

Stormwater and Wastewater Report

36 Old Hospital Road, Whangaroa

Lot 1 DP 184536

for

Peter Morgan

Haigh Workman reference 19 123

October 2019



Revision History

Revision N ^o	Issued By	Description	Date
A	Emily Collings	First Issue	10 October 2019

Prepared by



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Approved by



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Executive Summary

Haigh Workman Ltd was commissioned by Peter Morgan to complete a stormwater and wastewater report for a proposed development at 36 Old Hospital Road, Whangaroa.

This report concludes that for the proposed development:

Stormwater

- Resource consent is required for the proposed development as permitted impermeable surface areas are breached;
- Peak runoff from the site will be attenuated back to pre-approved flow by way of two 25,000 L stormwater detention tanks (a third tank may be required for potable water supply);
- Overflow from the detention tank is to discharge to the public stormwater network on Old Hospital Road;
- Driveway runoff to be captured in catch pits and discharged to the public stormwater network on Old Hospital Road;
- A council connection application should be submitted to FNDC;
- Downstream effects of runoff will be less than minor.

Wastewater

- The secondary wastewater treatment system be sized to cater for a consistent daily flow of 1,280 L/day and a peak five-day flow of 1,920 L/day;
- Effluent disposal be by at least 427 metres length of approved dripper irrigation tubing with 1.6 L/hour emitters at 0.5 m centres and installed to the manufacturer's specifications;
- Effluent be pumped to subsurface dripperlines to the west of the proposed development platforms;
- 30 % reserve area to remain undeveloped;
- The treatment plant be maintained to the manufacturer's specifications;
- The disposal field be arranged in accordance with the enclosed site plan.

1 **Introduction**

Haigh Workman Ltd (Haigh Workman) was commissioned by Peter Morgan (the Client) to complete a stormwater and wastewater report for a proposed development at 36 Old Hospital Road, Whangaroa (the “site”). This report presents the factual information available during the appraisal and interpretation of data obtained to provide stormwater and wastewater design and recommendations for the development.

The site is subject to consent conditions (D278164.4). Those relevant to this report:

- 2) *All lots are to have wastewater and disposal systems as detailed in the report prepared and submitted by the Environmental Impact Group Ltd.*
- 3) *That where possible the stormwater collected from roof catchment or access driveway be directed back to Old Hospital Road adjacent to Lot 2. All other stormwater collected from access driveway or paths be piped along the easement provided and discharged on to Old Hospital Road adjacent to Lot 3.*

The Environmental Impact Group Ltd Report and Consent notices are appended.

1.1 **Applicability**

This report has been prepared for the use of Peter Morgan with respect to the particular brief outlined to us. This report is to be used by our Client and their Consultants and may be relied upon when considering environmental advice. The information and opinions contained within this report shall not be used in other context for any other purpose without prior review and agreement with Haigh Workman Ltd.

2 Site Details and Description

Site Address: 36 Old Hospital Road, Whangaroa

Legal Description: Lot 1 DP 184536

Area: 1,864.1m²

2.1 Site Description

The site is situated in Whangaroa, approximately 150 m upslope of Whangaroa Harbour (coastal marine area).

The property is almost triangular in plan shape, featured on a north trending ridge. The site is currently an undeveloped block of residential land, predominantly covered by grass. The property is bordered by and accessed via Old Hospital Road to the east and west. The existing vehicle crossing is on the eastern side of the site.

Topographically, the site has a level plateau on the east of the site. Beyond this, a moderately steep slope of approximately 25 degrees slopes towards Old Hospital Road to the west (slope angles in excess of 30° were recorded during site investigations).



Figure 1 – Site Location Plan.

2.2 Proposed Development

The proposed development includes a dwelling, studio/cabin and concreted driveway and patio. The proposed development areas are generally located on the east of the site, see attached Site Features Plan.

Proposed impermeable surfaces total 617.2 m² (33.1%), exceeding the restricted discretionary activity rule of 15% impermeable surfaces for the 'Coastal Living' zone.

2.3 Geological Description

Sources of Information:

- NZMS 290 Sheet P 04/05, 1: 100,000 scale, 1980: *"Soil map of Whangaroa-Kaikohe Area"*;
- NZMS 290 Sheet P 04/05, 1: 100,000 scale, 1982: *"Rock map of Whangaroa-Kaikohe Area"*;
- GNS, 1:250,000 Scale, 1996: *"Geology of the Whangarei area"*.

Site soils are mapped by NZMS to be Marua (brown) clay loam (MRrH and MRH), described as *'well to moderately well drained'*.

Published geology shows the site to be underlain by Tupou Complex sandstone (Ku) of the Northland Allochthon, described as *'strongly indurated, poorly stratified conglomerate, sandstone and argillite'*.

Geological Maps are included in Appendix D.

2.4 Site Investigations

Six hand augured boreholes were drilled on site as part of a Haigh Workman geotechnical investigation on 8 August 2019. BH6 is at the location of the proposed disposal field and was drilled to 2.0 m below ground level (bgl). No groundwater was encountered.

Soils were found to be 0.2 m topsoil overlying light brown silt with some clay content.

3 Stormwater

3.1 Existing Stormwater Patterns

Currently, stormwater runoff is sheet flow across the site surface towards the west where it is intercepted by Old Hospital Road. Old Hospital Road has an established public stormwater network which will capture stormwater runoff in catch pits. The stormwater network discharges into Whangaroa Harbour at an existing outlet structure.

FNDC have assessed the stormwater network capacity at Old Hospital Road. The system can manage existing development (ED) 10 year ARI flows but not maximum possible development (MDP) 10 year ARI flows. The system overflows with MPD 10 year ARI flows.

3.2 District Plan Provisions

The site is zoned 'Coastal Living'.

Permitted activity in the Far North District Plan;

10.7.5.1.6 STORMWATER MANAGEMENT

The maximum proportion of the gross site area covered by buildings and other impermeable surfaces shall be 10% or 600m² whichever is lesser.

Restricted Discretionary activity in the Far North District Plan;

10.7.5.3.8 STORMWATER MANAGEMENT

The maximum proportion or amount of the gross site area covered by buildings and other impermeable surfaces shall be 15% or 1,500m², whichever is the lesser.

Proposed impermeable surfaces at the site exceed 15%, therefore is a discretionary activity.

3.3 Impermeable Area Calculation

We calculate the following impermeable areas at the subject site:

Component	Coverage (m ²)
Dwelling roof	211.17
Cabin/studio roof	73.44
Proposed concrete driveway	332.59
Total Impermeable Surfaces	617.2
Site area	1864.1
% coverage	33.1%

Impermeable coverage scales at approximately 617 m² or 33.1 %. The site is located in the 'Coastal Living' zone which limits impermeable surfaces to 10 %, therefore resource consent is required for the proposal.

3.4 Stormwater Calculation

We refer to Table 1 of NZBC verification method E1:VM1 Surface Water. Run-off coefficients are adopted to assess the change in run-off for developed surfaces:

Surface	Runoff coefficient, C
Roof	0.90
Concrete	0.85
Medium soakage pasture/garden with >20 % ground slope	0.30 + 0.10
Gardens and landscaping with >20 % ground slope	0.25 + 0.10

Rainfall intensity is calculated adopting HIRDS V4 rainfall estimates adjusted for the RCP 6.0 climate change scenario projected out to the 2081-2100 time period. This accounts for 1.63° C of warming and an associated increase in rainfall of approximately 20 %. The site is small so the minimum time of concentration of 10 minutes is used.

The output for this site is 109.2 mm/hr for a rainstorm with a 10 minute duration, 10 year ARI and 1.63°C climate change.

Adopting rational formula;

$$Q = \frac{C I A}{3600}$$

Where

- Q = run-off (litres/second)
- C = run-off coefficient (unitless)
- I = rainfall intensity (mm/hour)
- A = catchment area (m²)

We calculate the current pre-development run-off based upon existing impermeable areas:

	Area m ²	C	I ₁₀ mm/hr	Q L/s
Medium soakage Pasture with >20 % slope	1864.1	0.40	109.2	22.62
	1864.1		Total	22.62

We calculate the following runoff for the proposed development:

	Area m ²	C	I ₁₀ mm/hr	Q L/s
Dwelling Roof Area	211.2	0.90	109.2	5.76
Cabin Roof Area	73.4	0.90	109.2	2.00
Concrete drive/patio	332.6	0.85	109.2	8.58
Gardens and landscaping with >20 % ground slope	1246.9	0.35	109.2	13.24
	1864.1		Total	29.58
			Excess	6.97

It is proposed to reduce stormwater run-off from the roof back to pre-development flow rates for the 10 year ARI by using water tank detention for all roof runoff. The excess run-off created by the proposed development is 6.97 L/s.

We have developed a hyetograph which incorporates the 20, 30, 60 and 120 and 360 minute duration storms for the 1 in 10 year event to calculate the detention requirement (Figure 2). A 20 mm outlet on two 25,000L tanks would reduce the maximum outflow at the peak of the storm by 7 L/s. This provides stormwater neutrality. The volume to be set aside for stormwater detention is modelled to be 17.2 m³ (Figure 3).

