



SUITABILITY REPORT

576C Barrier View Road

Mangawhai

(Proposed Lot 2 of Lot 35 DP 313877)

SUITABILITY REPORT

576C Barrier View Road

Mangawhai

(Proposed Lot 2 of Lot 35 DP 313877)

Report prepared for: Peter & Nicky Chapman

Report reference: 20489

Date: 18 September 2026

Revision: 1

Document Control

Date	Revision	Description	Prepared by:	Reviewed by:	Authorised by:
18/09/2026	1	Building Consent Issue	M Davis	D Platt	M Jacobson



association of
consulting and
engineering

Contents

1.0	Introduction	1
2.0	Site Description	1
3.0	Desk Study	2
3.1	Referenced/Reviewed Documents	2
3.2	Site Geology	2
3.3	Aerial Photography	2
3.4	Subdivision Report	3
3.5	Natural Hazards	3
4.0	Field Investigation	3
5.0	Subsoil Conditions	4
6.0	Geotechnical Assessment	4
6.1	Slope Stability	4
6.2	Liquefaction	5
6.3	Expansive Soils	5
6.4	Shallow Soil Creep	5
7.0	On-site Wastewater Disposal	6
7.1	Site Evaluation	6
7.2	Design	6
7.3	Northland Regional Council Discharge Compliance	7
8.0	Stormwater Assessment	7
8.1	Attenuation	7
9.0	Engineering Recommendations	7
9.1	Site Subsoil Class	7
9.2	Earthworks	7
9.3	Foundations	8
9.4	Timber Pole Retaining Walls & Leading Edge Piles	9
9.5	Stormwater Disposal	9
10.0	Drawing Review	9
11.0	Construction Monitoring and Producer Statements	10
12.0	Conclusions	10
13.0	Limitations	11

Appendices

A	Drawings
B	Subsurface Investigations
C	On-site Wastewater Disposal Details
D	Wastewater Design PS1

SUITABILITY REPORT

576C Barrier View Road Mangawhai (Proposed Lot 2 of Lot 35 DP 313877)

1.0 Introduction

RS Eng Ltd (RS Eng) has been engaged by Peter & Nicky Chapman to investigate the suitability of the property (Proposed Lot 2 of Lot 35 DP 313877) for residential construction. The purpose of this report is to assess the suitability of the building site making foundation, earthworks and stormwater disposal recommendations and detail the design of an on-site wastewater disposal system.

The client proposes to construct a three-bedroom dwelling on timber pile foundations and a timber pole retaining wall.

2.0 Site Description

The 3.5ha property is located on the northern side of Barrier View Drive at the end of a right of way approximately 570m west of the intersection with Cove Road. The property contains gentle to steep slopes falling to the south and east becoming steeper towards the southern and eastern extents of the site. A tree lined watercourse is located along the southeastern boundary. Ground coverage is predominantly grass.



Figure 1: Lot 35 DP 313877 (Source: KDC GIS).

3.0 Desk Study

3.1 Referenced/Reviewed Documents

The following documents have been referenced in this report:

- GNS – *“Geology Of The Whangarei Area – Edbrooke & Brook – 2009.”*
- ENGEO – *“Geotechnical Assessment, Mangawhai, Kaipara District – April 2019.”*
- Wiley Geotechnical – *“Geotechnical Investigation for Proposed Subdivision at 576C Barrier View Road, Mangawhai – March 2023.”*

3.2 Site Geology

The GNS 1:250,000 scale New Zealand Geology Web Map indicates that the property is located within an area that is underlain by Pakiri Formation of Waitemata Group, which has been described as follows: *“Alternating thick-bedded, volcanic-rich, graded sandstone and siltstone.”*

3.3 Aerial Photography

RS Eng has undertaken a review of historical aerial photography and more recent satellite imagery, specifically two images, from 1963 and 1996. See Figure 2 below of the 1963 image. Notable features observed are listed below:

- The land is undeveloped in the 1963 image and signs of soil creep can be observed in the steeper sections of the building area.
- No signs of active or historic instability were observed in the historical imagery in the vicinity of the proposed building area.
- The accessway through the subdivision appears in the 2004 image and appears to have been widened and gravelled by 2025.

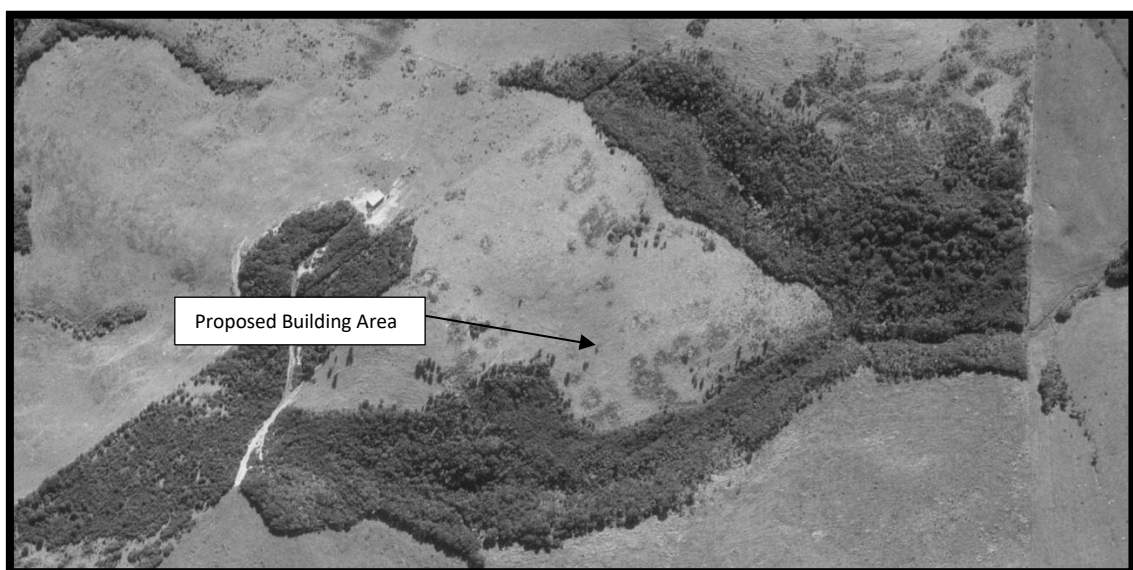


Figure 2: 1963 Aerial Image (Source: www.retrolens.nz).

