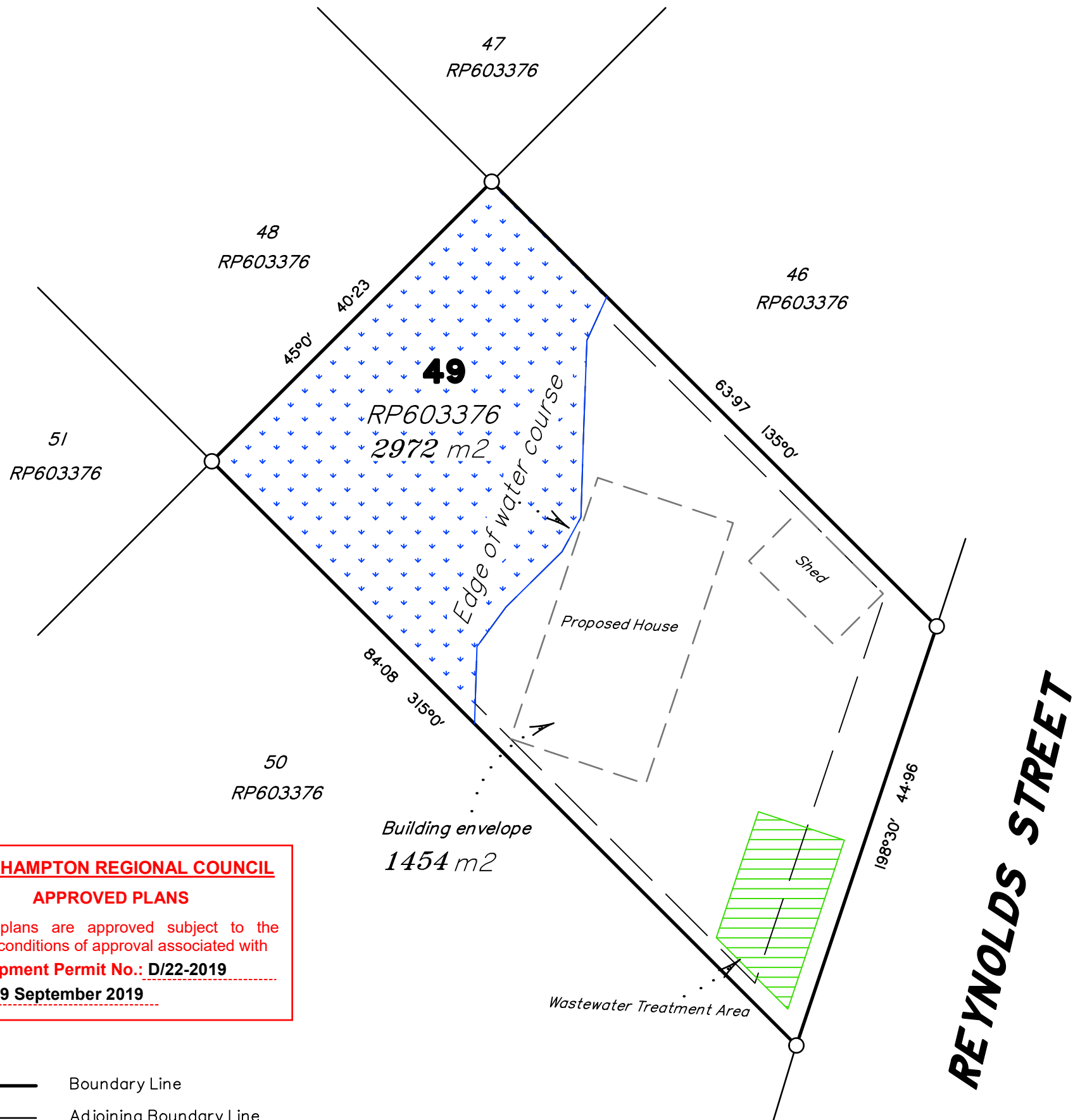


Note: – Water Course location attained from State Planning Policy Mapping on the 22/02/19



**ROCKHAMPTON REGIONAL COUNCIL**

**APPROVED PLANS**

These plans are approved subject to the current conditions of approval associated with

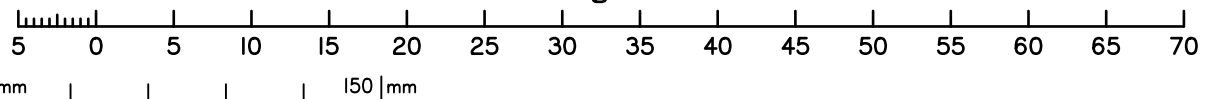
**Development Permit No.: D/22-2019**

**Dated: 9 September 2019**

**Legend**

- Boundary Line
- Adjoining Boundary Line
- Water Course
- Proposed Dwelling
- Building Envelope

**Scale 1:500 – Lengths are in Metres.**



**Plan of Proposed Dwelling House and Shed in Lot 49 on RP603376**

This plan was prepared to accompany a MCU application to Rockhampton Regional Council, and should not be used for any other purpose. The boundary information, dimensions and areas, shown here are approximate only and subject to field survey, therefore, no reliance should be placed on the information shown on this plan, especially for financial dealings. This note is an integral part of this plan.

**GSPC**

(Gracemere Surveying and Planning Consultants Pty Ltd)  
ABN: 40 124 780 445  
PO Box 379 Gracemere QLD 4702  
Rockhampton & Toowoomba  
PH: (07) 4922 7033 email: admin@gspc.com.au FAX: (07) 4922 7044

LOCALITY  
Lake Creek  
LOCAL GOVERNMENT  
Rockhampton R.C.  
HORIZONTAL DATUM  
CAM

MERIDIAN  
RP603376  
VERTICAL DATUM  
-----  
DERIVED vide  
-----  
MAP REF  
9051-33143

PLAN SCALE  
1:500  
AUTOCAD SCALE  
1:1000  
DATE  
12/06/19  
DRAWN  
Phil

SHEET **1** OF **1**  
REF.  
**190993-02**



## INVESTIGATION AND DESIGN FOR ON-SITE SEWERAGE FACILITY

**CLIENT:** I Muhammad

**SITE ADDRESS:** Lot 49 (RP603376)  
9A Reynolds Street, Lakes Creek

**JOB NUMBER:** CQ15980

**ISSUE DATE:** 20/05/2019

**ROCKHAMPTON REGIONAL COUNCIL**

**APPROVED PLANS**

These plans are approved subject to the  
current conditions of approval associated with

**Development Permit No.:** D/22-2019

**Dated:** 9 September 2019

### SUMMARY OF RECOMMENDATIONS

**Treatment Facility –Aerated Water Treatment System (AWTS)**

(Capable of producing ADVANCED secondary quality effluent)

**Disposal Mechanism**

**Two (2) Evapotranspiration/Absorption Beds**

16.3 metres x 3.0 metres – Total Area 98 sqm

## Client & Document Information

Client: I Muhammad  
Project: Lot 49 (RP603376)  
9A Reynolds Street, Lakes Creek

Investigation Type: **Wastewater Investigation and Design**  
Job Number: CQ15980  
Date of Issue: 20/05/2019

## Contact Information

**CQ SOIL TESTING**  
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## Document Control

Version	Date	Author	Design Drawings	Reviewer	Reviewer Initials
A	20/05/2019	T Warne	T Warne	Scott Walton	SWW

## 1. INTRODUCTION

The purpose of this report is to evaluate and define a suitable on-site sewerage treatment and disposal system for household effluents in accordance with Australian Standard 1547 "On-site domestic-wastewater management". The Queensland Plumbing and Wastewater Code has been used for reference purposes during the compiling of this report.

