Appendix B – Calculations

EXISTING SITE COVERAGE (39 RIDDELL ROAD)

IMPERVIOUS	4772m2 (DRIVEWAY/HOUSE/POND/SHED AREAS)
LAWN/GRASS	2717m2 (MOWED/LANDSCAPED)
PASTURE	98496m2 (GRAZING AREAS)

EXISTING COVERAGE 49 RIDDELL ROAD

IMPERVIOUS	1851m2 (DRIVEWAY/HOUSE/TENNIS COURT/PAVING)
LAWN/GRASS	5902m2 (MOWED/LANDSCAPED)

EXISTING COVERAGE 55 RIDDELL ROAD

IMPERVIOUS	7807m2
PERVIOUS	411m2

REFER GWE REPORT FULL MITIGATION TO PRE-DEVELOPMENT LEVELS

RIDDELL ROAD

EX METAL DRIVEWAYS

39 RIDDELL ROAD
LOT 2
DP543664

55 RIDDELL ROAD
LOT 1
DP543664

49 RIDDELL ROAD
LOT 1
DP180801

EX OVERLAND FLOWPATH AND EASEMENT IN FAVOUR OF 55 RIDDELL ROAD

EX CULVERTS AND DISCHARGE POINT FROM STORMWATER POND

EX POND AND EASEMENT IN FAVOUR OF 55 RIDDELL ROAD

EX POND WL=70.46m

EX HOUSE

EXISTING OVERLAND FLOW PATH 2

EXISTING OVERLAND FLOW PATH 1

EX WATERCOURSE THROUGH SITE CONVEYS FLOWS FROM UPSTREAM PROPERTIES

EX SHED AND STORAGE AREA

EX CUT OFF DRAIN AROUND BACK OF 49 RIDDELL ROAD

AREA SHEET FLOWS TO WEST

AREA SHEET FLOWS TO SOUTH

EXTENT OF CATCHMENT

NOTES
1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. Origin of levels = Code C30D Name RM 58 SO 55465
   - Northing 982430.570m
   - Easting 326338.700m
   - Elevation 57.74m
5. Contours are at 0.5m intervals.

LEGEND
- EX BDY
- PR BDY
- EX EASEMENT
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR SITE EXTENT
- EX STORMWATER
- PR STORMWATER
- EX/PROP SWMH
- EX WATERCOURSE
- EX OVERLAND FLOW
- EX SHEET FLOW
- EX SW CATCHMENT
- EX POND

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

Existing Coverage and Overland Flow Plan

No.	Revision (Description)	Name	Date
A	Resource Consent	GB	11/25
Surveyed		DW	09/25
Designed		-	-
Drawn		GB	09/25
Checked		TS	11/25

Project no.	10401		
Scale	1:2000 @ A3		
Cad file	10401 RIDDELL EX COVERAGE.DWG		
Drawing no.	C4500	Rev	A

NOTES

1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. Origin of levels = Code C30D Name RM 58 SO 55465
   - Northing 982430.570m
   - Easting 326338.700m
   - Elevation 57.74m
5. Contours are at 0.5m intervals.

LEGEND

- EX BDY
- PR BDY
- EX EASEMENT
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR SITE EXTENT
- EX STORMWATER
- PR STORMWATER
- EX/PROP SWMH
- EX FLOW DIRECTION
- PR-FLOWPATH 100YR
- PR-EXTENT 100YR
- PR-100YR FLOOD
- PR-SW-CATCHMENT

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100yr Overall Coverage and Flowpath Plan

No.	Revision (Description)	Name	Date
A	Resource Consent	GB	11/25
Surveyed		DW	09/25
Designed		-	-
Drawn		GB	09/25
Checked		TS	11/25

Project no.	10401		
Scale	1:3000 @ A3		
Cad file	10401 RIDDELL FLOODING.DWG		
Drawing no.	C4501	Rev	A

Conquel Consulting						Sheet	1 of 2
Job Title	39 Riddell Road						
Calc Title	Site Coverage Assessment						
Job Number	10401						
Author	GB	Checked	TS	Date	21/11/2025	Rev	A

Existing Site Coverage Allowances

39 Riddell Road	Area(m2)
Legal Lot Area	106185
Driveway	2691
Ex house/Shed	700
Ex Pond	1581
Grass/Lawn	2717
Grazed Pasture	98496

