WASTEWATER MANAGEMENT REPORT

M DAVIS & GILSON
PORT UNDERWOOD

Our Ref: 25544
Date: Oct 2014

davidson group

PROJECT PLANNERS
RESOURCE MANAGERS
CIVIL & STRUCTURAL ENGINEERS
BUILDING DESIGNERS
ENVIRONMENTAL ENGINEERS

Our Ref: 25544

31 Oct 2014

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Contents

1 INTRODUCTION

Our clients require a new on-site wastewater management system to serve a proposed three bedroomed house.

We have been engaged to assess the site and confirm appropriate wastewater system details for the sustainable discharge of treated domestic wastewater. Our investigation included:

- a general visual inspection;
- excavation of test pits to evaluate the soil properties;
- an assessment of the potential environmental effects and
- site survey work

2 SITE DESCRIPTION

The property (Lot 1 DP 8003) is located in Port Underwood, just north of Tumbledown Bay. It is approximately 1.1 Ha in size and comprises of a gully and steep side slopes. The slopes are covered in regenerating native bush.

Tumbledown Bay Road traverses around the eastern boundary.

View looking east towards the site

3 DESIGN SUMMARY

• Soil Description	Sandy CLAY
• Ribbon Length	60 - 75 mm
• Soil Category	5
• No. of Bedrooms	3
• No. of People	6 maximum
• Water Supply	Roof
• Wastewater Flow Allowance	160 l / person / day
• Daily Load	960 litres
• Land Application Details	
▫ Method	LPED
▫ Reduction for slope	20%
▫ Design Irrigation Rate (DIR)	2.0 mm / day
▫ Area (min)	480 m²

- Pump/Chamber Details
  - Size (min) 1,300 litres
  - Pump Duty 30 m head at 110 litres/min.
- Treatment Type Primary (4,000 litre septic tank with filter)

4 INVESTIGATION

An investigation was carried out in accordance with ASNZS 1547:2012 'On-Site Domestic Wastewater Management' and the Marlborough District Council 'Guidelines for New On-Site Wastewater Management Systems'. Refer to the site notes in the Appendix.

A moderate (22º) north facing slope above the building site, is stable, clear of surface water and is considered suitable for a wastewater land application system.

The exposure to the sun and wind is good and the vegetation is regenerating natives, providing good evapotranspiration assistance.

Three test pits were excavated by spade and logged. Refer to the site notes and logs in the Appendix.

The soil profile consisted of 200 mm to 300 mm thick topsoil overlying a light brown, firm, moist sandy/light CLAY to 400 mm depth.

The soil had ribbon lengths that varied from 60 mm to 75 mm. The ribbon lengths, grittiness and ability to roll into rods indicate that the soil is a Category 5 sandy or light CLAY.

5 DESIGN

5.1 General

Any land application system should be kept shallow to make maximum benefit of evapotranspiration and biological activity in the upper soil. The system should also be kept as simple as is practically possible to keep costs and maintenance to a minimum.

5.2 Loading

It is proposed to construct a three bedroomed dwelling with a roof water supply. We have allowed for a 20 l/p/day reduction for dual flush toilet cisterns.

For design purposes, the design wastewater loading is therefore 6 persons at 160 l /person/day i.e. 960 l/day. Refer to the wastewater design attached.

5.3 Land Application System

5.3.1 Assessment of Land Application Options

The following options were reviewed:

a) Primary Treatment to Trenches

This is the most basic system and uses the pipe work and aggregate in the trench to evenly distribute effluent onto the surface of the underlying soil which then provides further treatment before being completely assimilated.

However, we consider that the length of trenches required will be excessive / not fit within the area available and construction on the slopes will be inappropriate.

b) Primary or Secondary Treatment to Bed

This system has the advantage of reducing the area requirements. However, the lack of flat land again precludes the practical construction of this system.

c) Primary Treatment to Low Pressure Effluent Distribution (LPED)

The principle of the Low Pressure Distribution System (LPED) is to discharge primary effluent through a small diameter pipe nestled within a larger pipe to evenly distribute into the topsoil for evapotranspiration uptake by the vegetation covering the area.

This is considered to be a robust option, especially for a dwelling not occupied full time.

d) Secondary Treatment to Drip Irrigation

The principle of the drip irrigation system is irrigation into the topsoil at a low application rate for evapotranspiration uptake by the dense. The same area as for the LPED system is required.

Use of drip irrigation will require secondary treatment.

There are no environmental constraints which require treatment to a secondary standard and therefore we do not consider it necessary to use a system which is more expensive and has additional ongoing maintenance and service requirements.

Overall, primary treatment to LPED pipe work is considered to be the Best Practicable Option.

5.3.2 Detailed Design of Land Application System

The drawings show the proposed wastewater land application area (LAA) on the north facing slope above the building site.

For a Category 5 soil the Design Irrigation Rate (DIR) is 2.5 mm/day but for design purposes, this should be reduced 20% to allow for the sloping ground, making the DIR 2.0 mm/day.

The required LPED field area is therefore approximately 480 m², equivalent to a line length of 480 m. We would recommend that the lines are laid at 1.0 m maximum spacings, around the site on an even contour.

The preliminary design has spilt the LAA into three sectors using a 3-way sequencing valve because the load needed to dose the full 400 m line length will be over 1000 litres. This is too large and will lie in the pump chamber for too long.

As the property is to be used as a holiday home, we recommend that the system receives a flush of clean water prior to being left unused for any significant period. Three dosing cycles will therefore be required.

5.4 Distribution

It is proposed to distribute the treated effluent to the land application field by pump dose to ensure even loading throughout the whole field.

The pump chamber should be sized for a dose load of 350 litres and an emergency storage capacity equivalent to the maximum daily load of 960 litres, making a total chamber size of about 1300 litres minimum.

The pump duty should be about 30 m head at 110 litres/minute flow. This assumes an elevation head from the pump chamber to the sequencing valve at the top of the LPED field of 20 m.