The field investigation was carried out on the 9<sup>th</sup> May, 2019. This report relates exclusively to the proposed dwelling at the site identified on Page 1 of this report. This document has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

## 2. SITE DESCRIPTION AND SUPPLIED INFORMATION

### 2.1 Allotment and Effluent Disposal Site

- The landholder was not interviewed.
- ***All information included in this report relating to the dwelling size, water source, fixtures etc have been provided by the landholder.***
- The site is a rural residential type allotment located on Reynolds Street (a sealed road).
- The slope configuration in relation to surface drainage is linear planar.
- The proposed effluent disposal area is essentially level and is considered to have poor drainage.
- The soil surface condition was moist at the time of testing.
- There was no evidence of cracking of the surface during the investigation.
- There were no visible boulders on the surface of the allotment.
- There were no rock outcrops evident.
- There was no watercourse, bore, well, or dam evident within 10 m of the proposed disposal area at the time of this investigation.
- The proposed effluent disposal area is exposed to sun and wind.
- The proposed disposal site is an existing sparsely grassed area.
- Surface water will drain toward the west.
- Surface water drainage from adjoining allotments may traverse this site.
- The weather conditions prior to testing were periods of moist conditions.
- The site is a known flood area

### 2.1 Dwelling and Fixtures

- CQ Soil Testing has determined that the proposed dwelling shall be no greater than 4 bedrooms for the purposes of calculating the expected occupants  
***(6 equivalent persons – AS 1547:2012 Appendix J)***
- The water source is reticulated.  
***(150 litre/person/day – AS 1547:2012 Appendix H)***
- Standard water reducing fixtures ***are to be*** used throughout the dwelling
- A spa bath ***is not*** proposed to be installed
- A food waste disposal unit ***is not*** proposed to be installed



### 3. SOIL PROFILE

The borelogs carried out at the site (refer attached Site Plan for localities) indicate that the soil profile typically consists of clay soil. See Appendix 3 for detailed logs.

Groundwater was not encountered during the field investigation.  
Weathered rock was not encountered during the field investigation.

Whilst every effort has been made to ensure that the borelogs carried out at the subject allotment are indicative of the soil profile over the site any discrepancy between the profile detailed in the borelogs and that observed during construction shall be referred to CQ Soil Testing for immediate attention.

### 4. INVESTIGATION DETAILS

The investigation carried out at the site included machine augured boreholes up to 1500 mm depth and a series of permeability test pits (see Appendix 4). These test pits are located in the proposed effluent disposal area as shown on the attached site report.

The Queensland Plumbing and Wastewater Code and AS 1547 suggests that the use of a primary-treated effluent disposal system will be satisfactory provided;

- Sufficient permeable surface soil overlying rock is present over the disposal area, not less than 1.2 metres depth.
- A suitable soil category material (as per AS 1547) and minimum required depth is encountered.
- A minimum set-back distance of 50m is obtained.
- Acceptable permeability rates are obtained.

Not all the above requirements have been met, therefore it is concluded that the use of a primary-treated effluent septic system is not acceptable.

### 5. FINDINGS AND RECOMMENDATIONS

- All work must be carried out by a licensed plumber or drainer.
- All pipework shall be installed in accordance with AS3500.2.2, National Plumbing and Drainage, Part 2.2, Sanitary Plumbing and Drainage.
- The Design Loading Rate of 5 mm/day has been adopted.

**The clay soil encountered on this allotment is not conducive to rapid plant growth and has a poor water absorption capacity. Before the installation of a wastewater treatment system, the base of the proposed ETA bed shall be scarified and conditioned in the following way:**

**(a) Add gypsum at a rate of not less than 1kg/1sqm**

### **5.1. Treatment**

- The site shall be provided with a **“Wastewater-Treatment System” capable of producing advanced secondary quality effluent**, or an equivalent system, to Council’s approval in lieu of a septic tank.
- A filter is to be installed between the Treatment Plant and the Irrigation System. Regular maintenance of the Filter shall be undertaken, according to manufacturer’s recommendations.

### **5.2. Disposal**

- For the purpose of calculating evaporation, the long term average monthly pan evaporation and rainfall figures from the Bureau of Meteorology weather station at Rockhampton have been adopted. Water Balance and design calculations are appended.
- All wastewater shall be disposed of by Evapotranspiration/Absorption.
- The land application facility shall be by evapotranspiration-absorption beds with a total minimum total area of **98 sqm**.
- A diversion mound shall be constructed above the disposal area to divert overland water flows.
- Effluent shall be distributed evenly throughout the bed via the use of a distribution box or equivalent system.
- The beds shall be 3.0 m in width and 16.3 m in length. Two (2) are required.
- The beds shall be installed level and across the natural contour of the land.
- The finished surface shall shed water.
- See detailed drawings in Appendix 5.
- The disposal area has been calculated on a daily all-waste flow rate of 900 litres/day, (4 bedrooms/6 people each using 150 litres per day) and a design load rate of 5 mm/day. This flow rate will accommodate all-waste flows from the proposed four bedroom residence using Standard Water-Reducing Devices, which include using a dual flush 6/3 litre water closet (maximum), shower flow restrictors, aerated faucets and a water conserving washing machine.
- The disposal area should be located in the vicinity of BH1, BH2 and BH3 as per attached site plan.
- All set-back distances as required by the local authority shall be met.
- Stormwater run-off including roofwater from buildings shall be diverted around and away from the disposal area. Imported fill may be required should there be insufficient soil available for the design of the disposal system.

The following separation distances shall apply (extract of **Queensland Plumbing and Wastewater Code**):

**Table T4 - Setback distances for subsurface *land application area* for a *greywater treatment plant or an on-site sewage treatment plant***

Feature	Horizontal Separation Distance (metres)		
	Down slope	Up slope	Level
Distance from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature			
Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall footings.	2	4	2
In ground swimming pools.	6	6	6
In ground potable water tank.	6 *	6 *	6 *

\* Note: For Primary effluent the distance from an in-ground potable water tank must be 15 metres.

**Table T7 - Setback distances for *on-site sewerage facilities* and *greywater use facilities* (*Protection of surface water and groundwater*)**

Feature	Separation	Distance	(metres)
For onsite – see Appendix 1	Advanced Secondary	Secondary	Primary*
For greywater – see T1	High	Medium	Low
Top of bank of permanent water `course; or Top of bank of Intermittent water course; or Top of bank of a lake, bay or estuary or, Top water level of a surface water source used for agriculture, aquaculture or stock purposes or; Easement boundary of unlined open stormwater drainage channel or drain. Bore or a dam used or likely to be used for human and or domestic consumption	10	30	50
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

\* Note: Primary effluent typically has a BOD (Biological Oxygen Demand) of between 120 -240 mg/L and Total Suspended Solids of between 65 -180 mg/L.