49 Riddell Road	Area(m2)
Legal Lot Area	7753
Ex House/Paving	640
Ex Tennis Court	566
Ex Metal/Drive	645
Grass/Lawn	5902

55 Riddell Road	Area(m2)
Legal Lot Area	8218
Metal/impervious	7807.1
Pervious/Grass	410.9

Note: 55 Riddell Road has detention to pre-development levels refer GWE report site coverage taken from this report also

Conquel Consulting

Sheet 2 of 2

Job Title	39 Riddell Road						
Calc Title	Site Coverage Assessment						
Job Number	10401						
Author	GB	Checked	TS	Date	21/11/2025	Rev	A

Prop Site Coverage Allowances

39 Riddell Road	Area(m2)	
Legal Lot Area	106131	
JOAL 1	1479	Chipseal or Concrete Finish
JOAL 2	1911	Chipseal or Concrete Finish
JOAL 3	509	Chipseal or Concrete Finish
JOAL 4	603	Chipseal or Concrete Finish
Proposed Houses	17400	Allowance 600m2 Impervious per lot (20% site coverage average)
Rural Planting	1934	5m buffer planting along rural zone boundary
Ripirian Planting	2607	10m Ripirian planting around wetland
Wetland Planting	3723	Planting Existing wetland currently grazzed
Pond Planting	957	3m Ripirian planting around existing pond
55 Riddell Planting	931	Boundary planting as buffer
Ex House Lot 4/Pond	185	Existing house and pond surface
Prop Lawn/Planting	73892	Proposed Lawns/planting areas
Total Check	**106131**	

JOAL 5	*296*	*Not part of catchment discharges Southward to Rural Land*
JOAL 2	*229*	*Not part of catchment discharges Southward to Rural Land*

Remaining Catchment area unchanged

49 Riddell Road	*Area(m2)*
Legal Lot Area	*7753*
Ex House/Paving	*640*
Ex Tennis Court	*566*
Ex Metal/Drive	*645*
Grass/Lawn	*5902*

55 Riddell Road	*Area(m2)*
Legal Lot Area	*8218*
Metal/impervious	*7807.1*
Pervious/Grass	*410.9*

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Job Title	39 Riddell Road, Kerikeri
Calc Title	Catchment A - Slope by Area Method
Job Number	10401

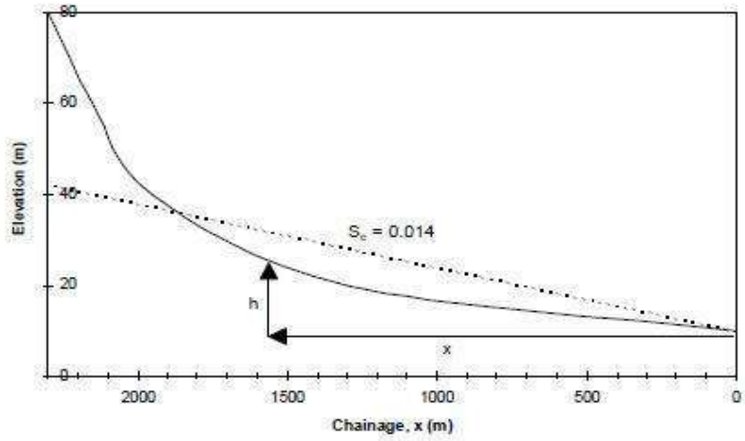
Author	GB	Checked	TS	Date	21/11/2025	Rev	A

Slope by Equal Area Method

Elev (m)	h (m)	x (m)	Delta Δx (m)	average h (m)	Delta Δ A (=h.Δx) (m^2)
70.46	0	0			
70.46	0	100	100	0	0
71.35	0.89	200	100	0.445	44.5
74.28	3.82	300	100	2.355	235.5
77	6.54	400	100	5.18	518
79	8.54	500	100	7.54	754
87.18	16.72	600	100	12.63	1263
101.72	31.26	700	100	23.99	2399
110	39.54	762	62	35.4	2194.8
			762		7408.8

Slope (Sc) **0.026**

Slope by equal area method:



elevation (m)	h (m)	x (m)	Δ x (m)	$\bar{h}$ (m)	Δ A (= $\bar{h}$. Δ x) (m^2)
10	0	0			
20	10	1300	1300	5	6500
40	30	1950	650	20	13000
60	50	2150	200	40	8000
80	70	2300	150	60	9000
			2300		36500

Slope, $S_c = \frac{2A}{L^2} = \frac{2(36500)}{2300^2} = 0.014$

Conquel Consulting

Job Title	39 Riddell Road, Kerikeri
Calc Title	Catchment A - Slope by Area Method
Job Number	10401

