maximum area of clearing permitted by the Planning Scheme for bushfire hazard mitigation. The Fire Management Plan may recommend lesser clearing on the basis of the specific nature of the development and of the site and the use of alternative fire hazard mitigation measures such as landscaping with fire retardant species.</i>	The removal of some vegetation and the provision of an access track in accordance with the proposed development will reduce the fire hazard of the subject site.
Fire/Maintenance Trails		
PC10 Fire/maintenance trails must be provided to: a) enable access for fire fighters, residents and equipment; b) mitigate against fire hazard; and c) allow fuel reduction activity.	AS10.1 The development is proposed in a Medium Potential Bushfire Hazard Area, and the subdivision design incorporates fire/maintenance trails located as close as possible to the boundaries of the lots and the adjoining bushland.	An access track of 3-5m is proposed to join Road No. 2 to the vegetation buffer along the eastern boundary. This track will run the length of the vegetation buffer and extends to Christensen Road to the south. This track will enable vehicular access to address fire hazard mitigation and maintenance.



	AS10.2 The fire/maintenance trail has: a) a minimum cleared width of six metres; b) a minimum formed width of four metres; and c) a maximum gradient of 16%, with adequate drainage to prevent soil erosion and minimise ongoing trail maintenance. AS10.3.1 Vehicular links are provided along the fire/maintenance trail either to existing fire/maintenance trails or roads, and these links are designed having regard to the topography of the site, fire fighter safety and the need to regularly access water supplies. AND AS10.3.2 The fire/maintenance trail has vehicular access at each end, and links either to existing fire/maintenance trails or roads. OR AS10.3.3 Vehicular access at each end of fire/maintenance trails does not exist, and a turning circle is provided for turning of fire fighting vehicles. OR AS10.3.4 Vehicular access at each end of fire/maintenance trails does not exist, and a 'T' or 'Y' shaped turning bay is provided for turning of fire fighting vehicles. AS10.4 The fire/maintenance trail provides areas for vehicles to pass or turn at intervals of not more than 400 metres and with a maximum grade of 5% (1 in 20). AS10.5.1 Fire/maintenance trails are located on public land (including public open space areas) to facilitate access for fire brigades. OR	The proposed access track will join Christensen Road to the south and will be intersection by proposed Road No. 2 to the north. N/A N/A The proposed access track will be between 3-5m and therefore will allow passing and turning of vehicles. The proposed access track will be adjoining the ecological corridor, which is become open space.
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	AS10.5.2 Fire/maintenance trails are located on public land (including public open space areas) to facilitate access for fire brigades and other purposes, such as pedestrian and cycling access. OR AS10.5.3 Fire/maintenance trails are located on the site, and an access easement is granted in favour of Council and fire brigades.	N/A The proposed access track will be adjoining the ecological corridor, which is become open space.
Advice to New Residents		
PC11 Reconfiguring a Lot occurs in a High and/or Medium Potential Bushfire Hazard Area and new residents must be informed about: a) the potential bushfire hazard on their site; b) their responsibility for fire management; and c) the measures available for ongoing fire hazard mitigation.	AS11 A copy of the Fire Management Plan is provided to each resident for the information of occupants.	The remaining vegetation on the subject site does not represent a medium or high bushfire risk.
Vehicular Access		
PC12 The vehicular access (including internal roads) must be designed to mitigate against bushfire hazard by ensuring adequate access for: a) fire fighting and other emergency vehicles; and b) the evacuation of residents and emergency personnel, in the event of an emergency.	AS12.1 The development is proposed in a High Potential Bushfire Hazard Area, and the Reconfiguring a Lot design incorporates a perimeter road that: a) is located between the boundary of the lots and the adjacent bushland; b) has a minimum cleared width of 20 metres; c) has a constructed road width of six metres; and d) is constructed to an all weather standard (refer Figure 2-2). AS12.2 The road design is capable of providing access for fire fighting and other emergency vehicles, in accordance with Planning Scheme Policy 11 – Land Development Guidelines. AS12.3 Reconfiguring a Lot is proposed to occur in a High Potential Bushfire Hazard Area, and all roads are through roads and culs-de-sac are not utilised (refer Figure 2-2).	N/A The remaining vegetation on the subject site does not represent a medium or high bushfire risk. N/A



	AS12.4.1 Reconfiguring a Lot is proposed to occur in a Medium Potential Bushfire Hazard area, and culs-de-sac are not more than 200 metres in length, and intersect or are met by a cross road or connecting road. OR AS12.4.2 Reconfiguring a Lot is proposed to occur in a Medium Potential Bushfire Hazard area, and culs-de-sac are utilised, and an alternative access links the cul-de-sac to other through roads.	No culs-de-sacs are proposed within the development design. N/A
Lot Layout		
PC13 In areas of High and/or Medium Potential Bushfire Hazard, access and internal roads must be constructed for the safe and effective operational use of the water supply and equipment on the fire fighting vehicles.	AS13 The development is proposed in a High and/or Medium Potential Bushfire Hazard Area, and roads are designed and constructed in accordance with Planning Scheme Policy 11 – Land Development Guidelines.	The remaining vegetation on the subject site does not represent a medium or high bushfire risk.
PC14 The lot layout of residential developments must be designed to mitigate any Potential Bushfire Hazard and provide safe sites for dwellings.	AS14 Residential lots are not located wholly within a High Potential Bushfire Hazard Area, and the building envelope is located in a lower Potential Bushfire Hazard Area of the site.	N/A
Land Use		
PC15 Any Material Change of Use, other than a detached dwelling, must not result in a high concentration of people living or congregating in a High Potential Bushfire Hazard Area.	AS15 The following uses are inappropriate in the High Potential Bushfire Hazard Area: a) educational establishment; b) hospital; c) aged persons accommodation; d) caravan park; e) child care centre; f) community care centre; g) corrective institution; h) ecotourism facility; i) minor tourist facility; or j) tourist cabins.	N/A

Appendix 3

CONSTRAINT CODES – NATURAL WETLAND AREAS AND NATURAL WATERWAYS

Development that is Code Assessable or Impact Assessable		
Performance Criteria	Acceptable Solutions	Proposed solution
Ecological Assessment		
PC1 Prior to commencing the development design: a) the ecological features and functions located on and/or adjacent to the site must be identified and assessed; b) any ecologically significant areas, including any wetland, aquatic and riparian areas, or degraded areas suitable for rehabilitation to become ecologically significant, and located on and/or adjacent to the site, must be identified.	AS1 An ecological assessment is prepared by a suitably qualified and experienced person in accordance with Planning Scheme Policy 8 – Guidelines for Ecological Assessments .	The preceding report has been prepared by a suitably qualified environmental scientist.
Retention of Ecologically Significant Areas		
PC2 Ecologically significant areas must be protected and maintained.	AS2 Development does not occur within an ecologically significant area, including wetlands, aquatic and riparian communities.	Development will not occur within the designated open space area adjacent to Sandy Creek.
PC3 Ecologically significant areas must not be negatively impacted upon, either directly or indirectly, by activity resulting from the establishment and operation of the development.	AS3 No acceptable solution provided.	All measures will be undertaken and adhered to ensure no negative impacts result from the proposed development. This will include appropriate stormwater and sediment and erosion control measures installed.
Setback		
PC4 All development (including structures, fill, infrastructure and services) must be set back from any ecologically significant areas, including wetlands, aquatic and riparian communities, to enable:	PC4 No acceptable solution provided.	As the riparian vegetation is to be retained the continued ecology function of the area will be increased. Access to the area will occur to continue monitoring and maintaining the vegetation within the open space area.



a) the continued ecological function of the area; and b) access to the area for maintenance and management purposes.		
Rehabilitation		
PC5 The degraded wetland and waterway areas, ecological corridors and buffer areas that are important to the viability of ecologically significant areas must be rehabilitated as near as is practical to the naturally occurring composition of plant species, and respond to the habitat requirements of fauna.	AS5.1 The degraded area identified in the approved Ecological Site Assessment as requiring rehabilitation is rehabilitated in accordance with an approved rehabilitation Plan utilising local endemic species and stock that: a) reflects the species composition of native remnant vegetation on the site or surrounds; b) consolidates existing habitats on the site; c) does not displace native flora species or degrade fauna habitat. AS5.2 A detailed Landscape Plan, incorporating the rehabilitation, is prepared in accordance with Planning Scheme Policy 13 – Landscape Strategy Part 2 – Landscape Works Documentation Manual.	A Rehabilitation and Landscape Plan will be provided. This plan will recommend species for rehabilitation planting and strategies for weed removal.
Water Management		
PC6 The natural hydrological regimes of wetlands and waterways, including natural water quality, quantity and groundwater conditions, must be maintained and enhanced.	AS6 A Stormwater Management Plan which is prepared for the site in accordance with the Stormwater Management and Water Quality Guidelines demonstrates that: a) stormwater is treated prior to discharge into the wetland or waterway; b) stormwater is discharged at appropriate areas of the waterway; c) the velocity and quality of stormwater to be discharged into the wetland or waterway does not degrade the environmental values of the wetland or waterway; d) the development will not impact on the geohydrology affecting the wetland or waterway.	A Stormwater Management Plan will be prepared for the subject site.
On-Site Effluent Disposal		
PC7 The ecologically significant areas must be buffered from effluent/ irrigation treatment plants/ disposal areas to ensure that suitable areas are provided for the treatment of wastewater, prior to entering into the existing groundwater system and adjoining waterway and wetland areas.	AS7 Where development is proposed to occur on unsewered land, any on-site wastewater disposal facility is to comply with the requirements of Part 7, Division 3 Constraint Codes, Chapter 17 – Unsewered Land.	The subject site is to be connected to local sewerage infrastructure. Wastewater will be treated appropriately in accordance with the Stormwater Management Plan prior to discharge to Sandy Creek.

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	OR AS8.1.6 Buffer/s, of dimensions and characteristics that will protect the long-term viability of any Other Natural Waterways and their associated riparian communities, as identified on Overlay Map OM11 – Natural Wetland and Waterway Areas, are in accordance with expert ecological advice provided as part of the approved Ecological Site Assessment. <i>Note: The buffer width for wetlands is measured from the outer, landward boundary of the mapped Freshwater or Tidal Wetland, as shown on Overlay Map OM11 – Natural Wetland and Waterway Areas, or as defined through an approved Ecological Assessment. The buffer width, on each side of the waterway, is measured from the top of the high bank or from the outer landward boundary of a mapped riparian community, as shown on Overlay Map OM11 – Natural Wetland and Waterway Areas, or as defined through an approved Ecological Assessment.</i>	N/A
Ecological Corridors		
PC9 Ecological corridors must be provided of dimensions and characteristics that can be demonstrated will effectively link ecologically significant areas on and/or adjacent to the site, in order to facilitate the effective movement of flora and fauna using the site and surrounds	AS9.1.1 Ecological corridors of not less than 100 metres are provided on-site and link ecologically significant areas either within or adjacent to the site. OR AS9.1.2 Ecological corridors of dimensions and characteristics that are sufficient to facilitate the movement of flora and fauna between ecologically significant areas located on and/or adjacent to the site are provided in accordance with expert ecological advice provided as part of the approved Ecological Site Assessment	N/A No critical linkages have been identified on the subject site. The riparian vegetation retained on the site will continue to provide important corridor values in relation to the adjacent vegetation.
Management Arrangements		
PC10 Management arrangements must facilitate the conservation and protection of ecologically significant areas, ecological corridors and buffers.	AS10.1 Ecologically significant areas, buffers and ecological corridors, identified in the Ecological Assessment, are: a) dedicated as Public Open Space, where required for public access or for some other public purpose consistent with their ecological values and functions; or b) incorporated within Private Open Space and included within a Voluntary Statutory Covenant under the Land Title Act 1994.	The Public Open Space will be rehabilitated and revegetated in accordance with a Rehabilitation Plan. Following an appropriate monitoring and maintenance period it will be dedicated to council.

	AS10.2 An Open Space Management Plan has been prepared, in accordance with Part 7, Division 2 Specific Development Codes, Chapter 21 – Landscape Work.	
Vehicular and Pedestrian Crossing		
PC11 The number of vehicular and pedestrian crossings over or through ecologically significant areas on the site (in particular, the wetland, aquatic and riparian communities) must be minimised.	AS11.1.1 Vehicular and/or pedestrian accessways do not cross over or through ecologically significant areas (in particular, wetland, aquatic and riparian communities) on the site. OR AS11.1.2 Any vehicular and/or pedestrian accessways that cross over or through ecologically significant areas (in particular, wetland, aquatic and riparian communities) on the site are designed to: - minimise the area of disturbance; - facilitate the unimpeded movement of fauna.	Proposed vehicular accessways do not cross over or through any ecologically significant areas. N/A

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as being ecologically significant in any ecological site assessment must be conserved.	AS3.2 Where the native fauna habitat located on the site is to be damaged as a consequence of development, fauna are to be relocated in accordance with an approved Fauna Management Plan, and utilizing the services of a licensed spotter-catcher: a) the native fauna is safely relocated to an area of similar habitat; b) fauna relocation occurs immediately prior to habitat disturbance; c) a spotter catcher, licensed by the Queensland Parks and Wildlife Service, is to be present on the site to direct and undertake the removal and relocation of fauna. AS3.3 The sequence of habitat disturbance ensures that fauna is not isolated from adjoining areas of habitat (for example, the roadside of the area is cleared first).	development, some habitat will be retained and enhanced in the eastern portion of the subject site A fauna management plan will be prepared prior to vegetation removal and a suitably qualified spotter-catcher will be engaged to be present during all clearing operations. The fauna management plan will contain a direction of clearing instruction.
Lot Size, Design and Layout		
PC4 Lot size, design and layout must support the protection of the site's ecologically significant areas.	AS4.1 Lot size, design and layout minimises fragmentation of any ecologically significant area. AS4.2 Lot size facilitates the implementation of the buffers and ecological corridors identified in the approved Ecological Site Assessment as required to maintain the viability of the site's ecologically significant areas.	Retention and improvement of the existing riparian in the south of the site and the vegetation corridor established in the east of the subject site will increase the value of linkages to adjacent bushland.
Large Habitat Systems and Foothill Buffers, Major Linkages (Land Based), Significant Remnants and Bushland Mosaics		
Ecologically Significant Areas		
PC5 Ecologically significant areas must be protected and maintained.	AS5.1 Development does not occur within an area identified as an ecologically significant area. AS5.2 The ecologically significant area is not negatively impacted, either directly or indirectly, by activity resulting from the construction and operation of the development.	The only ecologically significant area identified on the subject site is in the form of Sandy Creek

Other Remnant Vegetation		
PC6 The conservation of the	AS6.1 The development occurs wholly or	



site's ecologically significant areas must be supported.	partly within an area designated as a Large Habitat System and is restricted to existing cleared or degraded areas identified in the approved Ecological Site Assessment as not requiring rehabilitation. AS6.2 The development forms a consolidated and compact node which: a) maximises the use of existing cleared and/or degraded areas not requiring rehabilitation; b) maximises the conservation and retention of remnant vegetation; c) minimises the impact of 'edge effects'; d) minimises fragmentation of remnant vegetation; e) utilises building envelopes within which all development activity, residential uses and ancillary activities are to be located. Building envelopes are to be specified on site plans for each lot, and located so as to pose the least threat to ecological values; f) ensures that any recommended bushfire management practices do not compromise the integrity of any ecologically significant habitat identified in any Ecological Site Assessment.	The proposed development does not occur within an area designated as a Large Habitat System. N/A
Fauna Conservation		
PC7 Unimpeded movement of fauna within and through the site and along designated ecological corridors must be facilitated.	AS7.1 The development incorporates viable native fauna movement paths, and creates viable wildlife infrastructure: for example, fauna underpasses under roads and sewage infrastructure, and fauna overpasses over roads, where free movement of fauna along and within ecological corridors is not impeded by activity arising from the development. AS7.2 The development utilises fauna proof fencing to separate fauna from hazard, and/or to direct fauna to locations where wildlife infrastructure has been created, to enable wildlife to safely negotiate an intersection of development and ecological corridors.	Enhancement of the riparian vegetation along with the retention of vegetation to form a continual corridor is proposed. Habitat opportunities for native fauna will be maintained. No impediments to fauna movements will occur due to the proposed development. Fauna proof fencing will be utilised, where practical, to direct fauna along the proposed corridor.

Buffers		
PC8 Buffers must be provided to	AS8.1.1 Buffer/s of not less than 30 metres	A buffer of not less than 50



ensure viability of the values and functions of ecologically significant areas and natural reserves.	width, incorporating vegetated (representative of local native habitat) and degraded areas requiring rehabilitation, are provided between the development and ecologically significant areas located on and/or adjacent to the site. OR AS8.1.2 Buffer/s are provided of dimensions and characteristics that protect the long term viability of the ecologically significant areas located on and/or adjacent to the site from negative impacts associated with development on the site, in accordance with expert ecological advice provided as part of the approved Ecological Site Assessment. AS8.2 The site has been wholly or partly identified on Overlay Map OM11 – Natural Wetland and Waterway Areas as having wetland areas, and the development provides a buffer of an equal or greater width than that specified in Part 7, Division 3 Constraint Codes, Chapter 9 – Natural Wetland Areas and Natural Waterways .	metres will be provided between the proposed development and the ecologically significant area located in the southern portion of the site represented by Sandy Creek.
Ecological Corridors		
PC9 To facilitate the effective movement of flora and fauna on the site and surrounds, ecological corridors of sufficient dimensions and characteristics must be provided on-site to effectively link ecologically significant areas and natural reserves located on and/or adjacent to the site.	AS9.1.1 Ecological corridors of not less than 100 metres are provided on-site and link ecologically significant areas either within or adjacent to the site. a) 100 metres for eucalypt forests; b) 100 metres in koala habitat; c) 120 metres for ground based wildlife corridors. OR AS9.1.2 Ecological corridors are provided of dimensions and characteristics that are sufficient to facilitate the movement of flora and fauna between ecologically significant areas located on and/or adjacent to the site, in accordance with expert ecological advice as part of the Ecological Site Assessment.	An ecological corridor 50m in width will be retained and enhanced to link other ecologically significant areas adjacent to the site. No critical linkages are identified on the subject site. The site is linked to the north, south and east by intact existing bushland. The riparian vegetation retained on the southern part of Lot 240 W31320 provides important corridor values in relation to the adjacent bushland and will be retained.

Management Arrangements		
PC10 Management arrangements must facilitate the	AS10.1 Ecologically significant areas, buffers and ecological corridors are:	An ecologically significant area has been identified within the

conservation and protection of ecologically significant areas, ecological corridors and buffers	a) dedicated as Public Open Space where required for public access or for use for some other public purpose, consistent with their ecological values and functions; b) incorporated within Private Open Space and included within a Voluntary Statutory Covenant or a Vegetation Protection Area. AS10.2 An Open Space Management Plan has been prepared in accordance with Part 7, Division 2 Specific Development Codes, Chapter 21 – Landscape Work.	designated Open Space zone. This area, along with the proposed corridor, will be retained and rehabilitated and dedicated to GCCC upon completion of the proposed development. An Open Space Management Plan, will be prepared and submitted with this application.
Rehabilitation		
PC11 Degraded areas on the site required as a buffer to, or ecological corridor between, ecologically significant areas located on and/or adjacent to the site must be rehabilitated as near as is practical to the naturally occurring composition of plant species, and respond to the habitat requirements of fauna.	AS11 The degraded area identified in the Ecological Site Assessment as requiring rehabilitation is rehabilitated in accordance with an approved Rehabilitation Plan, using local endemic species and stock that: a) reflect the species composition of native remnant vegetation present on the site or surrounds; consolidate existing habitats on the site; b) do not utilise plant species that will displace native flora species or degrade fauna habitat; and c) support the habitat needs of any rare and threatened species.	A Rehabilitation and Landscape Plan, prepared by a suitably qualified consultant, will be provided. This plan will recommend species for rehabilitation planting and strategies for weed removal.
Landscape Work		
PC12 Landscape work must be consistent with and not degrade, the ecological values present on the site and its surrounds.	AS12 Landscape Work is consistent with Part 7, Division 2 Specific Development Codes, Chapter 21 – Landscape Work and: a) uses species and stock endemic to the local area; reflects the species composition of native remnant vegetation present on the site or surrounds; b) consolidates existing habitats on the site; and c) does not use plant species that will displace native flora species or degrade fauna habitat.	A Rehabilitation and Landscape Plan, prepared by a suitably qualified consultant, will be provided. This plan will recommend species for planting that will not displace but supplement the existing native species.

Existing Remnant Vegetation (and Other Natural Areas)		
Ecologically Significant Areas		
PC13 Ecologically significant areas must be conserved	AS13.1.1 Development does not occur within an area identified as ecologically significant.	The only ecologically significant area on the subject site is



and protected.	OR AS13.1.2 An area identified as ecologically significant is retained, unless an over-riding public safety consideration results in the ecologically significant area being modified or removed. AS13.2 The ecologically significant area is not negatively impacted, either directly or indirectly, by activity resulting from the construction and operation of the development.	represented by the riparian vegetation associated with Sandy Creek. 50m of this riparian zone is proposed to be retained in accordance with adjacent developments.
Buffers		
PC14 Buffers must be provided to ensure viability of the values and functions of ecologically significant areas and natural reserves.	AS14.1.1 Buffer/s of not less than 10 metres width, incorporating vegetated and degraded areas requiring rehabilitation, are provided between the development and ecologically significant areas on and/or adjacent to the site. OR AS14.1.2 Buffer/s of dimensions and characteristics that will protect the long term viability of the ecologically significant areas, located on and/or adjacent to the site, from negative impacts associated with development on the site are provided in accordance with expert ecological advice and approved as part of the Ecological Site Assessment.	The only ecologically significant area on the subject site is represented by the riparian vegetation associated with Sandy Creek. 50m of this riparian zone is proposed to be retained in accordance with adjacent developments.
Management Arrangements		
PC15 Management arrangements for ecologically significant areas and buffers must enable the ecological values and functions of these areas to be maintained.	AS15.1 Ecologically significant areas including buffers, are: a) dedicated as Public Open Space where required for public access or for use for some other public purpose, consistent with their ecological values and functions; b) incorporated within Private Open Space and included within a Voluntary Statutory Covenant or a Vegetation Protection Area. AS15.2 An open space management plan has been prepared, in accordance with Part 7, Division 2 Specific Development Codes, Chapter 21 – Landscape Work.	The only ecologically significant area on the subject site is represented by the riparian vegetation associated with Sandy Creek. 50m of this riparian zone is proposed to be retained in accordance with adjacent developments. An open space management plan will be provided.
Landscape Work		
PC16 Landscape work must: a) support the ecological values and functions of the ecologically	AS16 No acceptable solution provided.	A Rehabilitation and Landscape Plan, prepared by a suitably qualified consultant, will be provided. This plan will



significant areas; b) minimise impacts on the environmental values of the area; and c) contribute to the visual amenity and character of the site and local neighbourhood.		recommend species for rehabilitation planting and strategies for weed removal which will support the ecological value and function of proposed conservation areas.
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12 – OPEN SPACE MANAGEMENT STATEMENT & REHABILITATION PLAN (GDP)

OPEN SPACE MANAGEMENT STATEMENT AND REHABILITATION PLAN

Lot 1 on RP6882 and Lot 240 on W31320

Stapylton-Jacob's Well Road and
Christensen Road, Stapylton

PREPARED FOR

PATRICIA AND WILLIAM HESTER

30TH JUNE 2011



gassman
development
perspectives

project coordination
urban + regional planning
landscape + urban design
environmental management
visualisation + spatial services
surveying services
advisory services



- planning
- design
- environment
- surveying

DOCUMENT CONTROL SHEET

Original Date of Issue: **June 2011**

DOCUMENT DETAILS

Title:	Open Space Management Statement and Rehabilitation Management Plan
Principal Author:	M Spears
Project Manager:	B Gassman
Client:	Patricia and William Hester
Site Description:	Pastoral land, vegetated in parts. Soil conditioning plant
Client Address:	Stapylton-Jacobs Well Road, Stapylton
Client Contact:	William Hester

REVISION/CHECKLIST HISTORY

Revision Number	Date	Checked by	Issued by

DISTRIBUTION RECORD

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APPENDICES:

Appendix 1	Amended Site Plan (Including OSPA and Planting Modules)
Appendix 2	Monitoring Form



1 Introduction

1.1 Purpose

This Open Space Management Statement (OSMS) has been prepared for the purposes of maintaining the proposed Open Space area of dedication on the subject site.

This (OSMS) has been prepared in accordance with the Gold Coast City Council Open Space Management Guidelines: Guideline for the Preparation of Reports and Plans Associated with the Dedication of Public Open Space (March 2007, Version 1).

The purpose of this Open Space Management Statement is to provide the following information relating to a Development Application for a property described as Lot 1 on RP6882 and Lot 240 on W31320 at Stapylton-Jacob's Well Road and Christenson Road, Stapylton.

- 1 **Site Description and Analysis;**
- 2 **Park Description and Design;**
- 3 **Code and Development Compliance.**

The broad aim of this Open Space Management Statement is to provide Council Officers with confidence that the proposed Open Space Park Area will function appropriately in the context of the proposed development (and surrounding environment) whilst simultaneously meeting Council's requirements for the park's ongoing operation.

1.2 Site Description and Proposal

Site Owners	Pace Property Group
Location	Martens Street, Yatala
Legal Description	Lot 1 on RP6882 and Lot 240 on W31320
Development Application	Industrial subdivision

1.2.1 Site Characteristics

The subject site is accessed via Stapylton-Jacobs Well Road and Christenson Road, Stapylton. It is bounded industrial and residential uses in the south-west and north and Stapylton-Jacobs Well Road in the west. It is bounded to the east by a large landfill facility. To the south lies Sandy Creek.

Approximately half of the site is currently vegetated. The balance is comprised of cleared pastoral land and a soil and garden products manufacturing facility.

1.2.2 Proposed Development

The development application that this report supports is for the subdivision of the subject site into an industrial park of mixed lot sizes and uses. The proposal includes associated roads, stormwater treatment and other infrastructure.



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1.2.3 Summary of Open Space Areas

The aim of the Open Space Management Area (OSMA) is to establish an effective north-south ecological link which aims to connect the north of the site to the riparian corridor associated with Sandy Creek. A mixed approach of weed management, natural and assisted regeneration approaches will be undertaken to achieve the outcomes required for this area prior to dedication to Council.

1.2.4 Approvals for the site

At the time of writing this OSMS, the site has not been issued with any relevant Development Approvals.

This OSMS has been prepared in association with a development application for the subject site.

1.3 Relevant Development Constraints

Pursuant to the 2007 Open Space Management Guidelines the following possible areas of constraint have been assessed against possible constraints imposed upon it by Federal Government Departments, State Government Departments, Local Authorities and inherent physical constraints of the site.

1.3.1 Federal Government Departments

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) has been enacted to protect the environment, particularly matters of National Environmental Significance. The Australian Government: Department of the Environment, Water, Heritage and the Arts administers the EPBC Act and implements the Act, in part, via the Department's 'Protected Matters' environmental database tool.

The Protected Matters Database generates a report (based on a defined grid search area) that helps determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in or around the subject site. The information provided in the report is indicative only, and corroboration with a ground-truthing investigation is required.

An indication of possible Protected Matters, as they relate to the site and surrounding area, include:

- 1 x Wetland of International Significance;
- 14 x Threatened Species (being within the general area);
- 20 x Migratory Species (being within the general area).

The grid search area was identified as being within the same catchment area as the Moreton Bay RAMSAR Wetland of International Importance. The EPBC Act Protected Matters search did not identify any threatened ecological communities or commonwealth marine areas within the grid search area.

A ground-truthing investigation has determined there are no wetlands of International Significance present on site. An investigation of the potential habitat of the site indicated that the site was not likely to support significant populations of any listed species.

It is considered that the site is not significantly, or onerously constrained by matters of national significance.



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1.3.2 State Government Departments

Upon assessing the site against the latest DERM *Regional Ecosystem Map* (to assess the site against the provisions of the *Vegetation Management Act 1999*) it has been noted that the site contains portions of *least concern* regional ecosystem 12.11.5 throughout the site (see **Figure 1.1**).

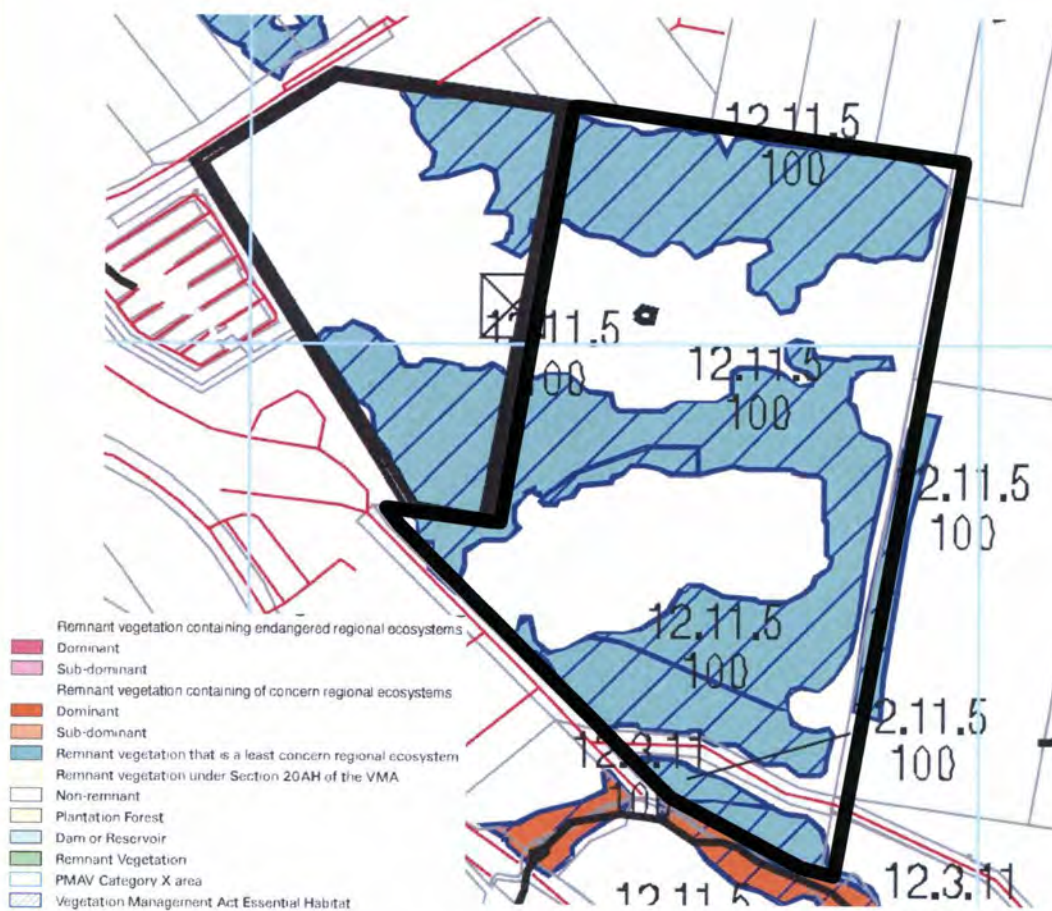


Figure 1.1: Excerpt of RE Map (DERM).

Closely associated with the Regional Ecosystem Mapping is the DERM Referable Wetland Data Base. A search of the site using the Referable Wetland Mapping Tool indicates that the site is constrained by natural wetlands deemed significant in the form of Sandy Creek at the southern boundary of the subject site (**Figure 1.2**). A 50m riparian buffer will be retained as part of this development proposal and will also be dedicated to Council as part of the open space areas associated with the subject site.

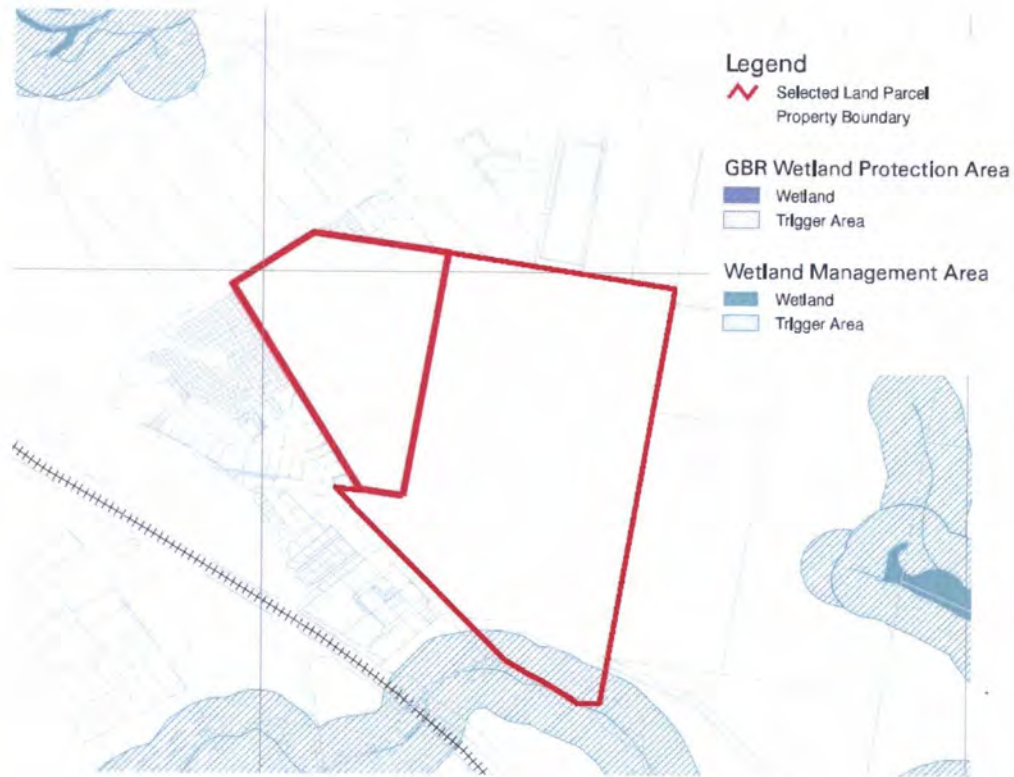


Figure 1.2: Excerpt of Referable Wetland Map (DERM).

The South East Queensland Koala Conservation State Planning Regulatory Provision (SPRP) and State Planning Policy 2/10: Koala Conservation in South East Queensland (SPP) are made under the Sustainable Planning Act 2009 (SPA). Koala Conservation State Planning Regulatory Provision (SPRP) trigger maps revealed that the subject site does not fall in a mapped assessable development area of Koala habitat.

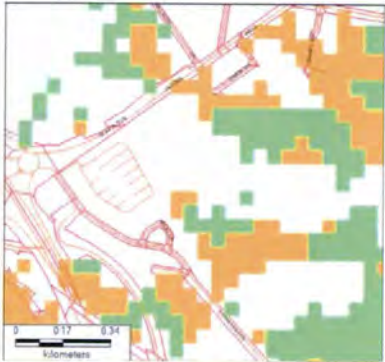
1.3.3 Local Authority

The Gold Coast Planning Scheme has identified the following development constraints over the site:



Local Area Plan Maps:

Conservation Strategy Plan Overlay Map identifies the subject site as containing "conservation" and "links".



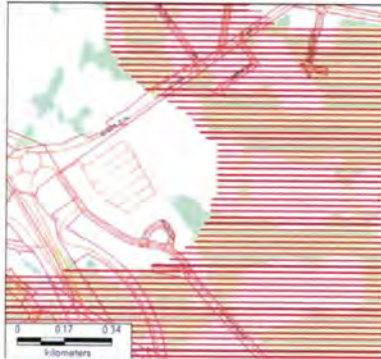
Potential Bushfire Hazard Areas – Overlay Map OM10

OM10 indicates that the site may be affected by *Low* and *Medium Potential Bushfire Risk* in various areas throughout the site.



Acid Sulphate Soil Hazard Areas - Overlay Map OM14

OM14 indicates that the site potentially contains Acid Sulphate Soils in the northwestern portion of the subject site.



Nature Conservation Strategy Plan - Overlay Map OM 20

OM20 indicates that the site contains remnant 1994 bushland, with a large portion of the site committed to future development.

1.3.4 Physical Constraints

There are no significant physical constraints to establishing the open space rehabilitation proposed for the subject site. At approximately half way along the length of the proposed rehabilitation section the site dips to a low lying area which was observed to be moist during a site inspection. If plantings are established after heavy rainfall, high levels of soil moisture may impede the establishment of these plantings.

1.4 Detailed Site Analysis

The development application incorporates some specialist reports. The table below directs the reader to the relevant report, which provides a more detailed site analysis of relevant constraints.

Appendix 1	Amended Site Plan (Including OSPA and Planting Modules)
Appendix 2	Monitoring Form

2 Park Dedication and Design

2.1 Open Space Parkland Summary

This section of this Open Space Management Statement will provide details about the design of the OSPA, including the rationale as to how the parkland was determined. In addition to design determinants, this section will also provide comment on the credible features of the parkland.

Parkland, Size, Shape and Distribution	The proposed OSPA encompasses a 50m wide strip which extends to the eastern boundary. It will form a north-south ecological link. In addition to this 50m strip, a 3m access track is proposed to traverse the length of the area on the western side of the OSPA.
Function and Connectivity	The OSPA has a number of functions consisting of: • Ecological area; • Habitat interactions and Rehabilitation potentials; • Aesthetic values; • Natural drainage. The OSPA has been principally created to enhance the ecological values of the area in addition to increasing connectivity between the areas north and south of the subject site.
Context	The OSPA has been designed in the context of its position in relation to surrounding vegetation, specifically the vegetation to the north of the subject site in the proximity of Rossmann's Road and the riparian vegetation associated with Sandy Creek. This open space is designed principally to create a cohesive ecological corridor between these two adjacent tracts of bushland.
Environmental Impact/Protection	A significant rationale for providing the conservation purpose area of OSPA is to assist in providing an ecological link through the site which is achieved via proposed revegetation and assisted regeneration. Particular attention needs to be paid to the site's role in any wider ecological corridor.
Access location	Provision is available for OSPA access via the internal road system of the proposed development.
Community impact	The park will have a beneficial impact on the local community by cohesively connecting a tract of bushland that did not previously exist. It will ensure that the ecological connectivity values of this site are maintained within the wider context of adjacent bushland.
Safety	There are no known safety issues associated with the Park Land.

2.2 Design Rationale

The OSPA design rationale has been based on the requirements of the Gold Coast Planning Scheme and the most appropriate location to situate such a corridor. As referred to above, the aim for this design is to ultimately provide contiguous connectivity to vegetation on adjacent sites.

In consideration of the site's developments constraints (identified earlier), the design of the park land has been influenced as follows:

- It creates a habitat corridor through the site and to link adjacent ecologically significant areas;
- Aesthetically pleasing area enhancing landscape features and native vegetation;
- Provide a green backdrop for future development and industry;

2.3 Open Space Park Constraints

Possible constraints that have been identified on site have been incorporated in the design of the OSPA. The following section of the Open Space Management Statement identifies further constraints and provides information on their mitigation.

2.3.1 Environmental, Cultural or Heritage Preservation

There have been no features of environmental, cultural or heritage significance identified on the site. As a consequence of development, reasonable and practical measures shall be executed where required in order to meet the duty of care requirements under the *Aboriginal Cultural Heritage Act (2003)*.

2.3.2 Environmentally Significant Functions

The proposed open space corridor connects vegetation to the north of the site to the riparian vegetation associated with Sandy Creek which is considered to be an environmentally significant area. These values will be maintained and enhanced through the proposed additional plantings.

2.3.3 Rehabilitation and Landscaping

A Rehabilitation Management Plan that covers the OSPA is attached to this OSMS.

2.3.4 Delineation of OSPA

A 3-5 metre access trail will separate the OSPA from the adjacent industrial development.

2.3.5 Embellishments and Fencing

As the intent for the OSPA is principally to facilitate natural processes and conservation, no public facility embellishments are proposed within the park. Access for maintenance and fire management will be provided via the internal road system and the proposed 3-5m access trail.

2.3.6 Linkages

As discussed previously, ecological linkages will be established throughout the proposed OSPA.

2.3.7 Bushfire

The vegetation associated with the OSPA is considered to pose a low bushfire threat level. Therefore, bushfire management and mitigation measures are not considered necessary for the subject site. However, fire management access will be provided via internal road system if needed.

2.3.8 Stormwater and Hydraulic Management Provisions

A report detailing stormwater and hydraulic management provisions will be prepared and submitted with this development application.

2.3.9 Other Infrastructure

No other infrastructure will be located within the OSPA.

2.4 Open Space Design

The open space design has been discussed in detail in the preceding sections and should be read in conjunction with this OSMS, as well as the attached Rehabilitation Management Plan.



3 Code and Development Compliance

3.1 Planning Process

The site is located within the Yatala Local Area Plan Domain as determined by the Gold Coast City Council Planning Scheme. The local area planning intent for this Domain is as follows:

Planning Intent (Local Area Plan)

The purpose of this Local Area Plan (LAP) is to provide for the detailed planning and development of the Yatala Enterprise Area (YEA). The YEA is a highly valuable resource for the City. There is an opportunity to create a dedicated area that could be a market leader in terms of innovative industrial development that would facilitate growth in long term employment in the 21st century. Therefore, the purpose of this LAP is to promote the orderly economic development of the YEA as a major industrial employment district for both the Gold Coast City and the South East Queensland region. The LAP provides locational and assessment criteria for the establishment of industrial activities in the defined Yatala/Stapylton area.

However, by virtue of the intended purpose for the land in question, this land shall be termed Open Space:

Planning Intent (Open Space)

The overall intent of this domain includes:

- a) conservation of areas of nature conservation with the Gold Coast City region and contribution to a viable city-wide nature conservation network;*
- b) conservation of the biodiversity of the Gold Coast City;*
- c) beaches, estuaries and river systems;*
- d) conservation, protection, rehabilitation or regeneration of nature habitat areas of wildlife that function as open space linkages between natural areas, including the preservation of riparian corridors, steep slopes, mountain peaks, plateaux and prominent ridge lines;*
- e) preservation of major topographical features and important areas of natural landscape character within the City;*
- f) protection of areas that perform important environmental management functions including riparian corridors, flood plains, overland flow areas and permanent wetlands;*
- g) the protection of major areas of natural resources, including water supply catchment areas and timber production areas;*
- h) establishment and maintenance of effective open space buffer areas between incompatible land uses;*
- i) protection and enhancement of a system of public open space, including beaches and coastal areas, to meet the outdoor recreational needs of Gold Coast City residents and visitors;*
- j) provision of a broad range of national, state, regional, district and local outdoor sporting facilities within the City;*
- k) provision of a very limited range of cafe, restaurant and retail facilities in those locations within the domain, which already experience extremely high levels of visitation;*
- l) achievement of a high standard of landscape design and, where applicable, built form, to complement the local character and to contribute to the City image and townscape; and*
- m) provision of a limited range of community services and facilities in the City's parks and foreshore reserves, including community halls, sporting clubrooms and surf life saving club facilities.*

With this domain, it is intended to provide for the protection of land in public ownership for nature conservation, outdoor recreation, landscape preservation, environmental buffers and natural



resource management and natural hazard management purposes. This domain applies to land that is intended to be retained in public ownership and maintained as open space. Land included within this domain may consist of very large parcels that encompass a range of land uses and topographical forms. It may also comprise small and medium sized parcels which are limited to one or two uses. Various sized land parcels may contribute to a network of open space, supported and connected by linear open space areas and/or complementary land uses in adjoining areas.

The Public Open Space Domain applies to open space in the ownership of federal, state or local government and private areas that are suitable for future public open space dedication. It includes National Parks, Conservation Parks, State Forests and Recreation Reserves. It also includes recreation camps in public ownership, major sporting facilities and local community parks. It is expected that access by the general public to land within this domain is generally unrestricted. It is envisaged that all land is to be subject to a development concept plan or integrated Management Plan which will guide future development. (**Overlay Map OM21 – Public Open Space Management** provides an indication of the management intent for open space in different parts of the City.)

3.2 Code Compliance

The following section will assess the OSPA against the relevant Gold Coast City Council Planning Scheme Codes for Open Space Areas. Following the identification of the applicable codes (as indicated in the Open Space Guidelines) a brief comment is made addressing the acceptable solution.

Changes to Ground Level and Creation of New Waterbodies Specific Development Code		
Performance Criteria	Complies With	Comment
PC19 & PC20	N/A	Not applicable as ground-level will not be changed within the area allocated for OSPA and no new waterbodies are proposed.

Landscape Work Development Code		
Performance Criteria	Complies With	Comment
PC1, PC2 & PC3	N/A	Landscape work, as defined in the Planning Scheme, is not proposed as part of this application.

Reconfiguring a Lot Specific Development Code		
Performance Criteria	Complies With	Comment
PC23	N/A	All significant vegetation, wetlands, waterways, and other habitat areas, their associated buffer and linkages/corridors and natural and cultural features will be retained and enhanced as part of the development. The stormwater management plan will ensure that stormwater will be appropriately treated prior to discharge into the waterway. The proper establishment, maintenance and ongoing inspection period has been prepared so it is cost effective to maintain.

Vegetation Management Code



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Performance Criteria	Complies With	Comment
PC1, PC2, PC3	N/A	No significant or otherwise protected vegetation is proposed to be harmed as a result of the proposed development.

Works for Infrastructure Specific Development Code

Performance Criteria	Complies With	Comment
PC6	AS	Open space areas have been designed and will be appropriately embellished in accordance with Council's Land Development Guidelines.

Bushfire Management Areas Code

Performance Criteria	Complies With	Comment
PC9 & PC10	Bushfire Management Areas Constraint	Code is not relevant as the remaining bushland is of low bushfire risk.

Canals and Waterways Code

Performance Criteria	Complies With	Comment
PC7 & PC8	NA	No areas of the subject site occur below high water level. As the open space area does not include the building of any structures, the water body will not be affected.

Car Parking Code

Performance Criteria	Complies With	Comment
PC8, PC19 & PC20	NA	As the OPSA within the development is created for the primary purpose of an ecological corridor, and is designed for industrial purposes in the Open Space, the development does not require: • Private or public car parking; • Bicycle parking and associated facilities; • Goods loading and circulation in public or private places; or • Integration of public transport with public or private development in the City.

Cultural Heritage Code (Indigenous)

Performance Criteria	Complies With	Comment
PC4	AS	Code is relevant – the Applicant acknowledges the cultural heritage duty of care measures noted in the <i>Aboriginal Cultural Heritage Act 2003</i> . As is Council's practice on other



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Cultural Heritage Code (Indigenous)		
Performance Criteria	Complies With	Comment
		applications, it is reasonable to include these provisions as part of advice notes on a Decision Notice.

Natural Wetland Areas and Natural Waterways Constraint Code		
Performance Criteria	Complies With	Comment
PC2, PC3, PC4, PC5, PC8, PC9, PC10 and PC11	N/A	A 50m buffer to Sandy Creek will be retained in line with adjacent land uses. This buffer is considered to adequately protect and maintain the natural processes associated with Sandy Creek.

Nature Conservation Constraint Code	
Performance Criteria	Comment
PC3	Whilst the majority of the vegetation on the site is proposed to be removed, the proposed open space linkage designated in a north-south orientation is considered to retain some fauna habitat value for the subject site.
PC5	AS5.1 Development will not occur within an area identified as an ecologically significant area. AS5.2 The ecologically significant area will not be negatively impacted, either directly or indirectly, by the development.
PC7	The OSPA has been primarily designed as an ecological corridor for fauna movement. Native vegetation characteristic of the area will be incorporated (discussed in detail in the Rehabilitation Management Plan) in order to enhance fauna use of the subject site.
PC8	AS8.1.1 The nominated buffer width of 50m from Sandy Creek is in agreement with the OM11 overlay code of the subject site. It is considered that 50m will adequately protect and enhance the ecological values of this environmentally significant area of the subject site.
PC9	AS9.1.1 The proposed ecological corridors will be approximately 50 metres wide throughout the open space area. This width is considered sufficient to establish and enhance ecological values of the subject site.
PC10	AS10.1(a) This Open Space Park area will assist in rehabilitating the site's ecological significance and further will protect this significance into perpetuity by being dedicated to Council.

Nature Conservation Constraint Code	
Performance Criteria	Comment
PC11	A Rehabilitation Management Plan has been prepared and will demonstrate how the development will meet PC11.
PC14	AS14.1.1 The design of the OSPA and overall proposal provides for 50m buffer from significant ecological areas adjacent to the site represented by the riparian vegetation of Sandy Creek.
PC15	AS15.1(a) This Open Space Park area will assist in rehabilitating the site's ecological significance and further will protect this significance into perpetuity by being dedicated to Council.



4 Rehabilitation Management Plan

4.1 Purpose

The purpose of the Rehabilitation Plan is provide details of works that enable the client to adequately plan and undertake works that are compliant with Council requirements. It also provides Council with clear expectations of scope of works and a means of ensuring works are completed according to the approved plan.

4.2 Scope

This RMP applies to the parcel of land to be dedicated as OSPA as identified in **Appendix 1** as the Rehabilitation Area.

4.3 Aims and Objectives

The Rehabilitation Plan **aims** to outline details of work and target outcomes that adequately link adjacent significant ecological areas together.

The broad objectives of this report are to:

- Comply with current 'best practice' guidelines as well as Council guidelines and policies
- Provide an overview of the sites environmental conditions;
- Ensure the long term environmental integrity and ecological linkages within the site;
- Provide a vegetated buffer between future land use of the site and the conservation area to the west.
- Improve ecological function and fauna opportunities of the site.

4.4 Intended Outcomes

The intended outcomes for successful rehabilitation of the sites dedicated open space are:

- Species composition reflects the relevant Regional Ecosystem and forest type and includes representatives of key species in all strata (species must be sought from local provenance).
- Plant spacing averages 1 plant per 1m² with survival rate of 90% or greater and canopy closure within 1.5 years of planting.
- Rehabilitation area is free from declared weed species.

4.5 Rehabilitation Approaches

There are four generally accepted approaches to rehabilitation as outlined in GCCC Open Space Guidelines. These are:

- a. Natural regeneration;
- b. Assisted natural regeneration;
- c. Reconstruction; or
- d. Fabrication.



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As the area to be treated is extensive and covers a range of areas that are in various states of degradation, the site has been apportioned into three (3) treatment zones. They are represented in the Rehabilitation Plan in **Appendix 1**. The treatment zones are described as follows:

1. Weed management only, natural regeneration facilitated
2. Physical and chemical weed removal and mechanical ripping of pastoral grass. Retention and protection of scattered *Eucalyptus* trees. Active planting of tubestock.
3. Physical and chemical weed removal. Active planting of tubestock.

4.6 Site Assessment

The site is located in the northern region of the Gold Coast within the Yatala Enterprise Area Local Area Plan (Map 2). Existing elements on the site reflect a history of pastoral land use. Whilst approximately half of the subject site is currently vegetated, the majority of this vegetation is proposed to be removed as part of this proposed development.

Overall, the site is undulating with a low lying depression occurring in the central portion of the eastern section of the subject site. The site falls away in the southern portion towards Sandy Creek.

The existing vegetation consists of low open woodlands, with occasional large trees. For detailed descriptions of the vegetation currently present on the subject site, refer to the Ecological Site Assessment (June 2010, Gassman Development Perspectives).

A description of the site constraints and relevant planning instruments are described in detail within **Part 1** of this document. The following shall describe the vegetation present on site in order to plan how the site is to be effectively rehabilitated.

4.6.1 Native Vegetation

The vegetation mapped as occurring in portions over the entire subject site is mapped as 'least concern' RE 12.11.5. (**Figure 4.1**). Ground truthing indicated that this mapping is correct. Consequently, it is proposed that the species selection for the rehabilitation of the Open Space Area be made with consideration to the description of species assemblages as found in **Table 4.2**.



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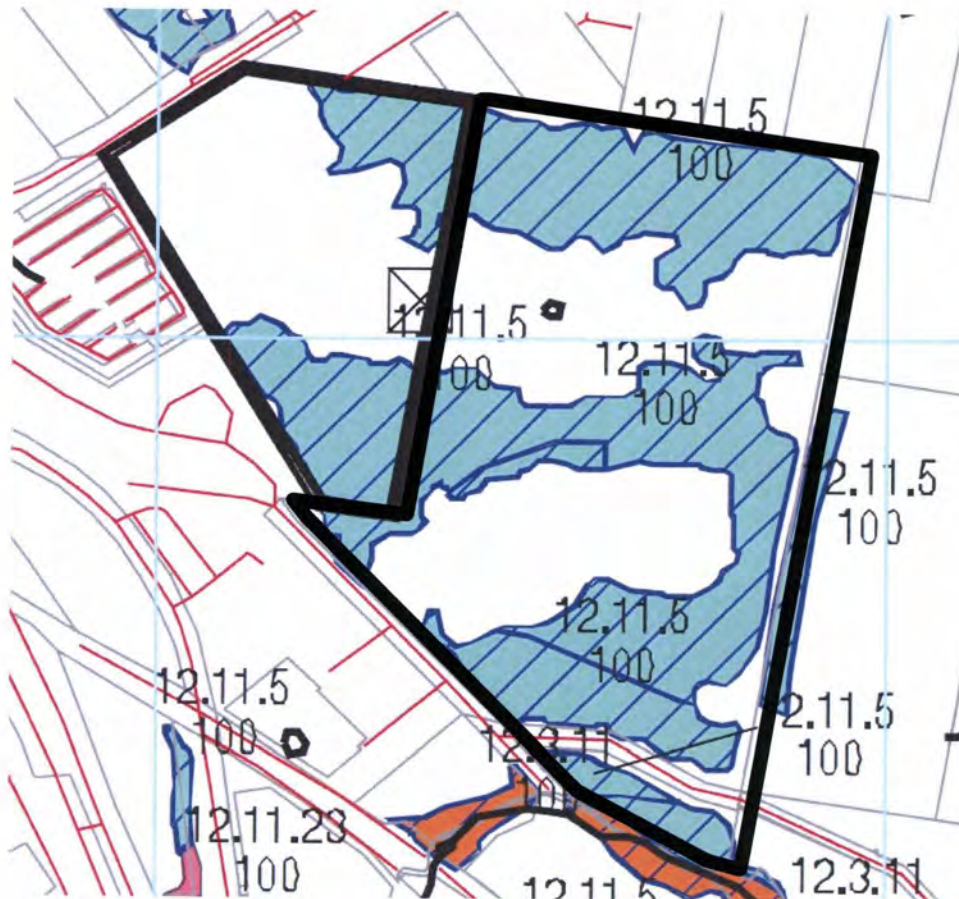


Figure 4.1: Excerpt from RE Map (DERM)

Table 4.2: Description of surrounding Regional Ecosystem classifications

RE 12.11.5 Least Concern

Description:

Open-forest complex in which spotted gum is a relatively common species. Canopy trees include *Corymbia citriodora* subsp. *variegata*, *Eucalyptus siderophloia* or *E. crebra* (sub coastal ranges), *E. major* and/or *E. longirostrata* and *E. acmenoides* or *E. portuensis* and/or *E. carnea* and/or *E. eugenioides*. Other species that may be present and abundant locally include *Corymbia henryi*, *C. intermedia*, *C. trachyphloia*, *Eucalyptus tereticornis*, *E. propinqua*, *E. biturbinata*, *E. moluccana*, *E. melliodora*, *E. fibrosa* subsp. *fibrosa* and *Angophora leiocarpa*. *Lophostemon confertus* often present in gullies and as a sub canopy or understorey tree. Mixed understorey of grasses, shrubs and ferns. Occurs on hills and ranges of Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics.

4.6.2 Exotic Vegetation

Several exotic plant species were observed on the site and are listed in **Table 4.3** below.

Table 4.3: Observed exotic plant species.

BOTANICAL NAME	COMMON NAME
<i>Ageratum conyzoides</i> subsp. <i>Conyzoides</i>	Billygoat weed
<i>Bidens pilosa</i>	Cobbler's pegs
<i>Bryophyllum delagoense</i>	Mother-of-millions
<i>Onopordum acanthium</i>	Scotch thistle
<i>Clover Trifolium</i>	Clover
<i>Commelina diffusa</i>	Wandering Jew
<i>Conyza sumatrensis</i>	Tall fleabane
<i>Crassocephalum crepidioides</i>	Thickhead
<i>Gomphocarpus fruticosus</i>	Narrow-leaved cotton bush
<i>Gomphocarpus physocarpus</i>	Balloon cotton bush
<i>Imperata cylindrical</i>	Blady Grass
<i>Lantana camara</i>	Lantana
<i>Lycopersicon esculentum</i> var. <i>cerasiforme</i>	Cherry tomato
<i>Melinis minutiflora</i>	Molasses grass
<i>Ottlochloa gracillima</i>	Graceful Grass
<i>Passiflora suberosa</i>	Corky Passion Vine
<i>Pennisetum purpureum</i>	Elephant Grass
<i>Pratia purpurascens</i>	White Root
<i>Senecio madagascariensis</i>	Fireweed
<i>Senna tora</i> OR <i>Senna pendula</i> var. <i>glabrata</i>	Easter cassia (winter senna)
<i>Sida rhombifolia</i>	Common sida (paddy's lucerne)
<i>Solanum chrysotrichum</i>	Giant devil's fig
<i>Solanum seaforthianum</i>	Brazilian nightshade
<i>Solanum torvum</i>	Devil's fig
<i>Tipuana tipu</i>	Rosewood
<i>Urochloa mutica</i>	Para grass

4.7 Herbicide application

Herbicide should be applied by qualified personnel with experience in bush regeneration and native plant species identification. It is recommended that spray operators have undertaken accredited training through a nationally accredited program such as Chemcert.



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Power operated spray equipment must only be undertaken or supervised by ACDC accredited operators and must comply with the ACDC Act. This Act also specifies limitations of certain herbicides and applications in Queensland Districts.

Spray operators have a legal responsibility to themselves and the public. Employers and employees have obligations under the Work Place Health and Safety Act to provide a 'Duty of Care'.

In Queensland, the 'off-label' permit allows bush regenerators to apply herbicide on plant species that are not listed on the label under Permit 7485. The off-label permit is administered by the Australian Pesticides and Veterinary Medicines Authority (APVMA). This relates to the ground distribution control of weeds in Non Agricultural Areas, Bushland, Forests and Wetlands.

It is a requirement of this permit, that all persons using the products covered by this off-label permit comply with the details and conditions listed in the permit. In addition, read the herbicide label carefully before use and always use the herbicide in accordance with the label directions. Chemical control of various weeds mentioned in this document will comply with permit 7485.

The operator is responsible to comply with environmental considerations, especially working in riparian areas. It is important to become familiar with the product MSDS, in particular aspects of soil residuality, translocation, break down in water and impact on amphibians (for example, Glyphosate herbicides are chelated with salts which can build up in the soil, changing the Ph and soil conditions). To ameliorate the impact of salt and modified ph, fulvic acid can be used in conjunction with herbicide. As a microbial stimulant fulvic acid increases the plants uptake of the herbicide and reduces soil residues, therefore minimizing environmental harm.

Within 10m of a water body only registered aquatic herbicides ("Biactive" glyphosate, Diquat, and Dichlobenil or approved equivalent) will be used.

4.8 Weed control methods

Weed control methods shall be utilised over the entire OSPA to ensure effective control of the weeds on site. This will include:

- **Cut - scrape - paint (cut stump)** is suitable for small to medium-sized woody weeds and some vines. The plant is cut off completely at its base as close to the ground as possible (about 2 cm above soil level) and at an angle. A herbicide solution is painted onto the exposed surface of the cut stump and the sides of the stump are then scraped lightly to reveal green tissue and more herbicide applied to the scraped area. Take care the brush is not contaminated with soil. It is imperative that the herbicide solution is applied as soon as the trunk or stem is cut (within 10 - 15 seconds) to ensure a good uptake.
- **Manual** – slash or brushcut, hand-pulling.

Weed control of the subject site will be limited to the rehabilitation area and will focus on the treatment of declared weeds and the treatment of other exotic species and grasses in preparation of planting.

If there are no flowers or seed on the plants, green waste can be chopped up & spread as mulch. If flowers and seed are present on the plants, green waste should be disposed off-site at an approved green waste disposal facility.

Exotic grass and areas for planting should be prepared by spraying with a glyphosate based herbicide and then slashed or brushcut and covered with mulch, or spread to be used as mulch (wetland species area).

4.8.1 Species Specific Weed Treatment

Table 4.4: Species specific weed treatment

BOTANICAL NAME	COMMON NAME	TREATMENT
<i>Ageratum conyzoides</i> subsp. <i>Conyzoides</i>	Billygoat weed	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Bidens pilosa</i>	Cobbler's pegs	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Bryophyllum delagoense</i>	Mother-of-millions	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Onopordum acanthium</i>	Scotch thistle	Spray 1:100 glyphosate + spray adjuvant +dye
<i>Clover Trifolium</i>	Clover	Spray 1:100 glyphosate + spray adjuvant +dye
<i>Commelina diffusa</i>	Wandering Jew	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Conyza sumatrensis</i>	Tall fleabane	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Crassocephalum crepidioides</i>	Thickhead	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Gomphocarpus fruticosus</i>	Narrow-leaved cotton bush	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Gomphocarpus physocarpus</i>	Balloon cotton bush	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Imperata cylindrical</i>	Blady Grass	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Lantana camara</i>	Lantana	Cut, scrape & paint base with 1:15 glyphosate. Spot spray regrowth. Overspray large infestations with 1:100 glyphosate + spray adjuvant + dye
<i>Lycopersicon esculentum</i> var. <i>cerasiforme</i>	Cherry tomato	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Melinis minutiflora</i>	Molasses grass	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Ottlochloa gracillima</i>	Graceful Grass	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Passiflora suberosa</i>	Corky Passion Vine	Vines can be severed at the base and left to dry in the canopy. Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Pennisetum purpureum</i>	Elephant Grass	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Pratia purpurascens</i>	White Root	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Senecio madagascariensis</i>	Fireweed	Hand pull out and bag waste to remove off site and dump at Council facility. Monitor for regrowth and spray with 1:100 glyphosate + 1Gmm:IOL water + adjuvant + dye.
<i>Senna tora</i> OR <i>Senna pendula</i> var. <i>glabrata</i>	Java Bean or Easter cassia (winter senna)	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Sida rhombifolia</i>	Common sida (paddy's lucerne)	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant +dye
<i>Solanum chrysotrichum</i>	Giant devil's fig	Cut, scrape & paint base with 1:15 glyphosate. Spot spray regrowth.
<i>Solanum seforthianum</i>	Brazilian	Hand pull or pray seedlings at 1:100 glyphosate +



BOTANICAL NAME	COMMON NAME	TREATMENT
	nightshade	adjuvant + dye. Cut scrape & paint saplings at 1:1.5 glyphosate. Inject large trees at 1:1.5 glyphosate
<i>Solanum torvum</i>	Devil's fig	Hand pull or spray seedlings at 1:100 glyphosate + adjuvant + dye. Cut scrape & paint saplings at 1:1.5 glyphosate. Inject large trees at 1:1.5 glyphosate
<i>Tipuana tipu</i>	Rosewood	Hand pull or spray seedlings at 1:100 glyphosate + adjuvant + dye. Cut scrape & paint saplings at 1:1.5 glyphosate. Inject large trees at 1:1.5 glyphosate
<i>Urochloa mutica</i>	Para grass	Hand pull or dig up. Spray 1:100 glyphosate + spray adjuvant + dye

4.9 Planting Details

Appendix 1 depicts the area of the rehabilitation area that requires planting after taking into account existing native vegetation.

Plants are to be supplied in tubestock, 75mm native tube or equivalent.

Plant stock is to be sourced from local nurseries, using local provenience parent material. Stock to be free of defects and pathogens and should show good root structure and vigor.

A survival rate of at least 90% is to occur within the rehabilitation area for the duration of the 3 month establishment and 12 month maintenance periods. Failure to achieve these targets will require plant replacement.

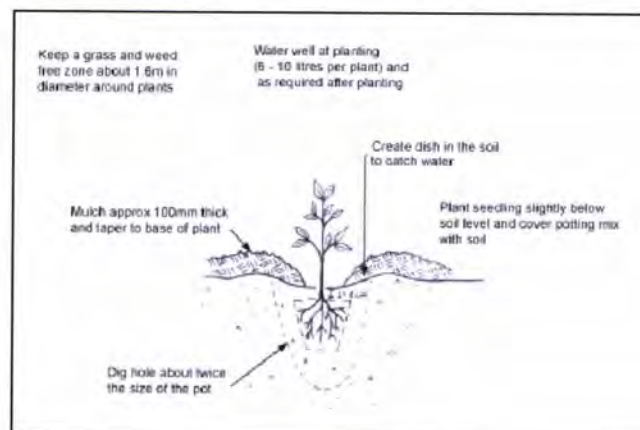


Figure 4.2: Planting Detail

4.9.1 Planting Module for Rehabilitation Area

The planting module for the area to be rehabilitated within the rehabilitation area is as follows (includes the area depicted in **Appendix 1**):

Area	20112m ²
Density:	1 plant per 1m ²
	12x Canopy Species per 100m ²
	30x Mid-storey Species per 100m ²
	58x Shrub/Grass Species per 100m ²

Total = 100 plants per 100m² module

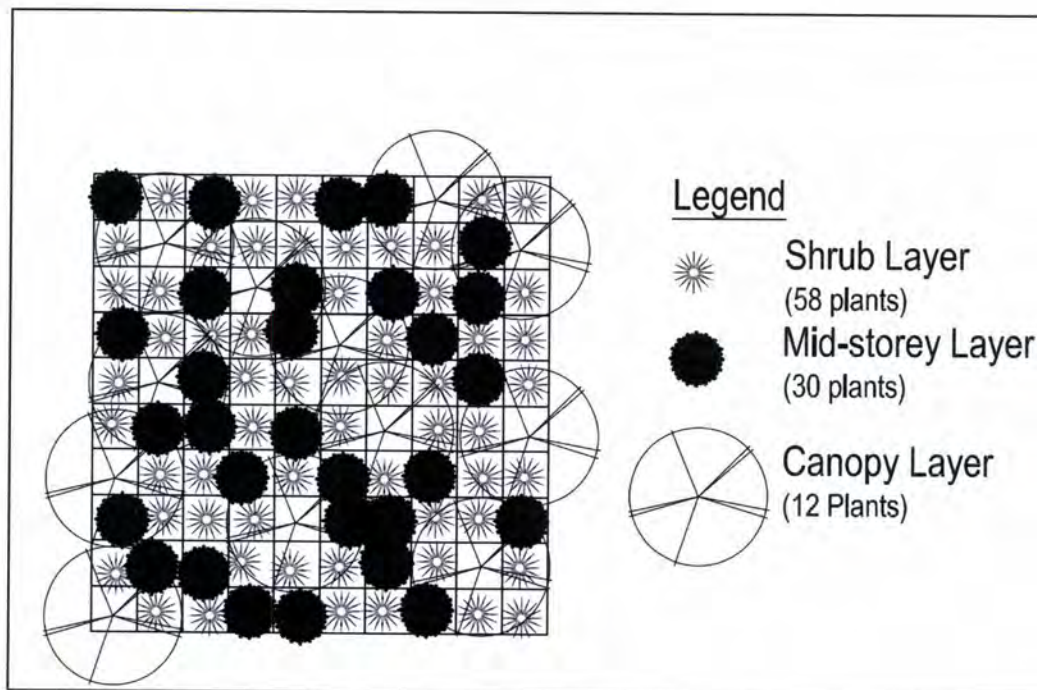


Figure 4.4: Planting Module for the rehabilitation area.



Table 4.5: Planting Module

Type	Botanical Name	Common Name	Pot size	Number
Canopy	<i>Corymbia citriodora</i>	Spotted Gum	tube	268
	<i>Corymbia henryii</i>	Large-leaved Spotted Gum	tube	268
	<i>Corymbia intermedia</i>	Pink Bloodwood	tube	268
	<i>Eucalyptus creba</i>	Narrow-leaved Ironbark	tube	268
	<i>Eucalyptus moluccana</i>	Grey Box	tube	268
	<i>Eucalyptus major</i>	Small-fruited Grey Gum	tube	268
	<i>Eucalyptus tereticornis</i>	Forest Red Gum	tube	268
	<i>Lophostemon confertus</i>	Brush Box	tube	268
	<i>Melaleuca quinquenervia</i>	Narrow-leaved paperbark	tube	268
Shrubs	<i>Alphitonia excelsa</i>	Red ash	tube	862
	<i>Callistemon viminalis</i>	Weeping bottlebrush	tube	862
	<i>Callistemon inune</i>	Bottlebrush	tube	862
	<i>Hovea acutifolia</i>	Pointed-leaved hovea	tube	862
	<i>Leptospermum liversidgei</i>	Olive Tee Tree	tube	862
	<i>Melaleuca nodosa</i>	Prickly leaved paperbark	tube	862
	<i>Weslingia fruticosa</i>	Native rosemary	tube	862
Grasses	<i>Gahnia aspera</i>	Sword Grass	tube	2916
	<i>Lomandra confertifolia</i>	Matt Rush	tube	2916
	<i>Poa labillardieri</i>	Tussock Grass	tube	2916
	<i>Themeda triandra</i>	Kangaroo Grass	tube	2916
				Total 20112

4.9.2 Mulch

Mulch is to be used on all planting areas within the rehabilitation area. The mulch shall consist of 100mm of weed free forest mulch throughout.

4.9.3 Watering

All plant stock is to be watered onsite prior to planting and as soon as practical after planting (within several hours). Water is to be sourced locally or, is to be recycled non-potable water.

4.10 Staging of Works

The total rehabilitation works should be for a period of 12 months, allowing 6 weeks for adequate preparation of planting areas. Rehabilitation works should be staged as follows:

Table 4.6: Staging of works

Step	Activity	Timing
1	Locate and delineate the rehabilitation area	Week1
2	Remove all rubbish and foreign debris from rehabilitation area	Week 1
3	Undertake initial weed treatment. Locate, mark out and prepare areas for planting within the covenant area	Week 1
4	Undertake follow up weed control and plant the specified species within the rehabilitation area according to the planting module.	Week 7 – 10
5	Scheduled maintenance of planting areas during establishment period within the rehabilitation area and follow up weed control within RA1.	6 weekly cycle: Week 16,22,28, 34 - 52



4.11 Maintenance

The maintenance period will be for 12 months following the 3 month plant establishment phase and shall consist of:

- Hand weeding and spot spraying in planting areas.
- Watering of planted plants if required.
- Top up mulch around planted areas if required.

The performance of maintenance activities will be assessed as part of allocated monitoring inspections.

Table 4.7: Measurement of health

<i>Time scale</i>	<i>Growth and development processes</i>	<i>Key indicator for species health</i>	<i>Maintenance Issues that may arise</i>	<i>Description of maintenance period</i>
0 – 3 Months	Growth rate and establishment	Seedling heights, foliage growth and colour, weed presence.	Weed removal, water requirements, impacts from unforeseen destruction, attrition rates.	At least 90% success in establishing the planted species. Minimal weeding required.
4 – 15 Months	Continued growth and establishment General health Minor habitat use	Increasing height and trunk diameter increasing, Canopy growth and density Weed presence, Canopy closure	Weed removal, possible impacts from past weed invasion measures.	Healthy foliage growth rates and characteristics corresponding with individual species.

4.12 Monitoring

The rehabilitation works are to be monitored by routine site inspections by a qualified professional. Refer to **Appendix 2** for a sample monitoring inspection form.