### **5.3 Greywater**

Surface irrigation of greywater directly (without treatment) from the dwelling's washing machine is permissible. CQ Soil Testing recommends the surface irrigation of greywater. The washing machine shall be connected to a flexible hose with the hose distributing greywater to the landholder garden/lawn. Provide an air admittance valve and suspend drainage (per AS/NZS 3500) to a rigid, fixed position external to building and reduce to a flexible hose fitting (minimum diam. 32 mm). Greywater should be used with care and used responsibly - Avoid:

- Ponding
- Run-off to neighbouring properties
- Causing an odour

When using greywater:

- Choose laundry detergents with low phosphorus, sodium and nitrogen content
- Take care not to keep watering the same spot - it can affect soil and can cause plants to die
- Be careful when using on native plants and don't use on edible parts of vegetables or fruits
- Make sure it doesn't enter swimming pools or flow into neighbouring properties
- Avoid ponding, bad smells or damage to plants by restricting use or moving the outlet
- Keep away from children's play areas and the footings of buildings.

### **5.4. Vegetation and signage**

- Water tolerant vegetation shall be planted to maximize evapotranspiration and shall be carefully chosen. See vegetation specified in AS 1547:2012 "Disposal Systems for Effluent from Domestic Premises (Appendix C)". CQ Soil Testing recommends consultation with local nurseries for selection/density of plantings.
- At least two signs stating "Recycled water – Do Not Drink" are to be erected on boundaries.
- The presence of buried pipes shall:

(a) Be indicated e.g. using underground marking tape to AS/NZS 2648.1; OR

(b) Be indicated by signage. Signs shall be prominently displayed with the words:

*"Sewage effluent pipework installed below. DO NOT DIG."*

## 6. CERTIFICATION

The landholder shall read and understand all aspects of this design. CQ Soil Testing may carry out amendments to this design if requested **(additional fees apply)**.

The local authority may request that an inspection and certification is to be undertaken on the installation of the system when nearing completion. CQ Testing is qualified to undertake this task, and issue the appropriate Form 8 **(additional fees apply)**. If certification is required the installer must:

- Contact CQ Soil Testing prior to “burying” the system to arrange an inspection
- Must photograph the entire installation process and supply to CQ Soil Testing
- Supply to CQ Soil Testing a Form 8 signed by the licensed installer

Yours faithfully



SCOTT WALTON  
Laboratory Manager

## APPENDIX 1 - NOTES

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.
2. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware however, that exploration is limited by time available and economic restraints. In some cases soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.
3. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.
4. This report may not be reproduced except in full. The information and site sketch in Appendix 3 shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.
5. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show approximate location of field tests only.
6. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted at that person assuming the responsibility for the long-term performance of the footing system, effluent disposal design.
7. The recommendations contained in this report have not taken into consideration the long term effects of any previous, current or potential subsurface work by mining companies or potential slope instability problems. At the time of writing this report, neither our client (nor his agent) nor the local authority had made the author aware that these problems may be affecting this allotment. If a mining subsidence or slope stability assessment is required for this allotment, the recommendations of a suitably qualified geotechnical engineer should be sought.
8. The following documents are available from various sources and shall be read and adhered to in relation to this site:

*AS/NZS 1547:2012 - On-site domestic wastewater management*

<http://www.standards.com.au/catalogue/script/Details.asp?DocN=AS417924235393>

**AS/NZS 1546.1 - On-site domestic wastewater treatment units - Septic tanks**

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

**AS/NZS 1546.2 - On-site domestic wastewater treatment units - Waterless composting toilets**

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

**AS/NZS 1546.3 - On-site domestic wastewater treatment units -Aerated wastewater treatment systems**

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

**Queensland Plumbing and Wastewater Code**

[http://www.lgp.qld.gov.au/docs/building\\_codes/New%20plumbing%20laws/plumbing\\_and\\_wastewater\\_code.pdf](http://www.lgp.qld.gov.au/docs/building_codes/New%20plumbing%20laws/plumbing_and_wastewater_code.pdf)

**Standard Sewerage Law**

<http://www.legislation.qld.gov.au/LEGISLTN/SLS/1998/98SL099.pdf>

The Land Application Area designed by CQ Soil Testing is in accordance with the relevant Australian Standards to provide the most economical solution with the intent of minimizing expense for the owner. Generally, this initial installation will be sufficient to successfully handle the load from the dwelling and/or building. Occasionally, however, all of the effluent is not absorbed or transpired due to reasons such as:

- diversion drains are not effective and stormwater enters the Land Application area
- plants used for the aid of transpiration have not reached maturity resulting in less than optimum transpiration
- water conservation is not being practiced within the household or building
- soils can vary significantly over short distances resulting in significant variations in absorption characteristics.

In such instances, enlargement of the Land Application area will be required, until all of the effluent is effectively absorbed or transpired. In the instances of minimizing costs, the builder will not have allowed for this additional area in the construction quotation. This will be an additional cost to the owner.

## **APPENDIX 2 - WASTEWATER TREATMENT SYSTEM “DO’S AND DON’TS”**

### **DO’S**

- Do use cleaning and laundry products labeled “septic safe” only.
- Do ensure you have the treatment system serviced regularly as specified by the manufacturer. Your local shire council requires that your system is serviced by an approved service person.
- Do make sure treated water from your system stays on your property, don’t allow it to run-off into the street or onto your neighbours property.

### **DON’TS**

- Don’t use fine droplet or mist sprays on your irrigation line, the fine spray can be carried a long way by the wind.
- Don’t allow surface water to flood the tank system or wastewater disposal area.
- Don’t use bleaches, strong disinfectants, or large amounts of natural antibacterials such as eucalyptus oil. Your treatment system relies on beneficial bacteria to treat the wastewater. Bleaches and other strong disinfectants can kill off these helpful bacteria, seriously reducing the system’s effectiveness.
- Don’t put cooking fat or oils down the sink.
- Don’t wash paint brushes or pour other chemicals in the sink.
- Don’t allow the treated water to come in contact with people or animals.
- Don’t use the treated water on your vegetable garden.
- Don’t pour Napisan or other soakers down the drain, soak clothes in a bucket and empty the bucket out on the grass instead.
- After mopping the floor, don’t pour the bucket of water (with Pine O Clean or other disinfectant/cleaner), down the drain. Empty the bucket out on the grass instead.
- Don’t use ‘Toilet Blue’ or toilet deodorizers that hang in the bowl. These add a continual low dose of disinfectant to the system.