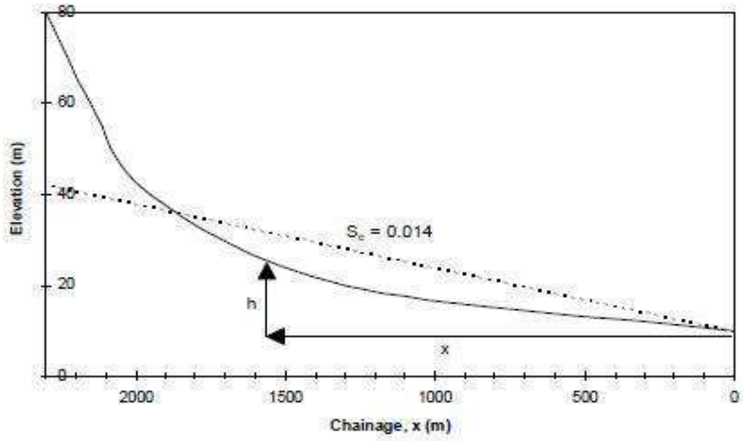
Author	GB	Checked	TS	Date	21/11/2025	Rev	A

Slope by Equal Area Method

Elev (m)	h (m)	x (m)	Delta Δx (m)	average h (m)	Delta Δ A (=h.Δx) (m^2)
70.46	0	0			
73.96	3.5	100	100	1.75	175
77.07	6.61	200	100	5.055	505.5
79.37	8.91	300	100	7.76	776
88.96	18.5	400	100	13.705	1370.5
98.19	27.73	500	100	23.115	2311.5
99	28.54	528.51	28.51	28.135	802.12885
			528.51		5940.62885

Slope (Sc) **0.043**

Slope by equal area method:



elevation (m)	h (m)	x (m)	Δ x (m)	$\bar{h}$ (m)	Δ A (= $\bar{h}$. Δ x) (m^2)
10	0	0			
20	10	1300	1300	5	6500
40	30	1950	650	20	13000
60	50	2150	200	40	8000
80	70	2300	150	60	9000
			2300		36500

Slope, $S_c = \frac{2A}{L^2} = \frac{2(36500)}{2300^2} = 0.014$

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Sheet 1 of 4

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Pre Development Catchment A Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Runoff Curve Number (CN) and initial Abstraction (Ia)

Soil name and classification	Cover description (cover type, treatment, and hydrologic condition)	Curve Number CN*	Area (ha) 10000m2=1 ha	Product of CN x area
C	Existing House/Driveway (Lot 4)	98	0.0611	5.99
C	Existing Pond	98	0.158	15.49
C	Upstream Properties Impervious (house/Paving)	98	0.4997	48.97
C	Existing Grazed Pasture	74	15.904	1176.86
* from Appendix B		Totals =	16.6224	1247.31

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1247.31}{16.622} =$ 75.0

Ia (weighted) = $\frac{5 \times \text{pervious area}}{\text{total area}} = \frac{5 \times 15.9}{16.622}$ 4.8 mm

2. Time of Concentration

Channelisation factor C = 1 (From Table 4.2)

Catchment length L = 0.762 km (along drainage path)

Catchment Slope Sc= 0.03 m/m (by equal area method)

Runoff factor, $\frac{CN}{200 - CN} = \frac{75.0}{200-75.0} =$ 0.60

$t_c = 0.14\ C\ L^{0.66}\ (CN/200\text{-}CN)^{-0.55}\ Sc^{-0.30}$

= 0.1 1 0.84 1.32 2.99 = 0.463 hrs

SCS Lag for HEC-HMS…. $t_p = 2/3\ t_c$ = 0.310 hrs

OK
use
0.46296658 hrs

Worksheet 1: Runoff Parameters and Time of Concentration

Conquel Consulting

Sheet 2 of 4

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Pre Development Catchment A Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Data

Catchment Area	A=	0.166224	km2(100ha =1km2)	
Runoff curve number	CN=	75.0	(from worksheet 1)	
Initial abstraction	Ia=	4.8	mm (from worksheet 1)	
Time of concentration	tc=	0.4629666	hrs (from worksheet 1)	

2. Calculate storage, S =(1000/CN - 10)25.4 = 84 mm

3. Average recurrence interval, ARI	100	(yr)	
4. 24 hour rainfall depth, P24	334.8	(mm)	FNDC 20% +CC
5. Compute c* = P24 - 2Ia/P24 - 2Ia+2S	0.658		
6. Specific peak flow rate q*	0.147		
7. Peak flow rate, $q_p=q^*A^*P_{24}$	**8.155**	(m3/s)	
8. Runoff depth, $Q_{24} = (P_{24}-Ia)^2/(P_{24}-Ia)+S$	262.7		
9. Runoff volume, $V_{24} = 1000xQ_{24}A$	43674.48	(m3)	

