

DEANE CONSULTANCY LTD

17 Kotare Place, RD 2, Warkworth.
09 4222 408 deanecl@xtra.co.nz

Ref: 19/106/Rev AA

**New Effluent Disposal System
Panetiki Development
20 Omaha Block Access Road, Leigh
Omaha 3 Block ML 14815 NA 26D/297 Area
9.0421 Ha**



Figure 1. Auckland Council Geo Maps Aerial

1) Preamble:

The owners propose to develop accommodation for visitors which includes a main complex with accommodation, a secondary complex with accommodation, a utility shed with managers accommodation, a pavilion and a small accommodation unit. Deane Consultancy has been requested to design an effluent disposal system for this proposal. A tertiary treatment system has been chosen to treat design flow. This proposal is a restricted discretionary activity in terms of Auckland Unitary Plan E5.4.1 therefore a discharge consent is required and is being applied for.

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2) Design outflow:

The design out flow is listed as follows: Table 1: Daily Design

Volume	Development:	Design Quantity	Total Design Flow (Litres)
	01 Visitors Accommodation 6 x Single Room Luxury Units	12 x 220 litres	2640
	Day Staff facilities	6 x 50 litres	300
	02 Visitors Accommodation- 4 x Single Rooms with ensuites	8 x 220 litres	1760
	03 Utility Shed with Managers Accommodation 1 Bedroom	2 x 180 litres	360
	Utility Shed Workers Facilities	4 x 50 litres	200
	04 Tennis Pavilion 4 x Visitors	4 x 50 litres	200
	05 Visitors Accommodation Unit 1 x Single Room	2 x 220 litres	440
		TOTAL USAGE FOR DESIGN	5900 Litres

Roof tank water supply is proposed. With partial water saving fixtures such as dual flush toilets, no garbage grinders and front-loading commercial washing machines the daily usage per head is 220 litres per person per day for luxury accommodation; 180 litres per person per day for managers accommodation and 50 litres per day for day staff facilities. The total peak daily design quantity is 5900 litres per day shown in table 1 above.

The ratio of lot area to daily design volume is 15.3 which is greater than the minimum of 3.0 for permitted use. The discharge exceeds the maximum of 2000 litres per day therefore it is considered a restricted discretionary activity in terms of Auckland Unitary Plan E5.4.1.

3) Treatment Quality and System:

The owners have requested that effluent be treated to a tertiary level. The chosen treatment method is an 8.7 Oxyfix FIXEUC90 Submerged Aerated Fixed Film Technology System with an Advanced C 1700 Ultra Violet Water Disinfection Unit. This includes a Greastop C-90 Grease trap, a screen tank fitted prior to the treatment system, and an 80 Micron filter on the irrigation pump. It is expected that this treatment plant will produce an effluent quality of:

- BOD (mg/L) 15
- TN (mg/L) 40
- 80 Micron Irrigation filter
- TSS (mg/L) 15
- E-coli (cfu/100ml) 1000
- UV C1700

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4) Design:

Deane Consultancy Ltd conducted a geotechnical investigation on 12 February 2020 in which two boreholes were augered in the proposed area for disposal. These boreholes found 300 – 500mm of topsoil over Waitemata Group, clayey silt. These soils are assessed as category 5 soakage in terms of Auckland Council TP58. A loading rate of 3mm has been used for design.

This gives a field area of 5900 litres/3mm = 1967m². A 50% reserve area of 984m² is required and is available on site. A separation distance of 600mm from ground water and 10m from surface water is recommended in Table 5.2 TP58 for tertiary treatment. Both of these requirements are more than satisfied by this design.

5) Disposal Field:

The disposal field is located on a north west facing slope. The slopes in the disposal area range from near level up to a maximum of 1V:5.2H (11°). The area is established with native plants and has excellent exposure to sun and wind. The field has a minimum 29m separation distance from the nearest over land flow path; and a minimum of 25m separation to coastal waters as indicated on the site plan. The dripper lines are to be fixed to the surface within the established planted area, covered with mulch, fenced off and planted out where required.

6) Treatment Plant:

- 2 x Greastop C-90 with a net capacity of 5790 litres and a grease holding capacity of 700 litres
- A 6000 litre screen tank
- A 15,000 litre Primary tank
- An 8.7 Oxyfix FIXEUC90 Submerged Aerated Fixed Film Technology System with an operating volume of 8700 litres per day
- 6000 litre irrigation tank
- 80 Micron irrigation filter
- An Advance C 1700 Ultra Violet Water Disinfection Unit capable of treating up to 14,030 litres per hour.
- 2 x Ø1.2m Pump chambers. One installed at visitor's accommodation and one installed at small accommodation unit.

7) Emergency Storage Volume:

Below is the estimated storage volume in the system:

- 01. Visitor Accommodation	1396 litres in pipe
- 02. Visitor Accommodation	3817 litres in pump chamber (Ø1.8 x 1.5m height)
- 03. Utility Shed/Managers Accom &	
- 04. Tennis Pavilion	1099 litres in pipe
- 05 Visitor Accommodation	3817 litres in pump chamber (Ø1.8 x 1.5m height)
- Screen tank	6000 litres
- Primary tank	2730 litres above outlet
Total Emergency Storage Volume	18,859 litres

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8) Recommendations:

- 1) Install grease traps in close vicinity to the kitchens in the main complex and the secondary visitor's accommodation. Locations to be advised.
- 2) All five proposed buildings to be connected to the treatment plant as stated below:
 - The main complex (#1) to be gravity fed to plant via a Ø150mm delivery line
 - The secondary complex (#2): Kitchen waste water is connected to a grease trap then effluent is pumped to treatment plant via a Ø50mm rising main. Install a Ø1.2m pump chamber (near complex) housing a Davey 42A/B (or equivalent) pump. **Note:** If enough fall is available to the treatment plant no pump chamber will be required.
 - Utility Shed with Managers accommodation (#3) to be gravity fed to plant via a Ø100mm delivery line.
 - The Pavilion (#4) connect to grease trap. Gravity feed to plant via a Ø100mm delivery line.
 - The small accommodation unit (#5) will be pumped via a Ø50mm rising main to treatment plant. Install a Davey 42A/B (or equivalent) pump in a Ø1.2m pump chamber near unit.
- 3) 6000 litre screen tank with removable coarse mesh screen connected to a 15,000 litre primary tank, connected to the 8.7 Oxyfix FIXEUC90 treatment plant, delivering treated effluent to a 6000 litre irrigation chamber with an Advance C 1700 UV disinfection treatment unit installed. Irrigation chamber to house a Davey 53A/B pump (or equivalent), with an 80micron irrigation filter attached at outlet.
- 4) Treated effluent to be delivered to a 1967m² field area as detailed on the attached site plan. The lines are to be 30 x 65.6m long Ø17mm pressure compensating dripper irrigation lines spaced at 1.0m centres. The PCDI lines are to be surface laid, pinned to the ground surface, covered with timber mulch or leaf litter and fenced off. The disposal area is to be planted out in areas where vegetation is not established. The ends of lines are to be marked. Lines to be installed in accordance with the manufacturer's guidelines.
- 5) A surface water cut off drain is required above the highest lines of the disposal field.
- 6) An earth bund of dimensions no less than 0.4m height constructed around the perimeter of the treatment plant area in order to capture any accidental spillages.
- 7) Deane Consultancy to be retained for inspections during construction and approve the completed system.