3.4 Subdivision Report

The underlying subdivision was reported on by Wiley Geotechnical in a report entitled “*Geotechnical Investigation for Proposed Subdivision at 576C Barrier View Road, Mangawhai*” dated 2 March 2023. The following recommendations were made in relation to the property in question:

- *We expect that a geotechnical ultimate bearing capacity of 300kPa would be available; however, further geotechnical investigations and design must be carried out at the building consent stage.*
- *Any proposed earthworks and drainage plans should be approved by a suitably qualified Geotechnical Engineer familiar with both the site and the recommendations within this report for review and comment.*
- *Additional design-level earthwork recommendations are required if cut and fills are greater than 600mm; and all proposed batter slopes should be restricted to gradients no steeper than 1V:3H.*
- *This report entailed an initial site investigation for the subdivision development of the site. The recommendations and considerations outlined are indicative of what is to be expected based on initial investigations. Further geotechnical review, site investigation and reporting will be required by purchasers for each of the proposed Lots at building consent stage.*

3.5 Natural Hazards

The site has been mapped by ENGEO in their hazard assessment report as follows:

- Liquefaction Susceptibility – Low.
- Settlement Susceptibility – Low.
- Slope Instability Potential – Low to Medium.
- Acid Sulphate Soil – Low.

4.0 Field Investigation

A Technician from this office visited the property on 27 August 2026 to undertake a walkover inspection, four hand augers and three Scala Penetrometer tests.

The walkover inspection observed generally even, gently to moderately sloping ground falling to the southeast towards a tree lined gully feature. The proposed building and retaining wall extent were pegged out upon arrival. The walkover did not observe any signs of concern at the building area in relation to the proposal. No signs of soil creep were observed at or below the building area.

The hand augers were dug to a maximum depth of 4.2m below ground level (BGL). Shear Vane readings were taken at regular intervals throughout the hand augers. Soil and rock descriptions are in general accordance with the New Zealand Geotechnical Society guideline.

The Scala Penetrometer tests were performed from the base of three of the hand augers to a maximum depth of 6.3m BGL.

5.0 Subsoil Conditions

Interpretation of the subsurface conditions is based on the investigations shown on the drawings in Appendix A. The conditions are summarised below.

- Topsoil was encountered to 0.2m BGL.
- Residual soils of the Pakiri Formation were encountered to depths ranging from 1.7m to 2.0m BGL. The residual soils consisted of highly plastic, firm to very stiff silty clays with trace sand. The In-Situ Undrained Shear Strengths ranged from 75kPa to 164kPa.
- Underlying the residual soils completely weathered, extremely weak siltstone was encountered consisting of highly plastic, firm to stiff silty clays with trace to minor sand. The In-Situ Undrained Shear Strengths ranged from 60kPa to 104kPa.
- Groundwater was encountered at 4.0m BGL and is assessed to be indicative of winter groundwater levels, with groundwater expected near the surface at the base of the slope to the south of the proposed building area.

6.0 Geotechnical Assessment

6.1 Slope Stability

The proposal is underlain by the Pakiri Formation of the Waitemata Group, comprising alternating thick-bedded, volcanic rich, graded sandstone and siltstone. The highly and moderately weathered rocks are often extremely weak, and bedding is often gently inclined. The proposed building area is positioned on a broad gentle to moderate southeast facing slope becoming steeper towards the south.

There is no evidence of recent or historic slope instability in the vicinity of the proposed building area. The proposed building area is relatively uniform in grade, with no localised steepening, incised drainage features or abrupt breaks in slopes. The steeper areas of the property are generally located towards the southern extent above an incised tree lined watercourse. The proposed building area is setback approximately 40m from the steeper southern slopes.

The most likely mechanism for inducing slope instability at the proposed building site would be through earthworks, particularly if significant cuts, over steepened batters, or poorly managed

drainage are created during development. However, the relatively uniform topography, absence of evidence of recent or historic slope instability and approximately 40m setback from the steeper southern slopes provides a reasonable basis for assessing the slope instability risk as low. Provided the proposed construction methodology is followed and the recommendations of this report are adhered to, RS Eng considers the risk of slope instability to the proposed building works as low.

6.2 Liquefaction

The proposal is positioned on land underlain by the Pakiri Formation of the Waitemata Group, consisting of soils that are cohesive in nature and therefore unlikely to liquefy when subjected to seismic shaking. RS Eng considers the risk of liquefaction to be low.

6.3 Expansive Soils

The clayey soils encountered on-site are likely to be subject to volumetric change with seasonal changes in moisture content (wet winters / dry summers); this is known as expansive or reactive soils. Apart from seasonal changes in moisture content, other factors that can influence soil moisture content include:

- Influence of garden watering and site drainage.
- The presence of large trees close to buildings. Large trees can cause variation in the soil moisture content for a distance of up to 1.5 times their mature height.
- Initial soil moisture conditions during construction, especially during summer and more so during a drought. Building platforms that have dried out after initial excavation should be thoroughly wet prior to any floor slabs being poured.
- Plumbing leaks.

Based on a visual tactile assessment made during the subsoil investigation, and laboratory test results in this geology within similar terrain, RS Eng considers the soils as being H1 (Highly Reactive) as per AS 2870.

6.4 Shallow Soil Creep

Seasonal changes in moisture content of clayey soils cause shrink/swell effects (expansive soils). On slopes generally more than 14° the cyclic shrink/swell characteristics combined with gravity forces cause the surface soil to displace downslope over time. This can be accelerated and exaggerated by stock. Soil creep can affect shallow slope angles which are underlain by weaker materials but may not affect steeper slopes when soil strengths are high.

Shallow creep was not evident on the gentle to moderate slopes at the building site; however shallow soil creep may be activated due to the proposed surcharge loading, the relatively low shear strengths recorded, and earthworks associated with the dwelling construction. Therefore, leading edge foundations shall be specifically designed by a Chartered Professional Engineer to

account for at least 1.5m of soil creep below ground level. Detailed recommendations have been made in the following sections of this report.

7.0 On-site Wastewater Disposal

7.1 Site Evaluation

The land available for effluent disposal is moderately sloped (11° to 14°) and waxing planar. Subsoil investigations have assessed the soil as Category 5 as per AS/NZS 1547:2012. RS Eng recommend the use of a secondary treatment system loading sub surface pressure compensating drip irrigation line within a planted and fenced area. These systems use lower application rates and are more easily laid around the boundary and on sloping ground when compared with conventional type soakage bed systems. A slope reduction factor of 20% has been incorporated into the design.

Disposal fields laid on ground slopes over 10° require a 10m vegetated buffer zone downslope of the lowest irrigation line to be included as part of the disposal field area and that the irrigation lines are firmly attached to the disposal area, complying with the relevant Northland Regional Council Regional Plan Rules for discharge of treated effluent to land. This has been indicated on Sheet 1 of Appendix A. A surface water diversion drain is recommended upslope of the proposed disposal field.

7.2 Design

The proposed dwelling has three bedrooms. The design calculations are presented in Table 1 below.

Table 1: Wastewater Disposal Calculations.

Number of Bedrooms	3	No.
Number of Persons	5	No.
Flow Allowance	180	L/person/Day
Total Flow	900	L/Day
Irrigation Rate (DIR)	3	L/m ² /day
Design Rate (DIR)	2.4	L/m ² /day
Slope Reduction Factor	20	%
Irrigation Area Required	375	m ²
Irrigation Line Spacing	1	m

7.3 Northland Regional Council Discharge Compliance

Table 2 below demonstrates compliance with the Northland Regional Council's Regional Plan.