Note:
HIRDS V4 Depth-Duration-Frequency Results used for rainfall based upon FNDC 20% Climate Change increase

Worksheet 2: Graphical Peak Flow Rate

Conquel Consulting

Sheet 3 of 4

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Pre Development Catchment B Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Runoff Curve Number (CN) and initial Abstraction (Ia)

Soil name and classification	Cover description (cover type, treatment, and hydrologic condition)	Curve Number CN*	Area (ha) 10000m2= 1ha	Product of CN x area
C	55 Riddell Road - Impervious GWE Report)	98	0.7805	76.49
C	47 Riddell/39 Riddell Ex Impervious	98	0.2833	27.76
C	Existing Pasture	74	5.759	426.18
C				
* from Appendix B		Totals =	6.8230	530.43

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{530.43}{6.823} = 77.7$

Ia (weighted) = $\frac{5 \times \text{pervious area}}{\text{total area}} = \frac{5 \times 5.8}{6.823}$ 4.2 mm

2. Time of Concentration

Channelisation factor C = 1 (From Table 4.2)

Catchment length L = 0.528 km (along drainage path)

Catchment Slope Sc= 0.04 m/m (by equal area method)

Runoff factor, $\frac{CN}{200 - CN} = \frac{77.7}{200-77.7} = 0.64$

$t_c = 0.14\ C\ L^{0.66}\ (CN/200\text{-}CN)^{-0.55}\ Sc^{-0.30}$

= 0.1 1 0.66 1.28 2.57 = 0.303 hrs

SCS Lag for HEC-HMS…. $t_p = 2/3\ t_c$ = 0.203 hrs

RL Start	67	OK
RL End	27	use
Diff	40	0.3028085 hrs

Worksheet 1: Runoff Parameters and Time of Concentration

Conquel Consulting

Sheet 4 of 4

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Pre Development Catchment B Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Data

Catchment Area	A=	0.06823	km2(100ha =1km2)	
Runoff curve number	CN=	77.7	(from worksheet 1)	
Initial abstraction	Ia=	4.2	mm (from worksheet 1)	
Time of concentration	tc=	0.302808526	hrs (from worksheet 1)	

2. Calculate storage, S =(1000/CN - 10)25.4 = 73 mm

3.	Average recurrence interval, ARI	100	(yr)
4.	24 hour rainfall depth, P24	334.8	(mm) FNDC 20% +CC
5.	Compute c* = P24 - 2Ia/P24 - 2Ia+2S	0.692	
6.	Specific peak flow rate q*	0.150	
7.	Peak flow rate, $q_p=q^*A^*P_{24}$	**3.431**	
8.	Runoff depth, $Q_{24} = (P_{24}-Ia)^2/(P_{24}-Ia)+S$	271.0	
9.	Runoff volume, $V_{24} = 1000xQ_{24}A$	18488.32	(m3)

Catchment A run off volume	**43674.48**	(m3)
Catchment B run off volume	**18488.32**	(m3)
Catchment A flow rate	**8.15**	(m3/s)
Catchment B flow rate	**3.43**	(m3/s)
Total Flow Rate at Existing Pond	**11.59**	(m3/s)

Use this flow rate for overflow rate to check ford on JOAL 1

Worksheet 2: Graphical Peak Flow Rate

Conquel Consulting

Sheet 1

Job Title	**39 Riddell Road, Kerikeri**
Calc Title	**TP108 - Post Development Catchment A Discharge**
Job Number	**10401**

Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Runoff Curve Number (CN) and initial Abstraction (Ia)

Soil name and classification	Cover description (cover type, treatment, and hydrologic condition)	Curve Number CN*	Area (ha) 10000m2=1 ha	Product of CN x area
C	Existing House/Driveway (Lot 4)	98	0.0611	5.99
C	Proposed Houses/Paving (600m2 Impervious)	70	0.780	54.60
	Upstream Properties Impervious (house/Paving)	98	0.4997	48.97
C	Existing Pond	98	0.158	15.49
C	Proposed JOAL 1, 4	98	0.185	18.09
C	Proposed Reveg Planting	70	1.015	71.06
C	Proposed Lawn around houses	70	2.5606	179.24
C	Existing Grazed Pasture (upstream)	74	11.363	840.87
* from Appendix B		Totals =	16.6224	1234.32