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P A Deane

09 September 2021

Prepared by:



Anna Finkenauer

Reviewed by:



Peter Deane, CMEngNZ, CPEng

Appendices:

- A: A3 Site Plan
- B: Calculations
- C: Plant Specifications and Technical
- D: Sheets Assessment of Environmental
- E: Effects Report TP 58 Appendix E with bore logs attached at rear

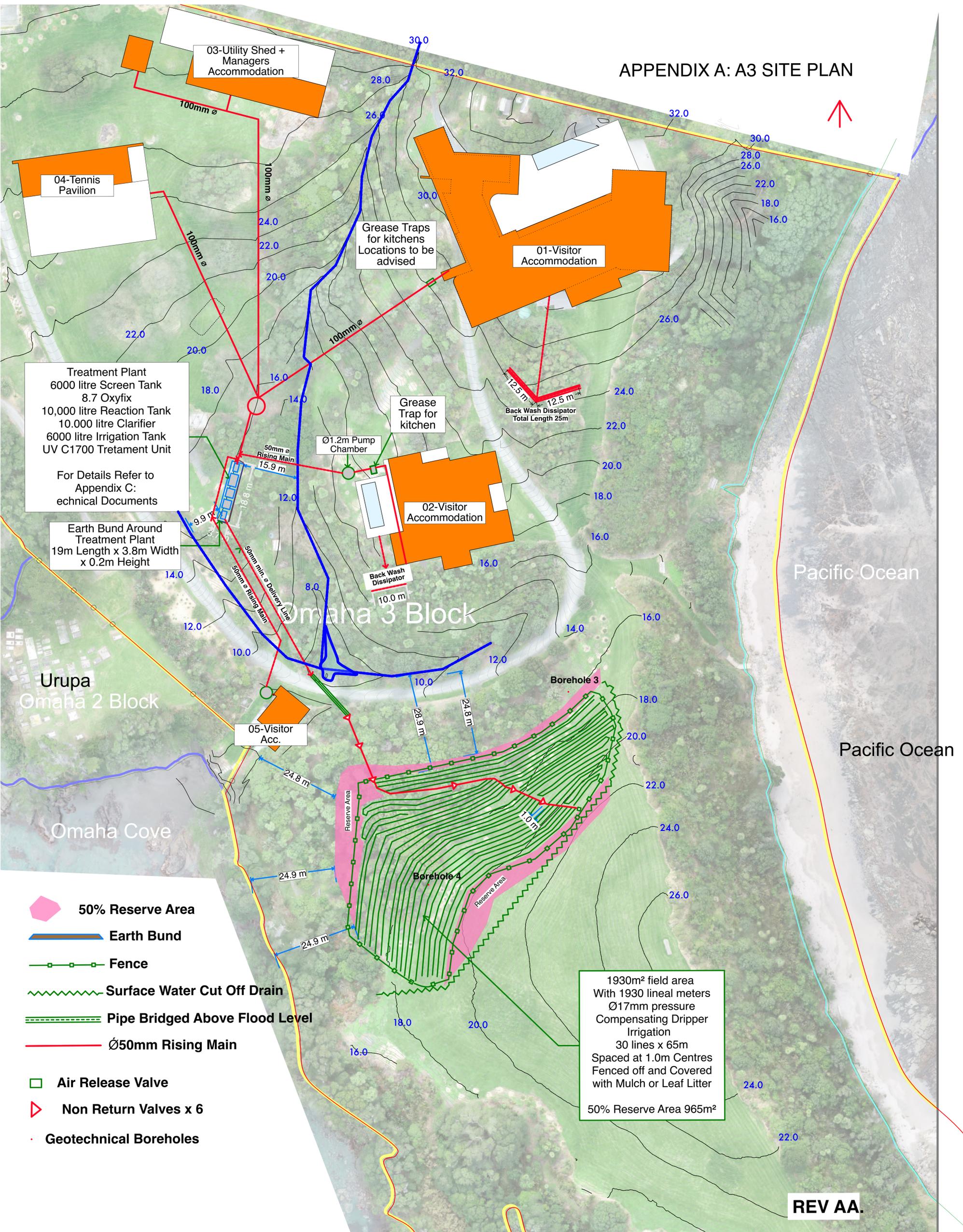
References:

Figure 1: Auckland Council Geo Maps Aerial of 20 Omaha Block Access Road, Leigh

<https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

Paragraph 4: Design Loading Rates from Table TS5 – 2: Auckland Council Technical Publication 58- On site Waste Water Systems Design and Management Manual - Third Addition 2004 Prepared by Sandy Ormiston and R E Floyd

APPENDIX A: A3 SITE PLAN



Treatment Plant
 6000 litre Screen Tank
 8.7 Oxyfix
 10,000 litre Reaction Tank
 10,000 litre Clarifier
 6000 litre Irrigation Tank
 UV C1700 Treatment Unit

For Details Refer to
 Appendix C:
 echnical Documents

Earth Bund Around
 Treatment Plant
 19m Length x 3.8m Width
 x 0.2m Height

1930m² field area
 With 1930 lineal meters
 Ø17mm pressure
 Compensating Dripper
 Irrigation
 30 lines x 65m
 Spaced at 1.0m Centres
 Fenced off and Covered
 with Mulch or Leaf Litter

50% Reserve Area 965m²

- 50% Reserve Area
- Earth Bund
- Fence
- Surface Water Cut Off Drain
- Pipe Bridged Above Flood Level
- Ø50mm Rising Main
- Air Release Valve
- Non Return Valves x 6
- Geotechnical Boreholes

REV AA.

SCALE 1:500

Created By: Anna Finkenauer
 Date: 06/09/2020
 Checked By: Peter Deane

**NEW EFFLUENT DISPOSAL SYSTEM
 PANETIKI DEVELOPMENT
 20 OMAHA BLOCK ACCESS ROAD, LEIGH
 OMAHA 3 BLOCK ML 14815 NA26D/297 AREA 9.0421
 REF: 19/106**

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APPENDIX B: CALCULATIONS:

DAILY DISCHARGE:

Peak Design discharge total = **5900 litres/day** (Refer to Table 1. Daily Design Volume)

LPED FIELD SIZE:

Areal loading rate = **3mm**

Field area = **5900 litres/day ÷ 3mm = 1967 m²**

Lines in LPED field = **30**

Field Area = **30 x 65.6m** lengths of Pressure Compensating Dripper Irrigation (PCDI)

Number of distribution lines required = 30 x 65.6m meter lengths

PUMP HYDRAULICS:

Required head for pump: Small Accommodation Unit to Treatment Plant = 13.5m
= 10m Rise + 3.52 for friction losses

Flow for pump Davey D42A/B = 16m head @ 100 l/min

Stroke = 330mm

Losses in **Ø50mm feeder line** at 100 l/min $H_{f_f} = \alpha \times L = 0.044 \times 80 = \mathbf{3.52m}$

Required head for pump: #2 Visitors Accommodation to Treatment Plant = 3.63m
= 3m Rise + 0.63m for friction losses

Flow for pump D42A/B at 10m head @ 118 l/min

Stroke = 330mm

Losses in **Ø50mm feeder line** at 118l/min $H_{f_f} = \alpha \times L = 0.021 \times 30 = \mathbf{0.63m}$

Required Head: Treatment Plant to PCDI Disposal Field = 8.56m

= 6m rise + friction losses 2.56

Flow for pump D53A/B at 20m head @ 108 l/min

Stroke = 330mm

Losses in **Ø50mm feeder line** at 100 l/min $H_{f_f} = \alpha \times L = 0.018 \times 142 = \mathbf{2.56m}$