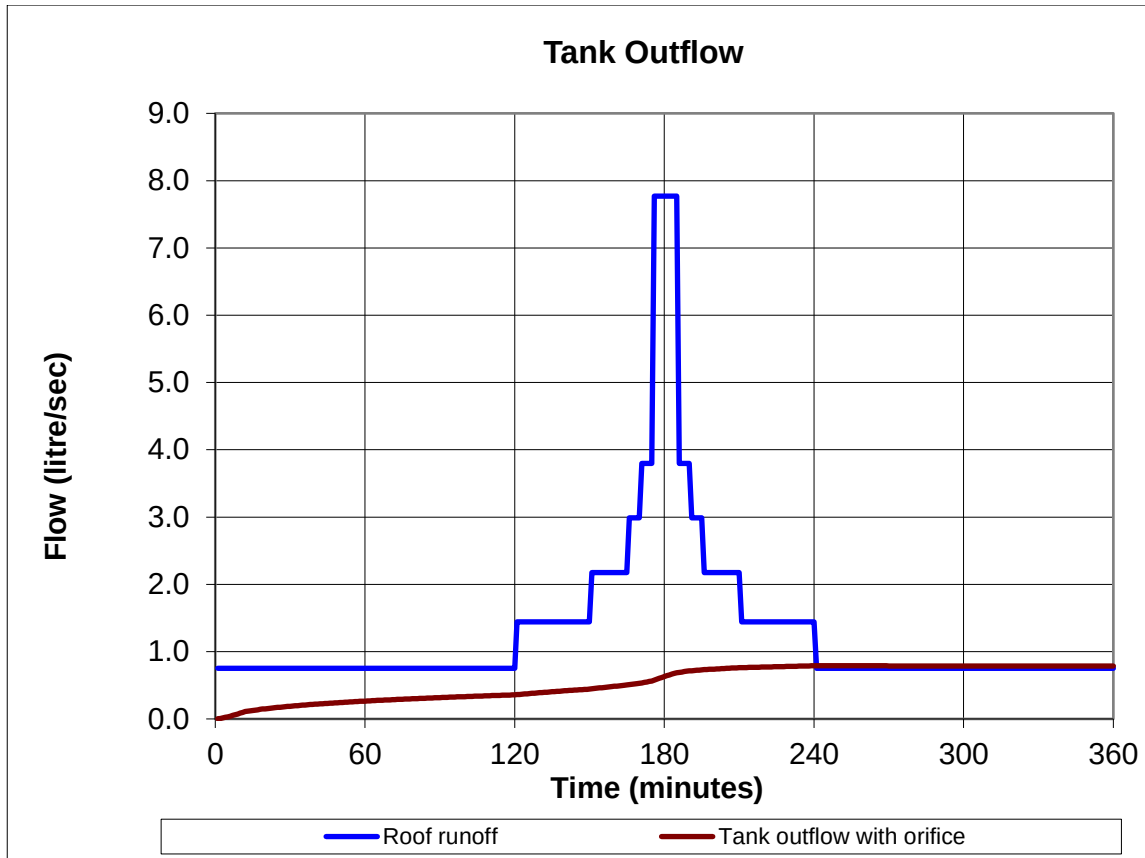


Figure 2 - Hydrograph model for two 25,000 L tanks with 20 mm outlet collecting all roof water.

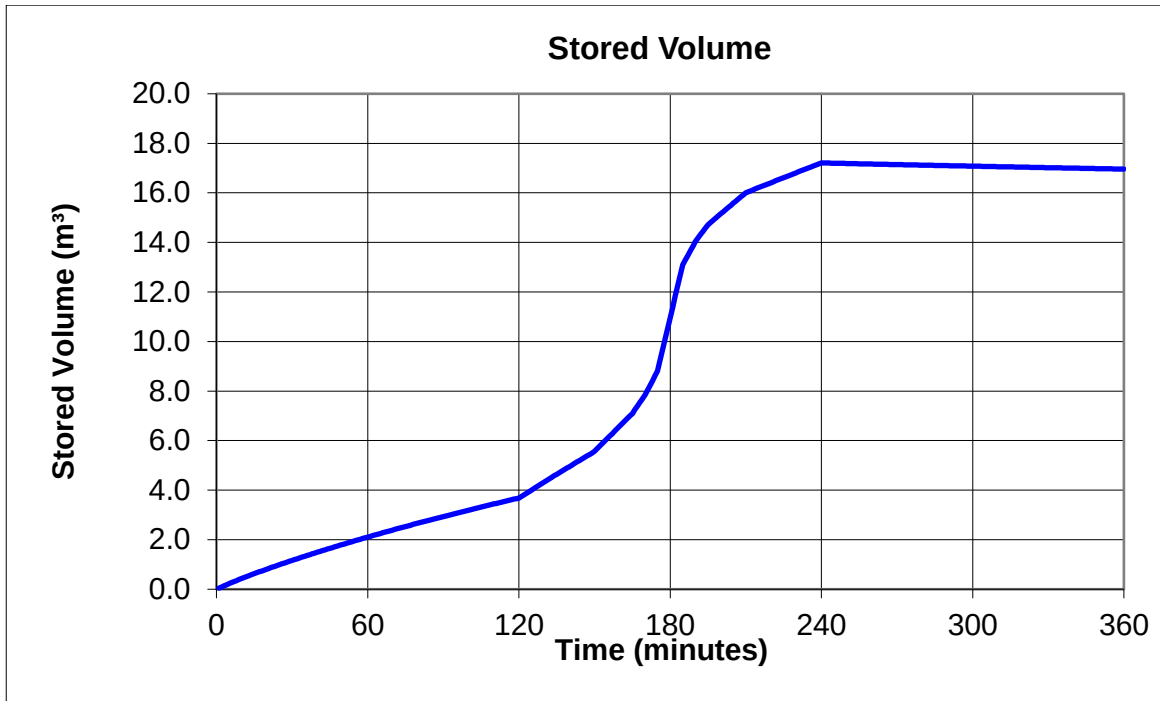


Figure 3 - Hydrograph model for two 25,000 L tanks with 20 mm outlet collecting all roof water.

3.5 Proposed Stormwater Management

3.5.1 *Roof runoff*

Due to the exceedance of impermeable surfaces and limited capacity of the Old Hospital Road stormwater network, stormwater attenuation is proposed. It is proposed that roof runoff from the proposed development is detained in two 25,000 L water storage tanks. A third may be required to provide potable drinking supply. The water tanks can be suitably located beneath the proposed studio, as shown on attached Site Plan.

Tank overflow can be discharged to Old Hospital Road by a connection into the council catch pit downstream of the site. A council connection application should be submitted to FNDC.

3.5.2 *Driveway runoff*

The proposed driveway comprises a large concrete area. Stormwater runoff from the driveway should be captured a manhole with grated lid and also discharged to Old Hospital Road.

3.5.3 *Retaining walls*

Retaining walls should have drainage installed. Subsoil drains can be connected into the proposed stormwater system or dispersed to landscaping away from the proposed wastewater disposal area.

3.6 Stormwater Assessment Criteria

The proposed stormwater management has been assessed against the Assessment Criteria in Section 10.7.5.3.8 of the Far North District Plan as follows:

Criterion	Assessment
a. The extent to which building site coverage and impermeable surfaces result in increased stormwater runoff and contribute to total catchment impermeability and the provisions of any catchment or drainage plan for that catchment,	The proposed development exceeds permitted impermeable surfaces therefore stormwater attenuation is proposed to limit flows to that of pre-development in the 10 year ARI.
b. The extent to which Low Impact Design principles have been used to reduce site impermeability,	Stormwater attenuation in water storage tanks is proposed.
c. Any cumulative effects on total catchment impermeability,	No cumulative effects, as stormwater neutrality is proposed.
d. The extent to which building site coverage and impermeable surfaces will alter the natural contour or drainage patterns of the site or disturb the ground and alter its ability to absorb water,	Natural contours will remain at the majority of the site.
e. The physical qualities of the soil type,	Soil type is poorly draining therefore stormwater disposal to ground is not proposed.
f. Any adverse effects on the life supporting capacity of soils,	None.
g. The availability of land for the disposal of effluent and stormwater on the site without adverse effects on the water quantity and water quality of water bodies (including groundwater and aquifers) or on adjacent sites,	There is adequate land available for effluent disposal. Stormwater is proposed to be piped to old Hospital Road, as detailed in the site consent notice (3).
h. The extent to which paved, impermeable surfaces are necessary for the proposed activity,	A driveway, parking and manoeuvring is required for the proposed development.
i. The extent to which landscaping may reduce adverse effects of run-off,	Gardens and landscaping reduce the run-off coefficient of land.
j. Any recognised standards promulgated by industry groups,	NA
k. The means and effectiveness of mitigating stormwater run-off to that expected by the permitted activity threshold,	Stormwater attenuation back to pre-development flows for the 10 year ARI storm is proposed.
l. The extent to which the proposal has considered and provided for climate change.	Stormwater calculations take into account climate change. It accounts for 1.63° C of warming and an associated increase in rainfall of approximately 20 %. The site is small so the minimum time of concentration of 10 minutes is used.