CN (weighted) = total product / total area = 1234.32 / 16.622 = 74.3

Ia (weighted) = 5 x pervious area / total area = 5 x 14.9 / 16.622 = 4.5 mm

2. Time of Concentration

Channelisation factor C = 1 (From Table 4.2)

Catchment length L = 0.762 km (along drainage path)

Catchment Slope Sc= 0.03 m/m (by equal area method)

Runoff factor, CN / (200 - CN) = 74.3 / (200- 74.3) = 0.59

$t_c = 0.14\ C\ L^{0.66}\ (CN/200\text{-}CN)^{-0.55}\ Sc^{-0.30}$

= 0.1 1 0.84 1.34 2.99 = 0.467 hrs

SCS Lag for HEC-HMS…. $t_p = 2/3\ t_c$ = 0.313 hrs

OK
use
0.46724028 hrs

Worksheet 1: Runoff Parameters and Time of Concentration

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Sheet 2

Job Title	**85 Whitford Park Road**						
Calc Title	**TP108 - Post Development Catchment A Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Data

Catchment Area	A=	0.166224	km2(100ha =1km2)	
Runoff curve number	CN=	74.3	(from worksheet 1)	
Initial abstraction	Ia=	4.5	mm (from worksheet 1)	
Time of concentration	tc=	0.4672403	hrs (from worksheet 1)	

2. Calculate storage, S =(1000/CN - 10)25.4 = 88 mm

3. Average recurrence interval, ARI	100	(yr)	
4. 24 hour rainfall depth, P24	334.8	(mm)	FNDC 20% +CC
5. Compute c* = P24 - 2Ia/P24 - 2Ia+2S	0.649		
6. Specific peak flow rate q*	0.145		
7. Peak flow rate, $q_p=q^*A^*P_{24}$	**8.097**	(m3/s)	
8. Runoff depth, $Q_{24} = (P_{24}-Ia)^2/(P_{24}-Ia)+S$	260.8		
9. Runoff volume, $V_{24} = 1000xQ_{24}A$	43348.35	(m3)	

Note:

HIRDS V4 Depth-Duration-Frequency Results used for rainfall based upon FNDC 20% Climate Change increase

600m2 Impervious Areas within proposed sections taken as pervious due to stormwater mitigation devices required for 5, 10 and 100yr stormevents to 80% of pre-development levels

Worksheet 2: Graphical Peak Flow Rate

Conquel Consulting

Sheet 3

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Post Development Catchment B Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Runoff Curve Number (CN) and initial Abstraction (Ia)

Soil name and classification	Cover description (cover type, treatment, and hydrologic condition)	Curve Number CN*	Area (ha) 10000m2= 1ha	Product of CN x area
C	55 Riddell Road - Impervious GWE Report)	98	0.7805	76.49
C	47 Riddell/39 Riddell Ex Impervious	98	0.2833	27.76
C	Proposed Houses/Paving (600m2 Impervious)	70	0.840	58.80
C	Proposed JOALS 2, 3 and 4 (part)	98	0.264	25.90
	Proposed Lawn,Grass, Planting	70	4.655	325.84
* from Appendix B		Totals =	6.8230	514.80

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{514.80}{6.823} = 75.5$

Ia (weighted) = $\frac{\text{5 x pervious area}}{\text{total area}} = \frac{5 \times 4.7}{6.823}$ 3.4 mm

2. Time of Concentration

Channelisation factor C = 1 (From Table 4.2)

Catchment length L = 0.528 km (along drainage path)

Catchment Slope Sc= 0.04 m/m (by equal area method)

Runoff factor, $\frac{CN}{200 - CN} = \frac{75.5}{200-75.5} = 0.61$

$t_c = 0.14\ C\ L^{0.66}\ (CN/200\text{-}CN)^{-0.55}\ Sc^{-0.30}$

= 0.1 1 0.66 1.32 2.57 = 0.311 hrs

SCS Lag for HEC-HMS…. $t_p = 2/3\ t_c$ = 0.208 hrs

RL Start	67	OK
RL End	27	use
Diff	40	0.3109935 hrs

Worksheet 1: Runoff Parameters and Time of Concentration

Conquel Consulting

Sheet 4

Job Title	**39 Riddell Road, Kerikeri**						
Calc Title	**TP108 - Post Development Catchment B Discharge**						
Job Number	**10401**						
Author	GB	**Checked**	TS	**Date**	19/11/2025	**Rev**	A