Table 2: NRC Permitted Discharge Compliance.

Feature	Regional Plan	Available
Identified Stormwater Flow Path	5m	>5m
River, Lake, Pond, Stream, Dam or Wetland	15m	>15m
Existing Water Supply Bore	20m	>20m
Property Boundary	1.5m	>1.5m
Groundwater	0.6m	>0.6m
10m Buffer Zone	Slopes >10°	Required
Floodplain Exclusion	5% AEP	>5% AEP
Reserve area	30%	30%

8.0 Stormwater Assessment

8.1 Attenuation

The property is zoned as Rural and within the Mangahwai Harbour overlay as designated in the Kaipara Operative District Plan 2013. The district plan states that up to 10% of the total lot area is permitted to be impervious. If the impervious surfaces exceed 10% the attenuation of stormwater flows to pre-development rates will be required. Further assessment can be undertaken once final impervious surfaces are known.

9.0 Engineering Recommendations

9.1 Site Subsoil Class

In accordance with NZS 1170.5:2004, Section 3.12.3 the site has been assessed for its Site Subsoil Class. Based on the observations listed above RS Eng considers the site soils lie within Site Class C *"Shallow Soil Site."*

9.2 Earthworks

To form level access to and create a building platform for the proposed building earthworks are proposed. To suitably develop the building area, RS Eng recommend as follows.

- Fills shall be limited to a maximum of 0.6m without further geotechnical assessment.
- Cuts greater than 0.6m shall be suitably retained and be limited to a maximum depth of 2.0m without further geotechnical assessment.
- Non retained batters should be sloped at angles less than 1V to 3H.
- Site works shall generally be completed in accordance with NZS 4431.

- The building site and driveway should be shaped to assist in stormwater run-off and avoid ponding of surface water.
- Surface water cut-off drains shall be considered above the proposed building site and wastewater disposal field.
- Temporary excavations batters shall be formed no steeper than 1V to 1.5H, to a maximum height of 2.0m, or shall be subject to specific assessment by a suitably experienced Chartered Professional Engineer.
- Steep temporary excavations should not be left unsupported with impending bad weather or for extended periods of time, typically less than 3 days.

9.3 Foundations

It is proposed to construct a timber floor dwelling upon NZS 3604 type piles modified for expansive soils and bearing capacities outlined below. To suitably found the proposed construction, RS Eng recommend the following:

- Leading edge piles on the downslope edge of the proposed dwelling shall be specifically designed by a suitably experienced Chartered Professional Engineer to account for the lateral forces associated with at least 1.5m of shallow soil creep below original ground level. The piles shall be designed for an effective retaining width of three times the pile diameter (unless spaced closer), using the assessed parameters listed in Table 3.
- The remainder of the timber pile foundations for the dwelling can be in general accordance with NZS 3604 but should extend to a minimum depth of 1.0m into natural ground to account for Class H1 soils and be specifically designed for the reduced bearing capacities outlined below.
- It is expected that the subfloor could be specifically designed to increase the bearer and joist spans from typical NZS 3604 type construction to reduce the number of piles required.

For specific design of bored pile foundations extending to a depth of at least 1m BGL, RS Eng has assessed the following in terms of B1/VM4 of the NZ Building Code.

- 250kPa Ultimate End Bearing Capacity (Geotechnical Ultimate).
- 125kPa Dependable Eng Bearing Capacity (Ultimate Limit State).
- 80kPa Allowable Eng Bearing Capacity (Serviceability Limit State).

For specific design of bored pile foundations extending to a depth of at least 3m BGL and diameter of minimum 0.45m, RS Eng has assessed the following in terms of B1/VM4 of the NZ Building Code.

- 450kPa Ultimate End Bearing Capacity (Geotechnical Ultimate).
- 225kPa Dependable Eng Bearing Capacity (Ultimate Limit State).
- 150kPa Allowable Eng Bearing Capacity (Serviceability Limit State).

9.4 Timber Pole Retaining Walls & Leading Edge Piles

Retaining walls and leading-edge piles shall be specifically designed by a suitably experienced Chartered Professional Engineer familiar with the contents of this report, using the assessed soil parameters presented in Table 3. Retaining wall and piles shall be designed for at rest earth pressures.

Where retaining walls are incorporated in buildings or located adjacent to buildings and property boundaries, the effects of deformation should be considered.

Table 3: Assessed Retaining Wall & Pile Design Parameters.

Parameter	Residual Soil	Completely Weathered Siltstone
Soil Density (kN/m ³)	18	18
Friction Angle (°)	23	26
Drained Cohesion, (kPa)	0	0
Undrained Shear Strength (kPa)	50	50
Depth BGL (m)	0 – 1.5	>1.5

A strength reduction factor of 0.5 shall be adopted for limit state design of the lateral capacity of cantilever retaining wall pile foundations.

9.5 Stormwater Disposal

All stormwater should be collected from roofs and paved surfaces and discharged in a controlled manner. RS Eng recommends stormwater is discharged to a suitably sized subsurface dispersal trench located downslope and to the southwest of the proposed dwelling. Under no circumstances shall uncontrolled stormwater be discharged to sloping ground.

10.0 Drawing Review

It is recommended that RS Eng Ltd carry out a review of final development drawings prior to submittal for building consent and / or resource consent. The review is to confirm that the recommendations outlined in this report have been applied in full and correctly to the design.

11.0 Construction Monitoring and Producer Statements

RS Eng recommends a suitably experienced Chartered Professional Engineer monitor the construction of the following works to confirm if the geotechnical conditions are consistent with that outlined in this report.

- Foundation excavations.

Any works not inspected will be excluded from future producer statements (PS4) to be issued by RS Eng. In any event, where doubt exists regarding inspections, this office should be contacted for advice and provided with reasonable notice of inspections.

12.0 Conclusions

It is the conclusion of RS Eng Ltd that the building area is suitable for the proposal provided the recommendations and limitations stated within this report are adhered to.

RS Eng Ltd also concludes that subject to the recommendations of this report, in terms of Section 72 of the Building Act 2004;

(a) the building work to which an application for a building consent relates will not accelerate, worsen, or result in slippage or subsidence on the land on which the building work is to be carried out or any other property; and

(b) the land is neither subject to nor likely to be subject to slippage or subsidence.

13.0 Limitations

This report has been prepared solely for the benefit of our client. The purpose is to determine the engineering suitability of the proposed dwelling, in relation to the material covered by the report. The reliance by other parties on the information, opinions or recommendations contained therein shall, without our prior review and agreement in writing, do so at their own risk.