4 **Wastewater**

4.1 **Wastewater generation**

We refer to the ARC publication TP58 Third Edition '*On-Site Wastewater Systems: Design and Management Manual*'.

The proposed treatment system is to service the proposed dwelling and studio at the site. Architectural plans show the dwelling as having four potential bedrooms (three-bedrooms plus office). The studio is considered a potential one bedroom sleepout.

We adopt TP58's recommended design occupancy of six persons for a four-bedroom house, plus a two person occupancy for the studio, totalling an eight person occupancy.

We adopt TP58's recommended per capita flowrate of 160 L/p/d for a house supplied with roof-water and fitted with standard wastewater fixtures.

We therefore assess the design flowrate as, $160 \times 8 = 1,280 \text{ L/d}$.

4.2 **Treatment system**

The most appropriate wastewater system for this site is a secondary treatment system to driplines.

The secondary treatment plant is to meet the quality output of AS/NZS 1546.3:2003 and be capable of producing effluent having less than 20 g/m^3 of BOD_5 and 30 g/m^3 TSS. We recommend the treatment plant is sized to cater for a consistent daily flow of 1,280 L/d and a peak five day flow of 1,920 L/d.

The treatment system may be suitably located to the west of the proposed studio. This positioning will allow acceptance of gravity wastewater from both proposed dwellings. Due to the distance between the two proposed development sites, wastewater pipes need to be set out to ensure minimum gradients are met in accordance with New Zealand Building Code Clause G13, Table 2.

The treatment plant is to be installed to the manufacturer's specification and a commissioning certificate is to be provided as is standard practice. A maintenance agreement is also to be entered into as part of the Code of Compliance application.

4.3 **Disposal Area**

The area chosen for effluent disposal is moderately steep sloping ground to the west of the proposed dwellings. This area has a slope of approximately 25° towards the west (slope angles in excess of 30° were recorded during site investigations). Slope analysis has been carried out on this area, refer Haigh Workman Geotechnical report.

The disposal field is to have minimum 3 m separation from proposed retaining walls and 5 m separation from Old Hospital Road kerb and channel.

The use of trickle irrigation disposal is sustainable here for the long term. It provides an easy and convenient system for distributing effluent over a wide area. Due to the site slope, dripperlines are to be laid subsurface. The area should be planted with suitable evapotranspiration plants (list of suitable species attached).

Site soils are classified as TP58 category 5, silty clay loam (equivalent to AS/NZS 1547:2000 category 4 clay loams). This concurs with the Environmental Impact Group Ltd report for the site, produced at the time of subdivision in 1997.

TP58 soil category 5 can be expected to sustain a loading rate of 3-4 mm/day, year-round. We choose a conservative irrigation rate of 3 mm/day due to steeply sloping ground. Therefore, this proposal requires an irrigation area of $1,280/3 = 427 \text{ m}^2$. Plus, 128 m^2 reserve area.

The dripperline is to be UniBioline or similar approved irrigation tubing with 1.6 L/hr drippers at 0.5 m spacing laid at 1.0 m centres, parallel to the slope. Dripperline non-leakage (DNL) valves should be installed to prevent backflow.

The disposal field is to be split into a minimum of two block, dosed via and indexing valve. The field will be pressurised by a conventional system of using a pump. A filter shall be installed to prevent clogging of emitters. A flush valve shall be installed at the end of each dripline.

Interception drains not are considered necessary, as the proposed dwellings, retaining walls and manhole intercept stormwater above the disposal field.

Appendix A - Drawings

FNDC - Approved Building Consent Document - EBC-2022-988-0 - Pg 16 of 53 - 11/04/2022 - NZBTC

Drawing No.	Title	Scale
01	Haigh Workman Ltd – Site Location Plan	1:2000
02	Haigh Workman Ltd – Site Features Plan	1:400
03	Haigh Workman Ltd – Stormwater and Wastewater Plan	1:400
04	Haigh Workman Ltd – Detention Tank Detail	NTS
05	Haigh Workman Ltd – Disposal Field Layout with DNL valves	NTS

NTS: Not to Scale

NOTES:

— SITE BOUNDARY

SITE BOUNDARIES AND AERIAL PHOTOGRAPH
TAKEN FROM LINZ DATA SERVICE AND QUICKMAP



Issue	Date	Revision	DWG Site Location Plan			Project 36 Old Hospital Road, Whangaroa		DWG No. 01	
A	24/07/2019	FIRST ISSUE				Lot 1 DP 184536			
						Client Peter Morgan		Sheet No. 1 of 5	
						Project No. 19 123 RC no.			
			File X:\19 JOBS\19 123 PETER MORGAN\ENGINEERING\DRAWINGS\19 123 - WW & SW.DWG						

Scale 1:2000 @A3		Date 24/07/2019	
Drawn EC	Checked TA	Approved JP	

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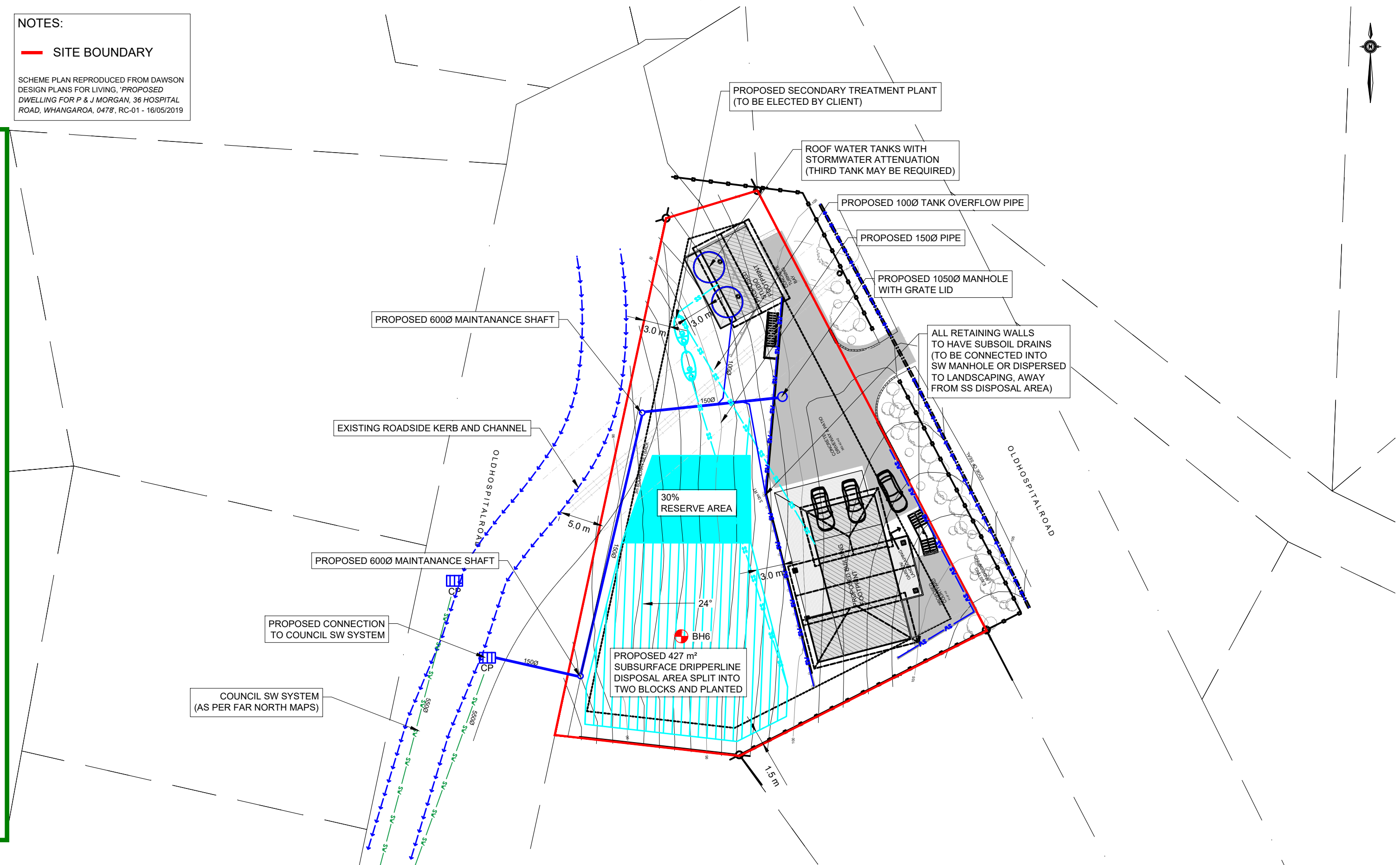
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FNDC - Approved Building Consent Document - EBC-2022-988-0 - Pg 19 of 53 - 11/04/2022 - NZBTC