1. Data

Catchment Area	A=	0.06823	km2(100ha =1km2)	
Runoff curve number	CN=	75.5	(from worksheet 1)	
Initial abstraction	Ia=	3.4	mm (from worksheet 1)	
Time of concentration	tc=	0.310993474	hrs (from worksheet 1)	

2. Calculate storage, S =(1000/CN - 10)25.4 = 83 mm

3.	Average recurrence interval, ARI	100	(yr)
4.	24 hour rainfall depth, P24	334.8	(mm) FNDC 20% +CC
5.	Compute c* = P24 - 2Ia/P24 - 2Ia+2S	0.665	
6.	Specific peak flow rate q*	0.147	
7.	Peak flow rate, $q_p=q^*A^*P_{24}$	**3.365**	
8.	Runoff depth, $Q_{24} = (P_{24}-Ia)^2/(P_{24}-Ia)+S$	265.2	
9.	Runoff volume, $V_{24} = 1000xQ_{24}A$	18097.32	(m3)

Catchment A run off volume	**43348.35**	(m3)
Catchment B run off volume	**18097.32**	(m3)
Catchment A flow rate	**8.10**	(m3/s)
Catchment B flow rate	**3.36**	(m3/s)
Total Flow Rate at Existing Pond	**11.46**	(m3/s)

600m2 Impervious Areas within proposed sections taken as pervious due to stormwater mitigation devices required for 5, 10 and 100yr stormevents to 80% of pre-development levels

Worksheet 2: Graphical Peak Flow Rate

CONQUEL CONSULTANTS

Job Number	Sheet	Rev		Author	Date	Checked	
10401	1	A	Calc Title: 100YR overland Flow	GB	28/11/2025	TS	

2.1c increase

Rainfall Depth	HIRDS V4 100YR	
HIRDs Rainfall	279	
Climate change Increase	334.8	

Far North Climate Change 20%

Pipe ks factor = 0.15 mm (pipes up to 1.0m dia)
0.6 mm (pipes over 1.0m dia)

Use flows for checking 100yr Flowpaths and culvert crossings within site

	CN Number	
Impervious area	98	
Pervious	74	
Proposed JOALS	88.4	Equivalent CN - (60% impervious coverage, 40% pervious coverage)
THAB & local business	93.2	Equivalent CN - (80% impervious coverage, 20% pervious coverage)
Rural Residential Lots	78.8	Equivalent CN - (20% impervious coverage, 80% pervious coverage)

CATCHMENT	Flow From	SW Line	Catchment Area	CN	Peak Flow rate - 100YR ARI	Cum. Flow	Pipe dia	Gradient	Capacity	Percent Capacity	Remaining	Velocity	Check
number	*description*	*letter*	*m2*		*l/s*	*l/s*	*m*	*%*	*l/s*	*%*	*l/s*	*m/s*	OK
Catchment A and B - JOAL and Swale Sizing													
A	LOTS	JOAL Channel	3551	78.8	178.6	178.6							
A	JOAL	JOAL Channel	967	88.4	52.2	230.8	Refer to Section DD for mannings calcs						
B	LOTS	Flowpath/Pipe	1335	78.8	67.2	298.0	Refer to Section EE for mannings calcs						
Catchment C and D - Swale Sizing													
C	LOTS	Flowpath	5640	78.8	283.7	283.7	Refer to Section FF for mannings calcs						
D	LOTS	Flowpath	3359	78.8	169.0	452.7	Refer to Section GG for mannings calcs						
Catchment E - JOAL swale sizing													
E	JOAL	JOAL Swale	1327	88.4	71.6	71.6	Refer to Section HH for mannings calcs						
Catchment F, G, H - JOAL swale sizing													
F	LOTS	JOAL Channel	3476	78.8	174.9	174.9							
F	JOAL	JOAL Channel	1218	88.4	65.7	240.6	Refer to Section II for mannings calcs						
G	JOAL	Swale	615	88.4	33.2	273.8	Refer to Section JJ for mannings calcs						
H	JOAL	Swale	1649	88.4	89.0	362.8	Refer to Section KK for mannings calcs						
Catchment I, J, K, L, M - Swale, Culvert sizing													
I	JOAL	Swale	615	88.4	33.2	33.2							
J	JOAL	Swale	1294	88.4	69.8	103.0							
K	LOTS	Culvert	13105	78.8	659.2	762.3							
L	LOTS	Culvert	7805	98.0	434.3	1196.5							
L	LOTS	Culvert	417	74.0	19.9	1216.5							
M	JOAL	Culvert	2078	88.4	112.2	1328.6	Refer to Section MM for mannings calcs						