Recommendations and opinions in this report are based on data obtained as previously detailed. The nature and continuity of subsoil conditions away from the test locations are inferred and it should be appreciated that actual conditions could vary from those assumed. If during the construction process, conditions are encountered that differ from the inferred conditions on which the report has been based, RS Eng should be contacted immediately.

Construction site safety is the responsibility of the builder/contractor. The recommendations included herein should not be construed as direction of the contractor's methods, construction sequencing or procedures. RS Eng can provide recommendations if specifically engaged to, upon request.

Prepared by:



Michael Davis
Senior Technician
NZDE(Civil), MEngNZ

Reviewed by:



David Platt
Geotechnical Team Leader
NZDE(Civil), MEngNZ

Approved by:

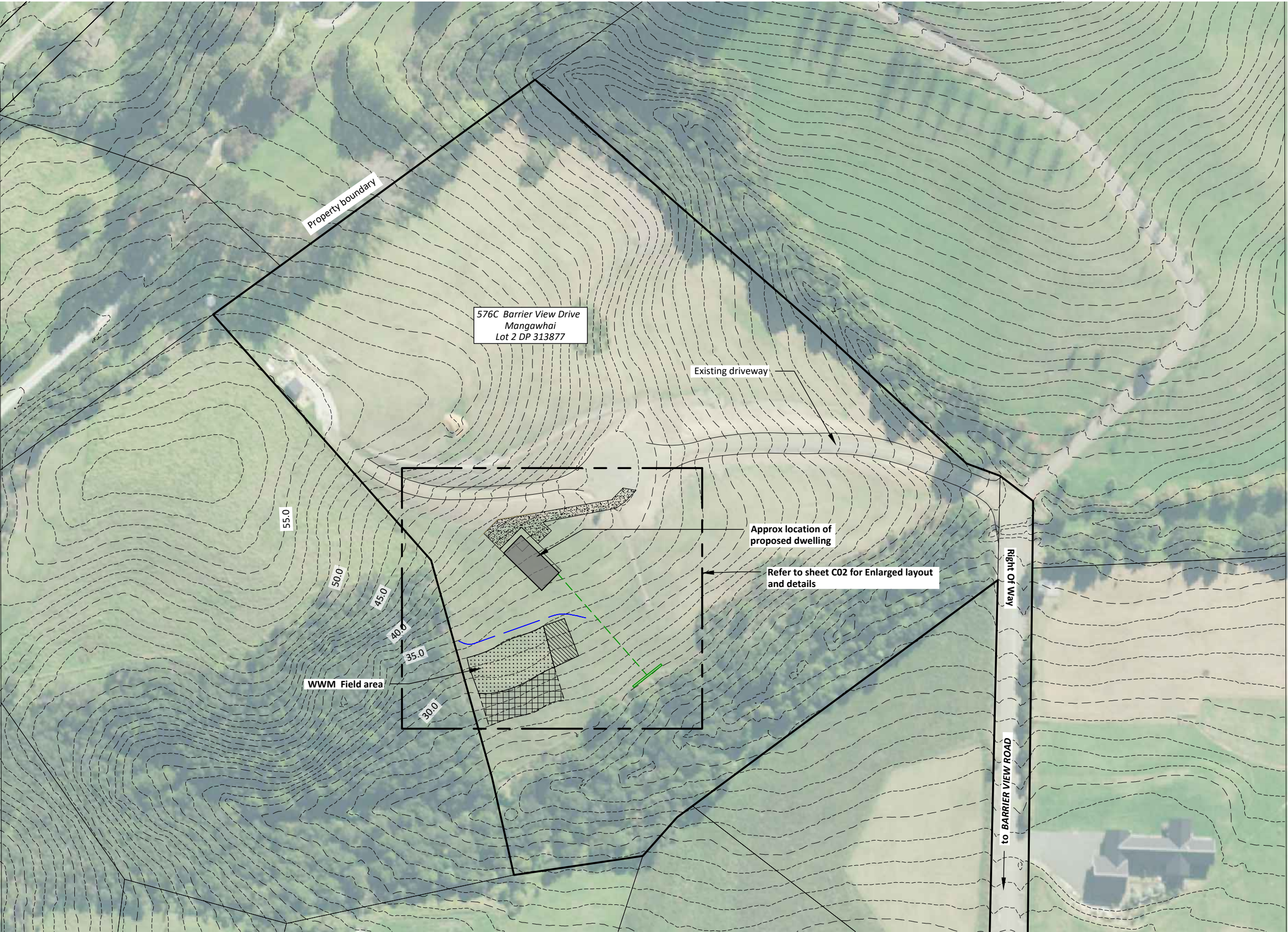


Matthew Jacobson
Director
NZDE(Civil), BE(Hons)(Civil), CPEng, CMEngNZ

RS Eng Ltd

Appendix A

Drawings



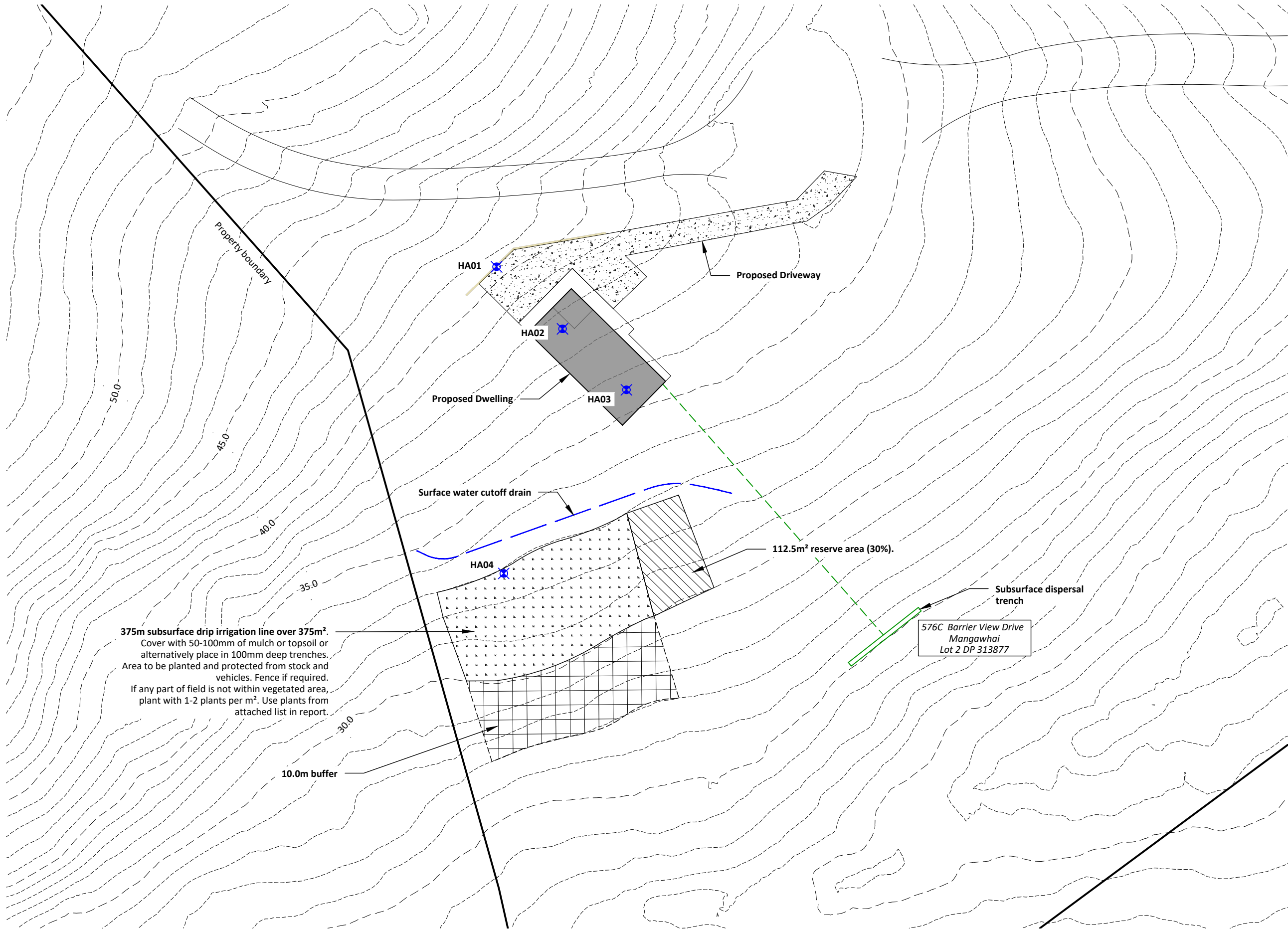
- NOTES:**
- If any part of these drawings are unclear, please contact RS Eng.
 - These plans are indicative only and shall not be used for construction set-out or scaled off.
 - All services shall be identified on-site prior to construction.
 - It is the responsibility of the lead designer/project manager to complete the design coordination and clash detection.
 - This plan is copyright to RS Eng Ltd and should not be reproduced without prior permission.