NOTES:

— SITE BOUNDARY

SCHEME PLAN REPRODUCED FROM DAWSON
DESIGN PLANS FOR LIVING, 'PROPOSED
DWELLING FOR P & J MORGAN, 36 HOSPITAL
ROAD, WHANGAROA, 0478', RC-01 - 16/05/2019



Issue	Date	Revision
A	24/07/2019	FIRST ISSUE

DWG Proposed Stormwater and Wastewater Management Plan

Scale 1:400 @A3

4 2 0 4 8 12 m

Date 24/07/2019

Drawn EC

Checked TA

Approved JP

File

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Civil & Structural Engineers

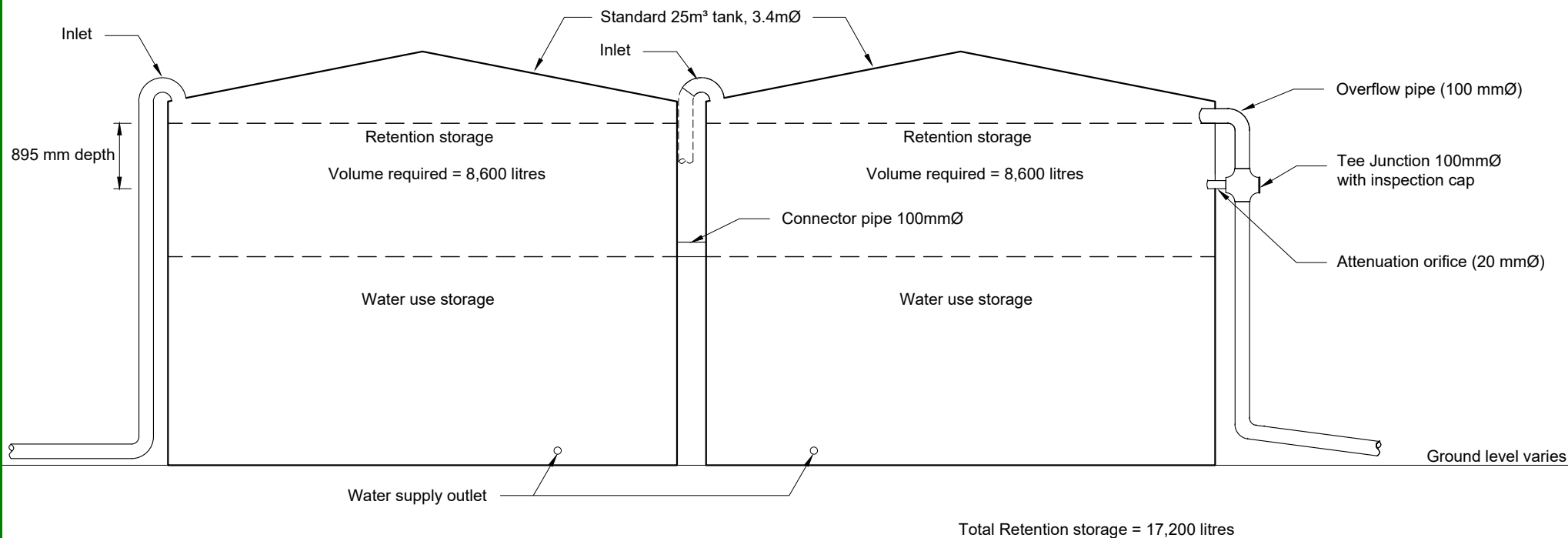
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Project	36 Old Hospital Road, Whangaroa Lot 1 DP 184536
Client	Peter Morgan
Project No.	19 123
RC no.	

DWG No.	03
Sheet No.	3 of 5



NOTE

- Maximum orifice pipe length is 150mm. Allow 75mm clearance from end of pipe to outside tank wall
- Fix orifice pipe to tee junction using reducer fittings

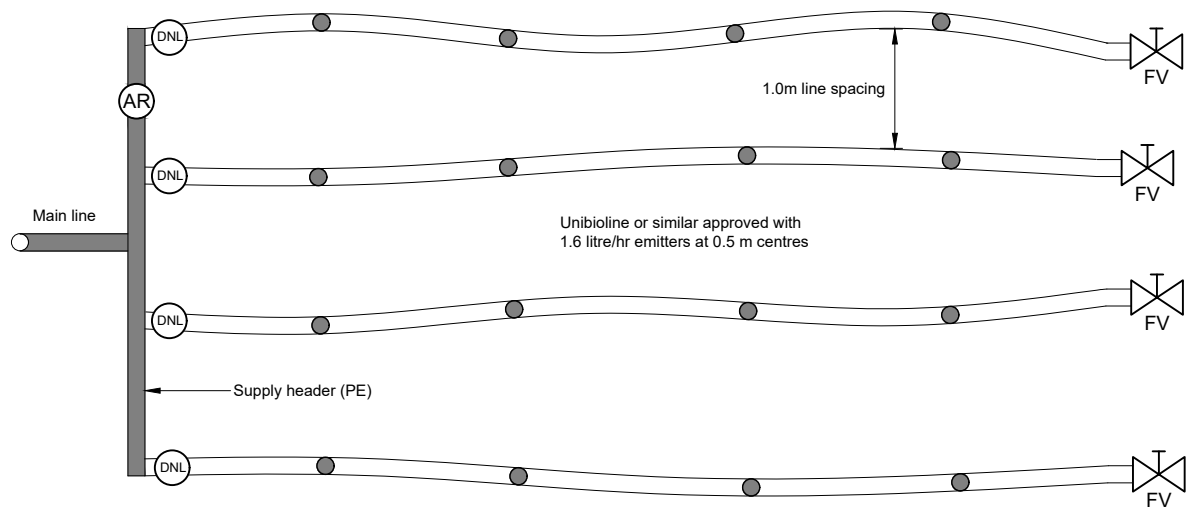
Date	Revision	DWG	Note	Project	
26/08/19	Revision A	Schematic Arrangement of Retention Storage		36 Old Hospital Road, Whangaroa	
		DWG No. 04	Scale NTS	Client	
		Drawn EC	Check JP	Peter Morgan	
		Approved EC	Date 26/08/2019	Project No.	
		Filename		19 123	RC no.

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Field Layout

DWG On-Site Effluent Disposal Typical Field Layouts. Trickle Irrigation				 6 Fairway Drive Kerikeri, BOI. T: 09 407 8327 F: 09 407 8378 E: info@haighworkman.co.nz	Project 36 Old Hospital Road, Whangaroa	
DWG No. 05	Sheet No. 5 of 5	Scale NTS			Client Peter Morgan	
Drawn SK	Checked EC	Approved JP	Date 26/08/2019	DIMENSIONS MUST NOT BE SCALE MEASURED FROM THESE DRAWINGS. THE CONTRACTOR SHALL CHECK & VERIFY ALL DIMENSIONS INCLUDING, SITE LEVELS, HEIGHTS AND ANGLES ON SITE PRIOR TO COMMENCING ANY WORK. THE COPYRIGHT TO THESE DRAWINGS AND ALL PARTS THERE OF REMAIN THE PROPERTY OF HAIGH WORKMAN. ©2006		
File MORGANENGINEERINGDRAWINGS\19 123 - WW WITH DNL.DWG				Project No. 19 123	RC no.	

Appendix B – Site Evaluation Checklist and Producer Statement

FNDC - Approved Building Consent Document - EBC-2022-988-0 - Pg 22 of 53 - 11/04/2022 - NZBTC

FAR NORTH DISTRICT COUNCIL
Appendix E TP58
On-site Wastewater Disposal Site Evaluation
Investigation Checklist

Part A –Owners Details

1. Applicant Details:

Applicant Name	<i>Peter Morgan</i>
Company Name	<i>NA</i>
Property Owner Name(s)	<i>Jenny Ann Emmanuel</i>

Nature of Applicant* *Owner*

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

2. Consultant / Site Evaluator Details:

Consultant/Agent Name	<i>Haigh Workman</i>		
Site Evaluator Name	<i>Emily Collings</i>		
Postal Address	<i>PO Box 89</i>		
	<i>Kerikeri</i>		
Phone Number	Business	<i>407 8327</i>	Private
	Mobile		Fax
Name of Contact Person			
E-mail Address	<i>emily@haighworkman.co.nz</i>		

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

Yes		No	☒	(Please tick)
If yes, give Reference Numbers and Description				

4. List any other consent 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.

(eg. LandUse, Water Take, Subdivision, Earthworks, Stormwater Consent)

<i>Stormwater consent</i>

Part B- Property Details
1. Property for which this application relates:

Physical Address of Property	36 Old Hospital Road
	Whangaroa
Territorial Local Authority	FAR NORTH DISTRICT COUNCIL
Regional Council	NORTHLAND REGIONAL COUNCIL
Legal Status of Activity	Permitted: ☒ Controlled: ☐ Discretionary: ☐
Relevant Regional Rule(s) (Note 1)	15.1.4 of Operative Water and Soil Plan
	C.6.1.3 of Proposed Regional Plan
Total Property Area (m ²)	1864 m ²
Map Grid Reference of Property If Known	

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

Lot No.	1	DP No.	184536	CT No.	NA115B/212
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

Has a relevant property history study been conducted?