## APPENDIX 3 - FIELD LOGS

BOREHOLE 1				
Depth (m)	Visual Class'n Symbol	Visual Description of Material	Estimated Moisture Condition	Estimated Consistency or Rel/Density
0.0		Fill		
1.5	CH	<u>Sandy CLAY</u> , high plasticity, fine to coarse grained, brown/grey mix, M, ST. <b>CAT 6 Medium Clay –weakly structured</b>		
Borehole terminated at 1.5 m				

### LEGEND

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	Remark
D – Dry	VS – Very Soft	VL – Very Loose	
M – Moist	S – Soft	L – Loose	
W – Wet	F – Firm	MD – Med Dense	
	ST – Stiff	D – Dense	
	V/ST – Very Stiff	VD – Very Dense	
	H – Hard		





## BOREHOLE 2

Depth (m)	Visual Class'n Symbol	Visual Description of Material	Estimated Moisture Condition	Estimated Consistency or Rel/Density
0.0		<b>Fill</b>		
1.5	CH	<u>Sandy CLAY</u> , high plasticity, fine to coarse grained, brown/grey mix, M, ST. <b>CAT 6 Medium Clay –weakly structured</b>		

**Borehole terminated at 1.5 m**

### LEGEND

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	Remark
D – Dry	VS – Very Soft	VL – Very Loose	
M – Moist	S – Soft	L – Loose	
W – Wet	F – Firm	MD – Med Dense	
	ST – Stiff	D – Dense	
	V/ST – Very Stiff	VD – Very Dense	
	H – Hard		



## BOREHOLE 3

Depth (m)	Visual Class'n Symbol	Visual Description of Material	Estimated Moisture Condition	Estimated Consistency or Rel/Density
0.0		<b>Fill</b>		
1.5	CH	<u>Sandy CLAY</u> , high plasticity, fine to coarse grained, brown/grey mix, M, ST. <b>CAT 6 Medium Clay –weakly structured</b>		

**Borehole terminated at 1.5 m**

## LEGEND

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	Remark
D – Dry	VS – Very Soft	VL – Very Loose	
M – Moist	S – Soft	L – Loose	
W – Wet	F – Firm	MD – Med Dense	
	ST – Stiff	D – Dense	
	V/ST – Very Stiff	VD – Very Dense	
	H – Hard		

## APPENDIX 4 – PERMEABILITY TEST RESULTS AND CALCULATIONS

**Table 1 - Determination of Soil Category**

Soil Category BH2	Soil Texture	Structure	Indicative Permeability	Indicative Drainage Class
6 (00-1500 mm)	Medium Clay	Weakly Structured	<0.06 m/day	Very Poorly Drained

**Table 2 – Permeability test results and conclusions**

Test No.	Soil Permeability	Test hole depth	Recommended Design Loading Rate
PT 1	<0.06	500 mm	
Average	<b>&lt;0.06</b>		<b>5 mm/day</b>

Permeability testing aids in the design of an “On-site domestic–wastewater management system”. CQ Soil Testing carries out a permeability testing in accordance with Appendix 4.1F of the Australian Standard 1547.

**Table 3 – Water Balance Calculations**

**EVAPO-TRANSPIRATION ABSORPTION**

<b>SITE DATA</b>			<b>DESIGN DATA</b> (AS1547:2000)			<b>DESIGN FLOWS</b> (AS1547:2000)		
Soil Category:	6		Retention Rate:	0.5		No. Bedrooms:	4	
Soil Texture:	Medium Clay		Evapotranspiration Factor:	0.75		Flow Rate per Person:	150 ltr/day	(A4.2D)
Soil Structure:	Weak		Design Loading Rate:	5 mm/day	(T4.2A2)	No. of persons:	6	(T4.3A1)
Measured Permeability:	<0.06	m/day	Indicative Permeability:	<0.06	mm/day (T4.2A2)	Black Water Factor:	1.00	
						Daly Flow Rate (Total):	900.0 ltr/day	

**AREA CALCULATION**

	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Sum	Ave
Days	31	28	31	30	31	30	31	31	30	31	30	31		
Rainfall (mm)	130.8	140.5	98.6	45.3	48.8	36.2	30.1	28.5	23	50.4	69.9	103.2	805.3	67.1
Retained Rainfall (mm)	65.4	70.3	49.3	22.7	24.4	18.1	15.1	14.3	11.5	25.2	35.0	51.6	402.7	33.6
Pan Evaporation	198.4	165.2	167.4	135.0	105.4	90.0	96.1	108.5	129.0	167.4	180.0	195.3	1737.7	144.8
	7.2	6.5	6.2	5.3	4.1	3.6	3.6	4.4	5.8	6.8	7.5	7.6	68.6	5.7
Evapotranspiration (mm)	223.2	182.0	192.2	159.0	127.1	108.0	111.6	136.4	174.0	210.8	225.0	235.6	2084.9	173.7
DLR per month (mm)	155.0	140.0	155.0	150.0	155.0	150.0	155.0	155.0	150.0	155.0	150.0	155.0	1825.0	152.1
Disposal Rate per month (ltr)	312.8	251.8	297.9	286.4	257.7	239.9	251.6	277.2	312.5	340.6	340.1	339.0	3507.3	292.3
Effluent per month (ltr)	27900.0	25200.0	27900.0	27000.0	27900.0	27000.0	27900.0	27900.0	27000.0	27900.0	27000.0	27900.0	328500.0	27375.0
Area (sq.m)	89.2	100.1	93.7	94.3	108.3	112.5	110.9	100.7	86.4	81.9	79.4	82.3		95.0

**STORAGE CHECK**

	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Area (sq.m)	98											
Application Rate (mm)	284.7	257.1	284.7	275.5	284.7	275.5	284.7	284.7	275.5	284.7	275.5	284.7
Disposal Rate (mm)	312.8	251.8	297.9	286.4	257.7	239.9	251.6	277.2	312.5	340.6	340.1	339.0
Excess Effluent (mm)	-28.1	5.4	-13.2	-10.8	27.0	35.6	33.1	7.5	-37.0	-55.9	-64.5	-54.3
Stored Effluent Increase (mm)	-93.7	18.0	-44.0	-36.1	90.0	118.7	110.5	25.1	-123.3	-186.4	-215.1	-181.0
Effluent Depth for month (mm)	0.0	0.0	18.0	0.0	0.0	90.0	208.7	319.2	344.3	221.0	34.7	0.0
Effluent Depth Total (mm)	0	0.0	18.0	0.0	0.0	90.0	208.7	319.2	344.3	221.0	34.7	0.0

Depth of Gravel	200 mm
Depth of Sand	200 mm
Depth of Storage Area	400 mm
Freeboard	50 mm
Permitted Depth of Effluent	350 mm