5.5 Treatment

Treatment of all waste in a single septic tank will be adequate at this site and land application system. The tank should be sized to cater for peak loading and for a minimum of 24 hours residence time. A minimum tank size of 4000 litres is recommended.

The fitment of an approved effluent filter to the outlet of the tank is required to prevent solids exiting the tank, improve treatment performance and the buffering of peak flows.

6 INSTALLATION, OPERATION AND MAINTENANCE

Appropriate operation and maintenance of the overall wastewater system is paramount to its performance and a service contract must be in place at the time of commissioning and remain so with the approved service agent. Records of maintenance work should be made available for Council inspection and records.

Davidson Group Ltd has carried out a site investigation and design in accordance with current codes and modern practice. However, the treatment and land application systems are biological (living) processes and modifications may have to be undertaken to the treatment and/or land application system in some circumstances, such as when there is/are:

a) An increase in design load
b) Disposal of inappropriate substances to the septic system
c) Poor maintenance
d) Poor workmanship or departure from construction drawings.

We strongly recommend that the homeowner and installer read and note the information included in the Appendix and shown on the drawings to ensure ongoing good practice and maintenance.

7 RISK ASSESSMENT

The following risk assessment follows the guidelines and recommendations in AS/NZS 1547:2012.

- Risk Reduction Measures (Table A1)

Hydraulic Failure

The risk of hydraulic failure will be reduced by the use of pressure dosing within the LPED field to create an even distribution.

Power Failure

The proposed system will have a 24 hour reserve storage capacity at full design flow.

Bacteria Washout

The septic tank is not sensitive to changes in hydraulic load.

Also, the risk of bacteria washout in the LPED field will be mitigated by the low application rate and pressurised (even) distribution.

Dispersive Soils

The soils are a sandy clay and not considered to be dispersive.

Marginal Soil Conditions

The soils are sandy/light clays but their low drainage properties are compensated by the good topsoil depth over, excellent exposure to the sun and wind, good vegetation cover, little stormwater runoff to the LAA and the drip type irrigation system proposed.

Site Constraints

There are no significant site constraints. The lot size is large and the proposed LAA is away from any water bodies, and is located on stable and moderate sloping ground.

Rainfall

The annual rainfall is about 1200 mm but there are high rainfall events on occasion. However, the catchment above the LAA is insignificant and will be reduced further by the construction of the drive way above which will intercept runoff. Also, there is a good topsoil depth to assimilate stormwater.

Salinisation

There is no water table at the LAA.

Highly permeable Soils

The soils are not free draining and there is no permanent water table.

No specific measures are therefore required to reduce the risk of water table contamination.

- Slope (Table M2)

  The slope at the LAA is 22°.

  Table M2 recommends that a reduction in the DIR for slopes over 6º. We have allowed for a 20% reduction.

- Setback Distances (Table R2)

The setback distances have been assessed by way of a weighting analysis (see Appendix) and can be summarised as follows:

Feature	Setback		Comment
	Assessed	Proposed	
Property Boundary	**34 m**	**15 m**	**Low to Moderate risk**
Building/House	5 m	20 m min	No risk
Surface Water	**72 m**	**40 m in plan (sea)**	**Low to Moderate risk**
Bore/well	39 m	No wells	No risk
In-ground water tank	11 m	No in ground tank	No risk
Retaining wall cut within 3 m or 45º	-	None within 3m or 45º	No risk
Ground Water	1200 mm	No groundwater	No risk
Hardpan/Bedrock	1100 mm	Assumed to be least 1500 mm	No risk

The critical setbacks are considered those to the property boundary (15 m) and surface water (40 m). However, the neighbouring property to the south is over the ridge, and the actual slope distance will be at least 45 m to the sea. Also, the application rate is very low and not concentrated as in trench type systems. Consequently the risk is considered to be low to moderate.

8 REFERENCES

Crites, R and Tchobanoglous, A (1998). 'Small and Decentralized Wastewater Management Systems'.

ARC Environment, Technical Paper No. 58, Third Edition 'On-Site Wastewater Disposal from Households and Institutions'.

A.S./N.Z.S. 1546.1:2008 'On-Site Domestic Wastewater Treatment Units, Part 1: Septic Tanks.

A.S./N.Z.S. 1547:2012 'On-Site Domestic Wastewater Management'.

MDC (11 July 2005) 'Guidelines for New On-Site Wastewater Management Systems'.

Marlborough Sounds Resource Management Plan.

Centre for Environment Training 'On-Site Wastewater Management Training Course', Christchurch 2001.

Davidson Group Ltd, April 2010, 'Engineering Report for M Davis & Z Gilson'.

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APPENDIX

A1. Field Assessment Report

A2. Land Application System Design

A3. Set back Risk Assessment Analysis

A4. Owner & Installer Guidelines

A5. Drawing Numbers 25544 sheets:

C1 Site Plans
C2 Long Section
C3 Typical Septic Tank Details
C4 Typical Pump Chamber Details & LPED Details

davidson group	**FIELD ASSESSMENT REPORT** **M Davis and Z Gilson** **Port Underwood**	**Job No** **Name** **Date**	25544 WLM 21.03.14

REFS : 1 MDC, 11.07.05 "Guidelines for new on-site wastewater management systems"
2 AS/NZS 1547:2012 "On Site Domestic Wastewater Management"

	Test Pit No.		
	1	2	3
1 Soil log (depth from surface in mm)	250 Topsoil 400 light brown, moist firm, sandy CLAY	300 Topsoil 400 dark bron, moist, firm, sandy CLAY	200 Topsoil 400 light brown, moist firm, light CLAY
2 Coarse Fragments (size / abundance)	none	occasional	none
3 Ribbon Length (mm)	60-75	60-70	60-70
4 Soil Structure (Pedal Content)	high	high	high
5 Soil Category (1 - 6)	**5**	**5**	**5**