Note: Flows calculated on MPD ignoring detention/mitigation of flows and includes climate change

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Job Number	Sheet	Rev		Author	Date	Checked	
10401	2	A	Calc Title: 100YR overland Flow	GB	28/11/2025	TS	

2.1c increase

Rainfall Depth	HIRDS V4 100YR	
HIRDs Rainfall	279	
Climate change Increase	334.8	Far North Climate Change 20%

Pipe ks factor = 0.15 mm (pipes up to 1.0m dia)
0.6 mm (pipes over 1.0m dia)

	CN Number	
Impervious area	98	
Pervious	74	
Proposed JOALS	88.4	Equivalent CN - (60% impervious coverage, 40% pervious coverage)
THAB & local business	93.2	Equivalent CN - (80% impervious coverage, 20% pervious coverage)
Rural Residential Lots	78.8	Equivalent CN - (20% impervious coverage, 80% pervious coverage)

Use flows for checking 100yr Flowpaths and culvert crossings within site

CATCHMENT	Flow From	SW Line	Catchment Area	CN	Peak Flow rate - 100YR ARI	Cum. Flow	Pipe dia	Gradient	Capacity	Percent Capacity	Remaining	Velocity	Check
number	*description*	*letter*	*m2*		*l/s*	*l/s*	*m*	*%*	*l/s*	*%*	*l/s*	*m/s*	OK
Catchment N, O, P - Swale, JOAL 3 Culvert sizing													
Incoming Flow	Catchment F, G, H					362.8							
Incoming Flow	Catchment I, J, K, L, M					1328.6							
N	JOAL	Swale	1062	88.4	57.3	1748.8	Refer Section LL for Mannings calcs (total flow 57.3l/s)						
O	LOTS	Swale	3444	78.8	173.2	1922.0	Refer Section NN for Mannings calcs						
P	LOTS	Culvert	8574	78.8	431.3	2353.3	Refer Section OO for Mannings calcs						
Catchment Q - Existing Swale to Pond													
Incoming flow catchment F, G, H, I, J, K, L, M						2353.3							
Q	LOTS	Swale	11385	78.8	572.7	2926.0	Refer Section PP for Mannings calcs						
Catchment R, S, T, U - JOAL swale sizing													
R	LOTS	2-1 to 1-3	4191	78.8	210.8	210.8							
S	JOAL	Channel	1096	88.4	59.2	270.0	Refer Section QQ for Mannings calcs						
T	LOTS		5662	78.8	284.8	554.8							
U	JOAL	Swale	928	88.4	50.1	604.9	Refer Section RR for Mannings calcs						

Note: Flows claculated on MPD ignoring detention/mitigation of flows and includes climate change

Conquel Consulting						Sheet	1 of 7
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section AA - Natural Watercourse/Wetland

Channel depth	1.5	m	
Overland channel slope (m/m)	0.015	m/m	
Cross section area (A)	9.759	m^2	
Wetted perimiter (P)	25.261	m	
Hydraulic radius (=A/P)	0.386		
Mannings n	0.070	Natural Channel with reveg	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	0.929	m/sec	Worst Case very conservative
			100yr Flow (TP108 Calcs)
Overland flowpath discharge (Q) (=V*A)	9063	l/sec	8.198 m3/s
	9.06284997	M3/S	

Section BB - Natural Watercourse/Wetland

Channel depth	1.4	m	
Overland channel slope (m/m)	0.015	m/m	
Cross section area (A)	8.811	m^2	
Wetted perimiter (P)	20.108	m	
Hydraulic radius (=A/P)	0.438		
Mannings n	0.070	Natural Channel with reveg	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	1.010	m/sec	100yr Flow (TP108 Calcs)
			8.198 m3/s
Overland flowpath discharge (Q) (=V*A)	8898	l/sec	

Section CC - Natural Watercourse/Wetland

Channel depth	0.65	m	
Overland channel slope (m/m)	0.03	m/m	
Cross section area (A)	6.515	m^2	
Wetted perimiter (P)	15.23	m	
Hydraulic radius (=A/P)	0.428		
Mannings n	0.070	Natural Channel with reveg	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	1.406	m/sec	100yr Flow (TP108 Calcs)
			8.198 m3/s
Overland flowpath discharge (Q) (=V*A)	9157	l/sec	

Conquel Consulting

Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section DD - JOAL 4 Section

Channel depth	0.08	m	
Overland channel slope (m/m)	0.07	m/m	
Cross section area (A)	0.145	m^2	
Wetted perimiter (P)	3.141	m	
Hydraulic radius (=A/P)	0.046		
Mannings n	0.013	Broomed Concrete JOAL	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.624	m/sec	
Overland flowpath discharge (Q) (=V*A)	381	l/sec	100yr Flow (TP108 Calcs) 0.231 m3/s