Area of ETA Bed	98
Bed Dimensions	
No. of Beds	2
Bed Length	16.3 m
Bed Width	3 m



## APPENDIX 5 – DESIGNS & PHOTOGRAPHS

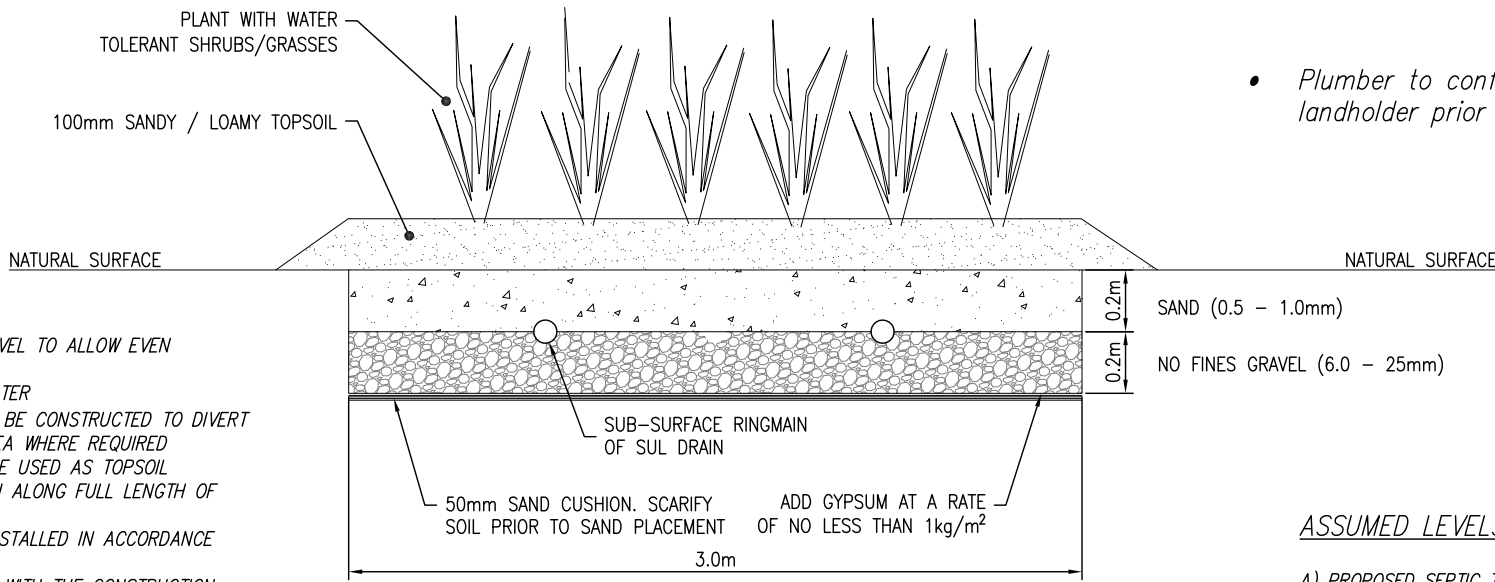
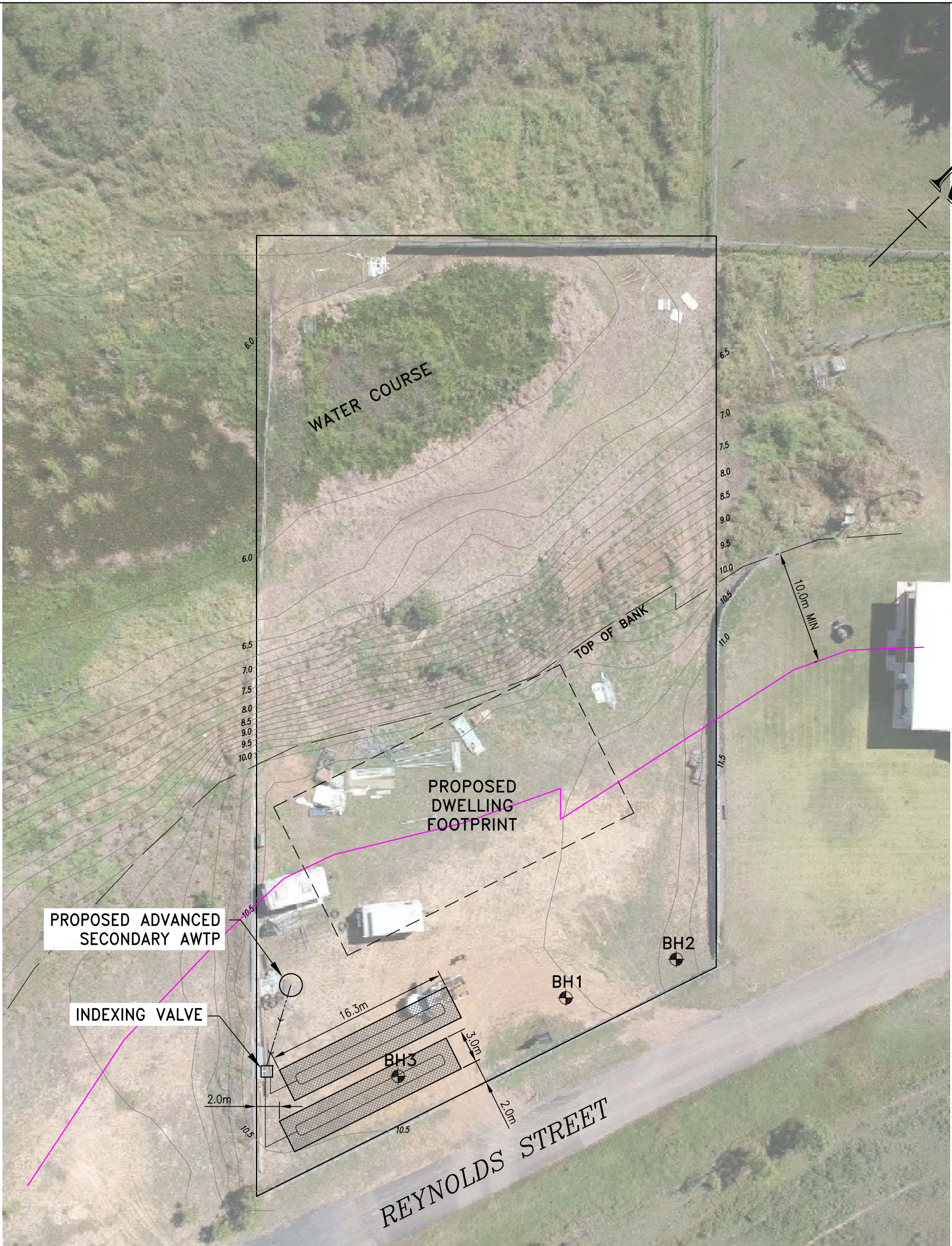


**Figure 1** Proposed disposal area and water course



**Figure2** Proposed disposal area and water course





- Plumber to confirm location with landholder prior to installation.

SEWERAGE NOTES:

- ENSURE THE BED IS INSTALLED LEVEL TO ALLOW EVEN DISTRIBUTION OF EFFLUENT
- FINISHED SURFACE IS TO SHED WATER
- DIVERSION DRAINS/BANKS ARE TO BE CONSTRUCTED TO DIVERT WATER AROUND THE DISPOSAL AREA WHERE REQUIRED
- CLAY BASED SOILS ARE NOT TO BE USED AS TOPSOIL
- 0.3m WIDE STRIP OF FILTER CLOTH ALONG FULL LENGTH OF PERFORATED PIPE
- AN INSPECTION PORT SHALL BE INSTALLED IN ACCORDANCE WITH AS1547\_4.5
- ALL WORK TO BE IN ACCORDANCE WITH THE CONSTRUCTION TECHNIQUES STATED IN AS1547
- DISPOSAL AREA TO BE FENCED OFF FROM LIVESTOCK

ASSUMED LEVELS:

- A) PROPOSED SEPTIC TANK INVERT  $\approx 10.2$
- B) PROPOSED INVERT AT INDEXING VALVE  $\approx$  NOT APPLICABLE AS SYSTEM IS PRESSURISED

**CQ SOIL TESTING**  
Servicing all of Central Queensland



QBCC - 1117681    ABN - 47715943484

Phone: (07) 4936 1163  
Email: info@cqsoiltesting.com.au  
Website: www.cqsoiltesting.com.au

Project:

LOT 49 REYNOLDS STREET  
LAKES CREEK, QLD

For:

I MUHAMMAD

Title: EFFLUENT DISPOSAL DESIGN			
Scale: 1:400 (A3)		Date: MAY '19	
Sheet: 1 of 1		Drawn: T.W.	
Job No: CQ15980		Rev: A	



## ROCKHAMPTON REGIONAL COUNCIL

### APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

**Development Permit No.: D/22-2019**

**Dated: 9 September 2019**

Austin Grillmeier  
Engineer - RPEQ 2048  
314 Blanchfield St  
North Rockhampton 4701

**Imran Mohammed**

**Information Request : D/22-2019**

**9A Reynolds St, LAKES CREEK**

**Lot 49 / RP 603376**

For the RFI from Council dated 3 April 2019, the following report addresses the Item 2.0 queries for:

#### **Overland Flow**

- 1. Catchment Area** – The watershed for the gully traversing this allotment is identified on the attached plan. The two road inverts at the intersection of Montgomerie & Totteridge Streets direct the water north of Montgomerie St across these roads and into the head of the Reynolds St catchment.
- 2. Peak Discharge** – This catchment lies on the outskirts of the suburban area and its allotment sizes are large. Infill to a more dense housing layout is not anticipated in this area for many years future. Allowing for some infill on several existing vacant allotments the fraction impervious from the aerial imaging is 0.079.

Following QUDM and applying the Rational Method for the peak discharge estimation :-

The other catchment parameters are: Area = 6.414ha; Equal Area slope = 0.036.  
and AEP 1% intensity = 180mm/hr

The AEP 1% Peak Discharge is **2.364cumecs**

- 3. Inundated Area** – A conservative calculation of the area likely to be covered in an AEP 1% Exceedence flow in this catchment is given in the appended plans and for reasons given later below should be given at the 7.5m contour level. At this level the areas towards the rear of this allotment are all covered while the areas for buildings etc towards the Reynolds Street frontage are approx 3metres above the inundation level.
- 4. Calculations & details** – The full calculations for the catchment discharge and flow levels are given on the appended plan showing the Catchment Area.

#### **Comment**

The RFI questions the impact of the downstream infrastructure –in particular the road and rail formations.

From the plans it is noted that the rail formation is at approx 7.0 AHD. The railway culverts along this section of track are small pipes which do not pass the runoff from the catchments above them but rather the rail formation diverts these catchments to the east to the larger gully crossing near Hartington St which is a rail bridge. The invert of the gully is approx 2.5m below 7.0m.

For the gully through No 9A Reynolds Street: a theoretical backwater calculation has several assumptions as follows :-

- The bypass of the water from this catchment to the east by the rail formation has become blocked by natural or man-made means so that the water in this catchment cannot successfully bypass towards the rail bridge and must overtop the rail.
- The cross-sectional shape of the gully is similar from No 9A Reynolds St to the railway formation.

While both of these assumptions are not valid at present their assumption gives a maximum possible water level in the gully at No 9A. The level of approx 7.5m to 7.6m calculated on the catchment sheet is therefore very conservative because the gully widens out from 50m at No 9A to 150m at the rail formation and this widening automatically reduces the backwater level required to enable the overtopping.

The bypassing at present also negates the calculation but the calculation gives a maximum guide.

For the present purposes an accurate backwater calculation is beyond the scope of this report because the whole of the catchments north of the rail formation would need to be modelled to approach feasible accurate water level estimates.

The level of inundation in the gully at No 9A Reynolds St of 7.5m AHD is therefore quite conservative and in any event well below the useable building platform on this allotment. The proposed development on the building platform represents no risk from flooding.

Austin Grillmeier  RPEQ 2048 29 May 2019

**Appendix :**

1. RFI
2. Catchment area and Calculations
3. Inundation Area on No 9A
4. Contour Plan of gully and Rail





Rockhampton Office  
232 Bolsover St, Rockhampton

Gracemere Office  
1 Ranger St, Gracemere

Mount Morgan Office  
32 Hall St, Mount Morgan

3 April 2019

Our reference: D/22-2019  
Enquiries to: Brandon Diplock  
Telephone: 1300 22 55 77

Imran Muhammad  
C/- GSPC  
PO BOX 379  
GRACEMERE QLD 4702

Dear Sir/Madam

**INFORMATION REQUEST – DEVELOPMENT APPLICATION D/22-2019 FOR A MATERIAL CHANGE OF USE FOR A DWELLING HOUSE AND SECONDARY DWELLING – SITUATED AT 9A REYNOLDS STREET, LAKES CREEK – DESCRIBED AS LOT 49 ON RP603376, PARISH OF ARCHER**

Council refers to your application received by Council on 25 March 2019.

Council officers have undertaken a detailed assessment of the development application and require you to provide further information to address the following issues:

**1.0 Sewerage**

- 1.1 Please prepare a Site Evaluation Report in accordance with the Queensland Plumbing and Wastewater Code for On-site Sewerage is requested. The report is to be completed by a qualified person in accordance with the code. The report must take into account the slope of the development site, flood implication and its proximity to a water course / overland flow.

**2.0 Overland Flow**

- 2.1 Please provide an overland flow path assessment report for the subject land, prepared and certified by a Registered Professional Engineer of Queensland that as a minimum includes:

- 2.1.1. Identification of catchment of this flow path;
- 2.1.2. An assessment of the peak discharge of a one percent (1%) Annual Exceedance Probability defined flood event;
- 2.1.3. Identification of all areas of the subject land to be provided / dedicated as easements in favour of Council for the purpose of conveyance of the one percent (1%) Annual Exceedance Probability defined flood event. These dedication / easement areas must be detailed on a suitably scaled and adequately dimensioned conceptual layout plan; and
- 2.1.4. Details of all calculations, assumptions and data files (where applicable).

Note: A Desktop assessment indicates that the existing highway and railway embankment in the south west acts as a hydraulic control for a number of sub-catchments. Stormwater detention / retention occurs towards the north east of the hydraulic control line together with overflow between the sub-catchments. An assessment of the water level behind the hydraulic control needs to be undertaken for a one percent

(1%) Annual Exceedance Probability defined flood event. Some commentary on the hydraulic control should be included.

Under section 13 of the Development Assessment Rules, the Applicant has three (3) options available in response to this information request. The Applicant must give the Assessment Manager:

1. all of the information requested; or
2. part of the information requested, together with a notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application; or
3. a notice:
  - i. stating the Applicant does not intend to supply any of the information requested; and
  - ii. requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

Response to this further information request should be forwarded to:

Development Assessment Section  
Rockhampton Regional Council  
PO Box 1860  
ROCKHAMPTON QLD 4700

A response needs to be received within a period of three (3) months from the date of this letter, in accordance with section 68 (1) of the *Planning Act 2016* and sections 12 and 13 of the Development Assessment Rules. Please forward your response to this information request to Council at your earliest convenience, in order for the assessment of your application to progress further.

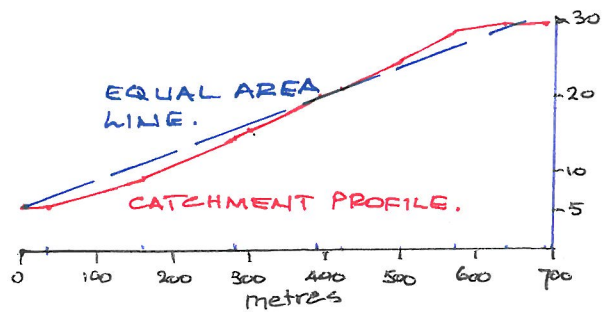
Should you have any queries regarding the above information request, please contact the undersigned on 1300 22 55 77.