6 Site Exposure to - sun	**high**
- wind	**high**
7 Nearby Water Bodies ?	yes
- Separation Distance ?	40 m (sea)
8 Nearby Wells ?	no
- Separation Distance ?	
9 Runoff To Be Controlled ?	no
10 Ground Water To Be Controlled ?	no
11 Any Stability Considerations ?	no
12 Depth to Water Table	no w.t.
13 Vegetation Cover Existing ?	young regenerating natives
- Proposed ?	young regenerating natives
14 Gravity Head to Proposed Disposal Field	no
15 Existing Systems Nearby - type	no
- proximity	
- perform'ce	
16 Reserve Area Available ?	minimal
17 Intended Water Supply	roof
18 Power Available?	yes
19 Other Comments ?	will suit primary treated effluent to LPED LAA

davidson group		**On Site Wastewater Design**			**Job No**	25544
		Client	Davis & Gilson		**Sheet No**	1
		Location	Port Underwood		**Name**	WLM
					Date	13.04.14
		FLOW ALLOWANCES				

REFERENCES :
1 ARC TP # 58 Third Edition
2 AS/NZS 1547:2012 "On Site Domestic Wastewater Management"
3 ON-SITE NewZ Special Report - 97/1
4 MDC,11 July 2005,"Guidelines for New On -Site Wastewater Systems"

		Appliance / Fixture per Capita Daily Flow Allowance				Total per Capita Flow (l/p/d)
		Toilet	Washing Machine	Shower	Basin (kitchen, bathroom, laundry)	
1	**Households with standard fixtures**	60	25	85	30	
		60	***25***	***70***	***25***	***120***
	(11 L wc, top loading washing machine)					
	Blackwater only	60				
		60				
	Greywater only		25	85	10	
			20	*65*	*5*	
2	**Households with standard water reduction fixtures**	40	20	80	25	
		40	*20*	*65*	*20*	***40***
	(11/5.5 dual flush wc, shower flow restrictors, aerator taps and water conserving automatic washing machines)					
	Blackwater only	40				
		40				
	Greywater only		20	80	10	
			15	*60*	*5*	
3	**Households with full water reduction facilities**	35	15	75	20	
		35	*15*	*55*	*15*	
	(6/3 dual flush wc, shower flow restrictors, aerator taps, front loading washing machine and flow/pressure control valves on all water use outlets)					
	Blackwater only	35				
		35				
	Greywater only		15	75	10	
			10	*55*	*5*	

Design wastewater flow per person per day	**160**
Number of Bedrooms	**3**
Equivalent Occupancy	**6**
Design Daily Wastewater Allowance	**960**

NOTES 1 Add 5 l/p/d for a bath
2 Figures in *italics* are for roof water supply. Other values are for creek, community and/or bore water supply (see also Note 6, Table H3, 1547).

davidson group	**On Site Wastewater Design**	**Job No**	25544
	Client Davis & Gilson	**Sheet No**	2
	Location Port Underwood	**Name**	WLM
		Date	13.04.14

SEPTIC TANK

Daily flow	960	litres	
Minimum residence time required	24	hours	
Pump out interval required	6	years	
Sludge / scum accumulation	80	litres / person / year	
Allowance for scum / sludge	2880	litres	
Minimum tank size	3840	litres	
Let tank size be	**4000**	**litres**	(4000 litres min.-Council)
Settling volume available	1120	litres	
Settling time available	28	hours	OK, > min. res. time

davidson group		**On Site Wastewater Design**			**Job No**	25544	
		Client	Davis & Gilson		**Sheet No**	3	
		Location	Port Underwood		**Name**	WLM	
					Date	13.04.14	
		LPED DESIGN					
1	Design Basis	Soil Category			5		
		DIR	2.5	20% reduction =	2.00	mm/day	
		Minimum land application area (A)= Q/DIR			480.0	m^2	
		Let wetted width (WW) =			1	m	
		Total length of LPED required (L) = A/WW			480.0	m	
		No. of subfields			3		
		Lateral	NB		20.0	LDPE	
			ID		19.0	mm	
			max length		11.0	m	
			hole dia		3.5	mm	
			hole centres		2.0	m	
			head req'd at end		1.0	m	
		Submain	NB		40.0		
			ID		38.0	mm	
			max length		20	m	
			elevation head (-ve if downhill)		-2.0	m	
		Rising Main	NB		40.0	LDPE	
			ID		38.0	mm	
			max length		40	m	
			elevation head		20	m	
		Sequencing Valve					
			Type		KRain 4400		
			Min. Flow rate to activate		38	litres/min.	
2	Design						
	Subfield	Flow variation			4.5%	OK,<5%	
		Head variation			9.6%	OK,<10%	
		Ideal dose vol			453.6	litres	
		Let dose vol be			350.0	litres	
		No.of doses / day			2.7		
	System head losses						
		Head at end of lateral			1.0	m	
		Line losses in lateral			1.4	m	
		Line loss in submain			1.7	m	
		Elevation head along submain			-2.0	m	
		Sequencing Valve		*KRain 4400*	3.0	m	
		Line loss along rising main			3.5	m	
		Elevation head along rising main			20.0	m	
		Loss thru bends etc			1.0	m	
			Total Head Losses		29.6	m	
3	Pump Details	Total Head, includes cham depth of		2	32	m	
		at Max Flow			118	litres/min.	
4	Check Sequencing Valve						
		Min flow			38	litres/min.	
		Flow			118	litres/min.	
					OK,>min flow		

davidson group	**SETBACK RISK ASSESSMENT**		**Job No**	25544
	re;AS/NZS 1547:2012, TABLE R1, (Weighted Assessment)		**Name**	WLM
	M Davis & Z Gilson		**Date**	13.04.14
	Port Underwood			