Yes	☐	No	☒	(Please tick one)
-----	--------------------------	----	-------------------------------------	-------------------

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

Not part of scope. New wastewater system for proposed new development.

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

Yes	✓	No	
-----	---	----	--

Please tick

If No, why not?

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

Author	John Power
Company/Agency	Haigh Workman
Date of Report	October 2019
Brief Description of Report Findings: Refer Haigh Workman Geotechnical report	

2. Site Characteristics (See Table 1 attached):

Provide descriptive details below:

Performance of Adjacent Systems:

No problems known.

Estimated Rainfall and Seasonal Variation:

1400 mm per year. 800 mm winter, 600 mm summer

Vegetation / Tree Cover:

Grass

Slope Shape: (Please provide diagrams)

Moderately steep slope towards west

Slope Angle:

24° degrees at proposed disposal area

Surface Water Drainage Characteristics:

Sheet flow

Flooding Potential: YES/NO

No

If yes, specify relevant flood levels on appended site plan, i.e. one in 5 years and/or 20 year and/or 100 year return period flood level, relative to disposal area.

Surface Water Separation:

Disposal field setback 5 m from kerb and channel on Old Hospital Road, downslope of the disposal area.

Site Characteristics: or any other limitation influencing factors

Steep slope

3. Site Geology

Check Rock Maps

Tapou Complex sandstone (Ku) of the Northland Allochthon, described as 'strongly indurated, poorly stratified conglomerate, sandstone and argillite'.

Geological Map Reference Number	NZMS 290 soil map and GNS geology map
---------------------------------	---------------------------------------

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

North		West	✓
North-West		South-West	
North-East		South-East	
East		South	

5. Site clearances, (Indicate on site plan where relevant)

Separation Distance from	Treatment Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries	1.5	1.5
Surface water, creeks, drains	5	5
Groundwater	>2	>2
Stands of Trees/Shrubs	na	na
Wells, water bores	na	None known
Embankments/retaining walls	3	3
Buildings	3	>3
Rivers, Coastal Marine area	>30	>30

PART D: Site Assessment - Subsoil Investigation

(Refer TP58 - Sn 5.1 General Purpose of Site Evaluation, and Sn 5.2.2(a) 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		Depth m	No of Test Pits	
Bore Hole	✓	Depth 2.0 m	No of Bore Holes	1 (BH6)
Other (specify):				

Soil Report attached?

Yes	✓	No		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. Percolation testing (mandatory and site specific for trenches in soil type 4 to 7)

Please specify the method

Test Report Attached?	Yes		No	✓	Please tick
-----------------------	-----	--	----	---	-------------

4. Are surface water interception/diversion drains required?

Yes	✓	No	
-----	---	----	--

Please tick

If yes, please show on site plan

4a Are subsurface drains required

Yes		No	✓
-----	--	----	---

Please tick

If yes, please provide details

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

Winter	4.8	m	Measured	✓	Estimated	
Summer	4.8	m	Measured		Estimated	✓

6. Are there any potential storm water 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?	Yes	If so, Topsoil Depth?	0.2 (m)
---------------------	-----	-----------------------	---------

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

Reasons for placing in stated category

Soil map classification, soil colour and texture investigation.

PART E: Discharge Details
1. Water supply source for the property (please tick):

Rainwater (roof collection)	✓
Bore/well	
Public supply	

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	4 + 1			
Design Occupancy	6 + 2 = 8			(Number of People)
Per capita Wastewater Production	145	☒ 160	180	(tick) (Litres per person per day)
Other - specify	200	220		
Total Daily Wastewater Production	1,280			(litres per day)

3. Do any special conditions apply regarding water saving devices

a) Full Water Conservation Devices?	Yes		No	☒	(Please tick)
b) Water Recycling - what %?		%			(Please tick)

If you have answered yes, please state what conditions apply and include the estimated reduction in water usage

4. Is Daily Wastewater Discharge Volume more than 2,000 litres:

Yes		(Please tick)
No	☒	(Please tick)

Note if answer to the above is yes, an N.R.C wastewater discharge permit may be required

5. Gross Lot Area to Discharge Ratio:

Gross Lot Area	1,864	m ²
Total Daily Wastewater Production	1,280	(Litres per day)(from above)
Lot Area to Discharge Ratio	1.4	

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

Yes		No	☒	Please tick
-----	--	----	-------------------------------------	-------------

Not a requirement in Far North.

8. Is a Northland 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: If not 4500 litre, dual chamber explain why not

Number of Tanks	Type of Tank	Capacity of Tank (Litres)
Secondary treatment plant		
	Total Capacity	

2. Type of Septic Tank Outlet Filter to be installed?

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	☒	
Home aeration plant	☐	
Commercial aeration plant	☐	
Intermediate sand filter	☐	
Recirculating sand filter	☐	
Recirculating textile filter	☐	
Clarification tank	☐	
Tertiary Treatment	☐	
Ultraviolet disinfection	☐	
Chlorination	☐	
Other	☐	Specify

PART H: Land Disposal Method

(Refer TP58 Section 8)

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

Gravity	☐
Dosing Siphon	☐
Pump	☒

2. High water level alarm to be installed in pump chambers

Yes ☒	No ☐
---	-----------------------------

If not to be installed, explain why

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

Total Design Head	<i>To be confirmed by supplier</i>	(m)
Pump Chamber Volume		(Litres)
Emergency Storage Volume		(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			Specify	
Sub-surface Dripper irrigation	✓			
Standard Trench				
Deep Trench				
Mound				
Evapo-transpiration Beds				
Other				

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	3	(Litres/m ² /day)
Disposal Area	Design 427	(m ²)
	Reserve 128	(m ²)

Explanation (Refer TP58 Sections 9 and 10)

Design irrigation rate for secondary treated effluent in TP58 category 5 soils (refer table 9.2 in TP58).

Refer to design report.

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

Reserve Disposal Area (m ²)	128
Percentage of Primary Disposal Area (%)	30

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:

Use a minimum of 427 m of Unibioline trickle tubing or equivalent with 1.6 litre per hour emitters

at 0.5 m spacing. Lines to be laid 1.0 m apart.

Flush valves are to be installed at the end of each line.

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)
-----	--	----	---	---------------

Name of Suppliers

To be confirmed

PART J: Assessment of Environmental Effects

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

(Refer TP58 section 5. Ensure all issues concerning potential effects addressed)

Yes	✓	No		(Please tick)
-----	---	----	--	---------------

If Yes, list and explain possible effects

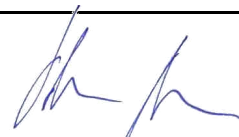
PART K: Is Your Application Complete?

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

Fully Complete this Assessment Form	✓
Include a <i>Location Plan</i> and <i>Site Plan</i> (with Scale Bars)	✓
Attach an Assessment of Environmental Effects (AEE)	✓

1. Declaration

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

Name	<i>John Papesch</i>	Signature	
Position	<i>Senior Engineer/Director</i>	Date	<i>10/10/2019</i>

Note:

Any alteration to the site plan or design after approval will result in non-compliance.

ENVIRONMENTAL EFFECTS, MITIGATION MEASURES

A. Assessment of Environmental Effects

Impact on Surface Water (incl. flood times) [Very Minor](#)

Impact on Ground Water [Very Minor](#)

Impact on Soils [Minor](#)

Impact on Amenity Values [Minor](#)

B Public Health Issues:

Should access to the disposal area be discouraged? [Yes](#)

Will odour effects be greater than usual? [No](#)

Will noise effects be greater than usual? [No](#)

C. Mitigation Measures

Has conservative approach been taken in choosing system design capacity? [Yes](#)

Is system design robust (cope with fluctuations of load, climate)? [Yes](#)

Is level of treatment high? [Medium – final treatment within soil](#)

Protection against failure storage, alarms? [Alarms](#)

Is hydraulic loading rate conservative? [Within TP58 recommended loading rate for Category 5 soils](#)

Is distribution area protected from hydraulic overload (interception drains)? [Yes](#)

Will soil type enhance treatment? [Yes](#)

Are desired separation distances attainable? (to surface water, groundwater, bores) [Yes, in accordance with Proposed Regional Plan for Northland \(5 m setback from kerb and channel\)](#)

Is the reserve area adequate? [Yes](#)

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY: Haigh Workman Limited (Job number: 19 097)
(Design Firm)

TO: Peter Morgan
(Owner/Developer)

TO BE SUPPLIED TO: Far North District Council
(Building Consent Authority)

IN RESPECT OF: Onsite wastewater system
(Description of Building Work)

AT: 36 Old Hospital Road
(Address)

Town/City: Whangaroa LOT 1 DP 184536 SO
(Address)

We have been engaged by the owner/developer referred to above to provide:

A design for an onsite wastewater system in accordance with technical publication TP58

(Extent of Engagement)

services in respect of the requirements of Clause(s) G13,B2 (durability 15 yrs) of the Building Code for:

☒ All or ☐ Part only (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

☐ Compliance Documents issued by the Ministry of Business, Innovation & Employment or
(verification method/acceptable solution)

☒ Alternative solution as per the attached schedule. technical publication TP58

The proposed building work covered by this producer statement is described on the drawings titled:

36 Old Hospital Road, Whangaroa and numbered 19 123;
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions site verification of the soil types
(ii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ☐ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, John Papesch am: ☐ CPEng # ☐ Reg Arch #
(Name of Design Professional)

I am a member of: ☒ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE (Civil) MEngNZ

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000*.