The following inspections are recommended:

Table 4.8: Monitoring Schedule

<i>Inspection</i>	<i>Timing</i>	<i>Purpose</i>	<i>Evidence</i>
1	Week 1	Confirm location of rehabilitation area & planting areas	Site visit
2-11	Week 2 - 12	Inspection of weed control & planting areas. Replace any dead plants	Inspection form & photographs
12+	Week 12-64	'On maintenance' inspection – assess ecological integrity of site; Plant establishment and vigour Effectiveness of weed control activities	Inspection form, photographs & certification to council

4 Conclusion

This Open Space Management Statement has addressed the objectives that are required to achieve a natural asset protected open space park pursuant to Council's Open Space guidelines.

By providing evidence and the rationale behind the creation of the Open Space Park Area, this report provides the various strategies and responses to achieve Council objectives, whilst effectively managing environmentally sensitive areas during the construction and operation of the proposed development.

The creation and spatial dimensions of the Rehabilitation Area have been based on reference to the relevant GCCC planning instruments.

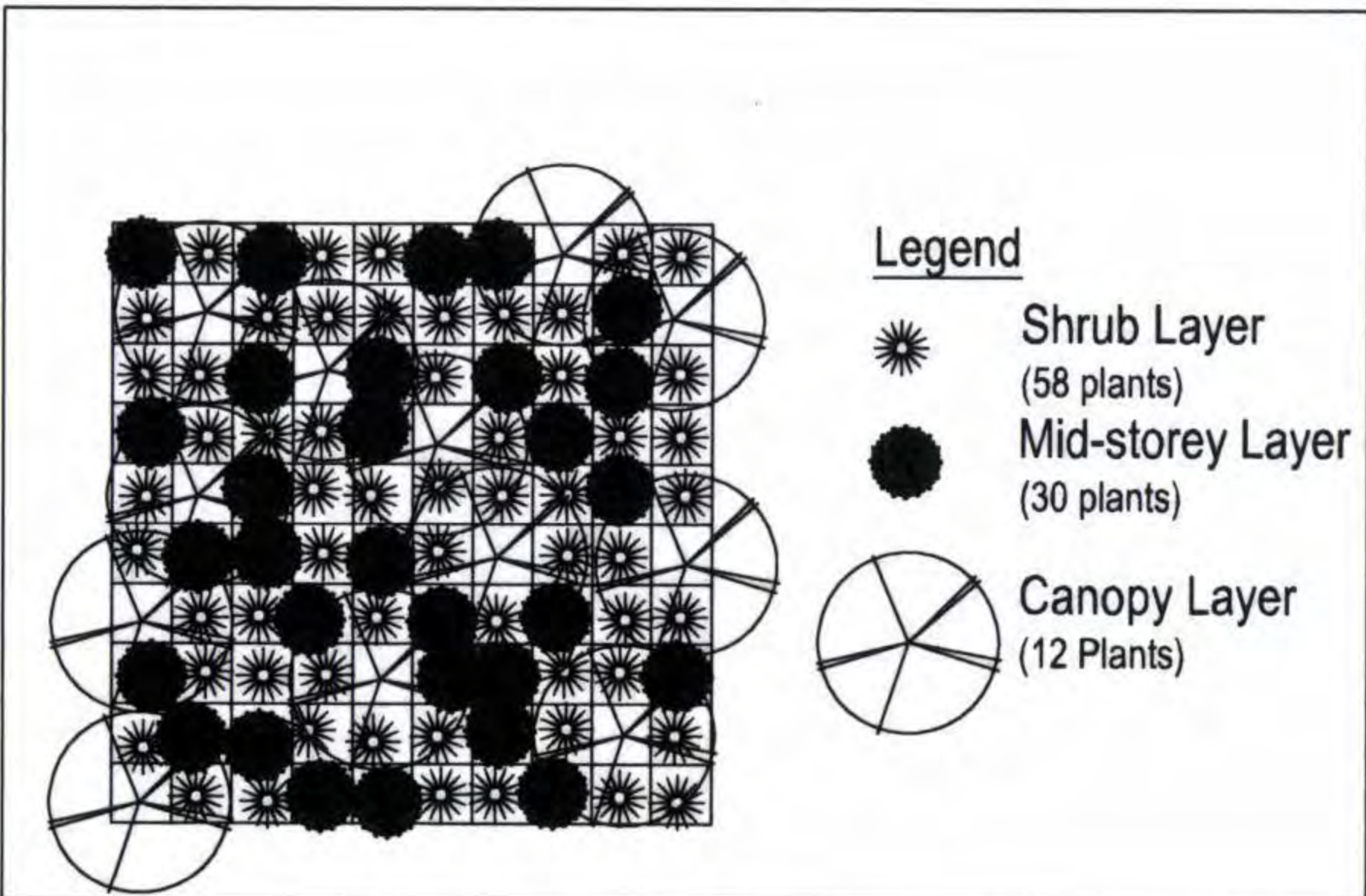
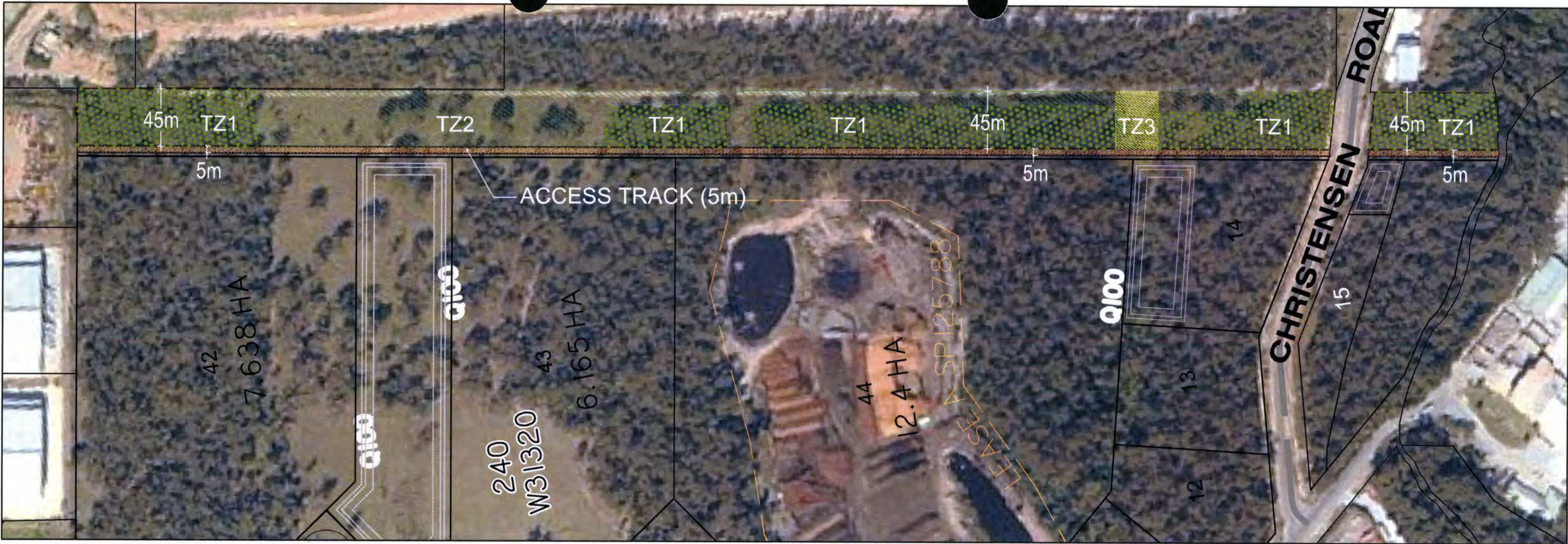
Resulting from the environmental context of the subject OSPA, rehabilitation will involve reconstructive rehabilitation to function primarily as an ecological corridor in addition to weed control to allow for natural regeneration and subsequently enhanced ecological functioning.

It is considered that the allocated area of the OSPA adheres to the Council's organisational requirements and produces a broad range of benefits to both potential user groups and the natural environment. These benefits have been identified primarily as addressing ecological issues, such as vegetation conservation, habitat protection and the future development and succession of the limited existing ecology.

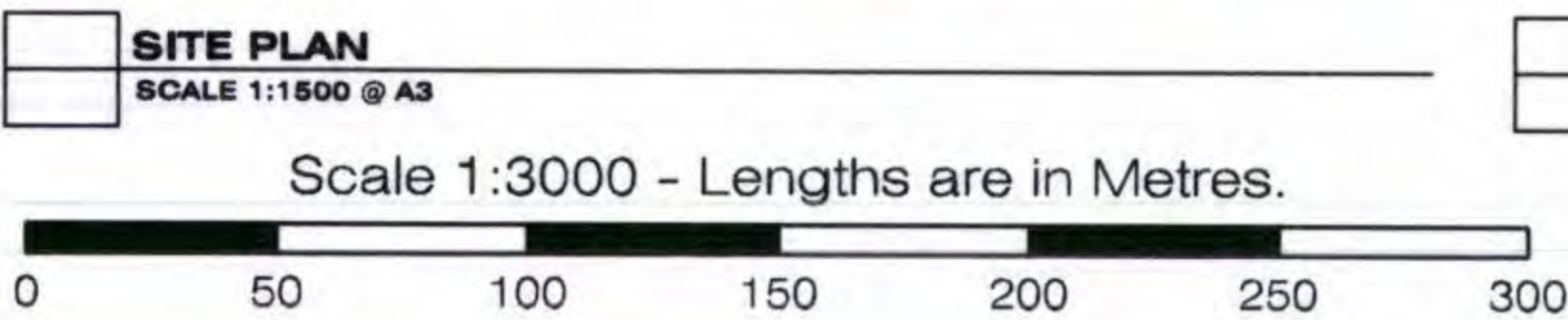
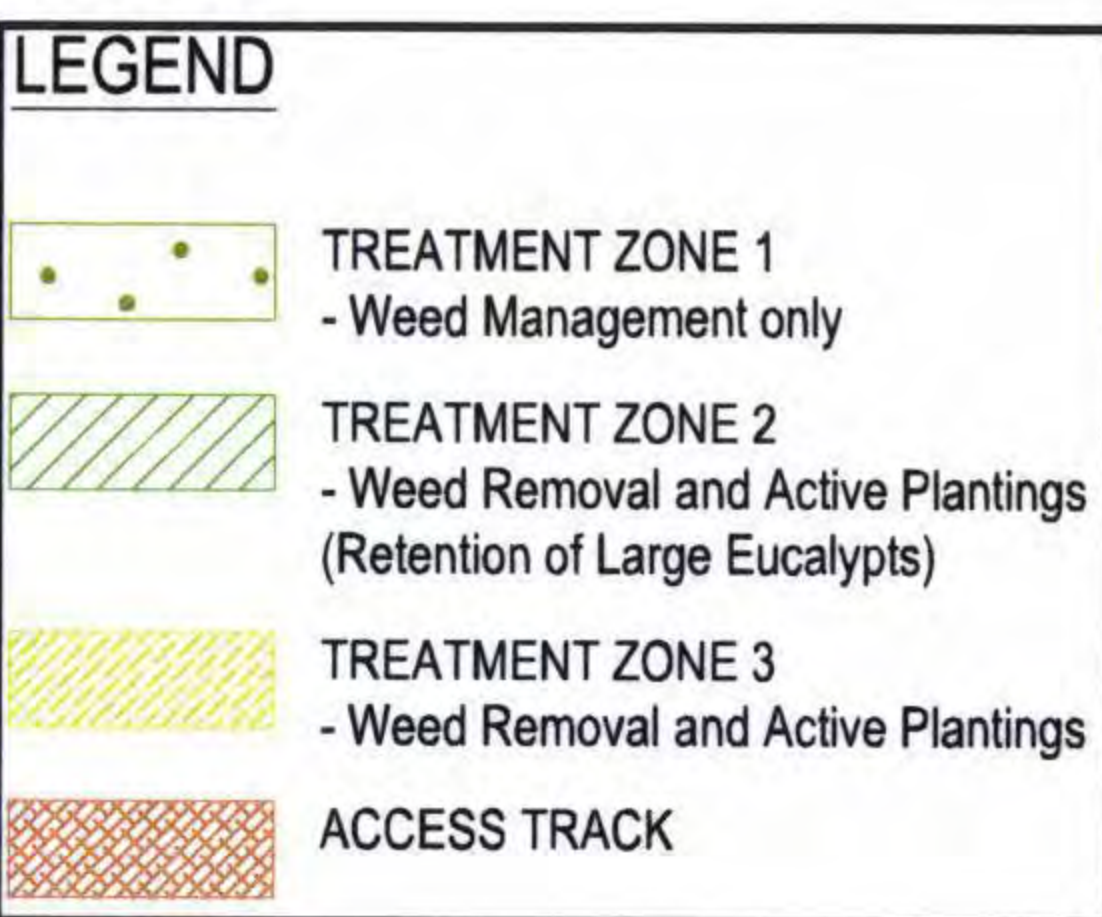


APPENDIX 1 – SITE MONITORING FORM

Amended Site Plan (Including OSPA and Planting Modules)



Type	Botanical Name	Common Name	Size	Density (plants/100m2)	Quantity
Canopy	<i>Corymbia citriodora</i>	Spotted Gum	Tubestock	12	268
	<i>Corymbia henryi</i>	Large-leaved Spotted Gum	Tubestock	12	268
	<i>Corymbia intermedia</i>	Pink Bloodwood	Tubestock	12	268
	<i>Eucalyptus creba</i>	Narrow-leaved Ironbark	Tubestock	12	268
	<i>Eucalyptus moluccana</i>	Grey Box	Tubestock	12	268
	<i>Eucalyptus major</i>	Small-fruited Grey Gum	Tubestock	12	268
	<i>Eucalyptus tereticornis</i>	Forest Red Gum	Tubestock	12	268
	<i>Lophostemon confertus</i>	Brush Box	Tubestock	12	268
Shrubs	<i>Meiroleuca quinquevneria</i>	Narrow-leaved paperbark	Tubestock	12	268
	<i>Alphitonia excelsa</i>	Red ash	Tubestock	30	862
	<i>Callistemon viminalis</i>	Weeping bottlebrush	Tubestock	30	862
	<i>Callistemon injune</i>	Bottlebrush	Tubestock	30	862
	<i>Hovea acutifolia</i>	Pointed-leaved hovea	Tubestock	30	862
	<i>Leptospermum liversidgei</i>	Olive Tee Tree	Tubestock	30	862
	<i>Meiroleuca nodosa</i>	Prickly leaved paperbark	Tubestock	30	862
	<i>Weslingia fruticosa</i>	Native rosemary	Tubestock	30	862
Grasses	<i>Gahnia aspera</i>	Sword Grass	Tubestock	58	2916
	<i>Lomandra confertifolia</i>	Matt Rush	Tubestock	58	2916
	<i>Poa labillardieri</i>	Tussock Grass	Tubestock	58	2916
	<i>Themeda triandra</i>	Kangaroo Grass	Tubestock	58	2916
Total					20112



APPENDIX 2 – SITE MONITORING FORM

SITE VISIT DETAILS	
Location:	
Site Visit No. & Date:	
Site Visit By:	
Weather:	
Purpose of the site visit	Tick box
Allocated routine inspection	

Score of 1: <5%cover Score of 2: 5-20% cover Score of 3: 20-50% cover Score of 4: 50-75% cover Score of 3: 75-100% cover

Site visit	Date	Criteria					
		Habitat	Species Diversity Indicators	Indigenous cover (tree, shrub, moss)	Occurrence of natural regeneration	Condition of fences	General Observations (fire, flood, breeding, flowering etc.)
1							
2							
3							
4							
5							
6							
7							
8							

13 – ACOUSTIC REPORT (TTM CONSULTING)

**Proposed Industrial Land
60 Stapylton-Jacobs Well Road
Stapylton**

ACOUSTIC REPORT

Prepared For: William Hester

C/- Gassman Development Perspectives

Date Prepared:

20 April 2011

TTMref: 34418 R03 Hester Land Stapylton Acoustic Report.doc

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1. INTRODUCTION

TTM Group has been engaged by Gassman Development Perspectives on behalf of William Hester to conduct an environmental noise assessment of proposed industrial zoned land at 60 Stapylton-Jacobs Well Road Stapylton.

Development layout plans are not available at this stage. Therefore it is not possible to accurately predict noise levels at receiver locations. This report provides a guide to the potential noise levels and acoustic treatments that may be needed to achieve compliance.

This report is based on the following;

- Noise criteria applied by the Gold Coast City Council.
- Site inspection, noise measurements, calculation and analysis by TTM.

The assessment includes the following:

- Description of the development site and proposal.
- Measurement of the existing ambient noise levels.
- The statement of assessment criteria relating to noise produced by the development.
- Identification of the nearest noise sensitive receivers.
- Identification and prediction of noise impacts from the development onto the receiver locations.
- Details of recommendations that should be incorporated into the development.

2. SITE DESCRIPTION

2.1. Site Location

The subject site is described by the following:

*Lot 1 on RP6882
60 Stapylton-Jacobs Well Road, Stapylton*

*Lot 240 on W31320
82 Christensen Road, Stapylton*

The site locality is shown in Figure 1 below.

Figure 1: Site Locality



2.2. Development Proposal

The subject site is currently used for residential and agricultural purposes. The proposal is to change the existing land designation (Future Business and Industry) to various preferred industrial uses. At this stage the layout of the development site is unknown.

This assessment will consider potential commercial and industrial noise generated by potential future uses at the site.

2.3. Acoustic Environment

The area surrounding the subject site contains a mix of commercial, industrial, and residential uses.

The existing daytime ambient acoustic environment in proximity to the site generally comprises of industrial activity and road traffic noise. The natural environment typically dominates ambient noise levels during the evening and night periods.

3. METHODOLOGY

3.1. Measurement Equipment

The following equipment was used to record noise levels at the site:

- ARL EL315 Environmental Noise Monitor (SN# 15-203-512).
- Rion NC73 Acoustical Calibrator.

The EL315 Environmental Noise Monitor was field calibrated before and after the monitoring session, with no significant drift from the reference signal recorded.

3.2. Unattended Noise Monitoring

Unattended noise monitoring was performed in order to measure the existing ambient background noise. The noise monitor was located at 60 Stapylton-Jacobs Well Road, with the noise monitoring location shown in Figure 2 below.

The microphone was in a free-field position, and was approximately 1.4m above ground height. Noise monitoring was performed between Wednesday 15/12/2010 and Wednesday 22/12/2010.

Figure 2: Noise Monitoring Location



The environmental noise monitor was set to record noise levels in 'A'-weight, 'Fast' response, over 15 minute statistical intervals. Noise measurements were conducted generally in accordance with Australian Standard AS1055 'Acoustics - Description and Measurement of Environmental Noise'.

Weather conditions during the noise survey were mostly fine. The temperature range was between 15°C and 31°C during the measurement period (Source: Bureau of Meteorology 2010).

3.3. Noise Source Measurement

Noise source levels taken from previous similar investigations were used in this assessment. The measurements were conducted generally in accordance with Australian Standard AS1055:1997 'Acoustics – Description & Measurement of Environmental Noise'.

4. MEASURED NOISE LEVELS

The measured ambient noise levels are as follows;

Table 1: Measured Ambient Noise Levels

Time Period	Measured Level dB(A) L ₉₀
Day (7am – 6pm)	47
Evening (6pm - 10pm)	53*
Night (10pm - 7am)	46

* The noise survey indicates increased ambient noise levels during the evening period when compared to the daytime. Given that noise monitoring was conducted during summer months in a grassy paddock, insect noise is expected to be the cause of raised noise levels during evening hours.

Graphical presentation of the measured noise levels is shown in Appendix B.

From previous similar investigations, the ambient evening noise level is typically somewhere between the daytime and night-time noise levels. Therefore the evening ambient noise level has been adjusted to 47 dB(A) for the purposes of this assessment. The ambient noise levels used for this assessment are presented in Table 2.

Table 2: Ambient Noise Levels used for Assessment

Time Period	Measured Level dB(A) L ₉₀
Day (7am – 6pm)	47
Evening (6pm - 10pm)	47
Night (10pm - 7am)	46

5. NOISE CRITERIA

5.1. Noise Produced by the Development

The proposed development shall be assessed against the acoustic quality objectives and background creep criteria of Environmental Protection (Noise) Policy (EPP) 2008. Details of the EPP (Noise) 2008 criteria limits are presented in the following sections.

5.1.1. Acoustic Quality Objectives

Table 3 below presents the acoustic quality objectives at noise sensitive receptors as detailed in Schedule 1 of the EPP (Noise) 2008.

Table 3: Acoustic Quality Objectives at Noise Sensitive Properties

Sensitive Receptor	Time of Day	Acoustic Quality Objectives, dB(A)		
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$
Dwelling (outdoors)	Day and Evening (7am – 10pm)	50	55	65
Dwelling (Indoors)	Day and Evening (7am – 10pm)	35	40	45
	Night (10pm - 7am)	30	35	40

5.1.2. Background Creep

EPP (Noise) 2008 states that noise from an activity that varies over time measured by $L_{Aeq,adj,T}$, must not be more than 5 dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.

Noise from steady-state (continuous) activities that are measured by the $L_{Aeq,adj,T}$, must not exceed the existing acoustic environment measured by $L_{A90,T}$.

In accordance with the Environmental Protection Regulation 2008, the time period (T) is considered to be a time interval of at least 15 minutes, or if the noise continues for less than 15 minutes, the duration of the noise source.

Table 4 presents the noise level targets based on the results of ambient noise monitoring.

Table 4: Background Creep Noise Limits at Noise Sensitive Properties

Time Period	Noise Level Limits SPL dB(A)	
	$L_{Aeq,T}$	$L_{A90,T}$
Day 7am – 6pm	52	47
Evening 6pm – 10pm	52	47
Night 10pm – 7am	51	46

5.2. Mechanical Plant

Noise from some types of mechanical plant is dealt with under the Environmental Protection Act 1994 (reprint 9A, 1 July 2009). The act refers to noise from air-conditioning (Section 440U) and refrigeration equipment (Section 440V), and states the following:

- (2) An occupier of the premises must not use, or permit the use of, the equipment on any day—
- (a) before 7a.m. if it makes a noise of more than 3dB(A) above the background level; or
 - (b) from 7a.m. to 10p.m. if it makes a noise of more than 5dB(A) above the background level; or
 - (c) after 10p.m. if it makes a noise of more than 3dB(A) above the background level.

To ensure compliance, any new plant should be designed and installed to the meet following targets:

Table 5: Recommended Mechanical Plant Noise Limit Criteria

Time Period	Noise Level Limits SPL dB(A) L_{eq}
Day (7am – 6pm)	52 dB(A)
Evening (6pm - 10pm)	52 dB(A)
Night (10pm - 7am)	49 dB(A)

The above noise limits should be assessed at the nearest potentially affected noise sensitive property, taking into account multiple plants in operation, and should be corrected for tonality if required.

6. ANALYSIS AND RESULTS

6.1. Receiver Locations

The following noise sensitive receivers were identified:

- Receiver 1: Dwellings in Hillside Drive
- Receiver 2: Dwellings in Cedar Drive

Figure 3: Receiver Locations



Note that if compliance is achieved at the residential receivers indicated above, compliance would be predicted to any remaining noise sensitive locations.

6.2. Noise Source Levels

Table 6 below presents the typical noise sources associated with an industrial development, and the respective measured noise levels in $L_{Aeq,T}$, $L_{A10,T}$ and $L_{A1,T}$.

Table 6: Noise Sources

Noise Source Description	Noise Level dB(A) at 1m			Typical Duration (secs)
	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A1,T}$	
Single event car door closure	75*	77*	77*	2
Single event car bypass @ 5km/h	69	75	75	6
Voice (conversations)	72	74	75	300
Truck Manoeuvring/ Passbys (to enter or exit the site)	83	85	86	60
Truck reverse alarm (to reverse into position)	87	90	95	30
Forklift operation	80	83	88	30
Waste removal (collection of industrial waste bin)	93*	94*	105*	40
Angle grinder (single event)	100*	101*	102*	15
Drop saw (single event)	99*	102*	103*	10
Hammering sheet metal (single event)	102*	108*	110*	20
Air Ratchet gun (single event)	96*	98*	100*	5

* A correction factor of 2 dB(A) has been applied to this source to account for the impulsiveness characteristic of noise produced.

6.3. Parameters for typical usage

The following parameters were used for noise calculations:

- Development plans are unavailable at this stage. Therefore the type and location of noise sources is unknown. This report assesses the typical industrial noise sources listed above at a location of 15m inside the site boundaries (expected to be the nearest location of any noise source).
- Car movements predicted from the centre of the development site. Calculations are based on the light industrial peak traffic generation rate from DTMR 'Road Planning and Design Manual'. Assuming 50% of the site area is used for industrial building GFA this would equate to a generation rate of 923 vehicles per hour.
- Car door closures noise predictions allow for 2 car door closures for each vehicle movement.
- Voice predicted from the most relevant location. Calculations are based on continuous 'loud' conversations occurring during any 15 minute period.
- Truck movements predicted from a point 15m inside the site boundary relative to both receivers. Calculations are based on 15 heavy vehicle arrivals per hour.
- Truck reverse alarms predicted from the same location as truck movements. Calculations are based on one reversing event per truck arrival.
- Forklift operation predicted from a point 15m inside the site boundary relative to both receivers. Calculations are based on continuous use in any 15 minute period.
- Waste collection predicted from a point 15m inside the site boundary relative to both receivers. Calculations are based on 1 event in any hour.

- Typical industrial noise such as angle grinders, drop saws, air ratchet guns, and hammering predicted from a point 15m inside the site boundary relative to both receivers. Predictions are based on the noise source occurring inside a shed with doors open. Calculations are based on 5 events of each noise source occurring in any 15 minute period.

Noise levels for voice are based on published data contained in Harris CM, Handbook of Acoustical measurements and Noise Control – 3rd ed. Ch 16.3, Mc Graw-Hill Inc. The average A-Weighted Sound Levels (long term averages) of speech for different individual vocal efforts under quiet conditions at a distance of 1 metre are as follows:

Table 7: Voice Noise Levels

Vocal Effort	Male dB(A)	Female dB(A)
Casual	53	50
Normal	58	55
Raised	65	62
Loud	75	71

The voice levels used for assessment are from the 'Loud' category with an associated noise level of 75 dB(A) for an individual male.

6.4. Predicted Noise Levels - Acoustic Quality Objectives

6.4.1. Without Acoustic Treatments

Table 8 presents the predicted noise levels at receivers in accordance with the acoustic quality objectives criteria. Noise source locations are unknown at this stage. Noise predictions are taken from a distance of 15m inside the site boundary for both receivers.

No acoustic treatments are included in Table 8 predicted noise levels.

Table 8: Predicted Noise Levels with respect to Acoustic Quality Objectives - No treatments

Receiver	Noise Source	Predicted Noise Level dB(A)					
		L _{Aeq,1hr}		L _{A10,1hr}		L _{A1,1hr}	
		Outdoors	Indoors	Outdoors	Indoors	Outdoors	Indoors
1 Dwellings in Hillside Drive	Car door closure	26	16	28	18	28	18
	Car bypass @ 5km/h	22	12	28	18	28	18
	Voice (conversations)	30	20	27	17	28	18
	Truck Passbys	38	28	40	30	41	31
	Truck reverse alarm	36	26	39	29	44	34
	Forklift operation	38	28	41	31	46	36
	Waste removal	31	21	n/a*	n/a*	43	33
	Angle grinder	37	27	n/a*	n/a*	39	29
	Drop saw	34	24	n/a*	n/a*	38	28
	Hammering sheet metal	39	29	46	36	48	39
	Air Ratchet gun	28	18	n/a*	n/a*	32	22
	TOTAL NOISE	45	35	49	39	52	42
2 Dwellings in Cedar Drive	Car door closure	32	22	34	24	34	24
	Car bypass @ 5km/h	27	17	33	23	33	23
	Voice (conversations)	44	34	41	31	42	32
	Truck Passbys	52	42	54	44	55	45
	Truck reverse alarm	50	40	53	43	58	48
	Forklift operation	52	42	55	45	60	50
	Waste removal	45	35	n/a*	n/a*	57	47
	Angle grinder	51	41	n/a*	n/a*	53	43
	Drop saw	48	38	n/a*	n/a*	52	42
	Hammering sheet metal	54	44	60	50	62	52
	Air Ratchet gun	42	32	n/a*	n/a*	46	36
	TOTAL NOISE	60	50	64	54	67	57

*Note: The duration of noise is likely to be less than the time required to assess the LA10 during a 1 hour period. Hence, noise is not assessable under these descriptors in this instance.

The summary of noise predictions is as follows;

- Noise associated with the development at Hillside Drive (Receiver 1) is predicted to comply with daytime and evening outdoor noise criteria. Noise levels would be slightly above the day and evening indoor noise criteria. The assessment has considered a worst case scenario with all noise sources occurring close to the site boundary. Noise levels are expected to reduce once a development plan is issued and actual noise source locations are known.

- Without acoustic treatment, noise at Receiver 2 is predicted to be well above the criteria.
- Noise at Receiver 2 can be reduced with the inclusion of a buffer zone; however noise levels may still be above the criteria. Acoustic treatment would be needed to achieve compliance at Receiver 2.

6.4.2. With Acoustic Treatments

Table 9 presents the predicted noise levels at Receiver 2 based on the inclusion of a 5m high acoustic barrier. This barrier could be achieved by a boundary fence, or a continuous line of industrial buildings along the residential boundary. Details of these recommendations are described in Section 7.

Noise predictions are taken at the same distance from the receiver as in Section 6.4.1.

Table 9: Predicted Noise Levels with respect to Acoustic Quality Objectives - With Treatment

Receiver	Noise Source	Predicted Noise Level dB(A)					
		L _{Aeq,1hr}		L _{A10,1hr}		L _{A1,1hr}	
		Outdoors	Indoors	Outdoors	Indoors	Outdoors	Indoors
1 Dwellings in Hillside Drive	Car door closure	26	16	28	18	28	18
	Car bypass @ 5km/h	22	12	28	18	28	18
	Voice (conversations)	30	20	27	17	28	18
	Truck Passbys	38	28	40	30	41	31
	Truck reverse alarm	36	26	39	29	44	34
	Forklift operation	38	28	41	31	46	36
	Waste removal	31	21	n/a*	n/a*	43	33
	Angle grinder	37	27	n/a*	n/a*	39	29
	Drop saw	34	24	n/a*	n/a*	38	28
	Hammering sheet metal	39	29	46	36	48	38
	Air Ratchet gun	28	18	n/a*	n/a*	32	22
	TOTAL NOISE	45	35	49	39	52	42
2 Dwellings in Cedar Drive	Car door closure	25	15	27	17	27	17
	Car bypass @ 5km/h	20	10	26	16	26	16
	Voice (conversations)	30	20	27	17	28	18
	Truck Passbys	38	28	40	30	41	31
	Truck reverse alarm	36	26	39	29	44	34
	Forklift operation	38	28	41	31	46	36
	Waste removal	35	25	n/a*	n/a*	47	37
	Angle grinder	36	26	n/a*	n/a*	38	28
	Drop saw	33	23	n/a*	n/a*	37	27
	Hammering sheet metal	38	28	45	35	47	37
	Air Ratchet gun	27	17	n/a*	n/a*	31	21
	TOTAL NOISE	45	35	48	38	52	42

*Note: The duration of noise is likely to be less than the time required to assess the L_{A10} during a 1 hour period. Hence, noise is not assessable under these descriptors in this instance.

With the inclusion of acoustic treatment, noise levels are capable of complying with day and evening criteria at Receiver 2. Noise levels at Receiver 1 are predicted to comply without the need for treatment.

6.5. Predicted Noise Levels - Background Creep

Table 10 presents the predicted noise levels in accordance with the Background Creep criteria. Noise predictions at Receiver 2 are shown with and without the acoustic barrier treatment described in Section 7.

Table 10: Predicted Noise Levels with respect to Background Creep

Receiver	Noise Source	Predicted Noise Level L_{eq} dB(A)	Complies with:		
			Day 52 dB(A)	Evening 52 dB(A)	Night 51 dB(A)
1 Dwellings in Hillside Drive	Car door closure	26	Yes	Yes	Yes
	Car bypass @ 5km/h	22	Yes	Yes	Yes
	Voice (conversations)	30	Yes	Yes	Yes
	Truck Passbys	38	Yes	Yes	Yes
	Truck reverse alarm	36	Yes	Yes	Yes
	Forklift operation	38	Yes	Yes	Yes
	Waste removal	37	Yes	Yes	Yes
	Angle grinder	37	Yes	Yes	Yes
	Drop saw	34	Yes	Yes	Yes
	Hammering sheet metal	39	Yes	Yes	Yes
	Air Ratchet gun	28	Yes	Yes	Yes
	TOTAL NOISE	46	Yes	Yes	Yes
2 Dwellings in Cedar Drive - No Treatment	Car door closure	32	Yes	Yes	Yes
	Car bypass @ 5km/h	27	Yes	Yes	Yes
	Voice (conversations)	44	Yes	Yes	Yes
	Truck Passbys	52	Yes	Yes	+1
	Truck reverse alarm	50	Yes	Yes	Yes
	Forklift operation	52	Yes	Yes	+1
	Waste removal	52	Yes	Yes	+1
	Angle grinder	51	Yes	Yes	Yes
	Drop saw	48	Yes	Yes	Yes
	Hammering sheet metal	54	+2	+2	+3
	Air Ratchet gun	42	Yes	Yes	Yes
	TOTAL NOISE	60	+8	+8	+9
2 Dwellings in Cedar Drive - With 5m Barrier, or building shielding	Car door closure	25	Yes	Yes	Yes
	Car bypass @ 5km/h	20	Yes	Yes	Yes
	Voice (conversations)	30	Yes	Yes	Yes
	Truck Passbys	38	Yes	Yes	Yes
	Truck reverse alarm	36	Yes	Yes	Yes
	Forklift operation	38	Yes	Yes	Yes
	Waste removal	42	Yes	Yes	Yes
	Angle grinder	36	Yes	Yes	Yes
	Drop saw	33	Yes	Yes	Yes
	Hammering sheet metal	39	Yes	Yes	Yes
	Air Ratchet gun	27	Yes	Yes	Yes
	TOTAL NOISE	47	Yes	Yes	Yes

The summary of Background Creep predictions is as follows;

- Noise associated with the development at Receiver 1 is predicted to comply with the Background Creep of the EPP (Noise) 2008.
- Without acoustic treatment, noise associated with the development is predicted to be above the Background Creep criteria. Noise levels at Receiver 2 are capable of complying with the criteria with the inclusion of acoustic treatment (i.e. acoustic barriers, buffer zones, etc.).

7. RECOMMENDATIONS

7.1. Noise from Industrial Activities

Noise levels are predicted to comply at Receiver 1 during day and evening without the need for further treatment. Night time noise levels are slightly above the criteria, however noise levels are likely to reduce once noise source locations are known.

Noise levels at Receiver 2 are predicted to be above the criteria without acoustic treatment. Approximately 18 dwellings would be directly noise affected at Receiver 2 across a distance of 280m. Acoustic treatment or design strategies would be needed to reduce noise to acceptable levels.

Suitable noise reduction can be achieved by appropriate layout and siting of buildings within the development site. To achieve the noise reduction, a continuous line of buildings adjacent to the full extent of the western residential boundary is recommended.

The buildings themselves, if constructed in accordance with the details listed below, will provide suitable degree of noise attenuation.

The area requiring this treatment is shown in Figure 4.

Figure 4: Extent of Building Treatment adjacent to Western Boundary



Details of this treatment option are as follows;

- Buildings should be minimum 5m high.
- No gaps between buildings.
- Buildings should be constructed of solid concrete or masonry with a thickness of at least 100mm.

- No openings (other than emergency doors) on the western façade facing residential properties. Any doors should be minimum 45mm thick solid core doors with a minimum density of 25kg/m². With acoustic gasket seals around the top and sides, and a drop seal at the base.
- Insulation blanket such as Bradford Acousticon or equivalent should be installed in the roof of these buildings. Insulation should be minimum 75mm thick.
- Any penetrations through the western building façade should be acoustically treated to ensure the acoustic rating is maintained.

The above recommendations refer to buildings adjacent to the western residential boundary only (shown in Figure 4).

7.2. Management Strategies

The following management strategies may be needed to further reduce noise levels where possible;

- Depending on the ultimate proximity of noise sources to the receiver, significant noise generating activities may need to be between the hours of 7am - 10pm.
- Waste collection between the hours of 7am - 6pm where possible.
- Surface finish for grade should be low-squeal i.e. no polished or painted concrete etc.
- Any grates or other protective covers in the car parks and access driveways must be rigidly fixed in position to eliminate clanging.

7.3. Plant Noise

Detailed plant selections are not available at this stage. Consequently it is not possible to carry out detailed examination of any measures that may be required to achieve compliance with the noise targets. Plant and equipment must be acoustically treated to prevent noise emissions from adversely impacting the surrounding properties. This may include selecting the quietest plant possible, or treating the plant equipment with enclosures, barriers, duct lining and silencers, etc if required to comply with the assessment criteria.

Experience with similar projects indicates that it is possible to achieve the criteria with appropriate acoustic treatment. This treatment would be determined at the Building Approval stage.

8. CONCLUSION

TTM Group has conducted an environmental noise assessment of proposed industrial land at 60 Stapylton-Jacobs Well Road Stapylton.

Potential noise produced by future industrial sites has been assessed for day, evening and night periods to receivers surrounding the site. Based on the expected location of noise sources, noise levels are predicted to be above the criteria of the EPP (Noise) 2008 in some instances. Acoustic design principles would be needed to reduce noise at the nearest receivers to the site.

With the inclusion of acoustic treatment, industrial uses at the subject site are capable of complying with the noise criteria listed in Section 5.

If you should have any queries please do not hesitate to contact us.

Report Compiled by:
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Report Reviewed by:
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MARK ENERSEN BSc (Physics) MAAS
Manager Acoustics Gold Coast

9. APPENDICES

9.1. Appendix A - Site Location Plan



**development
perspectives**

planning
design
environment
surveying
Riverside Office
Level 13
87 Creek Street Brisbane Q. 4000
t (07) 3201 8730
f (07) 3201 7000
David David and Logan Office
Avondale Business Park
36 Raymote Street Yalla Q. 4207
t (07) 3807 3333
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w. www.developmentperspectives.com.au

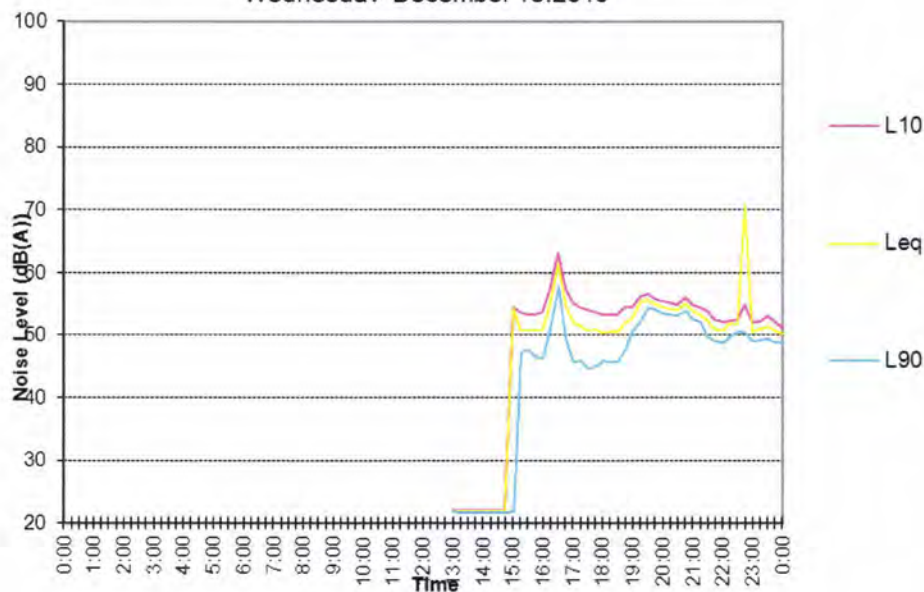
Hester site stapylton jacobs well road
stapylton

Drawn 19-11-10
Scale 1:8000
Design B.M.W./S.H.
Plan 5083 P.00.01

9.2. Appendix B - Noise Monitoring Graphs

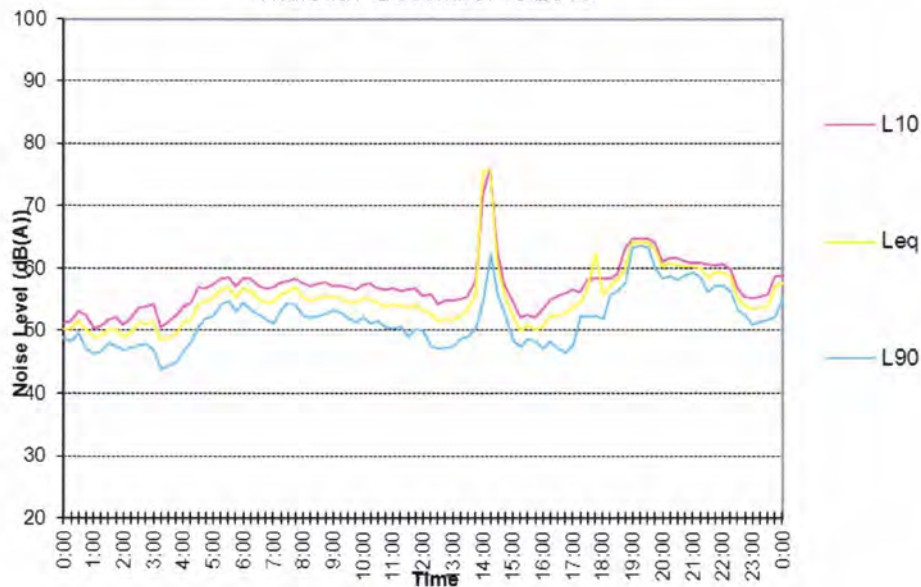
Ambient Noise Survey - 60 Stapylton-Jacobs Well Road, Stapylton

Wednesday December 15.2010



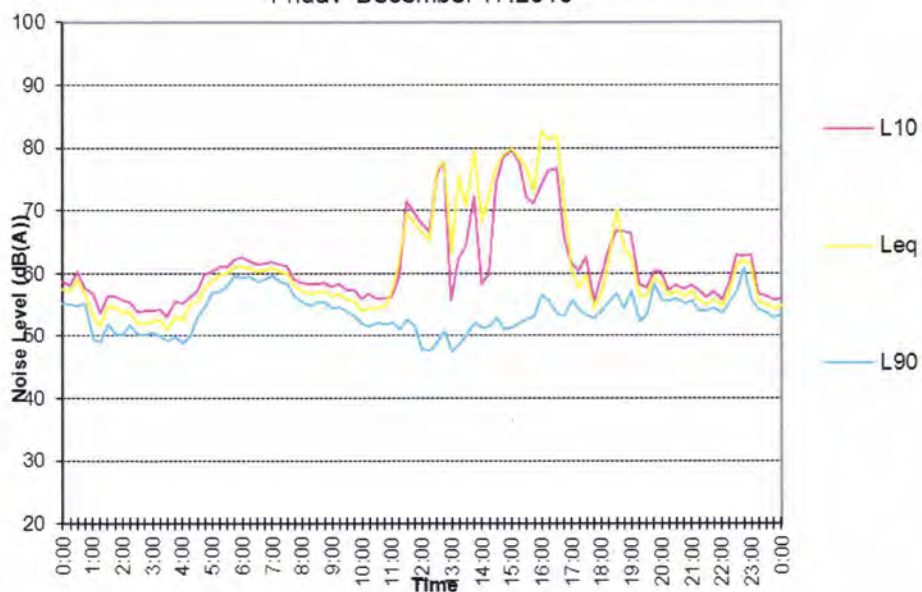
Ambient Noise Survey - 60 Stapylton-Jacobs Well Road, Stapylton

Thursday December 16.2010



Ambient Noise Survey - 60 Stapylton-Jacobs Well Road, Stapylton

Friday December 17.2010

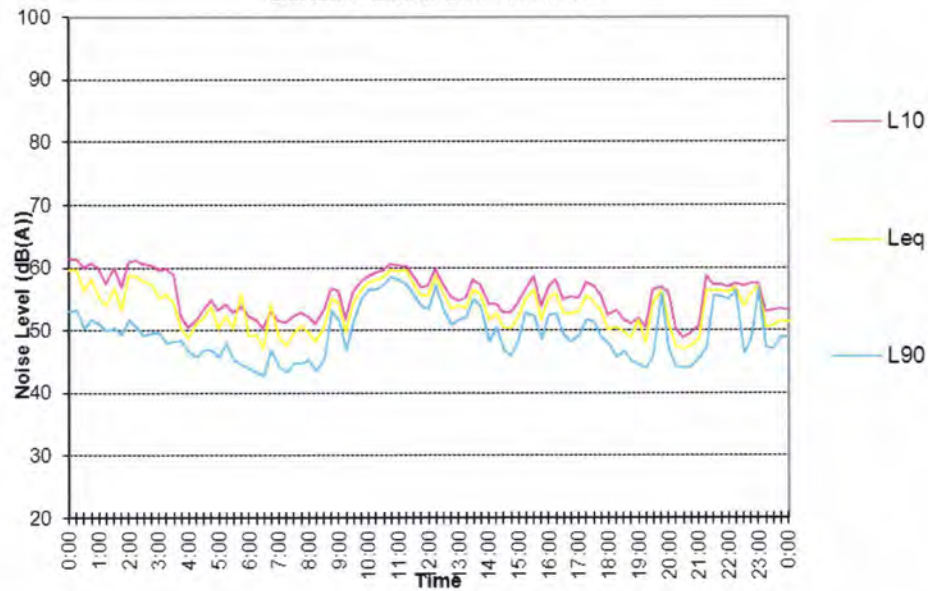


Ambient Noise Survey - 60 Stapylton-Jacobs Well Road, Stapylton

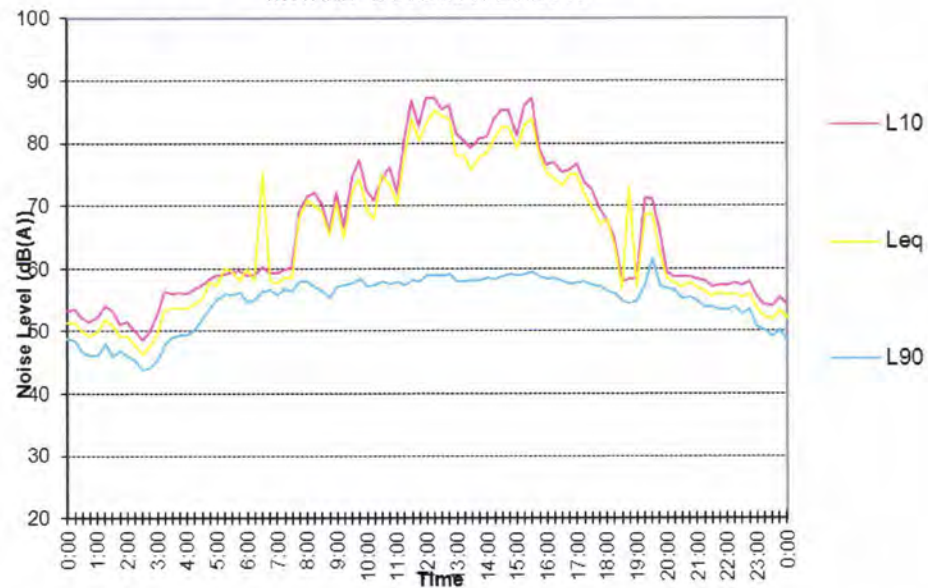
Saturday December 18.2010



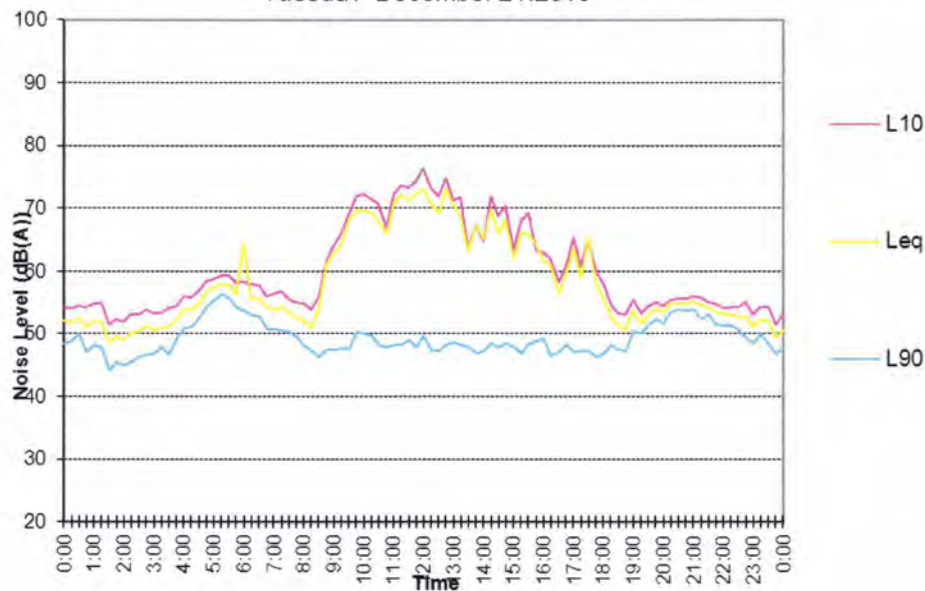
**Ambient Noise Survey -
 60 Stapylton-Jacobs Well Road, Stapylton**
 Sunday December 19.2010



**Ambient Noise Survey -
 60 Stapylton-Jacobs Well Road, Stapylton**
 Monday December 20.2010



**Ambient Noise Survey -
 60 Stapylton-Jacobs Well Road, Stapylton**
 Tuesday December 21.2010



**Ambient Noise Survey -
 60 Stapylton-Jacobs Well Road, Stapylton**
 Wednesday December 22.2010



14 – ACID SULFATE SOIL INVESTIGATION (ADG CONSULTING)

Acid Sulfate Soil Investigation

Proposed Industrial Development:

Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road and Christensen Road, Stapylton, Queensland.

August 2011

Prepared for:

William & Patricia Hester

c/- Gassman Development Perspectives

Report details

Project ref: ADG217.10
Project Manager: David Bayel
Report title: Acid Sulfate Soil Investigation
Proposed Industrial Development:
Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well
Road and Christensen Road, Stapylton, Queensland.
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ADG Consulting

David Bayel BEnvSc, MASSSI
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Date: 25 August 2011

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APPENDIX E: ACID SULFATE SOIL MANAGEMENT PLAN

1 Introduction

ADG Consulting (ADG) was engaged by William and Patricia Hester to undertake an acid sulfate soil (ASS) investigation for the proposed development within property described as Lot 1 on RP6882 and Lot 240 on W31320, situated at 60 Stapylton Jacobs Well Road and Christensen Road, Stapylton, Queensland.

1.1 Proposed development

Gassman Development Perspectives (GDP) has been instructed by William and Patricia Hester to prepare and lodge a Development Application for the above described property. The proposed development includes:

- Preliminary Approval for a Material Change of Use (MCU) converting the existing land use designation (Future Business and Industry) to various preferred industrial uses; and
- Preliminary Approval for Operational Works (OPW) for changes to ground levels and construction of retaining walls.

The development requires substantial cut to fill bulk earthworks to create level building pads, retaining walls and roadways throughout the site. The proposal comprises several stages of development and the associated earthworks will be undertaken progressively as required. Existing surface elevations range from 3.89m to 29.23m Australian Height Datum (AHD). Finished surface levels across the site will range from approximately 8.5m to 25.5m AHD following completion of the cut to fill earthworks.

1.2 Disturbance of ASS

Acid sulfate soils occur predominantly on coastal lowlands with elevations generally below 5m AHD (Ahern *et al.* 1998). The exposure of ASS to oxygen by drainage, excavation or filling results in the production of sulphuric acid and the mobilisation of aluminium, iron and other heavy metals. The acid can corrode concrete and steel infrastructure, whilst the acidic leachate and heavy metals can be highly toxic to aquatic organisms and native vegetation.

Gold Coast City Council's (GCCC's) ASS Overlay Map (OM14-1) and the Department of Natural Resources and Mines ASS mapping (SEA-I-AO 3329) indicates that approximately 6,000m² of the site is potentially underlain by ASS. This area is situated within the low lying land on Lot 1, adjacent to Stapylton Jacobs Well Road. Sediments associated with Sandy Creek are also mapped as containing actual acid sulfate soils (AASS), however it is not proposed to develop this part of the site and therefore no assessment of the area has been conducted.

The preliminary bulk earthworks drawings prepared by Hyder Consulting Pty Ltd (ref: DWG No. C001-AA003837 to C036-AA003837) indicate that the mapped area within Lot 1 will be filled to around 9.95m to 11.0m AHD. Therefore, whilst bulk excavation of ASS is not proposed, there remains the potential to disturb between 1,000 to 2,000m³ of ASS when stripping topsoils prior to filling.

1.3 Relevant guidelines

The investigation was conducted with reference to the following documents:

- *Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1, June 2004.* Ahern *et al.* (2004). Department of Natural Resources, Mines and Energy.

-
- *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland, 1998. Ahern et al. (1998). QASSIT, Department of Natural Resources and Mines.*
 - *Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines Version 3.8. Dear et al. (2002). Department of Natural Resources and Mines.*
 - *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils.*
 - *State Planning Policy 2/02 Guideline: Acid Sulfate Soils, Version 2.*

1.4 Investigation objectives

The objectives of the investigation were to:

1. Identify the presence and type of ASS at the site;
2. Quantify the existing and potential acidity in the soil; and
3. Provide effective management procedures to prevent environmental harm resulting from the disturbance of ASS.

1.5 Scope of work

To achieve the investigation objectives, the following scope of work was undertaken:

- A desktop assessment including a review of the development proposal, aerial photographs, geology and soil maps for the area.
- An inspection of the site and surrounding environment.
- The construction of four boreholes to a maximum depth of 3.0m below the ground surface.
- The recovery of soil samples for acid sulfate soil screening (pH_F and pH_{Fox}) at 0.25m depth intervals in each borehole, giving a total of 42 samples.
- Laboratory analysis of 20 selected samples to determine the acid generating capacity of the soil. Analysis was conducted using the Chromium Reducible Sulfur Suite.
- The preparation of this Acid Sulfate Soil Investigation Report and an Acid Sulfate Soil Management Plan (ASSMP) for submission to Gold Coast City Council (GCCC) and the Department of Environment and Resource Management (DERM).

2 Site characteristics

2.1 Property description

The site has a total combined area of 73.114 hectares and comprises the two allotments described in Table 2.1. The location of the site is displayed in Figure 1, Appendix A.

Table 2.1. Property details

Real property description	Area (Ha)	Area < 5m AHD (Ha)	Current land use
Lot 1 on RP6882	20.505	0.18*	Rural & residential
Lot 240 on W31320	52.609	0.00	Rural & light industrial

Table notes:

* Based on detailed site survey plan: GDP 5093 S CD 01

The area subject to investigation for ASS is displayed in images 1 and 2 below.



Image 1. View to north



Image 2. View to north-east

2.2 Surrounding environment

The surrounding land use and environment observed during the site inspection is described in Table 2.2.

Table 2.2. Surrounding land use and environment

Direction	Environment
North	Industrial development and Stapylton Jacobs Well Road, then agricultural land used predominantly for cattle grazing, then the Albert River.
East	Stapylton Landfill Facility, then extractive industry, then agricultural land used for sugar cane production.
South	Industrial development and Christensen Road, then the Pacific Motorway.
West	Industrial development, then the Pacific Motorway.

2.3 Topography

The site is characterised by rolling hills with gently to moderately inclined slopes, typically less than 10%. Surface elevations range from 3.89m to 29.23m AHD.

2.4 Geology

The geology at the site is mapped as Devonian/Carboniferous aged Neranleigh-Fernvale Beds, consisting of mudstone, shale, greywacke, chert, jasper, conglomerate, basic metavolcanics and pillow lava (Geological Survey of Queensland 1980).

ASS mapping of the Logan to Coomera Area (Department of Natural Resources and Mines-SEA-I-A0 3329) indicates that three ASS mapping units are present within the site, as follows:

The following ASS mapping units are present within the bounds of the site:

- S – Land mapped at 1:100,000 scale where ASS occurs within 5m of the surface. This mapped area of approximately 6,000m² is situated within the low lying land on Lot 1, adjacent to Stapylton Jacobs Well Road.
- A0LP – Land between the 5m contour and the outer limit of Holocene, estuarine ASS with low probability of ASS occurrence. However, the 'A0' prefix indicates that actual acid sulfate soil (AASS) may be encountered at 0m – 0.5m below the surface. This area is associated with Sandy Creek on the southern boundary of Lot 240, however no disturbances are proposed for this part of the site.
- NA – Land not assessed as part of the survey. It may include non ASS land beyond the boundary established as the limit of Holocene, estuarine sulfidic sediments. The majority of the site is mapped as NA and has elevations above 5m AHD.

An extract of the ASS map displaying the site is provided in Figure 2, Appendix A.

2.5 Hydrology

The majority of stormwater runoff from Lot 1 flows to the northern part of the site, where a culvert passes beneath Stapylton Jacobs Well Road to the Albert River floodplain. The remainder of the site generally drains via two catchments to the east. The southern portion of Lot 240 is bound by Sandy Creek, an upper tributary of the Logan River.

2.6 Hydrogeology

Groundwater monitoring conducted within Lot 240 by the current tenant indicates that standing water levels across that part of the site range from approximately 2 to 7m below the ground surface.

Based on the sites location and localised topography, the inferred groundwater gradients are to the north-west (most of Lot 1) and the east (Lot 240), however localised groundwater volume and movement is likely to be influenced by the surrounding development, in particular the landfill facility to the east of the site.

2.7 Vegetation

Vegetation across the site ranges from open pasture to moderately dense eucalypt forest. The area subject to the ASS investigation is dominated by pasture, with occasional medium to large sized trees adjacent the north-west property boundary.

3 Acid sulfate soil investigation

3.1 Methodology

The acid sulfate soil investigation was undertaken at the site on 14 January 2011 using a four wheel drive mounted Jacro 200 drilling rig. The rig was equipped with spiral flight augers, which was considered appropriate for the site and soil conditions encountered. A total of four boreholes were constructed within the 6,000m² area, which was identified in Lot 1 using the ASS maps. Boreholes were generally constructed to 3.0m (BH1, BH2 & BH3), however weathered rock was encountered at 1.6m in BH4 and this borehole was subsequently terminated prematurely. A site plan showing the borehole locations is provided in Figure 3, Appendix A.

Soil samples for acid sulfate soil screening were recovered at 0.25m depth intervals to the termination depth in each borehole. The lead auger was cleaned between samples to prevent cross contamination. Samples were recovered using a gloved hand and sealed into polyethylene bags with excess air extruded. All samples were stored in an insulated, ice filled container to preserve sample integrity and minimise analyte degradation. The samples remained chilled until arrival at the laboratory within the specified holding times.

A total of 42 samples were recovered and subjected to field pH (pH_f) and field peroxide pH (pH_{fox}) testing under laboratory conditions. The screening tests were undertaken using a fixed volume of soil (approximately 10g) and deionised water (30mL). The hydrogen peroxide (50% volume) was buffered to pH 4.5 using sodium hydroxide prior to the addition of 10mL to each peroxide pH sample. The solutions were thoroughly mixed at 20 minute intervals and the resulting pH_f and pH_{fox} values recorded after one hour.

Based on the results of the field screening, 20 samples were submitted to Mazlab Pty Ltd for laboratory analysis. The samples were analysed using the Chromium Reducible Sulfur Suite described in Ahern *et al.* (2004). The chromium reduction method measures reduced inorganic sulfur compounds and is not subject to significant interferences from the sulfur in either organic matter or sulfate minerals (Ahern *et al.* 2004).

3.2 Sub-surface conditions

The soil conditions encountered during the investigation can be separated into three categories, as follows:

- | | |
|-----------------|---|
| Alluvium: | An alluvial sequence of clayey sand and medium to high plasticity sandy clay to depths ranging from 1.6m to more than 3.0m below the ground surface. This material is underlain by; |
| Residual soil: | A residual sequence of clayey sand and medium plasticity sandy clay identified in BH1 and BH4 at a depth of 1.6m below the ground surface, underlain by; |
| Weathered rock: | Highly weathered sandstone, remoulding to sandy light clay. This material was encountered at depths of 2.0m and 1.6m in BH1 and BH4 respectively. |

Groundwater was recorded in a clayey sand matrix at a depth of 2.5m in BH3. Detailed borehole descriptions are provided in Appendix B.

3.3 Assessment criteria

The relevant assessment criteria are the *Texture-Based Acid Sulfate Soil Action Criteria* provided in Dear *et al.* (2002). The action criteria trigger the need to prepare a management plan based on the sum of the existing plus potential acidity. The criteria are texture-based, as clay content can influence a soils natural buffering capacity, permeability, and the rate of oxidation when soil is disturbed. The action criteria are provided in Table 3.3.

Table 3.3. Action criteria

Type of material		Action criteria if 1 - 1,000 tonnes of material is disturbed		Action criteria if more than 1,000 tonnes of material is disturbed	
		Existing + Potential Acidity		Existing + Potential Acidity	
Texture range	Approx. clay content (%)	Equivalent sulfur (%S)*	Equivalent acidity (mol H ⁺ /tonne)*	Equivalent sulfur (%S)*	Equivalent acidity (mol H ⁺ /tonne)*
Coarse texture Sands to loamy sands	≤5	0.03	18	0.03	18
Medium texture Sandy loams to light clays	5 - 40	0.06	36	0.03	18
Fine texture Medium to heavy clays and silty clays	≥40	0.1	62	0.03	18

Source: Dear *et al.* (2002).

* Oven-dry basis

Based on the expected volume of soil to be disturbed, the action criteria of 0.03%S or 18 moles H⁺/tonne of net acidity is applicable for the site.

3.4 Field pH testing

A total of 42 samples were subjected to field pH (pH_F) and field peroxide pH (pH_{FOX}) testing under laboratory conditions. The field pH measures the existing acidity of the soil, thereby indicating if actual acid sulfate soils (AASS) are present. A pH_F of ≤4.0 suggests the previous oxidation of sulphides and the presence of AASS.

The field peroxide test is used to indicate if iron sulphides or potential acid sulfate soils (PASS) are present. A combination of three factors must be considered to determine a positive result, including the strength of the reaction with hydrogen peroxide, the recorded value of pH_{FOX}, and the change between the pH_F and pH_{FOX} values.

The results of the field pH testing are provided in Appendix C. A summary of the results is provided below:

- Field pH values ranged from 3.5 to 6.7 with a mean field pH of 4.6 reported. Numerous samples, typically of alluvial origin recorded field pH values of 4.0 or below indicating the presence of AASS.
- Field peroxide pH values ranged from 1.7 to 7.5 with a mean peroxide pH of 4.9 reported. Two samples recovered from the alluvial soils to a depth of 0.5m in BH2 indicated the possible presence of PASS.

3.5 Laboratory analysis

A total of 20 soil samples were selected for laboratory analysis using the Chromium Reducible Sulfur Suite. Samples were typically analysed at a minimum of 0.5m depth intervals in the fill materials and underlying residual soils. Samples were selected based on the field pH and peroxide pH test results. The laboratory certificates are provided in Appendix D.

A summary of the analytical results is provided in Table 3.5. The net acid generating capacity of the soil was calculated using the chromium suite acid base accounting (ABA) method (acidity units) described in Ahern *et al.* (2004), as follows:

$$\text{Net acidity} = \text{Potential Sulfidic Acidity} + \text{Actual Acidity} + \text{Retained Acidity} - \text{Measured ANC/FF}$$

Table 3.5. Summary of Chromium Reducible Sulfur analysis

BH	Depth (m)	%S	S _{CR} (mol H ⁺ /t)	TAA (mol H ⁺ /t)	S _{NAS} (mol H ⁺ /t)	ANC (mol H ⁺ /t)	Net acidity (mol H ⁺ /t)
1	0.00 – 0.25	0.01	8	-	-	-	8
1	0.50 – 0.75	nd	nd	69	nd	-	69
1	1.00 – 1.25	nd	nd	71	nd	-	71
1	1.50 – 1.75	nd	nd	45	nd	-	45
1	2.00 – 2.25	nd	nd	31	nd	-	31
1	2.50 – 2.75	nd	nd	23	nd	-	23
2	0.00 – 0.25	0.01	5	25	-	-	30
2	0.25 – 0.50	nd	nd	20	-	-	20
2	0.75 – 1.00	nd	nd	20	-	-	20
2	1.25 – 1.50	nd	nd	3	-	-	3
2	1.75 – 2.00	nd	nd	3	-	-	3
2	2.25 – 2.50	nd	nd	3	-	-	3
3	0.25 – 0.50	nd	nd	2	-	-	2
3	0.75 – 1.00	nd	nd	25	nd	-	25
3	1.25 – 1.50	nd	nd	25	nd	-	25
3	1.75 – 2.00	nd	nd	27	nd	-	27
3	2.25 – 2.50	nd	nd	20	nd	-	20
4	0.00 – 0.25	nd	nd	5	-	-	5
4	0.50 – 0.75	nd	nd	27	nd	-	27
4	1.00 – 1.25	nd	nd	28	nd	-	28
Maximum		0.01	8	71	-	-	71
Action criteria		0.03	Not applicable				18

Table notes:

nd = non-detect

- = analysis not required

bold = criteria exceedance

4 Discussion

Field pH testing indicated moderate levels of existing acidity in the soils at the site, with a mean field pH of 4.6 reported. Field pH oxidation testing indicated the possibility of PASS in two samples, however the results were typically well above $\text{pH}_{\text{FOX}} 3.0$ suggesting that pyritic sulphides were not present. This was confirmed by the laboratory results, which reported oxidisable sulfur concentrations equal to, or below the laboratory limit of reporting (LOR) in all samples analysed.

Titratable actual acidity (TAA) concentrations ranging from 2 to 71 moles H^+ /tonne were reported in the alluvium and underlying residual soils confirming the presence of existing acidity, which is unlikely to have resulted from the oxidation of pyritic sulfides.

Retained acidity analysis was conducted on eleven samples due to the reported pH_{KCl} values being below 4.5 pH units, however no detectable concentrations were reported. Based on the pH_{KCl} results, there was no requirement to analyse for acid neutralising capacity (ANC) in any samples.

A maximum net acidity concentration of 71 moles H^+ /tonne was reported in the alluvial soil sample recovered from 1.00 – 1.25m in BH1. Of the 20 samples analysed, 70% reported net acidity concentrations above the action criteria of 18 moles H^+ /tonne.

5 Conclusions and recommendations

5.1 Conclusions

The results of the investigation indicate that acidic soils are present within the investigation area, and that minor disturbance of these soils will result from topsoil stripping prior to filling this part of the site.

The identified acidity is unlikely to have resulted from the oxidation of sulfidic estuarine sediments, however based on the reported levels of existing acidity, material excavated from below 5m AHD must be managed to prevent impacts on the receiving environment. The acid base account indicates a maximum acid generating capacity of 71 moles H⁺/tonne. This level is above the action criteria of 18 moles H⁺/tonne, thereby triggering the requirement for an Acid Sulfate Soil Management Plan (ASSMP).

5.2 Recommendations

Based on the levels of net acidity reported in the alluvial and residual soils, all soil disturbances below 5m AHD require management for AASS. A site specific Acid Sulfate Soil Management Plan (ASSMP) has been developed by ADG for the site, and is attached in Appendix E.

From an acid sulfate soils perspective, ADG considers that the site is suitable for the proposed development, and that the soil can be appropriately managed to prevent impacts on the surrounding environment.

5.3 Limitations of report

ADG Consulting Pty Ltd (ADG) has prepared this report for William and Patricia Hester in accordance with the agreed scope of work and for the purpose outlined in ADG's Fee Proposal dated 22 November 2010. The services performed by ADG have been conducted in a manner consistent with the normal level of care and expertise exercised by members of the environmental consulting profession. No other warranty or guarantee, expressed or implied, is made as to the professional advice included in this report.

This report is solely for the use of William and Patricia Hester and ADG accepts no responsibility for the use of any part of this report for any other purpose or by third parties, as it may not contain sufficient information for the purposes of other parties or users. This report must only be presented in full, and may not be used for any other objective, except where prior written approval is obtained from ADG. This report does not comment on legal obligations, as legal advice can only be given by qualified legal practitioners.

The information contained in this report is considered to be accurate at the date of issue. Subsurface conditions, including contaminant concentrations can change in space and time, either through natural processes or by the accidental or intentional addition of contaminants to a site. Where conditions encountered subsequently at the site are significantly different from those reported herein, ADG must be notified and be provided the opportunity to review the conclusions and recommendations of this report.

6 References

Ahern, C.R., Ahern, M.R. and Powell, B. (1998) *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998*. QASSIT, Department of Natural Resources, Resource Sciences Centre, Indooroopilly, Queensland, Australia. ISBN 0 7242 7442 1

Ahern, C.R., McElnea, A.E. and Sullivan, L.A. (2004). *Acid Sulfate Soils Laboratory Methods Guidelines*. Queensland Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia. ISBN 1 920920 66 8

Dear, S.E., Moore, N.G., Dobos, S.K., Watling, K.M. and Ahern, C.R. (2002). Soil Management Guidelines. In *Queensland Acid Sulfate Soil Technical Manual*. Department of Natural Resources and Mines, Indooroopilly, Queensland, Australia. QNRM02275

Department of Natural Resources and Mines. *Acid Sulfate Soils Map, Logan and Coomera Area*. Ref. No. NR&M-SEA-I-AO 3329.

Geological Survey of Queensland. 1980. Moreton Geology, 1:500,000 Sheet.

State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils*. Department of Local Government and Planning, and Department of Natural Resources and Mines.

State Planning Policy 2/02 Guideline: *Acid Sulfate Soils, Version 2*. Department of Local Government and Planning, and Department of Natural Resources and Mines.