SITE	SETBACK(m)		SITE	SCORE	WEIGHTED	COMMENTS
FEATURE	min	max	CONSTRT	(0 - 4)	SETBACK	
			ITEM	low-best	(m)	
				high-worst		
Property	1.5	50.0	**A**	4		The effluent is primary treated
Boundary			**D**	3		The slope is 22°
			J	1		LPED to top soil
			TOTAL	8	**33.8**	
Building/	2.0	6.0	**A**	4		The effluent is primary treated
houses			**D**	3		The slope is 22°
			J	1		LPED to top soil
			TOTAL	8	**4.7**	
Surface	15.0	100.0	**A**	4		The effluent is primary treated
water			**B**	3		Cat 5 soil, sea 40 m away
			D	3		The slope is 22°
			E	3		Upgradient of the sea
			F	2		Cat 5 soil, mod slope but no water table
			G	0		No flood potential
			J	1		LPED to top soil
			TOTAL	16	**72.1**	
Bore,	15.0	50.0	**A**	4		The effluent is primary treated
well			**C**	2		Cat 5 soil, mod resource and enviromental value but no water table
			H	4		Cat 5 soil, clayey soils, low porosity
			J	1		LPED to top soil
			TOTAL	11	**39.1**	
Recreatnl	3	15	**A**	4		The effluent is primary treated
areas			**E**	3		Upgradient of the sea
			J	1		LPED to top soil
			TOTAL	8	**11.0**	
In-ground	4	15	**A**	4		The effluent is primary treated
water tank			**E**	3		Upgradient of the sea
			J	1		LPED to top soil
			TOTAL	8	**11.3**	
Ret. wall,	3 or > 45°		**D**			The slope is 22°
embankm,			**G**			No flood potential
escarpmt,			**H**			Cat 5 soil, clayey soils, low porosity
cuttings						**nothing within 3 m**
Ground	0.6	1.5	**A**	4		The effluent is primary treated
water			**C**	2		Cat 5 soil, mod resource and enviromental value but no water table
			F	2		Cat 5 soil, mod slope but no water table
			H	4		Cat 5 soil, clayey soils, low porosity
			I	2		Uniform side slope
			J	1		LPED to top soil
			TOTAL	15	**1.2**	
Hardpan,	0.5	1.5	**A**	4		The effluent is primary treated
bedrock			**C**	2		Cat 5 soil, mod resource and enviromental value but no water table
			J	1		LPED to top soil
			TOTAL	7	**1.1**	

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GUIDELINES FOR INSTALLERS OF ON-SITE DOMESTIC WASTEWATER MANAGEMENT SYSTEMS

References

A.S./N.Z.S. 1546.1:2008 'On-Site Domestic Wastewater Treatment Units, Part 1:Septic Tanks'
A.S./N.Z.S. 1547:2000 'On-Site Wastewater Management'

1. GENERAL

(a) All products and construction shall be in accordance with the relevant standards and in general the best trade practices shall prevail. If there are any questions about any aspect of the work, please contact Council in the first instance.

(b) The Contractor shall act to protect the health and safety of staff and private persons at all times.

(c) The Contractor must be aware of the inspection requirements of Council and/or the Engineer and the need to provide As-Built locations of the treatment and land application systems to Council and the Owner.

(d) The Contractor should also educate the Owner about the functioning of their system, especially the maintenance requirements, and where appropriate put in place a maintenance contract for systems which rely on mechanical action in order to function properly.

2. LOCATION OF TREATMENT AND DISTRIBUTION SYSTEMS AND LAND APPLICATION AREAS

(a) All tanks and the land application area shall be located clear of structures to avoid the undermining of foundations. In general, a minimum clearance of 3.0 metres should be adequate but if in doubt check with Council or an Engineer.

(b) The Contractor must be aware of the required separation distances of tanks and/or the land application area to surface water (ponds, water courses and drainage paths), wells and/or boundaries.

(c) Treatment systems should be sited with consideration for access by desludging trucks.

3. GOOD CONSTRUCTION TECHNIQUE

(a) Treatment and Distribution Systems

(i) When working with existing systems or carrying out maintenance tasks, measures shall be in place to ensure staff are adequately protected from contact with wastewater.

(ii) All tanks located in areas where high seasonal groundwater levels are known to occur shall be weighted down or provided with anchorage in accordance with clause 3.2.2 of A.S./N.Z.S. 1546.1:2008.

(iii) The Contractor shall allow to carry out any treated effluent testing required by Council. Samples should be taken once the system has been in operation for approximately three months. In a holiday home situation, testing should be done in January.

(iv) All pump chambers shall be vented. The commissioning of pumped distribution systems shall consist of at least the following:

- A check of pump out and emergency storage volumes (reserve capacity equivalent to the peak daily flow should be provided).
- Three drawdown tests.
- Testing of the operation of controls and alarms.
- Checking of uniform flow throughout any pressurised distribution network prior to covering over.

(b) **<u>Land Application Area</u>**

The following excavation techniques shall be observed so as to minimise the risk of damage to the soil.

(i) Plan to excavate only when the weather is fine. Pudding, where washed clay settles on the base of the trench to form a relatively impermeable layer, must be avoided.

(ii) Avoid excavation when the soil has a moisture content above the plastic limit. This can be tested by seeing if the soil forms a “wire” when rolled between the palms.

(iii) During wet seasons or when construction cannot be delayed until the weather becomes fine, smeared soil (smooth) surfaces should be raked to reinstate a more natural soil surface taking care to use fine tines and only at the surface.

(iv) When excavating by machine, fit the bucket with “raker teeth” if possible, and excavate in small “bites” to minimise compaction.

(v) Avoid compaction by keeping people off the finished trench or bed floor.

In particular for trenches and beds:

(vi) If rain is forecast, cover any open trenches to protect them from rain damage.

(vii) Excavate perpendicular to the line of fall or parallel to the contour levels.