Volume in IDØ17mm PCDI lines = 0.23 x 30 x 65 = 449 litres

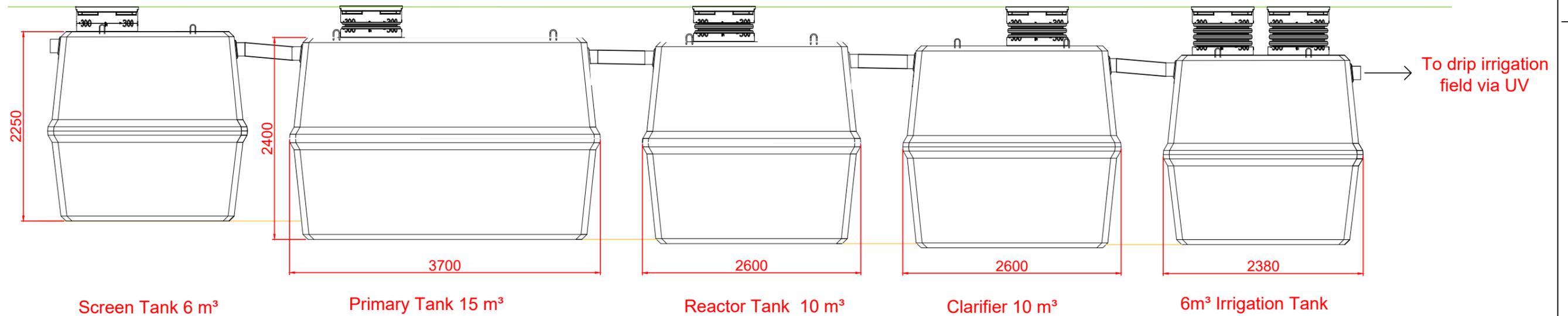
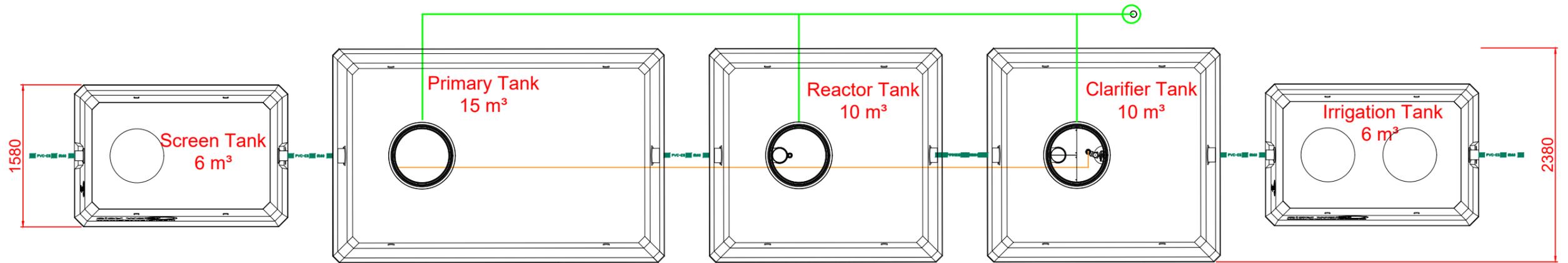
Area of Irrigation Chamber 1.5m width by 2.38m length = 3.57m²

Pump Stroke .33m

Area x Stroke = Volume.33 x 3.57 = 1.178 x 1000 = 1178 litres

Ratio 1178 litres /449 litres = 2.6

APPENDIX C: TECHNICAL SPECIFICATIONS



NOTES:

REVISIONS			
REV #	REVISION DESCRIPTION	DATE	DRAWN
B	B		

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 Tel: 09-571 0090
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 email: Peter.Carroll@hyndsenv.co.nz



PROJECT:
 Panetaki Development
 17 Kotare Lane
 Wastewater Treatment Plant

DRAWING TITLE:
 8.7 Oxyfix Module
 6m³ Screen Tank

REFERENCE/QUOTE NUMBER:	HWW-1215	
DRAWN: CM	DESIGN:	CHECKED:
SIGNATURE:	SIGNATURE:	SIGNATURE:
SCALE: N/A	Scale Varies	DATE:
PAPER SIZE: A3	See Legend	26/03/2020
DRAWING NUMBER:	REVISION NUMBER:	

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Product: Grease trap

Type : Greastop® DEGEUC90
 Model : C-90 6 m³ - 5 l/s

Grease trap / Greastop® C-90 6 m³ - 5 l/s

CHARACTERIZATION

Considered influent water : Grease in wastewater
 Nominal flow : 5 l/s
 Volume of sludge storage : 1.70 m³
 Volume of grease storage : 1.04 m³
 Average grease concentration : 250 mg/l
 Maximum grease density : 0.95 g/cm³
 Temperature : > 60°C
 Presence of cleaning and rinsing agents

DIMENSIONS | VOLUMES | WEIGHT

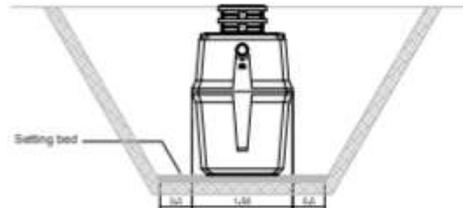
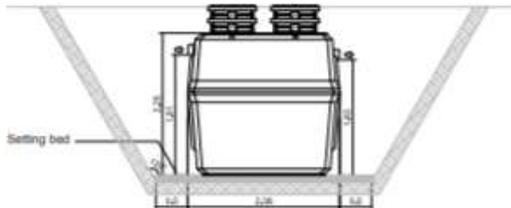
Measure	Unit	
Total height*	(cm)	225
Entry height*	(cm)	191
Exit height*	(cm)	183
Length :	(cm)	238
Width :	(cm)	158
Total volume :	(m ³)	5.73
Useful volume :	(m ³)	4.79
Weight :	(T)	2.65
Manhole :	(cm)	2 x Ø60
Ø IN / OUT :	(mm)	160/160



Material

Tank : high performance fibre reinforced concrete
 Joints : SBR (In and out)

SIZING



OPTIONS

- Odour cartridge
- Grease level alarm

GUARANTEES

Tanks : 10 years
 Accessories : 2 years
 Resistance : B125

OWNER'S MANUAL

COUPE A-A
(U.S.)

REMARQUES:
Type de moteur SCC Item CSMS CE+CAJ D14
Alésage: 28x4 kg

DATE	INDICES MODIFICATIONS	VALIDATION	
		Dessiné par:	Validé par:
		jean	SAVARY

eloy water
Zoning de Québec, rue des Sapins 13
1140 Saguenay (Québec)
TÉL: +381(418)414.00 - Fax: +381(418)414.21
Site: www.eloywater.com - info@eloywater.com

GREASTOP C-90 6000L
Plan Cuisine Électronique
Vue en plan, Élévation, Coupe A-A, SCD

GAMME STANDARD ELOY
DEG030-6-TD5H43

Échelle: 1/20
Date: 21/03/2011
Folio: 4/3

EW-189 R 400 E001

Ce plan est la propriété de S.A. ELOY WATER. Toute réimpression ou reproduction sans autorisation est formellement interdite.