Appendix A: Figures



Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 1: Site location



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

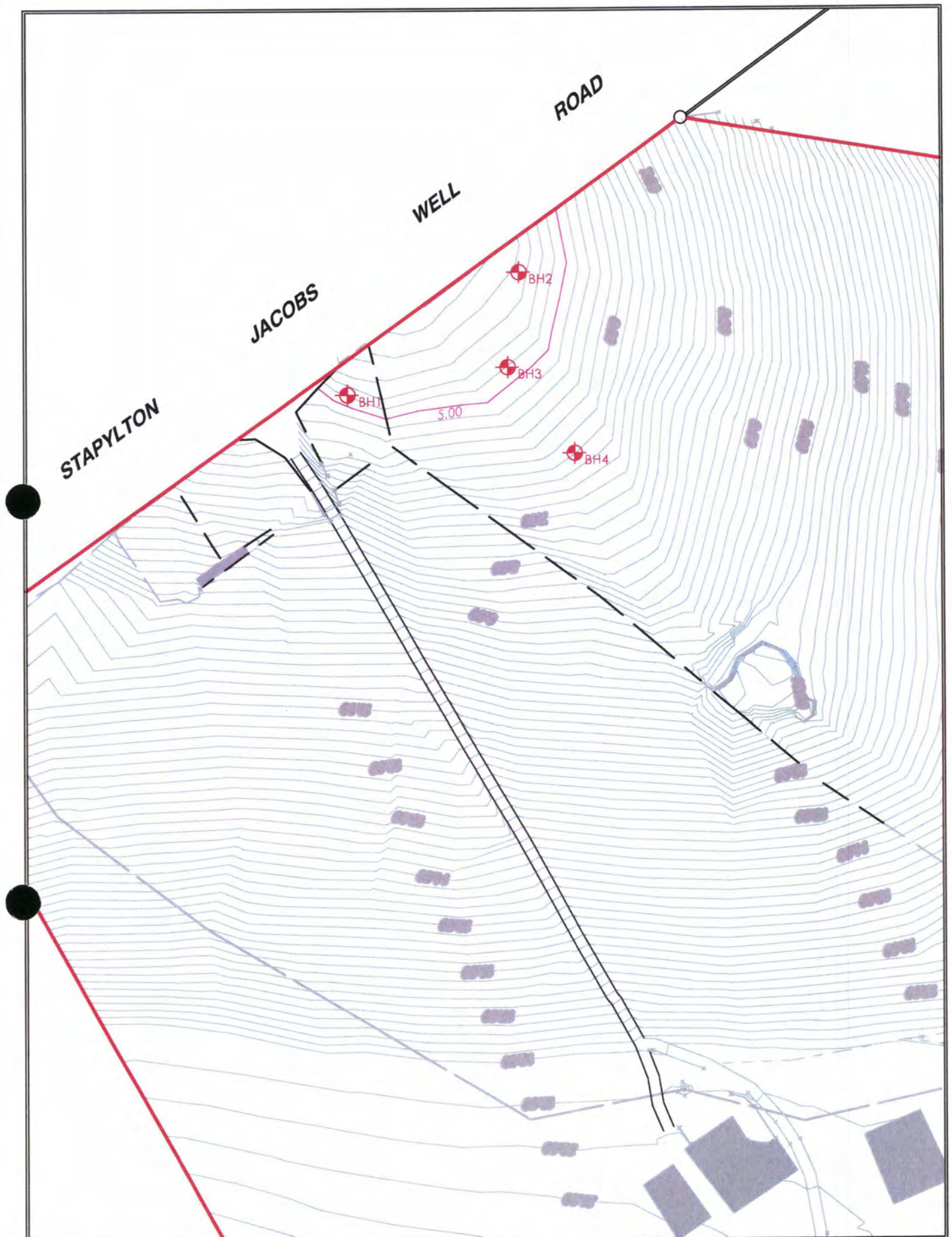
Project ref: ADG217.10

Drawn by: David Bayel Date: 03.02.11

Figure 2: ASS mapping



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 07.02.11

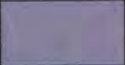
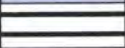
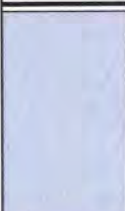
Figure 3: Borehole locations



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Appendix B: Borehole descriptions

BOREHOLE DESCRIPTION

Client: William & Patricia Hester c/- Gassman Development Perspectives				Borehole: BH1			
Project: Lot 1 on RP6882 Stapylton Jacobs Well Road, Stapylton, Queensland.				Location: Refer Figure 2			
Project ref: ADG217.10		Logged by: David Bayel		Date: 14.01.11	Surface level: ~4.75m AHD		
Equipment type: Jacro 200 drill rig				Hole diameter: 100mm	Notes:		
Geological profile	Water	Well detail	Depth (m)	Graphic log	Soil or rock type		
Alluvium			0.3		SILTY SAND: Dark brown, fine to medium grained, trace of organics (fine roots), moist.		
			0.6		CLAYEY SAND: Grey-brown, fine to medium grained, moist to very moist.		
			0.8		SANDY MEDIUM CLAY: Brown, with fine to medium grained sand, trace of organics (fine roots), moist.		
			1.0		SANDY MEDIUM CLAY: Orange and light brown mottled, with fine to medium grained sand, moist.		
			1.6		SANDY MEDIUM CLAY: Light brown and yellow mottled, with fine to medium grained sand, moist.		
Residual			2.0		SANDY MEDIUM CLAY: Light grey-white, with fine to medium grained sand, moist.		
			3.0		COMPLETELY WEATHERED SILTSTONE: Light orange and light brown-white mottled, with fine to medium grained sand, trace of fine to medium sized semi-angular gravel, moist.		
Borehole terminated at 3.0m Limit of investigation							

BOREHOLE DESCRIPTION

Client:				William & Patricia Hester c/- Gassman Development Perspectives			Borehole:		BH2								
Project:				Lot 1 on RP6882 Stapylton Jacobs Well Road, Stapylton, Queensland.					Location:		Refer Figure 2						
Project ref:				ADG217.10		Logged by:		David Bayel		Date:		14.01.11		Surface level:		~4.25m AHD	
Equipment type:						Jacro 200 drill rig				Hole diameter:		100mm		Notes:			
Geological profile		Water	Well detail	Depth (m)	Graphic log	Soil or rock type											
Alluvium				0.6		SILTY MEDIUM CLAY: Dark brown, with fine grained sand, trace of organics (fine roots), very moist.											
				0.8		SANDY MEDIUM CLAY: Brown with occasional orange mottles, with fine to medium grained sand, trace of organics (fine roots), moist.											
				1.25		SILTY HEAVY CLAY: Grey with occasional orange mottles, trace of fine to medium grained sand, trace of organics (fine roots), moist.											
				1.5		SANDY HEAVY CLAY: Grey with occasional dark green mottles, with fine to medium grained sand, trace of fine sized gravel, moist.											
				1.8		SANDY HEAVY CLAY: Pink grey and green mottled, with fine to medium grained sand, trace of fine sized gravel, moist.											
				2.0		SANDY MEDIUM CLAY: Grey, with fine to medium grained sand, trace of organics (fine roots), moist.											
				3.0		SANDY MEDIUM CLAY: Light grey with orange mottles, with fine to medium grained sand, trace of fine sized angular gravel, trace of organics (fine roots), moist.											
																	
																	
																	
						Borehole terminated at 3.0m Limit of investigation											

BOREHOLE DESCRIPTION

Client: William & Patricia Hester c/- Gassman Development Perspectives				Borehole: BH3	
Project: Lot 1 on RP6882 Stapylton Jacobs Well Road, Stapylton, Queensland.				Location: Refer Figure 2	
Project ref: ADG217.10		Logged by: David Bayel		Date: 14.01.11	Surface level: ~4.75m AHD
Equipment type: Jacro 200 drill rig				Hole diameter: 100mm	Notes:
Geological profile	Water	Well detail	Depth (m)	Graphic log	Soil or rock type
Alluvium	▼		0.25		SILTY MEDIUM CLAY: Dark brown, with fine grained sand, trace of organics (fine roots), very moist.
			0.6		CLAYEY SAND: Grey with occasional orange mottles, fine to medium grained, very moist.
			1.5		CLAYEY SAND: Grey and orange-brown mottled, fine to medium grained, trace of fine to medium sized angular gravel, moist.
			2.5		CLAYEY SAND: Grey-brown, fine to medium grained, moist to wet.
			3.0		
					Borehole terminated at 3.0m Limit of Investigation

BOREHOLE DESCRIPTION

Client: William & Patricia Hester c/- Gassman Development Perspectives					Borehole: BH4	
Project: Lot 1 on RP6882 Stapylton Jacobs Well Road, Stapylton, Queensland.					Location: Refer Figure 2	
Project ref: ADG217.10		Logged by: David Bayel			Date: 14.01.11	Surface level: ~6.5m AHD
Equipment type: Jacro 200 drill rig				Hole diameter: 100mm		Notes:
Geological profile	Water	Well detail	Depth (m)	Graphic log	Soil or rock type	
Alluvium			0.3		CLAYEY SAND: Dark brown, fine to medium grained, trace of organics (fine roots), moist.	
			0.6		CLAYEY SAND: Grey with orange mottles, fine to medium grained, moist.	
			0.8		SANDY MEDIUM CLAY: Grey and orange mottled, with fine to medium grained sand, moist.	
			1.3		CLAYEY SAND: Grey with orange mottles, fine to medium grained, moist.	
			1.6		SANDY MEDIUM CLAY: Grey and orange mottled, with fine to medium grained sand, moist.	
Residual			1.8		HIGHLY WEATHERED SANDSTONE: Orange-brown, with fine to medium grained sand, with fine to medium sized gravel, moist.	
					Borehole terminated at 1.8m Limit of investigation	

Appendix C: Field pH results

Field pH and field peroxide pH test results

Borehole	Depth (m)	Date	pH _F	pH _{FOX}	Reaction to peroxide	AASS	PASS	S _{CR} analysis
1	0.00-0.25	14.01.11	6.7	5.0	Strong			Yes
	0.25-0.50	14.01.11	4.9	3.6	Strong			
	0.50-0.75	14.01.11	4.0	3.4	Slight	Yes		Yes
	0.75-1.00	14.01.11	3.7	3.7	Slight	Yes		
	1.00-1.25	14.01.11	3.6	3.6	Slight	Yes		Yes
	1.25-1.50	14.01.11	3.7	3.7	Slight	Yes		
	1.50-1.75	14.01.11	3.7	4.0	Slight	Yes		Yes
	1.75-2.00	14.01.11	3.9	5.1	Slight	Yes		
	2.00-2.25	14.01.11	4.1	5.3	Slight			Yes
	2.25-2.50	14.01.11	4.1	5.0	Slight			
	2.50-2.75	14.01.11	4.2	5.8	Slight			Yes
	2.75-3.00	14.01.11	4.2	5.6	Slight			
2	0.00-0.25	14.01.11	4.7	1.7	Strong		Yes	Yes
	0.25-0.50	14.01.11	4.2	2.2	Moderate		Yes	Yes
	0.50-0.75	14.01.11	4.2	3.2	Slight			
	0.75-1.00	14.01.11	4.4	3.9	Slight			Yes
	1.00-1.25	14.01.11	4.7	5.5	Moderate			
	1.25-1.50	14.01.11	6.0	7.5	Slight			Yes
	1.50-1.75	14.01.11	5.9	6.6	Slight			
	1.75-2.00	14.01.11	6.2	6.8	Slight			Yes
	2.00-2.25	14.01.11	6.2	7.5	Slight			
	2.25-2.50	14.01.11	6.3	7.1	Slight			Yes
	2.50-2.75	14.01.11	6.4	7.0	Slight			
	2.75-3.00	14.01.11	6.4	6.9	Slight			
3	0.00-0.25	14.01.11	6.4	3.6	Strong			
	0.25-0.50	14.01.11	6.5	5.7	Slight			Yes
	0.50-0.75	14.01.11	4.2	4.8	Slight			
	0.75-1.00	14.01.11	3.9	4.9	Slight	Yes		Yes
	1.00-1.25	14.01.11	3.7	5.6	Strong	Yes		
	1.25-1.50	14.01.11	3.5	4.3	Strong	Yes		Yes
	1.50-1.75	14.01.11	3.6	5.0	Slight	Yes		
	1.75-2.00	14.01.11	3.8	5.8	Slight	Yes		Yes
	2.00-2.25	14.01.11	4.1	5.9	Slight			
	2.25-2.50	14.01.11	4.2	4.9	Slight			Yes
	2.50-2.75	14.01.11	4.1	5.6	Strong			
	2.75-3.00	14.01.11	4.2	5.7	Slight			
4	0.00-0.25	14.01.11	5.1	4.1	Strong			Yes
	0.25-0.50	14.01.11	5.3	5.4	Moderate			
	0.50-0.75	14.01.11	4.0	4.6	Slight	Yes		Yes
	0.75-1.00	14.01.11	3.6	3.7	Slight	Yes		
	1.00-1.25	14.01.11	3.6	4.4	Slight	Yes		Yes
	1.25-1.50	14.01.11	3.6	4.1	Slight	Yes		
Minimum			3.5	1.7				
Maximum			6.7	7.5				
Mean			4.6	4.9				
Median			4.2	5.0				

Table notes:

AASS & PASS results indicative only

Bold text = positive result

Appendix D: Laboratory certificates

Client: ADG Consulting
Mazlab Job No: ADG 2096

Project: ADG 217.10
Date: 20/01/2011

Certificate of Test Results – Chromium Reducible Sulphur

Sample No.	Client ID	Soil Description (truncated)	pH KCL	SCr mol IH+/t %S	TAA mol IH+/t %S	SNAS mol IH+/t %S	ANC mol IH+/t NA= Scr< action limit	Net Acidity mol IH+/t %S	Liming Rate (Kg/ dry t)
26557	BH01 0.00-0.25m	Silty Clayey SAND(SC) brown-dark brown	6.8	8 0.01%	- -	- -	NA	8	Nil
26558	BH01 0.50-0.75m	Sandy CLAY(CH) grey-brown, traces of orange-brown	3.9	<2 <0.01%	69 0.11%	<0.02%	-	69	5.4
26559	BH01 1.00-1.25m	Sandy CLAY(CI) brown-light brown, traces of light yellow & grey	3.8	<2 <0.01%	71 0.11%	<0.02%	-	71	5.5
26560	BH01 1.50-1.75m	Clayey SAND(SC) light grey, some orange-brown	4.0	<2 <0.01%	45 0.07%	<0.02%	-	45	3.5
26561	BH01 2.00-2.25m	Silty Clayey SAND(SC) light grey, traces of orange-brown	4.2	<2 <0.01%	31 0.05%	<0.02%	-	31	2.4
26562	BH01 2.50-2.75m	Silty Clayey SAND(SC) light grey, traces of orange-brown	4.3	<2 <0.01%	23 0.04%	<0.02%	-	23	1.8
26563	BH02 0.00-0.25m	Organic Silty CLAY(CL) dark brown	5.0	5 0.01%	25 0.04%	- -	- -	30	2.3
26564	BH02 0.25-0.50m	Silty Sandy CLAY(CI) grey-brown	4.5	<2 <0.01%	20 0.03%	- -	- -	20	1.6
26565	BH02 0.75-1.00m	CLAY(CH) grey, traces of orange-brown	4.7	<2 <0.01%	20 0.03%	- -	- -	20	1.6
26566	BH02 1.25-1.50m	Sandy CLAY(CH) grey, traces of orange-brown	6.4	<2 <0.01%	3 <0.01%	- -	- -	3	Nil
26567	BH02 1.75-2.00m	Sandy CLAY(CH) grey-light grey, some light grey & traces of orange-brown	6.4	<2 <0.01%	3 <0.01%	- -	- -	3	Nil
26568	BH02 2.25-2.50m	Sandy CLAY(CH) grey-light grey, some orange-brown	6.2	<2 <0.01%	3 <0.01%	- -	- -	3	Nil
26569	BH03 0.25-0.50m	Sandy CLAY(CI) grey-brown, traces of orange-brown	6.2	<2 <0.01%	2 <0.01%	- -	- -	2	Nil
26570	BH03 0.75-1.00m	Clayey SAND(SC) brown-orange-brown	4.3	<2 <0.01%	25 0.03%	<0.02%	-	25	1.9
26571	BH03 1.25-1.50m	Silty Sandy CLAY(CH) brown, some light grey	4.3	<2 <0.01%	25 0.03%	<0.02%	-	25	1.9
26572	BH03 1.75-2.00m	Silty Sandy CLAY(CH) brown, traces of orange-brown	4.4	<2 <0.01%	27 0.04%	<0.02%	-	27	2.1

Checked By:

Date:

Laboratory Test Methods follow procedures described in : QASSIT – Acid Sulphate Soils Laboratory Methods Guidelines – Version 2.1 June 2004

Form Number MAZREP08

Client: ADG Consulting
Mazlab Job No: ADG 2096

Project: ADG 217.10
Date: 20/01/2011

Certificate of Test Results – Chromium Reducible Sulphur

<u>Sample No.</u>	<u>Client I.D</u>	<u>Soil Description</u> (truncated)	<u>pH</u> KCL	<u>SCr</u> mol (H ⁺ /t) %S	<u>TAA</u> mol (H ⁺ /t) %S	<u>SNAS</u> mol (H ⁺ /t) %S	<u>ANC</u> mol (H ⁺ /t) NA= Ser< action limit	<u>Net Acidity</u> mol (H ⁺ /t) %S	<u>Liming Rate</u> (Kg/ dry t)
26573	BH03 2.25-2.50m	Sandy CLAY(CH) brown, traces of orange-brown	4.4	<2 <0.01%	20 0.03%	<0.02%	- -	20	1.6
26574	BH04 0.00-0.25m	Silty Clayey SAND(SC) grey-brown-dark grey-brown	5.6	<2 <0.01%	5 0.01%	- -	- -	5	Nil
26575	BH04 0.50-0.75m	Clayey SAND(SC) grey & orange-brown, traces of grey-dark grey	4.3	<2 <0.01%	27 0.04%	<0.02%	- -	27	2.1
26576	BH04 1.00-1.25m	Clayey SAND(SC) grey-light grey, traces of orange-brown	4.2	<2 <0.01%	28 0.04%	<0.02%	- -	28	2.2

Checked By:

Date:

Laboratory Test Methods follow procedures described in : QASSIT – Acid Sulphate Soils Laboratory Methods Guidelines – Version 2.1 June 2004

Form Number MAZREP08

Appendix E: Acid Sulfate Soil Management Plan

Acid Sulfate Soil Management Plan

Proposed Industrial Development:

Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road and Christensen Road, Stapylton, Queensland.

August 2011

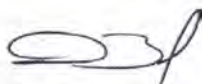
Prepared for:

William & Patricia Hester

c/- Gassman Development Perspectives

Report details

Project ref: ADG217.10
Project Manager: David Bayel
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Proposed Industrial Development:
Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well
Road and Christensen Road, Stapylton, Queensland.
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1 Introduction

ADG Consulting (ADG) was engaged by William and Patricia Hester to prepare an Acid Sulfate Soil Management Plan (ASSMP) for the proposed development within property described as Lot 1 on RP6882 and Lot 240 on W31320, situated at 60 Stapylton Jacobs Well Road and Christensen Road, Stapylton, Queensland.

The ASSMP is based on the conclusions and recommendations provided in the acid sulfate soil investigation report prepared by ADG in August 2011 (refer: *Acid Sulfate Soil Investigation, Proposed Industrial Development: Lot 1 on RP6882 and Lot 240 on W31320, 60 Stapylton Jacobs Well Road and Christensen Road, Stapylton, Queensland*).

1.1 Proposed development

Gassman Development Perspectives (GDP) has been instructed by William and Patricia Hester to prepare and lodge a Development Application to obtain the following:

- Preliminary Approval for a Material Change of Use (MCU) converting the existing land use designation (Future Industry – Precinct 3) to General Business and Industry (Precinct 1);
- Development Permit for a Reconfiguring a Lot (ROL) for a staged industrial subdivision; and
- Development Permit for Operational Works (OPW) for changes to ground levels and construction of retaining walls.

The development requires substantial cut to fill bulk earthworks to create level building pads, retaining walls and roadways throughout the site. The proposal comprises several stages of development and the associated earthworks will be undertaken progressively as required. Existing surface elevations range from 3.89m to 29.23m Australian Height Datum (AHD). Finished surface levels across the site will range from approximately 8.5m to 25.5m AHD following completion of the cut to fill earthworks.

1.2 Site assessment findings

The results of the investigation indicated that soils within an area of approximately 6,000m² situated on the northern part of the site, and below 5m AHD, contain existing acidity. A maximum net acid generating capacity of 71 moles H⁺/tonne was reported in samples recovered from the investigation area.

Based on the reported levels of net acidity in the alluvial soils, all disturbances below 5m AHD require management for ASS.

1.3 ASSMP objectives

The objectives of the ASSMP are to:

1. Assess the risk associated with the disturbance of ASS during the construction phase of the development.
2. Provide effective management procedures to prevent environmental harm occurring as a result of the ASS disturbance.

1.4 General environmental duty

The *Environmental Protection Act 1994* describes that all persons in Queensland have a "General Environmental Duty" and that "a person must not carry out an activity that

causes, or is likely to cause environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm".

The Act requires that appropriate action be taken to report that environmental harm is occurring or has the potential to occur, unless the harm is authorised under an environmental protection policy, an environmental management program, or an environmental protection order. This is known as the "Duty to Notify". Failure to fulfil this duty is an offence and may result in prosecution.

1.5 Relevant guidelines

The following documents are relevant to the management of acid sulfate soils in Queensland:

- *Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1, June 2004.* Ahern et al. 2004. Department of Natural Resources, Mines and Energy.
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* ANZECC/ARMCANZ. 2000.
- *Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines Version 3.8.* Dear et al. 2002. Department of Natural Resources and Mines.
- *Queensland Water Quality Guidelines, Version 2, March 2006.* Environmental Protection Agency (EPA). 2006.
- *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils.*
- *State Planning Policy 2/02 Guideline: Acid Sulfate Soils, Version 2.*

2 ASS Risk assessment

2.1 Disturbance of ASS

The investigation findings indicate that all excavation works below 5m AHD will disturb AASS. Based on an area of 6,000m² below this level, it is estimated that between 1,000 to 2,000m³ of ASS may be disturbed when stripping topsoils prior to filling. All of this soil will require treatment to neutralise the existing acidity.

2.2 Management strategies

The preferred strategy to manage ASS is avoidance. Dear *et al.* (2002) describes that avoiding the disturbance of ASS should be considered at all sites, however there will be situations where disturbance is unavoidable. In these situations, the following risk-based management strategies are preferred:

- Minimisation of disturbance;
- Neutralisation of ASS;
- Hydraulic separation (either on its own or in conjunction with dredging); and
- Strategic reburial of PASS below the permanent groundwater table.

It should be noted that the preferred strategies may not be suited to all sites, and each strategy presents its own environmental risks.

2.3 Management strategy selection rationale

The management strategy selected for the development is on-site neutralisation of ASS. ADG considers this strategy to be acceptable for the following reasons:

1. The acid generating capacity of the soil is generally low;
2. A relatively small volume of material requires treatment;
3. No PASS will be disturbed; and
4. Treatment can be conducted on-site within a dedicated treatment zone during the bulk earthworks program.

2.4 Neutralising agent and treatment rate

Neutralising agents should be slightly alkaline with a low solubility and a pH ranging from 7.0 to 9.0. These characteristics minimise the potential for the neutralising agent to leach from the soil during rainfall events, thereby preventing the contamination of surface waters and groundwater. The preferred neutralising agent is fine agricultural lime (CaCO₃) which has an acid neutralising value of approximately 97% CaCO₃.

The liming rate has been calculated in accordance with Ahern *et al.* (2004) and is based on the maximum net acidity concentration of 71 moles H⁺/tonne. A safety factor of 1.5 has been included in the liming rate calculation to allow for non-homogeneous mixing and poor reactivity of the lime, both of which reduce the theoretical neutralising efficiency.

The liming rate calculation is as follows:

$$((71 \text{ mol/H}^+/\text{tonne})/623.7) \times 46.0827 = 5.2\text{kg/dry tonne or } 8.4\text{kg/m}^3$$

2.5 Treatment category

The acid sulfate soil treatment categories provided in Dear *et al.* (2002) are based on the total weight of ASS to be disturbed and the existing plus potential acidity in the soil. Given the expected maximum disturbance of approximately 2,000m³ of AASS and the

highest net acidity concentration, the project is within the Very High treatment category (category VH) and will require up to approximately 17 tonnes of fine agricultural lime to effectively neutralise the net acidity identified in the soil.

Dear *et al.* (2002) describes that there is a general correlation between the level of treatment required and the environmental risk associated with a disturbance. However, several additional factors may also influence the environmental risk such as the type of disturbance, the duration of construction, soil characteristics, hydrology and hydrogeology, and the sensitivity of the surrounding environment.

Based on the site and soil characteristics and the above treatment category, the project is considered to present a low environmental risk that can be minimised by effective management.

3 Management of ASS

3.1 Responsibility

The Site Manager is responsible for implementing the management procedures described in this ASSMP.

3.2 Operational policy

To prevent impacts on the receiving waters (surface and groundwater) and built structures by effectively containing and neutralising all excavated acid sulfate soil and associated leachate during the earthworks and construction phase of the development.

3.3 Performance criteria

The appropriate criteria to measure the performance of acid sulfate soil management at the site are provided below.

3.3.1 Soil criteria

The following criteria must be achieved for all neutralised soil:

1. Validation sampling must demonstrate that excess acid neutralising capacity (ANC) is present in the soil.
2. The soil pH must be greater than 5.5.
3. The ANC must be 0.5 times the potential acidity of the soil.
4. If the ANC is less than 0.2 times the existing plus potential acidity, the soil must be re-treated and additional validation sampling conducted.

Validation of treated soil will be undertaken using the Chromium Reducible Sulfur suite. Chromium suite acid base accounting (ABA) will be used to validate the treated soil in accordance with Table A3.6 (Ahern *et al.* 2004).

3.3.2 Water criteria

All collected surface water and leachate must comply with the criteria provided in the *Queensland Water Quality Guidelines* (DERM 2009) and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ 2000) prior to discharge from the site.

3.4 Implementation strategy

All excavated soil will be treated on-site. A treatment pad will be established prior to the commencement of earthworks activities. ASS will be managed as described in the following sections.

3.4.1 Treatment pad design

The treatment pad will be constructed as follows:

1. A compacted clay pad will be constructed using non-ASS material. The clay must be compacted to 0.3m thick and be large enough to provide effective drying and treatment of the expected volume of ASS.
2. Earthen bunds will be constructed around the treatment pad to prevent surface water entering or leaving the treatment zone. The bunds must be constructed using non-ASS material.
3. Leachate collection drains and a leachate holding pond must be constructed within the bunded treatment zone. All collected leachate will be analysed prior to release from the holding pond.

4. A guard layer of neutralising agent will be spread across the treatment pad prior to the placement of soil. The guard layer, in conjunction with the compacted clay pad will minimise the risk of acidic leachate migrating to groundwater. The guard layer should be applied at a minimum rate of 5kg lime/m² across the treatment zone.
5. A guard layer will also be placed over all earthen bunds and leachate collection drains. The guard layer must be regularly re-applied following strong winds and/or rainfall events.

3.4.2 Earthworks strategy

The Site Manager and Earthworks Manager must formulate an earthworks strategy to ensure that the treatment pad can be accommodated on the site to allow adequate drying and treatment of the excavated soil. The treatment pad must be of sufficient size to allow for approximately five days laboratory turnaround time for validation test results, prior to the treatment of the next layer of soil.

3.4.3 Neutralising treatment

All excavated soil will be treated as follows:

1. Excavated soil will be placed on a guard layer within the treatment zone. The soil will be spread on the treatment pad in 0.15m to 0.3m layers to allow drying. Once dry, fine agricultural lime will be applied at a rate of **8.4kg/m³**.
2. The treated soil will be thoroughly mixed. Note: it may be necessary to rework the material several times to achieve effective mixing and drying of the soil.
3. Validation results must confirm successful neutralising treatment prior to removal of the soil from the site.

3.4.4 Backfill treatment

A guard layer will be placed across all disturbed soil surfaces during earthworks and construction activities. Backfill material placed in direct contact with underground infrastructure will be treated at a rate of 1.5 times the above liming rate to prevent the corrosive effects of ASS.

3.4.5 Stockpiling

Stockpiling of untreated soil outside of the treatment zone is not permitted for periods of greater than 12 hours. All excavated soil must be placed within the treatment zone with a guard layer of lime prior to the completion of works each day.

A minimum of 2,000kg of fine agricultural lime must be kept on-site at all times to control any potentially hazardous events. Lime stockpiles must be contained within bunded areas and covered during periods of strong wind and/or rainfall events.

3.5 Monitoring

3.5.1 Visual monitoring

Visual inspections of the site and treatment zone shall be undertaken daily by the Site Manager to identify the following:

- Corroded or stained concrete infrastructure;
- Loss of guard layer from the treatment zone, including bunds, leachate collection drains, leachate holding pond and soil stockpiles;
- Quantity of available neutralising agent kept on-site;
- Scalded or degraded vegetation; and
- Green blue or extremely clear water indicating high levels of dissolved aluminium.

3.5.2 Validation

Validation sampling will be undertaken at a minimum rate of one sample per 500m³ of neutralised material. All samples will be recovered by ADG Consulting in accordance with Ahern *et al.* (1988) and submitted to an approved acid sulfate soil laboratory for analysis. Validation samples will be analysed using the Chromium Reducible Sulfur Verification Suite described in Ahern *et al.* (2004).

3.6 Audits and reporting

Weekly audits of the acid sulfate soil management procedures, monitoring and validations test results will be conducted by ADG Consulting to ensure that all excavated ASS is sufficiently neutralised, and that no impacts are occurring either on, or off-site as a result of the ASS disturbance.

A validation report will be prepared by ADG Consulting and provided to Council following the completion of excavation works at the site. The report will include the validation test results, audit notes and recommendations made to the Site Manager during the earthworks phase of the development.

The Site Manager must keep records of volumes of neutralising agents used, treatment methods employed, and daily volumes of soil treated. These records must be available on-site at all times.

3.7 Contingencies

If validation results indicate that neutralising treatment was insufficient to comply with the performance criteria provided in Section 3.3, then additional treatment will be undertaken on the subject material. The additional treatment rate will be based on the results of the first round of validation testing. The material will be deemed to be sufficiently neutralised when the validation test results report an ANC of 0.2 times greater than the existing plus potential acidity.

4 References

Ahern, C.R., McElnea, A.E. and Sullivan, L.A. 2004. *Acid Sulfate Soils Laboratory Methods Guidelines*. Queensland Department of Natural Resources, Mines and Energy, Indooroopilly, Queensland, Australia. ISBN 1 920920 66 8

ANZECC/ARMCANZ. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

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DERM. 2009. *Queensland Water Quality Guidelines, Version 3, September 2009*. Department of Environment and Resource Management, Brisbane, Queensland, Australia.

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State Planning Policy 2/02 Guideline: *Acid Sulfate Soils, Version 2*. Department of Local Government and Planning, and Department of Natural Resources and Mines.

15 – PRELIMINARY SITE INVESTIGATION (CONTAMINATION) (ADG CONSULTING)

Stage 1 Preliminary Site Investigation

Proposed Industrial Development:

Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well
Road and Christensen Road, Stapylton, Queensland.

November 2011

Prepared for:

William & Patricia Hester

c/- Gassman Development Perspectives

Report details

Project ref: ADG217.10

Project Managers: David Bayel & Bill Gardyne

Report title: Stage 1 Preliminary Site Investigation
Proposed Industrial Development:
Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well
Road and Christensen Road, Stapylton, Queensland.

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APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: SITE SURVEY PLAN

APPENDIX D: BORE SEARCH RESULTS

APPENDIX E: LAND TITLES

APPENDIX F: GOVERNMENT SEARCHES

1 Introduction

ADG Consulting (ADG) and Oxbow Consulting (Oxbow) were engaged by William & Patricia Hester to undertake a Preliminary Site Investigation (PSI) within property described as Lot 1 on RP6882 & Lot 240 on W31320, situated at 60 Stapylton Jacobs Well Road and 82 Christensen Road, Stapylton, Queensland.

Bill Gardyne of Oxbow Consulting is the nominated Suitably Qualified Person (SQP) for the project.

1.1 Background

Gassman Development Perspectives (GDP) has been instructed by William and Patricia Hester to prepare and lodge a Development Application for the above described property. The proposed development includes:

- Preliminary Approval for a Material Change of Use (MCU) converting the existing land use designation (Future Business and Industry) to various preferred industrial uses; and
- Preliminary Approval for Operational Works (OPW) for changes to ground levels and construction of retaining walls.

The site is currently used for rural residential, agricultural and industrial purposes. Lot 1 is listed on the Environmental Management Register (EMR) for the Notifiable Activity *Livestock Dip or Spray Race Operations*. Part of Lot 240, herein referred to as 'Lease A' is subject to Environmentally Relevant Activities (ERAs) ERA 53 – *Composting and soil conditioner manufacturing* and ERA 8 – *Chemical storage (3a)*. Lease A is occupied by Amgrow Pty Limited (previously Envirogreen P/L), a manufacturer and distributor of soil conditioners, potting mixes, fertilisers, insecticides and fungicides.

This Stage 1 Preliminary Site Investigation is therefore required to develop a site history, establish the chemicals used, and identify any other potentially contaminating activities conducted on the site.

It is understood that in addition to providing a suitability statement for the intended use, the clients would like to take any necessary and reasonable actions to have Lot 1 removed from the EMR.

1.2 Relevant guidelines

The investigation was conducted with reference to the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*. Department of Environment (DoE) (1998).
- *National Environment Protection (Assessment of Site Contamination) Measure*, 1999. National Environment Protection Council (NEPC) (1999).

1.3 Investigation objectives

The investigation objectives were to:

- Describe the site and surrounding environment.
- Develop a site history to determine if the site has been subject to additional potentially contaminating activities.
- Identify potential sources of contamination and associated contaminants.
- Provide recommendations for additional investigations and associated costs.

- Identify potential sources of contamination and associated contaminants.
- Provide recommendations for additional investigations and associated costs.

1.4 Scope of work

To achieve the investigation objectives, the following scope of work was undertaken:

- A desktop study and preliminaries, including:
 1. Search of current and historic land titles held by the Department of Environment and Resource Management (DERM).
 2. Search of the Queensland Government's Environmental Management Register (EMR) and Contaminated Land Register (CLR).
 3. Review of published geology and soil maps for the area.
 4. Search of groundwater bores licensed by DERM within a 1 km radius of the site.
 5. Search of the Department of Defence website for unexploded ordnance.
 6. Review of current and historic aerial photographs held by DERM.
 7. Review of development information provided by GCCC's PD online.
 8. Conduct a *Dial Before You Dig* search of the site and surrounding area.
 9. Interview the site owners and senior employees.
 10. Search of Dip Wash Analysis Reports held by the Department of Primary Industries Chemical Residue Laboratory.
 11. Review of Dangerous Goods Licensing information and relevant Environmental Management Plans (EMPs) and Licensing Approvals associated with Lease Area A.
- Several inspections of the site and surrounding environment.
- The preparation of this Preliminary Site Investigation Report.

2 Site characteristics

2.1 Property description

The site has a total combined area of 73.114 hectares and comprises the two allotments described in Table 2.1. The site location is displayed in Figure 1 Appendix A, and features referred to throughout this report are shown in Figure 2.

Table 2.1. Property details

Real property description	Land area (Ha)	Current land use
Lot 1 on RP6882	20.505	Low intensity cattle grazing & residential
Lot 240 on W31320	52.609	Low intensity cattle grazing and industrial

The site is roughly triangular in shape and partially adjoins Stapylton Jacobs Well road to the north-west and Christensen Road to the west. The southern corner of the site is intersected by Christensen Road South. The site is within the Yatala Enterprise Area and is currently zoned as 'Industry 2' under the Gold Coast City Council's Planning Scheme. The site is shown in images 1 to 4 below and specific features are displayed in images 5 to 26, Appendix B.



Image 1. Lot 1 'Hester's Farm'.



Image 2. Lot 240, grazing area.



Image 3. Lease A, soil conditioning area.



Image 4. Lease A, bulk warehouse.

2.2 Surrounding environment

The surrounding environment and land use observed during the site inspections is described in Table 2.2.

Table 2.2. Surrounding land use and environment

Direction	Environment
North	Industrial development and Stapylton Jacobs Well Road, then agricultural land used predominantly for cattle grazing, then the Albert River.
East	Stapylton Landfill Facility, then extractive industry, then agricultural land used for sugar cane production.
South	Industrial development and Christensen Road, then the Pacific Motorway.
West	Industrial development, then the Pacific Motorway.

2.3 Topography

The site is characterised by rolling hills with gentle to moderate slopes, typically less than 10%. Surface elevations range from 3.89m to 29.23m Australian Height Datum (AHD). A contour and detailed survey plan of the site (excluding Lease A) is attached in Appendix C.

2.4 Geology & soils

The geology at the site is mapped as Devonian/Carboniferous aged Neranleigh-Fernvale Beds, consisting of mudstone, shale, greywacke, chert, jasper, conglomerate, basic metavolcanics and pillow lava (Geological Survey of Queensland 1980).

The site is within the Land Resource Area (LRA) described as Metamorphic Hills, which is characterised by rolling hills to steep mountains on phyllite, schist, slate, chert, greywacke and metasediments, supporting eucalypt open forest with some mixed rainforest. The dominant soil types are lithosols, soloths, shallow prairie soils, red podzolics, yellow podzolics, non-calcic brown soils and red earths (Nobel 1996).

2.5 Hydrology

The majority of stormwater runoff from Lot 1 flows to the northern part of the site, where a culvert passes beneath Stapylton Jacobs Well Road to the Albert River floodplain. The remainder of the site drains via two catchments to the east. Stormwater runoff from Lease A is contained and reused within that part of the site. The southern portion of Lot 240 is bound by Sandy Creek, an upper tributary of the Logan River.

2.6 Hydrogeology

A search of the Department of Environment and Resource Management (DERM) Groundwater Database was conducted on 2 February 2011. The search did not identify any licensed groundwater bores within a one kilometre radius of the site, however four monitoring bores were identified by ADG within Lease A. It is expected that additional monitoring bores are also located within the Stapylton Landfill Facility situated directly to the east of the site. The licensed bore locations and bore card reports are provided in Appendix D.

Groundwater monitoring conducted within Lease A by Amgrow Pty Limited indicates that standing water levels across that part of the site range from approximately 2 to 7m below the ground surface.

Based on the sites location and localised topography, the inferred groundwater gradients are to the north-west (most of Lot 1) and the east (Lot 240), however

localised groundwater volume and movement is likely to be influenced by the surrounding development, in particular the landfill facility to the east of the site.

2.7 Vegetation

Vegetation is typified by dense kikuyu grass throughout cleared areas, and open eucalypt forest throughout the remaining undeveloped parts of the site.

3 Site history

3.1 Historic land titles

At the request of ADG, an historic land title search was conducted by DERM on 9 December 2010. A summary of the title information is shown in Table 3.1, and the complete title documents are provided in Appendix E.

Table 3.1. Summary of historic title search results

Lot on Plan	Volume/folio	Created	Previous volume/folio	Registered owners	Date of ownership
Lot 1 on RP6882	11060216	07.06.1906	173726	Patricia Ann Hester & William Arthur Hester	07.09.2006 to present
Lot 1 on RP6882	11060216	07.06.1906	173726	Patricia Ann Hester Permanent Trustee Company	14.11.2003 to 07.09.2006
Lot 1 on RP6882	173726	07.06.1906	147207 147208	Henry Arthur Hester	20.06.1967 to 14.11.2003
Lot 1 on RP6882	173726	07.06.1906	147207	Johannes Carl Hester	26.05.1906 to 20.06.1967
Subdivision A Portion 128	147207	06.03.1888	107764	Christian Henry Hester	04.09.1896 to 26.05.1906
Subdivision A Portion 128	147208	06.03.1888	107764	John Charles Hester	04.09.1896 to 26.05.1906
Deed of Grant	69804	13.05.1979	n/a	Heinrich Hester	1887 to 04.09.1896
Lot 240 on W31320	10526129	08.12.1884	107764	Patricia Ann Hester & William Arthur Hester	07.09.2006 to present
Lot 240 on W31320	10526129	08.12.1884	107764	Patricia Ann Hester Permanent Trustee Company	14.11.2003 to 07.09.2006
Portion 240	57619	08.12.1884	n/a	Peter Driscoll	03.12.1875 to 04.09.1896

The historic title documents indicate that the land was granted between 1875 and 1887, with Portion 240 initially owned by Peter Driscoll. Both properties have been owned in their entirety by the Hester family since 1887 (Lot 1) and 1896 (Lot 240).

The documents indicate that part of Lot 240 on W31320 has been leased since 1995 by Envirogreen Pty Limited. A survey plan (No. 705630821) was produced in 2002 to define the boundaries of Lease A on SP125788. Lease A is currently occupied by Amgrow Pty Limited (previously Envirogreen P/L), a manufacturer and distributor of soil conditioners, potting mixes, fertilisers, insecticides and fungicides.

3.2 Aerial photograph review

A total of seven aerial photographs of the site were acquired from DERM to ascertain the historic site use. The photographs are provided in Figures 3 to 9, Appendix A, and discussed below.

1944: The site and most surrounding areas have been selectively cleared of native vegetation. It appears that dense remnant vegetation remains within the central

portion of the site, possibly due to the presence of a swampy area. Several tracks and sheds are established within the bounds of Lot 1, including the original farm house, old dairy, garage and barn. Additional sheds are visible in the location of the current dairy and the cattle tick dip. Several farm tracks are also visible within and adjacent to Lot 240.

- 1955:** Further tree clearing has been undertaken within the southern portion of Lot 1. The blacksmiths shed is visible to the east of the farm house and a well defined driveway has been established between the farm house and the western corner of the site. No additional changes on the site are visible in the photograph.
- 1965:** It appears that several additional small sheds have been constructed in the area to the south of the farm house. The cattle tick dip is clearly visible on the western part of Lot 1. No additional changes on the site are visible in the photograph.
- 1978:** The central part of the site has been cleared of the dense remnant vegetation, and with the exception of this area and the north-west part of the site, it appears that vegetation across most of the site is regenerating. An agricultural dam is visible within the recently cleared central portion of the site. A new residence has been constructed within the bounds of Lot 1 and the driveway now extends directly from the new residence to Stapylton Jacobs Well Road. An area of bare soil is visible to the north of the dairy shed. A drive-in cinema has been established to the north of the site. No additional changes on the site are visible in the photograph.
- 1987:** As previously identified, vegetation across most of the site has regenerated further and appears to be moderately dense throughout these areas. The central dam appears to have been enlarged and the hay shed has been constructed on Lot 1. The dairy shed has been extended to its current size. A residential development of relocatable homes has been established adjacent the western boundary of Lot 1. No additional changes on the site are visible in the photograph.
- 1997:** Lease A has been established within the bounds of Lot 240. The lease area appears to comprise two materials storage and composting areas and two effluent/stormwater retention ponds. What appears to be a small site office is located near Christensen Road. Vegetation has been cleared to the east of the central site dam and along the eastern and northern site boundaries. Commercial/industrial development has been established to the west of the site, adjacent the boundary of Lot 1. No additional changes on the site are visible in the photograph.
- 2009:** Two large industrial warehouses have been established adjacent to Christensen Road within Lease A. These are surrounded by what appears to be hardstand areas and site offices. The eastern effluent/stormwater retention pond has been expanded. Further industrial/commercial development has been constructed beyond the northern site boundary, and to the south-west of Christensen Road.

3.3 Site records

3.3.1 EMR/CLR search

A search undertaken on 22 November 2010 indicates that Lot 1 on RP6882 is listed on the Queensland Government's Environmental Management Register (EMR) for the Notifiable Activity *Livestock Dip or Spray Race*. Lot 240 on W31320 is not listed on the EMR, and neither site is included on the Contaminated Land Register (CLR). The search documents are provided in Appendix F.

3.3.2 Environmentally Relevant Activities

Amgrow Pty Ltd is currently registered in accordance with Section 73F of the *Environmental Protection Act 1994* to undertake the following Environmentally Relevant Activities (ERAs) within Lease A in Lot 240 on W31320:

ERA 53 – Composting and soil conditioner manufacturing: manufacturing, from organic material or organic waste, 200t or more of compost or soil conditioners in a year; and

ERA 8 – Chemical storage (3a): storing 10m³ to 500m³ of chemicals of class C1 or C2 combustible liquids under AS1940 or dangerous goods class 3.

A copy of the Certificate of Registration (No. ENRE01236410) is provided in Appendix F.

3.3.3 GCCC PD Online search

A search of GCCC's Planning & Development (PD) Online service was undertaken by ADG on 1 March 2011. The search provided a summary of recent development information for the subject site, the results of which are provided in Table 3.3.3.

Table 3.3.3. Summary of GCCC document search

Lot	Date	Applicant	Relevant information
1 RP6882	-	-	No development records provided
240 W31320	30.04.2007	Envirogreen Pty Ltd	Development Approval for an Industrial Building
240 W31320	13.03.2007	Kempe Management Services Pty Ltd	Development Approval for Operational Works – Change to Ground Level
240 W31320	16.10.2001	Envirogreen Pty Ltd	Development Approval for Operational Works – Landscaping Works
240 W31320	13.09.2001	n/a	Development Approval for a Material Change of Use for Light Industry – Modification to Approval
240 W31320	25.10.2001	DKM Constructions	Development Approval for a Warehouse Extension
240 W31320	14.05.2001	Envirogreen Pty Ltd	Development Approval for a Material Change of Use for Light Industry – Modification to Approval
240 W31320	27.10.1999	Henry Hester	Development Approval for a Warehouse Building

The above records are consistent with the aerial photograph findings, indicating that the development of warehouse buildings on Lot 240 commenced after October 1999.

3.3.4 DPI records

The Department of Primary Industries (DPI) Chemical Residue Laboratory was contacted by ADG to confirm recent chemical use within the cattle tick dip bath. A summary of the search results is provided in Table 3.3.4 and the complete Dip Wash Analysis Reports are provided in Appendix F.

Table 3.3.4. Summary of Dip Wash Analysis Reports

Date	Chemical components	Concentration (%)	Product used
07.06.2001	Amitraz	0.026	Taktic WP
30.01.2002	Amitraz	0.023	Taktic WP
16.01.2003	Amitraz	0.035	Taktic WP
21.11.2003	Amitraz	0.018	Amitik

The reports indicate that Amitraz concentrations approximated the recommended level of 0.025% and that the dip has a maximum working level capacity of 9,000 litres. Amitraz is a formamidine acaricide which is stabilised using hydrated lime.

3.3.5 Amgrow Pty Ltd records

The following documents were provided to ADG by Amgrow Pty Ltd to assist with the investigation of Lease A:

1. Form 12: Further notification of Large Dangerous Goods Location; and
2. Stormwater Management Plan prepared by Max Winders & Associates Pty Ltd (April 2001);

Dangerous Goods

A summary of the stated dangerous goods and combustible liquids kept within Lease A is provided in Table 3.3.5. Descriptions of the types of hazardous materials were also provided by Amgrow staff.

Table 3.3.5. Stated dangerous goods and combustible liquids within Lease A

Class	Type of hazardous material	Quantity at premises (L)	Prescribed quantity (kg or L)
2.1, Flammable gas	LPG (forklift use)	600	5,000
Aerosols	"Dy Mark" yellow paint	6,750	10,000
6.1, Toxic substances	Fenamiphos (400g/L); Bifenthrin (250g/L); Methidathion (400g/L)	660	2,500
	Clorpiriphos (500g/L); Diazinon (800g/L); Dimethoate (400g/L); Metalaxil (250g/L)	1,692	10,000
8, Corrosive substances	Ethephon (480g/L); "Relieph"	200	2,500
	Paraquat (250g/L); Diquat (200g/L); benzalkoniumchloride (500g/L)	4,920	10,000
9, Miscellaneous dangerous substances & articles	"Headway Maxx"=Azoxystrobin (62g/L)+ Propiconazole (104g/L); "Heritage Maxx"=	1,200	10,000

Class	Type of hazardous material	Quantity at premises (L)	Prescribed quantity (kg or L)
	Azoxystrobin (95g/L), Fluazifop-P-Butyl (128g/L)		
C1, Combustible liquids	Diesel fuel	10,000	100,000

Stormwater Management Plan

The Stormwater Management Plan provides the following relevant information:

- The site has been compacted to provide an impervious surface to prevent groundwater contamination from leachate.
- All runoff from the site is directed to two stormwater catch ponds, where it is recycled on-site for irrigation of compost stockpiles and dust suppression.
- Regular monitoring of water quality within holding ponds and on-site groundwater monitoring wells is conducted.
- Waters may be released to an unnamed gully from Release Point W2 if discharge criteria are met.

3.3.6 Interviews

The Hester's

The current site owners, William Hester and Patricia Hester (The Hester's) were contacted to provide historic site information. Patricia has resided on the site since 1978, and prior to this was located on a nearby farm to the north of Satpylton Jacobs Well Road. The Hester Family has resided on the site since 1887. The Hester's indicated that the site was cleared for cattle grazing and the original dairy was constructed in the late 1800's.

Patricia indicated that the cattle tick dip was constructed around 1940 and that to her knowledge Arsenic Trioxide, Bayticol (active constituent: flumethrin) and Taktic (active constituent: Amitraz) had been used in the dip. Patricia described that the Arsenic and Bayticol solutions were pumped out and the sludge removed and disposed of off-site following the cessation of use of these chemicals. William indicated that at one time the dip was pumped to a pit excavated immediately to the north of the bath (commonly referred to as an 'arsenic pit'). The last product to be used in the dip was Taktic/Amitraz in 2003, and this product remains in-situ in the dip bath.

The Hester's stated that chemicals are currently stored and mixed in the barn, and that this likely to have been undertaken historically in the barn or the old dairy shed. Chemicals recently used on the site include Roundup and other glyphosate products, Amicide 625 (phenoxy herbicide) and Cydectin (pour on tickicide, active constituent is Moxidectin 5g/L). Household waste was historically placed into a small rubbish dump situated to the south of the farm house. Small volumes of petrol and diesel have been stored on the farm in above ground fuel storage tanks (AGSTs) and the diesel AGST is still in use.

William explained that several areas of fill identified throughout the site were imported during the construction of the Pacific Motorway and neighbouring commercial developments.

Amgrow Pty Ltd

Mr Daryle McCallum (Bagging & Bulk Production Manager) and Ramiro Martinez (Technical Agronomist) were contacted to provide information relating to operations within Lease A. Mr McCallum stated that bio-solids have not been used at the site for

approximately 12 years, and provided a description of site processes that are detailed in Section 3.4.3 of this report.

Both indicated that all operations at the site are conducted in compliance with their conditions of development approval.

3.4 Site activities

3.4.1 Cattle tick dip

A cattle tick dip has been established on the site since circa 1940 and was in use until 2004. Cattle tick dips were first introduced in the 1890's to control ticks by dipping cattle into a bath containing tickicides. Since the introduction of cattle dips, tickicides have principally included arsenic (trioxide), organochlorine pesticides (OCPs) including DDTs (DDT and its derivatives DDE and DDD) and organophosphorus pesticides (OPPs). Arsenic, Bayticol, Dipathene and Amitraz/Tactic have been identified as chemicals used in the dip bath, however additional chemicals are also likely to have been used. With the exception of chlorinated pesticides, organic compounds are likely to have degraded in the soil within a year of application and are not considered major contaminants as they are typically not persistent in the environment.

NSW Agriculture (1996) *Guidelines for the Assessment and Cleanup of Cattle Tick Dip Sites for Residential Purposes* describes that the highest concentrations of contaminants are typically found adjacent to the bath and crush and in liquid and sludge disposal areas (generally located next to the bath). They also note that most of the contamination is usually confined to around 5m from the edge of the bath and draining yard, however where slopes are greater than five degrees contamination may extend down slope to 30m from the dip bath. NSW Agriculture (1996) describes that "residues generally are contained within the top 500 mm of soil in undisturbed areas and away from splash areas. In splash areas the penetration into the soil could be further and can only be determined by sampling. The same applies to the disposal pit, which runs parallel to the bath and about 600 mm out from the bath".

3.4.2 Earthworks & land filling

Earthworks and bulk filling has been conducted across Lease A to provide stormwater retention ponds, an impermeable base and trafficable conditions throughout the working areas of the site. The source and contamination status of this fill material is unknown.

Several areas of fill have been identified across the remainder of the site. This material was imported during the construction of the Pacific Motorway and neighbouring commercial developments. The contamination status of the fill material is currently unknown.

3.4.3 Industrial/agricultural processes

Agricultural processes include cattle grazing and dairy farming since the site was cleared of native vegetation in the late 1800's. Cattle have been dipped within Lot 1 since circa 1940, a process which is detailed in Section 3.4.1 above.

Industrial processes appear to be limited to the existing industrial use within Lease A, which includes:

- Storage of raw organic materials including sawdust, woodchips, and coconut fibres;
- The manufacture of potting mixes, mulches and soil conditioners using a series of composting windrows;

- Storage and blending of fertilisers. Fertilisers are imported in 1m³ transport bags and stored and blended using indoor automated machinery;
- Mixing, packaging, and storage of final products for distribution; and
- Storage and distribution of pre-packaged garden chemicals including pesticides, herbicides, and fungicides.

3.4.4 Waste disposal

Household waste generated by the farm was historically placed into a small waste disposal area situated to the south of the farm house. The contents of this area are currently unknown.

On at least one known occasion, liquid waste was pumped from the cattle dip to a disposal area (an 'arsenic pit') excavated immediately to the north of the dip. This area currently resembles a small pond with an adjacent mound.

Amgrow staff has indicated that waste disposal practices within Lease A are conducted in accordance with the conditions of development approval for this activity. Several areas of waste materials containing metal scraps and disused equipment were observed within the site.

3.4.5 Chemical storage and transfer areas

The site history information suggests that chemical storage, mixing, and transfer areas within the farm are limited to the barn and old dairy areas. However, chemicals were observed in the new dairy sheds and it is possible that all sheds have been used to store chemicals at some time in the past. Petrol and diesel fuel has also been stored outside of the barn in AGSTs with approximate volumes of 1,000 and 2,000 litres respectively. Furthermore, up to 9,000 litres of tickicide solution, comprising a variety of chemicals has been mixed and stored in the cattle tick dip bath.

Several chemical storage and transfer areas have been established within Lease A. These include designated areas within the warehouse buildings, a fertiliser shed, and an above ground diesel storage tank with 10,000 litres capacity. Concrete bunds surround the warehouse buildings to prevent migration of chemicals if spills occur. Similarly, the diesel tank is contained within a concrete block bund, however some minor hydrocarbon staining is evident on the surrounding concrete and soils. No bunding is established in fertiliser and oil drum storage areas adjacent the fertiliser shed.

3.4.6 Underground infrastructure

Dial Before You Dig searches were conducted for each allotment by ADG on 2 and 22 February 2011 to identify underground services within the site and immediate area. The searches indicate that Telstra Queensland and Energex have assets in the area, with Telstra services extending from Christensen Road into Lot 240 to supply the buildings within Lease A.

No additional underground infrastructure was identified within the bounds of the site.

3.4.7 Unexploded ordinance

A search of the Department of Defence website was conducted by ADG on 1 March 2011 to identify potential unexploded ordinance (UXO) in the area. No UXO are known to exist within 500m of the site.

3.5 Summary of historic land-use

The site history information indicates that the land was granted between 1875 and 1887 and both properties have been owned in their entirety by the Hester family since 1887 (Lot 1) and 1896 (Lot 240).

The majority of the site was cleared for cattle grazing and the original dairy was constructed in the late 1800's. A blacksmiths shed, barn, dwellings, a new dairy and additional storage sheds were progressively constructed within Lot 1, all of which currently remain on the site. A cattle tick dip was operated on the northern part of Lot 1 between circa 1940 and 2004, in which numerous tickicides have been used including arsenic trioxide and likely DDTs. Small volumes of petroleum and diesel have been stored within the farm in above ground storage tanks to supply machinery. Several areas of fill have been placed on the site in recent history, the result of spoil from the Pacific Motorway construction and adjacent industrial subdivisions.

Part of Lot 240 (Lease A) has been leased since 1995 by Amgrow Pty Limited (previously Envirogreen P/L). This part of the site has been progressively developed for industrial use including the manufacture of potting mixes, mulches and soil conditioners, blending of chemical fertilisers, and distribution of these products. A range of pre-packaged pesticides, herbicides and fungicides are also stored and distributed from the site.

The site history review indicates several potentially contaminating activities, each of which are described further in the following sections.

4 Site investigation

4.1 Site inspection

Several comprehensive site inspections were conducted by David Bayel and Bill Gardyne between December 2010 and February 2011. In accordance with NEPC (1999), the features listed in Table 4.1 were noted during the site inspections. Relevant features are shown in Figure 2, Appendix A.

Table 4.1. Site inspection observations

Features	Observations
Current uses of the site.	Most of Lot 1 and part of Lot 240 are used for low-intensity cattle grazing. A residential dwelling is located within the bounds of Lot 1. The area described as Lease A within Lot 240, is used for industrial purposes, including manufacturing of potting mixes, mulches and soil conditioners, blending of chemical fertilisers, and the distribution of these products and garden chemicals.
Disturbed, coloured or stained soil.	Disturbed soil was observed throughout Lease A as a result of the current site use, however this is not considered to be an indicator of contamination. Minor soil staining was noted to the rear of the diesel AGST in Lease A where overtopping of the containment bund has previously occurred. Soil staining was evident in localised areas along the south-west boundary of Lot 1, where industrial development has been constructed up to this boundary. It appears that wash-down and stormwater runoff from several neighbouring businesses has been directed to the site. No recently disturbed, coloured or stained soil was observed throughout the remaining site area.
Bare soil patches.	No bare soil patches which might indicate contamination were observed within the site.
Disturbed or distressed vegetation.	No disturbed or distressed vegetation was identified within the site.
Presence of chemical holding containers, holding tanks etc.	Details of dangerous goods stored within Lease A are provided in Section 3.3.5. Several drums of lubricating oil are stored on a non-bunded concrete slab between the diesel AGST and the fertiliser shed. A disused petroleum AGST of approximately 1,000 L volume was identified behind the new shed on Lot 1. This was previously located behind the garage on a concrete slab when in use. An operational diesel AGST of approximately 2,000 L capacity is located adjacent to the garage. Numerous chemical drums were identified in the farm sheds, in particular in the chemical storage areas within the Barn and the Dairy. These include small volumes of glyphosate products, Farm Mate (sodium hydroxide), Cydectin, Amicide 625, Nu-Tic WP and Taktic WP. The cattle tick dip bath contains approximately 8,000- 9,000 litres of Amitraz solution.

Features	Observations
Unusual odours.	No unusual odours were noted within the site.
Quality of surface water.	Both stormwater retention ponds situated with Lease A appeared to have elevated nutrient levels, however these are managed in accordance with the conditions of development approval for this activity. A small area of surface water was identified where a drain discharges to Lot 1 from the adjacent industrial development. This water also appeared to support high levels of nutrients. Water quality within the on-site agricultural dams appeared to be satisfactory.
Condition of buildings, concrete and bitumen floors and roads etc.	The buildings and all pavement materials within Lease A appeared to be in good condition.
Presence of fill, containment areas, sumps, drains and landfill sites – existing and buried.	Fill materials have been utilised across Lease A to provide a suitable construction base, improve access and provide an impermeable base throughout the site. Six additional areas of fill were identified throughout the remaining site area. One landfill area was identified to the south of the farm house on Lot 1. This area appeared to contain farm waste including corrugated iron and water tanks. It is understood that this area also contains household waste generated by the original farm house. A small stormwater drain enters south-west property boundary of Lot 1. This drain accepts stormwater from the neighbouring industrial development which has the potential for contamination. All stormwater runoff within Lease A is directed and contained within two retention ponds, potentially containing contaminated sediments.
Underground structures that may be associated with sub-surface contamination.	No underground structures were identified within the bounds of the site.
Condition of materials storage and handling facilities, and any solid or liquid waste disposal areas.	Generally, materials storage and handling areas within Lease A were observed to be in good condition, however some outdoor areas are not bunded and/or do not have a concrete base. All identified solid or liquid waste disposal areas appeared to be in good condition.
Evidence of off-site migration, on-site spillage of dangerous goods, abnormal colouration of ground or surface waters or sheens on water surfaces.	No evidence of off-site migration, on-site spillage of dangerous goods, abnormal colouration of ground or surface waters or sheens on water surfaces were observed.

4.2 Contaminants of potential concern

The contaminants potentially of concern provided in Table 4.2 are based on the current and known site uses and observations made during the site inspection conducted by ADG. The potential contaminants are associated with the cattle tick dip, storage of agricultural chemicals, fuel and lubricating oil storage, farm and industrial wastes, and imported fill materials.

Table 4.2. Contaminants of potential concern.

Contaminants	Area	Media
Heavy metals including arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc	- Cattle tick dip surrounds - Farm sheds - Farm waste disposal site - SW boundary adjacent industrial sheds - Imported fill stockpiles - Ponds and drains - Farm petrol tank area (Pb) - Non-bunded storage areas in Lease A	Soils, sediments and groundwater
Organochlorine and organophosphorus pesticides (OCPs & OPPs)	- Cattle tick dip surrounds - Farm sheds - Farm waste disposal site - Imported fill stockpiles - Ponds and drains	Soils, sediments and groundwater
- Total petroleum hydrocarbons (TPHs) - Benzene, toluene, ethylbenzene and xylenes (BTEX) - Polycyclic aromatic hydrocarbons (PAHs) - Phenolics	- Farm waste disposal site - Farm sheds - SW boundary adjacent industrial sheds - Imported fill stockpiles - Ponds and drains - Farm fuel tank areas - Diesel AGST area - Un-bunded storage areas in Lease A	Soils, sediments and groundwater
Polychlorinated biphenyls (PCBs)	Waste materials and imported fill stockpiles	Soils, sediments and groundwater
Asbestos	Waste materials and imported fill stockpiles	Soils

5 Conclusions and recommendations

5.1 Conclusions

The site history information indicates that the land was granted between 1875 and 1887 and the site was cleared for cattle grazing with the original dairy constructed in the late 1800's. A cattle tick dip was operated on the northern part of Lot 1 between circa 1940 and 2004, in which numerous tickicides have been used including arsenic trioxide and likely DDTs. Part of Lot 240 (Lease A) has been leased since 1995 and progressively developed for industrial use including the manufacture of potting mixes, mulches and soil conditioners, blending of chemical fertilisers, and distribution of these products.

Several potentially contaminated areas have been identified by ADG/Oxbow during the preliminary investigation, including:

1. Cattle tick dip comprising the splash areas, draining pen and paths, the liquid and sludge disposal pit and surrounds;
2. All farm sheds and chemical storage areas, including the areas surrounding the above ground fuel tanks;
3. The landfill used to dispose of farm and household waste situated to the south of the farm house;
4. Localised areas adjacent to the south-west boundary of Lot 1 where wash-down and stormwater from neighbouring industrial development may have impacted soils and drain sediments;
5. Imported fill materials/stockpiles placed across the site. Six areas were identified during the preliminary investigation (excluding fill materials with Lease A);
6. Retention pond sediments, fill materials and underlying natural soils within Lease A;
7. Localised areas throughout Lease A where machinery and oil drums etc. are stored on non-bunded areas.
8. Soils adjacent to the above ground diesel tank located on Lease A.

In addition to the above, the volumes of stated dangerous goods stored within Lease A may warrant the site being included on the Environmental Management Register (EMR) for the following Notifiable Activity:

- **Notifiable Activity 7. Chemical storage:** *(other than petroleum products or oil) – storing more than 10 tonnes of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.*

The findings of this preliminary site investigation indicate that a Stage 2 Detailed Site Investigation (DSI) is required to determine the contamination status of the identified areas of concern.

5.2 Recommendations

Based on the findings of the preliminary site investigation, the following recommendations are provided:

- Conduct a DSI to assess the contamination status of soils, sediments and fill materials within the potentially contaminated areas described above. Where relevant, the sampling density would comply with Australian Standard AS 4482.1 –

2005 *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*. The analytical program would target the contaminants of concern outlined in Table 4.2.

- Undertake an assessment of groundwater quality to target impacts associated with the cattle tick dip and the industrial use within Lease A.
- The objective of the DSI would be to provide sufficient information to allow a Remedial Action Plan (RAP) to be developed for the site.

5.3 Limitations of report

ADG Consulting Pty Ltd (ADG) and Oxbow Consulting Pty Ltd (Oxbow) have prepared this report for William and Patricia Hester in accordance with the agreed scope of work and for the purpose outlined in ADG's Fee Proposal dated 22 November 2010. The services performed by ADG & Oxbow have been conducted in a manner consistent with the normal level of care and expertise exercised by members of the environmental consulting profession. No other warranty or guarantee, expressed or implied, is made as to the professional advice included in this report.

This report is solely for the use of William and Patricia Hester and ADG/Oxbow accepts no responsibility for the use of any part of this report for any other purpose or by third parties, as it may not contain sufficient information for the purposes of other parties or users. This report must only be presented in full, and may not be used for any other objective, except where prior written approval is obtained from ADG & Oxbow. This report does not comment on legal obligations, as legal advice can only be given by qualified legal practitioners.

The information contained in this report is considered to be accurate at the date of issue. Subsurface conditions, including contaminant concentrations can change in space and time, either through natural processes or by the accidental or intentional addition of contaminants to a site. Where conditions encountered subsequently at the site are significantly different from those reported herein, ADG & Oxbow must be notified and be provided the opportunity to review the conclusions and recommendations of this report.

6 References

AS 4482.1 – 2005. 2005. *Australian Standard, Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*. Standards Australia. ISBN 0 7337 6974 8.