Contour Interval: 0.5m
Vertical Datum: NZVD2016
Survey Data Source: LiDAR (2024)

0 12.5 25
PLAN 1:1250

 RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110	These drawings are copyright to RS Eng Ltd and should not be reproduced without prior permission.		PROPOSED DWELLING SUITABILITY REPORT SITE INVESTIGATIONS	Client NICKY CHAPMAN					Scale 1:1250		Rev No. A	
	If any part of these documents are unclear, please contact RS Eng Ltd.			Location 576C BARRIER VIEW ROAD MANGAWHAI					Original A3		Sheet No.	
						09/09/2026 A Report issue 1					Job No.	
						Date Rev Notes					20489	
						Drawn by: VDT Reviewed by: NW Approved by: MJ					C01	



- NOTES:**
- If any part of these drawings are unclear, please contact RS Eng.
 - These plans are indicative only and shall not be used for construction set-out or scaled off.
 - All services shall be identified on-site prior to construction.
 - It is the responsibility of the lead designer/project manager to complete the design coordination and clash detection.
 - This plan is copyright to RS Eng Ltd and should not be reproduced without prior permission.

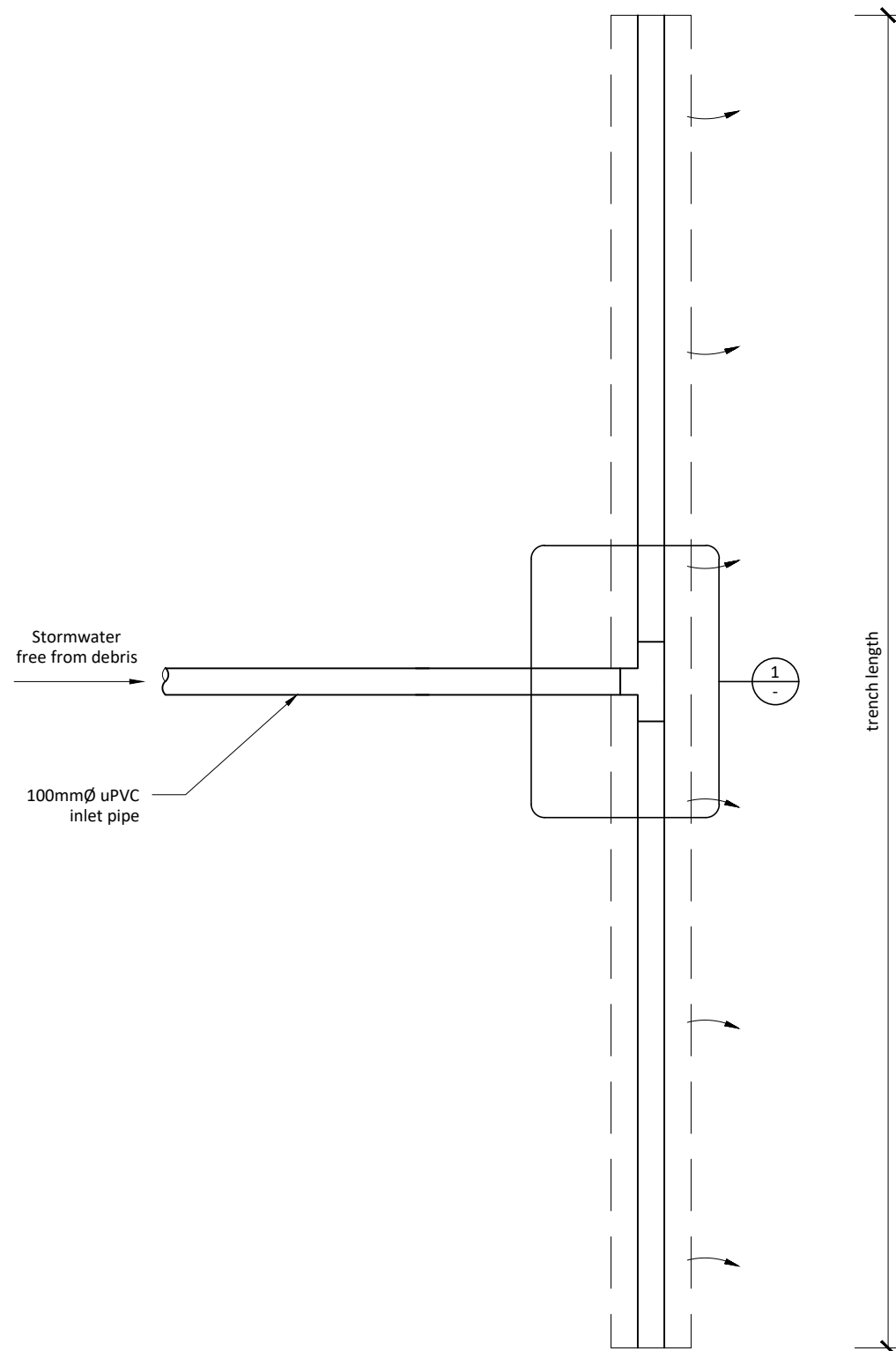


- LEGEND**
- Hand Auger Location
 - Proposed Dwelling
 - Timber Retaining Wall
 - WWM Field area
 - 30% reserve area