The Design Firm is a member of ACENZ: ☐

SIGNED BY: John Papesch (Signature) [Signature]
(Name of Design Professional)

ON BEHALF OF Haigh Workman Limited Date: 10/10/2019
(Design Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000.*

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.
THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand (now Engineering New Zealand), Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suit of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with reasonable grounds for the issue of a Building Consent or a Code Compliance Certificate, without having to duplicate design or construction checking undertaken by others.

PS1 Design Intended for use by a suitably qualified independent design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 Design Review Intended for use by a suitably qualified independent design professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011²

PS4 Construction Review Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACENZ, Engineering NZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as Engineering New Zealand (formerly IPENZ) or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent design professional".

*Professional Indemnity Insurance

As part of membership requirements, ACENZ requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to \$500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers³). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design firm's engagement.

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

- 1 Conditions of Contract for Building & Civil Engineering Construction
NZS 3910: 2013
- 2 NZIA Standard Conditions of Contract SCC 2011
- 3 Guideline on the Briefing & Engagement for Consulting Engineering Services
(ACENZ/IPENZ 2004)
- 4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org
www.nzia.co.nz



Appendix C – System Maintenance Schedule

ON-SITE DOMESTIC WASTEWATER MANAGEMENT

Advice to Home Owner/Occupier

Home owner and occupiers are legally responsible to keep their on-site wastewater system in good working order. The following schedule gives advice on the use and maintenance of the system.

1. Use of the System

For the on-site wastewater system to work well there are some good habits to encourage and some bad habits to avoid:

1.1 In order to reduce sludge building up in the tank:

- (i) Scrape all dishes to remove fats, grease etc, before washing.
- (ii) Keep all possible solids out of system.
- (iii) Don't use a garbage grinder unless the system has been specifically designed to carry the extra load.
- (iv) Don't put sanitary napkins, other hygiene products or disposable nappies into the system.

1.2 In order to keep 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 dispersive soil areas.
- (iv) Use detergents in the recommended quantities.
- (v) Don't use powerful bleaches, whiteners, nappy soakers, spot removers and disinfectants.
- (vi) Don't put chemicals or paint down drain.

1.3 Conservation of water will reduce the volume of effluent disposed to the land-application area, make it last longer and improving its performance. Conservation measures could include:

- (i) Installation of water-conservation fittings.
- (ii) Taking showers instead of baths.
- (iii) Only washing clothes when there is a full load.
- (iv) Only using the dishwasher when there is a full load.

1.4 Avoid overloading the system by spacing out water use evenly. For example not doing all the washing on one day and by not running the washing machine and dishwasher at the same time.

2. Maintenance

2.1 The primary wastewater-treatment unit (septic tank) will need to:

- (i) Be desludged regularly i.e. every 3 to 5 years, or when scum and sludge occupy 2/3 of the volume of the tank (or first stage of a two-stage system).
- (ii) Be protected from vehicles.
- (iii) Have any grease trap cleaned out regularly.
- (iv) Have the vent and/or access cover of the septic tank kept exposed.
- (v) Have the outlet filter inspected and cleaned.

2.2 The land-application area needs protection as follows:

- (i) Where surface water diversion drains are required by the design, these need to be kept clear to reduce the risk of stormwater runoff entering the effluent soakage area.
- (ii) No vehicles or stock should be allowed on trenches or beds.
- (iii) Deep rooting trees or shrubs should not be grown over absorption trenches or pipes.
- (iv) Irrigation areas are not play areas for children and access should be restricted.
- (v) Any evapotranspiration areas should be designed to deter pedestrian traffic.
- (vi) The baffles or valves in the distribution system should be periodically (monthly or seasonally) changed to direct effluent into alternative trenches or beds, if required by the design.

2.3 Evapo-transpiration and irrigation areas should have their grass mowed and plants maintained to ensure that these areas take up nutrients with maximum efficiency.

2.4 For aeration treatment systems. Check equipment and:

- (i) Follow the manufacturer's instructions for maintaining and cleaning pumps, siphons, and septic tank filters.
- (ii) Clean disc filters or filters screens on irrigation-dosing equipment periodically by rinsing back into the primary wastewater-treatment unit.
- (iii) Flush drip irrigation lines periodically to scour out any accumulated sediment.

Appendix D – Geological Maps

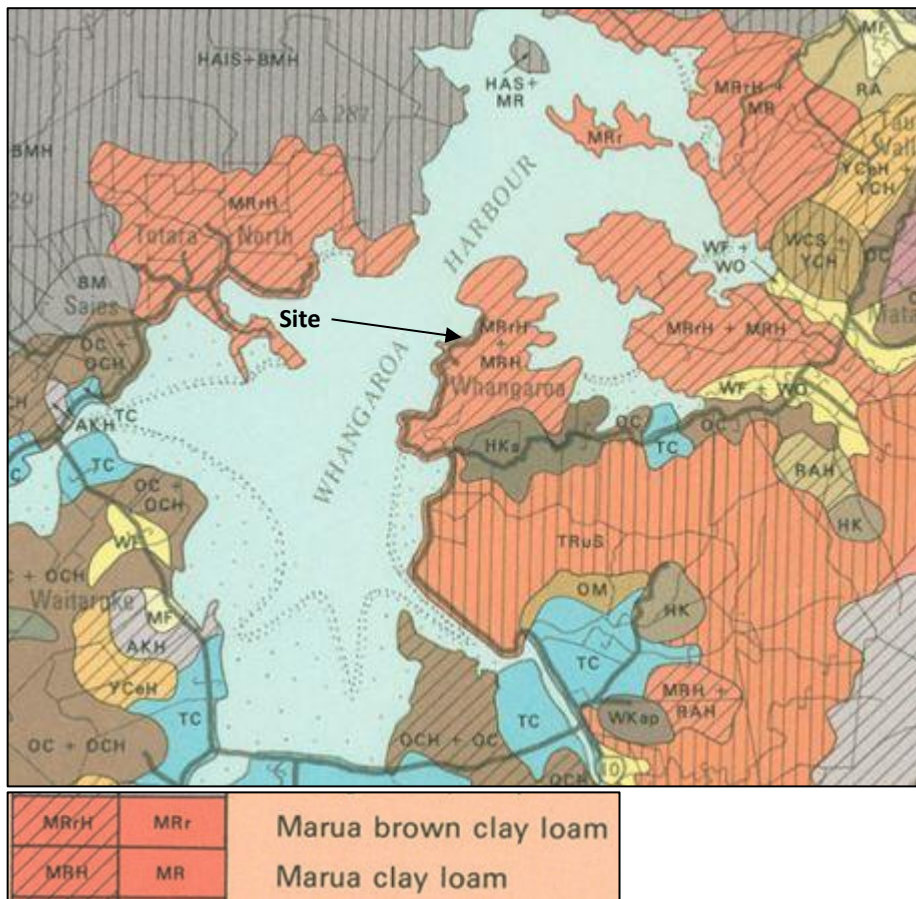


Figure 4 – NZMS 290 Soil Map, Sheet P04/05



Figure 5 – GNS, Geological Map 2

Appendix E – Borehole (BH6) Log

PO Box 89, 0245
6 Fairway Drive
Kerikeri, 0230
New Zealand



Phone 09 407 8327
Fax 09 407 8378
www.haighworkman.co.nz
info@haighworkman.co.nz

100
200
300
400

Borehole Log - BH6

Hole Location: Refer to Site Plan

JOB No. 19 123

CLIENT: Peter Morgan
Date Started: 08/08/2019
Date Completed: 08/08/2019
SITE: 36 Old Hospital Road, Whangaroa
DRILLING METHOD: Hand Auger
HOLE DIAMETER (mm): 50mm
LOGGED BY: JP
CHECKED BY: OT

Soil Description Based on NZGS Logging Guidelines 2005	Depth (m)	Geology	Graphic Log	Water Level	Sensitivity	Corrected Shear Vane Strength (kPa)	Scala Penetrometer (blows/100mm)
SILT , minor clay; dark brown to brown. Firm, moist, low plasticity. Rootlets.	0.0	T.S.					0 5 10 15 20
Clayey SILT ; light brownish orange and light orange. Very stiff, moist, low to medium plasticity.							
0.6m: becomes light orange, streaked orange, mottled light orange brown.	0.5				3	44 152	
SILT , some clay, trace fine gravel (weakly cemented clasts); light brownish grey and light orange, streaked orange. Very stiff, moist, low plasticity.	1.0				4	36 155	
1.2m: becomes light grey and light orange, streaked orange.							
SILT , minor clay; light grey, streaked orange and dark orange. Very stiff, moist, low plasticity.	1.5					UTP	
1.8m: becomes light grey and light orange, streaked orange.							
End of hole at 2.0m (UTP)	2.0					UTP	
	2.5						
	3.0						
	3.5						
	4.0						
	4.5						

LEGEND

TOPSOIL CLAY SILT SAND GRAVEL FILL

Corrected shear vane reading
Remoulded shear vane reading
Scala Penetrometer

Note: UTP = Unable to penetrate. T.S. = Topsoil.
Shear Vane S/N: 2220
Scala penetrometer testing not undertaken.