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Appendix A: Figures



Client: William & Patricia Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 1: Site location



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Client: William & Patricia Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 and Lot 240 on W31320 Stapylton Jacobs Well Road & Christensen Road, Stapylton, Queensland

Project ref: ADG217.10

Drawn by: David Bayel Date: 04.03.11

Figure 2: Site features



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 3: 1944 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 4: 1955 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 5: 1965 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 6: 1978 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 7: 1987 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 8: 1997 Aerial photograph



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Client: Patricia & William Hester c/- Gassman Development Perspectives

Project: Lot 1 on RP6882 & Lot 240 on W31320 Stapylton Jacobs Well Road, Stapylton

Project ref: ADG217.10

Drawn by: David Bayel Date: 02.02.11

Figure 9: 2009 Aerial photograph



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Appendix B: Site photographs



Image 5. Cattle tick dip



Image 6. Dip disposal pit



Image 7. Farm houses & barn



Image 8. The new dairy



Image 9. The barn



Image 10. Barn chemical storage area



Image 11. The blacksmiths shed



Image 12. The old dairy & diesel AGST



Image 13. The new shed



Image 14. Farm waste disposal area



Image 15. The hay shed



Image 16. Neighbouring industry: SW boundary



Image 17. Industry and drain: SW boundary



Image 18. Retention Pond 1



Image 19. Soil conditioning & Pond 2



Image 20. Un-bunded storage area



Image 21. 10,000 L Diesel AGST



Image 22. Un-bunded storage area



Image 23. Processing area



Image 24. Automated blending process

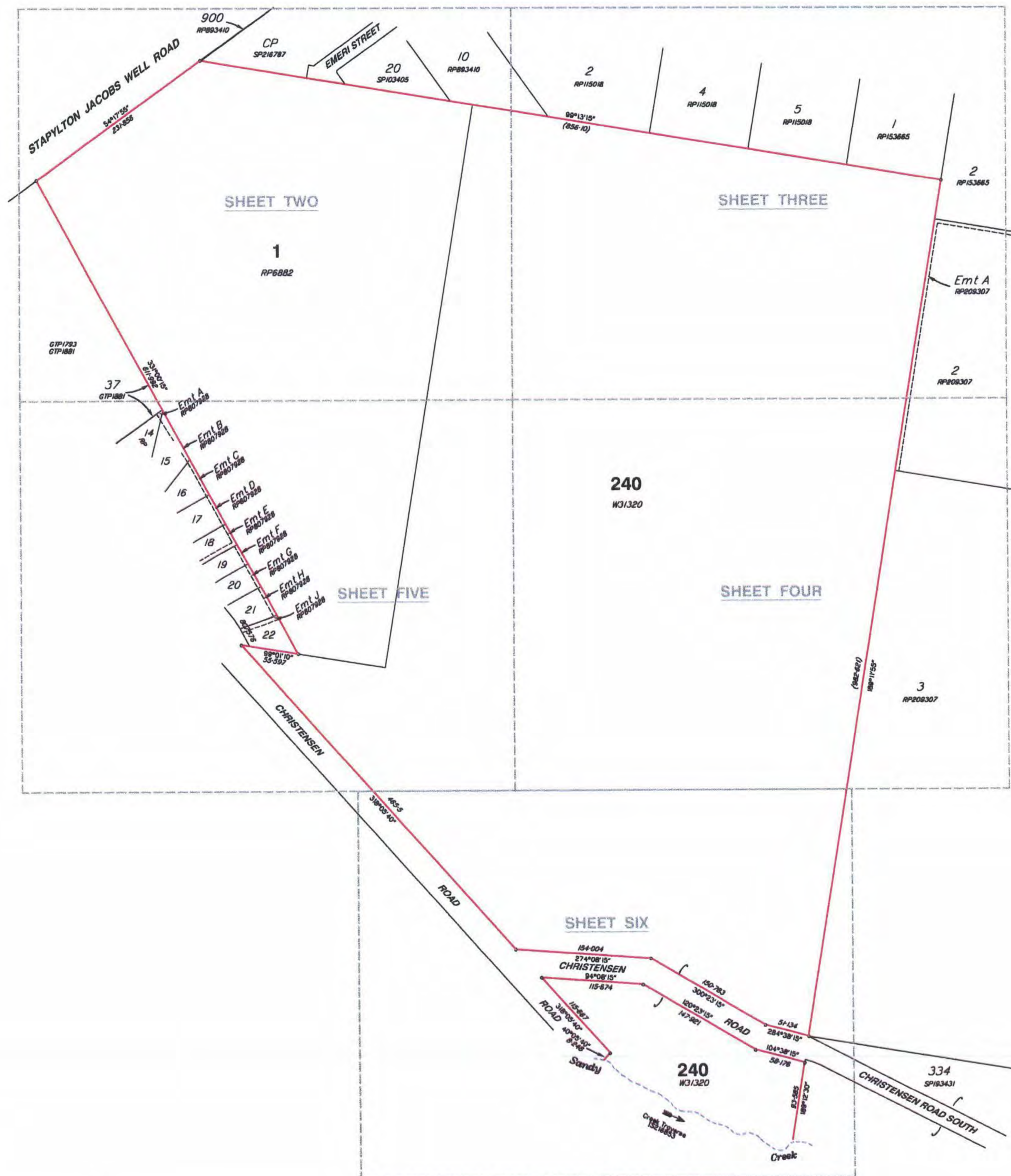


Image 25. Bagged product warehouse



Image 26. Pesticide storage warehouse

Appendix C: Site survey plan



Scale 1:2500 - Lengths are in Metres
0 20 40 60 80 100 120 140 160 180 200

Notes

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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	IS216853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Hall
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.169		
Scale (on A1 original)		Designed	
1:2500		Drawn	
		Date Designed	

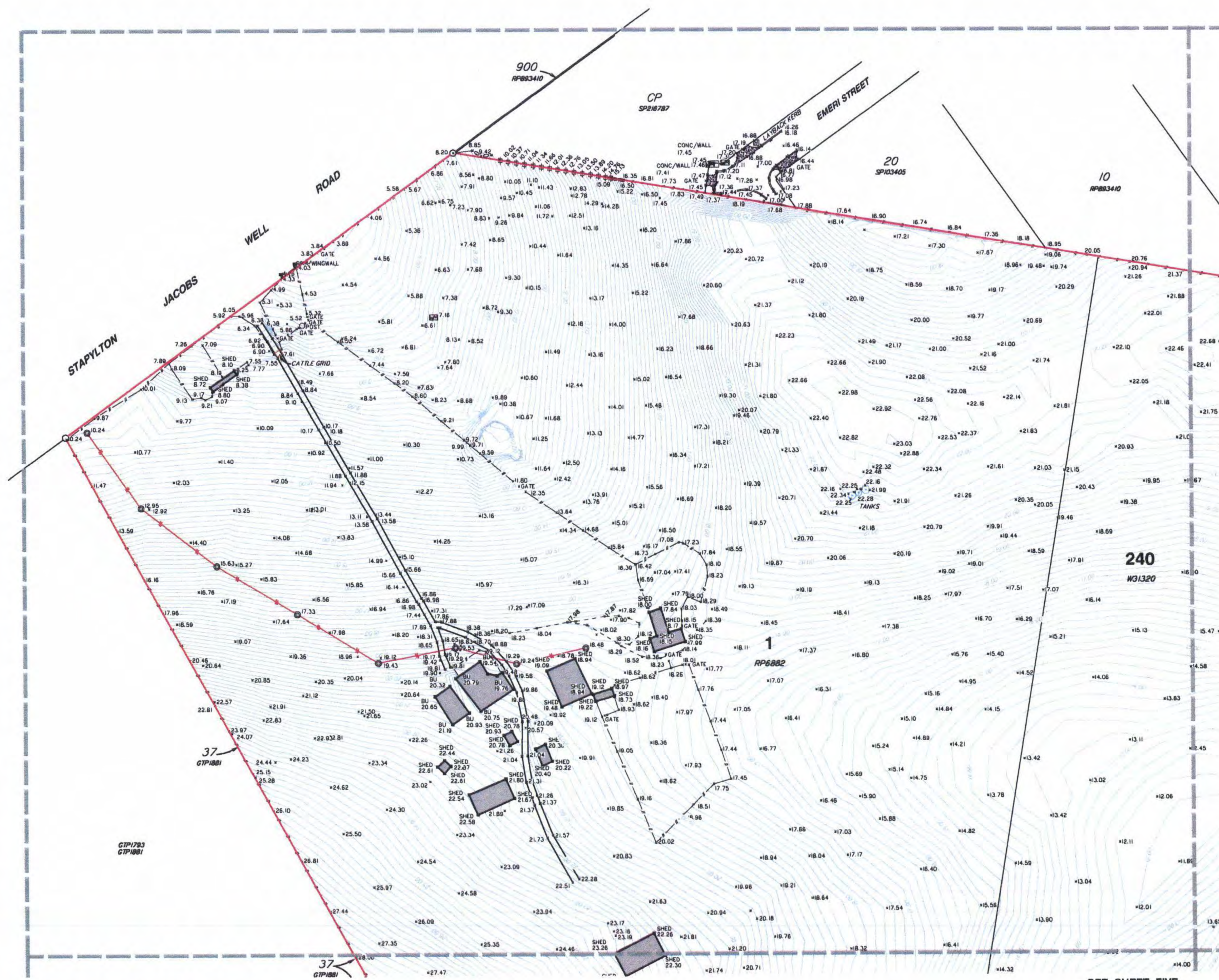


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w: www.gassman.com.au

REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**

SHEET 1 OF 6



LEGEND

- PERMANENT MARK
- SEWER MANHOLE
- SEWER INSPECTION OUTLET
- ELECTRICITY PILLAR
- ELECTRICITY POLE
- ELECTRICITY POLE WITH LIGHT
- TELSTRA PIT
- MANHOLE
- STORMWATER MANHOLE
- GULLY TRAP
- WATER METER
- FIRE HYDRANT
- VALVE
- GATE
- BOLLARD
- CONCRETE
- EDGE OF BITUMEN
- FENCE
- OVERHEAD ELECTRICITY
- OPEN DRAIN
- RETAINING WALL
- EDGE OF GARDEN
- CONTOUR LEVEL

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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

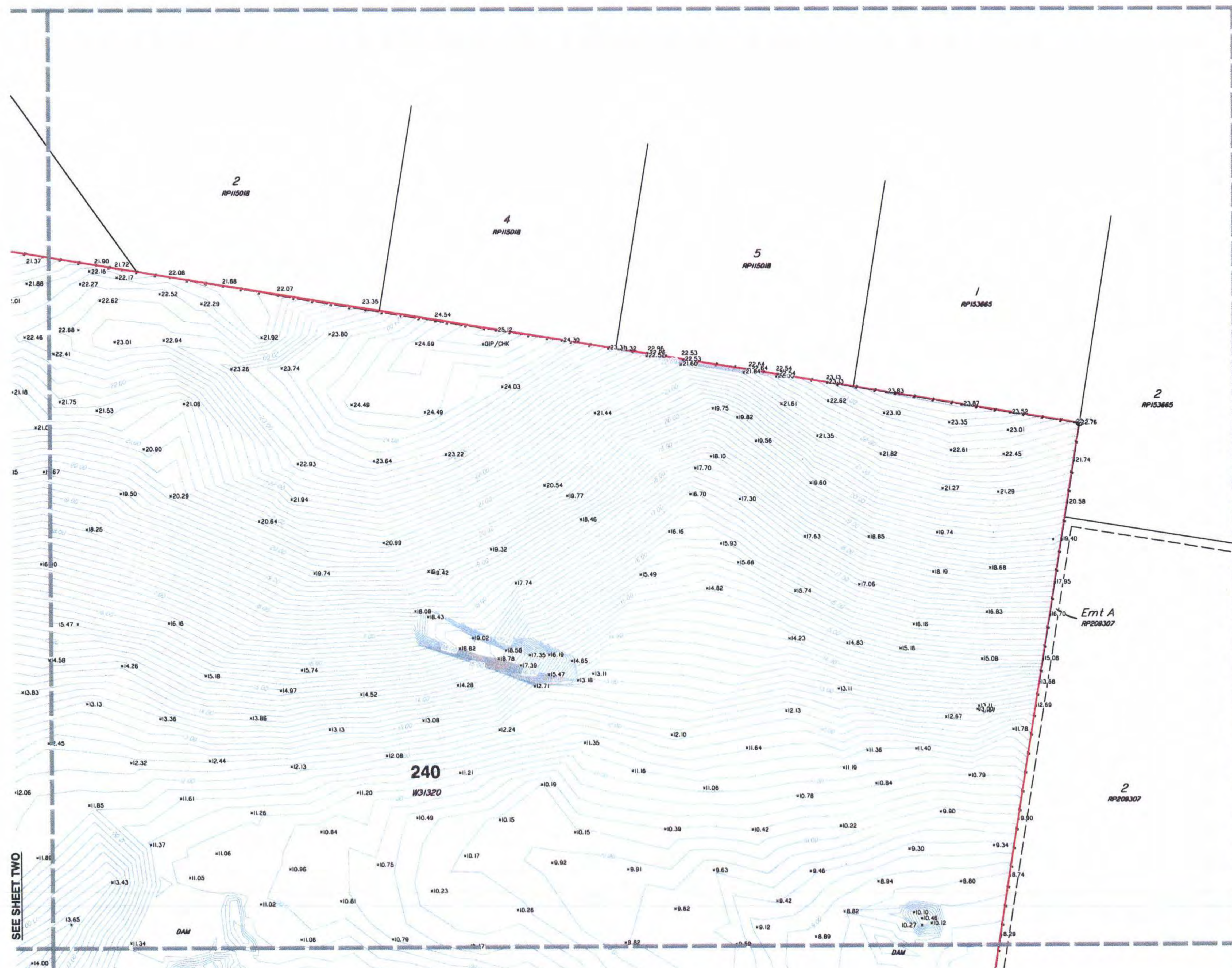
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Meridian	IS133471	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
Scale (on A1 original)	1:1000	Designed	
		Drawn	
		Date Designed	



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REFERENCE No. **5093-10**

PLAN No. **5093 S CD 01**



Scale 1:1000 - Lengths are in Metres.

- ### LEGEND
- PERMANENT MARK
 - SEWER MARK
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
 - ELECTRICITY POLE
 - TELESTRA PIT
 - MANHOLE
 - STORMWATER MANHOLE
 - GULLY TRAP
 - WATER METER
 - FIRE HYDRANT
 - VALVE
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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**
County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	15215853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.169		
Scale (en A1 original)		Designed	
1:1000		Drawn	
		Date Designed	

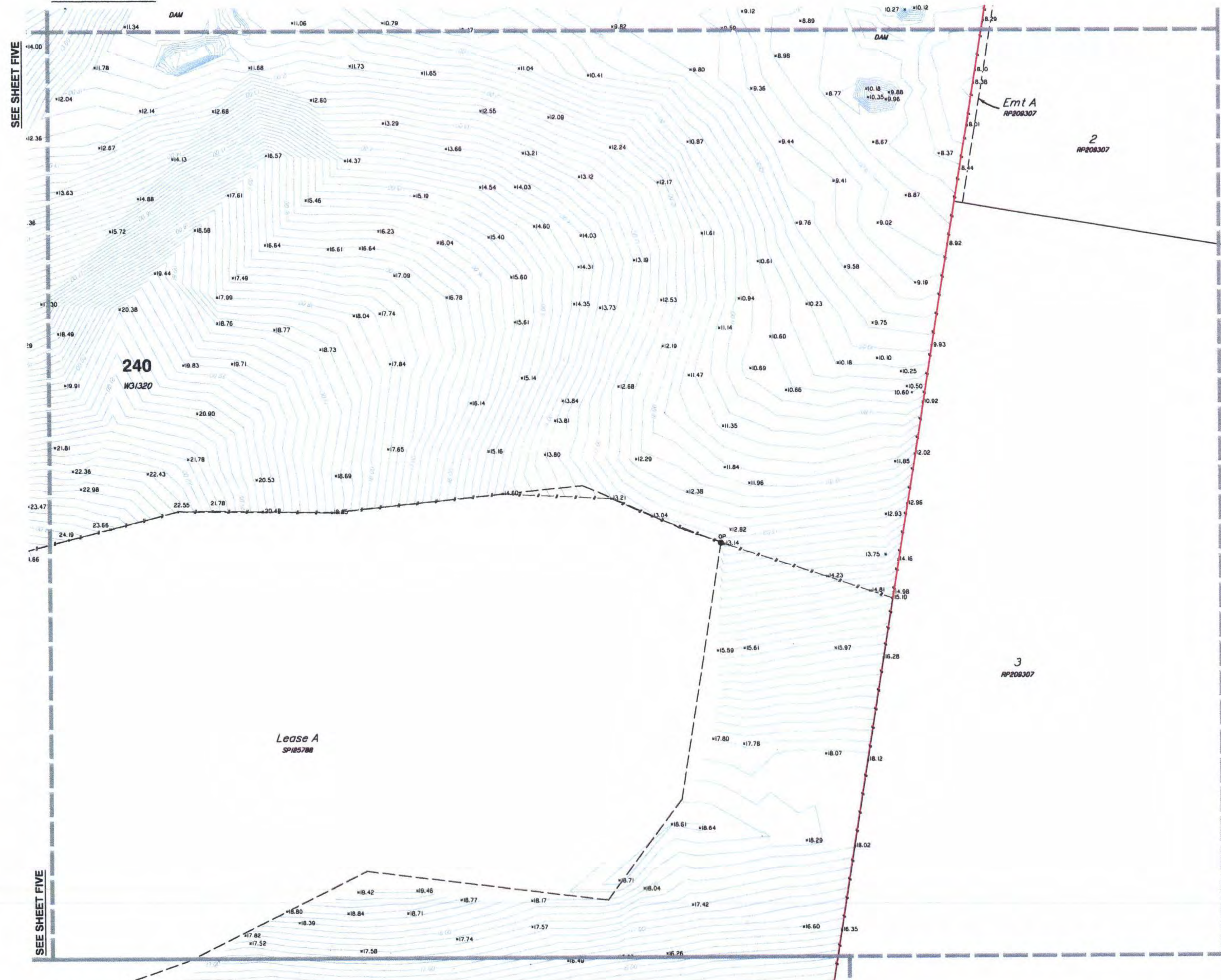


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t: (07) 39073333
f: (07) 32675461

REFERENCE No. 5093-10
PLAN No. **5093 S CD 01**



SEE SHEET THREE



SEE SHEET SIX

Scale 1:1000 - Lengths are in Metres.
0 10 20 30 40 50 60 70 80

LEGEND

- PERMANENT MARK
- SEWER MANHOLE
- SEWER INSPECTION OUTLET
- ELECTRICITY PILLAR
- ELECTRICITY POLE
- ELECTRICITY POLE WITH LIGHT
- TELSTRA PIT
- MANHOLE
- STORMWATER MANHOLE
- GULLY TRAP
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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

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Meridian	IS216853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Hall
F.S.	No	Date Drafted	02-02-2011
Origin	PSM (13471)	Checked	
Scale (on A1 original)	BL 22 189	Designed	
1:1000		Drawn	
		Date Designed	

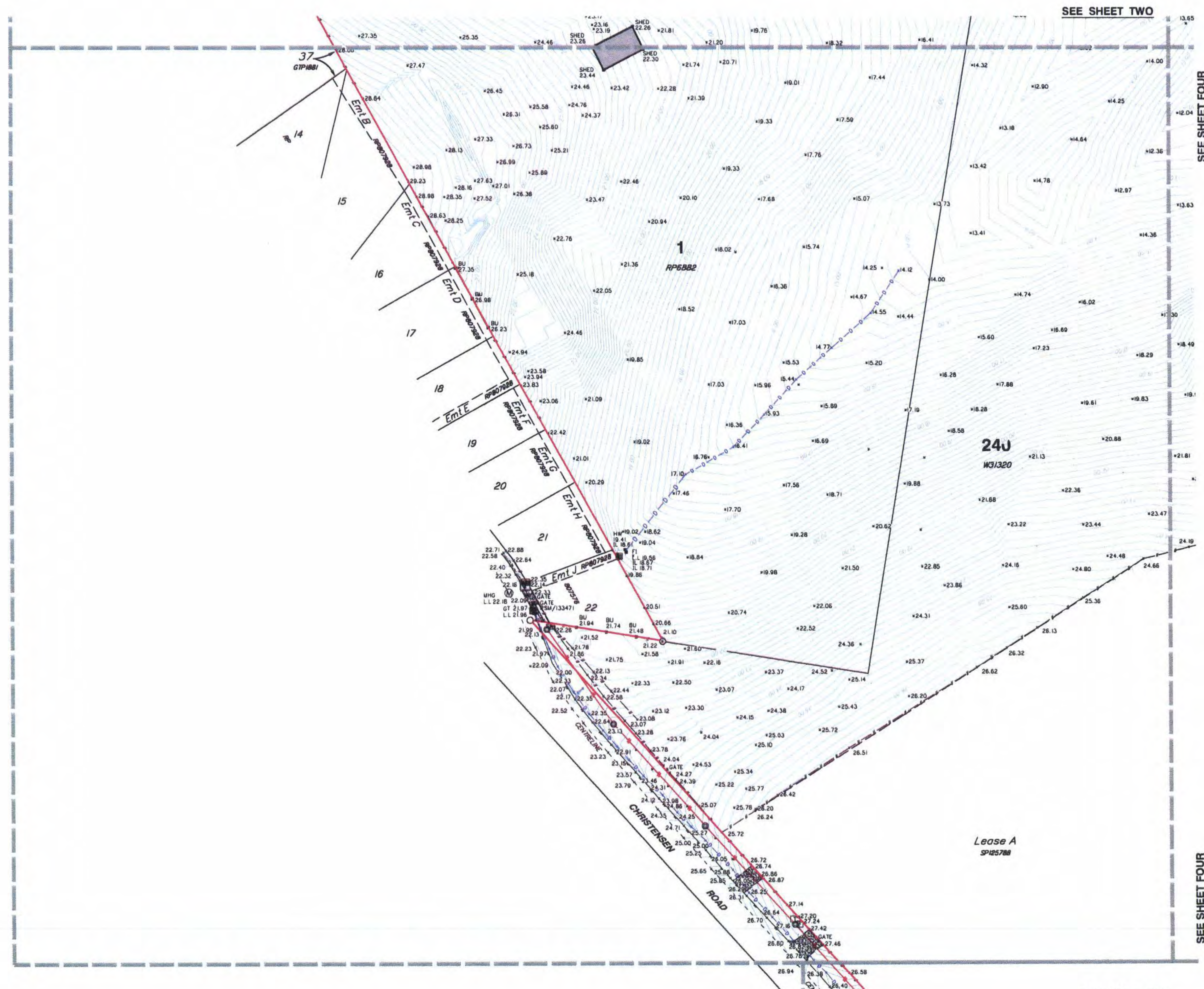


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PLAN No. **5093 S CD 01**

SHEET 4 OF 6



- LEGEND**
- PERMANENT MARK
 - SEWER MANHOLE
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
 - ELECTRICITY POLE
 - ELECTRICITY POLE WITH LIGHT
 - TELSTRA PIT
 - MANHOLE
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 - CONTOUR LEVEL

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Level Datum	A.H.D.	Date Surveyed	Jan 2011
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Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
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Scale (on A1 original)		Designed	
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		Date Designed	

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PLAN No. **5093 S CD 01**

SHEET 5 OF 6



- ### LEGEND
- ① PERMANENT MARK
 - ② SEWER MANHOLE
 - ③ SEWER INSPECTION OUTLET
 - ④ ELECTRICITY PILLAR
 - ⑤ ELECTRICITY POLE
 - ⑥ ELECTRICITY POLE WITH LIGHT
 - ⑦ TEL STRA PIT
 - ⑧ MANHOLE
 - ⑨ STORMWATER MANHOLE
 - ⑩ GULLY TRAP
 - ⑪ WATER METER
 - ⑫ FIRE HYDRANT
 - ⑬ VALVE
 - ⑭ GATE
 - ⑮ BOLLARD
 - ⑯ CONCRETE
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CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot
240 on WD31320

Parish of **ALBERT**
County of **Ward**
Local Govt **GOLD COAST CITY COUNCIL**

Level Datum	A.H.D.	Date Surveyed	Jan 2011
Meridian	IS216853	Surveyor	A. Macdonald
Contour Interval	0.2	Drawn	S. Holt
F.B.	No	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	PI 22 169		

Scale (on A1 original)	Designed
1:1000	Drawn
	Date Designed



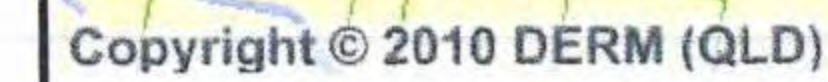
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REFERENCE No. 5093-10
PLAN No. 5093 S CD 01

SHEET 6 OF 6

Appendix D: Bore search results

2/02/2011



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Legend

-  Watercourses
-  All Towns
-  DCDB Water
-  DCDB Road
-  DCDB
-  Coastline
- (cont)

-  Queensland
-  Other Australian States

Legend

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 1 of 81

REG NUMBER 79305

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-42-37	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-13-13	MAP-SERIES
D/O FILE NO. 158/9	SHIRE 4590-LOGAN CITY	EASTING 521716	MAP-NO
R/O FILE NO.	LOT 11	NORTHING 6934872	MAP NAME
H/O FILE NO.	PLAN RP123087	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION 19 GREENFIELD ST	ACCURACY UNKN	PRES EQUIPMENT
	EAGLEBY	GPS ACC	
GIS LAT -27.7101900937	PARISH NAME 661-BOYD		ORIGINAL BORE NO
GIS LNG 153.2202583233	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		
			POLYGON
FACILITY TYPE SF	DATE DRILLED		RN OF BORE REPLACED
STATUS EX	DRILLERS NAME		DATA OWNER
ROLES	DRILL COMPANY		CONFIDENTIAL
	METHOD OF CONST.		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

**** NO RECORDS FOUND ****

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

REG NUMBER 79305

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

PIPE	DATE	RD ANALYST	QAN	DEPTH RMK SRC (m)	COND (uS/cm)	pH	SI (mg/L)	TOTAL IONS	TOTAL SOLIDS	HARD	ALK	FIG. OF MERIT	SAR	RAH
A	27/11/1989	1 GCL	132321	27.00 GB	7000	8.2	23	4308.37	4178.88	969	255	0.4	17.5	

WATER ANALYSIS PART 2

PIPE	DATE	RD	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	27/11/1989	1	1250.0	9.5	190.0	120.0	0.09	300.0	0.18	5.1	2350.0	1.80	4.7	77.0				

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

REGDET	CASING	STRLOG	AQUIFR	PUMTES	ELVDET	WLVDET	FIELDQ
Y 20/12/1991	Y 20/12/1991	Y 20/12/1991	Y 20/12/1991	Y 20/12/1991	Y 20/12/1991	Y 20/12/1991	Y 20/12/1991

VALIDATION LOG - PART 2

WATANL	SAMPLE	STRTIG	WIRLOG	MULCND	BRCOND	FPREAD	GNOTES
Y 20/12/1991		Y 20/12/1991		Y 20/12/1991			

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 3 of 81

REG NUMBER 79305

GENERAL NOTES
**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 4 of 81

REG NUMBER 79461

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-42-27	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-14-16	MAP-SERIES
D/O FILE NO. 84822	SHIRE 3430-GOLD COAST CITY	EASTING 523442	MAP-NO
R/O FILE NO.	LOT 101	NORTHING 6935176	MAP NAME
H/O FILE NO.	PLAN A1551	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION P101 ALBERTON	ACCURACY UNKN	PRES EQUIPMENT
	L101 ENKELMANN RD	GPS ACC	
GIS LAT -27.707448433	PARISH NAME 51-ALBERT		ORIGINAL BORE NO H BRENT
GIS LNG 153.2378278409	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		
			POLYGON
FACILITY TYPE SF	DATE DRILLED 01/06/1991		RN OF BORE REPLACED
STATUS EX	DRILLERS NAME		DATA OWNER
ROLES	DRILL COMPANY		CONFIDENTIAL
	METHOD OF CONST. SWL 9M PUMP 5000L/8HR		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	24.38	PHYLLITE SALTY SOAK @ 24M
2	24.38	53.34	ANDERSITE WATER
905			ROTARY K BROWN
910			COND. 7200US/CM

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

BORE CARD REPORT - PUBLISHABLE

REG NUMBER 79461

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

PIPE	DATE	RD ANALYST	QAN	DEPTH (m)	RMK	SRC	COND (uS/cm)	pH	Si (mg/L)	TOTAL IONS	TOTAL SOLIDS	HARD	ALK	FIG. OF MERIT	SAR	RAH
A	07/01/1992	1 GCL	140897	37.00	PU	GB	6521	7.2	31	3807.30	3695.52	1004	231	0.5	13.9	

WATER ANALYSIS PART 2

PIPE	DATE	RD	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	07/01/1992	1	1010.0	3.9	130.0	165.0	1.30	280.9	0.00	0.5	2054.0	0.70	0.0	161.0				

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 6 of 81

REG NUMBER 79461

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE

Page 7 of 81

BORE CARD REPORT - PUBLISHABLE

REG NUMBER 120315

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-52	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-13-03	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 521435	MAP-NO
R/O FILE NO.	LOT 19	NORTHING 6930718	MAP NAME
H/O FILE NO.	PLAN SP131515	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7476871462	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2173672938	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 23/04/2004		DATA OWNER
STATUS AD	DRILLERS NAME S.MATHAMS		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY SR & JL MATHAMS		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	23/04/2004	1	Cuttings or other fill between casing and h				0.00	60.50

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.50	HEAVY DARK CLAY (FILL)
2	1.50	6.00	DRY YELLOW CLAY
3	6.00	16.50	CLAY SHALE MX
4	16.50	60.50	GREY SHALE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

REG NUMBER 120315

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

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VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 120326

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-52	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-13-03	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 521435	MAP-NO
R/O FILE NO.	LOT 19	NORTHING 6930718	MAP NAME
H/O FILE NO.	PLAN SP131515	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7476849642	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2174634515	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 25/09/2002		DATA OWNER
STATUS EX	DRILLERS NAME MAX RITTER		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY AARMAX DRILLING PTY LTD		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD MATERIAL DESCRIPTION NUMBER	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	25/09/2002	1 Polyvinyl Chloride	6.000	WT	125	0.00	44.00
A	25/09/2002	2 Perforated or Slotted Casing				32.00	44.00
A	25/09/2002	3 Gravel Pack	4.600	GR		0.40	

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	TOP SOIL
2	1.00	5.00	CLAY
3	5.00	13.00	DECOMPOSED ROCK
4	13.00	34.00	BLUE METAL
5	34.00	35.00	BLACK SHALE *
6	35.00	44.00	BLUE METAL

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STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	34.00		SHLE	25/09/2002	-27.00	N	BRACKISH	0.23	Y	UC

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

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REG NUMBER 120326

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 120757

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-08	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-12-40	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520804	MAP-NO
R/O FILE NO.	LOT 204	NORTHING 6930227	MAP NAME
H/O FILE NO.	PLAN RP221562	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 50	
GIS LAT -27.75236214	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2111504	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED		DATA OWNER
STATUS AD	DRILLERS NAME		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY		
	METHOD OF CONST. JOY 125 RIG		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	9.00	CLAY SILTY BROWN
2	9.00	10.50	SILT CLAYEY BROWN
3	10.50	13.50	CLAY BROWN
4	13.50	15.00	CLAY SLIGHTLY SANDY BROWN
5	15.00	19.50	SAND CLAYEY FINE-MED GRAINED BROWN
6	19.50	20.00	SAND CLAYEY GRAVELLY MED-COARSE BROWN
7	20.00	23.00	PHYLLITE DARK GREY
8			DEPTH WATER INTERSECTED 19.5M

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

GROUNDWATER DATABASE
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REG NUMBER 120757

AQUIFER DETAILS

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

PIPE	DATE	RD ANALYST	QAN	DEPTH RMK SRC	COND (uS/cm)	pH	SI (mg/L)	TOTAL IONS	TOTAL SOLIDS	HARD	ALK	FIG. OF MERIT	SAR	RAH
A	01/01/1975	1 DME	H2606	GB	9600	8.1	18	5642.60	5560.46	1100	165	0.3	22.4	

WATER ANALYSIS PART 2

PIPE	DATE	RD	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	01/01/1975	1	1710.0	8.0	104.0	204.0	0.40	197.0	0.10	2.0	3040.0	1.10		376.0				

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

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VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 120760

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-52	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-12-33	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520614	MAP-NO
R/O FILE NO.	LOT 72	NORTHING 6930720	MAP NAME
H/O FILE NO.	PLAN SP106610	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 50	
GIS LAT -27.74782693	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2091474	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED		DATA OWNER
STATUS AD	DRILLERS NAME		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY		
	METHOD OF CONST. JOY 125 RIG		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.50	CLAY BROWN
2	1.50	10.50	CLAY SILTY SANDY BROWN
3	10.50	16.00	CLAY LIGHT GREY MINOR SAND GRAVEL
4	16.00	18.50	PHYLLITE GREY
5			DEPTH WATER INTERSECTED DRY

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

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REG NUMBER 120760

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

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REG NUMBER 120760

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 120761

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-09	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-12-14	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520093	MAP-NO
R/O FILE NO.	LOT 7	NORTHING 6930197	MAP NAME
H/O FILE NO.	PLAN RP215831	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 50	
GIS LAT -27.75239865	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2037843	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED		DATA OWNER
STATUS AD	DRILLERS NAME		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY		
	METHOD OF CONST. JOY 125 RIG		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	9.00	CLAY SLIGHTLY SILTY DARK BROWN
2	9.00	10.50	GRAVEL CLAYEY SILTY FINE-MED GRAINED
3	10.50	12.00	CLAY SANDY BROWN-GREY MINOR GRAVEL
4	12.00	15.80	PHYLLITE GREY
5			DEPTH WATER INTERSECTED DRY

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

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REG NUMBER 120761

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

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REG NUMBER 120761

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 120765

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-52	MAP-SCALE
DATE LOG RECD	SUB-AREA	LONGITUDE 153-12-55	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 521216	MAP-NO
R/O FILE NO.	LOT 11	NORTHING 6930719	MAP NAME
H/O FILE NO.	PLAN SP140331	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 50	
GIS LAT -27.74783062	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2153061	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED		DATA OWNER
STATUS AD	DRILLERS NAME		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY		
	METHOD OF CONST. JOY 125 RIG		

CASING DETAILS

**** NO RECORDS FOUND ****

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	12.00	CLAY SILTY BROWN
2	12.00	15.00	CLAY SILTY BROWN MINOR SAND GRAVEL
3	15.00	18.00	GRAVEL CLAYEY SANDY FINE-GRAINED
4			DEPTH WATER INTERSECTED 16.5M

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL FLOW (m)	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	16.50		CLAY				1.50 Y	UC	QUATERNARY - UNDEFINED

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PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

PIPE	DATE	RD ANALYST	QAN	DEPTH RMK SRC (m)	COND (uS/cm)	pH	SI (mg/L)	TOTAL IONS	TOTAL SOLIDS	HARD	ALK	FIG. OF MERIT	SAR	RAH
A	01/01/1975	1 DME	H2605	GB	3700	8.7	26	2174.00	2040.90	380	276	0.3	14.5	

WATER ANALYSIS PART 2

PIPE	DATE	RD	Na	K	Ca	Mg	Mn	HCO3	Fe	CO3	Cl	F	NO3	SO4	Zn	Al	B	Cu
A	01/01/1975	1	650.0	3.0	53.0	60.0		313.0		11.0	965.0	13.00		106.0				

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

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VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 124153

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-22	MAP-SCALE
DATE LOG RECD 20/DEC/04	SUB-AREA	LONGITUDE 153-13-24	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 522008	MAP-NO
R/O FILE NO.	LOT 4	NORTHING 6929785	MAP NAME
H/O FILE NO.	PLAN RP105801	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.75619334	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2233348	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 07/10/2004		DATA OWNER
STATUS EX	DRILLERS NAME MCINTYRE, CHRISTOPHER		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY MOUNTAIN WATER SERVICES		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	07/10/2004	1	Polyvinyl Chloride	5.500	WT	140	0.00	36.00
A	07/10/2004	2	Perforated or Slotted Casing	1.500	AP		18.00	30.00
A	07/10/2004	3	Gravel Pack	5.000	GR		8.00	36.00
A	07/10/2004	4	Bentonite Seal				7.00	8.00
A	07/10/2004	5	Cuttings or other fill between casing and h				0.00	7.00
A	07/10/2004	6	Grout			175	0.00	7.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	SANDY LOAM
2	1.00	4.00	SANDY CLAY
3	4.00	36.00	GREY SANDSTONE MG *

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STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	18.00		SDST	07/10/2004	-9.00	N	POTABLE	1.60	Y	UC

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
------	------	--------------	-----------------	----	-------------	---------------	--------------	------------	-----	------	--------

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REG NUMBER 124153

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	07/10/2004		150	6.4						PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

GROUNDWATER DATABASE

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REG NUMBER 133505

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-24	MAP-SCALE
DATE LOG RECD 08/NOV/05	SUB-AREA	LONGITUDE 153-12-26	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520419	MAP-NO
R/O FILE NO.	LOT 24	NORTHING 6929739	MAP NAME
H/O FILE NO.	PLAN RP186607	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7566366	PARISH NAME 1446-DARLINGTON		ORIGINAL BORE NO
GIS LNG 153.2072125	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
FACILITY TYPE SF	DATE DRILLED 06/10/2005		RN OF BORE REPLACED
STATUS EX	DRILLERS NAME CASHIN, PHILLIP WILLIAM		DATA OWNER
ROLES WS	DRILL COMPANY		CONFIDENTIAL Y
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	06/10/2005	1	Polyvinyl Chloride	9.000	WT	179	0.00	6.00
A	06/10/2005	2	Polyvinyl Chloride	9.000	WT	125	0.00	29.00
A	06/10/2005	3	Perforated or Slotted Casing	3.000	AP		20.00	29.00
A	06/10/2005	4	Gravel Pack	5.000	GR		0.50	29.00
A	06/10/2005	5	Grout			250	0.00	6.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	SOIL
2	1.00	3.00	CLAY
3	3.00	6.00	LIGHT SHALE
4	6.00	22.00	SOFT ROCK

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REG NUMBER 133505

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
5	22.00	29.00	GREY WACKIE *

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	23.00		XXXX	06/10/2005	-7.50	N	SALT	0.66	Y	UC

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

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REG NUMBER 133505

PIPE	DATE	DEPTH (m)	COND (uS/cm)	<u>FIELD MEASUREMENTS</u>					ALK	METH	SOURCE
				pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)			
A	06/10/2005		8330	6.8						PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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BORE CARD REPORT - PUBLISHABLE

REG NUMBER 133581

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-43-15	MAP-SCALE
DATE LOG RECD 03/JAN/06	SUB-AREA	LONGITUDE 153-15-51	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 526042	MAP-NO
R/O FILE NO.	LOT 1	NORTHING 6933696	MAP NAME
H/O FILE NO.	PLAN RP145926	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION DAVID	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7208159	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2641835	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 16/12/2005		DATA OWNER
STATUS AD	DRILLERS NAME SCHUMACHER, EVAN LYALL		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	16/12/2005	1	Cuttings or other fill betw een casing and h				5.00	30.00
A	16/12/2005	2	Grout			200	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	TOPSOIL
2	1.00	12.00	CLAY
3	12.00	30.00	SHALE*

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

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REG NUMBER 133581

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL FLOW (m)	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	20.00		SHLE				0.63 Y	UC	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	16/12/2005		15000							PU	GB

SPECIAL WATER ANALYSIS

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REG NUMBER 133581

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 133978

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-43-41	MAP-SCALE
DATE LOG RECD 24/MAY/06	SUB-AREA	LONGITUDE 153-15-18	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 525128	MAP-NO
R/O FILE NO.	LOT 6	NORTHING 6932906	MAP NAME
H/O FILE NO.	PLAN RP184832	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY UNKN	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7279665	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2549271	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 03/05/2006		DATA OWNER
STATUS EX	DRILLERS NAME MCLEOD, ROSS		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY AUSFLO		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	03/05/2006	1	Polyvinyl Chloride	6.000	WT	142	0.30	43.50
A	03/05/2006	2	Perforated or Slotted Casing	3.000	AP	150	10.00	16.00
A	03/05/2006	3	Perforated or Slotted Casing	3.000	AP	150	34.00	40.00
A	03/05/2006	4	Gravel Pack	5.000	GR		6.50	43.50
A	03/05/2006	5	Bentonite Seal				6.00	6.50
A	03/05/2006	6	Grout			216	0.00	1.50
A	03/05/2006	7	Grout			178	1.50	6.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	3.00	GREY SHALE
2	3.00	9.00	GREY SHALE SOFT

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REG NUMBER 133978

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
3	9.00	12.00	GREY BLACK SHALE *
4	12.00	43.70	BLACK SHALE HARD *

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD (l/s)	CTR	CONDIT	FORMATION NAME
1	11.30		SHLE					0.10	Y	UC	
2	43.70		SHLE	03/05/2006	-5.00	N	NONE POTABLE	0.28	Y	UC	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

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REG NUMBER 133978

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	EH (mV)	ALK	METH	SOURCE
A	03/05/2006		5500	8.0						PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

PIPE	DATE	REC	NOTES
A	03/05/2006	1	Water to be used for non potable requirements. 20300 casing used during drilling and pulled prior to cementing.

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REG NUMBER 134066

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-03	MAP-SCALE
DATE LOG RECD 24/MAY/06	SUB-AREA	LONGITUDE 153-12-19	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520230	MAP-NO
R/O FILE NO.	LOT 60	NORTHING 6930382	MAP NAME
H/O FILE NO.	PLAN RP215831	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7508333	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2052778	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 05/05/2006		DATA OWNER
STATUS AD	DRILLERS NAME MCLEOD, ROSS		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY AUSFLO		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD MATERIAL DESCRIPTION NUMBER	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	05/05/2006	1 Grout			216	0.50	1.50

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	6.00	WEATHERED GREY SHALE SOFT
2	6.00	12.00	GREY SHALE FIRM
3	12.00	29.00	GREY SHALE HARD
4	29.00	31.00	GREY SHALE SOFT
5	31.00	35.00	GREY SHALE HARD
6	35.00	36.00	GREY SHALE SOFT *
7	36.00	43.80	GREY SHALE HARD

STRATIGRAPHY DETAILS

DATE 02/02/2011

GROUNDWATER DATABASE
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REG NUMBER 134066

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	24.00		SHLE				SEEPAGE			UC
2	35.30		SHLE				NON-POTABLE	1.40 Y		UC

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

METH SOURCE

DATE 02/02/2011

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REG NUMBER 134066

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	05/05/2006		4800	8.0						PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

PIPE	DATE	REC	NOTES
A	05/05/2006	1	Hole Abandoned Backfilled w ith drill cuttings Cement plug installed 1m

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REG NUMBER 134070

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-03	MAP-SCALE
DATE LOG RECD 04/AUG/06	SUB-AREA	LONGITUDE 153-12-20	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520257	MAP-NO
R/O FILE NO.	LOT 60	NORTHING 6930382	MAP NAME
H/O FILE NO.	PLAN RP215831	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7508333	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2055556	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 13/07/2006		DATA OWNER
STATUS AD	DRILLERS NAME MCLEOD, ROSS		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY AUSFLO		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	13/07/2006	1	Grout			216	0.30	5.00

STRATA LOG DETAILS

**** NO RECORDS FOUND ****

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

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REG NUMBER 134070

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

PIPE	DATE	REC	NOTES
A	13/07/2006	1	Drill top 5m and grout seal Back to near surface

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REG NUMBER 134118

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-42-31	MAP-SCALE
DATE LOG RECD 31/JUL/06	SUB-AREA	LONGITUDE 153-14-28	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523770	MAP-NO
R/O FILE NO.	LOT 1	NORTHING 6935052	MAP NAME
H/O FILE NO.	PLAN RP217955	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7086111	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2411111	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 21/07/2006		DATA OWNER
STATUS EX	DRILLERS NAME SCHUMACHER, EVAN LYALL		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	21/07/2006	1	Polyvinyl Chloride	9.000	WT	140	0.00	36.00
A	21/07/2006	2	Perforated or Slotted Casing	4.000	AP		30.00	36.00
A	21/07/2006	3	Gravel Pack	5.000	GR		7.00	36.00
A	21/07/2006	4	Cuttings or other fill betw een casing and h				5.00	7.00
A	21/07/2006	5	Grout			200	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	0.50	TOPSOIL
2	0.50	3.00	GRAVELLY CLAY
3	3.00	10.00	SOFT SHALE CLAY
4	10.00	24.00	HARD SHALE

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REG NUMBER 134118

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
5	24.00	32.00	BROKEN SHALE *
6	32.00	36.00	HARD SHALE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	24.00		SHLE	21/07/2006	-13.00	N		0.25	Y	FR

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

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REG NUMBER 134118

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	21/07/2006		110							PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134134

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-42-32	MAP-SCALE
DATE LOG RECD 19/JUN/06	SUB-AREA	LONGITUDE 153-13-26	MAP-SERIES
D/O FILE NO.	SHIRE 4590-LOGAN CITY	EASTING 522067	MAP-NO
R/O FILE NO.	LOT 71	NORTHING 6935025	MAP NAME
H/O FILE NO.	PLAN RP123062	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY UNKN	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7088894	PARISH NAME 661-BOYD		ORIGINAL BORE NO
GIS LNG 153.2238369	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 09/05/2006		DATA OWNER
STATUS EX	DRILLERS NAME SCHUMACHER, EVAN LYALL		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	09/05/2006	1	Polyvinyl Chloride	9.000	WT	140	0.00	42.00
A	09/05/2006	2	Perforated or Slotted Casing	4.000	AP		30.00	42.00
A	09/05/2006	3	Gravel Pack	5.000	GR		15.00	42.00
A	09/05/2006	4	Cuttings or other fill between casing and h				5.00	15.00
A	09/05/2006	5	Grout			200	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	TOPSOIL
2	1.00	4.00	CLAY
3	4.00	33.00	YELLOW SANDSTONE
4	33.00	42.00	BROKEN BASALT *

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REG NUMBER 134134

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD (l/s)	CTR	CONDIT	FORMATION NAME
1	33.00		BSLT	09/05/2006	-12.00	N		3.16	Y	FR	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
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DATE 02/02/2011

GROUNDWATER DATABASE
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REG NUMBER 134134

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	09/05/2006		1200							PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134286

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-45-23	MAP-SCALE
DATE LOG RECD 31/OCT/06	SUB-AREA	LONGITUDE 153-12-23	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520337	MAP-NO
R/O FILE NO.	LOT 25	NORTHING 6929761	MAP NAME
H/O FILE NO.	PLAN RP186606	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.756439	PARISH NAME 1446-DARLINGTON		ORIGINAL BORE NO
GIS LNG 153.2063756	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		POLYGON
	FIELD LOCATION		RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 12/10/2006		DATA OWNER
STATUS AD	DRILLERS NAME SCHUMACHER, EVAN L		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD MATERIAL DESCRIPTION NUMBER	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	12/10/2006	1 Cuttings or other fill betw een casing and h				5.00	78.00
A	12/10/2006	2 Grout			200	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	3.00	GREY SHALE CLAY
2	3.00	33.00	SOFT SHALE
3	33.00	57.00	SOFT BLACK SHALE
4	57.00	78.00	HARD BLACK SHALE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

GROUNDWATER DATABASE
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REG NUMBER 134286

AQUIFER DETAILS

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

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GROUNDWATER DATABASE
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REG NUMBER 134286

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

DATE 02/02/2011

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REG NUMBER 134462

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-39	MAP-SCALE
DATE LOG RECD 05/DEC/06	SUB-AREA	LONGITUDE 153-14-04	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523100	MAP-NO
R/O FILE NO.	LOT 452	NORTHING 6929261	MAP NAME
H/O FILE NO.	PLAN CP890483	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY SKET	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.760907	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2344257	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 23/08/2006		DATA OWNER
STATUS AD	DRILLERS NAME COOPER, PATRICK		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY BUSHMENS DRILLING		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	23/08/2006	1	Cuttings or other fill betw een casing and h				5.00	63.00
A	23/08/2006	2	Grout			200	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	3.00	SHALE
2	3.00	63.00	GREY WACKE MUDSTONE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

GROUNDWATER DATABASE
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REG NUMBER 134462

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

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GROUNDWATER DATABASE
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REG NUMBER 134462

GENERAL NOTES

PIPE	DATE	REC	NOTES
A	23/08/2006	1	No water Decommission.

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REG NUMBER 134470

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-40	MAP-SCALE
DATE LOG RECD 05/DEC/06	SUB-AREA	LONGITUDE 153-14-08	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523214	MAP-NO
R/O FILE NO.	LOT 451	NORTHING 6929250	MAP NAME
H/O FILE NO.	PLAN WD5966	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION ALEX MILLER	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7610018	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2355824	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 28/09/2006		DATA OWNER
STATUS EX	DRILLERS NAME COOPER, PATRICK		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY BUSHMENS DRILLING		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	28/09/2006	1	Polyvinyl Chloride	6.000	WT	125	0.00	45.40
A	28/09/2006	2	Perforated or Slotted Casing	3.000	AP	150	26.00	45.40
A	28/09/2006	3	Gravel Pack	5.000	GR		25.00	45.40
A	28/09/2006	4	Cuttings or other fill between casing and h				5.00	24.00
A	28/09/2006	5	Grout			200	0.00	5.00
A	28/09/2006	6	Grout			200	24.00	25.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	3.00	YELLOW SHALE
2	3.00	10.00	DECO ROCK *
3	10.00	45.40	BASALT *

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STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD (l/s)	CTR	CONDIT	FORMATION NAME
1	30.00		BSLT	28/09/2006	-27.00	N	SALTY	0.11	Y	UC	
2	42.40		BSLT	28/09/2006	-39.00	N	SALTY	0.11	Y	UC	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

METH SOURCE

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GROUNDWATER DATABASE
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REG NUMBER 134470

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	28/09/2006		2940							PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134666

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-31	MAP-SCALE
DATE LOG RECD 07/FEB/07	SUB-AREA	LONGITUDE 153-13-49	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 522701	MAP-NO
R/O FILE NO.	LOT 501	NORTHING 6929508	MAP NAME
H/O FILE NO.	PLAN CP890484	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7586802	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2303712	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 06/01/2007		DATA OWNER
STATUS EX	DRILLERS NAME CASHIN, PHILIP W		CONFIDENTIAL Y
ROLES WS	DRILL COMPANY		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD MATERIAL DESCRIPTION NUMBER	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	06/01/2007	1 Polyvinyl Chloride	9.000	WT	175	0.00	5.00
A	06/01/2007	2 Polyvinyl Chloride	9.000	WT	100	0.00	28.50
A	06/01/2007	3 Perforated or Slotted Casing	3.000	AP		16.50	28.50
A	06/01/2007	4 Grout			250	0.00	5.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	5.00	GREY WAKIE
2	5.00	17.50	GREY WAKIE
3	17.50	20.50	GREY WAKIE BROKEN SEAMS OF ROCK *
4	20.50	28.50	GREY WAKIE

STRATIGRAPHY DETAILS

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GROUNDWATER DATABASE
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REG NUMBER 134666

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	17.50		XXXX	06/01/2007	-6.00	N		0.33	Y	UC

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
------	------	--------------	-----------------	----	-------------	---------------	--------------	------------	-----	------	--------

DATE 02/02/2011

GROUNDWATER DATABASE
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REG NUMBER 134666

PIPE	DATE	DEPTH (m)	COND (uS/cm)	pH	TEMP (C)	NO3 (mg/L)	DO (mg/L)	Eh (mV)	ALK	METH	SOURCE
A	06/01/2007		1970	7.8						PU	GB

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134836

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-38	MAP-SCALE
DATE LOG RECD 06/SEP/07	SUB-AREA	LONGITUDE 153-14-24	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523639	MAP-NO
R/O FILE NO.	LOT 6	NORTHING 6929289	MAP NAME
H/O FILE NO.	PLAN CP890481	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7606423	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2398976	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 17/04/2007		DATA OWNER
STATUS AD	DRILLERS NAME PATRICK COOPER		CONFIDENTIAL N
ROLES WS	DRILL COMPANY BUCHMENS DRILLING		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	17/04/2007	1	Grout				0.00	5.00
A	17/04/2007	2	Cuttings or other fill betw een casing and h				5.00	63.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	4.00	SHALE, YELLOW
2	4.00	15.00	SHALE, GREY
3	15.00	63.00	SCHIST, BLUE-QUARTZ?

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

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REG NUMBER 134836

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

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VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134837

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-42	MAP-SCALE
DATE LOG RECD 06/SEP/07	SUB-AREA	LONGITUDE 153-14-21	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523559	MAP-NO
R/O FILE NO.	LOT 6	NORTHING 6929173	MAP NAME
H/O FILE NO.	PLAN CP890481	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7616905	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2390881	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 28/03/2007		DATA OWNER
STATUS AD	DRILLERS NAME PATRICK COOPER		CONFIDENTIAL N
ROLES WS	DRILL COMPANY BUSHMENS DRILLING		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD MATERIAL DESCRIPTION NUMBER	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	28/03/2007	1 Grout				0.00	5.00
A	28/03/2007	2 Cuttings or other fill betw een casing and h				5.00	55.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	3.00	SHALE, GREY
2	3.00	10.00	SHALE, YELLOW
3	10.00	55.00	GRAVEL, BLUE, BROKEN

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

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REG NUMBER 134837

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

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VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 134927

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-58	MAP-SCALE
DATE LOG RECD 24/APR/07	SUB-AREA	LONGITUDE 153-12-22	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520304	MAP-NO
R/O FILE NO.	LOT 59	NORTHING 6930525	MAP NAME
H/O FILE NO.	PLAN RP215831	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7495376	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2060274	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 21/04/2007		DATA OWNER
STATUS EX	DRILLERS NAME PHIL CASHIN		CONFIDENTIAL N
ROLES WS	DRILL COMPANY PHIL CASHIN		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	21/04/2007	1	Polyvinyl Chloride	7.550	WT	200	0.00	6.00
A	21/04/2007	2	Polyvinyl Chloride	4.850	WT	114	0.00	38.00
A	21/04/2007	3	Grout				0.00	6.00
A	21/04/2007	4	Gravel Pack	6.000	GR		5.00	38.00
A	21/04/2007	5	Perforated or Slotted Casing	3.000	AP		2.00	38.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	0.50	CLAY
2	0.50	2.00	SHALE
3	2.00	6.00	GREYWACKE
4	6.00	33.50	GREYWACKE

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REG NUMBER 134927

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
5	33.50	34.50	WATER
6	34.50	38.00	GREYWACKE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD (l/s)	CTR	CONDIT	FORMATION NAME
1	33.50	34.50	SEDI	21/04/2007	-8.00	N	TDS 457PPM	0.16	N	FR	

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

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REG NUMBER 134927

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE

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REG NUMBER 138427

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-02	MAP-SCALE 253
DATE LOG RECD 04/NOV/10	SUB-AREA	LONGITUDE 153-15-21	MAP-SERIES M
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 525212	MAP-NO 9542 24
R/O FILE NO.	LOT 25	NORTHING 6930403	MAP NAME
H/O FILE NO.	PLAN RP134407	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY GPS	PRES EQUIPMENT
		GPS ACC 10	
GIS LAT -27.7509164	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2555563	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 19/12/2008		DATA OWNER
STATUS EX	DRILLERS NAME LEHMANN, MARK		CONFIDENTIAL N
ROLES WS	DRILL COMPANY DRILLMARK PTY LTD		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	18/09/2008	1	Polyvinyl Chloride	5.900	WT	140	0.00	90.00
A	18/09/2008	2	Perforated or Slotted Casing	2.000	AP	140	39.00	51.00
X	18/09/2008	3	Grout			200	0.00	6.00
X	18/09/2008	4	Cuttings or other fill betw een casing and h			200	6.00	38.00
X	18/09/2008	5	Gravel Pack	5.000	GR	200	38.00	90.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.00	FILL
2	1.00	2.00	SOFT SANDSTONE
3	2.00	5.00	YELLOW SANDSTONE
4	5.00	10.00	WHITE SANDSTONE

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REG NUMBER 138427

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
5	10.00	17.00	YELLOW SANDSTONE
6	17.00	25.00	YELLOW AND GREY SANDSTONE
7	25.00	28.00	COMING INTO BASALT
8	28.00	34.00	BASALT
9	34.00	40.00	BASALT
10	40.00	48.00	BASALT
11	48.00	90.00	BASALT

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	40.00	48.00	BSLT	19/12/2008	-28.00	N	940 COND	0.50	Y	FR NERANLEIGH-FERNVALE BEDS

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

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REG NUMBER 138427

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

REGDET	CASING	STRLOG	AQUIFR	PUMTES	ELVDET	WLVDDET	FIELDQ
Y	04/11/2010						

VALIDATION LOG - PART 2

WATANL	SAMPLE	STRTIG	WIRLOG	MULCND	BRCOND	FPREAD	GNOTES
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GENERAL NOTES

**** NO RECORDS FOUND ****

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REG NUMBER 145109

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-45-44	MAP-SCALE
DATE LOG RECD 05/JUL/07	SUB-AREA	LONGITUDE 153-14-23	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 523620	MAP-NO
R/O FILE NO.	LOT 6	NORTHING 6929126	MAP NAME
H/O FILE NO.	PLAN CP890481	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.762114	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2397086	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 25/05/2007		DATA OWNER
STATUS AD	DRILLERS NAME STEVEN MATHAMS		CONFIDENTIAL N
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	22/05/2007	1	Grout				0.00	7.00
A	22/05/2007	2	Cuttings or other fill betw een casing and h				7.00	60.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	6.00	FILL
2	6.00	60.00	SHALE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

**** NO RECORDS FOUND ****

REG NUMBER 145109

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE
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REG NUMBER 145109

GENERAL NOTES

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE

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REG NUMBER 145369

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1450	LATITUDE 27-46-26	MAP-SCALE
DATE LOG RECD 05/OCT/07	SUB-AREA	LONGITUDE 153-13-51	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 522731	MAP-NO
R/O FILE NO.	LOT 524	NORTHING 6927837	MAP NAME
H/O FILE NO.	PLAN RP231134	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7737628	PARISH NAME 1446-DARLINGTON		ORIGINAL BORE NO
GIS LNG 153.230704	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		
	FIELD LOCATION		POLYGON
			RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 27/09/2007		DATA OWNER
STATUS EX	DRILLERS NAME STEVEN MATHAMS		CONFIDENTIAL N
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	27/09/2007	1	Polyvinyl Chloride	5.900	WT	140	0.00	72.00
A	27/09/2007	2	Grout				0.00	5.00
A	27/09/2007	3	Gravel Pack	5.000	GR		5.00	72.00
A	27/09/2007	4	Perforated or Slotted Casing	2.000	AP		36.00	42.00
A	27/09/2007	5	Perforated or Slotted Casing	2.000	AP		66.00	72.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	1.50	CLAY, YELLOW
2	1.50	8.00	CLAY SHALE, YELLOW
3	8.00	37.00	SHALE, BLUE
4	37.00	38.00	FRACTURE

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

REG NUMBER 145369

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
5	38.00	66.00	SHALE, BLUE
6	66.00	67.00	FRACTURE
7	67.00	72.00	SHALE, BLUE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

REC	TOP BED(M)	BOTTOM BED(M)	BED LITHOLOGY	DATE	SWL (m)	FLOW	QUALITY	YIELD CTR (l/s)	CONDIT	FORMATION NAME
1	37.00	38.00	SHLE	27/09/2007	-21.00	N	1800PPM SALT	0.13	N	FR
2	66.00	67.00	SHLE	27/09/2007	-21.00	N	1800PPM SALT	0.13	N	FR

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 77 of 81

REG NUMBER 145369

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE

BORE CARD REPORT - PUBLISHABLE

Page 78 of 81

REG NUMBER 145601

REGISTRATION DETAILS

OFFICE Brisbane	BASIN 1451	LATITUDE 27-44-30	MAP-SCALE
DATE LOG RECD 11/DEC/07	SUB-AREA	LONGITUDE 153-12-39	MAP-SERIES
D/O FILE NO.	SHIRE 3430-GOLD COAST CITY	EASTING 520780	MAP-NO
R/O FILE NO.	LOT 15	NORTHING 6931403	MAP NAME
H/O FILE NO.	PLAN RP124580	ZONE 56	PROG SECTION
	ORIGINAL DESCRIPTION	ACCURACY	PRES EQUIPMENT
		GPS ACC	
GIS LAT -27.7416052	PARISH NAME 51-ALBERT		ORIGINAL BORE NO
GIS LNG 153.2108459	COUNTY WARD		BORE LINE -
CHECKED Y	PROPERTY NAME		POLYGON
	FIELD LOCATION		RN OF BORE REPLACED
FACILITY TYPE SF	DATE DRILLED 08/11/2007		DATA OWNER
STATUS EX	DRILLERS NAME MATHAMS, STEVEN ROBERT		CONFIDENTIAL N
ROLES WS	DRILL COMPANY DRILLPOWER		
	METHOD OF CONST. ROTARY AIR		

CASING DETAILS

PIPE	DATE	RECORD NUMBER	MATERIAL DESCRIPTION	MAT SIZE (mm)	SIZE DESC	OUTSIDE DIAM	TOP (m)	BOTTOM (m)
A	08/11/2007	1	Grout				0.00	5.00
A	08/11/2007	2	Cuttings or other fill between casing and h				5.00	66.00

STRATA LOG DETAILS

RECORD NUMBER	STRATA TOP (m)	STRATA BOT (m)	STRATA DESCRIPTION
1	0.00	2.00	TOPSOIL
2	2.00	11.00	SHALE, CLAY, YELLOW
3	11.00	66.00	SHALE, BLUE

STRATIGRAPHY DETAILS

**** NO RECORDS FOUND ****

AQUIFER DETAILS

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 79 of 81

REG NUMBER 145601

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 1

**** NO RECORDS FOUND ****

PUMP TEST DETAILS PART 2

**** NO RECORDS FOUND ****

BORE CONDITION

**** NO RECORDS FOUND ****

ELEVATION DETAILS

**** NO RECORDS FOUND ****

WATER ANALYSIS PART1

**** NO RECORDS FOUND ****

WATER ANALYSIS PART 2

**** NO RECORDS FOUND ****

WATER LEVEL DETAILS

**** NO RECORDS FOUND ****

WIRE LINE LOG DETAILS

**** NO RECORDS FOUND ****

FIELD MEASUREMENTS

**** NO RECORDS FOUND ****

SPECIAL WATER ANALYSIS

**** NO RECORDS FOUND ****

VALIDATION LOG - PART 1

**** NO RECORDS FOUND ****

DATE 02/02/2011

GROUNDWATER DATABASE
BORE CARD REPORT - PUBLISHABLE

Page 80 of 81

REG NUMBER 145601

VALIDATION LOG - PART 2

**** NO RECORDS FOUND ****

GENERAL NOTES

**** NO RECORDS FOUND ****

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**** End of Report ****

Appendix E: Land titles

HISTORICAL TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10624988

Search Date: 09/12/2010 11:03

Title Reference: 11060216

Date Created: 07/06/1906

Creating Dealing: 602739225

REGISTERED OWNER

Interest

Dealing No: 709915935 07/09/2006

PATRICIA ANN HESTER
WILLIAM ARTHUR HESTER

1/2
1/2

AS TENANTS IN COMMON

TRANSFER No 709915935
PATRICIA ANN HESTER TENANT IN COMMON 1/2
WILLIAM ARTHUR HESTER TENANT IN COMMON 1/2
Lodged at 09:48 on 07/09/2006

TRANSMISSION BY DEATH No 707193834
PATRICIA ANN HESTER
PERMANENT TRUSTEE COMPANY LIMITED A.C.N. 000 000 993
PERSONAL REPRESENTATIVE
UNDER INSTRUMENT 707193834
Lodged at 09:08 on 14/11/2003

TRANSFER No 709414925 FULLY WITHDRAWN ON 14/03/2006
Lodged at 16:19 on 06/03/2006

TRANSMISSION BY DEATH No 709414905 FULLY WITHDRAWN ON 14/03/2006
Lodged at 16:12 on 06/03/2006

ESTATE AND LAND

Estate in Fee Simple

LOT 1 REGISTERED PLAN 6882
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. APPLICATION FOR TITLE No 711561745
A Certificate of Title has been issued
Lodged at 15:27 on 08/04/2008
2. Rights and interests reserved to the Crown by
Deed of Grant No. 10695064 (POR 128)

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 09/04/2008 711561745 Certificate No. 2

HISTORICAL TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10624988

Search Date: 09/12/2010 11:03

Title Reference: 11060216

Date Created: 07/06/1906

Caution - Charges do not necessarily appear in order of priority

** End of Historical Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (ENVIRONMENT AND RESOURCE MANAGEMENT) [2010]
Requested By: External Supervisor

a. No. 254391

QUEENSLAND.

No. 175728

(C)

No. of PREVIOUS

Certificates of Title 147207
and 147208

REGISTER BOOK, VOL. 1060 FOLIO 210

VOL. 5 1060 FOR 215



11060216

CERTIFICATE OF TITLE.

Johannes Carl ~~John Charles~~ Hester

of Yplala, Farmer,

pursuant to Memorandum of Conveyance No. 428766 produced the Eleventh day of

May 1906, registered the twelfth day of May 1906 is now seized of

an Estate in Fee-Simple, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in

All that piece of Land situated in the County of Ward Parish of Albert

Being subdivision 1 of Subdivision A of portion 128

containing by admeasurement fifty acres two rods twenty-seven perches
more or less, commencing at the South-east corner of the subdivision and bounded thereon
the East by portion 240 bearing 5° thirty-two chains three links and eight tenths of a
link on the north by portion 231 bearing 270° 9' fifteen chains seventy-two links and
three tenths of a link on the north-west by a road bearing 225° 16' seven chains
forty-eight links and six tenths of a link on the south-west by subdivision two bearing
144° 33' thirty chains forty-eight links and three tenths of a link and on the south
by a line bearing 90° four chains three links to the point of commencement

originally granted by Deed of Grant No. 698014

to Heinrich Hester

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

In WITNESS whereof, I have hereunto signed my name and affixed my seal this Twelfth
day of June 1906 One thousand nine hundred and six

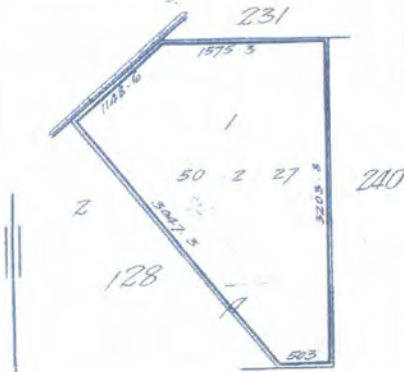
Signed, Sealed, and Delivered, the

day of June 1906 in presence of

Heinrich Hester
PARISH OF ALBERT

Heinrich Hester
REGISTRAR OF TITLES.

ABEYANCE
No. A 539020



Scale, 10 Chains per inch.

PURSUANT to Memo. of TRANSFER No. 539020 produced
7 May 1943 at 12.50 p.m., registered 24 May 1943
Heinrich Leonhard Hester

is now SEIZED of an Estate IN FEE
SIMPLE in the WHOLE of the within Land.

Heinrich Hester
REGISTRAR OF TITLES.

Names corrected to Johannes Carl
Hester, this 26 day of June 1914
vide Request No. 606 896
Dep. Registrar of Titles

Henry Arthur Healer

10

notified of an Estate in fee-simple in the within land.

Transfer No. *DH08375* Produced *19 Dec* 1966 at *9.11* a.m.

Registered *20 June 1967*

J. M. Miller

REGISTRAR OF TITLES

Th
04 08375
Decy 19-12-66

THE DESCRIPTION OF THE WITHIN LAND IS CONVERTED
 TO LOT(S) *1*

ON REGISTERED PLAN NO. *6882*

25 MAR 1986 *W. Byrne*

REGISTRAR OF TITLES

Albert
R.I.
S.A.
P. 12E

1060-216

VOL 5 910 FOL 197



10910197

b No. 20763

(C)

QUEENSLAND.

No. 147207

No. of PREVIOUS Certificate of Title 1071604



REGISTER BOOK, VOL. 910 FOLIO 197

CERTIFICATE OF TITLE.

*Christian Henry Hester*of *Yatala Farmer*

pursuant to Memorandum of Conveyance No. 301162— produced the *first*— day of *September* 1896 registered the *fourth*— day of *September*— 1896, is now seized of an Estate in Fee-simple, as tenant in common with *another*— in *one*— undivided *half* part or share, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in all that piece of Land situated in the County of *Hard*— Parish of *Albert*—

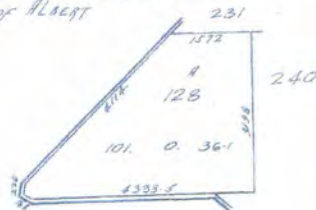
Being Subdivision A of Portion one hundred and twenty-eight containing by admeasurement one hundred and one acres thirty six perches and one tenth of a perch more or less, commencing at the north west corner of portion two hundred and forty and bounded thereon to the east by that portion bearing 180° 5' thirty one chains ninety eight links on the south by portion two hundred and forty and a road bearing west forty three chains thirty three links and half a link and 296° 14' one chain sixty eight links on the west and north west by a road bearing north two chains twenty six links 45° 8' forty one chains fourteen links and on the north by part of portion two hundred and thirty one bearing 90° 5' fifteen chains twenty two links to the point of Commencement.

which said piece of Land is *part*— of the *portion*— marked *128*— delineated in the Public Map of the said *parish*— deposited in the Office of the Surveyor-General, originally granted the *sixth*— day of *March* 1888 by — Deed of Grant No. *69804*— under the Seal of the Colony of *Queensland*— and the Hand of *Sir Anthony Musgrave, G.C.M.G.*— then Governor of the said Colony, to *Henrich Hester*—

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

In WITNESS whereof, I have hereunto signed my name and affixed my seal this *twelfth* day of *September*— One thousand eight hundred and *ninety six*—

Signed, Sent, and Delivered, the

day of *September* 1896, in presence ofSigned of *Albert*

Scale, 20 Chains per inch.



No. 278247 Bill of Mortgage produced 26 May 1894 at 11.45 a.m. registered 26 May 1894 from *Henrich Hester* to *The Commercial Banking Company of Australia* principal sum secured two hundred and fifty pounds and further advances with interest as therein stated Bill of Repayable with interest as therein stated

RELEASED
endorsed
No. 278247
31 May 1894
Dep. Registrar of Titles.

No 278252 Transfer of Bill of Mortgage No. 278247
produced 26 May 1894 at 11.30 a.m. registered
31 May 1894 from The Commercial Banking
Company of Sydney to the Commercial Banking Com-
pany of Sydney Limited.
W. J. P. Jones
Dep. Registrar of Titles.

No 28765 TRANSFER of 50 Acres 2nd 2nd Sec. 2.
Christian Henry Hester produced
11 May 1896 at 3.36 p.m. registered 29 May 1896
Cancelled as above vide
Vol. 260 Fol. 218
W. J. P. Jones
Dep. Registrar of Titles.

No 28766 TRANSFER of 50 Acres 2nd 2nd Sec. 1.
John Charles Hester produced
11 May 1896 at 3.37 p.m. registered 29 May 1896
Cancelled as above vide
Vol. 260 Fol. 218
W. J. P. Jones
Dep. Registrar of Titles.

50 2-21-9
50 2-21-9
101-2-28

FULLY CANCELLED

VOL. 5 910 FOL. 198



QUEENSLAND.

No. 147208

(C)

No. of Previous

Certificate of Title 1077618

REGISTER BOOK, Vol. 4

FOLIO. 198



CERTIFICATE OF TITLE.

John Charles Hester

of Yakola, Farmer

pursuant to Memorandum of Conveyance No. 20162 — produced the first — day of September 1896
registered the fourth — day of September — 1896, is now seized of an Estate in Fee-simple, as tenant
in common with another — in one — undivided half part or share, subject nevertheless to such
encumbrances, liens, and interests, as are by memorandum notified hereon, in All that piece of Land situated in the County
of Hard — Parish of Albert —

Being subdivision A of Porhon one hundred and twenty eight
containing by admeasurement one hundred and one acres thirty six perches and one tenth of an acre
more or less, commencing at the north west corner of porhon two hundred and forty and bounded
thence on the east by that porhon bearing $N 80^{\circ} 5'$ thirty one chains ninety eight links on
the south by porhon two hundred and forty and a road bearing west forty three chains
thirty three links and half a link and $296^{\circ} 14'$ one chain sixty eight links on the
west and north west by a road bearing north two chains twenty six links $N 45^{\circ} 8'$
forty one chains fourteen links and on the north by part of porhon two hundred and
thirty one bearing $90^{\circ} 5'$ fifteen chains twenty two links to the point of commence-
ment.

which said piece of Land is part of the pothorn
marked 128 delineated in the Public Map of the said parish
deposited in the Office of the Surveyor-General, originally granted the sixth day of March 1888
by Deed of Grant No. 69804 under the Seal of the Colony of Queensland
and the Hand of Sir Anthony Musgrave, G.C.M.G. then
Governor of the said Colony, to Herrick Hester

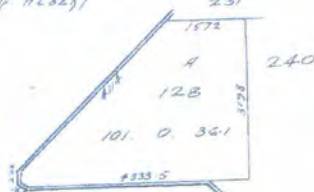
Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

IN WITNESS whereof, I have hereunto signed my name and affixed my seal this Twelfth
day of September One thousand eight hundred and ninety Six

Signed, Sealed, and Delivered, the 1st
day of September 1896 in presence of

day of September 1878, in presence of
R. Miller
 Parish of ALBERT 23

Parish of ALBERT



Scale. 20 Chains per inch.



REGISTER OF TITLE

No. 278247 Bill of Mortgage produced 26 May
 1894 at 11.15 a.m. registered 31 May 1894
 from ~~James Alexander & Co. Ltd.~~ ~~James Alexander & Co. Ltd.~~ ~~James Alexander & Co. Ltd.~~
 to ~~James Alexander & Co. Ltd.~~ ~~James Alexander & Co. Ltd.~~ ~~James Alexander & Co. Ltd.~~
 principal sum of Two hundred and fifty
 pounds and further advances
 Repayable with interest as
 there stated.
 No. 278247
 Dec. Registrar of Titles.

No 278252 Transfer of Bill of Mortgage No 278247
produced 26 May 1894 at 11.20 a.m. registered
31 May 1894 from The Commercial Bank &
Company of Sydney to the Commercial Banking Com-
pany of Sydney Limited

Chapman
Dep. Registrar of Titles

No 278765 TRANSFER of 50 Acres 2nd Sec 2
to Christian Henry Nester produced
11 May 1906 at 3.45 p.m. registered 29 May 1906
Cancelled as above vide
Vol. 1060 Fol. 218 } *W. Nester*
Dep. Registrar of Titles

no 2
no 1
15/5/06

No 278766 TRANSFER of 50 Acres 2nd Sec 1
to John Charles Nester produced
11 May 1906 at 3.45 p.m. registered 29 May 1906
Cancelled as above vide
Vol. 1060 Fol. 216 } *W. Nester*
Dep. Registrar of Titles

FULLY CANCELLED

No. 69804
 County Ward
 Parish Albert
 Number and Date of Surrendered Grant 39623
13th May 1899
 Date of Surrender 23rd April 1899
 Area 101 ac. 10 r. 5 p.

QUEENSLAND.

A DEED OF GRANT UNDER THE PROVISIONS OF "THE CORRECTED TITLES TO LAND ACT OF 1882."—

Country Lot.

WITNESSED, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—

WE ARE to whom these Presents shall come, Granting:

WHEREAS, in pursuance of the provisions of an Act of Parliament of Our Colony of Queensland styled "The Corrected Titles to Land Act of 1882," Her Majesty Queen Victoria of the Owner thereof, has surrendered to Us, All that Piece or Parcel of Land in Our said Colony of Queensland, containing by Admeasurement One hundred Acres be the same more or less, situated in the County of Ward and Parish of Albert
Portion One hundred and twenty eight described in Deed of Grant No 39623 dated 13th May 1899

in consideration that a new Deed of Grant with the Description hereinafter contained should issue: John Fawcett Esq. That for the considerations aforesaid, and in further consideration of the Quit-Rent hereinafter reserved, We, with the advice of the Executive Council of Our said Colony, have Granted, and for Us, Our Heirs and Successors, do hereby Grant, unto the said Her Majesty Queen Victoria h/s Administrators and Assigns, subject to the several and respective Reservations hereinafter mentioned, All that

Piece or Parcel of Land in Our said Colony, containing by Admeasurement One hundred and one acres one rood five perches be the same more or less, situated in the County of Ward and Parish of Albert
Portion One hundred and twenty eight
Being the land granted under the 2nd section of "The Corrected Titles to Land Act of 1882"
commencing at the southwest corner of section One hundred and twenty one and bounded
thence on the north by that portion bearing ninety degrees five minutes fifteen chains and
south by two links on the east by a line bearing one hundred and eighty degrees five
minutes thirty one chains and ninety eight links to the south by a line bearing West
forty four chains and eighty four links and on the West and Northwest by a road bearing
North three chains and half a link and forty five degrees eight minutes forty one chains
and fourteen links to the point of commencement

VOL. 5 595 VOL. 54



10695064

with all the Rights and Appurtenances whatsoever thereto belonging: To Hold unto the said Her Majesty Queen Victoria h/s Administrators and Assigns for ever,

Yielding and Paying therefor Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded: But Subject Notwithstanding to the several Conditions and Reservations contained and deduced in the Laws of Our said Colony in that behalf: In Testimony Whereof, We have caused this Our Grant to be Sealed with the Seal of Our said Colony.