Contour Interval: 0.5m
Vertical Datum: NZVD2016
Survey Data Source: LiDAR (2024)

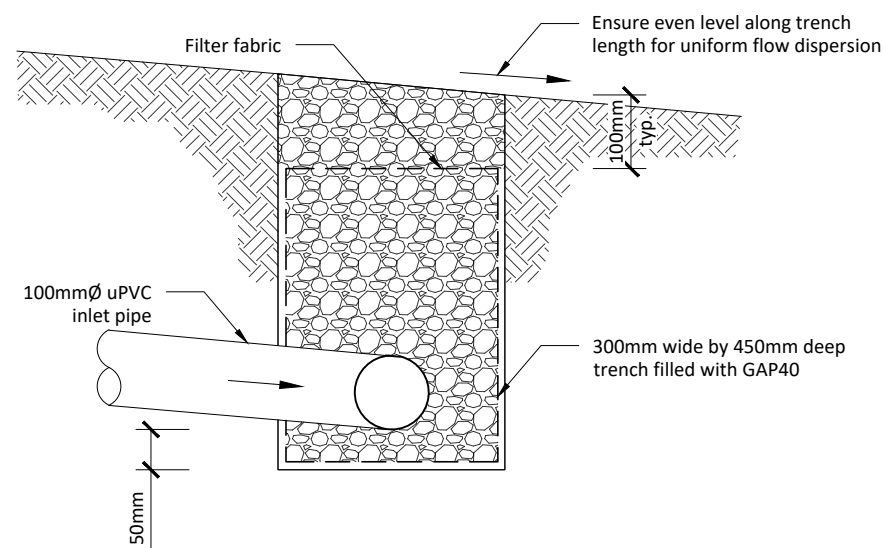
0 5 10
PLAN 1:500

	RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110	These drawings are copyright to RS Eng Ltd and should not be reproduced without prior permission. If any part of these documents are unclear, please contact RS Eng Ltd.	PROPOSED DWELLING SUITABILITY REPORT SITE INVESTIGATIONS	Client					Scale	Rev No.
				NICKY CHAPMAN					**SCALE**	A
				Location					Original	Sheet No.
				576C BARRIER VIEW ROAD MANGAWHAI					A3	C02
		09/09/2026	A	Report issue 1			Job No. 20489			
Date	Rev	Notes								
Drawn by: VDT			Reviewed by: NW		Approved by: MJ					

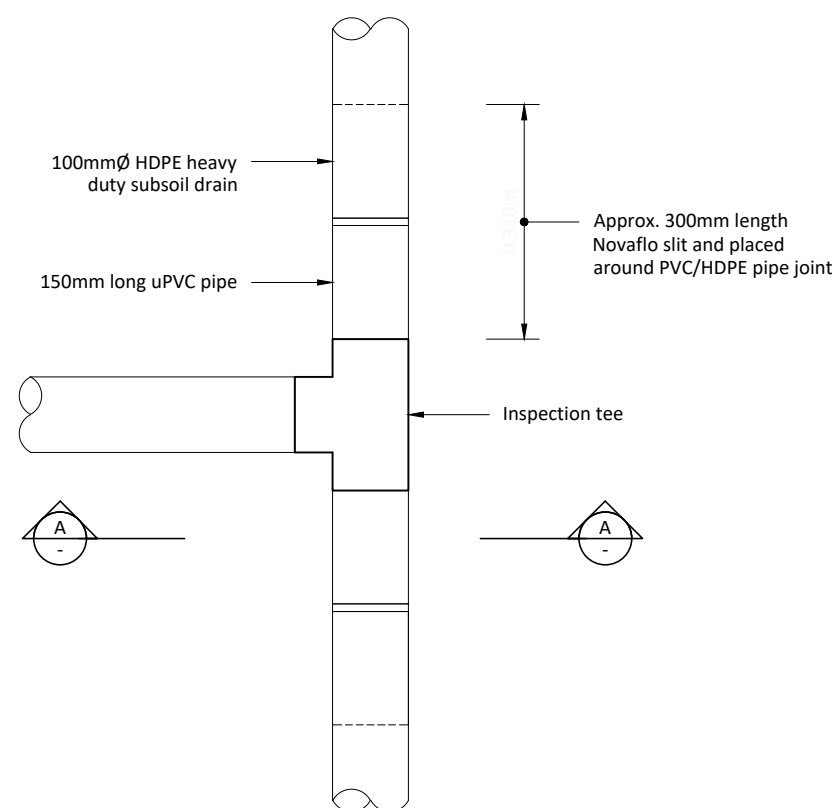


NOTE:
Keep dispersal trench 3.0m clear of property boundary

PLAN
1:25



SECTION A
1:10



PIPE CONNECTION DETAIL
1:10

NOTES:

- All services should be located on-site prior to commencement of works.
- All works to comply with all relevant local authority by-laws and council regulations where applicable.
- Contractors to confirm all dimensions on site prior to commencing any work.
- Do not scale off drawings.
- These drawings are to be read in conjunction with specifications - plans take precedence.
- If any part of these documents are unclear, please contact RSEng Ltd.
- This plan is copyright to RSEng Ltd and should not be reproduced without prior permission.

DESIGN PARAMETERS

EFFECTIVE CATCHMENT AREA DRAINED (m²)	TRENCH LENGTH (m)
100	11
200	16
300	19
400	22
500	24
600	27

RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110	
Title	
STANDARD DISPERSAL DRAIN TYPICAL DETAIL	
Client	
Peter & Nicky Chapman	
Location	
576C Barrier View Road, Mangawhai	
Date	Rev
10/09/2026	A
Date	Notes
Original Issue	
Scale	Original
AS SHOWN	A3
Drawn	Approved
MD	MJ
File #	Rev
	A
Sheet	
3	