(viii) Ensure that the inverts are horizontal or sloped at not more than 1 in 200.

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HOW TO GET THE BEST FROM YOUR ON-SITE WASTEWATER MANAGEMENT SYSTEM

Helpful Information for Homeowners/Occupiers

1. GOOD HOUSEHOLD PRACTICES

(a) Reduce solids disposal to treatment tanks as much as possible including food scraps, fats, grease etc. Scrape all dishes before washing and do not install a waste disposal unit unless the wastewater system has been specifically designed to carry the extra load.

(b) Do not put any of the following down sinks, drains or the toilet.

- **(i)** Oil/grease from e.g. a deep fryer;
- **(ii)** Stormwater and any drainage other than wastewater generated in the house;
- **(iii)** Petrol, oil and other flammable/explosive substances;
- **(iv)** Household, garden, garage and workshop chemicals (e.g. pesticides, paint cleaners, photographic chemicals, motor oil and trade waste);
- **(v)** Disposable nappies and sanitary napkins.

(c) In order to keep the bacteria working in the tank and in the land application area:

- **(i)** Use biodegradable soaps;
- **(ii)** Use a low-phosphorus detergent;
- **(iii)** Use a low-sodium detergent in the dispersive soil areas;
- **(iv)** Use detergents in the recommended quantities;
- **(v)** Do not use powerful bleaches, whiteners, nappy soakers, spot removers and disinfectants including cold water washing products.
- **(vi)** Do not put chemicals or paint down the drain.

(d) Conserve water. Less water means a lower load on the treatment system and land application area, with ensuing improved and more reliable performance. Conservation measures include:

- **(i)** Installation of water-conservation fittings such as low water use toilets, spray taps and water saving automatic washing machines;
- **(ii)** Taking showers instead of baths;

(iii) Only putting the dishwasher or washing machine on when there is a full load.

(e) Space washing machine and dishwasher use out to avoid overloading the wastewater system. Try not to do a large amount of washing in any one day and avoid running the washing machine and dishwasher at the same time.

(f) For the physical protection of treatment and land application systems:

(i) The treatment unit must be protected from vehicles;

(ii) Pedestrian traffic routes should not cross effluent field areas;

(iii) No vehicles or heavy stock should be allowed on effluent fields;

(iv) Deep rooting trees or shrubs should not be grown over absorption trenches or beds.

2. MAINTENANCE

(a) General

The appropriate maintenance of your treatment and land application systems will be the key to their effective and reliable performance. Please contact a drainlayer or Council if you are unsure about anything or require further advice.

(b) Septic Tanks

Any septic tank (primary wastewater treatment unit) will need to:

(i) Be cleaned out regularly i.e. every three to five years or when scum and sludge occupy two thirds of the volume of the tank (or first stage of a two-stage system). All scum, sludge and septage material must be disposed of in an approved manner. Pump chambers should be cleaned out at the same time if necessary;

(ii) Have grease traps cleaned out regularly (typically three monthly or as required);

(iii) Keep the access cover of the septic tank exposed;

(iv) Have any outlet filter inspected and cleaned, normally at the same time as septic tank cleaning. Remove the cartridge and rinse off with a garden hose, being careful to rinse all septage material back into the tank. It is not necessary that the cartridge be cleaned “spotless”. The biomass growing on the filter aids in the pre-treatment process and should be left on the cartridge.

(c) Secondary Treatment Systems

Improved treatment systems, such as aerated plants or media systems, require specialist maintenance and must be looked after under a maintenance contract. Owners should ensure that they are aware of the manufacturers/suppliers recommended maintenance intervals and that a contract is in place for routine checks of mechanical components.

These systems will typically have a primary treatment stage which should be treated as in (b) above.

(d) **Effluent Field**

Reliable performance from your effluent field (including shallow trenches or beds, drip or LPED irrigation fields) will be aided by regular attention including one or more of the following depending on the type of system:

(i) Keep any surface water diversion drains upslope of and around the land application area clear to reduce absorption of rainwater into trenches or beds;

(ii) Evapotranspiration and irrigation areas should have their vegetation maintained to ensure that these areas take up nutrients with maximum efficiency;

(iii) Ensure pumps, alarms and sequencing valves are operating correctly;

(iv) Clean disc filters or filter screens on irrigation-dosing equipment periodically by rinsing back into the primary wastewater treatment unit;

(v) Irrigation systems which discharge wastewater that has only been treated by a septic tank and filter (i.e. LPED systems), must be flushed through with clean water before and after any significant period of non-use.

(vi) Regular maintenance of the treatment system (as per manufacturers recommendations), especially for aerated and media-type systems.

North

Lot 1
DP 8003

JETTY

SHED

NEW DITCH

NO SIDE CASTING

-40°

A
C2

NEW CULVERT

IMPROVE DITCH

EXISTING CULVERT
(TO BE RELOCATED?)

NEW MANHOLE (TO BE CONFIRMED)

EXISTING DITCH

P1
P2
P3
P4
P5
P6

2m
2
2

5m

SUITABLE BUILDING ENVELOPE

SEPTIC TANK & PUMP CHAMBER

TOE OF SLOPE

1500

TP3
TP2
TP1

WASTEWATER FIELD

12.5m

SIDE CAST (AFTER STRIPPING)

TUMBLE DOWN BAY ROAD

RECAMBER TO INSIDE (TYPICAL)

IMPROVE WATER TABLE

CUT OUT BANK & LEAVE STABLE

M.H.W.S.

40 NB (33ID) LDPE RISING MAIN

-40°

SHELLY BAY

PIPE/CHANNEL TO ENSURE STORMWATER STAYS ON THIS PROPERTY

TO RELOCATE CULVERT HERE?

NOTES:

LOCATIONS OF FEATURES ARE APPROXIMATE ONLY AND HAVE NOT BEEN PRECISELY SURVEYED.

PLAN
1:500

'C' REMOVE DIMENSIONS FOR WASTEWATER FIELD.