Yours faithfully



Brandon Diplock  
Planning Officer  
Planning and Regulatory Services





CATCHMENT DETAILS:  
Length  $L = 690\text{ m} \approx 0.69\text{ km}$ .

AREA  $A = 6.414\text{ ha}$ .

EQUAL AREA SLOPE  $= 0.036$

IMPERVIOUS.  $5040\text{ m}^2$

$$f_i = \frac{5040}{64140} = 0.079$$

TIME OF CONCENTRATION,

$$t_c = \frac{91 L}{A^{0.1} S^{0.2}}$$

$$= \frac{91 \times 0.69}{6.414^{0.1} \times 36^{0.2}}$$

$$= 25 \text{ minutes}$$

QUDM TABLE 5.04.3.

$$f_i = 0.079 \quad C_{10} = 0.614$$

$$C_{100} = 0.614 \times 1.2$$

$$= 0.736$$

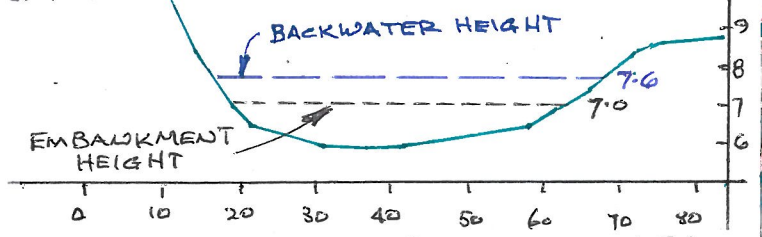
FROM ROCKHAMPTON RAINFALL GRAPH. DS.04.17

$$^{25}I_{100} = 180\text{ mm/hr.}$$

$$Q = F.C.I.A.$$

$$Q_{100} = 0.00278 \times 0.736 \times 180 \times 6.414$$

$$= 2.364\text{ cumecs.}$$



GULLY WIDTH @ 7.6m  $\approx 51.5\text{ m}$ .  
BACKWATER SLOPE  $1\text{ in } 270$  (ASSUMED).

USING MANNING'S:  $Q = \frac{A R^{2/3} S^{1/2}}{n}$

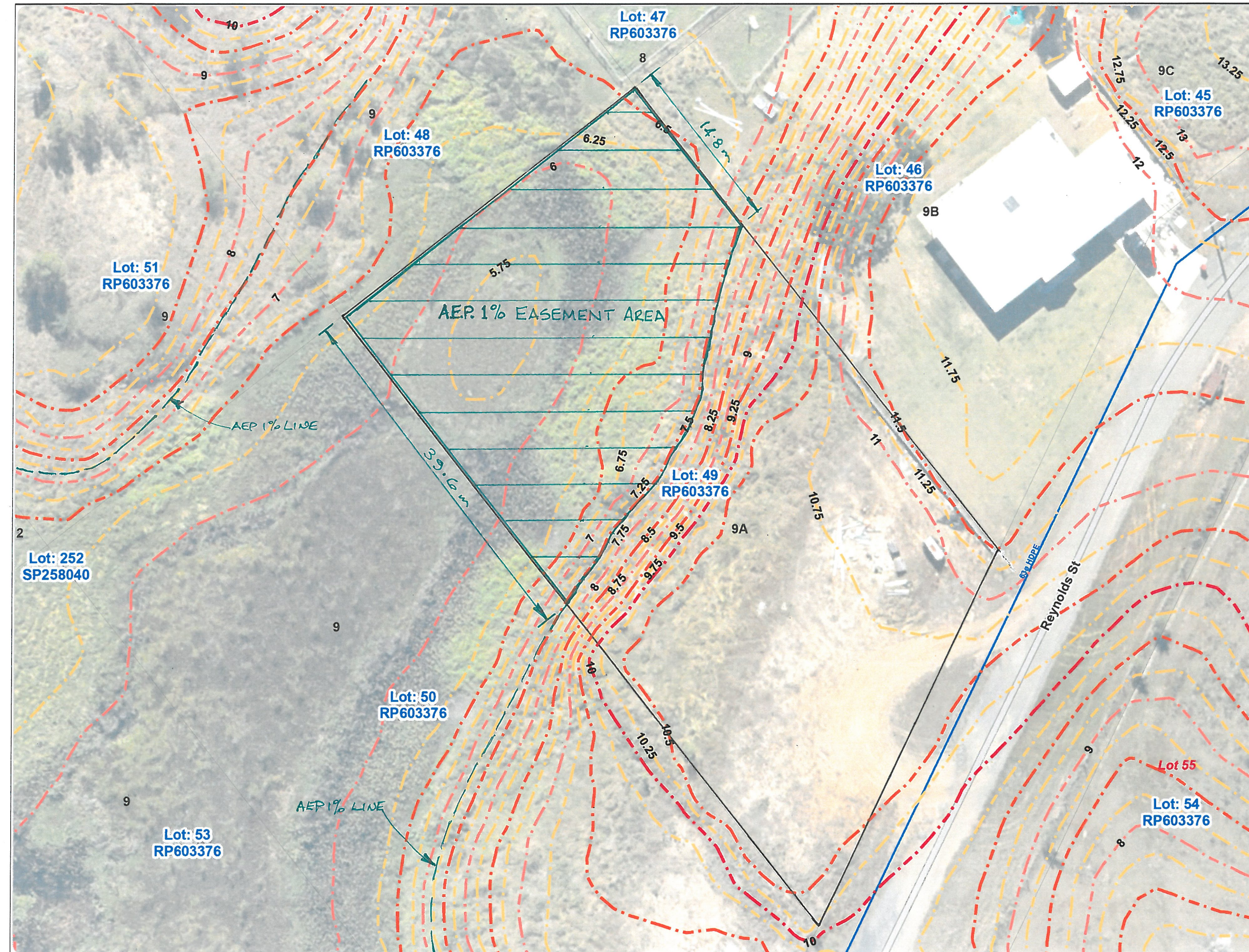
$$= \frac{(51.5 \times 0.134) \times \left( \frac{51.5 \times 0.134}{51.768} \right)^{2/3} \times (0.004)^{1/2}}{0.045 \text{ (OPEN GULLY FLOW)}}$$