WITNESS Our Trusty and Well-beloved Sir ANTHONY MURRAY, Knight Grand Cross of the Most Distinguished Order of St. Michael and St. George, Governor and Commander-in-Chief of the Colony of QUEENSLAND and its Dependencies, at Government House, Brisbane, in QUEENSLAND aforesaid, this sixth day of March in the fifty first year of Our Reign, and in the year of our Lord One thousand eight hundred and eighty-eight.

ENTERED in the Register Book
 day of March 1888.

Vol. 695, Folio 64, this eighth

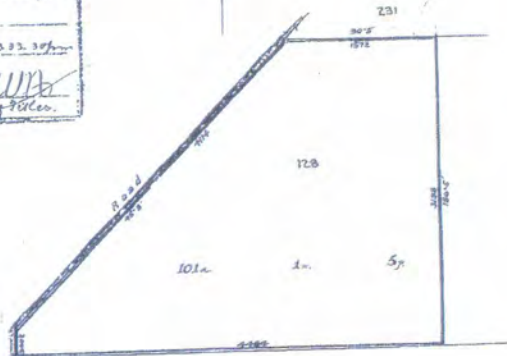
96-7-067.

Amphlett
Edwards
 Secy. REGISTRAR OF TITLES

Parish of Albert

179.506 101 ac 36 tows. sub. A.
1st March 1909 at 3.02.30 pm
J. L. Brown
Clerk Registrar of Deeds

J. L.



Scale 10 chains to an inch
M.S.D. 1844

J. L.

FULLY CANCELLED

HISTORICAL TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10624988
Search Date: 09/12/2010 11:03

Title Reference: 10526129
Date Created: 08/12/1884

REGISTERED OWNER

Interest

Dealing No: 709915914 07/09/2006

PATRICIA ANN HESTER
WILLIAM ARTHUR HESTER

1/2
1/2

AS TENANTS IN COMMON

TRANSFER No 709915914
PATRICIA ANN HESTER TENANT IN COMMON 1/2
WILLIAM ARTHUR HESTER TENANT IN COMMON 1/2
Lodged at 09:44 on 07/09/2006

TRANSMISSION BY DEATH No 707193834
PATRICIA ANN HESTER
PERMANENT TRUSTEE COMPANY LIMITED A.C.N. 000 000 993
PERSONAL REPRESENTATIVE
UNDER INSTRUMENT 707193834
Lodged at 09:08 on 14/11/2003

TRANSFER No 709414925 FULLY WITHDRAWN ON 14/03/2006
Lodged at 16:19 on 06/03/2006

TRANSMISSION BY DEATH No 709414905 FULLY WITHDRAWN ON 14/03/2006
Lodged at 16:12 on 06/03/2006

ESTATE AND LAND

Estate in Fee Simple

LOT 240 CROWN PLAN W31320
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. APPLICATION FOR TITLE No 713375783
A Certificate of Title has been issued
Lodged at 15:43 on 27/07/2010
2. AMENDMENT OF LEASE No 713369769
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL
Lodged at 14:54 on 23/07/2010
3. APPLICATION FOR TITLE No 713111892
A Certificate of Title has been issued
Lodged at 15:22 on 11/03/2010
4. AMENDMENT OF LEASE No 713076568
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL
Lodged at 15:03 on 23/02/2010

HISTORICAL TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10624988
Search Date: 09/12/2010 11:03

Title Reference: 10526129
Date Created: 08/12/1884

EASEMENTS, ENCUMBRANCES AND INTERESTS

5. CHANGE OF NAME No 713027062
LEASE: 707931618
AMGROW PTY LIMITED A.C.N. 069 900 456
Lodged at 12:03 on 01/02/2010
6. CORRECTION No 711592843
to remove
LEASE NO 705630839
Lodged at 13:40 on 21/04/2008
7. CORRECTION No 711592841
OF THE ENDORSEMENT FOR LEASE NO 707931618 FROM:
ENVIRONGREEN PTY LIMITED A.C.N. 069 900 456
OF LEASE A ON SP 125788
Lodged at 13:39 on 21/04/2008
8. APPLICATION FOR TITLE No 711561747
A Certificate of Title has been issued
Lodged at 15:28 on 08/04/2008
9. LEASE No 707931618
ENVIROGREEN PTY LIMITED A.C.N. 069 900 456
OF LEASE A ON SP 125788
TERM: 01/07/2005 TO 30/06/2010 OPTION 5 YEARS
Lodged at 10:43 on 29/07/2004
10. LEASE No 705630839 CANCELLED BY 711592843
ENVIROGREEN PTY LIMITED A.C.N. 069 900 456
LEASE A ON SP125788
Lodged at 09:11 on 20/05/2002
11. SURVEY PLAN No 705630821
subdivides
THE LAND INTO LEASE A ON SP125788
Lodged at 09:08 on 20/05/2002
12. APPLICATION FOR TITLE No 701180011
A duplicate copy of this Title has been requested.
Lodged at 14:29 on 27/02/1996
13. LEASE No 701089103
to
ENVIROGREEN PTY LIMITED
Original term commencing
01/07/1995
Terminating
30/06/1998
with options as therein stated over part of the land
Lodged at 14:28 on 03/01/1996
14. Rights and interests reserved to the Crown by
Deed of Grant No. 10526129 (SEL 814)

HISTORICAL TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10624988

Search Date: 09/12/2010 11:03

Title Reference: 10526129

Date Created: 08/12/1884

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 30/07/2010 713375783 Certificate No. 5

Caution - Charges do not necessarily appear in order of priority

** End of Historical Title Search **

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Requested By: External Supervisor

No. 6009

(C)

QUEENSLAND

No. 1077/64

No. of Previous Deed of Grant 69804



Register Book, Vol.

699 Folio 4

CERTIFICATE OF TITLE.

Heinrich Hester

of Yatala

pursuant to Memorandum of Request No. 147506 received the fourteenth day of March A.D. 1888, is now seized

of an Estate in Fee Simple, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in All that piece of Land situated in the County

of Ward Parish of Albert

Being Subdivision A of Portion 128

containing by admeasurement One hundred and one acre thirty six perches and one tenth of a perch more or less, commencing at the Northwest corner of Portion Two hundred and forty and bounded thence on the East by that Portion bearing 180° 5' thirty one chains ninety eight links On the South by Portion Two hundred and forty and a road bearing West Forty three chains thirty three links and one half of a link and 296° 12' One chain sixty eight links On the West and Northwest by a road bearing North two chains twenty six links 145° 8' four one chain sixteen links and on the North by part of Portion Two hundred and thirty one bearing 90° 5' fifteen chains seventy two links to the point of commencement.

which said piece of Land is part of the Portion

marked 128 delineated in the Public Map of the said Parish

deposited in the Office of the Surveyor-General, originally granted the sixth day of March 1888

by Deed of Grant, No. 69804 under the Seal of the Colony of Queensland

and the Hand of Sir Anthony Musgrave G.C.M.G.

Governor of the said Colony, to Heinrich Hester.

Having always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

In WITNESS whereof, I have hereunto signed my name and affixed my seal this twenty ninth day of March One thousand eight hundred and eighty eight.

Signed, Sealed, and Delivered, the 29 day of March 1888, in presence of

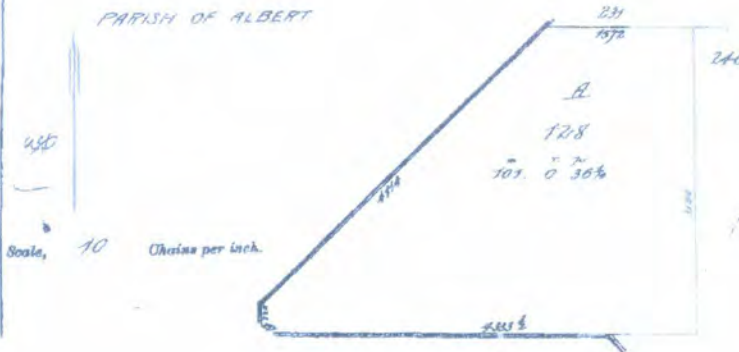
At

A. Mills

REGISTRAR OF TITLES.



PARISH OF ALBERT



No. 278247 Bill of Mortgage produced 26 May 1894 at 11 15 a. m. registered 31 May 1894 from Heinrich Hester to the Commercial Banking Company of Sydney — principal sum secured Two hundred and fifty pounds plus further advanced Repayable with interest as therein stated.

Heinrich Hester
Dep. Registrar of Titles.

No 278252 Transfer of Bill of Mortgage No 278247 produced 26 May 1894 at 4 30 p. m. registered 31 May 1894 from The Commercial Banking Company of Sydney to the Commercial Banking Company of Sydney Limited.

Heinrich Hester
Dep. Registrar of Titles.

No. 301162 TRANSFER of the whole of the land to *Christian Henry Hester and John Charles Hester* produced 11 Sep 1894 at 10 30 a. m. registered 22 Sep 1894 Subject to Mortgage No 278247. Canceled in full 11 Sep 1894.

Christian Henry Hester and John Charles Hester
Vide Vol. 12, p. 127. Dep. Registrar of Titles.

FULLY CANCELLED

No. 57619

QUEENSLAND.

FORM No. 1.

County WardParish AlbertDate of Purchase 2nd August 1875Area 130 acres

A. LAND PURCHASE.

WEEDS, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—

TO ALL to whom these Presents shall come, Greeting.

WHEREAS, in conformity with the Regulations now in force for the Alienation of Crown Lands in Our Territory of Queensland:

Peter Driscoll of the Land hereinafter described, for the Sum of Thirty two pounds Ten Shillings Sterling:

Now Know Ye, That for and in consideration of the said Sum, for and on Our behalf well and truly paid into the Colonial Treasury of Our said Territory, before these Presents are issued, And in further consideration of the Quit-Rent hereinafter reserved, We, with the advice of Our Executive Council of Queensland, have granted, and for Us, Our Heirs and Successors, do hereby Grant unto the said

Peter Driscoll his Heirs and Assigns, subject to the several and respective Reservations hereinafter mentioned, All that

Piece or Parcel of Land in Our said Territory, containing by Admeasurement One hundred and thirty acres be the same more or less, situated in the County of Ward and Parish of Albert

Selection Eight hundred and fourteen Beenleigh District Portion Two hundred and forty Commencing on the left bank of Sandy Creek at a point five chains and ninety one links South from the Southwest corner of portion Two hundred and forty eight and bounded thence on the East by a line and that portion bearing North fifty four chains and sixty eight links on the North by that portion and portion Two hundred and thirty one bearing West twenty six chains and eighty one links on the West by portion One hundred and twenty eight bearing South thirty one chains and eighty two links and West eight chains and thirty three links on the Southwest by a road bearing one hundred and twenty nine degrees thirty one chains and two hundred and eleven degrees forty one links to Sandy Creek and thence by that Creek downwards to the point of commencement: exclusive of a surveyed road as shown on plan of Survey deposited in the Surveyor General's Office Being the land selected under the 16th Section of "The Crown Lands Alienation Act of 1868"

with all the Rights and Appurtenances whatsoever thereto belonging: To hold unto the said Peter Driscoll his Heirs and Assigns for ever,

Yielding and paying therefor Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded: Provided Nevertheless, and We do hereby Reserve unto Us, Our Heirs and Successors, all such parts and so much of the said Land as may hereafter be required for making Public Ways, Canals, or Railroads, in, over, and through the same, to be set out by Our Governor for the time being of Our said Territory, or some person by him authorised in that respect; And also all Sand, Clay, Stone, Gravel, and Indigenous Timber, and all other Materials, the natural produce of the said Land, which may be required at any time or times hereafter for the construction and repair of any Public Ways, Bridges, Canals, and Railroads, or any Fences, Embankments, Dams, Sewers, or Drains, necessary for the same, together with the right of taking and removing all such Materials; And We do hereby further Reserve unto Us, Our Heirs and Successors, the right of full and free ingress, egress, and regress, into, out of, and upon the said Land, for the several purposes aforesaid: In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said Territory.

WITNESSE Our Trusty and Well-beloved Sir ANTHONY MURRAY, Knight Commander of the Most Distinguished Order of St. Michael and St. George, Governor and Commander-in-Chief of the Colony of QUEENSLAND and its Dependencies, at Government House, Brisbane, in the County of Port Phillip this 10th day of December year of Our Reign, and in the year of our Lord One thousand eight hundred and eighty

ENTERED in the Register Book
day of December

Vol. 5526 Folio 129 this light
15th 1884

VOL. 5 526 VOL. 129



10526129

REGISTERED

Appendix F: Government searches

QLD DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)**

Transaction ID: 1273545 EMR Site Id: 3579 22 November 2010
This response relates to a search request received for the site:
Lot: 1 Plan: RP6882

EMR RESULT

The above site IS included on the Environmental Management Register.
Lot: 1 Plan: RP6882
Address: 7044 STAPYLTON/JACOBS WELL RD
STAPYLTON 4207

The site has been subject to the following Notifiable Activity pursuant to section 374 of the *Environmental Protection Act 1994*.
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The EPA may hold further information relating to the location of the dip site within this property.

CLR RESULT

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

ADDITIONAL ADVICE

EMR/CLR Searches may be conducted online through the State Government Website www.smartservice.qld.gov.au or Citec Confirm www.confirm.com.au.

If you have any queries in relation to this search please phone (07) 3330 5685.

Darryl Byers
Registrar, Contaminated Land Unit

QLD DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT

**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)**

Transaction ID: 1273548 EMR Site Id: 22 November 2010
This response relates to a search request received for the site:
Lot: 240 Plan: W31320

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

**EMR/CLR Searches may be conducted online through the State Government
Website www.smartservice.qld.gov.au or Citec Confirm www.confirm.com.au.**

If you have any queries in relation to this search please phone (07) 3330 5685.

Darryl Byers
Registrar, Contaminated Land Unit

DIP WASH ANALYSIS REPORT

FROM:
Chemical Residue Laboratory
Block 10, Level 2
Health and Food Sciences Precinct
39 Kessels Road
Coopers Plains Qld 4108

Date of Report 3/02/2011
Property Number: QBGC0048
PROPERTY DIP NAME HESTER
Submitter Reference
or
Collection Date

HESTER HA
60 JACOBS WELL RD
STAPYLTON 4207

RESULTS

LABORATORY NUMBER	ANALYSIS DATE	CHEMICAL COMPONENTS	ANALYSIS RESULT (%)	RECOMMENDED STRENGTH (%)
AM7621	7/06/2001	AMITRAZ	0.026	0.025
		LIME	0.74	

Note: The results reported pertain only to the samples submitted to the laboratory.
All enquiries should be directed to your local Department of Primary Industries office.

SIGNED: _____ DATE: 3/02/2011

Cameron Kath
Laboratory Technician

END OF LABORATORY REPORT

DIP MANAGEMENT ADVICE:

Listed below are the dip details supplied with sample.

Please advise DPI if incorrect!!

Capacity of dip at maximum working level.	9000	Litres
Volume of dip when sampled :	7000	Litres
Product used :	TAKTIC WP	

Due to the variability of sampling techniques and limitations of laboratory analysis any dip analysis result within 10% of the recommended working concentration indicates that the dip fluid sampled contains a satisfactory amount of active chemical.

Note: If water and / or chemical and /or if animals have been dipped since submission of the sample reported above, the following recommendations may not apply.

Information supplied indicates that water can be added to the dip to give a concentration within 10% of the recommended working concentration.

The amount of water to be added is given below.

280.0 Litres

1.7 [Litres of product] or [500 gram packs of product] required for top up water after the dip is normalised.

Since the volume of the dip was extra low, details of chemical (above) and extra water to add (below) are given.

1720.0 Litres of water.

Enquiries to: YOUR LOCAL DPI OFFICE Our Ref: Dip Analysis AM7621
ANIMAL AND PLANT HEALTH SERVICE DIP DATA BASE

DIP WASH ANALYSIS REPORT**FROM:**

Chemical Residue Laboratory
Block 10, Level 2
Health and Food Sciences Precinct
39 Kessels Road
Coopers Plains Qld 4108

Date of Report 3/02/2011
Property Number: QBGC0048
PROPERTY DIP NAME HESTER
Submitter Reference
or 30/01/2002
Collection Date

HESTER HA
60 JACOBS WELL RD
STAPYLTON 4207

RESULTS

LABORATORY NUMBER	ANALYSIS DATE	CHEMICAL COMPONENTS	ANALYSIS RESULT (%)	RECOMMENDED STRENGTH (%)
AM8265	30/01/2002	AMITRAZ	0.023	0.025
		LIME	0.7	

Note: The results reported pertain only to the samples submitted to the laboratory.

All enquiries should be directed to your local Department of Primary Industries office.

SIGNED: _____ DATE: 3/02/2011

Cameron Kath

Laboratory Technician

END OF LABORATORY REPORT

DIP MANAGEMENT ADVICE:

Listed below are the dip details supplied with sample.

Please advise DPI if incorrect!!

Capacity of dip at maximum working level. 9000 Litres

Volume of dip when sampled : 8000 Litres

Product used : TAKTIC WP

Due to the variability of sampling techniques and limitations of laboratory analysis any dip analysis result within 10% of the recommended working concentration indicates that the dip fluid sampled contains a satisfactory amount of active chemical.

Note: If water and / or chemical and /or if animals have been dipped since submission of the sample reported above, the following recommendations may not apply.

The analysis shows that the fluid analysed from your dip is within 10% of the recommended working concentration.

Since the analysis result shows the chemical level to be LOWER than the working concentration, you will need to add chemical to the dip.

The number of 500 gram packs of product above is given.

1000.0 Litres of water.

The amount of chemical includes chemical required to top up the dip with water.

1.6 Number of 500 gram packs of product above required.

Refer to manufacturers directions for use of stabilizer (hydrated lime).

Enquiries to: **YOUR LOCAL DPI OFFICE** Our Ref: Dip Analysis AM8265

ANIMAL AND PLANT HEALTH SERVICE

DIP DATA BASE

DIP WASH ANALYSIS REPORT

FROM:
Chemical Residue Laboratory
Block 10, Level 2
Health and Food Sciences Precinct
39 Kessels Road
Coopers Plains Qld 4108

Date of Report 3/02/2011
Property Number: QBGC0048
PROPERTY DIP NAME HESTER
Submitter Reference
or
Collection Date

HESTER HA
60 JACOBS WELL RD
STAPYLTON 4207

RESULTS

LABORATORY NUMBER	ANALYSIS DATE	CHEMICAL COMPONENTS	ANALYSIS RESULT (%)	RECOMMENDED STRENGTH (%)
AM9210	16/01/2003	AMITRAZ	0.035	0.025
		LIME	> 0.8	

Note: The results reported pertain only to the samples submitted to the laboratory.
All enquiries should be directed to your local Department of Primary Industries office.

SIGNED: _____ DATE: 3/02/2011

Cameron Kath
Laboratory Technician

END OF LABORATORY REPORT

DIP MANAGEMENT ADVICE:

Listed below are the dip details supplied with sample.

Please advise DPI if incorrect!!

Capacity of dip at maximum working level.	9000	Litres
Volume of dip when sampled :	8000	Litres
Product used :	TAKTIC WP	

Due to the variability of sampling techniques and limitations of laboratory analysis any dip analysis result within 10% of the recommended working concentration indicates that the dip fluid sampled contains a satisfactory amount of active chemical.

Note: If water and / or chemical and /or if animals have been dipped since submission of the sample reported above, the following recommendations may not apply.

Since the analysis result shows the chemical level to be HIGHER than the working concentration, you will need to add water to the dip.

The amount of water to be added is given below.

High Analysis: water to be added:	1000.0	Litres
-----------------------------------	--------	--------

The expected dip concentration after water is added is given. 0.031%

The possibility of the level being toxic is UNKNOWN. Should you require further clarification please contact the manufacturer.

Refer to manufacturers directions for use of stabilizer (hydrated lime).

Enquiries to: **YOUR LOCAL DPI OFFICE** Our Ref: Dip Analysis AM9210
ANIMAL AND PLANT HEALTH SERVICE **DIP DATA BASE**

DIP WASH ANALYSIS REPORT

FROM:
Chemical Residue Laboratory
Block 10, Level 2
Health and Food Sciences Precinct
39 Kessels Road
Coopers Plains Qld 4108

Date of Report 3/02/2011
Property Number: QBGC0048
PROPERTY DIP NAME HESTER
Submitter Reference
or 15/11/2003
Collection Date

HESTER HA
60 JACOBS WELL RD
STAPYLTON 4207

RESULTS

LABORATORY NUMBER	ANALYSIS DATE	CHEMICAL COMPONENTS	ANALYSIS RESULT (%)	RECOMMENDED STRENGTH (%)
AM10014	21/11/2003	AMITRAZ	0.018	0.025

LIME > 0.8

Note: The results reported pertain only to the samples submitted to the laboratory.

All enquiries should be directed to your local Department of Primary Industries office.

SIGNED: _____ DATE: 3/02/2011

Cameron Kath

Laboratory Technician

END OF LABORATORY REPORT

DIP MANAGEMENT ADVICE:

Listed below are the dip details supplied with sample.

Please advise DPI if incorrect!!

Capacity of dip at maximum working level. 9000 Litres

Volume of dip when sampled : 8000 Litres

Product used : AMITIK

Due to the variability of sampling techniques and limitations of laboratory analysis any dip analysis result within 10% of the recommended working concentration indicates that the dip fluid sampled contains a satisfactory amount of active chemical.

Note: If water and / or chemical and /or if animals have been dipped since submission of the sample reported above, the following recommendations may not apply.

Since the analysis result shows the chemical level to be LOWER than the working concentration, you will need to add chemical to the dip.

The number of 500 gram packs of product above is given.

1000.0 Litres of water.

The amount of chemical includes chemical required to top up the dip with water.

3.2 Number of 500 gram packs of product above required.

Refer to manufacturers directions for use of stabilizer (hydrated lime).

Enquiries to: **YOUR LOCAL DPI OFFICE** Our Ref: Dip Analysis AM10014
ANIMAL AND PLANT HEALTH SERVICE **DIP DATA BASE**

PROPERTY NUMBER:	DATE:	LAB NUMBER:	DIP NAME:	PRODUCT:	ANALYSIS:
QBGC0048	7/06/2001	AM7621	HESTER	TAKTIC WP	0.026
QBGC0048	30/01/2002	AM8265	HESTER	TAKTIC WP	0.023
QBGC0048	16/01/2003	AM9210	HESTER	TAKTIC WP	0.035
QBGC0048	21/11/2003	AM10014	HESTER	AMITIK	0.018



Enquiry Confirmation

Job No. 4456461

PO Box 378
Abbotsford VIC 3067
Phone: 1100

To: Mr David Bayel
Company: ADG Consulting Pty Ltd
Address: PO Box 4372
Robina Town Centre Qld 4230

Caller ID: 895178
Phone: 0755591930
Mobile: 0422425601
Fax No: 0755591920
Email: mail@adgconsulting.com.au

Dig Site Details

Warning: The map below only displays the location of the proposed dig site and does not display any asset owner's pipes or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly. Asset owners aim to provide you with details of their assets within 2 working days.

Enquiry Date: 2/02/2011 4:34:42 PM
Start Date: 5/02/2011
Address: 60 Stapylton Jacobs Well Rd
Stapylton QLD 4207
Intersection: Not Specified



- Check that the location of the dig site is correct. If not you **MUST** submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Map Ref: UbdBris 285A9

Additional work site information:

Visit our new Web site - www.dialbeforeyoudig.com.au (QLD)

Your Responsibilities and Duty of Care

- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you **MUST** advise the asset owner immediately.
- By using this service, you agree to the terms and disclaimers set out at www.1100.com.au.
- **For more information on safe excavation practices, visit www.1100.com.au**

Asset Owner Details

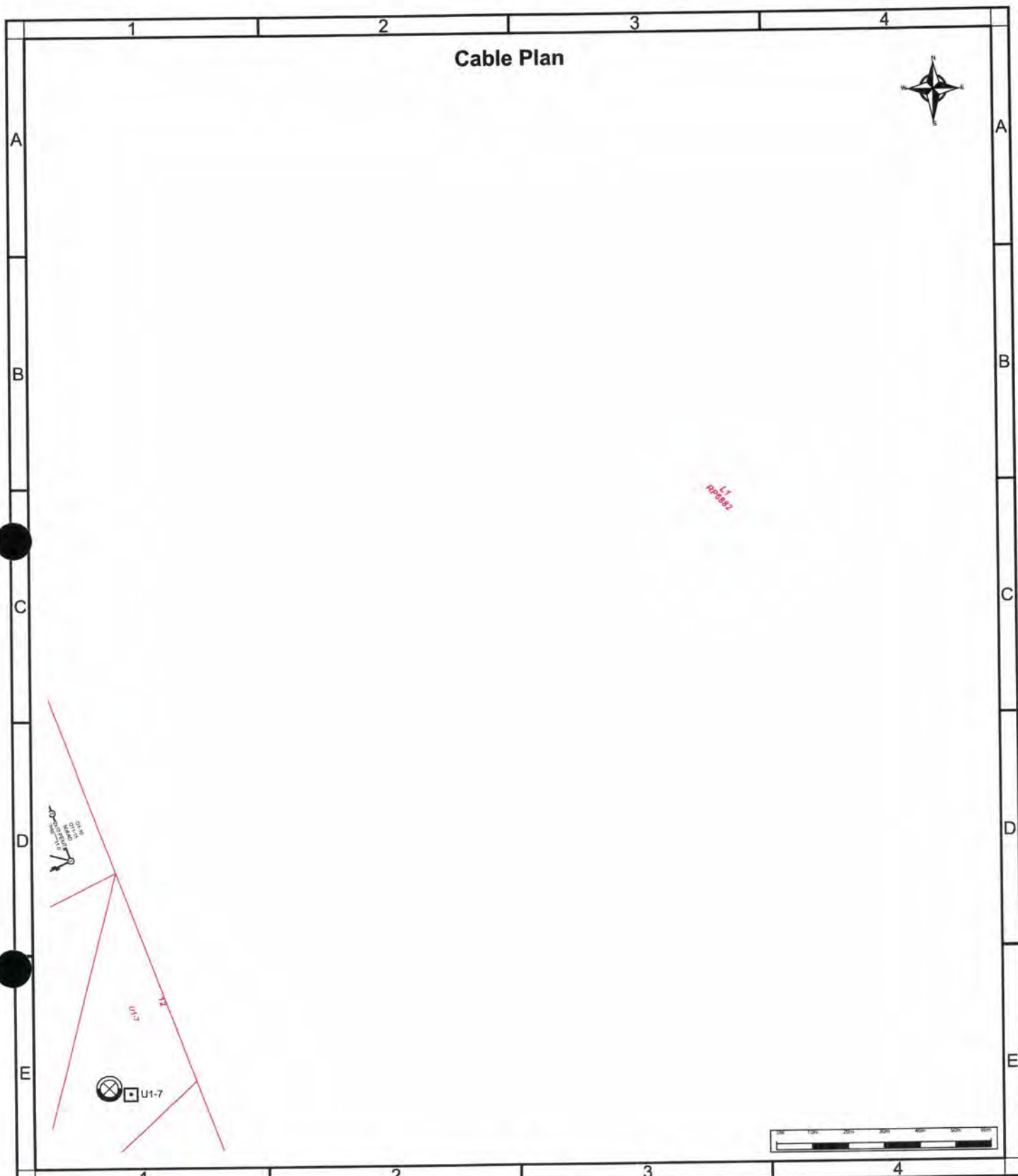
The asset owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post.

Seq No.	Asset Owner	Contact No	Notification Status
20574066	Telstra QLD, South East	1800653935	Notified

** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.

Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

LODGE YOUR FREE ENQUIRY ONLINE – 24 HOURS A DAY, SEVEN DAYS A WEEK



	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 20574066
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	Exchange Area: BEEL	
Generated On 02/02/2011 17:04:57		

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



Enquiry Confirmation

Job No. 4496938

PO Box 378
Abbotsford VIC 3067
Phone: 1100

To: Mr David Bayel
Company: ADG Consulting Pty Ltd
Address: PO Box 4372
Robina Town Centre Qld 4230

Caller ID: 895178
Phone: 0755591930
Mobile: 0422425601
Fax No: 0755591920
Email: mail@adgconsulting.com.au

Dig Site Details

Warning: The map below only displays the location of the proposed dig site and does not display any asset owner's pipes or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Asset owners aim to provide you with details of their assets within 2 working days.



Enquiry Date: 22/02/2011 10:14:31 AM
Start Date: 24/02/2011
Address: 82 Christensen Rd
Stapylton QLD 4207
Intersection: Not Specified

- Check that the location of the dig site is correct. If not you **MUST** submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Map Ref: UbdBris

285D8;285C8;285B8;285D9;285C9;285B9;285D10;285C10;285B10;285A10;285D11;285C11;285B11;285A11;285C12;285B12

Additional work site information: 240/W31320

Visit our new Web site - www.dialbeforeyoudig.com.au (QLD)

Your Responsibilities and Duty of Care

- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you **MUST** advise the asset owner immediately.
- By using this service, you agree to the terms and disclaimers set out at www.1100.com.au.
- **For more information on safe excavation practices, visit www.1100.com.au**

Asset Owner Details

The asset owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post.

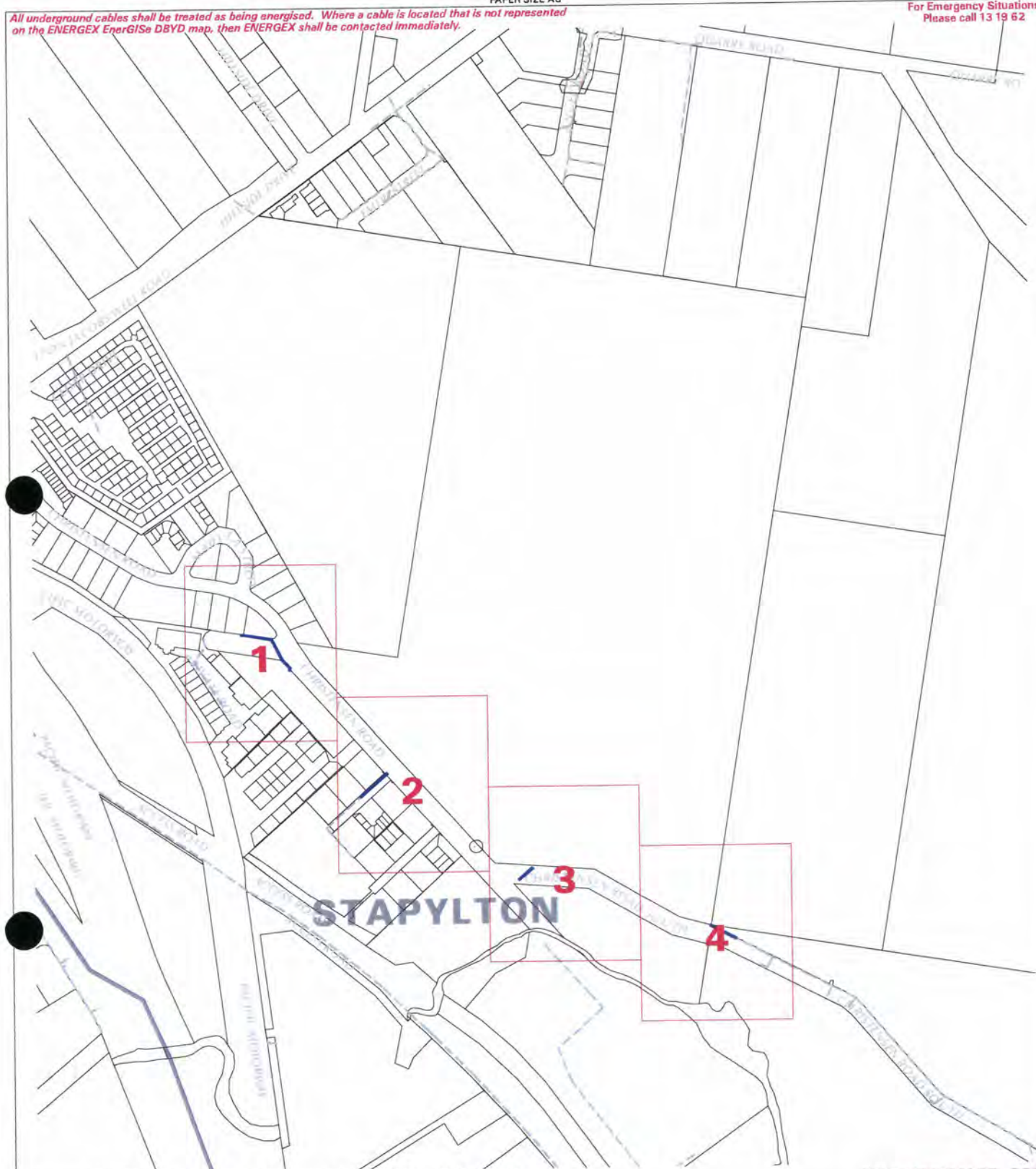
Seq No.	Asset Owner	Contact No	Notification Status
20749350	Energex, Electricity (Qld)	0734076381	Notified
20749349	Telstra QLD, South East	1800653935	Notified

** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.

Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

LODGE YOUR FREE ENQUIRY ONLINE - 24 HOURS A DAY, SEVEN DAYS A WEEK

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.



This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

UNCONTROLLED COPY



Date: 22 Feb 11 Time: 09.24.56
Requested By: DBYD

NOT TO SCALE

Enquiry No: 20749350

KEY MAP

PAPER SIZE A3

LOCALITY DIAGRAM



All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.



This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

UNCONTROLLED COPY

	Ground Transformer		Street Light Pole		Cable Voltage Less Than 33kV
	Cubicle Transformer		Earth		Cable Voltage 33kV or Higher
	Ring Main Unit		Works Order Polygon		Direct-Lay Cable
	Metering Unit		Conduit		Multi-Section Duct
	Link Pillar		Trench		Cable Tray
	Service Pillar		Cable Marker		
	Junction Pillar				
	Pit				
	Cable Joint				
	Cable Termination				
	Cable Marker				



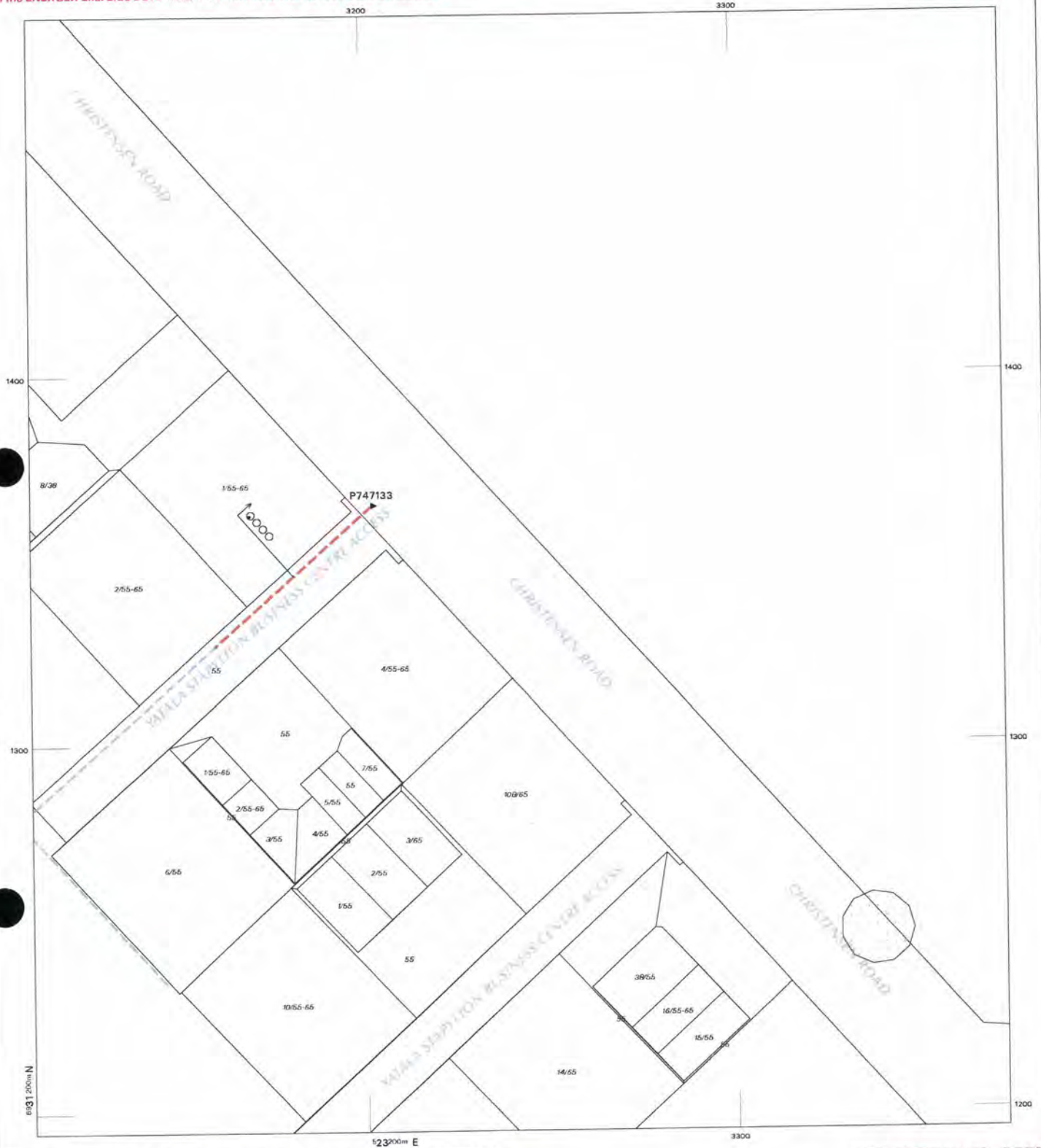
Date: 22 Feb 11 Time: 09.25.08
Requested By: DBYD

SCALE 1:1000

Enquiry No: 20749350
STRIP No: 1



All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.



This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

UNCONTROLLED COPY

	Ground Transformer		Street Light Pole		Cable Voltage Less Than 33kV
	Cubicle Transformer		Earth		Cable Voltage 33kV or Higher
	Ring Main Unit		Works Order Polygon		Direct-Lay Cable
	Metering Unit				Conduit
	Link Pillar				Multi-Section Duct
	Service Pillar				Trench
	Junction Pillar				Cable Tray
	Pit				Tunnel
	Cable Joint				
	Cable Termination				
	Cable Marker				



Date: 22 Feb 11 Time: 09.25.24
Requested By: DBYD

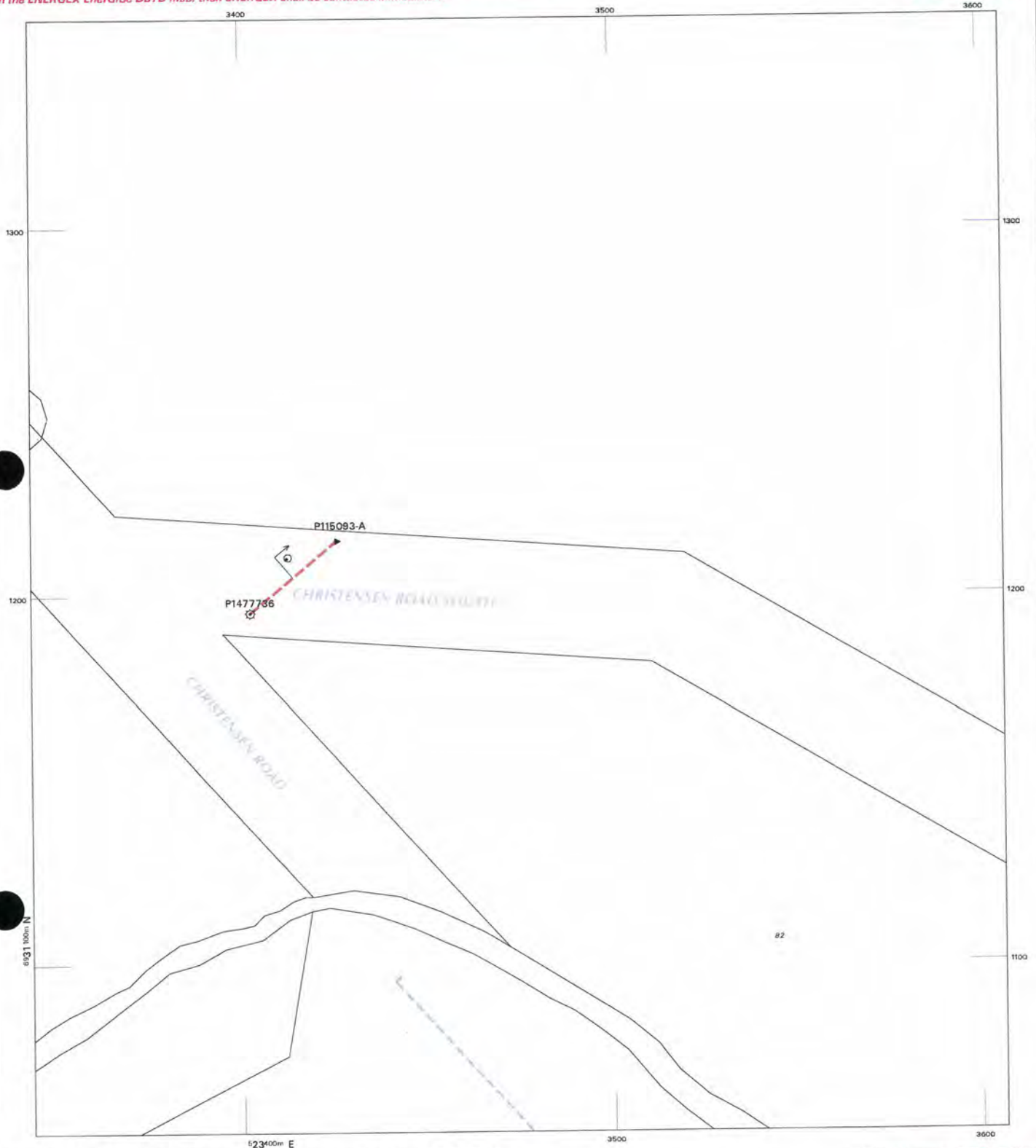
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Enquiry No: 20749350

STRIP No: 2



All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.



This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

- | | | |
|---------------------|---------------------|------------------------------|
| Ground Transformer | Street Light Pole | Cable Voltage Less Than 33kV |
| Cubicle Transformer | Earth | Cable Voltage 33kV or Higher |
| Ring Main Unit | Works Order Polygon | Direct-Lay Cable |
| Metering Unit | | Conduit |
| Link Pillar | | Multi-Section Duct |
| Service Pillar | | Trench |
| Junction Pillar | | Cable Tray |
| Pit | | Tunnel |
| Cable Joint | | |
| Cable Termination | | |
| Cable Marker | | |



Date: 22 Feb 11 Time: 09:25:39
Requested By: DBYD

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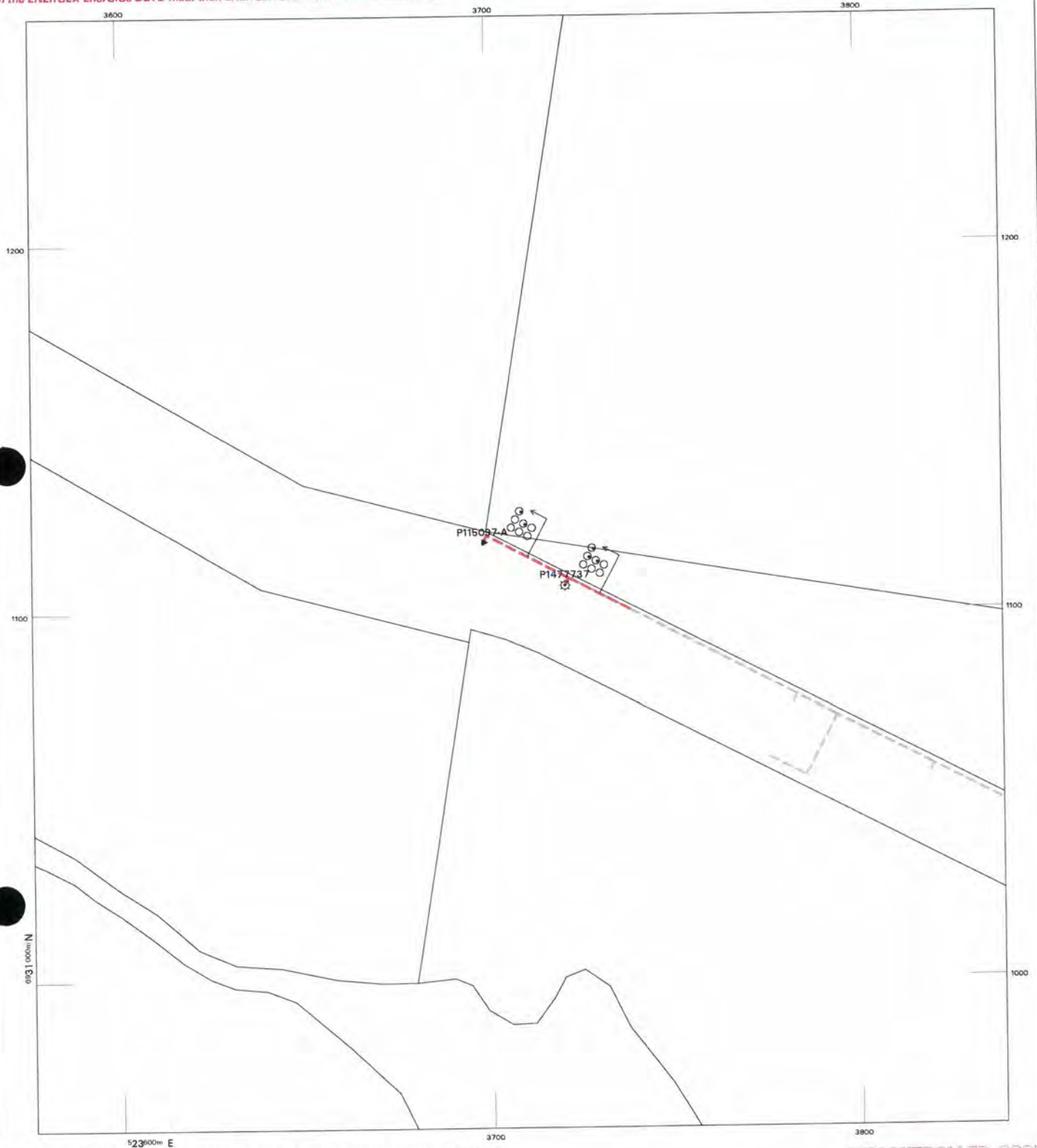
Enquiry No: 20749350
STRIP No: 3



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All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX EnerGISE DBYD map, then ENERGEX shall be contacted immediately.



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	Ground Transformer		Street Light Pole		Cable Voltage Less Than 33kV
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	Link Pillar		Trench		Cable Tray
	Service Pillar		Tunnel		
	Junction Pillar				
	Pit				
	Cable Joint				
	Cable Termination				
	Cable Marker				



Date: 22 Feb 11 Time: 09.25.58
Requested By: DBYD

SCALE 1:1000

Enquiry No: 20749350

STRIP No: 4



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16 – GEOTECHNICAL INVESTIGATION (MORRISON GEOTECHNIC)

FEBRUARY, 2011

JOB NO. GE11/002

MR WILLIAM AND MS PATRICIA HESTER

BROAD GEOTECHNICAL ASSESSMENT

PROPOSED INDUSTRIAL DEVELOPMENT

LOT 1 ON RP6882 AND LOT 240 ON W31320

**STAPYLTON JACOBS WELL ROAD & CHRISTENSEN ROAD,
STAPYLTON**

(HESTER SITE)



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Gold Coast Office
Job No.: GE11/002
Ref: 10969
Author: Leigh Bexley

21st February, 2011

Mr William Hester & Ms Patricia Hester
C/- Gassman Development Perspectives
79 Business Street
Yatala Qld 4207

ATTENTION MR BRENDON WALKINSHAW

FAX NO. 3287 5461

Dear Sir

RE: **BROAD GEOTECHNICAL ASSESSMENT FOR PROPOSED INDUSTRIAL DEVELOPMENT - LOT 1 ON RP6882 AND LOT 240 ON W31320 (HESTER SITE), STAPYLTON-JACOBS WELL ROAD AND CHRISTENSEN ROAD, STAPYLTON**

1.0 INTRODUCTION

This report presents the results of a broad geotechnical assessment carried out for a proposed staged industrial subdivision at Lot 1 on RP6882 and Lot 240 on W31320 (Hester Site), Stapylton-Jacobs Well Road and Christensen Road, Stapylton. The work was commissioned by the owners of the property Mr William Hester and Ms Patricia Hester.

From the information provided in a brief by Mr Brendon Walkinshaw of Gassman Development Perspectives, it is anticipated that the proposed development will involve the subdivision of numerous industrial Lots with associated roads. The earthworks for the proposed development will require minor cutting and filling works and possibly the construction of several minor retaining structures and batters. No lot layout or earthworks plan have been provided at this stage.

Based on correspondence with Mr Brendon Walkinshaw of Gassman Development Perspectives, our report contains the following:-

- Broad division of the site into identified Landform Units based on a combination of topography, surface features and slope stability, if appropriate.
- Broad assessment of subsurface profile in each identified Landform Unit, based on borehole drilling.
- Broad slope stability assessment of each identified Landform Unit.
- Drainage issues and impacts for development.



- Identification of the more significant geotechnical constraints or issues which would impact on future industrial development and design methodologies to overcome these. This includes issues such as identifying such features as soft compressible soils, wet zones, fill mounds etc.
- Broad recommendations for filling and excavations, including site preparation and stripping depths, bulk excavation conditions, temporary and permanent batter slope angles and recommendations for road construction.
- Preliminary foundation design parameters, including founding depths, allowable bearing pressures and estimated settlements for proposed structures.
- Broad recommendations for industrial development including the suitability and feasibility of the site for industrial development.

2.0 METHODOLOGY

A contour and site plan of the assessment zone (provided by Gassman Development Perspectives) was enlarged to a scale suitable for mapping the area of the site. A desk study of the Beenleigh 1 : 100 000 Geological Series Map, 9441 and contour plan was performed to identify rock types and major site features such as drainage lines, possible wet zones, and signs of recent or past instability such as slumps, hummocks, back scarps and scree debris fans that may not be visible from the ground surface.

A walk over survey of the site was performed by an Engineering Geologist from our Gold Coast office on the 2nd February 2011. This involved mapping and measuring features of significance to slope stability such as bedrock outcrops, slope angles and direction, erosion problems, surface and subsurface drainage, wet zones, vegetation density and the presence of irregular surface features such as slips, slumps, hummocks, back scarps, scree debris fans or any associated features. This was followed by the drilling of fourteen (14) boreholes (BH1 to BH14) at various locations across the site to assess soil profiles and depths to bedrock. One (1) Dynamic Cone Penetration (DCP) Test was also carried out in an area which was inaccessible with the drill rig. The boreholes were drilled to depths ranging between 0.4m and 3.0m below the existing ground surface using a utility mounted Jacro 200 drilling rig. The boreholes were logged by an engineering geologist from our Gold Coast office who also carried out pocket penetrometer assessments of q_u on the encountered clay soils. All borehole locations were recorded using a hand held GPS system.

From features identified in the desk study, walk over survey of the site and borehole drilling, the assessment area was divided into Landform Units based on landform and geomorphology. All identified features which may impact on the conceptual layout design for the development have been included, such as rock outcrops, seepage zones, drainage lines and zones of possible recent past instability.

A broad stability assessment of each identified Landform Unit has also been carried out. The slope stability assessment methodology adopted for this assessment generally follows the Gold Coast City Council (GCCC) 'Geotechnical Stability Assessment Guidelines' June 2007: Version 1.0. A stability assessment of the future earthworks has not been carried out as no earthworks plans have been provided.

Locations of features were mapped using a hand held GPS, cross referencing features such as boundary fence lines, houses, drainage swales, crests and dams. Some inaccuracy must be expected but would not be more than approximately 5 metres.

Contour plans of the site are presented in Appendix A to this report whilst site photographs are attached in Appendix B. The logs of the boreholes are presented in Appendix C. A SMEC Landslide Hazard Overlay Map showing areas of potential landslip hazard is attached in Appendix D. A Landform Unit Map showing the identified Landform Units, Landslide Hazard Risk Ratings for each Landform and borehole locations is attached to this report. An aerial photo of the site is also attached.

3.0 SITE CONDITIONS

3.1. Site Description

The site is typically triangular in shape with the site boundaries typically ranging between 900m and 1400m in length. The site topography comprises gently sloping terrain with several flat, low lying areas as well as several crests and ridges. The gently sloping terrain is evident throughout most of the site and typically ranges between 5° and 10° in slope gradient whilst the crests and ridges as well as the relatively flat terrain which is generally associated with the drainage swales is typically less than 5° .

No major drainage features are evident at the site. There are however several flat, wide drainage swales which align in an east to west lineation through the centre and southern portion of the site. Most surface water from rainfall events appears to flow as sheet flows across the surface of the gently sloping terrain and into these flat, wide drainage swales.

Surface levels at the site range from typically from RL10.0m within the flat terrain to the northwest and far east, up to RL29.0m within the slightly elevated terrain to the north and south.

The central portion of the site has mostly been cleared of vegetation and currently supports grass with a sparse cover of native tree vegetation whilst the remainder of the site to the north and south supports a moderate covering of native bush vegetation.

3.2. Landform Description

The site comprises gentle slopes throughout most of the site with several slightly elevated crests and ridges as well as several drainage swales. A review of the contour map and the walk over survey of the site has identified three distinct Landforms as well as the drainage swales. These Landforms are Gently Sloping Topography, Flat Topography and Crest and Ridges. Descriptions of each Landform are presented below. The interpreted locations and extents of the Landforms are shown on the attached Site Plan and Landform Unit Map. It must be noted that these locations and boundaries are intended to differentiate broadly between the identified Landforms on a large scale. On this basis, each Landform shown on the Site Plan and Landform Unit Map can be expected to contain topography or characteristics belonging to other Landforms.

3.2.1. Gently Sloping Topography

This Landform is the dominant Landform at the site and is evident throughout most areas. It is characterised by surface gradients typically ranging between 5° and 10° . The soil profile is shallow in this Landform with bedrock typically encountered at depths of less than 1.0m below the existing ground surface. This Landform typically supports a moderate covering of native bush vegetation with the exception of the central portion of the site which has been cleared of vegetation and supports grass. This Landform exhibits no signs of instability.

3.2.2. Flat Topography

This Landform is evident within the central and southern portion of the site, typically aligning in an east to west lineation. It is characterised by surface gradients of less than 5° and typically forms flat drainage swales which collect surface water flows from the upslope areas. Several dams are evident within this Landform. The soil profile is slightly deeper in this Landform with bedrock typically encountered at depths ranging between 1.5m and 3.0m below the existing ground surface. This Landform has typically been cleared of most tree vegetation in the central portion and supports a moderate covering of bush vegetation in the southern portion. This Landform contains no evidence of instability.

No surface water is evident within most of this Landform Unit. The exceptions are the dams and the drainage swale in the southern portion of the site at the location of DCP15. This swale is poorly drained and comprises a significant amount of pooled water at the surface.

3.2.3. Crest and Ridges

This Landform is typically evident in the far northern portion of the site as well as the cleared area being leased out (Lease A) in the central southern portion of the site. The crest and ridges are typically orientated in an east to west lineation and are characterised by being slightly elevated terrain with surface gradients of less than 5°. The soil profile is shallow in this Landform with bedrock typically encountered at depths of less than 1.0m below the existing ground surface. This Landform typically supports a moderate covering of native bush vegetation with the exception of the leased area which has been cleared of vegetation. This Landform contains no evidence of instability.

4.0 SUBSURFACE CONDITIONS

The site geology forms part of the Neranleigh Fernvale Beds and is Undifferentiated but thought to have been formed in the Silurian Geological Time Period. The regional geology of the site comprises greywacke, argillite, quartzite, chert, shale, sandstone and greenstone (Beenleigh 1:100 000 Geological Series, Sheet 9542).

Based on borehole drilling, the site geology consists of extremely weathered (XW) argillite and sandstone rock typically encountered at shallow depths of less than 1.0m below the existing ground surface which are overlain by residual and slopewash clay soils. The soil profile is slightly deeper in the drainage swales with bedrock encountered at depths typically ranging between 1.5m and 3.0m below the existing ground surface.

The subsurface conditions encountered in the boreholes are summarised in the following sections:-

4.1. Gently Sloping Topography (BH1, BH3, BH5, BH8, BH10, BH11, BH13 & BH14)

<i>Topsoil:</i>	Comprising, moist, loose and medium dense, silty sand, extending to depths ranging between 0.1m and 0.25m, underlain by
<i>Slopewash Soil:</i>	Comprising, moist, loose and medium dense, silty sand and silty gravelly sand, extending to depths of 0.3m and 0.35m in boreholes BH8 and BH13 only, underlain by
	Moist, very stiff and hard, silty clay and sandy clay of typically high plasticity, extending to depths ranging between 0.4m and 0.7m, underlain by

Residual Soil: Comprising moist, very stiff and hard, silty clay and sandy clay of typically low to medium plasticity, extending to depths ranging between 0.7m and 0.9m, underlain by

Bedrock: Comprising extremely weathered (XW), very low and low strength argillite and sandstone extending to depths ranging in excess of 0.75m and 1.3m.

Boreholes BH1, BH3, BH5, BH8, BH10, BH11, BH13 and BH14 were terminated at depths ranging between 0.75m and 1.3m.

4.2. Flat Topography (BH2, BH6, BH9 and BH12)

Topsoil: Comprising moist, loose and medium dense, silty sand and moist, firm, silt of high plasticity, extending to depths ranging between 0.1m and 0.3m, underlain by

Slopewash/Alluvial Soil: Comprising wet, loose, silty sand and moist, firm and very stiff, silty clay and sandy clay of high plasticity, extending to depths ranging between 1.2m and 2.55m, underlain by

Residual Soil: Comprising moist, stiff to very stiff, very stiff and hard, silty clay and sandy clay of low to medium and medium plasticity, extending to depths ranging between 1.5m and 2.7m, underlain by

Bedrock: Comprising extremely weathered (XW), very low and low strength argillite and sandstone extending to depths ranging in excess of 2.0m and 3.0m.

Boreholes BH2, BH6, BH9 and BH12 were terminated at depths ranging between 2.0m and 3.0m.

4.3. Crests and Ridges (BH4 & BH7)

Topsoil: Comprising moist, loose and medium dense, silty sand, extending to depths ranging between 0.1m and 0.15m, underlain by

Slopewash Soil: Comprising moist, medium dense, silty gravelly sand, extending to depths of 0.3m and 0.4m, underlain by

Bedrock: Comprising extremely weathered (XW), very low and low strength sandstone extending to depths in excess of 0.4m and 1.3m.

Boreholes BH4 and BH7 were terminated at depths of 1.3m and 0.4m, respectively.

5.0 GROUNDWATER

During drilling operations, no groundwater was encountered in any of the boreholes. The exception is borehole BH2 which encountered wet soils at a depth of 0.3m, however no standing groundwater was recorded. It is anticipated that groundwater seepage may possibly be encountered at the location of borehole BH2, if excavations are left open for extended periods.

It should also be noted that the drainage swale in the southern portion of the site (DCP15), where no access was available for the drill rig, is also expected to encounter groundwater as this area is completely saturated at the surface.

6.0 STABILITY ASSESSMENT

There is no evidence of recent past slope instability involving small-scale or large-scale movements of significant quantities of soil or rock in a short duration event such as slips, slumps, debris slides or a landslide. There are however some weak, wet soils at the surface in some of the drainage swales that will need to be removed prior to filling or development.

The drainage swales at the site are open and wide and do not show any sign of erosion or instability. There is however minor evidence of erosion within the banks of the dams throughout the Flat Topography Landform. It is anticipated that the dams and drainage swales may be filled as part of the development of the industrial Lots which may initiate minor instability issues within these areas. Modification of these drainage swales for industrial development is acceptable providing drainage at the site is maintained. The recommendations regarding drainage issues stated in Section 8.0 of this report must be followed to minimise the potential for instability within the drainage swales which may be associated with the proposed industrial development.

Minor groundwater seepage was encountered in the drainage swale at the location of borehole BH2 and wet zones were observed at the surface of the drainage swale at the location of DCP15. These wet areas are located in flat or gently Sloping Topography and are not expected to impact on the stability of the site providing the weak surficial soils are removed prior to filling and drainage is implemented.

The risk of slope movement in the form of deep seated failures through the rockmass below the soil cover is considered to be very low. This is due to the gentle surface gradients, shallow depths to bedrock and favourable geology.

The site appears to be geotechnically stable at present with respect to slope stability. There are no major constraints or irregularities visible at the site which would impact on the proposed development. There is however potential for instability during and after construction for the lots located within the drainage swales. Drainage is important in these areas and must be addressed to minimise the potential for instability.

6.1. Generalised Slope Stability Assessment

A generalised slope stability assessment of each Landform Unit was carried out in accordance with the Gold Coast City Council (GCCC) 'Geotechnical Stability Assessment Guidelines' June 2007: Version 1.0. It must be noted that the boundaries between Landform Units are gradational and not abrupt. On this basis it should be expected that the Hazard Rating zones may encroach upon one another. Detailed small scale assessments of localised areas would be required to refine the stability zones on a Lot by Lot basis. Lot by Lot assessments are not expected to produce risk rating classifications significantly different to the broad scale assessments carried out for this study.

Calculations used in the generalised slope stability assessment have been based on the following factors:-

- Ground surface slope angle
- Slope shape
- Geology
- Depth of soil cover and soil type (eg. colluvium, residual)
- Presence of erosion features, surface irregularities or existing instability
- Seepage and drainage conditions as assessed during the walkover survey carried out for this study

The results of the generalised slope stability assessment for each Landform Unit is presented in Table 1.

Table 1 – Landslide Risk Hazard Ratings

Landform Unit	Relative Frequency	Hazard Risk Rating
Gently Sloping Topography	0.113	Very Low
Flat Topography	0.194	Low to Very Low
Crest and Ridges	0.016	Very Low

The Landform Units and associated Landslip Hazard Risk Ratings are shown in the attached Site Plan and Landform Unit Map.

6.2. Implications of Hazard Risk

The implications of hazard risk ratings are presented in the Gold Coast City Council (GCCC) 'Geotechnical Stability Assessment Guidelines' June 2007: Version 1.0 and reproduced in Table 2.

Table 2 – Implications of Hazard Classifications (AGS)

Hazard Rating	Implications
VH (Very High Hazard)	Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to acceptable levels.
H (High Hazard)	Detailed investigation, planning and implementation of treatment options required to reduce risk to acceptable levels.
M (Moderate Hazard)	Tolerable provided treatment plan is implemented to maintain or reduce risk. May be accepted. May require investigation and planning of treatment options.
L (Low Hazard)	Usually accepted. Treatment requirements and responsibility to be defined to maintain or reduce risk.
VL (Very Low Hazard)	Accepted. Managed by normal slope maintenance procedures.

In summary, the following comments can be made with respect to the slope stability of the site:

- The Gently Sloping Topography Landform has a Very Low Hazard Risk Rating.
- The Crest and Ridges Landform has a Very Low Hazard Risk Rating.
- The Flat Topography Landform has a Low to Very Low Hazard Risk Rating.
- There is no evidence of any slope instability which would impact on the proposed development. There is however, minor weak, wet soils at the surface in some drainage swales that will need to be removed and drainage installed prior to development.
- In all Landforms the risk of slope movement in the form of deep seated failures through the rockmass is considered to be very low due to the gentle surface gradients, shallow depths to bedrock and favourable geology.
- The site is assessed to be geotechnically stable at present with respect to slope stability.

7.0 GEOTECHNICAL ISSUES OR CONSTRAINTS FOR DEVELOPMENT

The existing site is considered to be suitable and feasible for industrial development as there are no major geotechnical issues or constraints which would impact on the proposed development. The site is relatively flat and there is no evidence of any major existing or recent past instability at the site. There is also no evidence of any soft compressible soils which would require preloading or any evidence of notable filling being placed on the site. There are, however, several geotechnical issues which must be addressed prior to development or earthworks on the site.

These issues include providing adequate drainage or maintaining existing drainage at the site, removal of several small fill mounds, removal of weak soils from the surface of the drainage swales and dewatering and removal of soft sediments associated with the existing dams. If significant earthworks are to be carried out there may also be issues associated with bulk excavations due to the presence of shallow bedrock. Recommendations to overcome or manage these minor geotechnical issues are described in the Sections below.

8.0 DRAINAGE ISSUES

Most of the site is well drained with no surface water evident within the Gently Sloping Topography or Crests and Ridges Landform Units. Drainage within the Flat Topography Landform Unit is expected to be poor to moderate. No surface water was evident within most of the Flat Topography Landform Unit, however due to the relatively flat surface gradients, surface water would be expected to saturate the surficial soils within the swales for several days after significant rainfall events. The drainage swale in the southern portion of the site at the location of DCP15 was saturated at the surface during this investigation indicating that drainage is poor at this location.

Properly designed, constructed and maintained surface and subsurface drainage is important to the long term performance of the site in terms of slope stability, soil creep and erosion. The ingress of surface water into the cleared terrain or structural fill platforms is assessed to be a potential trigger for instability at the site. Therefore, minimising the ingress of surface and subsurface water into these structural fill platforms and slopes is of significant importance as saturation of these materials can result in creep movements and slips.

If the drainage swales are to be filled, consideration should be given to the interception and diversion of surface water flows. Options include:-

- Maintaining the existing drainage lines by installing conduits such as pipes and culverts at the base of the fills within the drainage swales. Modification of the drainage swales is acceptable providing positive drainage is maintained.
- Intercepting runoff from the higher catchments and diverting the flows upslope of the site or along dedicated drainage easements within the site such as lined channels.

One of these options would particularly need to be applied to the poorly drained drainage swale in the southern portion of the site at the location of DCP15.

9.0 BULK EXCAVATION CONDITIONS

The information and advice presented in this section of the report is based on the conditions encountered in boreholes BH1 to BH14 only. Variations in these conditions will occur across the site and must be expected.

No information has been supplied by the Client regarding the extent or depth of excavations that may occur at the site. It is expected, however, that excavations will not exceed 5.0m in depth. Excavations up to 5.0m will require the removal of topsoil, natural soils and the extremely weathered (XW) to possibly slightly weathered (SW) sandstone and argillite rock.

Drilling refusal depths in the Gently Sloping Topography and Crest and Ridges Landform Units ranged between 0.4m and 1.3m below the existing ground surface whilst in the Flat Topography Landform Unit drilling refusal depths ranged between 2.0m and in excess of 3.0m. In the Gently Sloping Topography and Crest and Ridges Landform Units the natural soils and very low and low strength, extremely weathered (XW) sandstone and extremely weathered (XW) argillite rock can be excavated to depths of approximately 2.0m below the existing ground surface using conventional earthmoving equipment such as dozers and excavators. Excavations below a depth of approximately 2.0m will most probably encounter less weathered sandstone and argillite rock which should be excavatable to a depth of approximately 3.0m to 4.0m using D9 to D11 dozers fitted with ripper attachments or large excavators (32 tonne to 40 tonne) fitted with tiger tooth rock buckets. It should be noted that excavation to depths in excess of 3.0m to 4.0m below the existing ground surface will most likely encounter slightly weathered (SW), very high strength bedrock which may require the use of hydraulic rock hammers or drill and blast techniques to achieve the required excavation depths.

It should be noted that defects within the rock is a major factor in the rippability of the encountered rock. NMLC coring of the bedrock in the elevated portions of the site would need to be carried out below a depth of approximately 2.0m to assess the weathering, strength and defect patterns within the underlying rock and to provide an accurate assessment of the excavation conditions.

In the lower, Flat Topography Landform Unit the natural soils and very low and low strength, extremely weathered (XW) sandstone and argillite rock should be excavatable to depths of at least 4.0m below the existing ground surface using conventional earthmoving equipment such as dozers and excavators.

No significant groundwater problems are expected to be encountered during the excavation works. The exception is the drainage swale in the southern portion of the site at the location of DCP15 where there is a significant amount of water at the surface. Results of the DCP testing and nearby drilling, indicates that bedrock is relatively shallow at this location and groundwater seepage would not be expected from the underlying soils. Intercepting and diverting upslope surface water should therefore reduce surface water pooling in this area.

10.0 TEMPORARY AND PERMANENT BATTERS

Maximum safe cut batter angles for the different materials encountered on site are shown below in Table 3 for unsurcharged batters less than 3.0m high. Where surcharges are located within H(m) (height of the batter) of the top of the batter, then some reduction in the design angle will be required.

Table 3 – Safe Batter Angles for Cuts

Material	Short Term	Long Term
Silty Sand/Clayey Sand	35° (1V:1.5H)	26° (1V:2H)
Stiff and Very Stiff Clay Soils	40° (1V:1.2H)	26° (1V:2H)
Hard Clay Soils	45° (1V:1H)	26° (1V:2H)
XW Rock	60° (1V:0.6H)*	45° (1V:1H)*
Note: *Subject to inspection by experienced geotechnical engineer/engineering geologist. It should also be noted that soft or firm clay soils which are to be battered should be inspected onsite during excavations.		

Structural fill batters should be overconstructed and trimmed back at no steeper than 2(H):1(V) or 26°. It is recommended that for cut batters which only partially expose XW bedrock in the face, the cut should be battered to an angle of no steeper than 2(H):1(V) or 26° unless inspected by a geotechnical engineer or engineering geologist.

All exposed permanent batters should be properly vegetated and mulched to minimise erosion. Properly maintained vegetation should reduce the occurrence of surface erosion by impingent rainfall. Upslope surficial water flows should also be directed away from the batters limiting the ingress of water into the fill. The pavement drainage system may be sufficient for some batters.

11.0 PRESENCE OF SOFT COMPRESSIBLE SOILS

From results of borehole drilling at the site, no weak compressible soils were encountered. Potential settlements of the natural clay soils associated with the placement of fill are therefore expected to be minor (less than 20mm). It is therefore anticipated that no generalised subgrade replacement or preloading will be required in association with the placement of fill over the majority of the existing ground surface. At the time of this investigation there was, however, some moist to wet, loose and firm, topsoils extending to depths ranging between 0.20m and 0.80m within the drainage swales (Flat Topography Landform). There are also several dams which are expected to comprise minor wet, weak, compressible soils at the base of the dams. These areas will require treatment prior to the placement of fill. Recommendations for treatment of the surficial soils prior to the placement of fill material are described in the Section 12.0 below.

12.0 SITE PREPARATION AND STRIPPING DEPTHS

Prior to the placement of fill there are several issues and requirements which must be addressed regarding the surficial soils at the site. These issues include dams, trees, grass, minor fill mounds, weak surface soils and topsoil at the surface. This will most likely require the removal of the upper 0.2m to 0.35m of topsoil in most areas but ranging up to 0.80m in some drainage swales. Most boreholes indicate the presence of clays, which are stiff, very stiff or hard for soils deeper than typically 0.35m below the ground surface.

The following treatment action is recommended within the development area prior to the placement of structural fill on the site:-

- Remove all trees, grass, minor fill mounds and topsoil from the existing ground surface across the entire site which is expected to extend to depths ranging up to approximately 0.35m below the existing natural ground surface.
- The drainage swales at the locations of Borehole BH2 and DCP15 where some wet, weak soils are evident at the surface, the removal of up to 0.8m of the surficial soil may possibly be required.