0mm 100mm

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M DAVIS & Z GIBSON
LOT 1 DP 8003
PORT UNDERWOOD

site plan – wastewater

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
04/14	A3	25544	C1	C

DES L.M. | DRN W.H. | CK L.M. | REF

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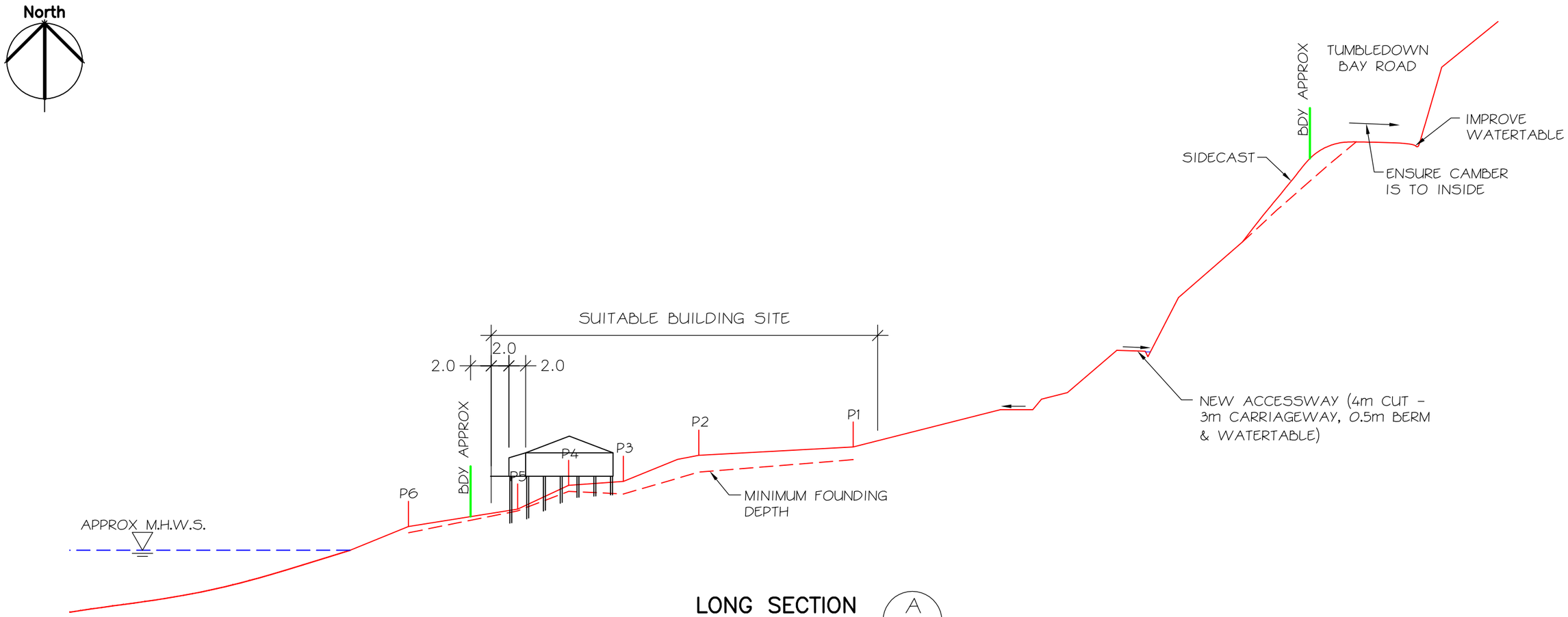

LONG SECTION

1:500

A / C1

NOTES:

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'B' PROPOSED HOUSE LOCATION 16-07-2014

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long section

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
04/14	A3	25544	C2	B

DES	DRN	CK	REF
L.M.	W.H.	L.M.	

0mm 100mm

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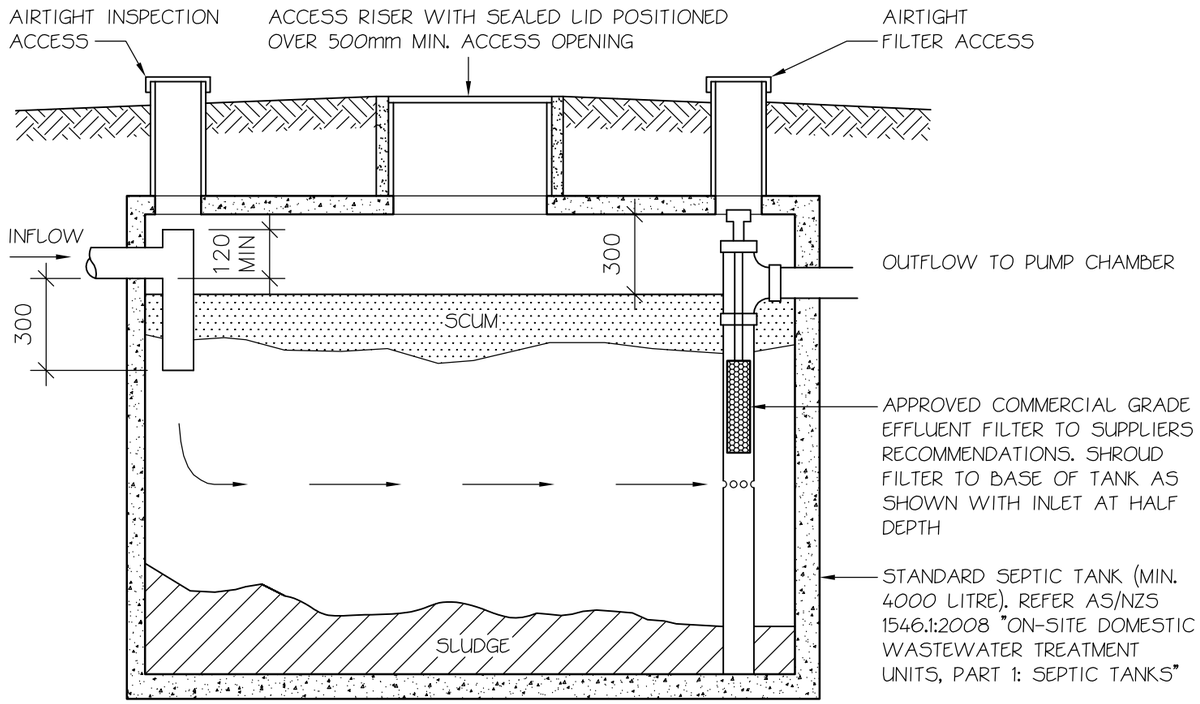