Appendix B

Subsurface Investigations

RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110 RS Eng		HAND AUGER LOG					HOLE NO.: HA01	
CLIENT: P & N Chapman PROJECT: Geotechnical Investigations					JOB NO.: 20489			
SITE LOCATION: Lot 2, 576C Barrier View Drive, Mangawhai CO-ORDINATES: 1740697mE, 6005818mN					ELEVATION: 41m START DATE: 27/08/2026 END DATE: 27/08/2026 LOGGED BY: MD			
UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane: GEO1433		WATER
TS	TOPSOIL.		0.2	TS				
Pakiri Fm	Silty CLAY, with minor sand; light brown. Stiff to very stiff; moist; high plasticity.		0.4					
			0.6					
			0.8					
			1.0					
			1.2					
			1.4					
	Completely weathered; SILTSTONE; extremely weak.		1.6					
	Silty CLAY, with trace sand; light brown and orange. Firm to stiff; moist; high plasticity.		1.8					
			2.0					
			2.2					
			2.4					
			2.6					
	Minor sand, moist to wet.		2.8					
			3.0					
			3.2					
		3.4						
	Trace sand.		3.6					
	Minor sand, light grey.		3.8					
	Groundwater inflow.		4.0					
	End Of Hole: 4.20m		4.2					
			4.4					
			4.6					
			4.8					
			5.0					
			5.2					
			5.4					
			5.6					
			5.8					
			6.0					
			6.2					
			6.4					
			6.6					
			6.8					
PHOTO(S)				REMARKS				
				Coordinates and elevations are in NZTM projection and NZVD, and are approximate only.				
				WATER				
				☒ Standing Water Level ☐ Out flow ☐ In flow				
				INVESTIGATION TYPE				
				☒ Hand Auger ☐ Test Pit				

 RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110		HAND AUGER LOG					HOLE NO.: HA02	
CLIENT: P & N Chapman PROJECT: Geotechnical Investigations		JOB NO.: 20489						
SITE LOCATION: Lot 2, 576C Barrier View Drive, Mangawhai CO-ORDINATES: 1740702mE, 6005810mN		START DATE: 27/08/2026 ELEVATION: 39.5m END DATE: 27/08/2026 LOGGED BY: MD						
UNIT	MATERIAL DESCRIPTION (See Classification & Symbolology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane: GEO1433		WATER
TS	TOPSOIL.		0.2	TS TS				
Pakiri Fm	Clayey SILT, with some sand; brown . Stiff to very stiff; moist; high plasticity.		0.4	TS TS				
	Silty CLAY, with trace sand; light brown with orange staining. Stiff to very stiff; moist; high plasticity.		0.6	TS TS			134 54	
			0.8	TS TS				
			1.0	TS TS			134 83	
			1.2	TS TS				
			1.4	TS TS				
	Completely weathered; SILTSTONE; extremely weak.		1.6	TS TS			83 36	
	Silty CLAY, with trace sand; light grey with orange staining. Firm to stiff; moist; high plasticity.		1.8	TS TS				
			2.0	TS TS			89 45	
			2.2	TS TS				
			2.4	TS TS				
			2.6	TS TS			86 48	
			2.8	TS TS				
			3.0	TS TS			75 45	
			3.2	TS TS				
			3.4	TS TS				
			3.6	TS TS			98 60	
	Silty CLAY, with some sand; light grey. Firm; moist to wet; high plasticity.		3.8	TS TS				
	Groundwater inflow.		4.0	TS TS			75 45	↙
	End Of Hole: 4.20m		4.2	TS TS				
			4.4	TS TS	2			
			4.6	TS TS	5			
			4.8	TS TS	5			
			5.0	TS TS	7			
			5.2	TS TS	9			
			5.4	TS TS	8			
			5.6	TS TS	9			
			5.8	TS TS	12			
			6.0	TS TS	12			
			6.2	TS TS	12			
			6.4	TS TS	15			
			6.6	TS TS				
			6.8	TS TS				
PHOTO(S)			REMARKS					
			Coordinates and elevations are in NZTM projection and NZVD, and are approximate only.					
			WATER ▼ Standing Water Level ▷ Out flow ↙ In flow					
			INVESTIGATION TYPE ☒ Hand Auger ☐ Test Pit					

 RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110		HAND AUGER LOG				HOLE NO.: HA03	
CLIENT: P & N Chapman PROJECT: Geotechnical Investigations		JOB NO.: 20489					
SITE LOCATION: Lot 2, 576C Barrier View Drive, Mangawhai CO-ORDINATES: 1740710mE, 6005797mN		ELEVATION: 35.8m		START DATE: 27/08/2026 END DATE: 27/08/2026 LOGGED BY: MD			
UNIT	MATERIAL DESCRIPTION (See Classification & Symbolology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 100mm)	VANE SHEAR STRENGTH (kPa) Vane: GEO1433	WATER
TS	TOPSOIL.		0.2	TS TS			
Pakiri Fm	Silty CLAY, with trace sand; brown . Stiff to very stiff; moist; high plasticity.		0.4				164 72
	Silty CLAY; orange. Stiff; moist; high plasticity.		0.6				110 60
			0.8				
			1.0				
			1.2				
			1.4				95 60
	Completely weathered; SILTSTONE; extremely weak.		1.6				
	Silty CLAY, with trace sand; light grey with orange staining. Soft to firm; high plasticity.		1.8				75 42
			2.0				
			2.2				
			2.4				72 36
			2.6				
			2.8				
	Clayey SILT, with minor sand; light grey. Soft to firm; moist to wet; high plasticity.		3.0				69 42
			3.2				
		3.4					
	Wet.		3.6			60 30	
			3.8				
	Groundwater inflow.		4.0			66 42	
	End Of Hole: 4.20m		4.2				
			4.4		2		
			4.6		3		
			4.8		4		
			5.0		5		
			5.2		8		
			5.4		10		
			5.6		10		
			5.8		11		
			6.0		13		
			6.2		15		
			6.4		15		
			6.6				
			6.8				
PHOTO(S)			REMARKS				
			Coordinates and elevations are in NZTM projection and NZVD, and are approximate only.				
			WATER				
			☒ Standing Water Level ☐ Out flow ☐ In flow				
			INVESTIGATION TYPE				
			☒ Hand Auger ☐ Test Pit				

 RS Eng Ltd 09 438 3273 office@RSEng.co.nz 2 Seaview Road, Whangarei 0110		HAND AUGER LOG					HOLE NO.: HA04	
CLIENT: P & N Chapman PROJECT: Geotechnical Investigations		JOB NO.: 20489						
SITE LOCATION: Lot 2, 576C Barrier View Drive, Mangawhai CO-ORDINATES: 1740696mE, 6005780mN					ELEVATION: 33.1m		START DATE: 27/08/2026 END DATE: 27/08/2026 LOGGED BY: MD	
UNIT	MATERIAL DESCRIPTION (See Classification & Symbology sheet for details)	SAMPLES	DEPTH (m)	LEGEND	SCALA PENETROMETER (Blows / 0mm)	VANE SHEAR STRENGTH (kPa) Vane: GEO1433		WATER
TS	TOPSOIL.							
Pakiri Fm	Clayey SILT, with some sand; orange. Stiff to very stiff; moist; low plasticity.		0.2					
	Silty CLAY, with trace sand; orange and light brown. Stiff to very stiff; moist.		0.4					
			0.6				140	
			0.8				36	
			1.0				146	
			1.2				75	
			1.4				146	
	End Of Hole: 1.50m		1.6				89	
			1.8					
			2.0					
			2.2					
			2.4					
			2.6					
			2.8					
PHOTO(S)				REMARKS				
				Coordinates and elevations are in NZTM projection and NZVD, and are approximate only.				
				WATER				
				☒ Standing Water Level ☐ Out flow ☐ In flow				
				INVESTIGATION TYPE				
				☒ Hand Auger ☐ Test Pit				