In the central portion of the site there are several dams which range between approximately 10m and 25m in diameter. If these dams are to be filled the following treatment will be required prior to the placement of fill.

The following treatment is recommended for the dams in the central portion of the site prior to the placement of fill:-

- Dewater and remove all wet loose/soft material from the dam floor, as well as the dam wall.
- Replace with moisture conditioned controlled fill material compacted in thin layers to at least 98% SMDD.

Mr William Hester & Ms Patricia Hester

MORRISON GEOTECHNIC

13.0 RECOMMENDATIONS FOR ROAD CONSTRUCTION

Roads associated with the proposed development are expected to traverse drainage swales, contour across slopes and align directly up and down the slopes. In areas where the roads traverse gullies or larger drainage swales the installation of conduits such as pipes and culverts at the base of the fills may be required. In these areas soft or loose soils and moderate water flows may be encountered requiring appropriate design considerations. In areas where the roads contour the sloping ground surface, sidling filling with minor cutting may be required.

The following recommendations are appropriate for the design and construction of road fills:-

- Strip ground surface and remove all weak and wet areas associated with drainage swales.
- In areas where the sloping terrain is greater than 7° bench the foundation to minimise lateral creep of the fill.
- Place fill material in thin layers and compact to 100% SMDD using non dispersive fill material.
- Over construct the batter and trim back at 2(H) : 1(V) or flatter and topsoil, mulch and vegetate to avoid erosion.
- All drainage swale crossings should comprise pipes, culverts or bridges founding below weak soils and soils subject to erosion by water flows. Alternatively, if the drainage swale is to be filled, surface water can be intercepted upslope and redirected into dedicated drainage easements.

Prior to construction of the roadways on-grade or in cutting, the subgrade should be tyned to a depth of 200mm, moisture conditioned and compacted to at least 100% of the Standard Maximum Dry Density.

14.0 PRELIMINARY FOUNDATION DESIGN PARAMETERS

No information has been supplied by the Client regarding the type of buildings to be constructed or the loads that may be imposed by these buildings but it is anticipated that the proposed development would consist of industrial buildings.

Suitable footing systems include stiffened rafts, high level strips, pads or bored piles founding in structural fill, slopewash soils, alluvial soils, residual clay soils or extremely weathered (XW) bedrock below all topsoils and shallow alluvial and slopewash soils.

The design of the thickened portions of stiffened rafts forming strip and pad footings, and isolated strip and pad footings founding in structural fill or the stiff to very stiff, very stiff and hard, slopewash, alluvial or residual soils and XW bedrock can be based on the design parameters presented in Table 4. All footings should found at a minimum depth of 500mm below the finished ground surface. The total settlements of strip and pad footings less than 2.0m in width should be limited to less than 25mm.

Table 4 – Design of Strip and Pad Footings

Footing	Allowable Bearing Pressures in Founding Material (kPa)			
	Structural Fill	Slopewash/Alluvial Soils	Residual Soil	XW Bedrock
Pads	100	100	150	400
Strips	100	100	125	300

As an alternative to high level strip and pad footings, consideration could be given to the installation of bored piles. Bored piles founding at least 4 pile diameters below the alluvial/slopewash soil surface, residual soil surface or XW bedrock surface but at a minimum depth of 2m can be designed for the allowable end bearing pressures and allowable shaft adhesion values presented in Table 5 below.

Table 5 – Design of Bored Pile Footings

Bored Pile Footings	Allowable Pressures in Founding Material (kPa)		
	Slopewash/Alluvial Soil	Residual Soil	XW Bedrock
Shaft Adhesion	15	20	35
End Bearing	250	350	800

The above shaft adhesion pressures can be adopted providing the piles are not cased, and the walls of the bored pile holes are not softened or otherwise affected by groundwater or the method of construction. The sides and bases of the bored pile holes must be thoroughly cleaned of all loose soil and rock debris and side smear using proper cleaning tools. The practice of using water and spinning the auger is not acceptable.

Groundwater seepage into bored pile holes is not expected but may possibly be encountered in the drainage swales if the boreholes are left open for an extended period. The groundwater seepage rates are not expected to be significant, however the use of liners or construction under bentonite or polymer drilling fluid should not be discounted in these areas. If the bored piles holes are drilled and the concrete poured immediately, the use of liners or construction under bentonite or polymer drilling fluid will most probably not be required.

Groundwater may possibly be encountered within and around the location of borehole BH2 and the drainage swale in the southern portion of the site at the location of DCP15. In these areas the use of liners or construction under bentonite or polymer drilling fluid may be required. Piles constructed using temporary liners must be dewatered prior to the placement of steel and concrete.

The total long term settlements of bored piles designed in accordance with the recommendations made above, are not expected to exceed 25mm.

15.0 BROAD RECOMMENDATIONS FOR INDUSTRIAL DEVELOPMENT

The proposed industrial development at the site is expected to involve minor cutting within the Gently Sloping Topography and Crests and Ridges Landform Units and minor filling within the Flat Topography Landform Unit to form a flat surface for an industrial subdivision. The industrial subdivision is expected to involve the development of industrial lots and associated access roads.

The relatively flat existing ground surface, the typical absence of soft compressible soils, the minimal amount of filling expected and the presence of suitable subsurface foundation material indicates that the proposed development is considered to be feasible and suitable with respect to the existing geotechnical conditions at the site. Minor treatment will be required in the dams and the drainage swales in the far north western portion of the site (BH2) and the southern portion of the site (DCP15) where some minor wet, weak soils are encountered near the surface. This is expected to involve the removal of up to 0.3m of surficial soil, but typically the removal of the upper 0.2m to 0.35m of topsoil in most other areas.

If the recommendations in this report are followed, including the drainage recommendations (Section 8.0) and the recommendations regarding the stripping of the surficial soils (Section 12.0), there will be no major geotechnical issues which will impact on the placement of fill at this site.

Development recommendations for building envelopes at the site are summarised below.

- The fill used in the construction of the batters is placed and compacted to at least 98% Standard Maximum Dry Density (commercial development) and is "Controlled Fill" in accordance with A.S. 2870 (Clause 6.4.2 (a)) – "Residential Slabs and Footings" and A.S. 3798.
- Upslope surficial water flows should also be directed away from the batters limiting the ingress of water into the fill. The pavement drainage system may be sufficient for some batters.
- For building envelopes located within sloping terrain, surface contour drains and subsoil drains should be installed to minimise infiltration of upslope surface run-off into the slopewash soils. These drains should be located upslope of the building pads and along roads and should discharge into the drainage corridors or swales via lined channels or pipes.
- All building pad runoff and roof water should be discharged into stormwater systems via a system of pipe conduits to minimise water infiltration into the slopes. Alternatively roof water can be discharged into roof water tanks for storage.
- Earthworks should take account of the sloping terrain and be limited to cuts and fills which can be adequately constructed by normal industry methods without resorting to specialised contractors.
- No development should take place within any surface irregularities such as washouts, erosion features or fill mounds. If development is to occur in these areas, surface irregularities must be removed prior to development and the drainage improved.
- Vegetation clearing must be kept to a minimum and topsoiling with non dispersive topsoil should be adopted. Revegetation should commence immediately after the completion of earthworks to minimise the potential for erosion.
- Batters are vegetated and mulched to minimise erosion. Properly maintained vegetation should reduce the occurrence of surface erosion by impingent rainfall.
- Where the ground surface slopes at 7° or more, the foundation is benched prior to filling.
- Fill slopes should be no steeper than 2(H):1(V) and be over-constructed and trimmed back to the design geometry to ensure compaction in the outer zones. Natural soil batters should also be no steeper than 2(H):1(V).
- All permanent excavations exceeding 1.0m should be supported by adequately engineered retaining walls incorporating drainage, or battered at appropriate angles.
- Building footings should be founded in structural fill platforms, weathered rock or stiff, very stiff or hard natural clays below any topsoils or weak soils.

- Water storage tanks must be located downslope of the building pads and must be constructed, operated and maintained in accordance with the suppliers requirements. Overflow must be directed to the stormwater system and not be allowed to run-off the slopes.
- Commercial design for all construction at the site should be carried out in accordance with the attached Guidelines for Hillside Construction.

16.0 LIMITS OF INVESTIGATION

Recommendations given in this report are based on information supplied regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type or in building location may require additional testing and/or make recommendations invalid.

Every reasonable effort has been made to locate test sites so that bores are representative of the soil conditions within the area to be investigated. The client should be made aware however, that this assessment has been based on limited site data using small diameter boreholes. In some cases, soil conditions can change dramatically over short distances, therefore even careful exploration programmes may not locate all the variations. If soil conditions differing from those shown on the log sheet are encountered during construction, this office should be advised immediately.

Unless otherwise stated in commissioning documents, any dimensions or slope directions and magnitudes should not be used for any building or costing calculations. Any sketch supplied should be considered only as approximate pictorial evidence of site work.

Please do not hesitate to contact the undersigned if you require any further information.

Yours faithfully



M D RILEY (RPEQ 5641)

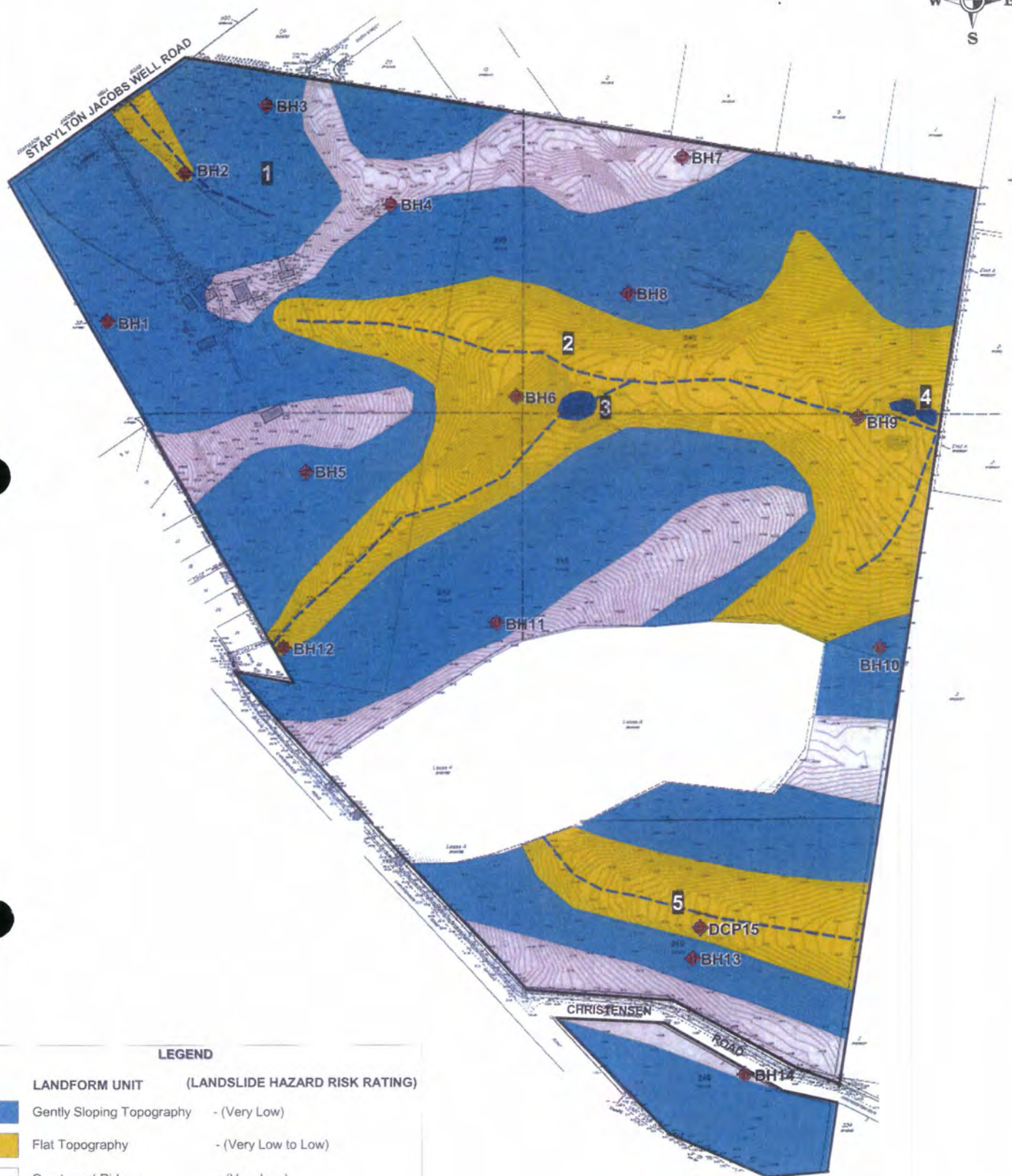
for and on behalf of

MORRISON GEOTECHNIC PTY LIMITED

Encl Landform Unit Map and Borehole Location
 Aerial Photo
 Appendix A - Site Photographs
 Appendix B - Contour Plans
 Appendix C - Borehole Logs
 Appendix D - SMEC Landslip Hazard Overlay Map
Important Information About your Geotechnical Engineering Report

Mr William Hester & Ms Patricia Hester

MORRISON GEOTECHNIC



LEGEND

LANDFORM UNIT (LANDSLIDE HAZARD RISK RATING)

- Gently Sloping Topography - (Very Low)
- Flat Topography - (Very Low to Low)
- Crests and Ridges - (Very Low)
- Dam
- Drainage Lines
- Photo Plate Location
- Borehole Location



MORRISON GEOTECHNIC PTY LTD

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Email: goldcoastlab@morrisongeo.com.au Fax: 5527 2027

Engineers: D. Riley, J. Daly & D. Dragun
Geologists: L. Bexley & R. Howchin
Laboratory: M. Morrison

Map Description: LANDFORM UNIT MAP AND BOREHOLE TEST LOCATIONS

Client: WILLIAM AND PATRICIA HESTER

Project: GEOTECHNICAL INVESTIGATION
Proposed Industrial Development

Location: 60 STAPYLTON JACOBS WELL ROAD, STAPYLTON

Project No: GE11/002 Drawing No: 0931GE11/002 Scale: 1:4000 (A3)



Scale 1:8000 - Lengths are in Metres.

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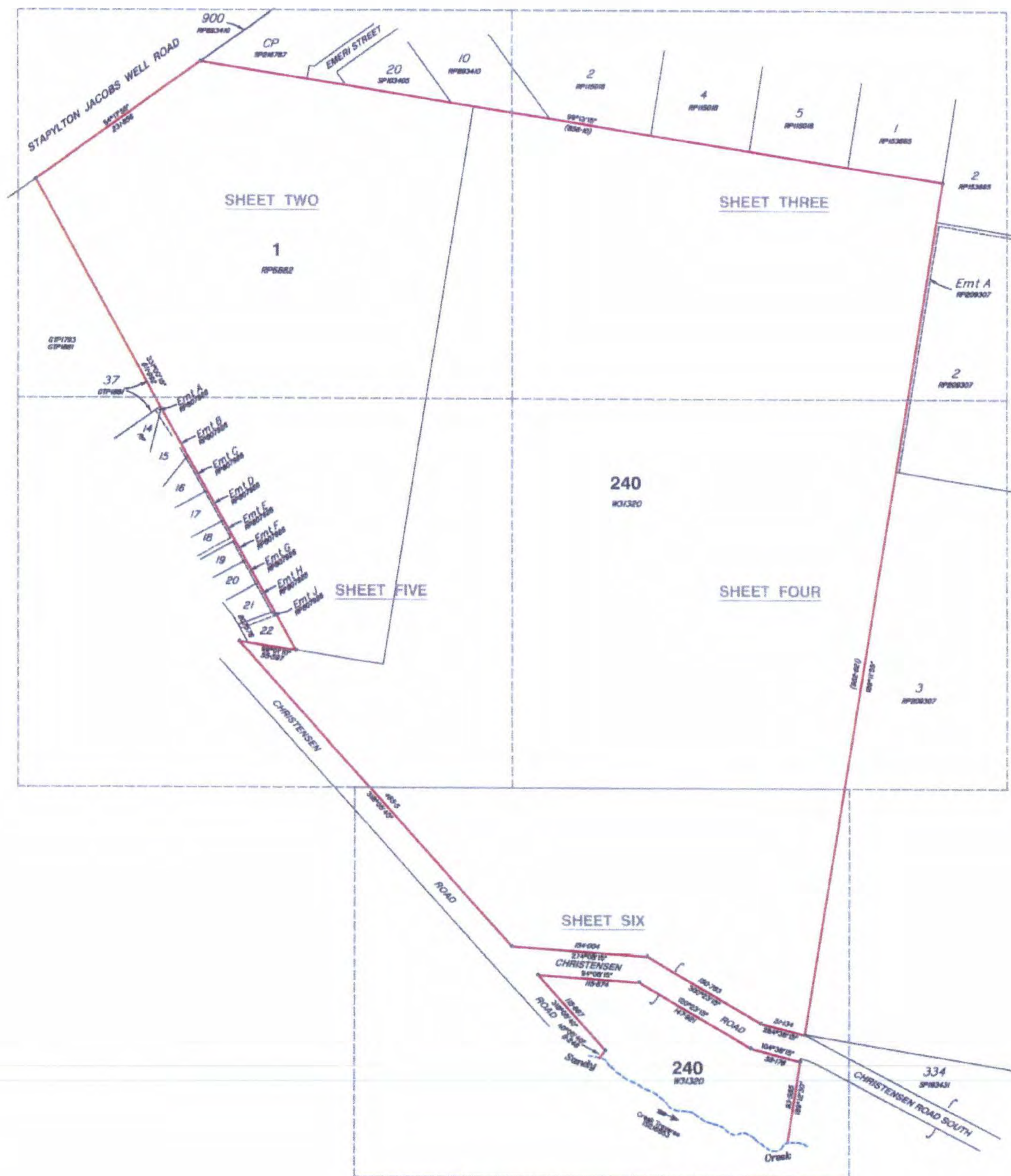
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w www.developmentperspectives.com.au

Hester site stapylton jacob's well road
stapylton

date 19-11-10
scale 1:8000
design BLW/SJH
plan 8093 P 00 01

APPENDIX 'A'

CONTOUR PLANS



Scale 1:2500 - Lengths are in Metres.
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Notes

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Client
HESTER

Project
CONTOUR AND DETAIL PLAN
Over Lot 1 on RP6882 and Lot 240 on WD1320

Parish of ALBERT
County of Ward
Local Govt GOLD COAST CITY COUNCIL

Level Datum A.M.D.	Date Surveyed Jan 2011
Meridian 15218853	Surveyor A. Macdonald
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F.S. No	Date Drafted 02-02-2011
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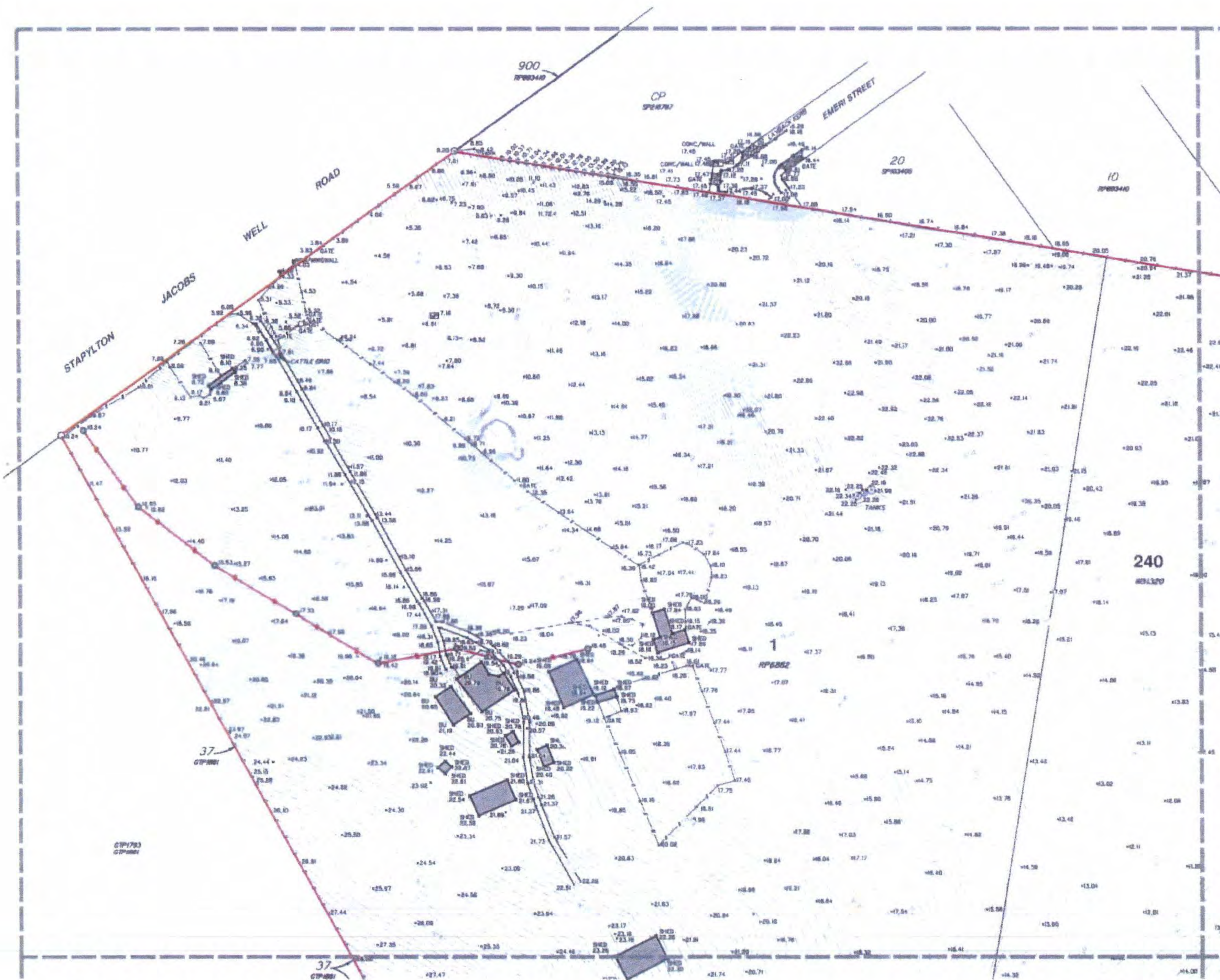
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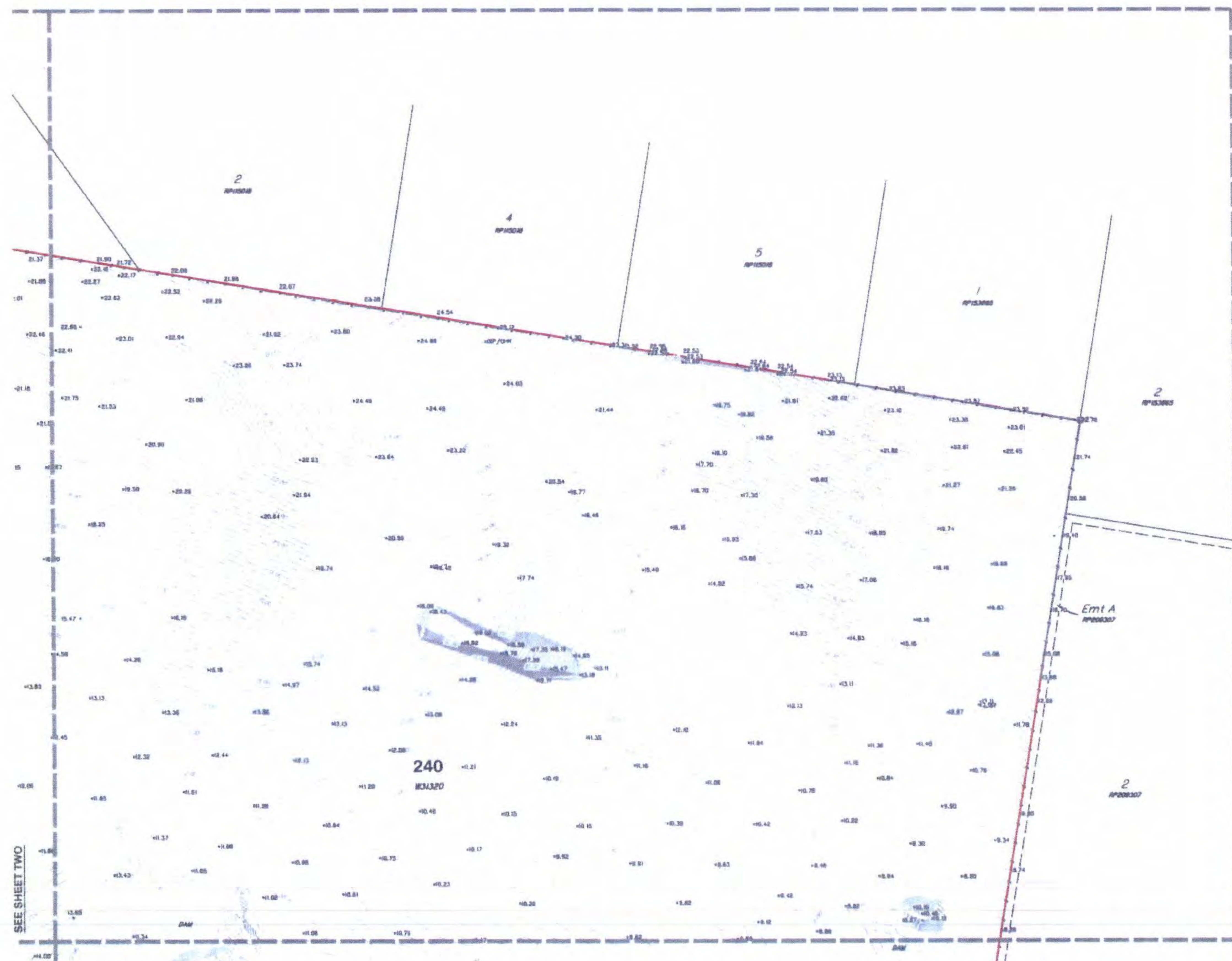
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REFERENCE No. 5093-10
PLAN No. 5093 S CD 01



- REFERENCE No. 5093-10
PLAN No. 5093 S CD 01



Scale 1:1000 - Lengths are in Metres.

LEGEND

- PERMANENT MARK
- SEWER MANHOLE
- SEWER INSPECTION OUTLET
- ELECTRICITY PILLAR
- ELECTRICITY POLE
- ELECTRICITY POLE WITH LIGHT
- TELSTRA PIT
- MANHOLE
- STORMWATER MANHOLE
- GULLY TRAP
- WATER METER
- FIRE HYDRANT
- VALVE
- GATE
- BOLLARD
- CONCRETE
- EDGE OF BITUMEN
- OVERHEAD ELECTRICITY
- FENCE
- OPEN DRAIN
- RETAINING WALL
- EDGE OF GARDEN
- CONTOUR LEVEL

Notes

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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of **ALBERT**

County of **Ward**

Local Govt **GOLD COAST CITY COUNCIL**

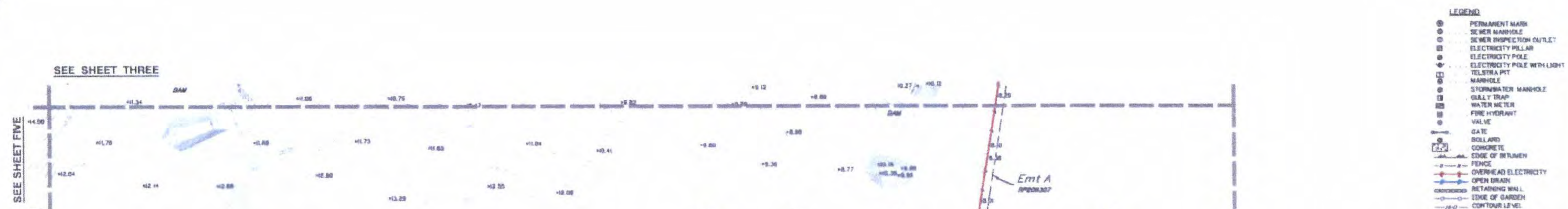
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Project No. 5093-10
Project Name: CONTOUR AND DETAIL PLAN
Project Location: Lot 1 on RP6882 and Lot 240 on WD31320
Project Status: In Progress
Project Manager: A. Rendonald
Project Engineer: S. Hall
Project Designer: S. Hall
Project Checker: S. Hall
Project Approver: S. Hall

REFERENCE No. 5093-10

PLAN No. 5093 S CD 01



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Client

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CONTOUR AND DETAIL PLAN

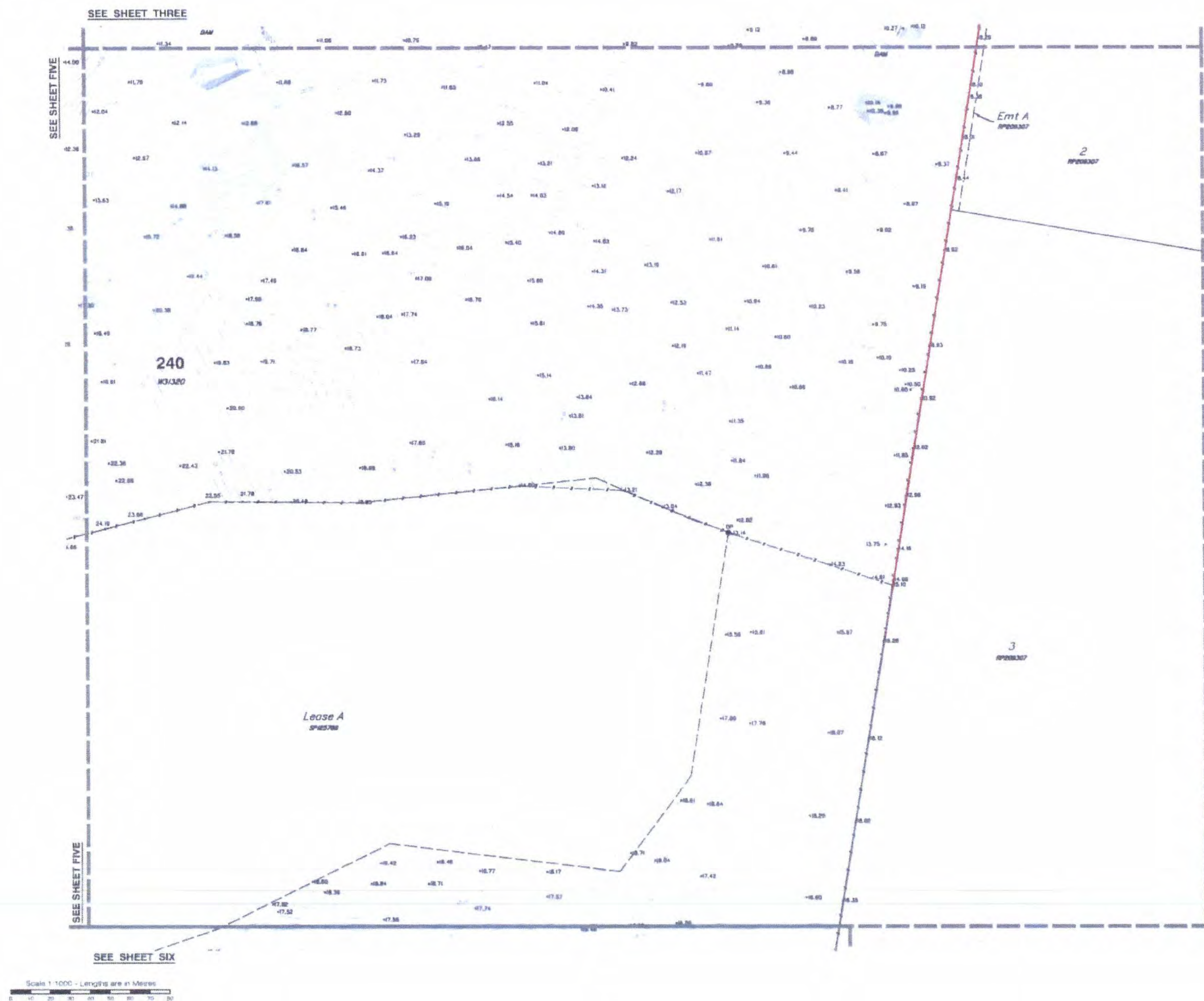
Over Lot 1 on RP6882 and Lot 240 on WD31320

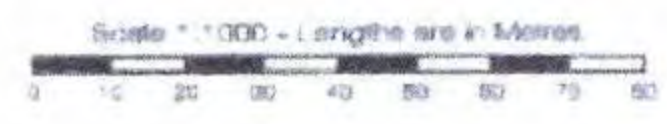
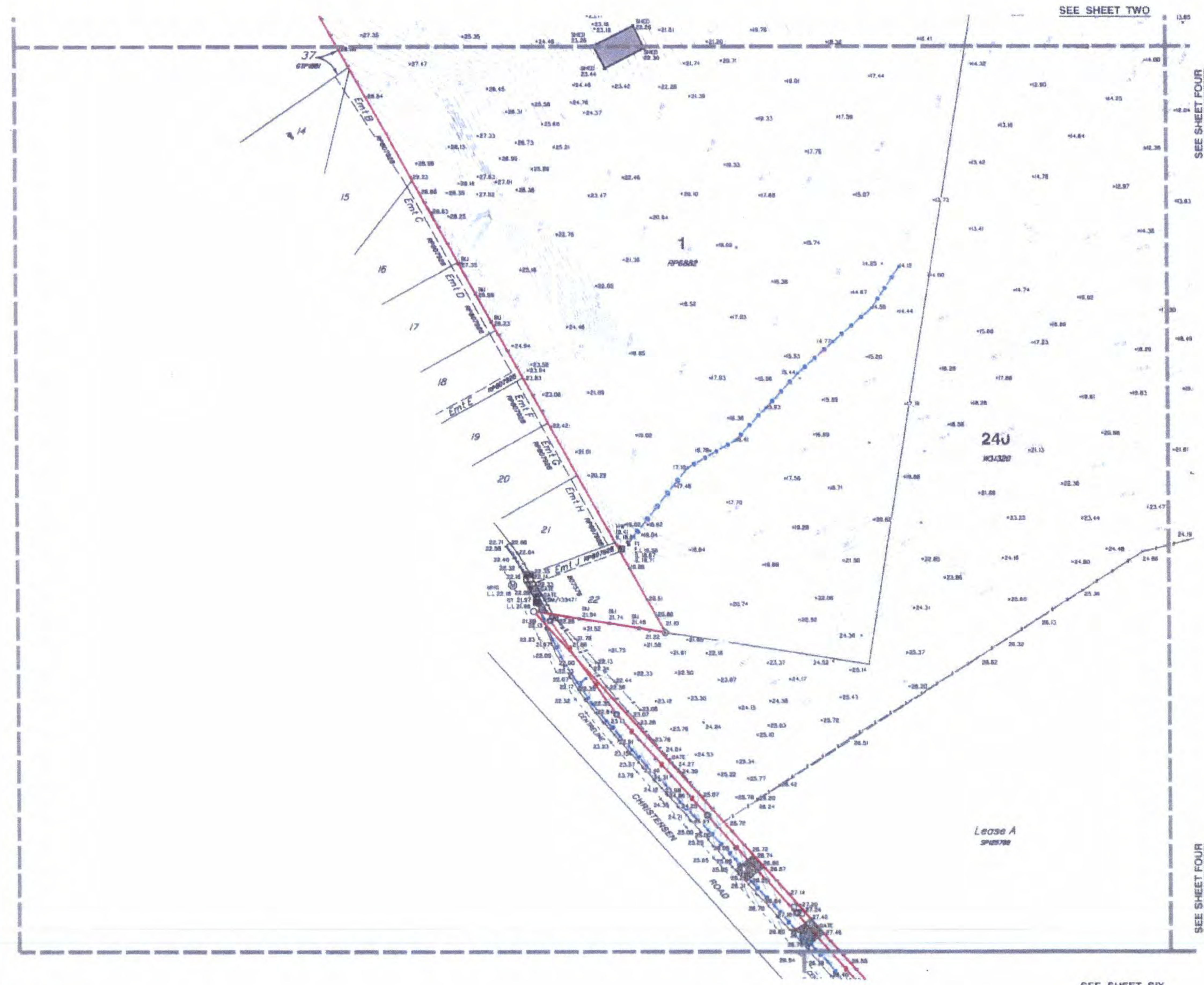
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County of **Ward**
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REFERENCE No. 5093-10
PLAN No. 5093 S CD 01





- LEGEND**
- PERMANENT MARK
 - SEWER MANHOLE
 - SEWER INSPECTION OUTLET
 - ELECTRICITY PILLAR
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Client
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CONTOUR AND DETAIL PLAN
Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of ALBERT
County of Ward
Local Govt GOLD COAST CITY COUNCIL

Level Datum	A.H.D.	Date Surveyed	Jan 2011
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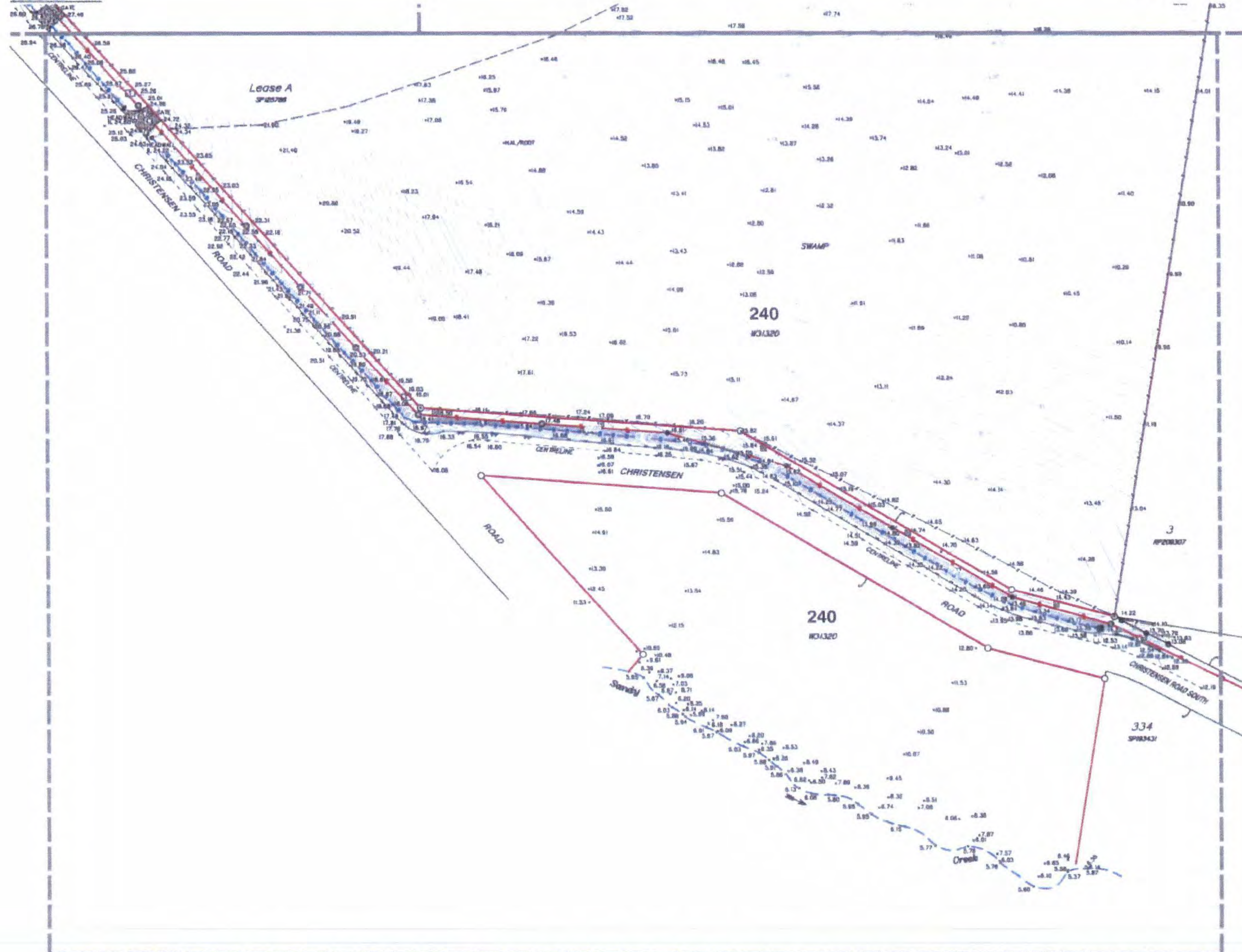
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SEE SHEET FIVE

SEE SHEET FOUR



LEGEND

- PERMANENT MARK
- SEWER MANHOLE
- SEWER INSPECTION OUTLET
- ELECTRICITY PILLAR
- ELECTRICITY POLE
- ELECTRICITY POLE WITH LIGHT
- TELSTRA PIT
- MANHOLE
- STORMWATER MANHOLE
- GULLY TRAP
- WATER METER
- FIRE HYDRANT
- VALVE
- GATE
- BOLLARD
- CONCRETE
- EDGE OF BITUMEN
- FENCE
- OVERHEAD ELECTRICITY
- OPEN DRAIN
- RETAINING WALL
- EDGE OF GARDEN
- CONTOUR LEVEL

Notes

This plan has been prepared for the exclusive use and purposes of the client as stated on this plan and should not be used by any other person or corporation and for any other purpose.

Property boundaries have not been defined by this survey and have been compiled from 15216853.

Only those underground features and services as shown on this plan have been located by this survey. Prior to any construction, demolition or excavation on the site, the relevant authority should be contacted for the location of any further underground services and detailed location of all services.

This plan may not be photocopied unless these notes are included.

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Client

HESTER

Project

CONTOUR AND DETAIL PLAN

Over Lot 1 on RP6882 and Lot 240 on WD31320

Parish of ALBERT

County of Ward

Local Govt GOLD COAST CITY COUNCIL

Level Datum	A.M.D.	Date Surveyed	Jun 2011
Vertical	15216853	Surveyor	A. Hester
Contour Interval	0.2	Drafter	S. Hester
F.S.	Ha	Date Drafted	02-02-2011
Origin	PSM 133471	Checked	
	RL 22.188		

Scale (as A1 original)	1:1000	Designer	
		Drafter	
		Date Designed	



NOTA: SEE THE SITE
Sustainable Planning
Lot 1 on RP6882
Lot 240 on WD31320
1:1000 Scale
Date: 02-02-2011
Author: S. Hester
Check: S. Hester
Date: 02-02-2011
Project: 5093 S CD 01
Drawing: 5093 S CD 01

Scale 1:1000 - Lengths are in Metres

APPENDIX 'B'

SITE PHOTOGRAPHS



Plate 1 - Looking southwards over Gently Sloping Topography from north western corner of site.
Drainage swale in centre which is aligning left to right.



Plate 2 - Looking southwards over Flat Topography in the central northern portion of the site.



Plate 3 - Large dam within Flat Topography in the central northern portion of the site.



Plate 4 - Dam within Flat Topography in north eastern portion of the site.

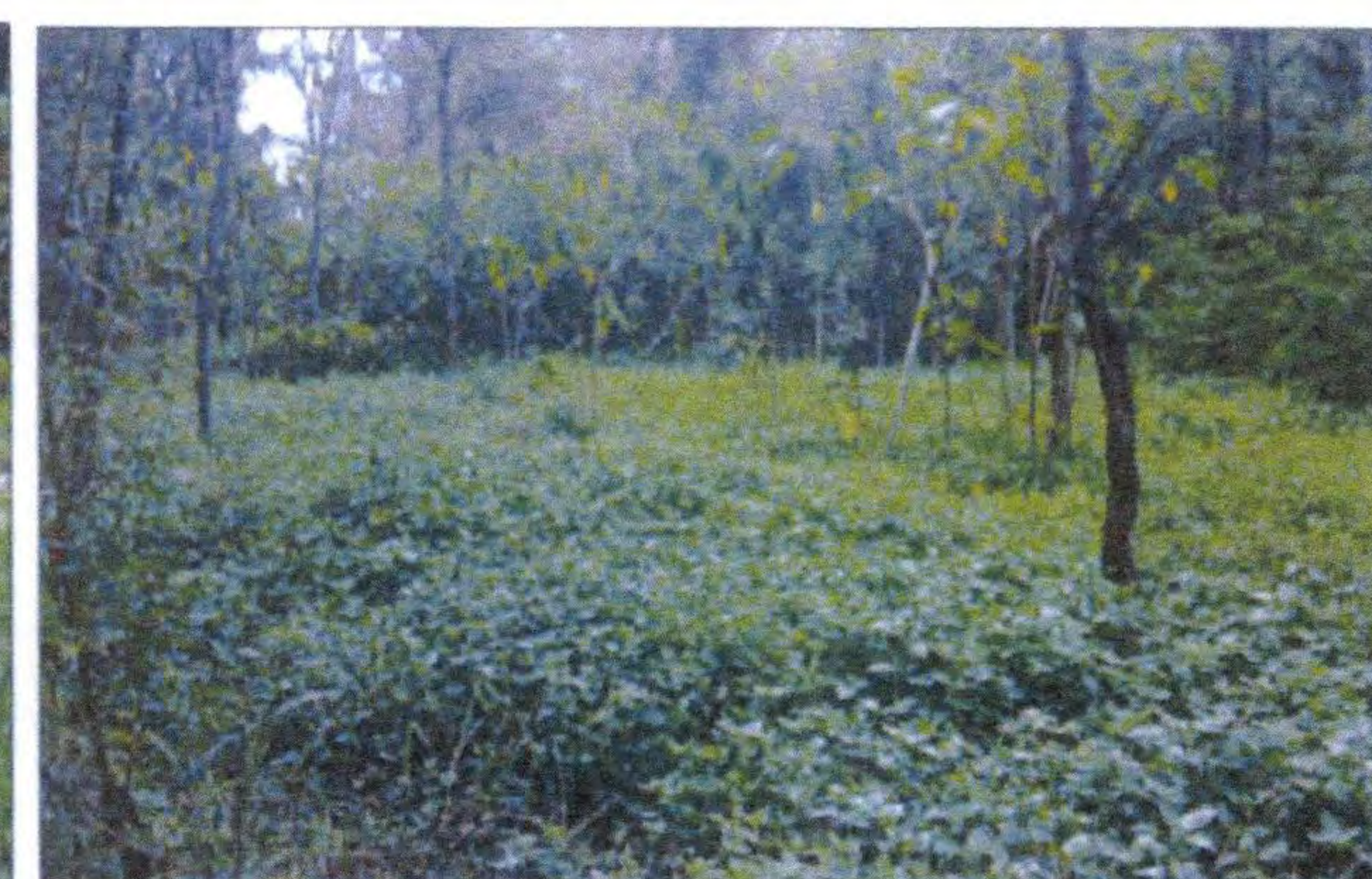


Plate 5 - Drainage swale (Flat Topography) in southern portion of the next adjacent to the location of DCP15.

APPENDIX 'C'

BOREHOLE LOGS



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH1**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523030.00

Drilling Rig: Jacro 200

Northing: 6932135.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 1.30

Date: 02/02/2011

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger				Topsoil		SM	Silty SAND: Medium dense, fine to medium grained sand, dark grey, trace of clay fines, moist		M	MD				
			0.25	Slope/wash		CH	Sandy CLAY Stiff to very stiff, high plasticity, grey mottled orange brown, fine to medium grained sand, moist		M	St-VSt		0.4	PP	200-220kPa
			0.55	Residual		CL-CI	Sandy CLAY As above but very stiff and low to medium plasticity		M	VSt				
		0.7	Bedrock			SST	SANDSTONE Extremely weathered, very low strength, orange brown mottled grey	XW		VLS				
		1.0												
			1.2			SST	SANDSTONE: As above but low strength	XW		LS				
			1.3	1.30m: BOREHOLE TERMINATED AT TC REFUSAL										
			2.0											
			3.0											

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VS Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



Morrison Geotechnic Pty Ltd

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Engineering Log - Borehole

Borehole No.: **BH2**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523113.00
Northing: 6932298.00
RL:
Total Depth: 2.00
Drilling Rig: Jacro 200
Driller: Morrison Geotechnic
Logged By: L. Bexley
Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with 100mm Dia. Auger				Topsoil		SM	SILTY SAND: Loose, fine to medium grained sand, dark brown, trace of clay fines, moist		M	L	
			0.3	Slopewash		SM	SILTY SAND: As above but dark grey and wet, with clay fines throughout, fine to coarse grained sand		W	L	
			0.6			SM	SILTY SAND: As above but orange brown		W	L	
			0.85			CI-CH	SANDY CLAY: Stiff to very stiff, medium to high plasticity, orange brown streaked grey, fine to medium with some coarse grained sand, moist		M	St-VSt	
			1.0								
			1.2	Residual		CI	SANDY CLAY: As above but very stiff and grey mottled orange brown and medium plasticity		M	St-VSt	1.2 - PP - 200kPa
			1.5	Bedrock		SST	SANDSTONE: Extremely weathered, very low strength, grey	XW		VLS	
			1.7			SST	SANDSTONE: As above but orange brown mottled grey	XW		VLS	
			1.9			SST	SANDSTONE: As above but low strength	XW		LS	
			2.0				2.00m: BOREHOLE TERMINATED AT TC REFUSAL				
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown Water inflow Water outflow	RS Residual soil XW Extremely weathered DW Distinctly weathered SW Slightly weathered FR Fresh	VS Very soft S Soft F Firm St Stiff VSt Very stiff H Hard Moisture D Dry M Moist W Wet	VL Very loose L Loose MD Medium dense D Dense VD Very dense	ELS Extremely low VLS Very low LS Low MS Medium HS High VHS Very high EHS Extremely high	U50 Undisturbed 50mm diam tube. D Disturbed sample. SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm. PP Hand penetrometer estimate of unconfined compressive strength, kPa. S Vane shear value kPa DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section. From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Engineering Log - Borehole

Borehole No.: **BH3**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523201.00

Drilling Rig: Jacro 200

Northing: 6932372.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 0.85

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with 100mm Dia. Auger			0.2	Topsail		SM	Silty SAND: Medium dense, fine to medium grained sand, dark brown, moist		M	MD	
			0.6	Slopewash		CH	Sandy CLAY: Very stiff, high plasticity, orange brown mottled grey, fine to medium grained sand, moist, some fine to medium gravel		M	VSt	
			0.75	Residual		CL-CI	Sandy CLAY: As above but hard, and low to medium plasticity		M	H	
			0.85	Bedrock		SST	SANDSTONE: Extremely weathered, low strength, grey mottled orange	XW		LS	
			1.0				0.85m: BOREHOLE TERMINATED AT TC REFUSAL				
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	LS Low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
				VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH4**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523334.00

Drilling Rig: Jacro 200

Northing: 6932265.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 1.30

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Strength	DC Test Results
TC bit with 100mm Dia. Auger			0.1	Topsoil		SM	Silty SAND: Medium dense, fine to medium grained sand, dark brown, moist		M	MD	
				Slipewash		SM	Silty Gravelly SAND Medium dense, fine to coarse gravel, fine to medium grained sand, orange brown, moist		M	MD	
			0.4	Bedrock		SST	SANDSTONE Extremely weathered, very low strength, orange brown mottled grey	XW		VLS	
			1.0								
			1.2			SST	SANDSTONE As above but low strength	XW		LS	
			1.3				1.30m: BOREHOLE TERMINATED AT TC REFUSAL				
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
				VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Engineering Log - Borehole

Borehole No.: **BH5**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523241.00

Drilling Rig: Jacro 200

Northing: 6931971.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 1.00

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with 100mm Dia. Auger			0.2	Topsoil		SM	Silty SAND Medium dense, fine to medium grained sand, dark grey, moist		M	MD	
			0.7	Slopewash		CH	Silty CLAY Very stiff, high plasticity, orange brown mottled grey and brown, some fine to medium grained sand, moist		M	VSt	
			0.9	Residual		CL-Cl	Silty CLAY As above but hard, and low to medium plasticity		M	H	
			1.0	Bedrock		ARG	ARGILLITE Extremely weathered, low strength, dark grey	XW		LS	
			1.00m	1.00m: BOREHOLE TERMINATED AT TC REFUSAL							
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Verv dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Engineering Log - Borehole

Borehole No.: **BH6**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523467.00

Drilling Rig: Jacro 200

Northing: 6932054.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 2.10

Date: 02/02/2011

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.1	Topsoil		ML	SILT Loose, some fine grained sand, dark grey/ black, moist		M	L				
						ML	SILT As above but grey		M	L				
			0.3	Slopewash		CH	Silty CLAY Very stiff, high plasticity, orange brown mottled grey, trace of fine grained sand, moist		M	VSt				
			1.0											
			1.2	Residual		CI	Sandy CLAY Very stiff, medium plasticity, light grey mottled orange brown, fine to coarse grained sand, moist		M	VSt				
			1.5	Bedrock		SST	SANDSTONE Extremely weathered, very low strength, orange brown mottled grey	XW		VLS				
			2.0											
			2.1			SST	SANDSTONE As above but low strength	XW		LS				
			2.10m	BOREHOLE TERMINATED AT TC REFUSAL										
			3.0											

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample
► Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.8kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



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Engineering Log - Borehole

Borehole No.: **BH7**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523647.00

Drilling Rig: Jacro 200

Northing: 6932318.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 0.40

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with			0.1	Top soil		SM	Silty SAND Medium dense, fine to medium grained sand, brown, moist		M	MD	
			0.2	Slope wash		SM	Silty Gravelly SAND Medium dense, fine to medium grained sand, orange brown, fine to coarse gravel, moist		M	MD	
			0.3	Bedrock		SST	SANDSTONE Extremely weathered, low strength, orange brown mottled grey	XW		LS	
			0.4				0.40m: BOREHOLE TERMINATED AT TC REFUSAL				
			1.0								
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	LS Low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSl Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



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Engineering Log - Borehole

Borehole No.: **BH8**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523588.00

Drilling Rig: Jacro 200

Northing: 6932168.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 0.95

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density	DC Test Results
TC bit with 100mm Dia. Auger			0.1	Topsoil		SM	Silty SAND Medium dense, fine to medium grained sand, dark brown, moist		M	MD	
			0.3	Slopewash		SM	Silty Gravelly SAND Medium dense, fine to medium grained sand, dark brown, fine to coarse gravel, moist		M	MD	
			0.6	Residual		CH	Sandy CLAY Very stiff, high plasticity, orange brown mottled grey and brown, fine to medium grained sand, moist		M	VSI	
			0.8	Bedrock		CL-CI	Sandy CLAY As above but hard, and low to medium plasticity, fine to coarse grained sand		M	H	
			0.95	Bedrock		SST	SANDSTONE Extremely weathered, low strength, orange brown, some quartz veining	XW		LS	
0.95m: BOREHOLE TERMINATED AT TC REFUSAL											
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 752mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Engineering Log - Borehole

Borehole No.: **BH9**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523834.00

Drilling Rig: Jacro 200

Northing: 6932033.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 3.00

Date: 02/02/2011

Total Depth: 3.00				Date: 02/02/2011										
Drilling Information				Material Description							Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger				Topsoil		MH	SILT: Firm, high plasticity, dark grey/ black, some fine grained sand, moist		M	F				
			0.2	Slopewash		CH	Silty CLAY Firm, high plasticity, dark grey mottled orange brown, trace of fine grained sand, moist.		M	F				
		0.4	CH			Silty CLAY As above but stiff to very stiff and brown mottled orange brown		M	St-VSt					
		0.6	CH			Silty CLAY: As above but very stiff and grey mottled orange brown		M	VSt					
		1.0										0.8 -	PP	250kPa
		1.1		CH	Silty CLAY As above but dark grey mottled orange brown		M	VSt				1.2	U50	PP: 280kPa
		2.0												
		2.4		CH	Sandy CLAY Very stiff, high plasticity, dark grey mottled orange brown, fine to medium grained sand, moist		M	VSt						
		2.55		CH	Silty CLAY: Very stiff, high plasticity, dark grey, some orange brown mottling, moist		M	VSt				2.5 -	PP	260kPa
		2.7		CL-CI	Silty CLAY: As above but hard and low to medium plasticity		M	H						
			2.7	Residual		ARG	ARGILLITE Extremely weathered, very low strength, dark grey	XW		VLS				
			3.0	Bedrock										

3.00m: BOREHOLE TERMINATED

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



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Engineering Log - Borehole

Borehole No.: **BH10**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523856.00
Northing: 6931780.00
RL:
Total Depth: 1.00

Drilling Rig: Jacro 200
Driller: Morrison Geotechnic
Logged By: L. Baxley
Date: 02/02/2011

Total Depth: 1.00				Date: 02/02/2011											
Drilling Information				Material Description							Test Samples				
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger				Topsoil		SM	Silty SAND Medium dense, fine to medium grained sand, dark grey, moist		M	MD					
			0.25	Slopewash		CH	Sandy CLAY: Very stiff, high plasticity, grey streaked orange brown and dark grey, fine grained sand, moist		M	VSI					
			0.7	Residual		CL-CI	Sandy CLAY: As above but hard and low to medium plasticity		M	H					
			0.9	Bedrock		SST	SANDSTONE Extremely weathered, low strength, grey	XW		LS					
			1.0												
							1.00m: BOREHOLE TERMINATED AT TC REFUSAL								
			2.0												
			3.0												

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
► Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 752mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
				VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



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Engineering Log - Borehole

Borehole No.: **BH11**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523444.00

Drilling Rig: Jacro 200

Northing: 6931806.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 1.00

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with 100mm Dia. Auger			0.2	Topsoil		SM	Silty SAND: Medium dense, fine with some medium grained sand, grey, moist		M	MD	
			0.3	Slope wash		CI-CH	Sandy CLAY: Very stiff, medium to high plasticity, grey mottled orange brown, fine to medium grained sand, moist		M	VSt	0.3 - PP - 370kPa
			0.4	Residual		CL-CI	Sandy CLAY: As above but hard and low to medium plasticity		M	H	
			0.7	Bedrock		SST	SANDSTONE: Extremely weathered, very low strength	XW		VLS	
			0.9			SST	SANDSTONE: As above but low strength	XW		LS	
			1.0				1.00m: BOREHOLE TERMINATED AT TC REFUSAL				
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		Moisture			
		D Dry M Moist W Wet			



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Engineering Log - Borehole

Borehole No.: BH12

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523205.00
Northing: 6931780.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 200
Driller: Morrison Geotechnic
Logged By: L. Baxley
Date: 02/02/2011

Drilling Information				Material Description						Test Samples				
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger				Topsoil		SM	Silty SAND: Medium dense, fine to medium grained sand, dark grey brown, moist		M	MD				
			0.3	Slopewash		SM	Silty SAND: As above but grey with some orange brown streaking		M	MD				
		0.5			CH	Sandy CLAY: Very stiff, high plasticity, orange brown mottled grey, fine to medium grained sand, moist		M	VSt		0.6 -	PP	250kPa	
		0.9			Cl	Sandy CLAY: As above but medium plasticity		M	VSt					
		1.1			CH	Sandy CLAY: As above but high plasticity, and grey streaked orange brown		M	VSt					
		2.0												
		2.5		Residual		Cl	Sandy CLAY: As above but medium plasticity and orange brown mottled grey, and fine to coarse grained sand		M	VSt				
	2.7		Bedrock		SST	SANDSTONE: Extremely weathered, very low strength, orange brown	XW		VLS		1.8 -	PP	300kPa	
			3.0											

3.00m: BOREHOLE TERMINATED

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH13**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Easting: 523652.00

Drilling Rig: Jacro 200

Northing: 5931439.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 0.75

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Strength	DC Test Results
TC bit with 100mm Dia.			0.2	Topsoil		SM	Silty SAND: Loose, fine to medium grained sand, dark brown, moist		M	L	
			0.35	Slope wash		SM	Silty SAND: As above but grey		M	L	
			0.6	Residual		CH	Sandy CLAY: Very stiff, high plasticity, grey mottled orange brown, fine to medium grained sand, moist		M	VSt	
			0.7	Bedrock		CL	Sandy CLAY: As above but hard and low plasticity, orange brown mottled grey		M	H	
			0.75	Bedrock		SST	SANDSTONE Extremely weathered, very low strength, orange brown mottled grey	XW		VLS	
			1.0				0.75m: BOREHOLE TERMINATED AT TC REFUSAL				
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
				EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		Moisture			
		D Dry M Moist W Wet			



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Engineering Log - Borehole

Borehole No.: **BH14**

Page: 1 of 1

Job Number: GE11/002

Client: W. Hester and P. Hester

Project: Geotechnical Investigation

Location: 60 Stapylton Jacobs Well Road, Stapylton

Eastings: 523707.00

Drilling Rig: Jacro 200

Northings: 6931312.00

Driller: Morrison Geotechnic

RL:

Logged By: L. Bexley

Total Depth: 1.10

Date: 02/02/2011

Drilling Information				Material Description				Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results
TC bit with 100mm Dia. Auger			0.15	Topsoil		SM	Silty SAND Loose, fine grained sand, dark grey, moist		M	L	
				Slipewash		CH	Sandy CLAY Hard, high plasticity, grey mottled orange brown and light grey, fine to medium grained sand, moist		M	H	
			0.7	Residual		CL-CI	Sandy CLAY As above but low to medium plasticity		M	H	
			1.0	Bedrock		SST	SANDSTONE Externally weathered, low strength, grey mottled orange brown	XW		LS	
			1.10	1.10m: BOREHOLE TERMINATED AT TC REFUSAL							
			2.0								
			3.0								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown Water inflow Water outflow	RS Residual soil XW Extremely weathered DW Distinctly weathered SW Slightly weathered FR Fresh	VS Very soft S Soft F Firm St Stiff VSt Very stiff H Hard	VL Very loose L Loose MD Medium dense D Dense VD Very dense	ELS Extremely low VLS Very low LS Low MS Medium HS High VHS Very high EHS Extremely high	U50 Undisturbed 50mm diam tube. D Disturbed sample. SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer failing 762mm. PP Hand penetrometer estimate of unconfined compressive strength, kPa. S Vane shear value kPa DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section. From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		Moisture D Dry M Moist W Wet			



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Engineering Log - DCP Test

DCP No.: **DCP15**

Page: 1 of 1

Job Number: GE11/002

Easting: 523660.00

Drilling Rig:

Client: W. Hester and P. Hester

Northing: 6931473.00

Driller: Morrison Geotechnic

Project: Geotechnical Investigation

RL:

Logged By: L. Bexley

Location: 60 Stapylton Jacobs Well Road, Stapylton

Total Depth: 1.40

Date: 02/02/2011

Total Depth: 1.40				Date: 02/02/2011				Location: 000			
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Comments:

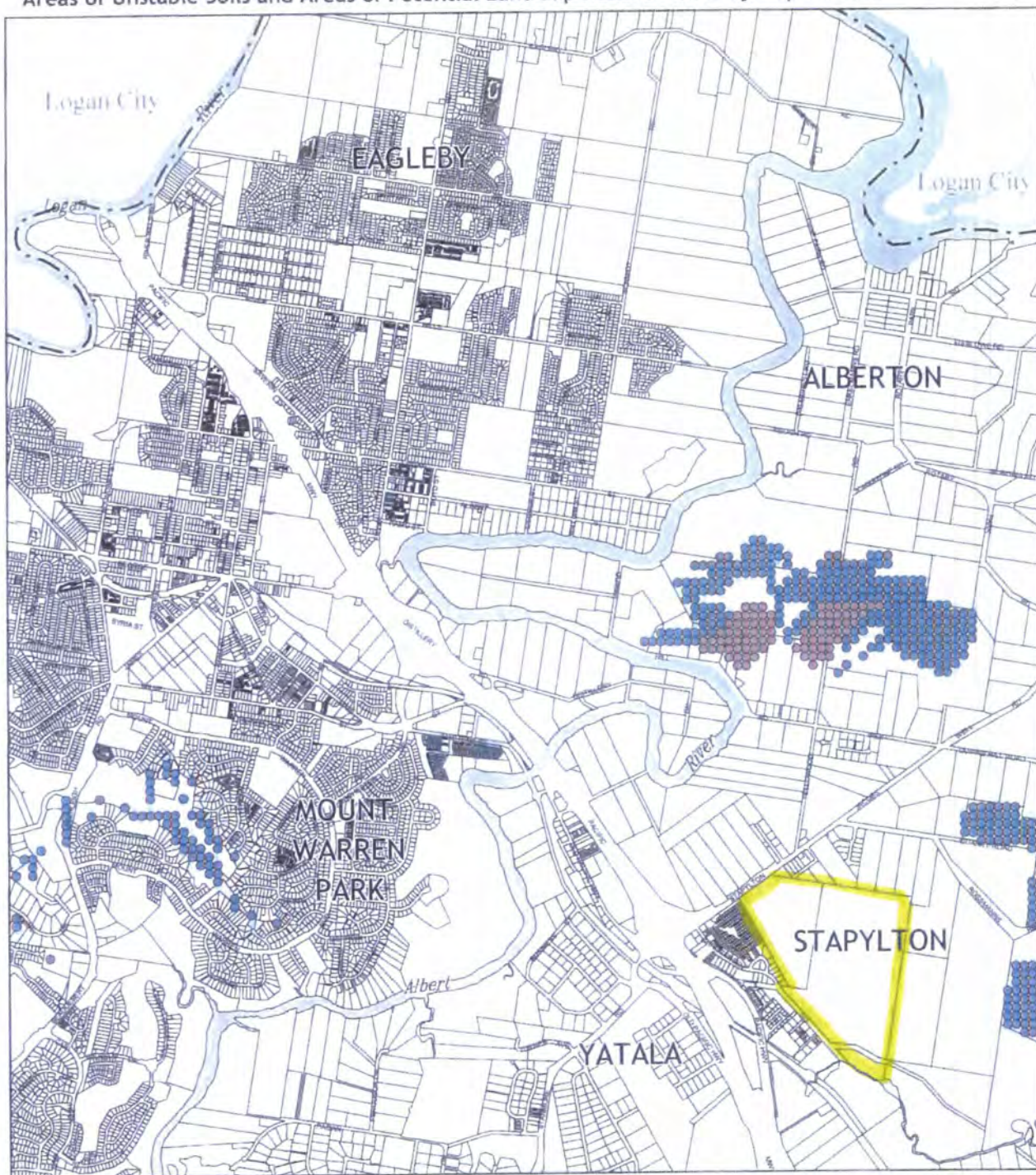
Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa
	FR Fresh	VS _t Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			

Areas of Unstable Soils and Areas of Potential Land Slip Hazard - Overlay Map OM16-2

Ver. 1.2



Legend

- VERY HIGH RISK OF INSTABILITY
- HIGH RISK OF INSTABILITY
- MODERATE RISK OF INSTABILITY
- VERY LOW RISK OF INSTABILITY

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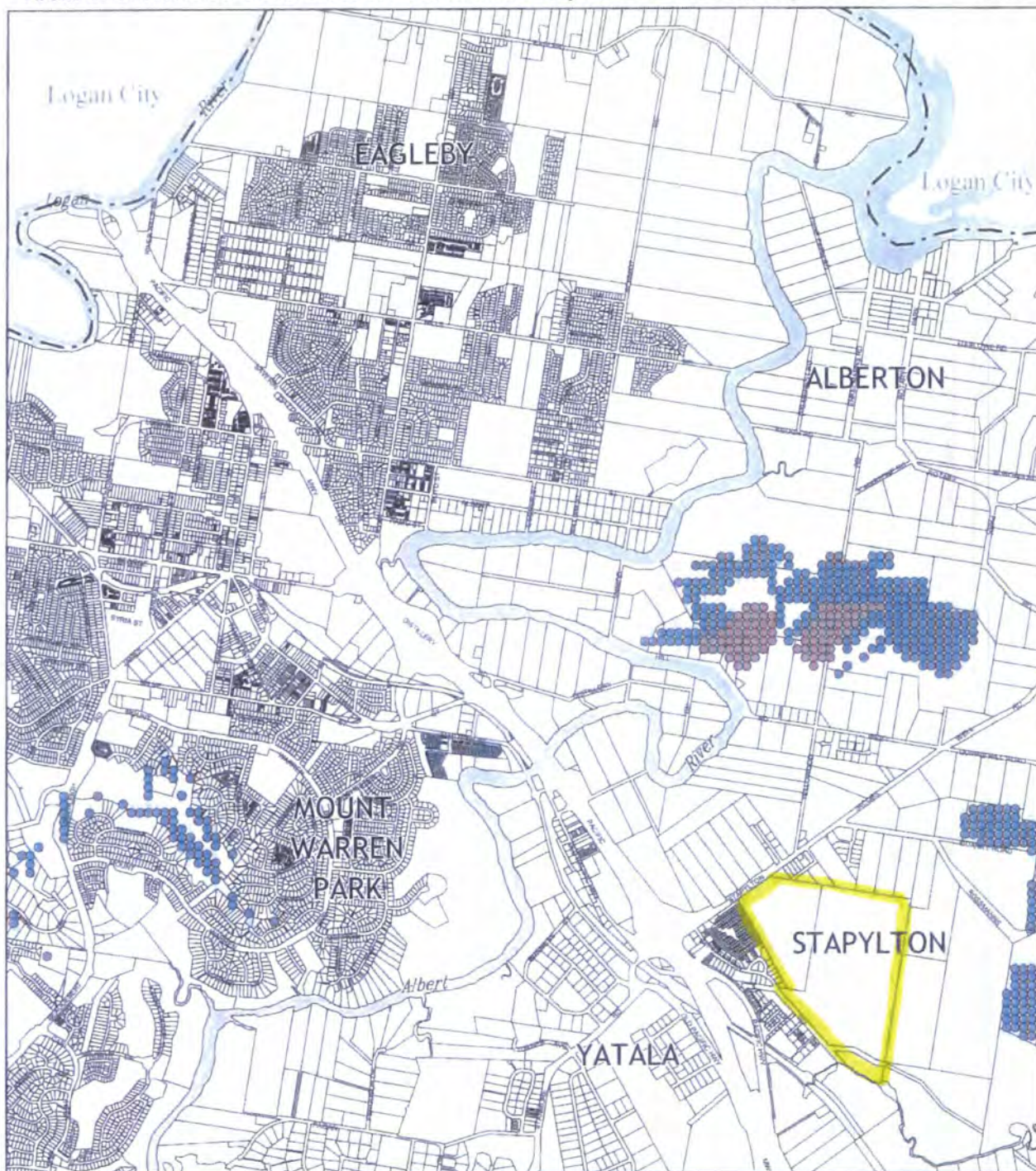
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Adjoining Maps Series



Areas of Unstable Soils and Areas of Potential Land Slip Hazard - Overlay Map OM16-2

Ver. 1.2



Legend

- VERY HIGH RISK OF INSTABILITY
- HIGH RISK OF INSTABILITY
- MODERATE RISK OF INSTABILITY
- VERY LOW RISK OF INSTABILITY

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Adjoining Maps Series



GDA

Gold Coast City Council

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. And no one—not even you—should apply the report for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report is Subject To Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the

report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations", many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any *geoenvironmental* findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own *geoenvironmental* information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Rely on Your Geotechnical Engineer for Additional Assistance

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE PROFESSIONAL
FIRMS PRACTICING
IN THE GEOSCIENCES

8811 Colesville Road Suite G106 Silver Spring, MD 20910

Telephone: 301-565-2733 Facsimile: 301-589-2017

email: info@asfe.org www.asfe.org

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IIGER06983.5M

17 – RELEVANT PRE-LODGE MEETING MINUTES AND SEARCHES

14. Jun. 2011 15:29

No. 0180 P. 1

5093
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14/6/11

Facsimile



Gold Coast City Council

PO Box 5042 Gold Coast MC Qld 9729
goldcoastcity.com.au

Date: Tuesday, 14 June 2011

Number of pages including cover page: 6

To: Brendon Walkinshaw
Gassman Development Perspectives
Ph: 3807 3333
Fax: 3287 5461

From: Julie Carstairs
Town Planner
Ph: (07) 5582 8081
Fax: (07) 5582 8248

Remarks: ☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Brendon,

PRELODGEEMENT MEETING NOTES – LOT 1 RP6882 AND LOT 241W31320, STAPYLTON-JACOBS WELL ROAD AND CHRISTENSON ROAD, STAPYLTON

Please find attached the notes from the Prelodgement Meeting held on 7 June 2011 in relation to the proposed development of the above site.