Product : Sewage treatment plant

Type : Oxyfix® FIXEUC90
 Model : 8.7 m³/day - C-90 CB 58 PE (3) Tri 3x400V+N
 Process : Submerged Aerated Fixed Film (SAFF) Technology

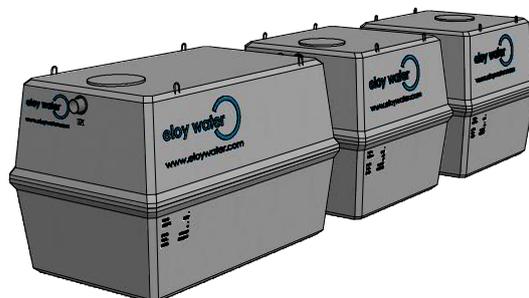
PERFORMANCE

Assumed Influent Values

Application :	Wastewater Treatment*
Pollutant load BOD ₅ :	400 mg/L
Pollutant load TSS :	600 mg/L
Pollutant load Ntot :	80 mg/L
Pollutant load Ptot :	13 mg/L

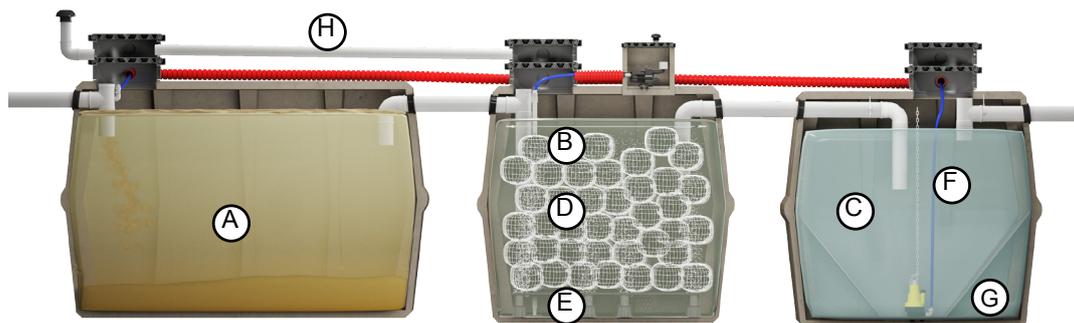
Purification performance

BOD ₅ :	20 mg/L
TSS :	30 mg/L



* We recommend placing a grease trap for treating waste water generated by a restaurant, kitchens used for commercial purposes, etc.

FEATURES



ELECTROMECHANICAL COMPONENTS

Blower

Quantity :	1 pc(s)
Type :	side channel air blower
Installed power :	1.10 kW
Power consumption :	0.82 kW
SPL (Sound Performance Lab) :	59 dB(A)
On / Off :	30/30 min.
Voltage :	3x400V

Air Diffusers

Quantity :	9 pc(s)
Type :	fine bubbles

Sludge recirculation

Type :	submerged pump
Installed power :	0.85 kW
Power consumption :	0.85 kW
On / Off :	8/52 min.

Control panel

Type :	inside
--------	--------

Legend

- A Primary settling compartment
- B Biological reactor
- C Secondary settling compartment
- D Bacterial support
- E Diffusers
- F Sludge recirculation
- G Settling cone

APPROVALS AND CERTIFICATES

 : 2014/04/140/A

DIMENSIONS | VOLUMES | WEIGHTS

Measure	Unit	Tank 1	Tank 2	Tank 3
Total height* :	(cm)	240	240	240
Entry height* :	(cm)	213	213	213
Exit height* :	(cm)	209	209	209
Length :	(cm)	370	260	260
Width :	(cm)	238	238	238
Total volume :	(m³)	15.00	10.00	10.00
Useful volume :	(m³)	13.68	9.19	9.19
Weight :	(T)	7.50	6.23	5.82
Weight (w/o shipping cover):	(T)	-	-	-
Manhole(s) :	(cm)	1 x Ø60	1 x Ø60	1 x Ø60
Ø In / Out :	(mm)	160/160	160/160	160/160

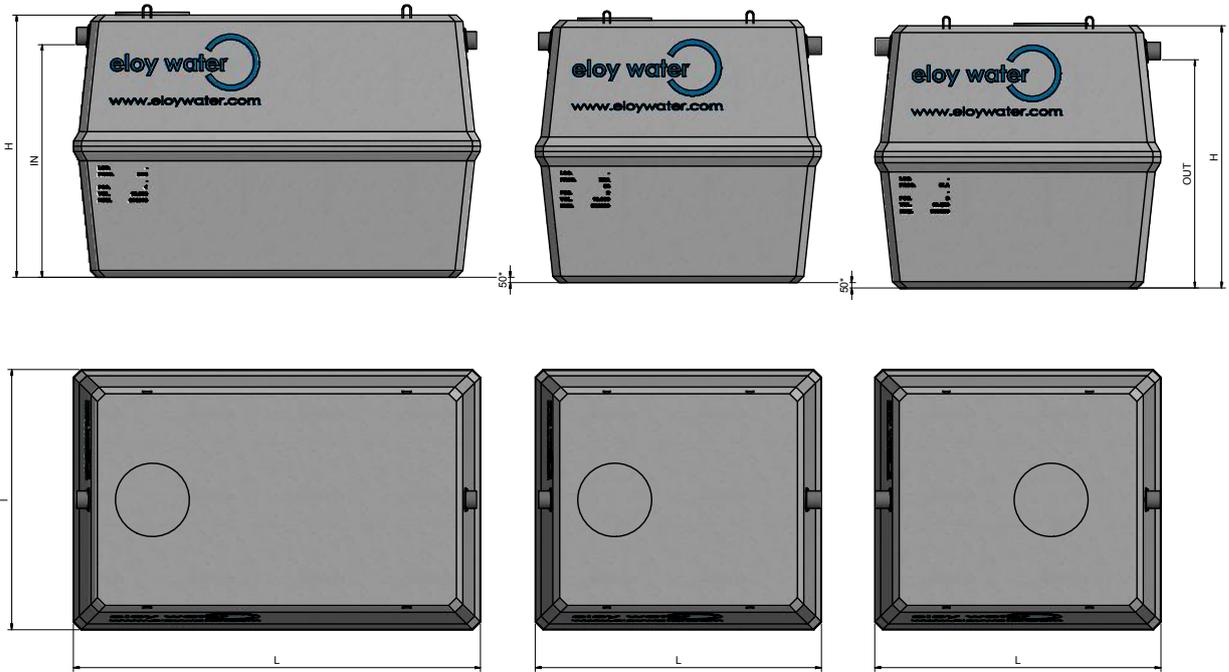
* tolerance ± 2 cm



Material

Tank(s): High performance steel reinforced concrete
 Biocarrier: Recycled PP
 Air feed pipes: PVC PN16

TANK DIMENSIONS



OPERATION

Useful volumes/surfaces

Primary settling compartment:	13.68	m³
Biological reactor:	9.19	m³
Clarifier:	4.41	m²

Operation

Sampling chamber: integrated
 Theoretical desludging frequency: every 11 months
 Approximate energy consumption: 4,584.40 kW
 Maintenance frequency : annually (recommended)
 Admissible load : 80 cm of fill + pedestrian load

Consumables

Blower filter: annually
 Blower membranes: -
 Air diffusers: every 8 years

OPTIONS

Wall support for blower
 PE/concrete tank cover riser 3 pcs
 PE/steel tank cover 3 pcs

GUARANTEES

Electromechanical kit : 2 years
 Tanks : 10 years
 Resistance : B125

ADVANCE C1700

The ADVANCE UV Systems Pty Ltd, **ADVANCE C1700** ultra-violet water disinfection unit for disinfecting drinking or process water. This model can also be sized to disinfect treated waste water, and other liquids with low UV transmission.

Reactor: Stainless steel reactor, horizontal mounting with outlet pointing up.

Material	:	Stainless steel g316L, electropolished
In-outlet connection	:	2" male BSPT
Reactor volume (litres)	:	4.7 l
Reactor length overall approx. (A)	:	1,315 mm
Space required for servicing (B)	:	1,300 mm
Reactor Weight dry (kg)	:	8 kg
Max. operating pressure (bar)	:	10 bar
Lamp power W	:	180 watts
UV-C output W	:	57 watts
Number of lamps (per unit)	:	1
Lamp life	:	12,000 hours

Features:

- Lamp parallel to water flow
- View/monitor port
- Easy to install mounting brackets

Power Supply Box: PSL1B-180-A, painted mild steel with standard 10A GPO plug

Input	:	220-240 VAC, 50-60 Hz
Power consumption W	:	200 watts
Max. ambient temperature (°C.)	:	40°C
Power box dimensions (mm)	:	400 x 300 x 200 mm
Power box weight (kg)	:	9 kg
Power box protection class	:	IP65
Lamp lead length (m)	:	2 m

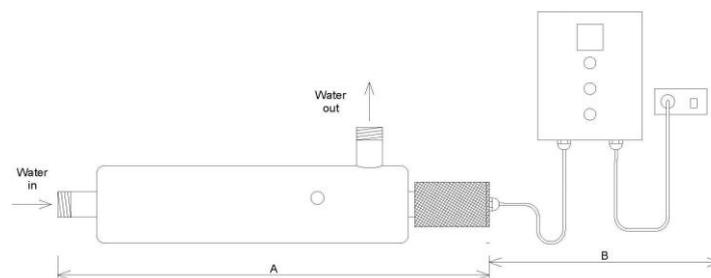
Options: (additional cost)

- UV intensity monitor
- Spare set of volt free contacts
- Higher IP rating
- Enclosure material 316ss, or glass reinforced polyester
- Longer lamp lead
- Chamber thermostat with solenoid valve for over-temperature protection

Version: **PSL1B-180-DDCV**

Includes visible and audible lamp fail alarm, lamp operation count down timer 365 – 0 days, lamp change alert, volt free contacts for remote indication of fault, Indoor operation only (IP21).