TYPICAL CROSS SECTION
NTS

SUGGESTED OPERATION AND MAINTENANCE SEPTIC TANK

1.) THE INFLOWING SEWAGE SHOULD NOT CONTAIN ANYTHING OTHER THAN HUMAN WASTE AND TOILET PAPER, AND FOOD MATERIAL SUCH AS MAY GO DOWN A KITCHEN SINK DRAIN. GARBAGE GRINDERS ARE NOT RECOMMENDED, ALTHOUGH THEY NEED NOT BE FORBIDDEN. MORE FREQUENT DESLUDGING OF THE SEPTIC TANK MAY BE NEEDED IF A GARBAGE GRINDER IS USED. NORMAL USE OF SOAPS, DETERGENTS, BLEACHES, PLUMBING FIXTURE CLEANERS, DRAIN CLEANERS AND DISINFECTANTS WILL NOT HARM THE FUNCTIONING OF THE SEPTIC TANK OR THE SOIL ABSORPTION SYSTEM.

2.) PROHIBITED DISCHARGES TO THE SEPTIC TANK INCLUDE:
OIL/GREASE FROM E.G. A DEEP FRIER.
STORMWATER AND ANY DRAINAGE OTHER THAN SEWAGE GENERATED IN THE HOUSE.
PETROL, OIL, AND OTHER FLAMMABLE/EXPLOSIVE SUBSTANCES.
LABORATORY, GARDEN, GARAGE, AND WORKSHOP CHEMICALS (E.G. PESTICIDES, PAINT CLEANERS, PHOTOGRAPHIC CHEMICALS, MOTOR OIL AND TRADE WASTE).
DISPOSABLE NAPPIES AND SANITARY NAPKINS.

3.) SEPTIC TANKS NEED TO BE PUMPED (SEPTAGE REMOVED WHEN THE SLUDGE AND SCUM HAVE ACCUMULATED TO THE EXTENT THAT THE CLEAR SPACE (BETWEEN SCUM AND SLUDGE) HAS A VOLUME LESS THAN 1500 LITRES). SEPTAGE REMOVAL MAY NEED TO BE DONE AS OFTEN AS EVERY THREE YEARS BUT AT NO LONGER THAN FIVE YEAR INTERVALS.

EFFLUENT FILTER

1.) THE OUTLET FILTER SHOULD PREVENT DISCHARGE OF SUSPENDED PARTICLES > 3mm AND ENSURE TSS < 100g/m^3.

2.) THE SEPTIC TANK SHOULD BE PUMPED PRIOR TO REMOVAL OF THE FILTER TO PREVENT ANY SOLIDS FROM ESCAPING TO THE BED WHEN THE CARTRIDGE IS REMOVED.

3.) THE FILTER SHALL BE CLEANED AT THE SAME TIME AS THE NORMAL SEPTIC TANK SERVICING (3-5 YEARS).

4.) REMOVE THE CARTRIDGE AND RINSE OFF WITH A GARDEN HOSE, BEING CAREFUL TO RINSE ALL SEPTAGE MATERIAL BACK INTO THE TANK.
IT IS NOT NECESSARY THAT THE CARTRIDGE BE CLEANED "SPOTLESS".
THE BIOMASS GROWING ON THE FILTER AIDS IN THE PRE-TREATMENT PROCESS AND SHOULD BE LEFT ON THE CARTRIDGE.

NOTES:

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LOT 1 DP 8003
PORT UNDERWOOD

typical septic tank details

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
04/14	A3	25544	C3	A

DES	DRN	CK	REF
L.M.	W.H.	L.M.	