Average Soil Sensitivity 3.9

Appendix F – Evapotranspiration Plants

SUITABLE PLANTS FOR EVAPO-TRANSPIRATION SYSTEMS

Native Shrubs and Trees

Coprosma	<i>Coprosma propinqua</i>
Hebe	<i>Hebe</i>
Manuka	<i>Leptospermum Scoparium</i>
Weeping Mapou	<i>Myrsine Divaricata</i>
Flax (fast)	<i>Phormium Tenax</i>
Pokaka (slow)	<i>Elaeocarpus Hookerianus</i>
Cabbage Tree (fast)	<i>Cordyline Australias</i>
Rangiora (fast)	<i>Brachyglottis Repanda</i>
Lacebark (fast)	<i>Hoheria Populnea</i>
Ribbonwood (fast)	<i>Plagianthus Regius</i>
Poataniwha	<i>Melicope Simplex</i>
Heketara	<i>Olearia Rani</i>
Poataniweta	<i>Carpodetus Serratus</i>
Kohuhu (fast)	<i>Pittosporum Tenufolium</i>

Grasses

Jointed Twig Sedge	<i>Baumea Articulata</i>
Longwood Tussock	<i>Carex Comans</i>
Pukio	<i>Carex Secta</i>
Toetoe (use native species- not invasive Pampas Grass)	<i>Cortaderia Fulvida</i>
Umbrella Sedge	<i>Cyperus Ustulatus</i>
Oioi	<i>Leptocarpus Similis</i>
Hooksedge	<i>Uncinia Unciniata</i>

Introduced Species

Canna Lilies, Taro, Aralia,
Fuschia, Philodendrons,
and Begonias



CARING FOR NORTHLAND AND ITS ENVIRONMENT

WHANGAREI: 36 Water Street, Private Bag 9021, Whangarei; Phone 09 438 4639, Fax 09 438 0012.

OPUA: Unit 10, Industrial Marine Park, Opuia; Phone 09 402 7516, Fax 09 402 7510.

DARGAVILLE: 61B Victoria Street, Dargaville; Phone 09 439 3300, Fax 09 439 3301.

KAITAIA: 192 Commerce Street, Kaitaia; Phone 09 408 6600, Fax 09 408 6601.

Freephone: 0800 002 004 Environmental Hotline: 0800 504 639 Website: www.nrc.govt.nz

Appendix G – DNL Specification



DNL

DRIPPERLINE NON LEAKAGE VALVE



APPLICATIONS

For use: in nurseries and greenhouses pulsed irrigation, in orchards intensive irrigation and sloped fields, where irrigation precision is imperative. The DNL is unsuitable for subsurface application.

SPECIFICATIONS

- Available in 0.2, 0.4 and 0.6 bar shut-off pressure
- A color coded piston: 0.2 bar – red; 0.4 bar – black; 0.6 bar – brown
- Inlets/outlets: 1/2" male threaded connector (with the possibility of connecting to a suitable dripperline adaptor)
- Ultrasonic welding of the newly improved cover and body
- A new silicon diaphragm enables much more pulses and suitable for intensive pulse irrigation

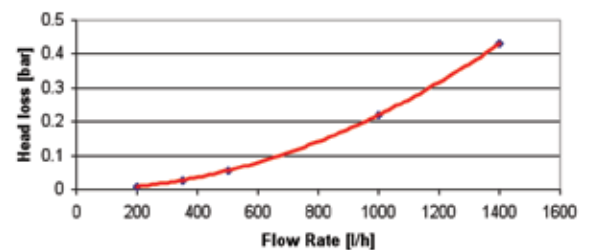
FEATURES AND BENEFITS

- Automatic end of irrigation shut-off valve
- Prevents water backflow or drainage of the system into low areas
- Eliminates the need for system water refill at the beginning of the next irrigation cycle
- Solution for: pulsed irrigation in greenhouses and nurseries. Intensive irrigation in orchards. Slope fields where irrigation precision is imperative

TECHNICAL INFORMATION

FLOW RATE RECOMMENDED RANGE (L/H)	MAX. WORKING PRESSURE (BAR)	MIN. OPERATING PRESSURE (BAR)	SHUT-OFF PRESSURE (BAR)	INLET/OUTLET
0-1000	4	0.8	0.2	1/2" male th.
0-1000	4	1.2	0.4	1/2" male th.
0-1000	4	1.6	0.6	1/2" male th.

DNL - HEAD LOSS



Appendix H – Enviro-Impact Group Ltd Report

INTRODUCTION

It is proposed to subdivide Lot 2 D.P. 100503 of 5,460 sq.m into three residential potential sections; Refer the attached scheme plan prepared by R J Donaldson & Associates of KeriKeri.

SITE INVESTIGATION

A 150 mm diameter test bore was drilled on each of the three Lots where shown on the linked up scheme plan. The average depth of the bore holes was 750 mm. The bore holes were drilled to confirm the upper level soils types and also to undertake porosity tests in order to evaluate soils permeability characteristics and design the appropriate on-site domestic origin wastewater treatment and "to ground" end effluent disposal systems for the 3 Lots.

SOILS TYPES

Reference has been made to the NZ Geological Mapping series Map 290 Sheet P04 / 05. The site test bores / soils appraisal confirmed the "Soils Map" soils type statement as noted below.

An average of 150 mm of topsoil overlays relatively cohesive "Marua clay loam". At lower levels on the approach road to the proposed subdivision outcrops of weathered "Greywacke" are apparent indicating the probable rock type beneath the subject sites.

SOAKAGE TEST RESULTS

A soakage / permeability test was undertaken, in accordance with TP 58 procedures, on each of the three test holes. The 24 Hour presoak filling of the holes was undertaken on 25 Aug '96; the average drop in water level after 24 Hours over the three holes was 359 mm. The 4 Hour (4 Hour intervals) soakage test was conducted on 26 Aug'96 and was abandoned for all holes after three hours when it was observed that drop over the precedent 0.5 Hour period was a mere 1 mm. It is concluded that the soils types, in accordance with TP 58 Figures 8.1 & 8.2, are at the least Category #4 and more probably Category #5.

CONCLUSIONS

Noting the poor permeability characteristics of the sites soils types conventional TP 58 soakage trenches are not an option for ex-septic tank end effluent disposal. Two of the "specific design" options considered appropriate to the subdivision are described in subsequent sections of this report.

DOMESTIC WASTEWATER TREATMENT AND DISPOSAL RECOMMENDATIONS

The most satisfactory option for end effluent disposal to ground is by sub-soil irrigation using "Raam" pressure fed drippers located within the topsoil mantle, say 100 to 150 mm below ground level.

The end effluent, ex the treatment process, is required to have a low BOD & SS levels to avoid clogging of the Raam drippers and further to enhance the disposal field area life. To achieve the above requirements one of the following treatment options should be installed on each of the proposed residential sites;

- a) Anaerobic / Aerobic and end effluent filtration as can be achieved by a "Hynds Clearwater" treatment plant, or
- b) Anaerobic (septic tank) treatment with an end effluent polishing filter followed by an intermittantly dosed sand filter as supplied by "Reflection Treatment System"

POSSIBLE INDIVIDUAL LOT DEVELOPMENT SCENARIOS & END EFFLUENT DISPOSAL AREA REQUIREMENTS

Assume on each site a 4 bedroom dwelling

TP 58 occupancy = 6 persons

TP 58 unit wastewater loading = 140 litre / head / day

Maximum daily wastewater loading for treatment and on-site disposal = 840 litre

High Pressure Sub-soil Irrigation (HPSSI) daily loading rate = 5 mm / day

Disposal field area (minimum) = reserve area = 170 sq.m

CONCLUSIONS

On site treatment and disposal of domestic origin wastewater can be achieved on all three Lots forming the proposed using commercially proven and available systems that comply with the recommendations of TP 58.