Dimensions: 265 x 75 x 53 mm, Weight: 1.2 kg



SUBMERSIBLE DRAINAGE PUMPS

Model Numbers: D42A, D42M,
D42A/B, D53A/B

DEPEND ON
DAVEY

WATER PRODUCTS



SUMP PUMPS

PRODUCT DESCRIPTION

Submersible sump pump with two and three impeller designs for higher pressure, up to 45m head

APPLICATIONS

- Lawn & garden irrigation
- Sump emptying to higher heads
- Treated effluent disposal
- Water transfer from wells
- A/B models are specially designed for non potable rainwater applications

"A" suffix models equipped with present length automatic float switch fitted for automatic operation.

FEATURES & BENEFITS

Double mechanical seal, one in oil bath on motor and extra mechanical seal on pump

- Superior reliability
- Long service life

Corrosion resistant 304 stainless steel shaft, motor shell and fasteners

- Long service life

D42A/B & D53A/B have cast 316 stainless steel motor caps and super tough engineered thermo plastic pump casing

- Outstanding corrosion resistance
- Long life

Centrifugal multistage 2 & 3 impeller designs

- Higher pressures & increased efficiency

Closed vane impellers with long engagement "D" drives

- Positive operation
- Long service life

D42A & D42M have labyrinth impeller neck rings

- Maintain pump performance
- Less susceptible to wear

D42A/B & D53A/B have patented independently floating neck rings

- Outstanding pump performance
- Long pump life

Corrosion resistant hard wearing polycarbonate impellers

- Long service life

Corrosion resistant stainless steel fine mesh suction strainer with large surface area

- Prevents blockages of the pump by solids

In-built automatic thermal overload

- Protects the motor in the event of blockage or voltage supply problems

HO7RNF oil resistant leads, 10 metres long with 3 pin power plug

- Easy to connect to power supply
- Longer life in dirty water

OPERATING LIMITS

	D42A/M	D42A/B, D53A/B
Capacities to	110 lpm	130 lpm
Max. total head	26m	32m, 45m
Max. submergence		12m
Max. pumped water temperature		40°C
Max. soft solids		1.9mm O.D.
Outlet size (BSP)		1" F

Suitable Fluids

Clean water of neutral pH containing up to 1% small solids. Some wear should be expected while pumping hard solids in suspension.

TECHNICAL SPECIFICATIONS

MATERIALS OF CONSTRUCTION

PART	MATERIAL
Impeller	Glass filled polycarbonate
Lock nut	304 stainless steel
Pump casing	Cast iron - FC200 (D42A&M)
	Glass filled polycarbonate (D42A/B), (D53A/B)
Diffuser and blanking ring	Glass filled noryl
Mechanical seal - pump	Carbon/ceramic
Mechanical seal - motor	Silicon carbide/ceramic in oil bath
Shaft seal elastomer	Nitrile rubber
Pump shaft	304 stainless steel
Orings	Nitrile rubber
Motor shell	304 stainless steel
Bottom bearing housing	Cast iron - FC200 (D42A&M)
	Cast 316 stainless steel (D42A/B), (D53A/B)
Upper motor cover	Cast iron - FC200 (D42A&M)
	Cast 316 stainless steel (D42A/B), (D53A/B)
Handle	304 stainless steel
Fasteners	304 stainless steel
Float & power supply leads	HO7RN-F oil resistant

ELECTRICAL DATA

	D42, D42A/B	D53A/B
Supply voltage	220-240V	
Supply frequency	50Hz single phase	
Speed	2 pole, 2850rpm	
Full load current	4.0A	5.7A
Locked rotor current	14A	
Input power (P ₁)	0.94kW	1.31kW
Output power (P ₂)	0.60kW	0.84kW
IP rating	X8	
Insulation class	Class F	
Starting	P.S.C.	
Lead	10m long	

INSTALLATION & PRIMING

Use a rope to position and retrieve the pump. Do not lower or retrieve the pump using the power lead as this may damage the cable entry seals, causing water leaks and unsafe operation.

Don't use this product for recirculating or filtering swimming pools, spas, etc. While these pumps are built to high safety standards, they are not approved for installations where people will be in the water while they are operating.

Don't pump abrasive materials. Sand and grit in the water being pumped will accelerate wear, causing shortened pump life.

Keep your pump clean, particularly in situations where lint, hair or fibrous materials may get bound around the pump shaft. Regular inspection and cleaning will extend pump life.

Make room for the float switch to operate. Automatic models have a float switch to turn them on when the water level rises and turn them off again when it has been pumped down to the safe operating level of the pump. If the float switch is not free to rise and fall, correct pump operation may not be possible.

Don't run your pump dry. Non-automatic models must be switched off manually or by way of an external float/level switch when the water level is reduced to the top of the pump housing.

This literature is not a complete guide to product usage. Further information is available from your Davey dealer, Davey Customer Service Centre and from the relevant product installation and Operating Instructions. This data sheet must be read in conjunction with the relevant product Installation and Operating Instructions and all applicable statutory requirements. Product specifications may change without notice.

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DEPEND ON
DAVEY

WATER PRODUCTS

Davey Water Products Pty Ltd

Member of the GUD Group
ABN 18 066 327 517

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Website: davey.com.au

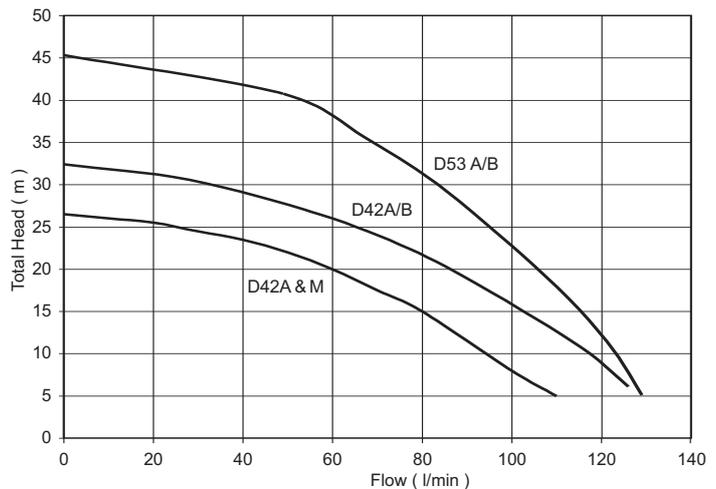
Customer Service Centre

Ph: 1300 367 866
Fax: 1300 369 119
E-mail: sales@davey.com.au

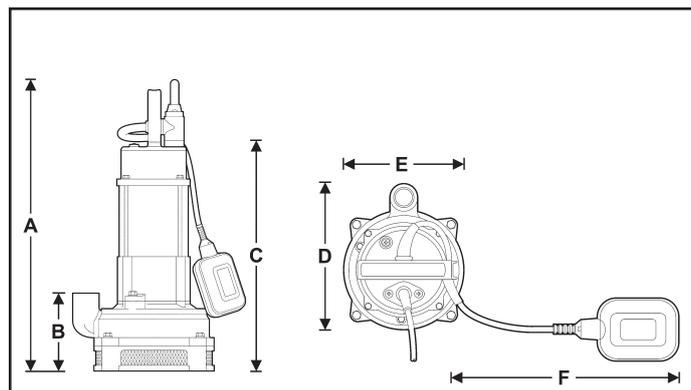
Interstate Offices

Sydney • Brisbane • Adelaide
Perth • Townsville

HYDRAULIC PERFORMANCE



DIMENSIONS



Model	A	B	C	D	E	F	Outlet B.S.P.	Net Weight (kg)
D42A	475	130	370	235	195	330	1" F	20
D42M	475	130	370	235	195	330	1" F	19.5
D42A/B	475	130	370	235	195	330	1" F	18.5
D53A/B	535	170	430	235	195	330	1" F	19.5

All dimensions in mm unless otherwise stated.