If you have any queries in relation to the above please contact me to discuss.

Julie Carstairs
Town Planner

If you do not receive all of this transmission please telephone (07) 5582 8684

DISCLAIMER:

The information contained in this facsimile has been extracted from Council's records in response to your enquiry, and whilst it is believed to be accurate no responsibility is assumed for any error or omission.

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Working for our future - today



Planning Environment & Transport Directorate

Prelodgement Meeting Agenda and Minutes

File Number: PN133853/16

Meeting Details	Date: 7 June 2011	Time: 2pm-3pm
Property Description	Lot & Registered Plan	
	Lot 240 W31320 and Lot 1 RP6882	
	Address	
	Stapylton-Jacobs Well Road and Christenson Road, Stapylton	
Proposal	Preliminary approval for a Material Change of Use (predominately Precinct 1 preferred land uses) and Operational Works (bulk earthworks) and Development Permit for a Reconfiguration of a lot (industrial subdivision).	

The purpose of a Pre-lodgement Meeting is to provide an opportunity for applicants and Council Officers to informally discuss key issues relevant to the assessment of a proposal prior to lodging an application.

The applicant accepts that:

- a Pre-lodgement Meeting enables informal discussion and advice only. It does not constitute a detailed assessment and does not indicate in any way the outcome of any subsequent assessment process;
- advice will be given on issues detailed by the applicant on this form. Council may raise other issues during the subsequent assessment process. Applicants cannot rely on GCCC officers to identify all areas of non-compliance during Pre-lodgement Meetings;
- a formal record of the Pre-lodgement Meeting will not be provided. Council officers may provide hand written summaries of key points discussed, however attendees are encouraged to take their own notes.

Typically, Pre-lodgement Meetings should be conducted having regard to the following format:

▪ Introduction:

All parties to be introduced and the Supervising Planner / Planner shall reiterate the purpose of the meeting and the need to limit discussion to the issues identified in the request form:

- Discussion of issues described in the Request Form;
- Discussion of any additional issues/topics;
- Summary of points discussed,

Participants	Internal	External - Fax No: 3287 5461
	Adam Brown, Gavin Coller, Renee Weightman, Julie Carstairs	Brendon Walkinshaw
	Steve McBean, Joel Burnett	Brian Gassman
	Rauf Abdur	Mitchell Bray
	Sharon Dyer	Mark Spears
	Susan Lallala, Kevin Travers	

Part A: Summary notes of discussion**Subdivision Engineer**

- o The road layout is generally acceptable.
- o All roads (except for Road 3) are to be 'Industrial Collector Streets'. Though, depending on the proposed staging arrangement, Road 3 may also need to be constructed to a Collector street standard as well (pavement depth only).
- o Possible future subdivision of the larger lots (42 to 44) was noted.
- o Retaining wall issue raised as there were a number of retaining walls shown on the proposal plans. It was requested that more detailed information be submitted with the application such as cross-sections of all retaining walls. The applicant suggested cross-sections through entire site to help with the assessment of the application.
- o Timing of the road construction through the Drive-in site was not know. The applicant is to liaise with the adjacent developers regarding this issue.

Hydraulic Engineering

- o Approximately 2.5ha area adjacent to the Stapylton Jacobs Well Road is below the designated flood level, which will be filled to raise the level above flood. It was advised that loss of flood storage to be balanced within the site. In response to the intention from the applicant's side to compensate the flood storage loss on a nearby land outside these two lots (subject site), it was advised that any land to be used for compensatory cut has to form part of the subject site of the application.
- o The applicant is required to submit a copy of the Constraint Codes for the Flood Affected Areas addressing all the relevant issues, in particular PC6 and PC10.
- o The submitted plans show the applicant will provide five basins for stormwater detention and treatment purpose. It has been advised to reduce the number of basins to lessen the future maintenance burden, however not affecting any downstream property. This may be achieved by diverting minor flows from smaller catchments toward larger basins and providing over treatment capacity in the larger basins. However, this has to be designed in a logical way considering the direction of the receiving waters.
- o The applicant was advised to design the basins in a way that the depths and batter slopes comply with the requirements of QUDM and GCCC Land Development Guidelines.
- o All other requirements of QUDM and GCCC Land Development Guidelines are to be satisfied.

Town Planning (ROL)

- o It was recommended that the future application for a preliminary Material Change of Use be a 242 application to override the Planning Scheme. This would allow the applicant to set up appropriate codes for the future development of the proposed lots.
- o The applicant was advised that a specific code should be developed and submitted with the application incorporating specific uses and built form guidelines. This code would need to address potential acoustic, lighting, odour and visual impacts associated with the proposed industrial development on the adjoining residential development. It was suggested that a specific precinct which incorporates specific low-impact uses could be established for proposed Lots 1-4.
- o It appears from the preliminary earthworks plans provided that the industrial area at the rear of the existing residential development will be significantly higher than the existing residential development. Cross-sections of the interface between the residential and industrial areas should be provided to illustrate how amenity issues are to be addressed.
- o Details of any buffers to the residential areas are to be provided, this is to include maintenance details of these buffers.
- o The heights of any proposed retaining walls are to be clearly identified on the proposal plans. The preliminary earthworks plans provided incorporate retaining walls with heights of up to 4m within industrial lots. This type of arrangement would not be supported by Council. The applicant advised that this would not be carried through to the final design concept.
- o The proposed retention basins should be under public ownership and not private lots.

Town Planning (MCU)

- o An Economic Needs Analysis (ENA) report would be requested as part of the application to demonstrate the proposed development would not compromise the development of other parts of the Yatala LAP area. The assessment should address the current supply of industrial land, demand for industrial land, economic consequences of the proposed development on other land identified as Precinct 1 and 2 etc. The ENA is to be prepared by a qualified professional.
- o The subject site is located on a Scenic Routes and Transitory Gateways (Planning Strategy Map PS14 / OM22) required to be addressed in Planning Report.
- o The applicant would be required to address the City Image (Planning Strategy Map PS13) as well as relevant DEO's.
- o Overlay Map 23 is applicable to the site as Stapylton Jacobs Well Road is designated as an Extractive Industry Haulage Route - this needs to be addressed. Also State Planning Policy 2/07 - Protection of Extractive Resources may need to be addressed in the application as the site is partially within the Key Resource Boundary on OM23.

Environmental and Landscape Assessment

73 ha site designated as both Future Industrial & Public Open Space under Yatala LAP. The site is located immediately adjacent to the Natural Waterway of Sandy Creek - Referrable Wetland and designated Public Open Space Corridor under Yatala LAP.

Site triggers:

- o Referral to DERM as within 100m of a referrable wetland - Advice.
- o Referral to DERM as contains Remnant Vegetation under the VMA- Concurrence. The applicant was advised to clarify if referral to DERM in this case is applicable as Council is unsure if DERM considered the designation of Future Industry as urban.
- o The applicant was directed towards the above referral requirements.

Vegetation

- o The site currently contains remnant vegetation mapped under VMA version 6 2007 as RE12.11.5k or GC Vegetation type 4a dominated by Gum topped Iron Bar (*Eucalyptus dura*) disturbed type 4a. This vegetation is subject to ground truthing and would be required to be described accurately by a suitably qualified person.
- o The northern bank of Sandy Creek (designated as Public Open Space) contains remnant 'Of Concern' Vegetation.
- o A 50m buffer is required from Sandy Creek with any other services i.e. sewage, basins, maintenance trails etc required to be outside this 50m, with an additional width required to accommodate these functions where necessary.
- o Environmental public open space being relocated along the eastern boundary of the site, forming a buffer with any retention of remnant vegetation to support this environmental corridor/buffer being considered favourably.
- o While it was acknowledged the site is designated future industry, an ecological assessment is required to determine the values of the site.
- o Applicant noted that flood storage would be compensated within other nearby sites (not presented as part of this application as yet). It was discussed that any other sites required for basins or flood storage sites must be on hand with the application and presented with all the environmental features of that site examined.

Transport Planning

- o The application will require referral to the Department of Transport and Main Roads primarily for being within 100m of Stapylton Jacobs Well Road. Other triggers may be applicable.
- o The applicant will be required to submit a detailed traffic impact report (TIA) in accordance with the requirements of Councils Car Parking Access and Transport Integration Constraints Code, Section 6- Traffic Impact

Assessment from the anticipated year of opening of the final stage for a design horizon of ten years. The key intersections appear to be Stapylton Jacobs Well Road/ Road1, Christensen Road/ Road 1, Quarry Road/ Stapylton Jacobs Well Road and Exit 38 roundabout at Christensen Road/ Stapylton Jacobs Well Road/ Henry Hester Drive. The traffic impact report will need to identify all required external road intersection works resulting from the increase in traffic from the proposed development.

- o The applicant will need to consider the suitability of the location of the proposed Christensen Road access which appears to create a four way access with a private driveway to the south.
- o Proposed Lots 1 to 8 are currently shown as split level lots with a grade difference of 3-4m between pads. This may result in vehicle access issues to the rear portion of the proposed lots in terms of vehicle access and private circulation roadway grading.
- o The proposed design provides the strategic connection between Quarry Road and Christensen Road and Stapylton Jacobs Well Road generally as envisaged by the Yatala Enterprise Area Local Area Plan AS35.3, Map 29.5 Transport Infrastructure.

Allconnex

Allconnex advised via e-mail correspondence dated 7 June 2011 the following:

- o Sewerage: There are plans to service the area, but as of yet due to the abandonment of the Stapylton Wastewater Treatment Plant, confirmation from Allconnex Water's planning team is required before we can issue any advice.
- o Water is available to the site.

Please contact Kerim Sijercic from Allconnex if you wish to discuss these issues further.

Parks and Recreation

- o The subject site is located within the Yatala Enterprise Area Local Area Plan. The applicant is proposing a 73ha development that consists of 44 industrial allotments with the development intended to be staged.

Parks and Recreational Services have identified that the applicant is proposing multiple detention basins within the development which will eventually become Council assets.

Parks and Recreational Services will be working with Council Hydraulics Officers to review the design aspects of the stormwater bio-retention/detention basins ensuring compliance with Land Development Guidelines and CPTED principles in regard to:

- providing adequate maintenance access into the basins and surrounding the facilities;
- ensuring the basins and associated battered slopes are setback from the adjacent property boundary and/or road reserve to accommodate maintenance access and to ensure adequate separation distances from the vegetation buffer;
- basin depths must be no deeper than the maximum permissible without providing fencing around the facility;
- the batters and basins will be required to be vegetated as a deterrent for general public access and to provide clear distinction of the function of the open space (i.e. not recreational/linkage);
- providing adequate servicing platform areas for maintenance functions; and
- the submitted application must not contain any retaining walls within the public open space areas.
- o The applicant will need to indicate how the stormwater infrastructure will be managed through the staging of the development
- o Given the size of the larger basin and its proximity to the ecological corridor/link the applicant is requested to consider replacing the basins with an integrated wetland system in this vicinity to facilitate the stormwater requirements while also providing a more naturalised outcome to integrate with the environmental area. The Hydraulics Officers and P&RS are willing to work with the developer on achieving an exemplar WSUD/ public open space outcome, potentially of a regional capacity with high environmental values.
- o The applicant will be required to submit an Open Space Management Statement for all public open space and a Statement of Landscape intent that displays any landscaping works intended for the site.

- o The applicant will be required to provide multiple cross and long sections through the public open space and its interfaces with any adjacent private lot and/or road reserve. The cross sections must include accurate batter slopes (R:R), separation distances and any proposed features within the public open space.

Health and Regulatory Services

- o Acoustic controls i.e. built form are to be included in the Preliminary Approval application based on a comprehensive acoustic report detailing the expected impact of relevant commercial noise sources against the Environmental Protection (Noise) Policy 2008.
- o Preliminary Approval application to incorporate precinct for lots 1- 4 (i.e. lighter industry), to allow for identification of types of uses for these lots adjacent to residential.
- o Preliminary approval application is to address the SPP 5/10 - Air/Noise and Hazardous Materials.
- o Due to the close proximity to the adjacent residential areas, the applicant is requested to report on all possible impacts of odour from the proposed activity.

Planning Officer: Julie Carstairs **Date:** 14 June 2011



7 April 2011

Gassman Development Perspectives Pty Ltd
PO Box 392
Beenleigh Qld 4207

Attention: Brendon Walkinshaw

Dear Sir

RECEIVED			
REF	5093	SCAN	AL
11 APR 2011			
B.G.		B.W.	
D.H.		B.W.	✓
G.C.		M.R.	
D.J.		T.E.	
L.R.			

MEETING RECORD

Gold Coast City Council: Staplyton - Jacobs Well Road
Lot 1 on RP6882 & Lot 240 on W31320
Situated at 60 Staplyton -Jacobs Well Road & 82 Christensen Road South, Staplyton

Thank you for meeting with the department on 14 March 2011 in relation to your planning investigations of a possible future Industry subdivision on the above land.

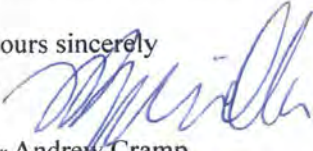
It is expected that the Department of Transport and Main Roads would be a Concurrence Agency for a future Reconfiguration of a Lot and/or Material Change of Use – Industry application, should a development application be formally lodged with Gold Coast City Council under Section 260 of the *Sustainable Planning Act 2009*.

We note Gassman Development Perspective's advice that the planning for the proposal is only in the preliminary investigative stage and that no plans or engineering documents were available to show the department at the time of the meeting. Accordingly, we may only provide general advice in relation to a use consistent with the assumptions of the Yalata Local Area Plan.

We encourage you to arrange a further pre-lodgement meeting as your planning advances, so more in-depth pre-lodgement advice can be provided. This advice cannot replace the in-depth investigation normally associated with the formal assessment of an application. While the advice is given in good faith, it in no way binds a decision by the Department of Transport and Main Roads.

Please find attached 'Pre-lodgment Record' from the meeting.

Yours sincerely


for Andrew Cramp
Regional Director (South Coast)

Enc – Meeting Record

Transport and Main Roads
Assets and Operations
South Coast Region/Gold Coast Office
36-38 Cotton Street, Nerang QLD 4211
PO Box 442, Nerang QLD 4211

ABN 39 407 609 291

Our ref 230/1003/1RP6882 mmmr-mm.419 **10977**
Your ref 5093-10-BG/BW
Enquiries Melissa Royce
Telephone +61 7 5596 9500
Facsimile +61 7 5596 9511
Website www.tmr.qld.gov.au
Email nerangdo@tmr.qld.gov.au

PRE-LODGEEMENT RECORD

APPLICANT Gassman Development Perspectives		FILE REFERENCE 230/1003/1RP6882	
Date	14 March 2011		
Time	3:00pm		
Location	Department of Transport & Main Roads, 36-38 Cotton St, Nerang		
Company	Gassman Development Perspectives Pty Ltd	Attendance	Brian Gassman, Principal – Gassman;
Site	Lot 1 on RP6882 & Lot 240 on W31320		Brendon Walkinshaw – Town Planner – Gassman;
Address	60 Staplyton-Jacobs Well Road and 82 Christensen Road South, Staplyton		Mitchell Bray, Engineer;
RPD			Glen Holdsworth, Traffic Engineer;
			Andrew Eke – Traffic Engineer, TMR;
			Greg Lerch- Engineer, TMR;
			Melissa Royce, Town Planner, TMR.

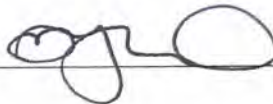
Proposal: Industrial subdivision

Area Classification: Yatala Local Area Plan – Future Industry

Issues Identified by the Applicant for discussion:

- Planning for DTMR intersection between the site and Staplyton Jacobs Well Road;

Signed _____



Date 1 / 4 / 2011

Disclaimer:

The aim of a pre-lodgement meeting is to provide initial advice on likely major issues relevant to a development proposal to assist in the timely processing of applications. It cannot replace the in-depth investigation normally associated with the formal assessment of an application. While the advice is given in good faith, it in no way binds a decision by the Department of Transport and Main Roads.

Please note that as this is a Department of Transport and Main Road document it will be subject to the provisions of the Right to Information Act.

Supporting information provided by applicant (eg. plan/reports)

A locality plan identifying the site was provided.

It was advised that planning was in the preliminary investigative stages. No site plan or report was provided.

Issues Discussed

Future Intersection between Staplyton – Jacobs Well Road

In accordance with the Yatala Local Area Plan and the department's planning for the future upgrade of Staplyton Jacobs Well Road, an intersection is proposed between Lot 1 on RP6882 and Staplyton – Jacobs Well Road in accordance with Drawing 387557 Job No. 160/1003/901 which was provided to you at the meeting. It was advised that the impacts of the development may trigger a slightly varied intersection design (median and turning lane lengths) which should be identified in the applicant's traffic report. As discussed, Longitudinal Section Drawing for Chainage 0 – 700 of Staplyton – Jacobs Well Road (Drawing No. 387593 Rev A) is attached for your reference.

Works between Henry Hester Drive – Staplyton Jacobs Well Road roundabout (not including the roundabout) to the Christensen Road Connection Intersection and further to the east may be conditioned so as to mitigate safety and efficiency impacts.

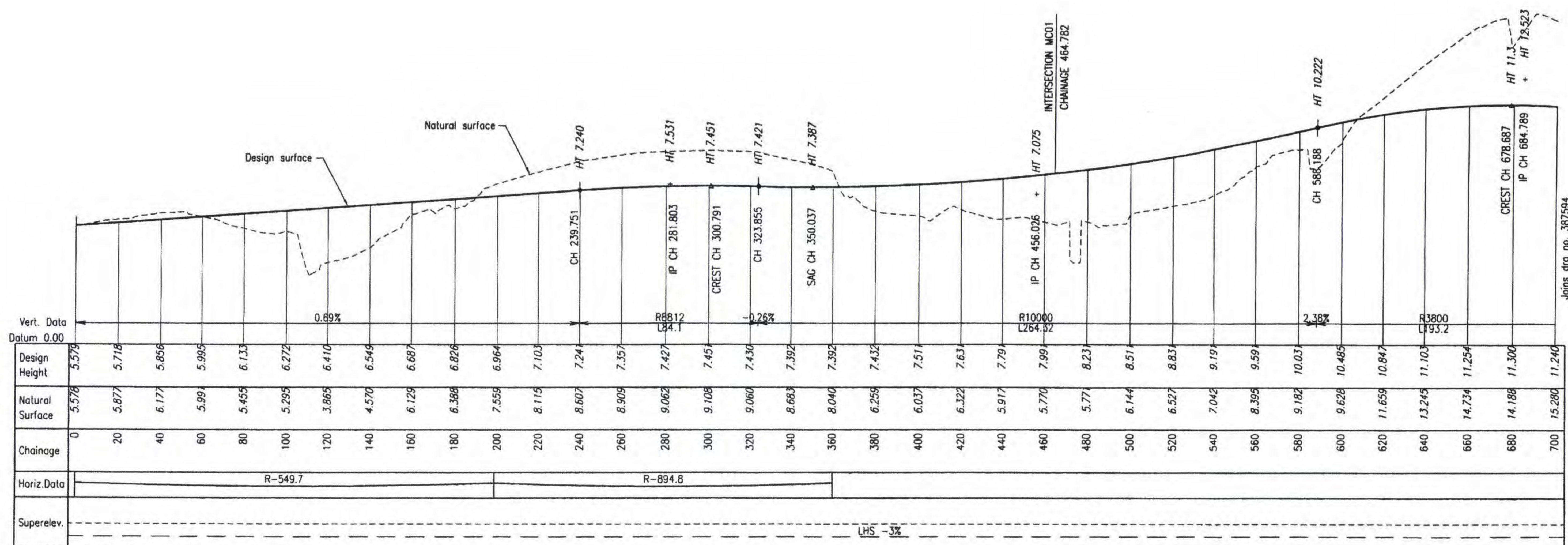
Christensen Road Connection is required to join the existing Christensen Road South. The applicant's Traffic Report should identify the warrants for the opening of the connection to Christensen Road South. The development should be staged so as to facilitate this connection in order to ensure access and movement through the site is not concentrated entirely at the Staplyton Jacobs Well Road access intersection.

This drawing has been prepared to assist in managing development of the existing road corridor and to determine possible future requirements for road infrastructure, but does not depict firm road planning.



Manager (Network Planning & Performance)

01 / 02 / 08



Revisions				Verified	Date	Microfilmed	Associated Job Nos	Survey Data			Scales 0 10 20 30 40m 1 : 2000 (HORIZ) 0 1 2 3 4m 1 : 200 (VERT) (Full size A3) Dimensions shown in metres except where shown otherwise	CITY OF GOLD COAST				LONGITUDINAL SECTION				 Queensland Government Department of Main Roads Job No. 160/1003/901 Contract No. Drawing No. 387593 A Series Number 41 of 77 WRR Detail A1 (11/05)	
								Auxiliary Drg Nos Refer Drawing Index Drg. No. 387553 (1)	Horiz. Datum	GDA94 Zone 56		 GDA	STAPYLTON - JACOBS WELL ROAD				CHGE 0 - 700 C.L. MCA1				
									Azimuth Datum	GDA94 Zone 56			CTL CHGE 0.000 - 4910.112 C.L. MCA1								
									Height Datum	PM63854; Height 12.142 AHD			Reference Points								
Original Issue							Survey Books	MR81863, 1003-50, & 1003-44				Preceding RP	Dist. to start of job (km)	From start to end of job	From end to following RP	Following RP	Drawing SPR	Design SAH	Design Review GEL	Recommended	
												NO2243190/1A	0.00	4.90	2.94	NO282313N/2	Checked KMS	Verified PJD	 W.G. Sheef Principal Engineer (Network Planning)		
CAD FILES				Through Chingage From Start of Gazettal 0.0km to 4.90km																	

QLD DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)**

Transaction ID: 1273545 EMR Site Id: 3579 22 November 2010

This response relates to a search request received for the site:

Lot: 1 Plan: RP6882

EMR RESULT

The above site IS included on the Environmental Management Register.

Lot: 1 Plan: RP6882

Address: 7044 STAPYLTON/JACOBS WELL RD
STAPYLTON 4207

The site has been subject to the following Notifiable Activity pursuant to section 374 of the *Environmental Protection Act 1994*.

LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The EPA may hold further information relating to the location of the dip site within this property.

CLR RESULT

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

ADDITIONAL ADVICE

EMR/CLR Searches may be conducted online through the State Government Website www.smartservice.qld.gov.au or Citec Confirm www.confirm.com.au.

If you have any queries in relation to this search please phone (07) 3330 5685.

Darryl Byers
Registrar, Contaminated Land Unit

QLD DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)**

Transaction ID: 1273548 EMR Site Id: 22 November 2010
This response relates to a search request received for the site:
Lot: 240 Plan: W31320

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

EMR/CLR Searches may be conducted online through the State Government Website www.smartservice.qld.gov.au or Citec Confirm www.confirm.com.au.

If you have any queries in relation to this search please phone (07) 3330 5685.

Darryl Byers
Registrar, Contaminated Land Unit

QLD DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)**

Transaction ID: 14242396 EMR Site Id: 25 August 2011
This response relates to a search request received for the site:
Lot: 4 Plan: RP6843

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

From the 1st August 2011, the price of an EMR/CLR search will increase to \$40.15 per lot for internet based searches and \$47.20 per lot for EMR/CLR searches done by means other than the internet.

If you have any queries in relation to this search please phone (07) 3330 5685.

Darryl Byers
Registrar, Contaminated Land Unit

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10503084

Search Date: 22/11/2010 13:56

Title Reference: 11060216

Date Created: 07/06/1906

Creating Dealing: 602739225

REGISTERED OWNER

Interest

Dealing No: 709915935 07/09/2006

PATRICIA ANN HESTER

1/2

WILLIAM ARTHUR HESTER

1/2

AS TENANTS IN COMMON

ESTATE AND LAND

Estate in Fee Simple

LOT 1 REGISTERED PLAN 6882
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10695064 (POR 128)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 09/04/2008 711561745 Certificate No. 2

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (ENVIRONMENT AND RESOURCE MANAGEMENT) [2010]
Requested By: D APPLICATIONS CITEC CONFIRM

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 10776460

Search Date: 12/01/2011 08:42

Title Reference: 10526129

Date Created: 08/12/1884

REGISTERED OWNER

Interest

Dealing No: 709915914 07/09/2006

PATRICIA ANN HESTER

1/2

WILLIAM ARTHUR HESTER

1/2

AS TENANTS IN COMMON

ESTATE AND LAND

Estate in Fee Simple

LOT 240 CROWN PLAN W31320

County of WARD

Parish of ALBERT

Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10526129 (SEL 814)
2. LEASE No 707931618 29/07/2004 at 10:43
ENVIROGREEN PTY LIMITED A.C.N. 069 900 456
OF LEASE A ON SP 125788
TERM: 01/07/2005 TO 30/06/2010 OPTION 5 YEARS
3. CHANGE OF NAME No 713027062 01/02/2010 at 12:03
LEASE: 707931618
AMGROW PTY LIMITED A.C.N. 069 900 456
4. AMENDMENT OF LEASE No 713076568 23/02/2010 at 15:03
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL
5. AMENDMENT OF LEASE No 713369769 23/07/2010 at 14:54
LEASE: 707931618
TERM: 01/07/2005 TO 30/06/2015 OPTION NIL

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - Yes 30/07/2010 713375783 Certificate No. 5

Corrections have occurred - Refer to Historical Search

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: D APPLICATIONS GLOBAL X

Page 1/1

CURRENT TITLE SEARCH

ENVIRONMENT AND RESOURCE MANAGEMENT, QUEENSLAND

Request No: 11739459

Search Date: 17/06/2011 13:55

Title Reference: 13168037

Date Created: 24/12/1958

Previous Title: 10391085

REGISTERED OWNER

Dealing No: 705557478 19/04/2002

WILLIAM ARTHUR HESTER

ESTATE AND LAND

Estate in Fee Simple

LOT 4 REGISTERED PLAN 6843
County of WARD Parish of ALBERT
Local Government: GOLD COAST

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10112135 (POR 19)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (ENVIRONMENT AND RESOURCE MANAGEMENT) [2011]
Requested By: D APPLICATIONS CITEC CONFIRM

705630821

\$218.65
20/05/2002 09:08

BH 400

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

EHRICH MONAHAN & TISDALL

BH02

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

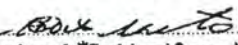
1. Certificate of Registered Owners or Lessees.

I/we HENRY ARTHUR HESTER

(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

* Rule out whichever is inapplicable

2. Local Government Approval.

*
hereby approves this plan in accordance with the :
%

Dated this day of

* 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 :

Surveyor : 1292-95

5. Existing

Title Reference	Lot	Plan	Created	Lots	Emts	Road
10526129	240	W31320	LEASE A			

SEL 814

Orig

Lots

7. Portion Allocation :

a. Map Reference :

9542-42222

9. Locality :

STAPYLTON

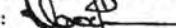
10. Local Government :

GOLD COAST C.C.

11. Passed & Endorsed :

By : Gassman & Assoc. Pty. Ltd. ACN 010 752 388

Date : 21st February 2000

Signed : 

Designation : Licensed Surveyor

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

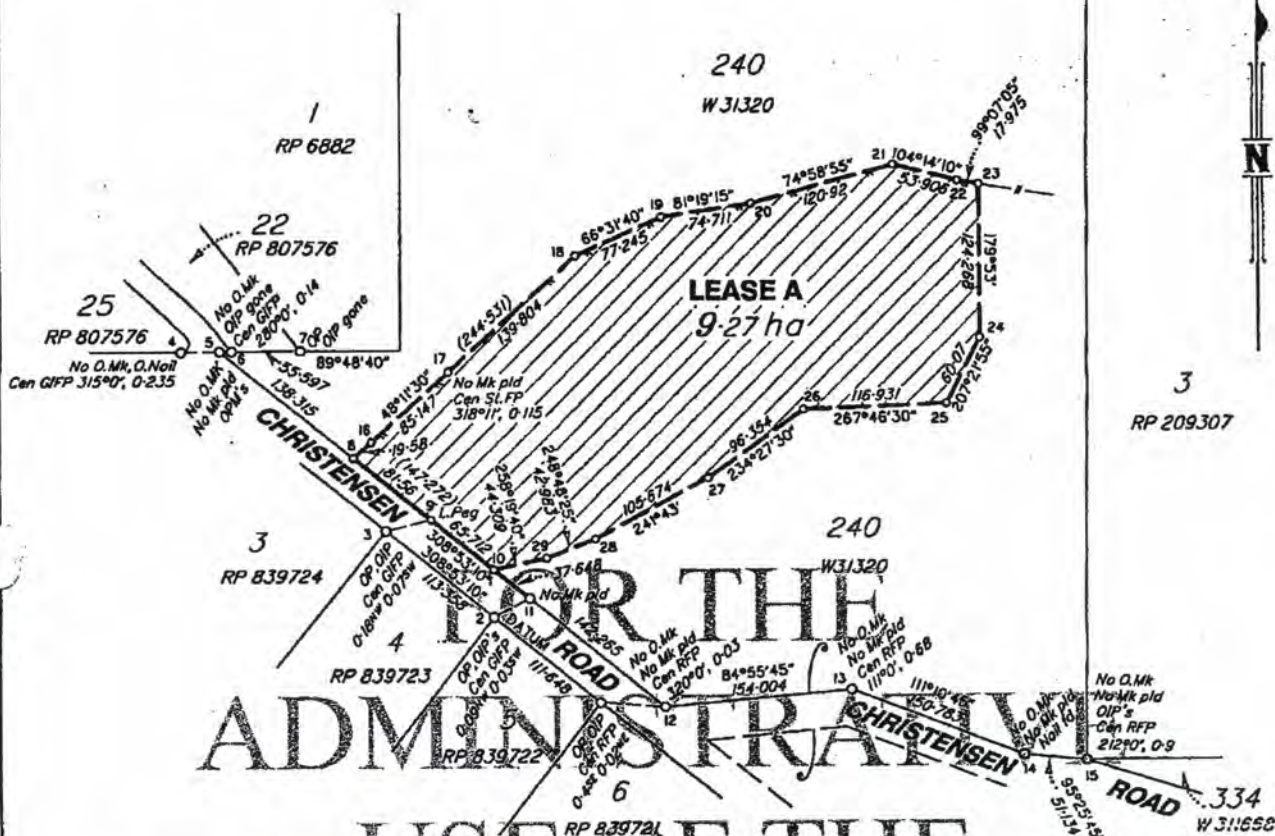
Licensed Surveyor/Director * Date
* delete words not required

13. Lodgement Fees :

Survey Deposit	\$
Lodgement	\$
..... New Titles	\$
Photocopy	\$
Postage	\$
TOTAL	\$

14. Insert
Plan
Number

SP125788



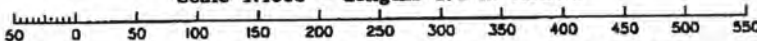
STN	TO	ORIGIN	BEARING	DIST
1	OIP	16/RP113275	37°54'	1.026
2	OIP	18/RP113275	40°0'	1.017
3	OIP	3/RP839722	168°41'	2.106
4	OIP	20/RP113275	38°53'20"	1.026
5	OIP	4/RP807576	119°26'25"	1.222
6	Scrub in No	10/RP807576	269°48'40"	1.0
7	OIP gone	3/RP807576	44°58'50"	1.2
8	OIP gone		29°49'	1.47
9	Pin		257°46'	2.97
10	Pin		257°47'30"	15.254
11	Nail in Bit.		218°53'	2.63
12	Pin		10°31'	1.664
13	Pin		355°05'	8.268
14	Nail in Tree		29°21'	10.11
15	Stump Id.		26°28'	13.424
16	Pin	41/RP209307	92°13'20"	0.119
17	OIP	41/RP209307	250°55'25"	2.778
18	Pin		269°32'	1.653
19	Pin		327°46'	1.8
20	Pin		330°52'	2.606
21	Pin		349°52'	1.902
22	Pin		67°58'	5.033
23	Pin		24°55'	1.46
24	Pin		20°46'	1.603
25	Pin		72°22'	2.004
26	Pin		123°02'	2.085
27	Pin		330°09'	2.047
28	Pin		180°43'	2.097
29	Pin		182°48'	2.077

LINEL	BEARING	DISTANCE
1-12	94°17'50"	53.155
2-11	62°25'	32.912
3-9	76°21'50"	38.023
4-5	89°48'40"	30.79
5-6	89°48'40"	9.593

PM	ORIGIN	BEARING	DIST	NO
5-OPM		286°31'15"	343.646	97175
5-OPM		236°43'30"	394.043	116789

75x75mm Peg placed at Stations 8, 10 & 23-29.
50x50mm Peg placed as Line Pegs.
Nail pld in Cen RFP at Stations 16 & 18-22.

Scale 1:4000 - Lengths are in Metres.



Plan of Lease A in Lot 240 on
W31320.

I, Brian Francis GASSMAN, Licensed Surveyor, hereby certify that I have surveyed the land comprised in this plan by Gary Lee COUCHMAN, Licensed Surveyor, for whose work I accept responsibility, that the plan is accurate, that the said survey was performed in accordance with the Surveyors Act 1977 and the Surveyors Regulation 1992 and that the said survey was completed on 04-02-2000.

21.2.00

[Signature]
Licensed Surveyor

PARISH: ALBERT

COUNTY: Ward

Meridian: RP113275

F/N: No

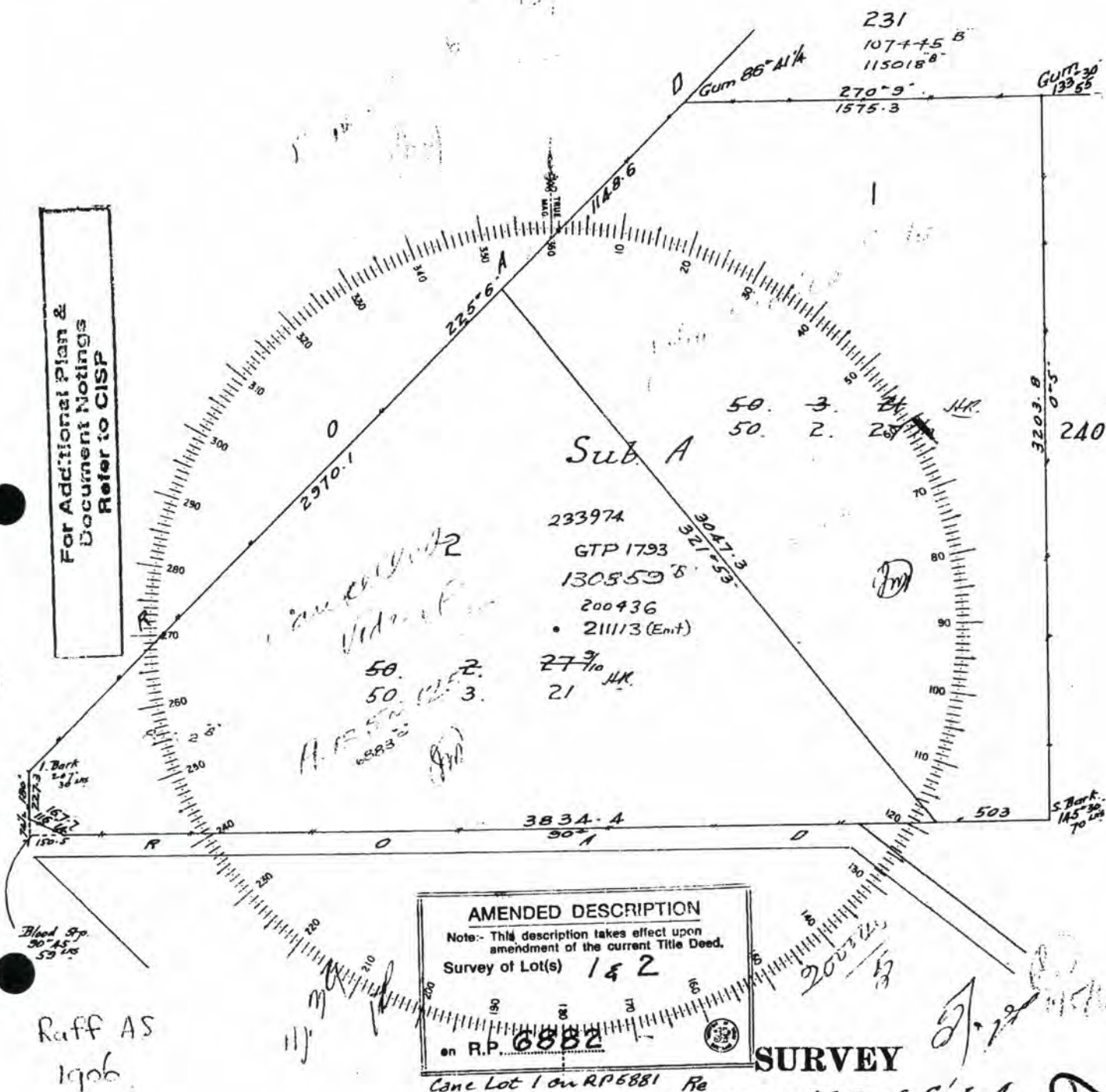
Scale: 1:4000

Format: STANDARD



SP125788

Plan Status:



AMENDED DESCRIPTION
 Note:- This description takes effect upon amendment of the current Title Deed.
 Survey of Lot(s) 1 & 2
 on R.P. 6882

SURVEY

SCALE 5 chains to an inch.

As proprietor of this land, I agree to this Plan of subdivision.

Signature of Proprietor

C. H. Hester
J. C. Hester
6882

Re
 OF SUBDIVISIONS 1 & 2 of Sub A
 OF ALLOTMENT OR PORTION No. 128
 OF SECTION _____
 COUNTY of Ward
 PARISH of Albert

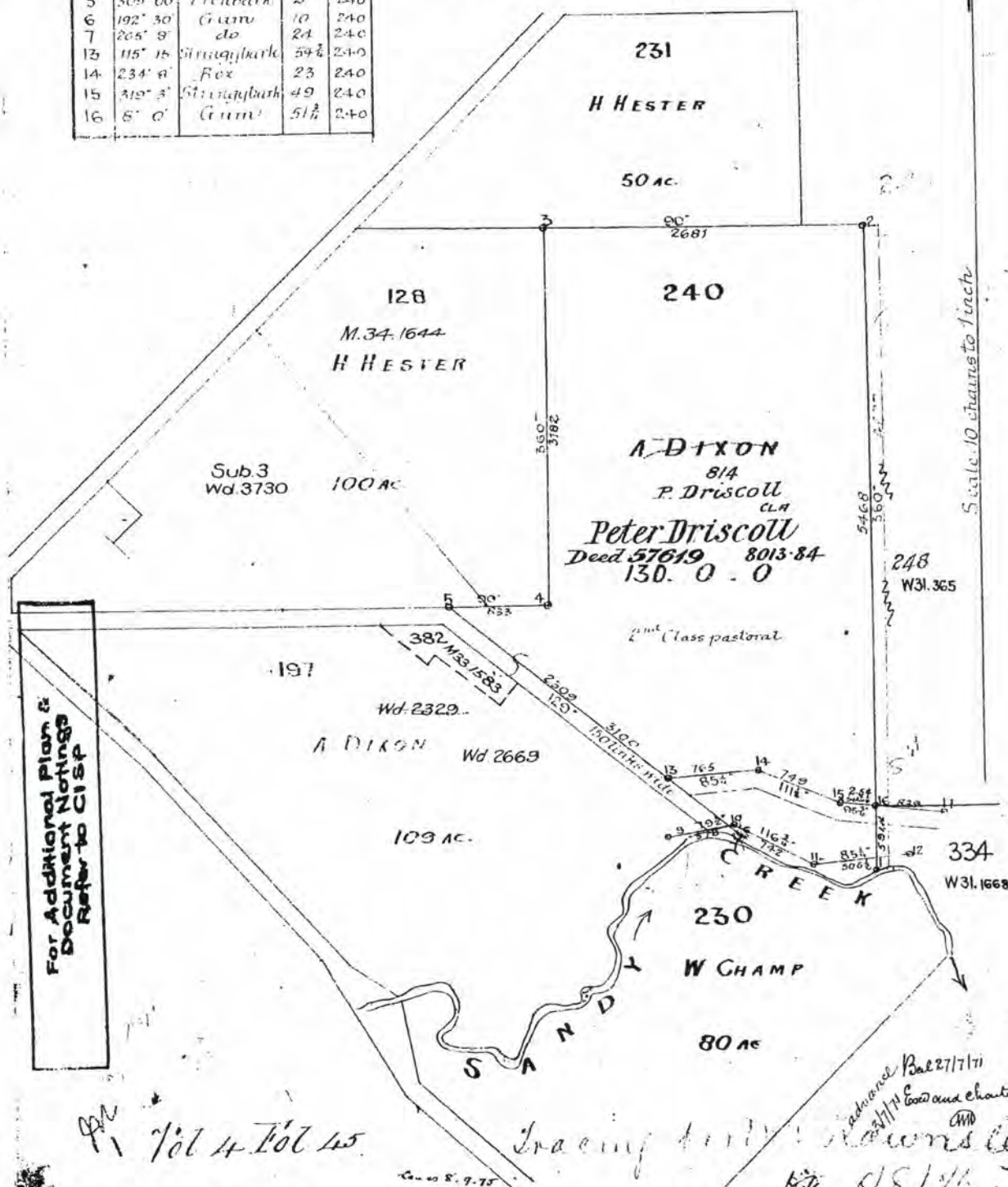
Cat. No. A135-88

CISP

6882

Reference				
N°	BEARING	FROM	LINKS	N°
1	162° 30'	Bloodwood	5.4	240
2	1° 47'	Gum	35	240
3	134° 15'	do	55½	128
4	165° 10'	Stringybark	10½	281240
5	309° 00'	Leathbark	2	240
6	192° 30'	Gum	10	240
7	205° 8'	do	24	240
13	115° 15'	Stringybark	59½	231-0
14	234° 8'	Rex	23	240
15	310° 3'	Stringybark	49	240
16	8° 0'	Gum	51½	240

Country lands alienated, &c.; 2722
 volume 4, p. 155. P. 12.12.79.



Surveyed under Instructions from Surveyor-General

No. 187

Transmitted to the Surveyor-General

with my Letter No. 145 dated 26 June 1871

Martin Lavell
 Lived here

SURVEY

OF PORTIONS Nos. 240 ADDITIONAL TO 197

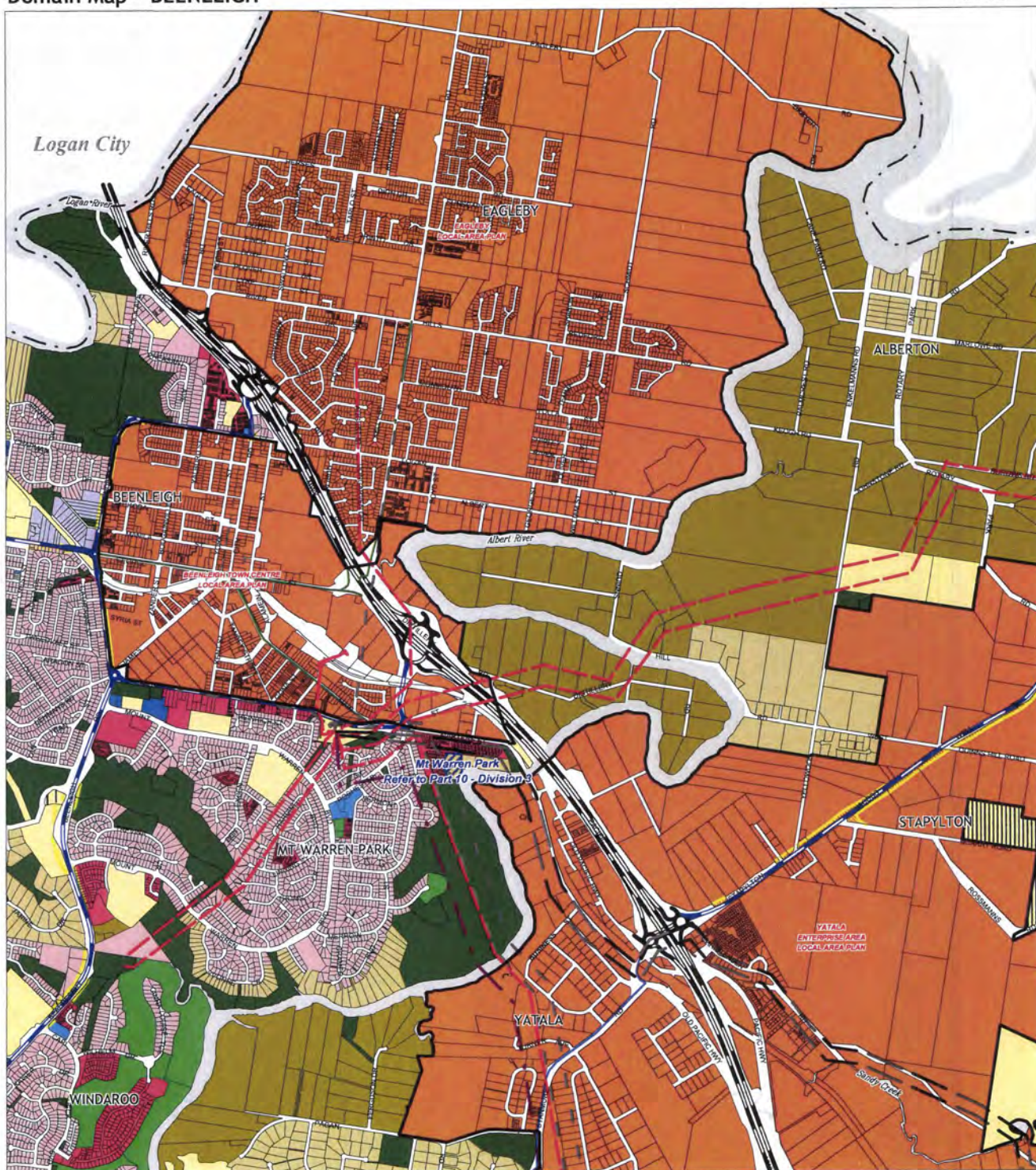
PARISH OF ALBERT

COUNTY OF Ward

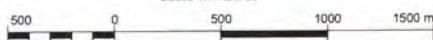
DISTRICT OF BEENLEIGH

Est. No. W31320

W. 31. 320



Scale in Metres



Adjoining Map Series

BLACKS CREEK	CARBROOK	
WATERFORD	BEENLEIGH	GILBERTON
WOLFFSDENE	DARLINGTON	ORMEAU

Legend

Domains	Existing Road Hierarchy
RURAL	STATE STRATEGIC ROAD (MAIN ROADS)
PARK LIVING	REGIONAL ROAD (MAIN ROADS)
VILLAGE	DISTRICT ROAD (MAIN ROADS)
DETACHED DWELLING	ARTERIAL ROADS (GCCC)
RESIDENTIAL CHOICE	SUB-ARTERIAL ROADS (GCCC)
TOURIST & RESIDENTIAL	DISTRIBUTOR ROADS (GCCC)
INTEGRATED BUSINESS	
LOCAL BUSINESS	Future Road Requirement
FRINGE BUSINESS	ROAD REQUIREMENT LINE (GCCC)
INDUSTRY 1	ROAD REQUIREMENT LINE (MAIN ROADS)
INDUSTRY 2	AREA REQUIRED FOR ROAD CORRIDOR (GCCC)
WATER BODY	AREA REQUIRED FOR ROAD CORRIDOR (MAIN ROADS)
TO BE BORN NAME	
	Transmission Lines
	EXISTING 110 KV
	EXISTING 275 KV
	EXISTING 33 KV
	PROPOSED 110 KV
	PROPOSED 33 KV

© Gold Coast City Council 2008

Based on Cadastral Data provided with the permission of the Department of Natural Resources and Water. (Current as at March 2008)

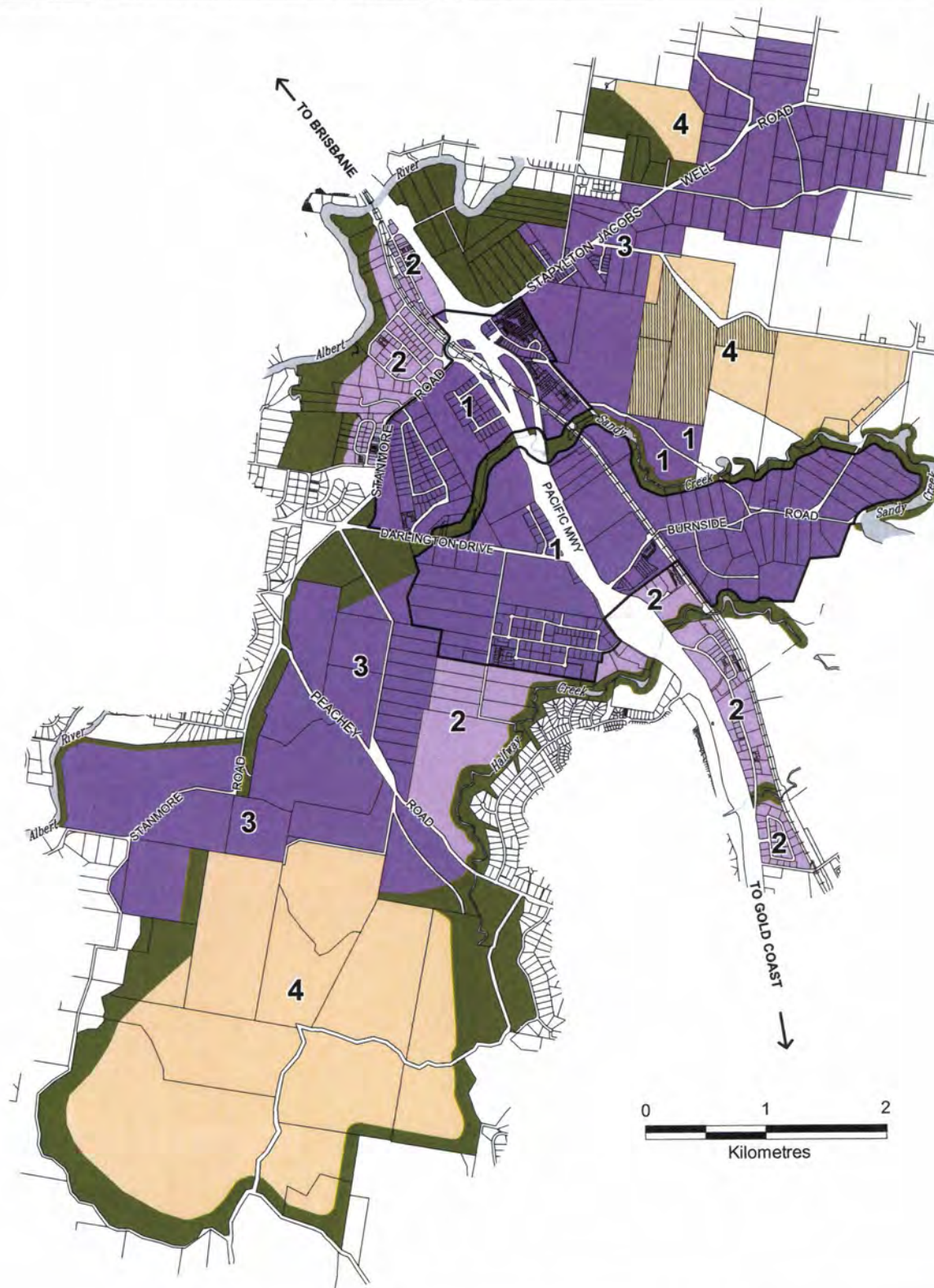
While every care is taken to ensure the accuracy of this data, the Gold Coast City Council makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

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GDA

Gold Coast City Council



Legend

- | | | | |
|---|--------------------------------------|---|-----------------------------------|
| 1 | GENERAL IMPACT BUSINESS AND INDUSTRY | 4 | EXTRACTIVE INDUSTRY |
| 2 | LOW IMPACT BUSINESS AND INDUSTRY | 5 | OPEN SPACE |
| 3 | FUTURE INDUSTRY | 6 | DESIGNATED DEVELOPMENT - LANDFILL |

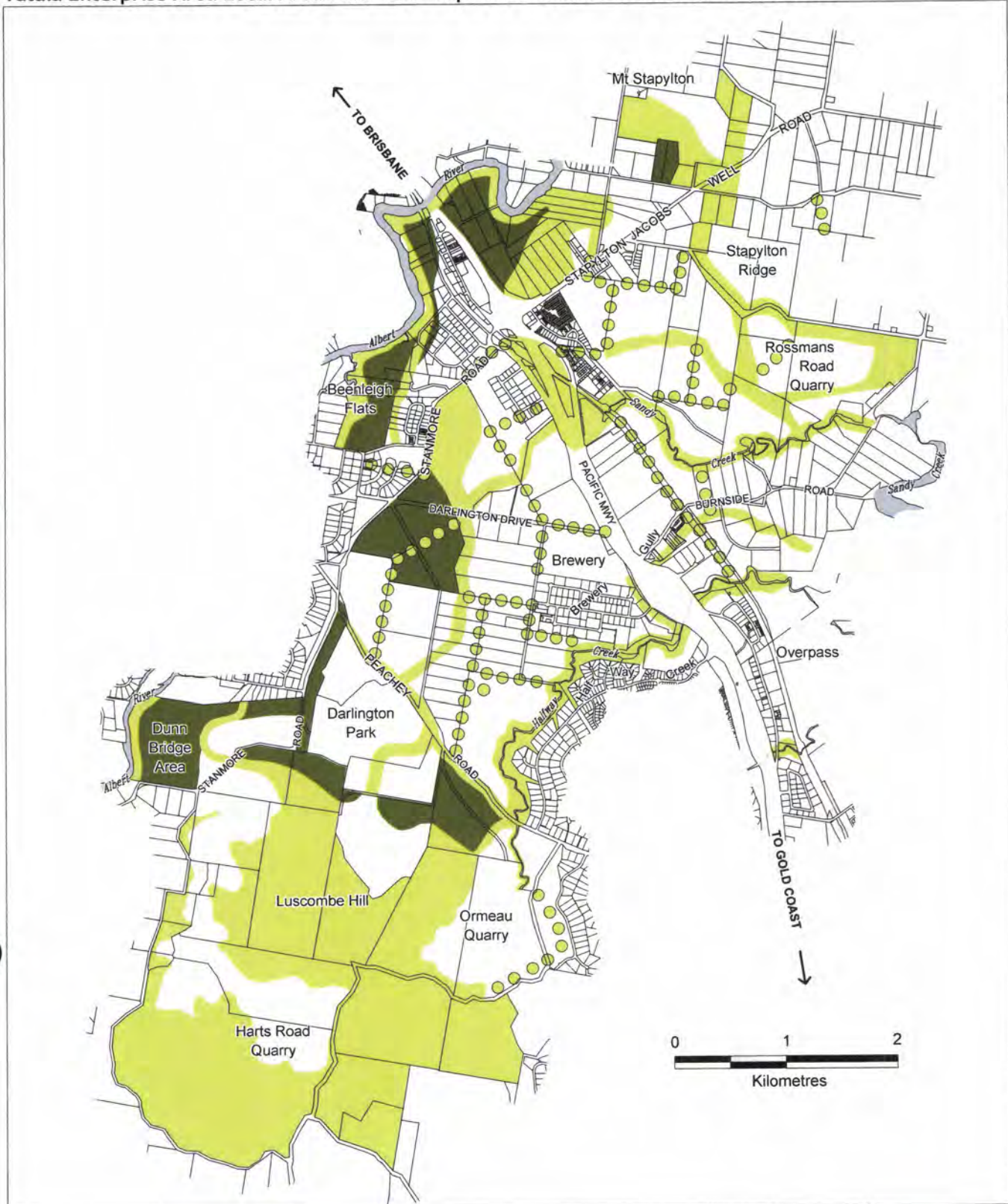
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Legend



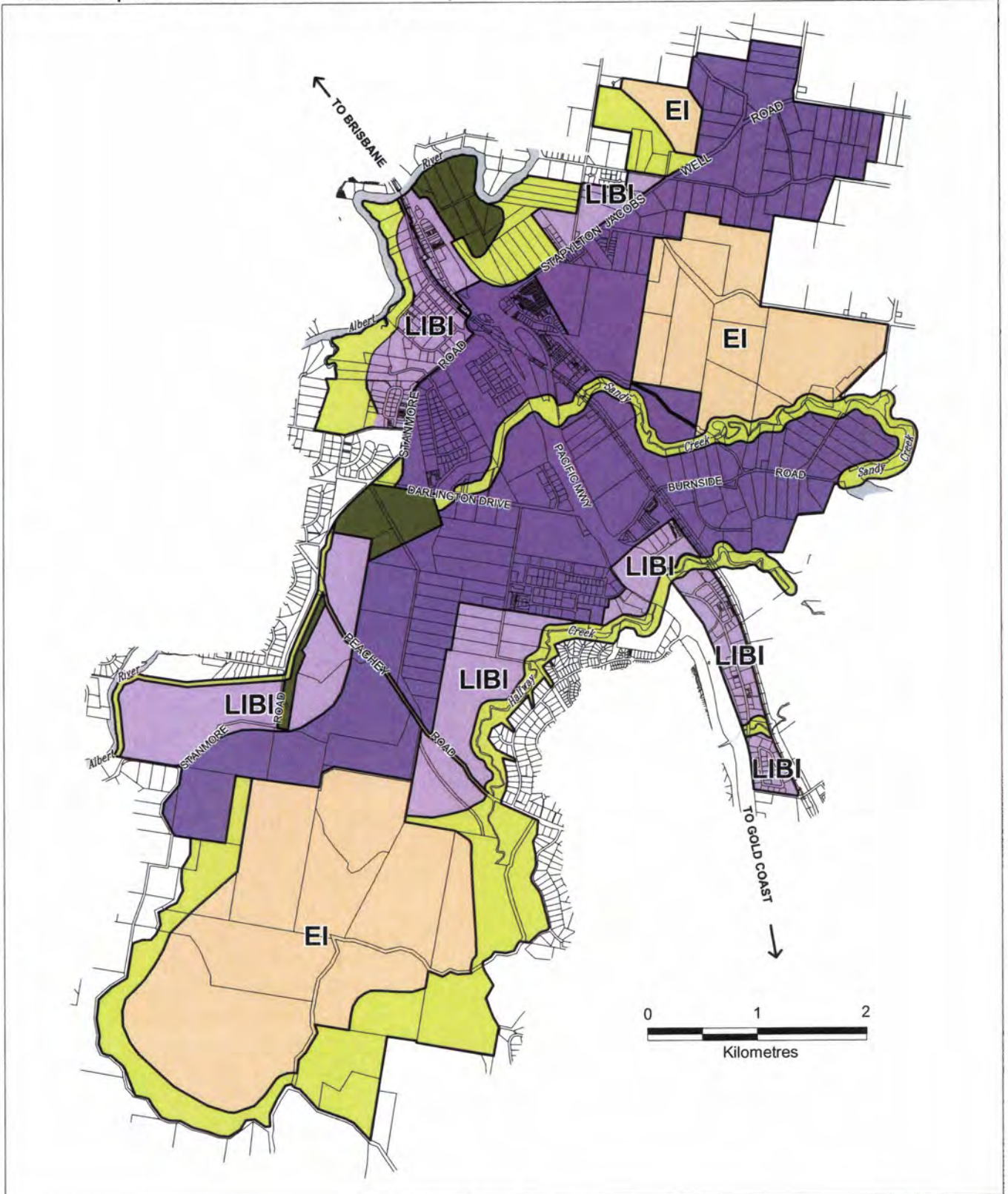
© Gold Coast City Council 2007

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Legend

	GENERAL IMPACT BUSINESS AND INDUSTRY		EI	EXTRACTIVE INDUSTRY
	LIBI	LOW IMPACT BUSINESS AND INDUSTRY		OPEN SPACE

© Gold Coast City Council 2009

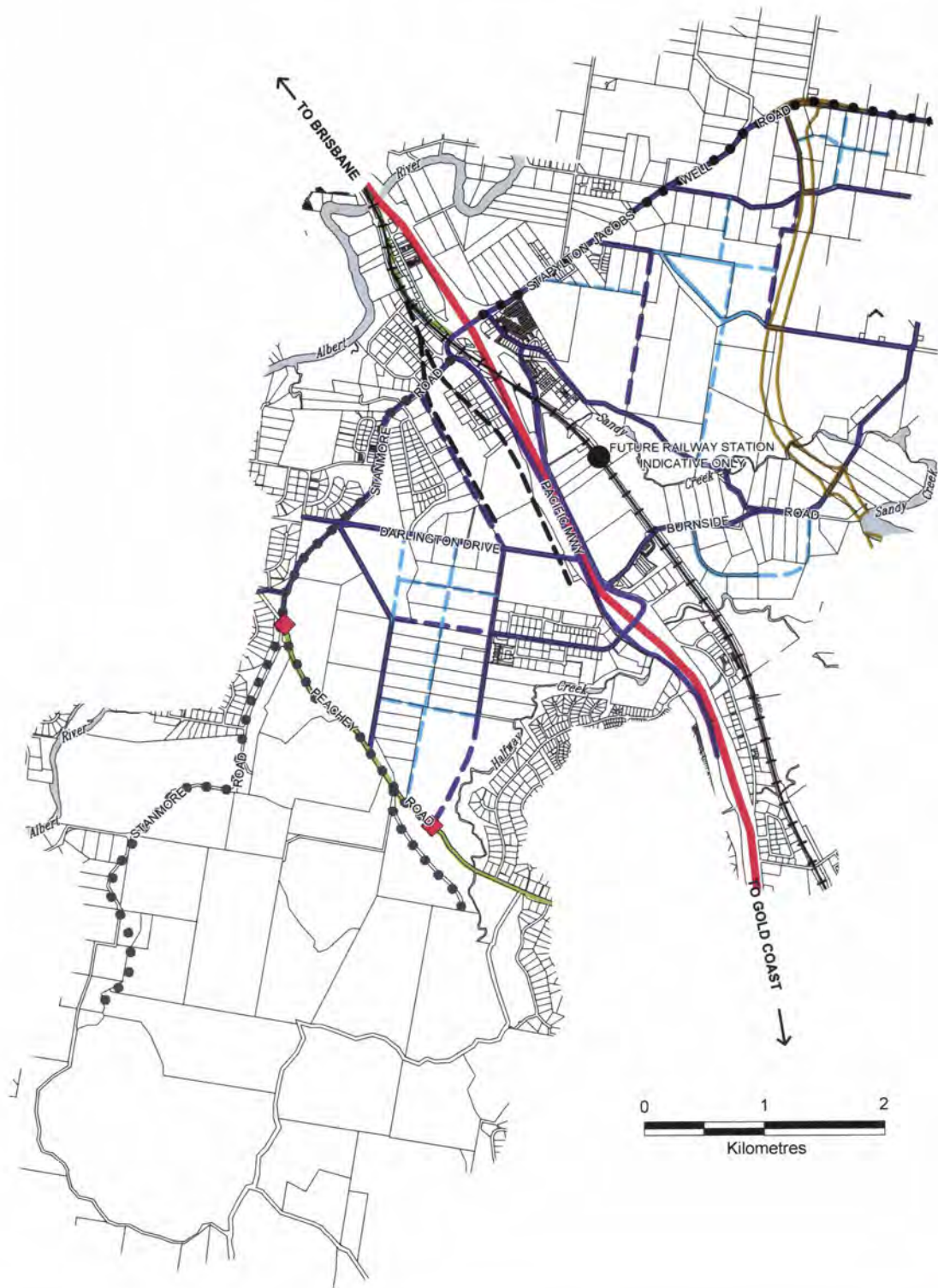
Based on Cadastral Data provided with the permission of the Department of Natural Resources and Water. (Current as at December 2009)

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Legend

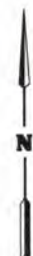
—+—+— EXISTING RAILWAY	—●—●— SUB ARTERIAL ROAD - NON INDUSTRIAL (PROPOSED)
- - - PROPOSED RAIL SPUR LINE (OPTIONS 1 & 2)	● ● ● HAUL ROADS
— REGIONAL ROAD - PACIFIC HIGHWAY	— CONNECTOR ROADS (EXISTING)
— ARTERIAL ROAD - MAJOR INDUSTRIAL ROAD (EXISTING)	— CONNECTOR ROADS (PROPOSED)
— ARTERIAL ROAD - MAJOR INDUSTRIAL ROAD (PROPOSED)	◆ INDUSTRIAL TRAFFIC CONTROL POINT
— SUB ARTERIAL ROAD - MAJOR INDUSTRIAL ROAD (EXISTING)	— INTRA REGIONAL TRANSPORT CORRIDOR

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Koala Habitat in South East Queensland

Legend

 Area of interest - Road/Lot & Plan

Koala SPP - Habitat Values

Bushland Habitat

High Value Bushland

Medium Value Bushland

Low Value Bushland

Suitable for Rehabilitation

High Value Rehabilitation

Medium Value Rehabilitation

Low Value Rehabilitation

Other Areas of Value

High Value Other

Medium Value Other

Low Value Other

Generally not suitable

Water

South East Queensland Koala Habitat Values western SEQ

Bushland habitat

Suitable for rehabilitation

Other areas of value

Generally not suitable

Water

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13.52.08

Centered on Lot on Plan:

1 RP6882



Queensland
Government

LOCALITY DIAGRAM



This scale bar is approximate only

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

This product is unprojected and is not suitable for measuring distances

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Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2010.

Note - These maps are not regulatory. Regulatory maps and requirements can be downloaded from the DERM website. Further information in relation to regulatory requirements for development and planning activities should be sought from the relevant Local Government Authority or the Department of Environment and Resource Management.

— Cadastral Boundaries

— Local Government Boundaries

Road Names

© Pitney Bowes Business Insight

Pty Ltd 2010

© The State of Queensland, 2010



Koala Habitat in South East Queensland

Legend

 Area of interest - Road/Lot & Plan

Koala SPP - Habitat Values

Bushland Habitat

High Value Bushland

Medium Value Bushland

Low Value Bushland

Suitable for Rehabilitation

High Value Rehabilitation

Medium Value Rehabilitation

Low Value Rehabilitation

Other Areas of Value

High Value Other

Medium Value Other

Low Value Other

Generally not suitable

Water

South East Queensland Koala Habitat Values western SEQ

Bushland habitat

Suitable for rehabilitation

Other areas of value

Generally not suitable

Water

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13.54.56

Centered on Lot on Plan:
240 W31320



Queensland
Government

LOCALITY DIAGRAM



This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

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Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2010.

Note - These maps are not regulatory. Regulatory maps and requirements can be downloaded from the DERM website. Further information in relation to regulatory requirements for development and planning activities should be sought from the relevant Local Government Authority or the Department of Environment and Resource Management.