0mm 100mm

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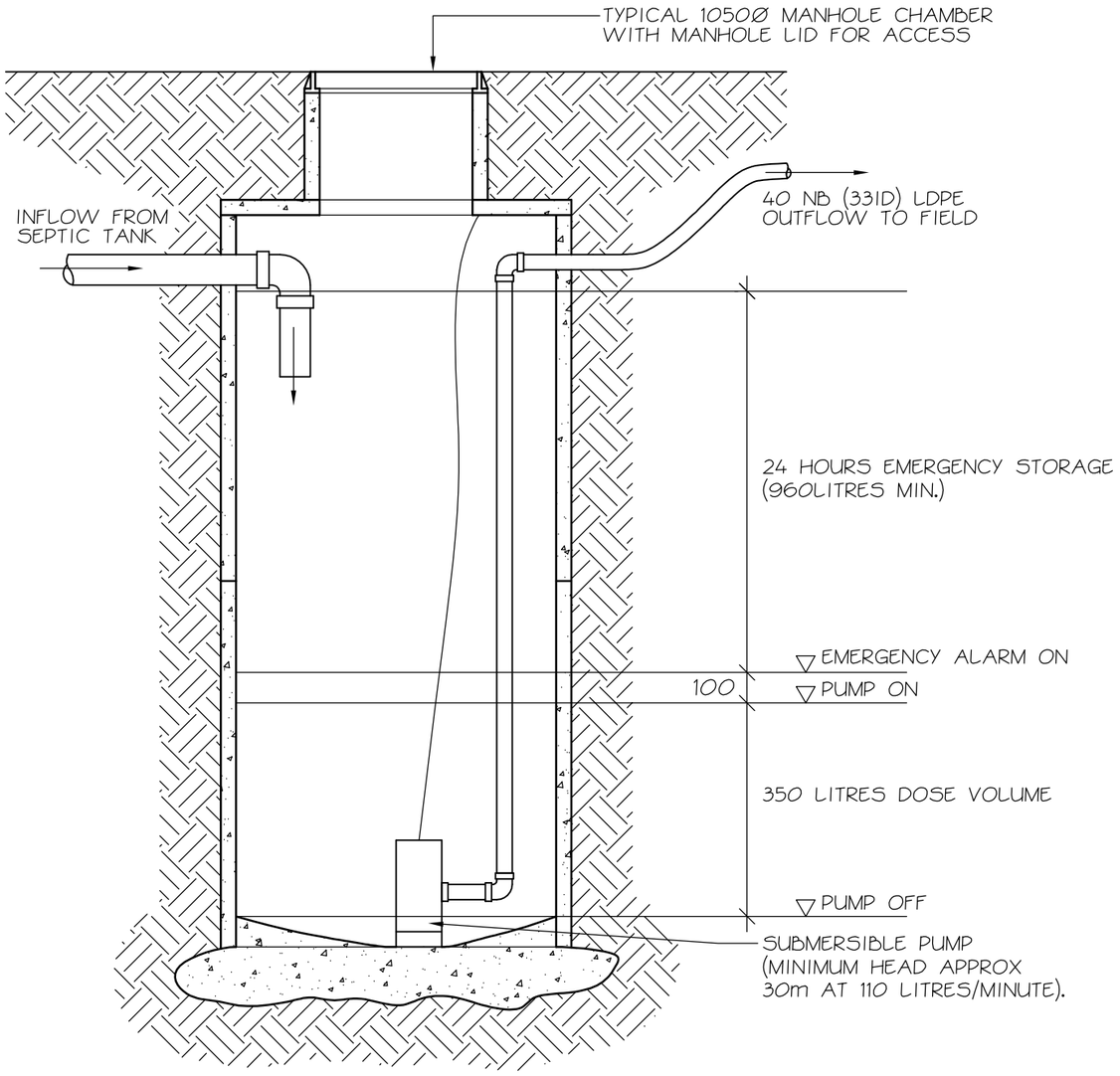
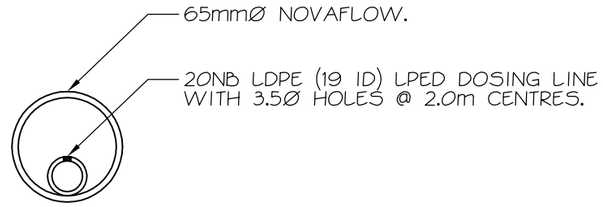
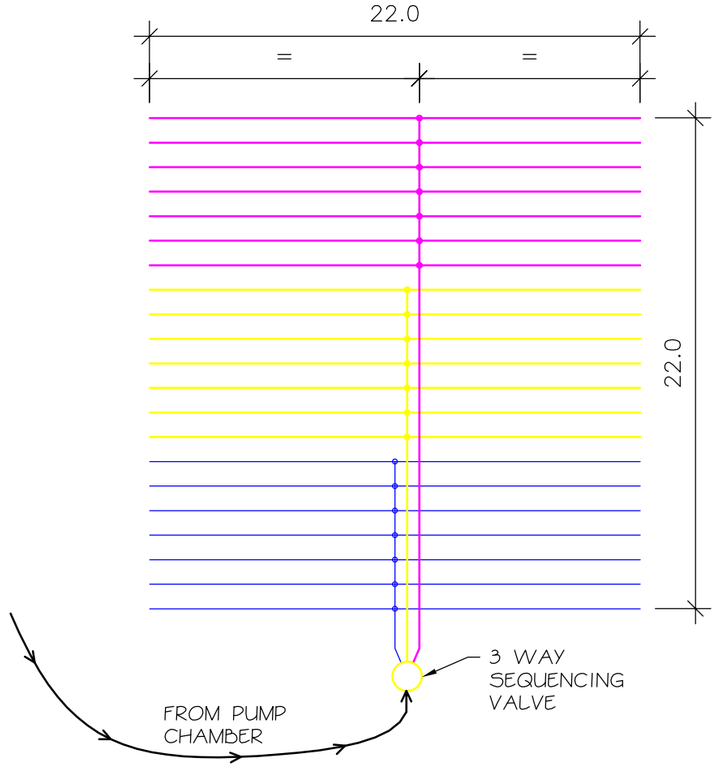


PUMP CHAMBER
NTS



DISTRIBUTION DRAIN
1:5



LAND APPLICATION AREA LAYOUT
1:250

NOTES:

1.) MATERIALS AND INSTALLATION OF WASTEWATER SYSTEM TO BE IN ACCORDANCE WITH AS/NZS 1547:2012, AS/NZS 1546.1:2008 AND THE MANUFACTURERS SPECIFICATIONS.

2.) PUMP CHAMBER TO BE FITTED WITH A HIGH LEVEL FLOAT SET JUST ABOVE NORMAL OPERATING LEVEL. WIRED TO AUDIO AND VISUAL ALARMS.

3.) PUMP CHAMBER SHOWN IS AN EXAMPLE ONLY. OTHER TYPES COULD BE APPROVED, E.G. MODIFIED SEPTIC TANK.

4.) OPERATION OF DISTRIBUTION SYSTEM TO BE FULLY TESTED PRIOR TO COVERAGE OF PIPEWORK. ENGINEER TO BE PRESENT.

'B' ALTER FIELD DIMENSIONS & LPED DETAILS.

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typical pump chamber & lped details

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
04/14	A3	25544	C4	B

DES L.M. | DRN W.H. | CK L.M. | REF

0mm 100mm

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