Visit Davey on-line for further information
davey.com.au

International

6 Lakeview Drive,
Scoresby, Australia 3179
Ph: +61 3 9730 9121
Fax: +61 3 9753 4248
E-mail: export@davey.com.au

Germany

Kantstrasse 53,
04275 Leipzig
Ph: +49 341 301 0412
Fax: +49 341 301 0413
E-mail: akrenz@daveyeurope.com

USA

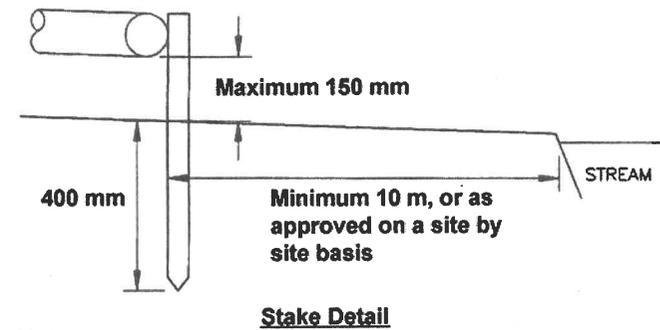
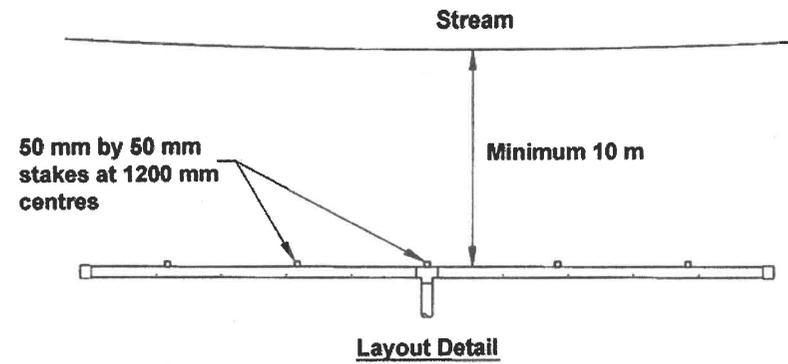
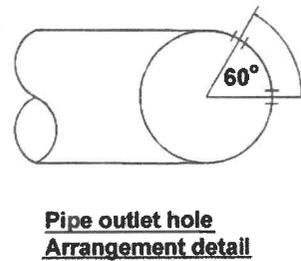
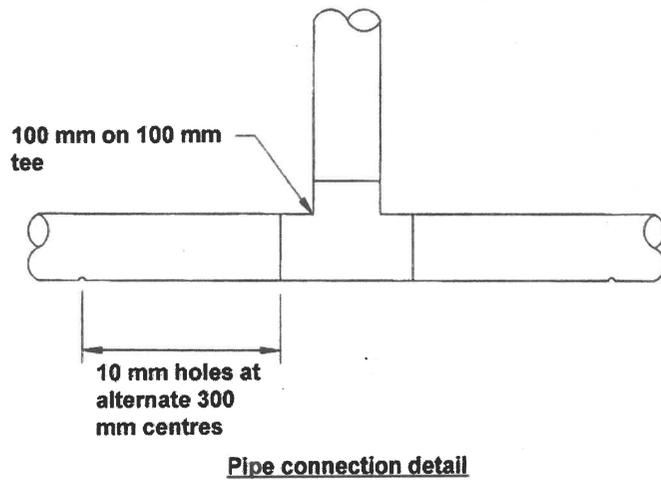
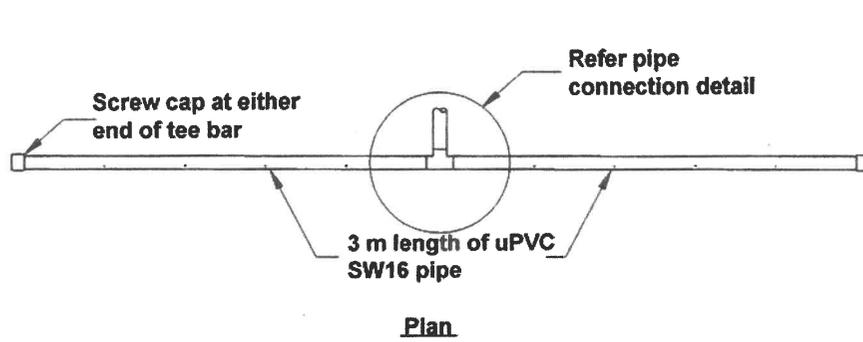
Ph: +1 630 898 6976
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Davey Water Products - New Zealand

7 Rockridge Avenue,
Penrose, Auckland 1061
Ph: +64 9 570 9135
Fax: +64 9 527 7654
Website: daveynz.co.nz
E-mail: sales@daveynz.co.nz

Davey Spa - New Zealand

2 Rothwell Avenue,
North Harbour, Auckland 0632
Ph: +64 9 415 8622
Fax: +64 9 415 8621
Website: spa-quip.co.nz
E-mail: service@spa-quip.co.nz



Notes

1. Pin pipe and tee bar using 50x50 mm 114 treated stakes at 1200 mm centres. Level pipe and fix to stakes using down pipe clips.
2. Stakes to be driven 400 mm into ground. Tee bar to be no more than 150 mm above ground level at any point and to be constructed dead level across length of tee bar.

Figure C22
Above Ground Flow Dispersal

BACK WASH DISSIPATOR DETAIL:

DEANE CONSULTANCY LTD

17 Kotare Place, RD 2, Warkworth.
09 4222 408 deanecl@xtra.co.nz

19/106/REV AA

**Assessment of Environmental Effects
New Effluent Disposal System
Panetiki Development
20 Omaha Block Access Road, Leigh
Omaha 3 Block ML 14815 NA 26D/297 Area
9.0421 Ha**

The proposed system is described in the design report and in the TP58 Appendix E checklist referenced 19/106/REV AA and dated 06 September 2021.

Possible environmental effects and their mitigation measures:

1) Impact on groundwater:

The proposed disposal system will treat effluent to a tertiary level with an 80 micron filter and UV disinfection. It relies on surface laid, pressure compensating dripper irrigation lines which disperse effluent within the topsoil layer, from where it is dispersed by direct evaporation and by evapo-transpiration through plant action. The surface soils are underlain by poorly draining silts and clays which will seal off the groundwater table from ingress of effluent. Therefore, no leaching of effluent into groundwater is likely at the proposed siting of the disposal field.

2) Impact on surface water:

The field will be protected from runoff from above by a surface water cut off drain. It is 29m distant from surface water. The treatment plant will have an earth bund constructed around it to protect surface water from contamination in the event of malfunction. Thus, the risk of contamination of surface waters by effluent from this system is minimal. All pump chambers will have alarms installed to warn of high levels.