ENVIRO - IMPAC GROUP LTD

Hugh Ward

Hugh Ward

FNDC - Approved Building Consent Document - EBC-2022-9880 - Pg 48 of 53 - 11/04/2022

Appendix I – Certificate Title and Consent Notices

FNDC - Approved Building Consent Document - EBC-2022-988-0 - Pg 49 of 53 - 11/04/2022 - NZBTC

Quickmap Title Details



Information last updated as at 11-Aug-2019

RECORD OF TITLE DERIVED FROM LAND INFORMATION NEW ZEALAND FREEHOLD

Identifier NA115B/212

Land Registration District North Auckland

Date Issued 04 June 1998

Prior References

NA55C/22

Type Fee Simple
Area 1864 square metres more or less
Legal Description Lot 1 Deposited Plan 184536

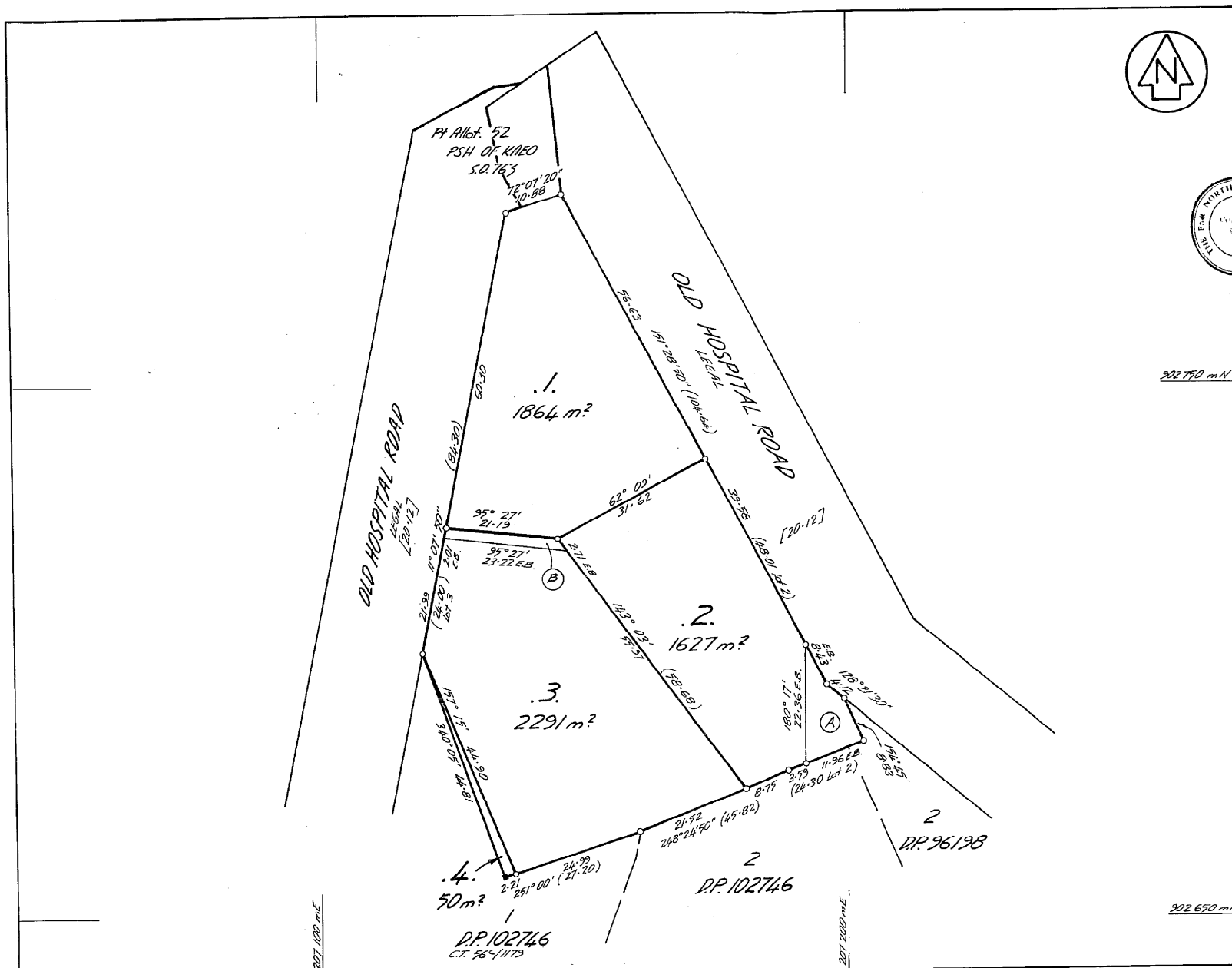
Registered Owners

Jenny Ann Emmanuel

D278164.4 Consent Notice pursuant to Section 221(1) Resource Management Act 1991 by Far North District Council - 4.6.1998 at 2.41 pm

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K.C. 1970 257 1/10/98



Approvals

Registered Owner: G.S. HOLLEY

APPROVED PURSUANT TO SECTION 223 OF THE RESOURCE MANAGEMENT ACT 1991 ON THE 11th DAY OF MAY 1997 SUBJECT TO THE GRANTING OR RESERVING OF THE EASEMENTS SET OUT IN THE MEMORANDUM HEREIN AND SUBJECT TO THE AMALGAMATION CONDITION SET OUT HEREIN.

THE COMMON SEAL OF THE FAR NORTH DISTRICT COUNCIL IS AFFIXED HERETO IN THE PRESENCE OF



[Signature]
AUTHORISED OFFICER
(Under Delegated Authority)

KC 1970 257

MEMORANDUM OF EASEMENTS.

PURPOSE	SERVIENT TENEMENT	SHOWN	DOMINANT TENEMENT
Right of Way Right to Drain Water Right to Convey Water Right to Transmit Electricity and Telecommunications.	Lot 2 hereon.	(A)	Lot 1 & 3 RP 374/37 CT 359/244
Right to Drain Water.	Lot 3 hereon.	(B)	Lot 2 hereon

302 750 mN

AMALGAMATION CONDITION

THAT LOT 4 HEREON BE TRANSFERRED TO THE OWNER OF LOT 1 RP 102746 (CT 565/1173) AND THAT ONE CERTIFICATE OF TITLE BE ISSUED TO INCLUDE BOTH PARCELS. See A 631305

New C.S.T. allocated:

Lot 1: 1158/212 Lot 2: 1158/213
Lot 3: 1158/214 Lot 4: 1158/215

Total Area 5832 m²

Comprised in C.T. 559/22 (all)

I, ROBERT JOHN DONALDSON, Registered Surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to section 25 of the Survey Act 1986) hereby certify that this plan has been made from surveys executed by me or under my directions, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1972 or any regulations made in substitution thereof.

Dated at AUCKLAND this 3rd day of June 1997 Signature *[Signature]*

Field Book p. Traverse Book p.

Reference Plans

Examined *[Signature]* Correct

Approved as to Survey

3 11 197 Deputy Chief Surveyor

Deposited this 11th day of June 1998

District Land Registrar

File 3065 Received 1 SEP 1997

Instructions DP 184536

302 650 mN

LAND DISTRICT NORTH AUCKLAND
Survey Blk. & Dist. VII WHANGARUA S.D.
NZMS 261 Sheet Record Map No. *[Signature]*

LOTS 1 - 4 BEING A SUBDIVISION OF
LOT 2 D.P. 100503

TERRITORIAL AUTHORITY FAR NORTH DISTRICT
Surveyed by R.J. DONALDSON & ASSOCIATES
Scale 1: 500 Date May 1997

W.A. ROBERTSON, DIRECTOR GENERAL/SURVEYOR GENERAL, DEPARTMENT OF SURVEY AND LAND INFORMATION, NEW ZEALAND

DOSLI FORM 015



7 JUL 1998

THE RESOURCE MANAGEMENT ACT 1991**SECTION 221 : CONSENT NOTICE**

REGARDING The subdivision of
Lot 2 DP 100503 S.D North Auckland Registry.

PURSUANT to Section 221 for the purposes of Section 224 of the Resource Management Act 1991, this Consent Notice is issued by the FAR NORTH DISTRICT COUNCIL to the effect that conditions described in the schedule below are to be complied with on a continuing basis by the subdividing owner and the subsequent owners after the deposit of the survey plan, and is to be registered on the appropriate new titles.

SCHEDULE

- (1) All buildings are to have specific designed foundations designed by a Registered Engineer and submitted in conjunction with any building consent application.
- (2) All lots are to have wastewater treatment and disposal systems as detailed in the report prepared and submitted by the Environmental Impact Group Ltd.
- (3) That where possible the stormwater collected from roof catchment or access driveway be directed back to Old Hospital Road adjacent to Lot 2. All other stormwater collected from access driveway or paths be piped along the easement provided and discharged on to Old Hospital Road adjacent to Lot 3.

SIGNED:


by the FAR NORTH DISTRICT COUNCIL
under delegated authority.

DATE:

4 November 1997

241 04 JUN 98 D
PARTICULARS
LA R
ASCO A
278164-4
AND REGISTRAR