$$= \frac{6.901 \times 0.241 \times 0.061}{0.045}$$

$$= 2.435\text{ cumecs.}$$





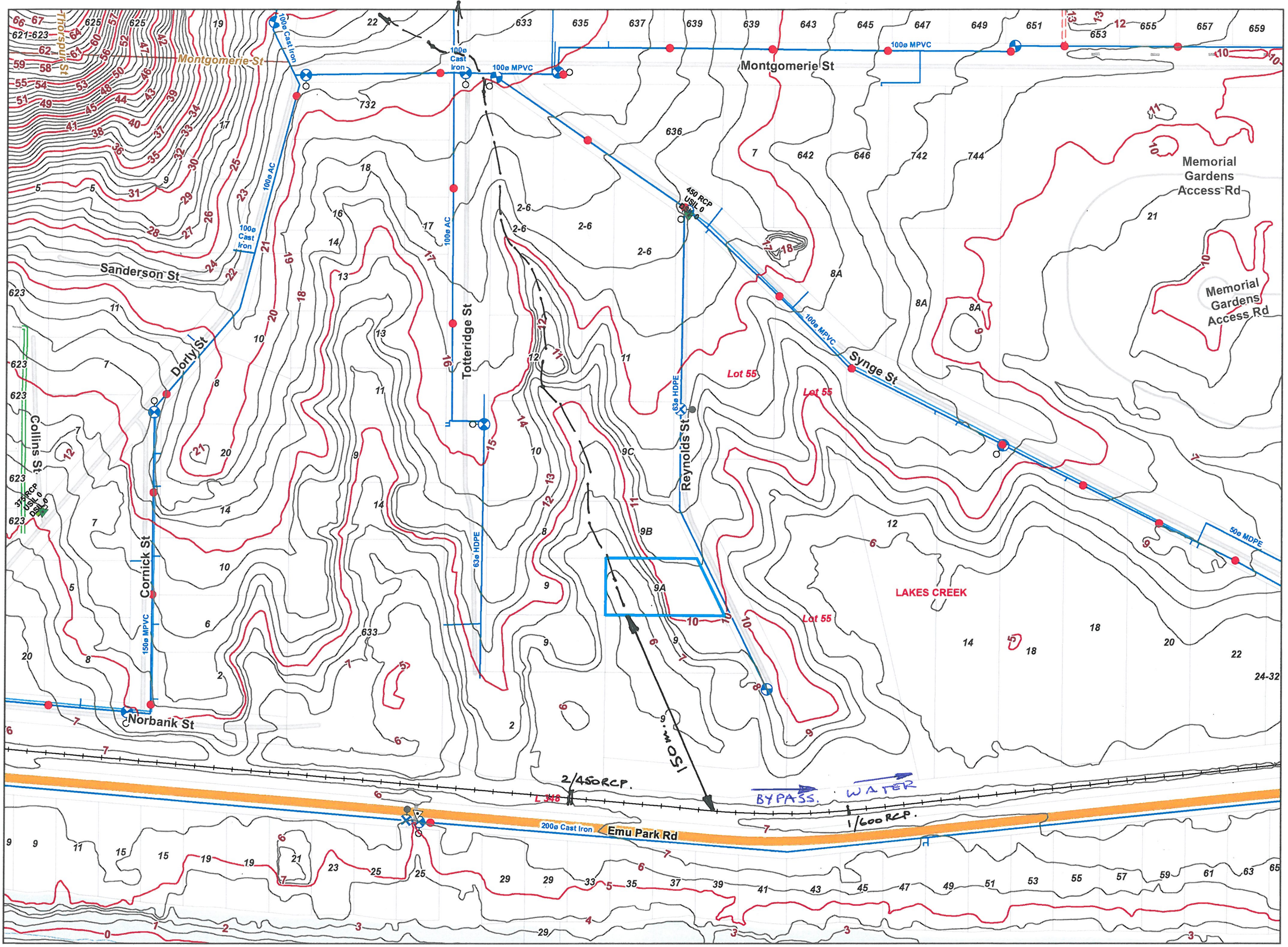


- Legend**
- Hydrants
  - Other Valve Type
  - Gate, Sluice, Butterfly
  - Air Valve
  - Ball Cock, Stop Cock
  - Ball Valve
  - Motor Sluice Valve
  - Non Return Valve
  - Pressure Reducing Valve
  - RPZ Valve
  - Reflux Valve
  - Scour Valve
  - Sluice Bypass Valve
  - Tap
  - Open - Dialysis
  - Closed - Zone
  - Valve Normally Open
  - Valve Normally Closed
  - Other Main Type
  - Trunk Main
  - Reticulation Main
  - Raw Water Main
  - Scour Line
  - Water Service
  - Sampling Points
  - Unknown
  - Intake
  - Pump Station
  - Treatment Plant
  - Reservoirs
  - Abandoned Mains
  - Private Water Hydrants
  - Private Water Valves
  - Private Water Mains
  - Private Water Abandoned Mains
  - Pump Station
  - STP Treatment Plant
  - Sewer Gravity Mains
  - Sewer Rising Mains
  - Access Chambers
  - Roll Over
  - Lamp Hole | Inspection Opening
  - Overflow Chamber
  - Sewer Valves
  - Sewer Jump Ups
  - Sewer Access Chambers Abandoned
  - Sewer Mains Abandoned
  - Pump Station
  - STP Treatment Plant
  - Sewer Access Chambers Private
  - Sewer Joints Private
  - Sewer Valves Private
  - Sewer Gravity Mains Private
  - Sewer Rising Mains Private
  - Sewer Jump Ups Private
  - Sewer Mains Abandoned Private
  - Sewer Access Chambers Abandoned Private
  - Flood Mitigation Devices
  - Culverts
  - Headwalls
  - Stormwater Junctions
  - Pollution Trap
  - Subsoil Clean-Out pit
  - Stormwater Jump ups
  - Connector; Reticulation Main
  - Culvert Pipe; LinkSlab
  - Inter-Allotment
  - Low Flow Pipe
  - Other
  - Stormwater Drop Structures
  - Batter Chute; Open Channel
  - Bio-Retention Swale
  - Subsoil Drain
  - Weirs
  - Abandoned, Private
  - Abandoned
  - Abandoned, Private
  - Abandoned
  - Abandoned, Private
  - Abandoned
  - Abandoned, Private
  - Abandoned
  - Biofiltration Basin
  - Detention Basin
  - Culverts Private
  - Headwalls Private
  - Stormwater Junctions Private
  - Pollution Trap Private
  - Subsoil Clean-Out pit Private
  - Stormwater Jump Up Private
  - Stormwater Main Private
  - Open Channel Private
  - Subsoil Drain Private
  - Retention Basins Private
  - Effluent Meters
  - Effluent Structures
  - Effluent Valves
  - Effluent Mains
  - Easements
  - Property Parcels (Main)
  - Main Roads (TMR)
  - Major Council Roads
  - Council Roads
  - Access/Service Roads
  - Private Roads
  - Unconstructed Roads

**Lot 49 on RP603376  
9A Reynolds Street  
Lakes Creek, QLD 4701**

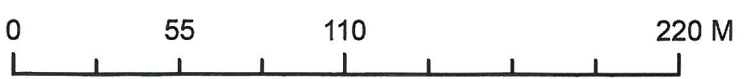






- Legend**
- ▲ Culverts
  - Culvert Pipe; LinkSlab
  - Batter Chute; Open Channel
  - △ Culverts Private
  - Stormwater Main Private
  - Hydrants
  - ⊗ Gate, Sluice, Butterfly
  - ⊗ Scour Valve
  - Valve Normally Open
  - Valve Normally Closed
  - Reticulation Main
  - Water Service
  - Abandoned Mains
  - Easements
  - Property Parcels (Main)
  - Property Parcels (White)
  - Coastline
  - Ocean
  - Main Roads
  - Standard Council Roads
  - Access Roads
  - Unconstructed
  - Railway Lines**
  - Operational

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Lot 49 on RP603376  
9A Reynolds Street, Lakes Creek  
Services and Contours  
Date: 04/04/2019