3) Impact on soils:

Nutrients from effluent will be taken out of the soil by plant action.

4) Potential odour effects:

Odour effects are normally minimal to non-existent when the system is running correctly. Any odours point to the need for maintenance.

5) Noise effects:

A low-pitched humming noise will be audible when the pumps and the aerator are operating. The noise can be reduced to some degree by plantings.

6) System management and maintenance plans:

The building consent will require that the owners engage in a maintenance agreement with the Hynds Installer.

7) Effects of construction works:

Excavations for the treatment plant will be out of sight of neighbouring properties.

DEANE CONSULTANCY LTD

17 Kotare Place, RD 2, Warkworth.

09 4222 408 deanecl@xtra.co.nz

Summary:

The proposed treatment system and disposal method will treat and dispose of effluent within the subject lot without harmful effects to the environment or public health, provided that correct management and maintenance procedures are followed.

06 May 2020

Prepared by:



Anna Finkenauer

Reviewed by:



Peter Deane, CMEngNZ, CPEng

Appendix E

On-site Wastewater Disposal Site Evaluation Investigation Checklist

On-site Wastewater Disposal Site Evaluation Investigation Checklist

PART A: Contact Details

1. Applicant Details:

Applicant Name	
Company Name	

	First Name(s)	Surname
Property Owner Name(s)		

Nature of Applicant*	
----------------------	--

(* i.e. Owner, Lessee, Prospective Purchaser, Developer)

2. Consultant/Site Evaluator Details:

Consultant/Agent Name				
Site Evaluator Name				
Postal Address				
Phone Number	Business		Private	
	Mobile		Fax	
Name of Contact Person				
E-mail Address				

3. Are there any previous existing discharge consents relating to this proposal or other waste discharge/disposal on the site?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If yes, give Reference Number(s) and Description

4. List any other consents in relation to this proposal site and indicate whether or not they have been applied for or granted.

If so, specify Application Details and Consent No.):

(e.g. Land Use, Water Take, Subdivision, Earthworks Stormwater Consents)

PART B: Property Details

1. Property for which this application relates:

Physical Address of Property			
Territorial Local Authority			
Regional Council			
Legal Status of Activity	Permitted:	Controlled:	Discretionary:
Relevant Regional Rule(s) [Note 1]			
Total Property Area (m ²)			
Map Grid Reference of Property [Note 2]			
Notes:			
1. In the Auckland Region, the relevant Permitted Activity criteria is as specified in the ARC Proposed Regional Plan: Air Land and Water (ARC: ALWP) Decision Version October 2004 Rule 5.5 20-23 (refer Appendix C and in particular C5, in TP58).			
2. NZMS 260 series, scale 1:50,000			

2. Legal description of land (as shown on Certificate of Title):

Lot No.		DP No.		CT No.	
Other (specify)					

Please ensure copy of Certificate of Title is attached.

PART C: Site Assessment – Surface Evaluation

(Refer TP58 – Sn 5.1 General Purpose of site Evaluation and Sn 5.2.2(a) Site Surface Evaluation)
Note: Underlined terms defined in Table 1, attached

1. Has a Desk Study been undertaken for this property

Yes No (Please tick one)

If yes, please specify the findings of the Desk Study, and if not please specify why this was not considered necessary.

2. Has a Slope Stability Assessment been carried out on the property?

Yes No (Please tick one)

If No, why not?

If Yes, please give details of report (and if possible, please attach report):

Author:	
Company/Agency	
Date of Report	
Brief Description of Report Findings	

3. Site Characteristics (See Table 1 attached):

Provide descriptive details below:

Performance of Adjacent Systems:
Estimated Rainfall and Seasonal Variation:
Vegetation Cover:
Slope Shape:
Slope Angle:
Surface Water Drainage Characteristics:
Flooding Potential: YES/NO
If yes, specify relevant flood levels on appended site plan, i.e. one in 5 year and/or 20 year and/or 100 year return period flood level, relative to disposal area.
Surface Water Separation:
Site Clearances (Provide general description and specific dimensions in Part 6 below and in Site Plan :
Site Characteristics:

4. Site Geology of the subject property

Geological Map Reference Number	
---------------------------------	--

5. What Aspect(s) does the proposed disposal system face (please tick)?

North	<input type="checkbox"/>
North-West	<input type="checkbox"/>
North-East	<input type="checkbox"/>
East	<input type="checkbox"/>

West	<input type="checkbox"/>
South-West	<input type="checkbox"/>
South-East	<input type="checkbox"/>
South	<input type="checkbox"/>

6. Site clearances, which should also be shown on the site plan:

Separation Distance from	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries		
Surface water		
Groundwater		
Stands of Trees/Shrubs		
Wells, water bores		
Embankments/retaining walls		
Buildings		
Other (specify):		

PART D: Site Assessment – Subsoil Investigation

(Refer TP58 – Sn 5.1 General Purpose of Site Evaluation, Sn 5.2.2(b) Site Surface Evaluation and Sn 5.3 Subsurface Investigations)

Note: *Underlined terms defined in Table 2, attached*

1. Please identify the soil profile determination method:

Test Pit	<input type="checkbox"/>	(Depth____m)	No. of Test Pits	<input type="checkbox"/>
Bore Hole	<input type="checkbox"/>	(Depth____m)	No. of Bore Holes	<input type="checkbox"/>
Other (specify)	<input type="text"/>			
Soil Report Attached?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	(Please Tick)	

2. Was fill material intercepted during the subsoil investigation?

Yes No (Please tick)

If yes, please specify the effect of the fill on wastewater disposal

3. Has percolation testing been carried out?

Yes No (Please tick)

If yes, please specify the method

Test Report Attached? (Please tick)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

4. Are surface water interception/diversion drains required?

Yes No (Please tick)

If Yes, please show on site plan

5. Please state the depth of the seasonal water table:

Winter		(m)	
Summer		(m)	
Please indicate whether measured		<input type="checkbox"/>	or estimated <input type="checkbox"/> (please tick)

6. Are there any potential short circuit paths?

Yes No (Please tick)

If the answer is yes, please explain how these have been addressed

7. Based on results of subsoil investigation above please indicate the disposal field soil category (Refer TP58 Table 5.1):

Is Topsoil Present?	If so, Topsoil Depth?			(m)
---------------------	-----------------------	--	--	-----

Soil Category	Description	Drainage	Tick One
1	Gravel, coarse sand	Rapid draining	<input type="checkbox"/>
2	Coarse to medium sand	Free draining	<input type="checkbox"/>
3	Medium-fine & loamy sand	Good drainage	<input type="checkbox"/>
4	Sandy loam, loam & silt loam	Moderate drainage	<input type="checkbox"/>
5	Sandy clay-loam, clay loam & silty clay-loam	Moderate to slow drainage	<input type="checkbox"/>
6	Sandy clay, non-swelling clay & silty clay	Slow draining	<input type="checkbox"/>
7	Swelling clay, grey clay, hardpan	Poorly or non-draining	<input type="checkbox"/>

Reasons for placing in stated category

PART E: Discharge Details

1. Water supply source for the property (please tick):

Rainwater (roof collection)	<input type="checkbox"/>
Bore/well	<input type="checkbox"/>
Public supply	<input type="checkbox"/>

2. Calculate the maximum daily volume of wastewater to be discharged, unless accurate water meter readings are available (Refer TP58 Table 6.1 and 6.2):

Number of Bedrooms	<input type="text"/>	
Design Occupancy	<input type="text"/>	(Number of people)
Per capita Wastewater Production	<input type="text"/>	(Litres per person per day)
Other - Specify	<input type="text"/>	
	<input type="text"/>	
Total Daily Wastewater Production	<input type="text"/>	(Litres per day)