Appendix C

On-site Wastewater Disposal Details

Irrigation Field Installation Details

- Use a system producing secondary treated effluent.
- **Use 375m (minimum) of Sub Surface Pressure Compensating Drip irrigation line**, with Arkal filters, flushing and air release valves fitted.
- Irrigation line is to be laid in a 50-100mm (minimum) trench (sub surface) or covered in mulch surface).
- Irrigation line is to be laid parallel with the contour.
- Disposal Field to be Planted.
- System to be installed and maintained as per manufacturer's recommendations including regular de-sludging of the primary treatment tank.
- Disposal area to be protected from stock and vehicles.
- Refer to "How to look after your septic tank" (published by the Northland Regional Council) when protecting the disposal area.
- The system will benefit from the use of water reduction fixtures, i.e. dual flush 6/3 litre water closets, shower-flow restrictors, aerator tap fittings and water conserving automatic washing machines.

Irrigation Line Specification

- Distribution is to be via drip irrigation line with self-compensating pressure drip emitters.
- Install an Arkal disc filter at the outlet of the treatment system. Install pressure checkpoints on either side of the filter to allow for gauges to check for blockages. Install pressure checkpoints at the end of each lateral.
- Install either manual or automatic flushing valves at the end of each lateral. Install air release valves in the high points of the irrigation field.
- Allow 5m head loss from semi-blocked filter and ensure 12m of end pressure for the lowest emitter in the field.
- Ensure there is laminar flow through all lines in the field. Ensure flushing velocity is greater than 0.5m/s.
- **Use drip irrigation line with 1.0m dripper spacing and 1.0m spacing between laterals.**

Suitable Plant Species for Evapo – Transpiration Systems

(Source: NRC *“Looking after your household Sewerage System”*)

Native Shrubs and Trees

- Coprosma
- Hebe
- Manuka
- Weeping Mapou
- Flax (Fast)
- Pokaka (slow)
- Cabbage Tree (fast)
- Rangiora (fast)
- Lacebark (fast)
- Ribbonwood (fast)
- Poataniwha
- Heketara
- Poataniweta
- Kohuhu (fast)

Grasses

- Jointed Twig Sedge
- Longwood Tussock
- Pukio
- Toetoe (native species)
- Umbrella Sedge
- Oioi
- Hooksedge

Introduced Species

- Canna Lilies
- Taro
- Aralia
- Fuschia
- Philodendrons
- Begonias

Appendix D

Wastewater Design PS1



Producer Statement Design

On-site Effluent Disposal System (AS/NZS 1547:2012)

To be completed by the design professional who has been engaged to do the work

Author's name	Matthew Jacobson	Building consent no.	TBC
Author's company	RS Eng Ltd	Author registration no.	
Site address	Lot 2 of Lot 35 DP 313877, 576C Barrier View Road, Mangawhai		
Legal description	Lot 35	DP 313877	
Engaged by	Peter Chapman		
Work undertaken	Onsite secondary treated wastewater disposal design.		

The on-site wastewater treatment and disposal system specified above has been designed in accordance with AS/NZS1547:2012 as per the requirements of section G13 of the NZ Building Code and the Northland Regional Council (NRC).

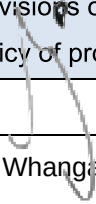
The proposed building work covered by this producer statement design is described in the drawings/report referenced below.

RS Eng: 20489 Suitability Report dated September 2026.

I believe on reasonable grounds that the proposed building work will comply with the relevant portions of the Building Code if constructed in accordance with the drawings, specifications and other documents provided with this consent.

I, understand that the Kaipara District Council will rely on this producer statement for the purposes of establishing compliance with the relevant provisions of the Building Act 2004, Building Regulations and Building Code.

I confirm that I hold a current policy of professional indemnity insurance to a minimum value of \$200,000.

Signature		Date	18/09/2026
Address	2 Seaview Road, Whangarei Postcode 0110		
Email	matthewj@rseng.co.nz		

Note: This form is to accompany every application for a Building Consent incorporating AS/NZS 1547:2012. Approval as a design professional is at Council's discretion.

Council use only

Producer Statement accepted as establishing compliance with the consented plans	☐ Yes	☐ No
Received by (name)	Signature	

On-Site Wastewater Summary for Council

Consent conditions	☒	No	☐	Yes ¹	Development Proposed	Residential	☒	Commercial	☐
---------------------------	-------------------------------------	----	--------------------------	------------------	-----------------------------	-------------	-------------------------------------	------------	--------------------------

Bedrooms	3	Other rooms²		Total Occupancy	5	Persons
-----------------	----------	--------------------------------	--	------------------------	----------	---------

Design occupancy allowances for Kaipara District Council		
Note: Where further rooms are designed that may reasonably be seen to be used as a bedroom, a minimum additional occupancy allowance of one person per room is to be added to the design. Exceptions to the above requirements are: 1) Rooms less than 6m² or containing inbuilt furniture that reduces the usable space to below 6m² 2) Rooms that are not able to be closed off from the rest of the house, i.e. with no door, or used as a through way 3) Rooms with no windows.	Number of bedrooms	Occupancy for design purposes
	1	2
	2	4
	3	5
	4	6
	5	8
	6	9

Geology	Pakiri Formation of the Waitemata Group				
Topsoil thickness	200mm		Soil category	5	
Treatment level	Secondary		Treatment plant	Oasis S2000 or similar	
Disposal loading method	☐ Siphon	☒ Pump	☐ Gravity ³		
Water supply source	☒ Tank	☐ Bore/public supply			
Per capita effluent flow	180 From Table H3, AS/NZS1547:2012		☐ Standard Water Reduction ?	☐ Full Water Reduction ?	
Total daily effluent flow	900		*If >2000L/day then NRC discharge consent required		
Land disposal method	Sub surface pressure compensating drip irrigation lines.				
Slope angle (degrees)	11 to 14 degrees		Depth to groundwater	4.0m	
Compliant with NRC Rules	☒ Yes	☐ No	*If no then NRC discharge consent required		
Effluent loading rate	2.4mm/day following 20% slope reduction factor				
Slope reduction applied?	no				
Effluent fields area	Primary 375 m ²		Reserve 112.5 m ²		

¹ Attach Consent conditions from Record of Title

² As per KDC's Occupancy Allowances

³ Gravity trickle systems will be assessed on the ability of the system to comply with the requirement to ensure even loading of the effluent distribution system as per AS/NZS1547:2012