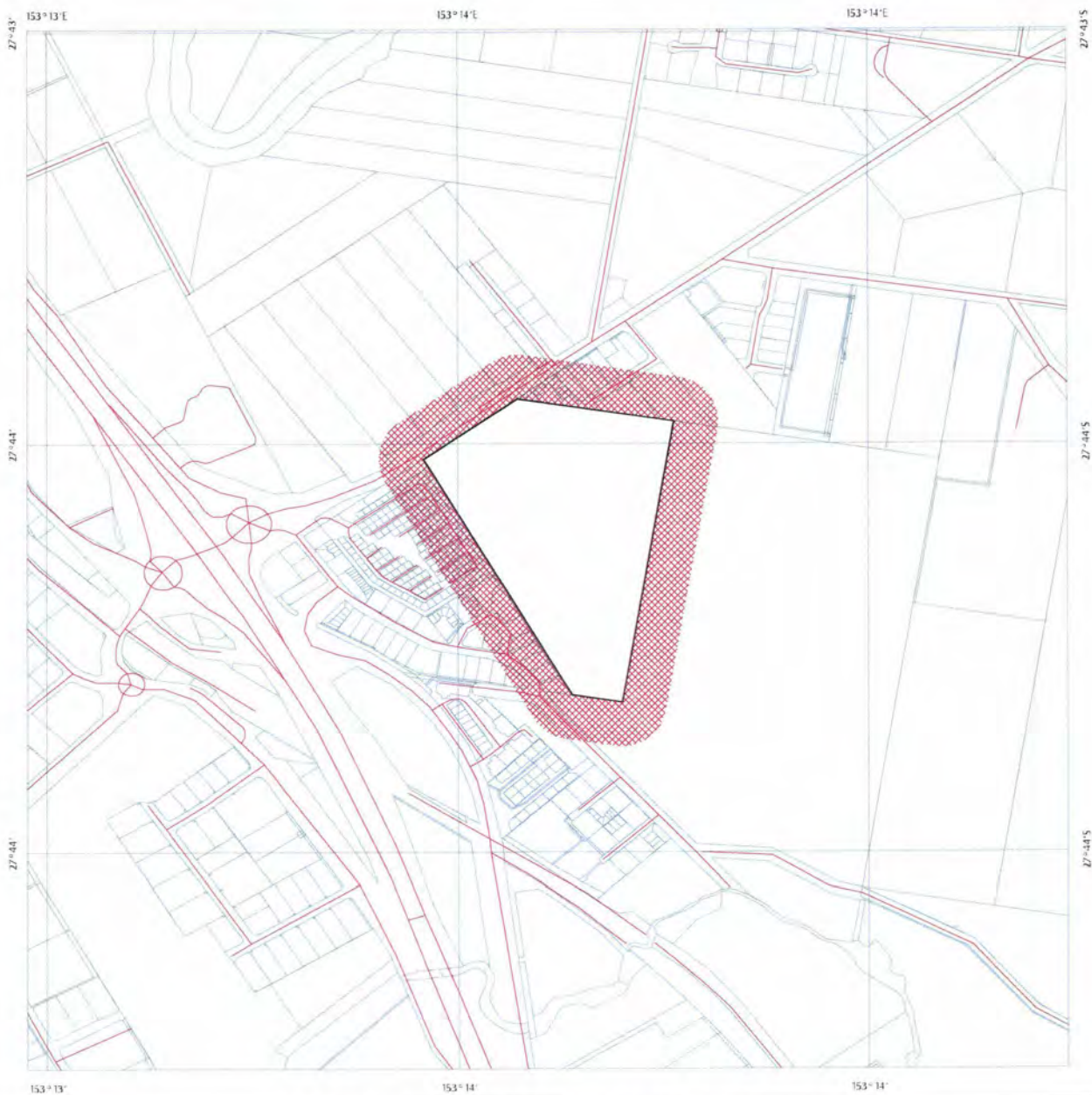
Cadastral Boundaries

Local Government Boundaries

Road Names

© Pitney Bowes Business Insight
Pty Ltd 2010

© The State of Queensland, 2010



SUSTAINABLE PLANNING REGULATION 2009

MAP OF REFERABLE AREAS (ADVICE)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.55.17

Centered on Lot on Plan:
1 RP6882

- Conservation Estate
- Heritage Places
- 100 metre buffer
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2010
- Cadastral Boundaries
- Property boundaries shown are provided as a locational aid only.
- Towns



Queensland
Government

LOCALITY DIAGRAM



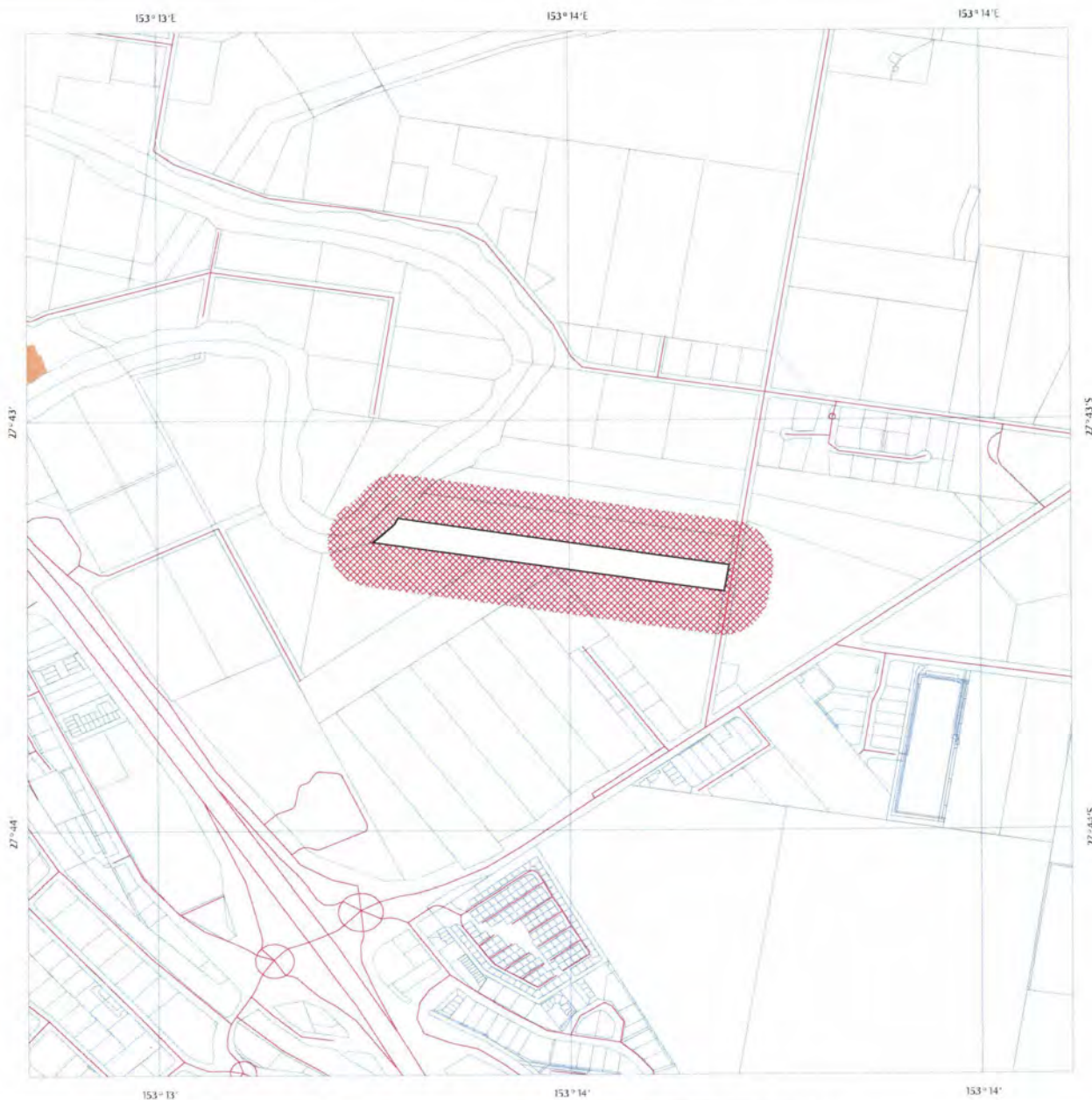
This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

Development applications made under the Sustainable Planning Act 2009 must be referred to DERM if the subject lot is identified as sharing a common boundary with a heritage place or is in or within 100m of a conservation estate and meets the criteria required under Schedule 7 of the Sustainable Planning Regulation 2009.

Information shown on this map includes current data for conservation estate and heritage places as required under Schedule 7 of the Sustainable Planning Regulation 2009. All datasets are updated as they become available to provide the most current information as of the date shown on this map.

Line work for the referable areas has been compiled at a variety of scales and should be used as a guide only. Consideration of the effects of mapped scale is necessary when interpreting the data. Buffer area shown is equivalent to approximately 100m from the boundary of the subject lot.

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SUSTAINABLE PLANNING REGULATION 2009

MAP OF REFERABLE AREAS (ADVICE)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 24 Aug 11 Time: 17.39.13

Centered on Lot on Plan:
4 RP6843

- Conservation Estate
- Heritage Places
- 100 metre buffer
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2010
- Cadastral Boundaries
- Property boundaries shown are provided as a locational aid only.
- Towns



Queensland
Government

LOCALITY DIAGRAM



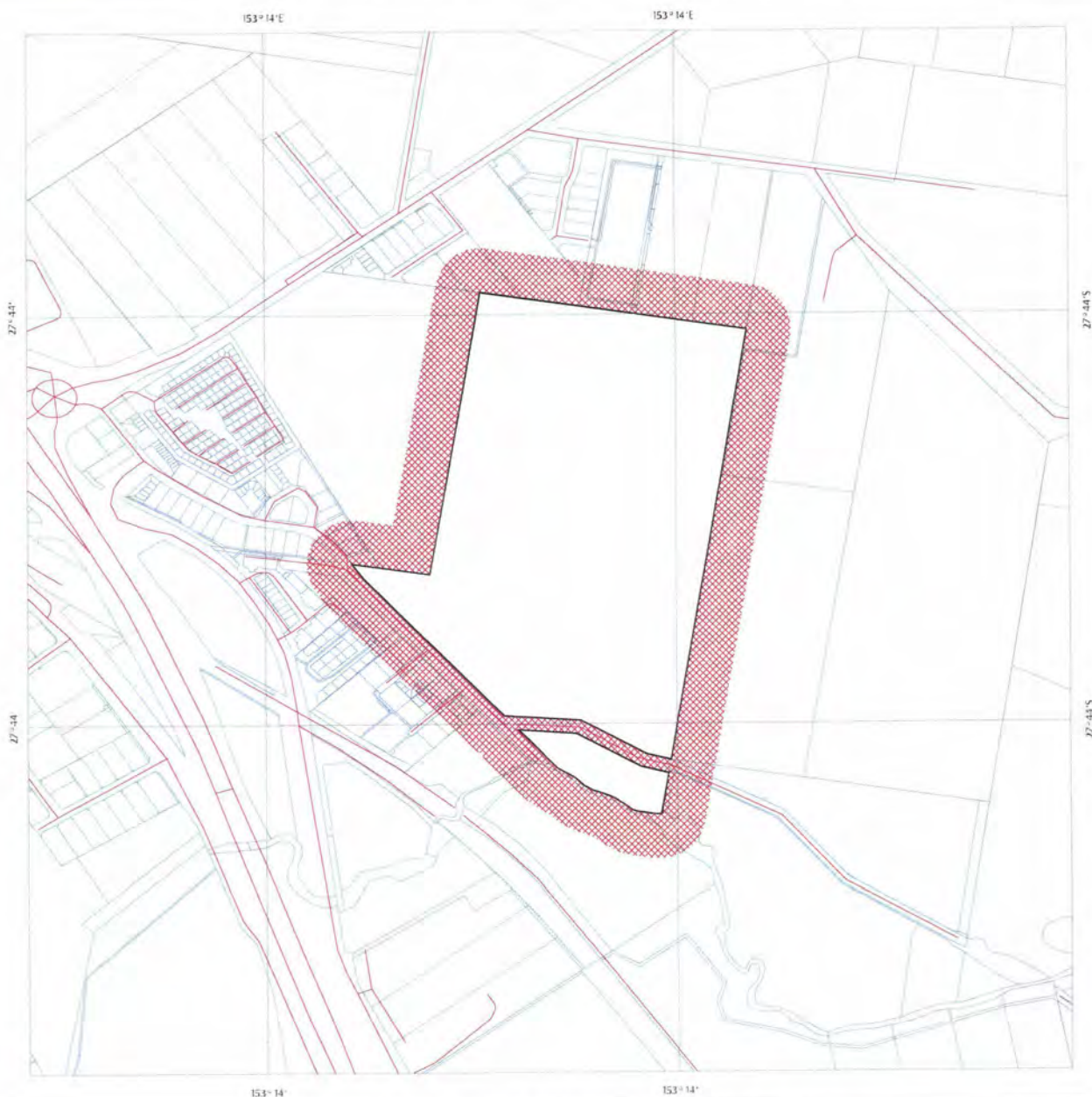
This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
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SUSTAINABLE PLANNING REGULATION 2009

MAP OF REFERABLE AREAS (ADVICE)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.55.33

Centered on Lot on Plan:
240 W31320

- Conservation Estate
- Heritage Places
- 100 metre buffer
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2010
- Cadastral Boundaries
- Property boundaries shown are provided as a locational aid only.
- Towns



Queensland
Government

LOCALITY DIAGRAM



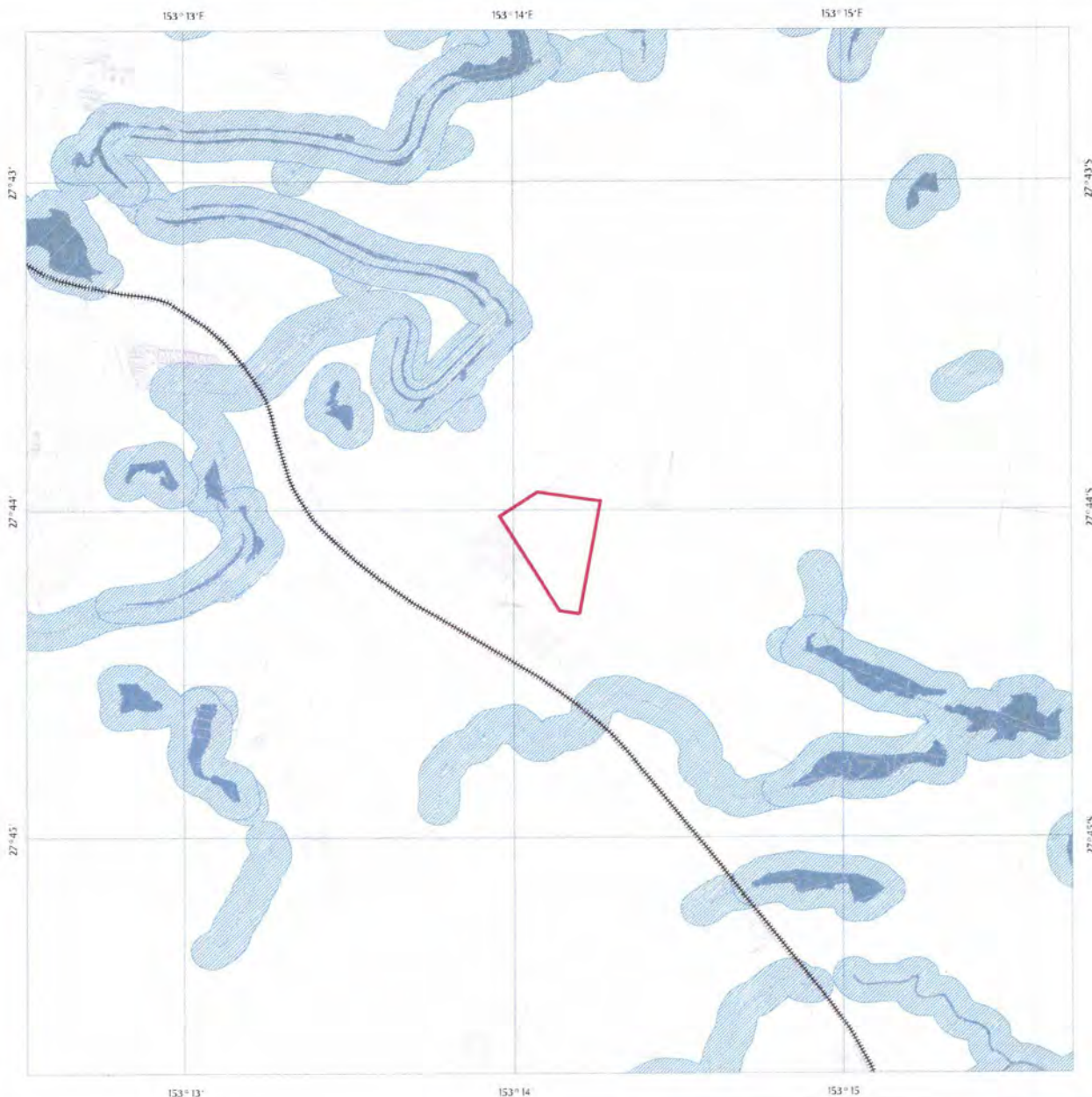
This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

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Map of Referable Wetlands

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.55.56

Centered on Lot on Plan:
1 RP6882



Queensland
Government

LOCALITY DIAGRAM



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Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

Legend

- Selected Land Parcel
- Property Boundary

GBR Wetland Protection Area

- Wetland
- Trigger Area

Wetland Management Area

- Wetland
- Trigger Area

This map should only be used to apply policies outlined in the Temporary State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (SPP for GBR Wetlands).

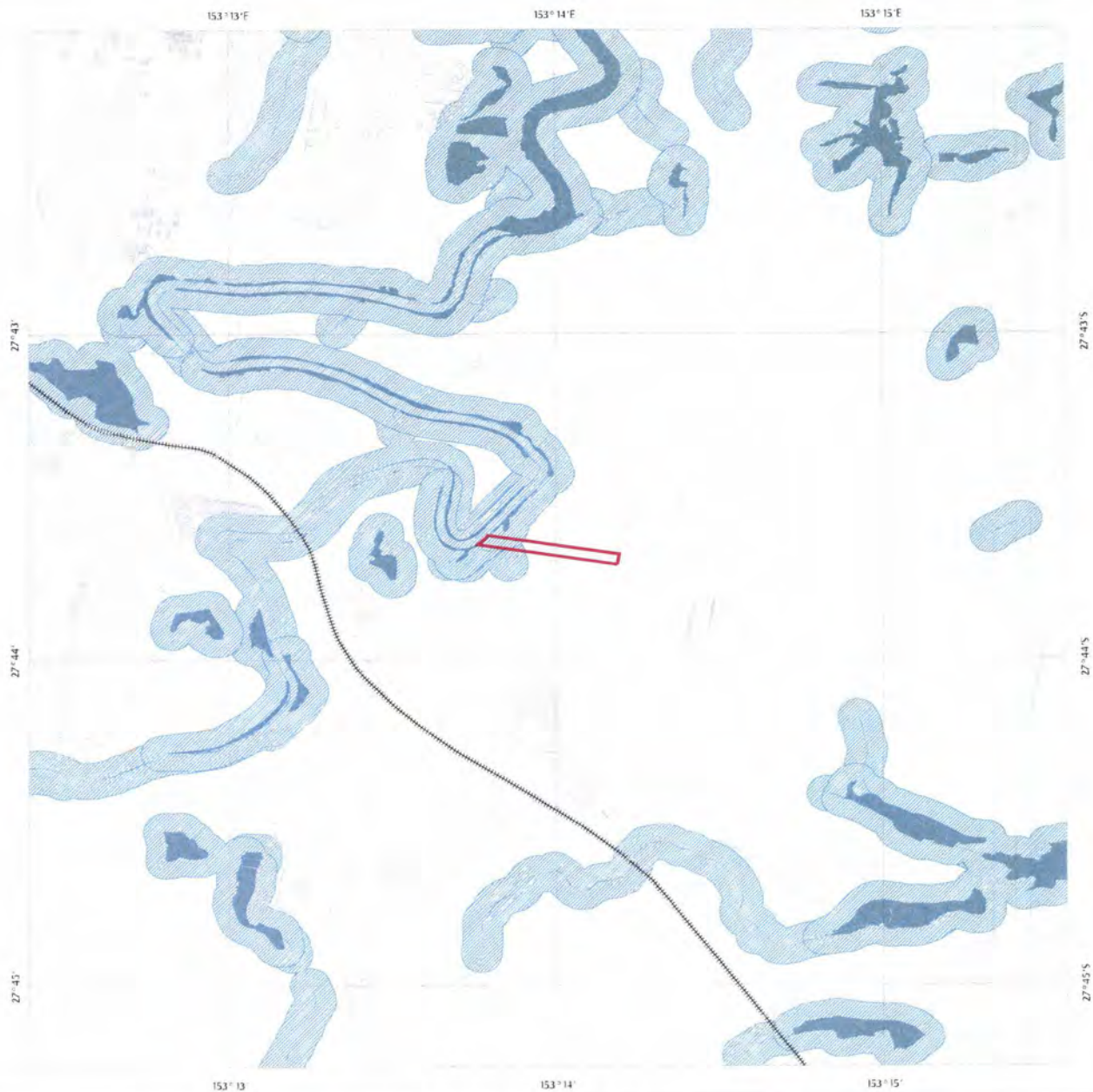
Information shown on the map includes multiple spatial datasets that define policies stated in the Temporary State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (SPP for GBR Wetlands). Datasets include wetlands, roads, rail lines and cadastral boundaries.

All datasets are current as at 30 April 2010.

The maps are produced at a scale relevant to the size of the lot on plan identified and should be printed as A4 size in portrait orientation. Consideration of the effects of mapped scale is necessary when interpreting data at a large scale i.e. property level. For property assessment, digital linework should be used as a guide only.

The Wetlands Regulatory Map is A4 portrait and should be printed at this size.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Resource Management at planning.support@derm.qld.gov.au



Map of Referable Wetlands

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 24 Aug 11 Time: 17.39.00

Centered on Lot on Plan:
4 RP6843



Queensland
Government

LOCALITY DIAGRAM



This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

Legend

- Selected Land Parcel
- Property Boundary

GBR Wetland Protection Area

- Wetland
- Trigger Area

Wetland Management Area

- Wetland
- Trigger Area

This map should only be used to apply policies outlined in the Temporary State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (SPP for GBR Wetlands).

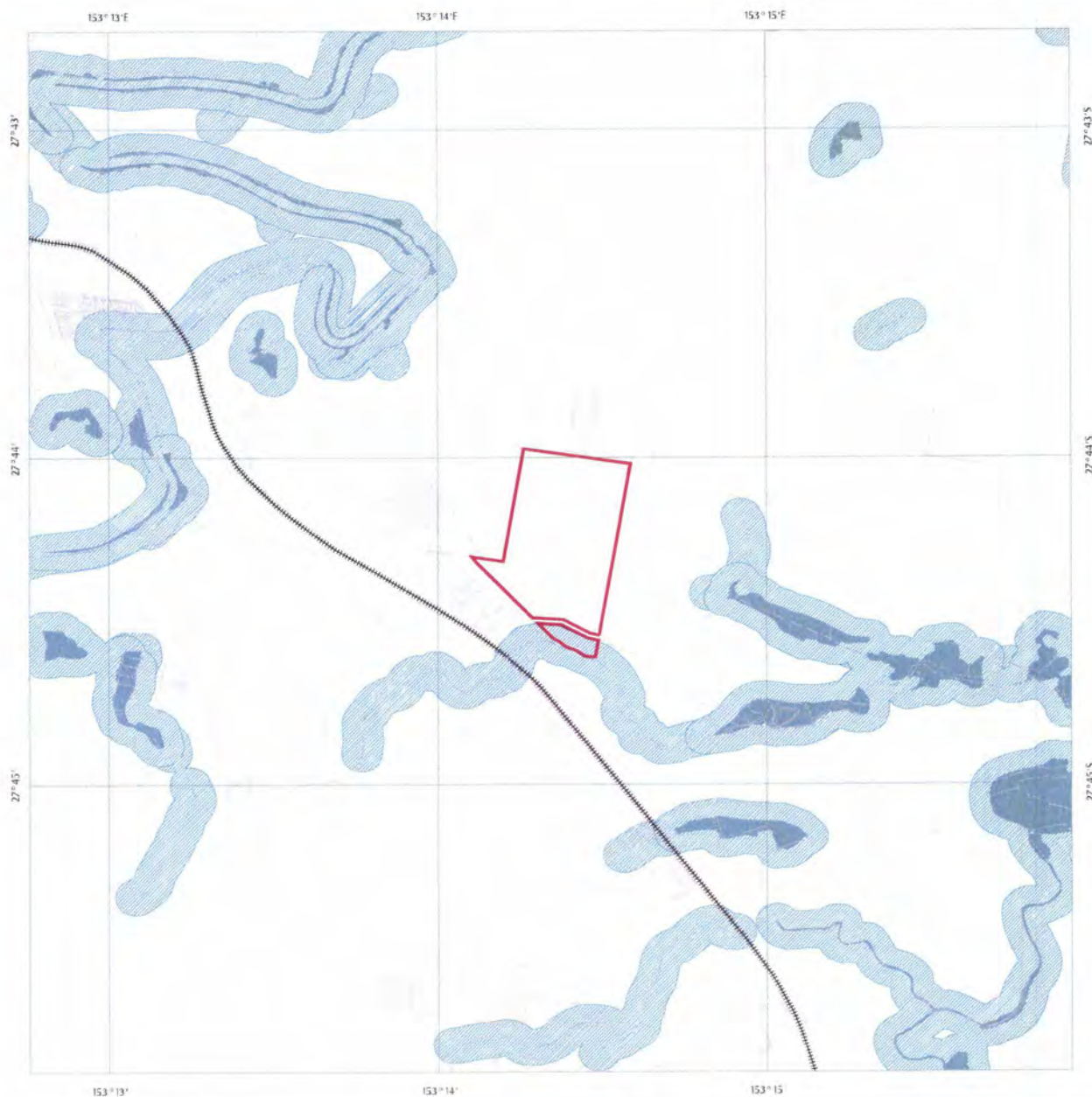
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For further information or assistance with interpretation of this product, please contact the Department of Environment and Resource Management at planning.support@derm.qld.gov.au



Map of Referable Wetlands

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.56.09

Centered on Lot on Plan:
240 W31320



Queensland
Government

LOCALITY DIAGRAM



This scale bar is approximate only
Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)
This product is unprojected and is not suitable for measuring distances

Legend

- Selected Land Parcel
- Property Boundary

GBR Wetland Protection Area

- Wetland
- Trigger Area

Wetland Management Area

- Wetland
- Trigger Area

This map should only be used to apply policies outlined in the Temporary State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (SPP for GBR Wetlands).

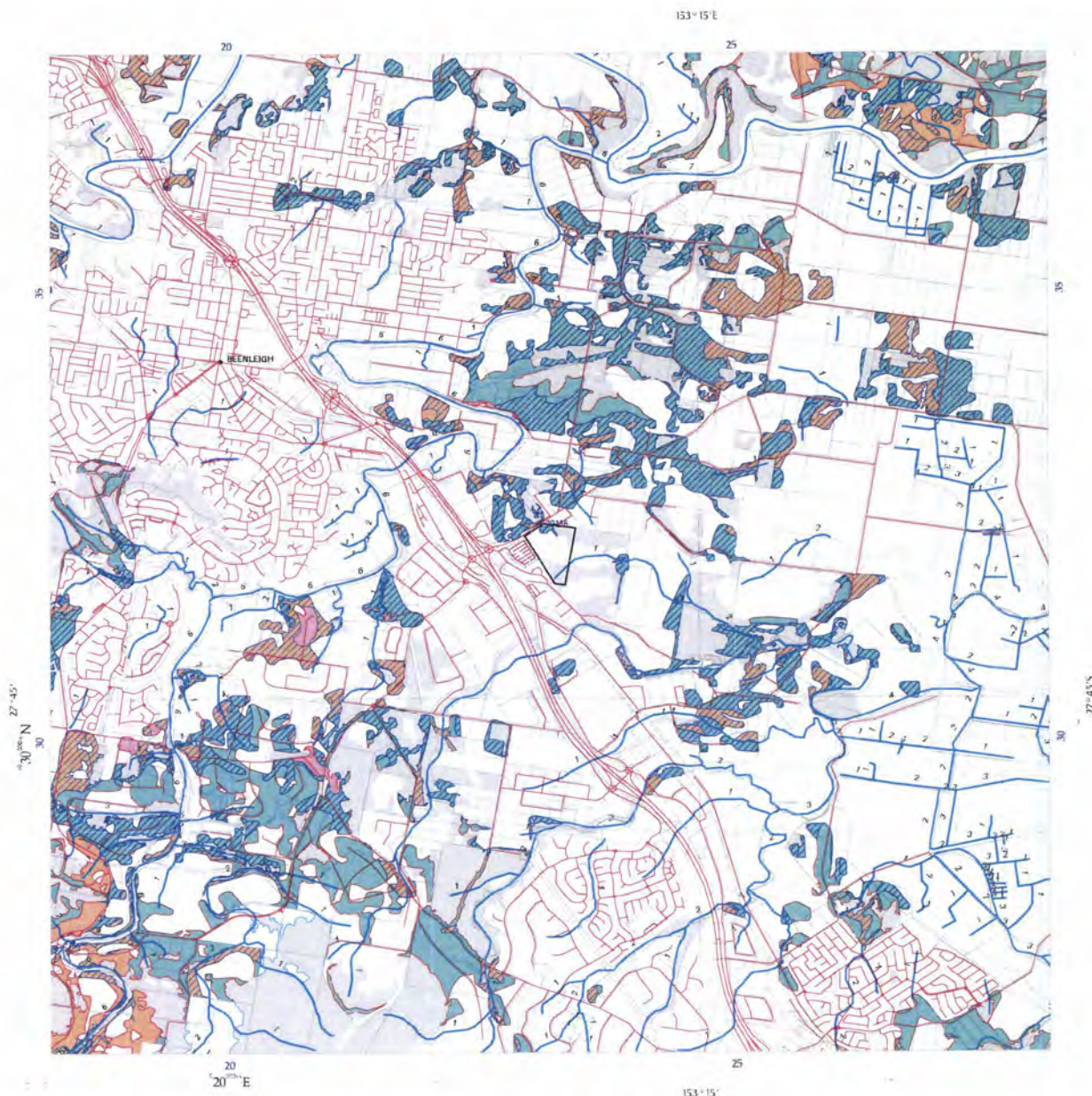
Information shown on the map includes multiple spatial datasets that define policies stated in the Temporary State Planning Policy: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (SPP for GBR Wetlands). Datasets include wetlands, roads, rail lines and cadastral boundaries.

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The Wetlands Regulatory Map is A4 portrait and should be printed at this size.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Resource Management at planning.support@derm.qld.gov.au



REGROWTH VEGETATION MAP - Version 2.0

- Vegetation Management Act Essential Regrowth Habitat with example label number
- Great Barrier Reef Wetland Protection Area
- High value regrowth vegetation containing Endangered regional ecosystems
- High value regrowth vegetation containing Of Concern regional ecosystems
- High value regrowth vegetation that is a Least Concern regional ecosystem
- Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
- Non-remnant
- PMAV Category X area
- Regrowth watercourse (Stream order shown as black number against stream)
- Other watercourse (Stream order shown as black number against stream where available)
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2009
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.51.23

Centered on Lot on Plan:
1 RP6882



Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot. Labels correlate to the label field in the attached essential regrowth habitat database.

The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.derm.qld.gov.au> or contact Vegetation Management, Department of Environment and Resource Management.

Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

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Property Maps of Assessable Vegetation (PMAVs)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.51.26

Centered on Lot on Plan:
1 RP6882

Property Map of Assessable Vegetation Vegetation Category Area

- Category A area
- Category B area
- Category C area
- Category X area
- Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
- Subject Lot
- Roads
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns



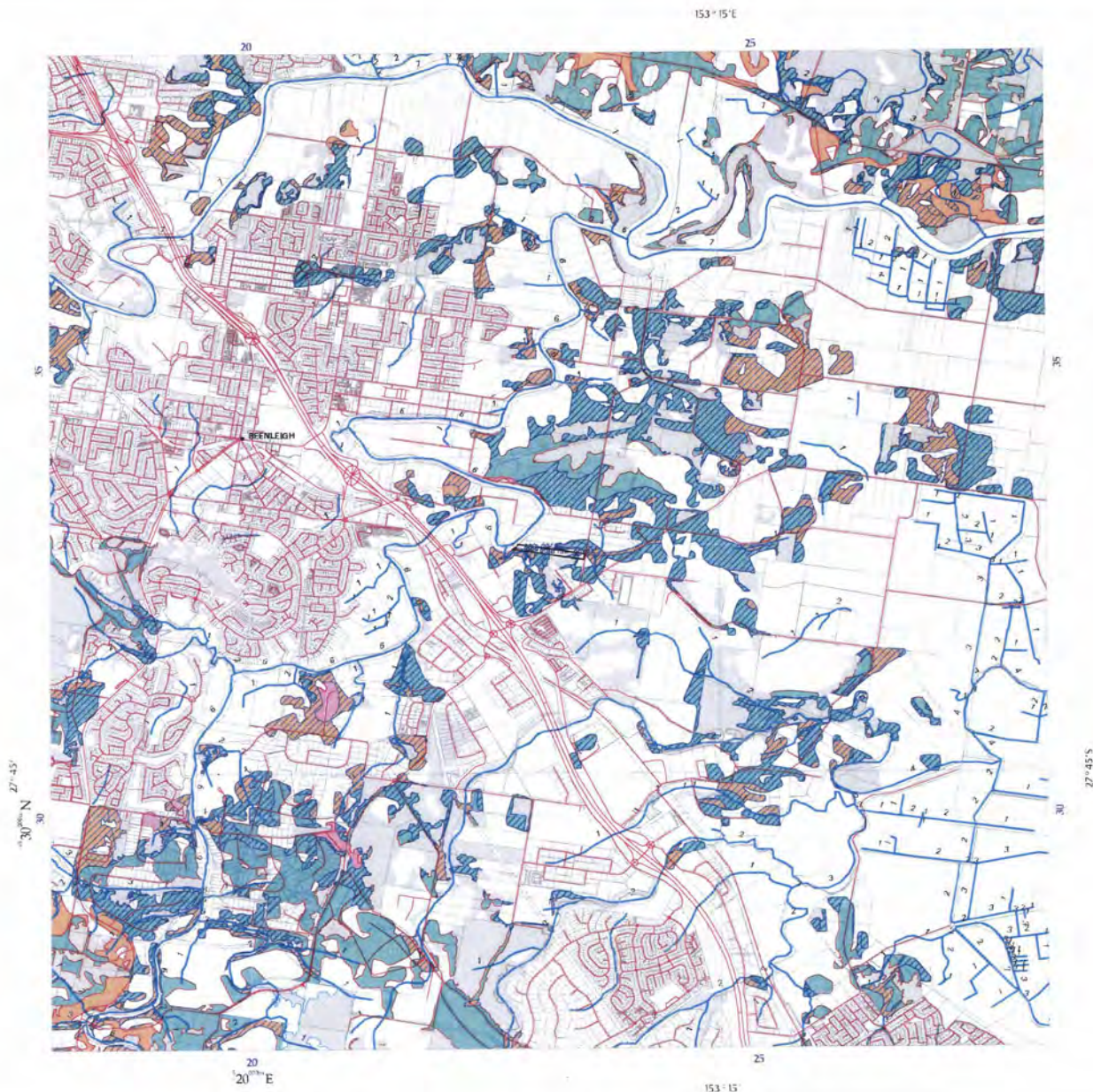
LOCALITY DIAGRAM



The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.derm.qld.gov.au/vegetation/index.html>
or contact Vegetation Management, Department of Environment and Resource Management.



REGROWTH VEGETATION MAP - Version 2.0

- Vegetation Management Act Essential Regrowth Habitat with example label number
- Great Barrier Reef Wetland Protection Area
- High value regrowth vegetation containing Endangered regional ecosystems
- High value regrowth vegetation containing Of Concern regional ecosystems
- High value regrowth vegetation that is a Least Concern regional ecosystem
- Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
- Non-remnant
- PMAV Category X area
- Regrowth watercourse (Stream order shown as black number against stream)
- Other watercourse (Stream order shown as black number against stream where available)
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2009
- Cadastral line
Property boundaries shown are provided as a locational aid only.
- Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 24 Aug 11 Time: 17.41.25

Centered on Lot on Plan:
4 RP6843



LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot.
Labels correlate to the label field in the attached essential regrowth habitat database.

The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.derm.qld.gov.au> or contact Vegetation Management, Department of Environment and Resource Management.

Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.



Property Maps of Assessable Vegetation (PMAVs)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 24 Aug 11 Time: 17.41.29

Centered on Lot on Plan:
4 RP6843

The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.derm.qld.gov.au/vegetation/index.html>
or contact Vegetation Management, Department of Environment and Resource Management.

Property Map of Assessable Vegetation Vegetation Category Area

- Category A area
- Category B area
- Category C area
- Category X area
- Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2009
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns



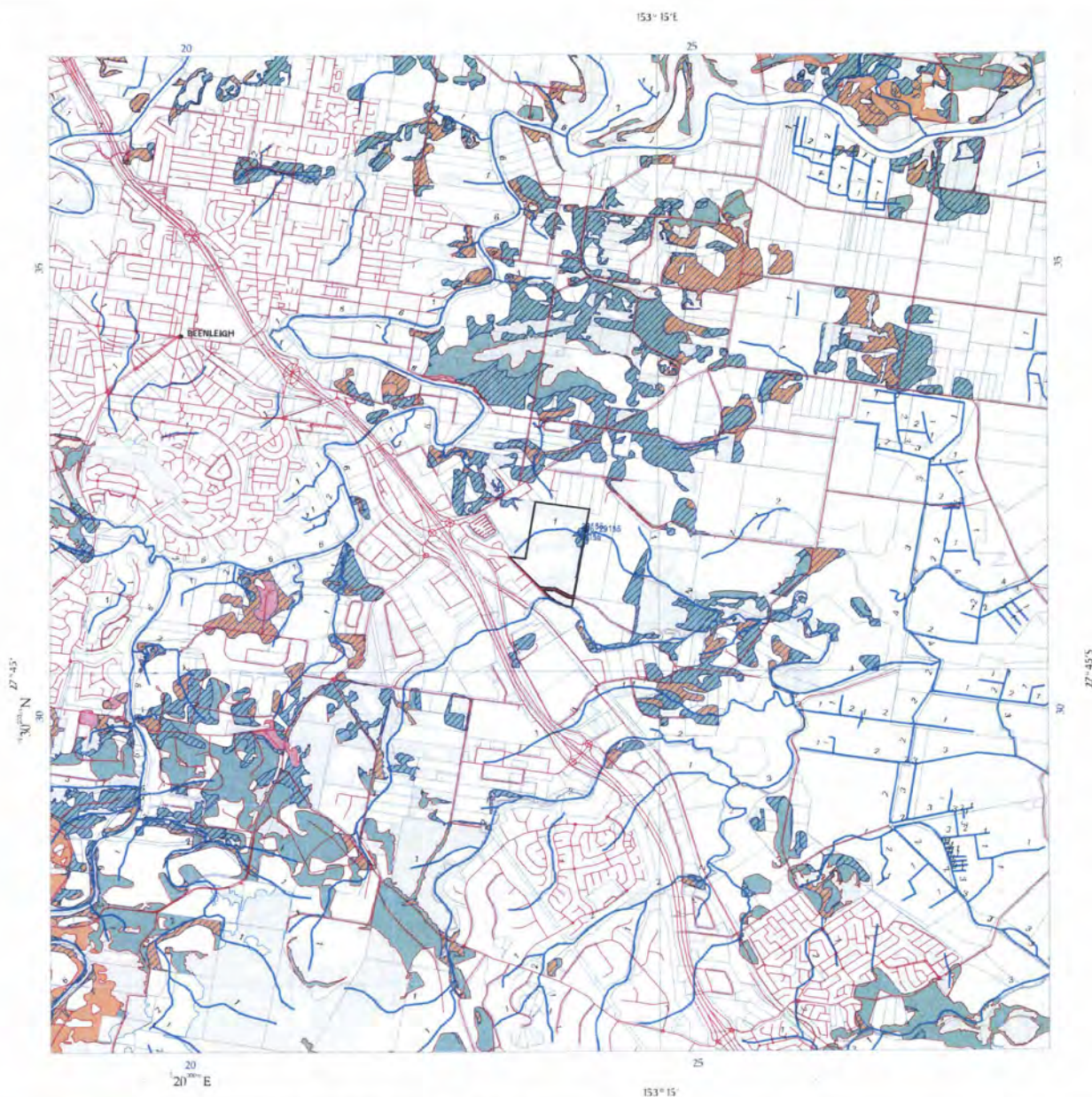
Queensland
Government

LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

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REGROWTH VEGETATION MAP - Version 2.0

- Vegetation Management Act Essential Regrowth Habitat with example label number
- Great Barrier Reef Wetland Protection Area
- High value regrowth vegetation containing Endangered regional ecosystems
- High value regrowth vegetation containing Of Concern regional ecosystems
- High value regrowth vegetation that is a Least Concern regional ecosystem
- Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
- Non-remnant
- PMAV Category X area
- Regrowth watercourse (Stream order shown as black number against stream)
- Other watercourse (Stream order shown as black number against stream where available)
- Subject Lot
- Roads
- MapInfo Australia Pty Ltd 2009
- Cadastral line
- Property boundaries shown as provided as a locational aid only.
- Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.52.08

Centered on Lot on Plan:
240 W31320

Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot. Labels correlate to the label field in the attached essential regrowth habitat database.

The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.derm.qld.gov.au> or contact Vegetation Management, Department of Environment and Resource Management.



LOCALITY DIAGRAM

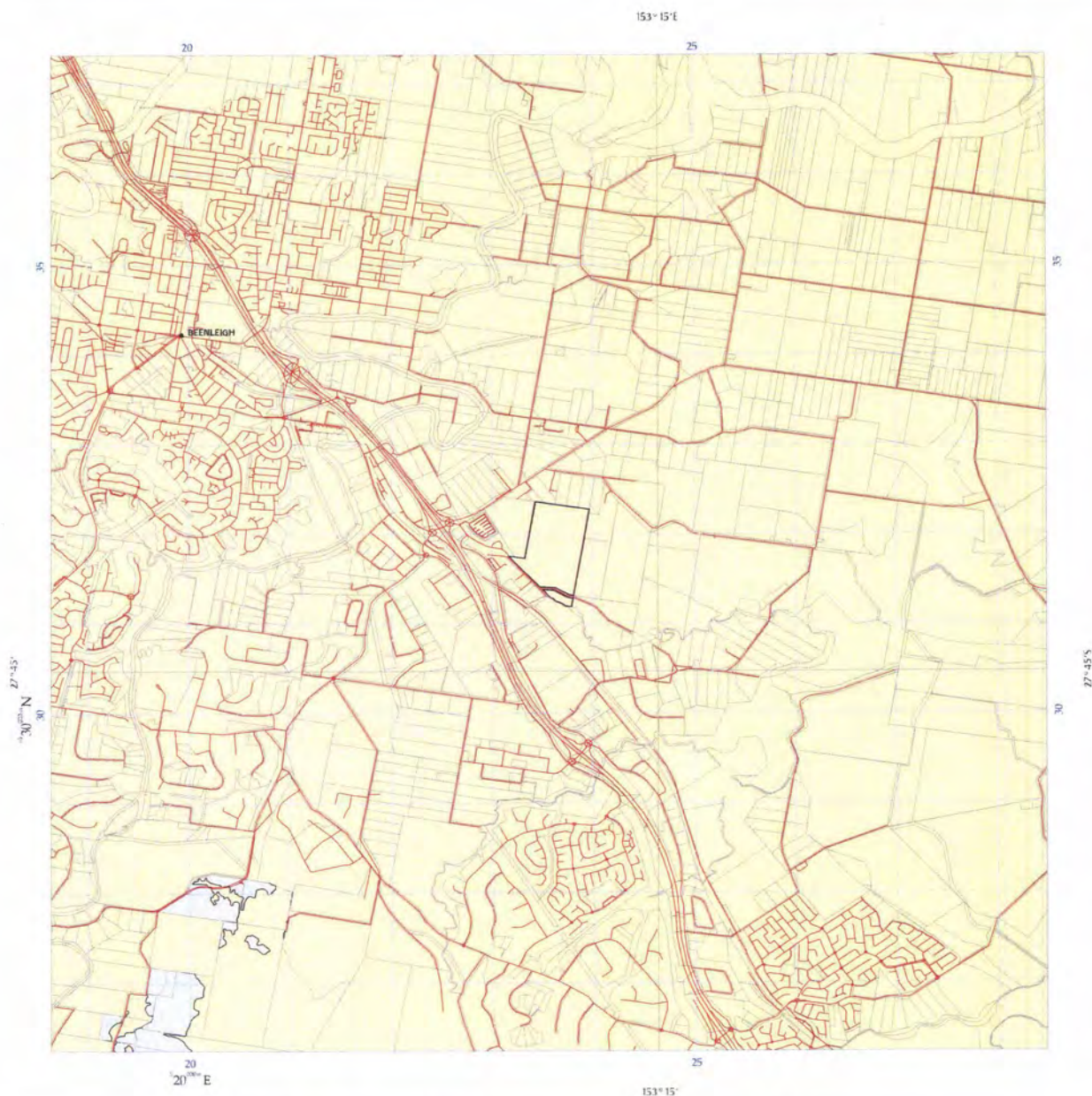


Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.

1000 0 1000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

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Property Maps of Assessable Vegetation (PMAVs)

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 22 Nov 10 Time: 13.52.11

Centered on Lot on Plan:
240 W31320

Property Map of Assessable Vegetation Vegetation Category Area

- Category A area
- Category B area
- Category C area
- Category X area
- Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
- Subject Lot
- Roads
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns

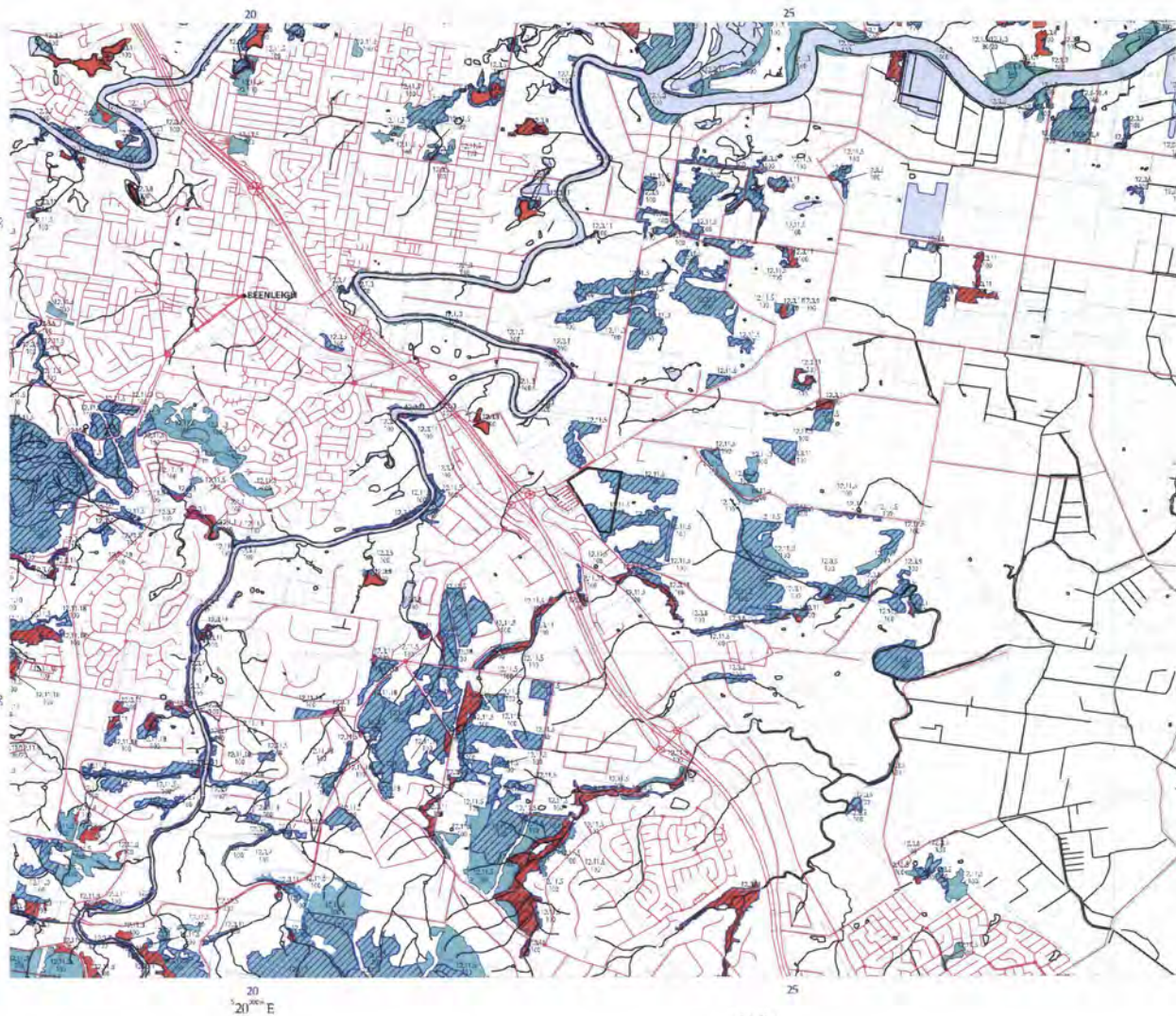


Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.derm.qld.gov.au/vegetation/index.html>
or contact Vegetation Management, Department of Environment and Resource Management.



Vegetation Management Act Regional Ecosystem and Remnant Map-Version 6

Remnant vegetation containing endangered regional ecosystems

Based on 2006 Landsat TM imagery

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13.49.55

Centered on Lot on Plan:
1 RP6882

Bioregion: Southeast Queensland

Dominant

Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant

Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMVA Category X area

Great Barrier Reef Wetlands

Vegetation Management Act Essential Habitat
For further information on VMA Essential Habitat,
please see the attached VMA Essential Habitat map.

Subject Lot

Watercourse (Stream order shown as black
number against stream where available)

Bioregion boundary

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest
and other reserves

Cadastral line
Property boundaries shown are
provided as a locational aid only.

Towns



Queensland
Government

LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

A remnant map covers areas not covered by a regional ecosystem map.

Defined map areas are labelled with the regional ecosystem (RE) code
along with the percentage breakdown if more than one RE occurs within
the area. Detailed definitions of regional ecosystems are available
from www.derm.qld.gov.au/REDD. Defined map areas smaller than 5ha
may not be labelled.

Regional ecosystem linework has been compiled at a scale of 1:100 000,
except in designated areas where a compilation scale of 1:50 000 is
available. Linework should be used as a guide only. The positional
accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres.
The extent of remnant regional ecosystems as of 2006, depicted on this
map is based on rectified 2006 Landsat TM imagery (supplied
by the Statewide Landcover and Trees Study (SLATS)), Department of
Environment and Resource Management (DERM)).

Some watercourse lines are derived from GeoScience Australia 1:250 000
mapping.

Disclaimer:

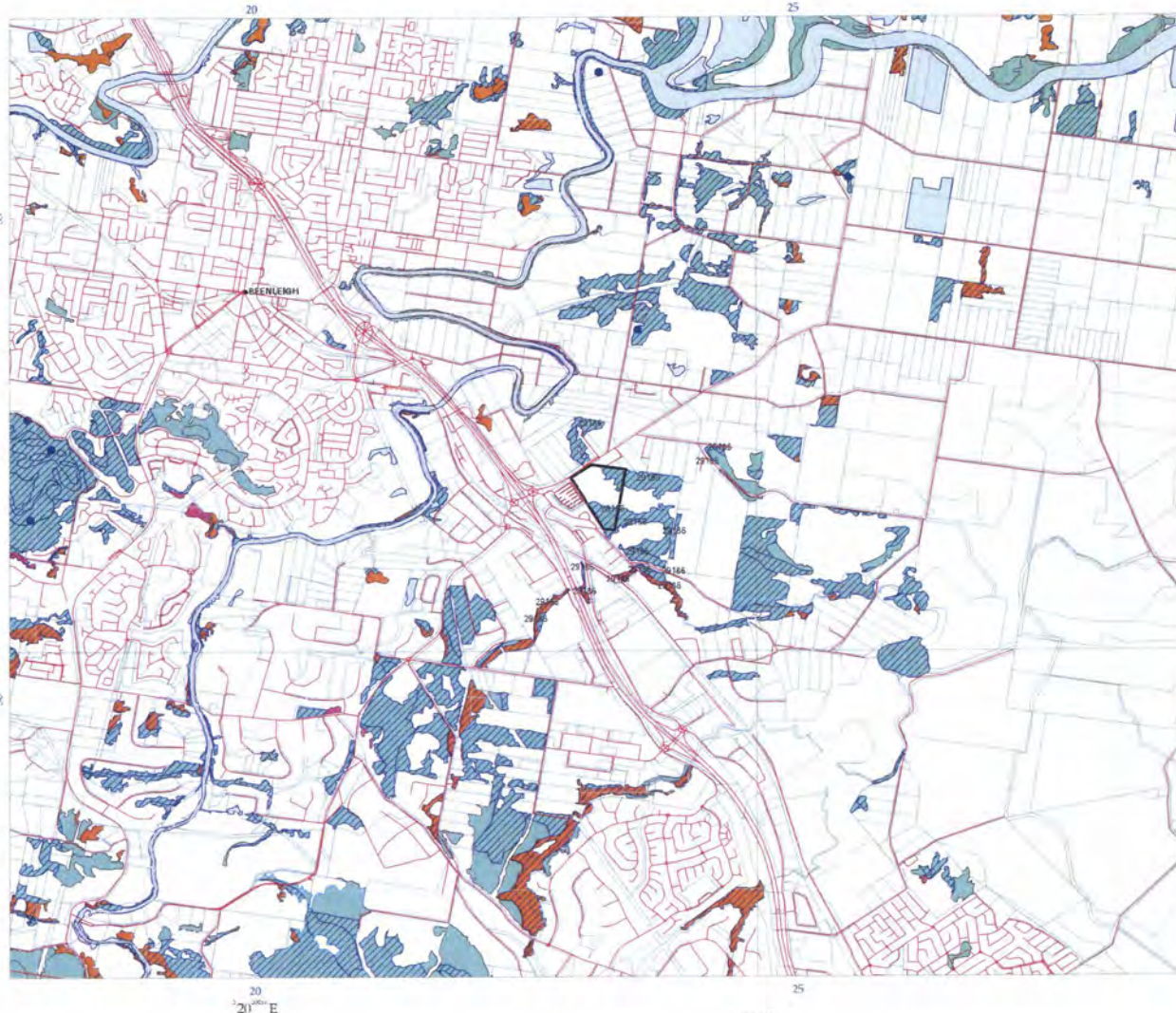
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without limitation, liability in negligence) for all expenses, losses,
damages (including indirect or consequential damage) and costs which
you might incur as a result of the product being inaccurate or
incomplete in any way and for any reason.

All datasets are updated as they become available to provide the
most current information as of the date shown on this map.

Additional information is required for the purposes of land clearing or
assessment of a regional ecosystem map or PMVA applications. For
further information go to the web site: www.derm.qld.gov.au/vegetation
or contact the Department of Environment and Resource Management.

Digital regional ecosystem data is available in shapefile format, for Lot
on Plans from www.derm.qld.gov.au/REDDATA or from DERM for larger
areas.

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Vegetation Management Act Essential Habitat Map Version 3.0

Remnant vegetation containing endangered regional ecosystems

Dominant

Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant

Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMAV Category X area

Vegetation Management Act Essential Habitat

Vegetation Management Act Essential Habitat Species Records

Subject Lot

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest and other reserves

Cadastral line
Property boundaries shown are provided as a locational aid only.

Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13.50.02

Centered on Lot on Plan:

1 RP6882



Queensland
Government

LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

Labels for the Vegetation Management Act Essential Habitat are centred on the subject lot (1.1km surrounding and including a Lot on Plan). Labels correlate to the label field in the attached essential habitat database.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by SLATS, Department of Environment and Resource Management).

Disclaimer:

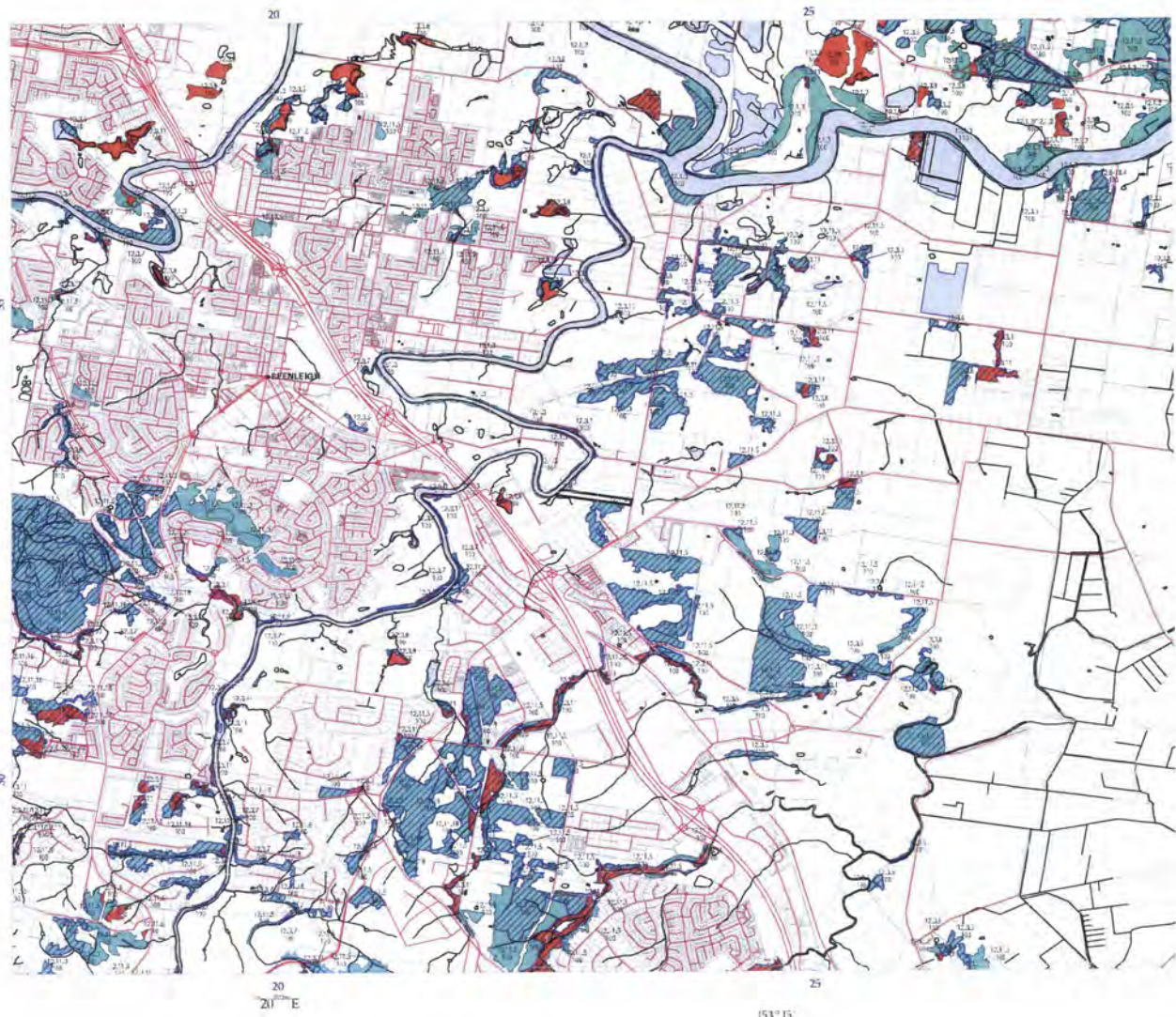
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Additional information is required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.derm.qld.gov.au/vegetation or contact the Department of Environment and Resource Management.

Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDATA or from DERM for larger areas.

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Vegetation Management Act Regional Ecosystem and Remnant Map-Version 6

Remnant vegetation containing endangered regional ecosystems

Based on 2006 Landsat TM imagery

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 24 Aug 11 Time: 17.40.43

Centered on Lot on Plan:
4 RP6843

Bioregion: Southeast Queensland

Dominant
Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant
Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMAV Category X area

Great Barrier Reef Wetlands

Vegetation Management Act Essential Habitat

For further information on VMA Essential Habitat, please see the attached VMA Essential Habitat map.

Subject Lot

Watercourse (Stream order shown as black number against stream where available)

Bioregion boundary

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest and other reserves

Cadastral line
Property boundaries shown are provided as a locational aid only.

Towns



Queensland
Government

LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

A remnant map covers areas not covered by a regional ecosystem map.

Defined map areas are labelled with the regional ecosystem (RE) code along with the percentage breakdown if more than one RE occurs within the area. Detailed definitions of regional ecosystems are available from www.derm.qld.gov.au/REDD. Defined map areas smaller than 5ha may not be labelled.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by the Statewide Landcover and Trees Study (SLATS), Department of Environment and Resource Management (DERM)).

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

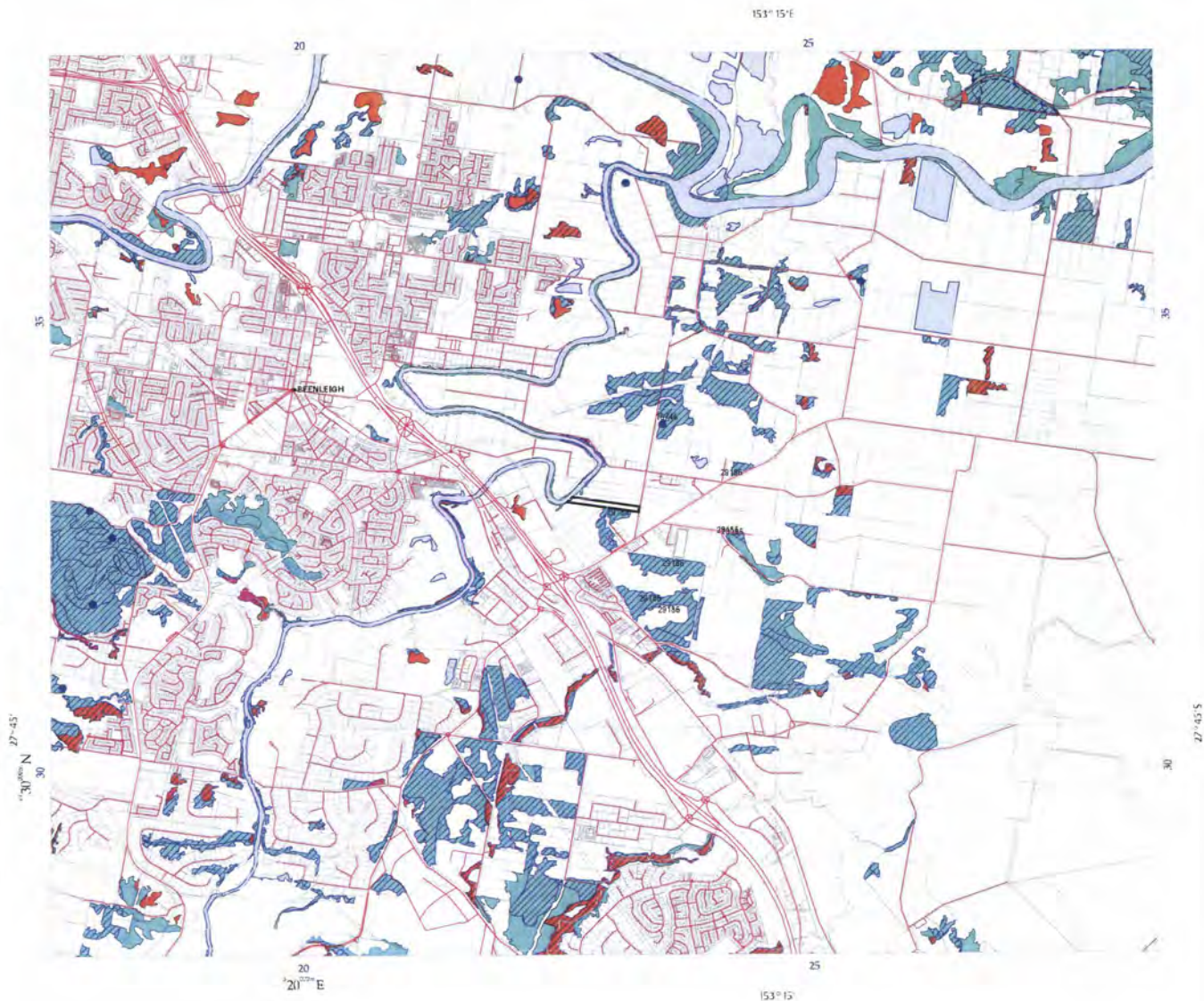
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Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDDATA or from DERM for larger areas.

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Vegetation Management Act Essential Habitat Map Version 3.0

Remnant vegetation containing endangered regional ecosystems

Dominant

Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant

Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMAV Category X area

Vegetation Management Act Essential Habitat

Vegetation Management Act Essential Habitat Species Records

Subject Lot

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest and other reserves

Cadastral line
Property boundaries shown are provided as a locational aid only.

Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU
Date: 24 Aug 11 Time: 17.40.51

Centered on Lot on Plan:
4 RP6843



Queensland
Government

LOCALITY DIAGRAM



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

Labels for the Vegetation Management Act Essential Habitat are centred on the subject lot (1.1km surrounding and including a Lot on Plan). Labels correlate to the label field in the attached essential habitat database.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by SLATS, Department of Environment and Resource Management).

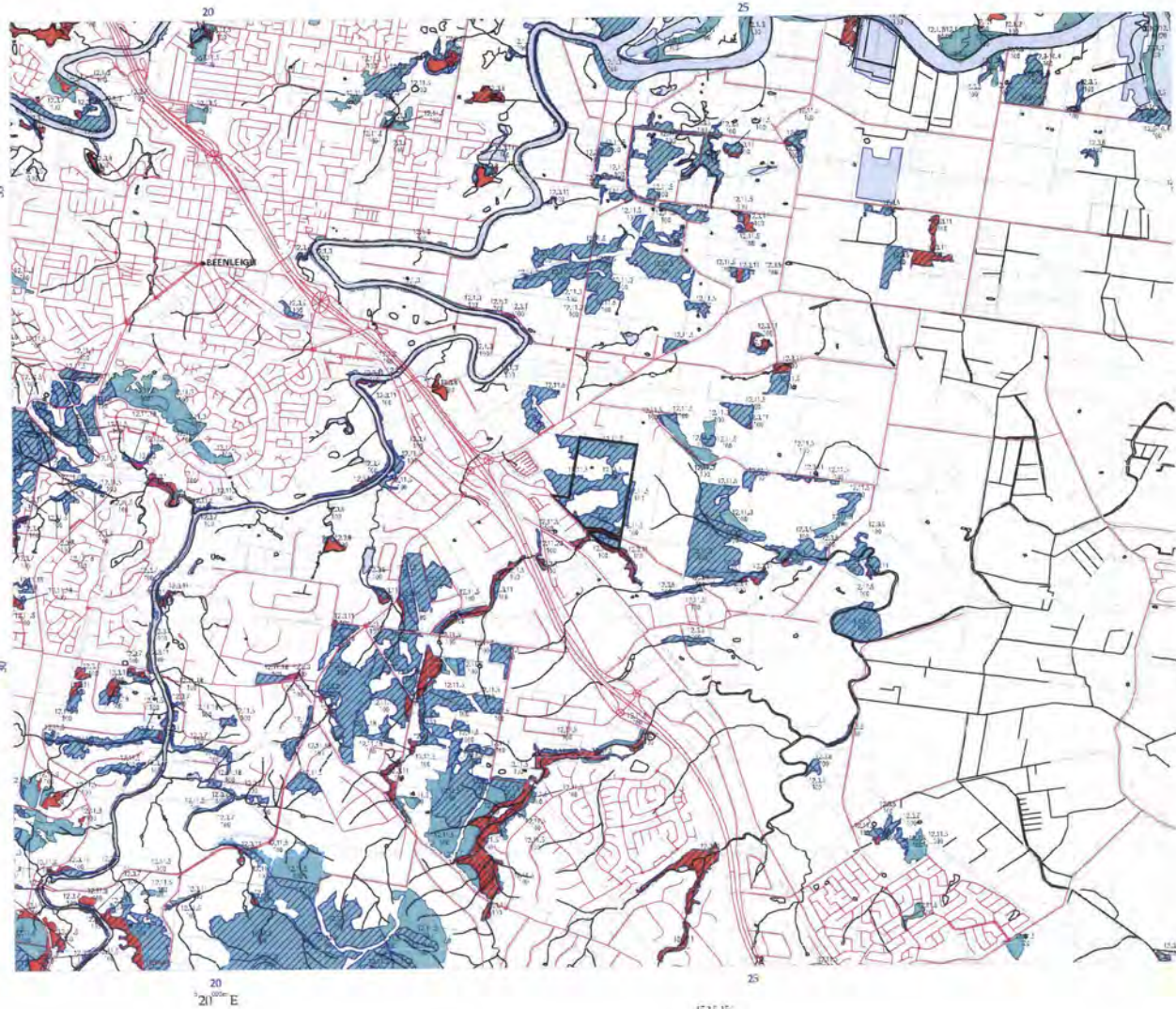
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Vegetation Management Act Regional Ecosystem and Remnant Map-Version 6

Remnant vegetation containing endangered regional ecosystems

Based on 2006 Landsat TM imagery

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13:50:49

Centered on Lot on Plan:
240 W31320

Bioregion: Southeast Queensland

Dominant

Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant

Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMAV Category X area

Great Barrier Reef Wetlands

Vegetation Management Act Essential Habitat
For further information on VMA Essential Habitat,
please see the attached VMA Essential Habitat map.

Subject Lot

Watercourse (Stream order shown as black
number against stream where available)

Bioregion boundary

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest
and other reserves

Cadastral line
Property boundaries shown are
provided as a locational aid only.

Towns



Queensland
Government

LOCALITY DIAGRAM



1000 0 1000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

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Environment and Resource Management (DERM)).

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Disclaimer:

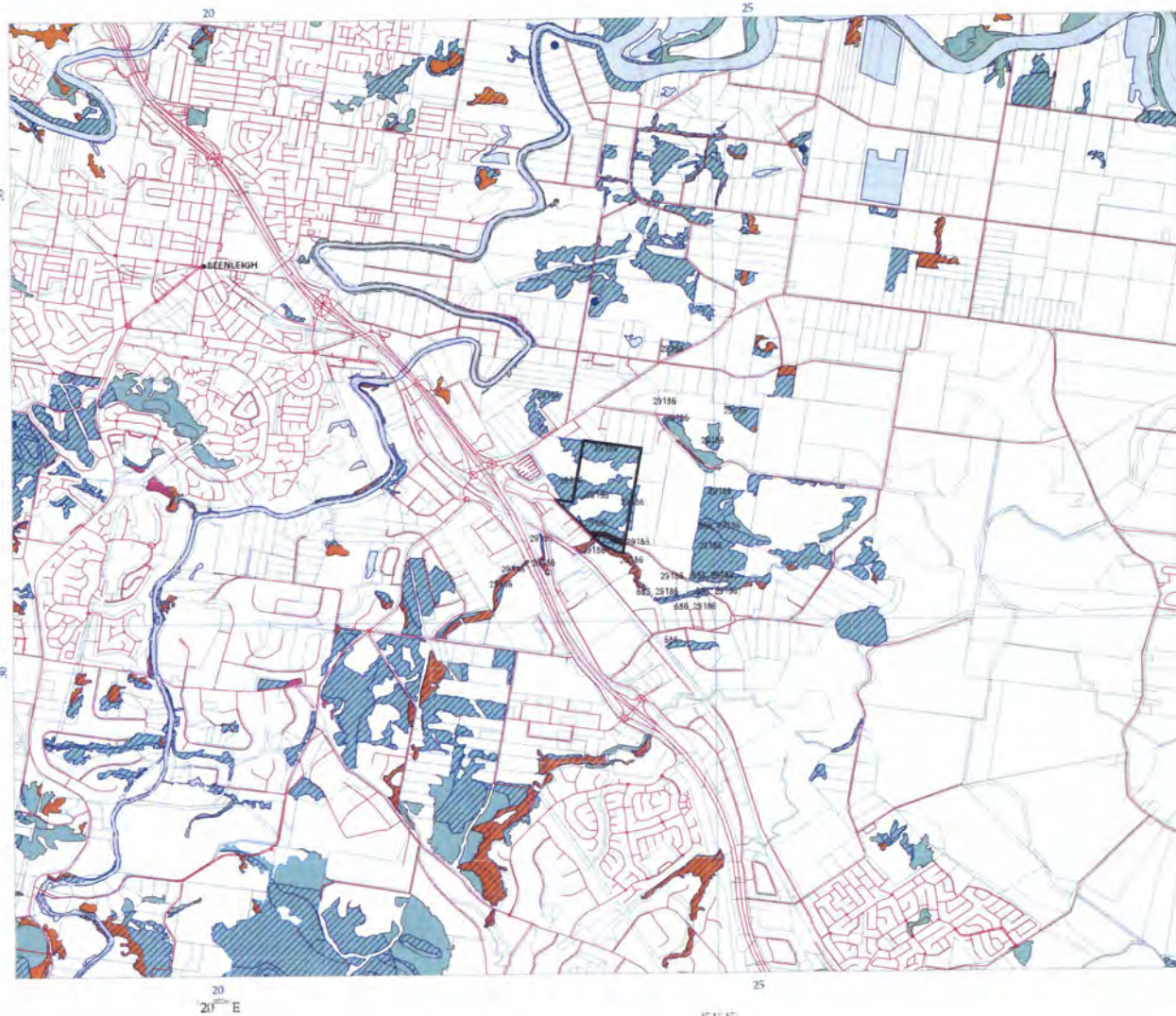
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areas.

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Vegetation Management Act Essential Habitat Map Version 3.0

Remnant vegetation containing endangered regional ecosystems

Dominant

Sub-dominant

Remnant vegetation containing of concern regional ecosystems

Dominant

Sub-dominant

Remnant vegetation that is a least concern regional ecosystem

Remnant vegetation under Section 20AH of the VMA

Non-remnant

Plantation Forest

Dam or Reservoir

Remnant Vegetation

PMAV Category X area

Vegetation Management Act Essential Habitat

Vegetation Management Act Essential Habitat Species Records

Subject Lot

Roads MapInfo Australia Pty Ltd 2009

National Park, Conservation Area State Forest and other reserves

Cadastral line
Property boundaries shown are provided as a locational aid only.

Towns

Requested By: BWALKINSHAW@GASSMAN.COM.AU

Date: 22 Nov 10 Time: 13.50.55

Centered on Lot on Plan:
240 W31320



LOCALITY DIAGRAM



1000 0 1000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

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