3. Do you propose to install:

a) Full Water Conservation Devices?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	(Please tick)
b) Water Recycling – what %?	%	<input type="text"/>	No	<input type="checkbox"/>	(Please tick)

If you have answered Yes, please provide additional information including the estimated reduction in water usage:

4. Is Daily Wastewater Discharge Volume more than 2000 litres:

Yes	<input type="checkbox"/>	(Please tick)
No	<input type="checkbox"/>	(Please tick)

Note if the answer to the above is yes an ARC wastewater discharge permit will be required

5. Gross Lot Area to Discharge Ratio:

Gross Lot Area	<input type="text"/>	m ²
Total Daily Wastewater Production	<input type="text"/>	(Litres per day) (from above)
Lot Area to Discharge Ratio	<input type="text"/>	

6. Does this proposal comply with the Auckland Regional Council Gross Lot Area to Discharge Ratio of greater than 1.5)

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	(Please tick)
-----	--------------------------	----	--------------------------	---------------

7. Does this proposal comply with the Auckland Regional Council Gross Lot Area to Discharge Ratio of greater than 3

Yes No (Please tick)

8. Is an Auckland Regional Council Discharge Consent Required?

Yes No (Please tick)

PART F: Primary Treatment (Refer TP58 Section 7.2)

1. Please indicate below the no. and capacity (litres) of all septic tanks including type (single/dual chamber grease traps) to be installed or currently existing:

Number of Tanks	Type of Tank	Capacity of Tank (Litres)
Total Capacity		

2. Is a Septic Tank Outlet Filter to be installed?

Yes No (Please tick)

If Yes, please state the type

PART G: Secondary and Tertiary Treatment

(Refer TP58 Section 7.3, 7.4, 7.5 and 7.6)

1. Please indicate the type of additional treatment, if any, proposed to be installed in the system (please tick):

Secondary Treatment	<input type="checkbox"/>
Home aeration plant	
Commercial aeration plant	
Intermittent sand filter	
Recirculating sand filter	
Recirculating textile filter	
Clarification tank	
Tertiary Treatment	
Ultraviolet disinfection	
Chlorination	
Other	<input type="checkbox"/>
Specify	
<input type="text"/>	

PART H: Land Disposal Method (Refer TP58 Section 8)

1. Please indicate the proposed loading method (please tick):

Gravity	<input type="checkbox"/>
Dosing Siphon	<input type="checkbox"/>
Pump	<input type="checkbox"/>

2. Is a high water level alarm being installed in pump chambers?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	(Please tick)
-----	--------------------------	----	--------------------------	---------------

3. If a pump is being used, please provide the following information:

Total Design Head	<input type="text"/>	(m)
Pump Chamber Volume	<input type="text"/>	(Litres)
Emergency storage volume	<input type="text"/>	(Litres)

4. Please identify the type(s) of land disposal method proposed for this site (please tick) (Refer TP58 Sections 9 and 10):

Surface Dripper Irrigation	<input type="checkbox"/>
Sub-surface Dripper Irrigation	<input type="checkbox"/>
Standard Trench	<input type="checkbox"/>
Deep Trench	<input type="checkbox"/>
Mound	<input type="checkbox"/>
Evapo-transpiration Beds	<input type="checkbox"/>
Other (Please Specify)	<input type="text"/>

5. Please identify the loading rate you propose for the option selected in Part H, Section 4 above stating the reasons for selecting this loading rate:

Loading rate	<input type="text"/>	(Litres/m ² /day)	
Disposal Area	Basal	<input type="text"/>	(m ²)
	Areal	<input type="text"/>	(m ²)

Explanation (Refer TP58 Sections 9 and 10)

6. What is the available reserve wastewater disposal area (Refer TP58 Table 5.3)

Reserve Disposal Area (m ²)	<input type="text"/>
Percentage of Primary Disposal Area (%)	<input type="text"/>

7. Please provide a detailed description of the design and dimensions of the disposal field and attach a detailed plan of the field relative to the property site:

Description and Dimensions of Disposal Field:

refer to site plan attached

Plan Attached? Yes No (Please tick)

If not explain why not

PART I: Maintenance & Management (Refer TP58 Section 12.2)

1. Has a maintenance agreement been made with the treatment and disposal system suppliers?

Yes No (Please tick)

Required for consent

PART J: Assessment of Environmental Effects

1. Is an assessment of environmental effects (AEE) included with application?

(Refer TP58 section 4 (particularly 4.4.2), section 5, and section 11 (parts 11.1 & 11.8). Ensure all issues concerning potential effects addressed)

Yes No (Please tick)

2. Are there any specific environmental constraints?

Yes No (Please tick)

If Yes, please explain

PART K: Is Your Application Complete?

1. In order to provide a complete application you have remembered to:

(Refer to TP58 section 3.5 for summary list of information to be covered):

Fully Complete this Assessment Form	<input checked="" type="checkbox"/>
Include a <i>Location Plan and Site Plan</i> (with Scale Bars)	<input checked="" type="checkbox"/>
Include a Property Title (Certificate of Title)	<input checked="" type="checkbox"/>
Attach an Assessment of Environmental Effects (AEE)	<input checked="" type="checkbox"/>

2. Declaration

I hereby certify that, to the best of my knowledge and belief, the information given in this application is true and complete.

Name	Anna Finkenauer	Signature	<i>Anna Finkenauer</i>
Position	Consultant	Date	06 May 2020

17 Kotare Place, RD2, Warkworth
 09 4222 408 deanecl@xtra.co.nz

DATE: 12/02/2020

LOCATION: Panetiki CLIENT: Fisher BOREHOLE: 3 (Effluent)

GEOLOGICAL INTERPRETATION	GRAPHIC LOG	SOIL DESCRIPTION	DEPTH (m)	SHEAR VANE STRENGTH (kPA)					
				Remoulded/Peak	50	100	150	200	250
Waitemata series		Silty topsoil, dark brown, dry	0.0 - 0.1						
		Clayey silt, mid-brown + grey	0.1 - 0.2						
		Tree roots	0.2 - 0.3						
		Tree roots. Moist	0.3 - 0.4						
		Stiff in-situ	0.4 - 0.5						
		End of borehole (No watertable)	0.5 - 0.6						
			0.6 - 0.7						
			0.7 - 0.8						
			0.8 - 0.9						
			0.9 - 1.0						

KEY

	Topsoil		Organic		Fill		Clay		Silt		Sand		Gravel		Peat		Bedrock
	Peak Value		Remoulded Value		Ground water at time borehole drilled		Standing Ground water										

17 Kotare Place, RD2, Warkworth
 09 4222 408 deanecl@xtra.co.nz

DATE: 12/02/2020

LOCATION: Panetiki		CLIENT: Fisher		BOREHOLE: 4 (Effluent)							
GEOLOGICAL INTERPRETATION	GRAPHIC LOG	SOIL DESCRIPTION	DEPTH (m)	SHEAR VANE STRENGTH (kPA)	GRAPHICAL SHEAR STRENGTH						
				Remoulded/Peak	50	100	150	200	250		
Waitemata series		Dried grass, gravels on ground surface	0.5								
		Silty topsoil, grey, dry. HTA Auger grinding									
		Auger grinding. HTA. Gravels < 50mm	1.0								
		Clayey silt, mid-brown + grey. Gravels < 50mm									
		Clayey silt, grey. Moist	1.5								
		Stiff in-situ									
		Wet	2.0								
		End of borehole (No watertable)									
				2.5							
				3.0							
			3.5								
			4.0								

KEY

	Topsoil		Organic		Fill		Clay		Silt		Sand		Gravel		Peat		Bedrock
	Peak Value		Remoulded Value		Ground water at time borehole drilled		Standing Ground water										