Section EE - Lot 21 Overland Flowpath

Channel depth	0.2	m	
Overland channel slope (m/m)	0.18	m/m	
Cross section area (A)	0.12	m^2	
Wetted perimiter (P)	1.265	m	
Hydraulic radius (=A/P)	0.095		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.946	m/sec	100yr Flow (TP108 Calcs) 0.298 m3/s
Overland flowpath discharge (Q) (=V*A)	354	l/sec	

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Section FF - Lot 16 and 17 Overland Flowpath

Channel depth	0.25	m		
Overland channel slope (m/m)	0.025	m/m	Start RL	84.3
			End RL	81.7
Cross section area (A)	0.238	m^2	Diff	2.6
			Distance	103
Wetted perimiter (P)	1.78	m	Grade	0.025
Hydraulic radius (=A/P)	0.134			
Mannings n	0.030	Grass Swale 1 in 3 sides		
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	1.380	m/sec	100yr Flow (TP108 Calcs) 0.284 m3/s	
Overland flowpath discharge (Q) (=V*A)	328	l/sec		

Conquel Consulting						Sheet	3 of 7
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section GG - Lot 19 Overland Flowpath

Channel depth	0.15	m		
Overland channel slope (m/m)	0.128	m/m	Start RL	81.7
			End RL	73.1
Cross section area (A)	0.238	m^2	Diff	8.6
			Distance	67
Wetted perimiter (P)	1.78	m	Grade	0.128
Hydraulic radius (=A/P)	0.134			
Mannings n	0.030	Grass Swale 1 in 3 sides		
Velosity V = $R^{(2/3)}$ $S^{(1/2)}$/n	3.123	m/sec		
			100yr Flow (TP108 Calcs)	
Overland flowpath discharge (Q) (=V*A)	743	l/sec	0.452	m3/s

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Section HH - JOAL 1 Overland Flowpath

Channel depth	0.2	m	
Overland channel slope (m/m)	0.0168	m/m	From Roading Plans
Cross section area (A)	0.12	m^2	
Wetted perimiter (P)	1.265	m	
Hydraulic radius (=A/P)	0.095		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity V = $R^{(2/3)}$ $S^{(1/2)}$/n	0.900	m/sec	100yr Flow (TP108 Calcs)
			0.71 m3/s
Overland flowpath discharge (Q) (=V*A)	108	l/sec	

Section II - JOAL 4 Western End

Channel depth	0.07	m	
Overland channel slope (m/m)	0.05	m/m	From Roading Plans
Cross section area (A)	0.145	m^2	
Wetted perimiter (P)	3.141	m	
Hydraulic radius (=A/P)	0.046		
Mannings n	0.013	Broomed Concrete JOAL	
Velosity V = $R^{(2/3)}$ $S^{(1/2)}$/n	2.218	m/sec	100yr Flow (TP108 Calcs)
			0.241 m3/s
Overland flowpath discharge (Q) (=V*A)	322	l/sec	

Conquel Consulting						Sheet	4 of 7
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section JJ - JOAL 2 CH290

Channel depth	0.2	m	
Overland channel slope (m/m)	0.115	m/m	
Cross section area (A)	0.141	m^2	
Wetted perimiter (P)	1.463	m	
Hydraulic radius (=A/P)	0.096		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.380	m/sec	
Overland flowpath discharge (Q) (=V*A)	336	l/sec	100yr Flow (TP108 Calcs) 0.273 m3/s

Section KK - JOAL 2 CH200

Channel depth	0.25	m	
Overland channel slope (m/m)	0.071	m/m	From Roading Plans
Cross section area (A)	0.22	m^2	
Wetted perimiter (P)	1.83	m	
Hydraulic radius (=A/P)	0.120		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.167	m/sec	100yr Flow (TP108 Calcs) 0.362 m3/s
Overland flowpath discharge (Q) (=V*A)	477	l/sec	

Section LL - JOAL 2 CH140

Channel depth	0.25	m	
Overland channel slope (m/m)	0.008	m/m	From Roading Plans
Cross section area (A)	0.22	m^2	
Wetted perimiter (P)	1.83	m	
Hydraulic radius (=A/P)	0.120		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	0.727	m/sec	100yr Flow (TP108 Calcs) 0.112 m3/s
Overland flowpath discharge (Q) (=V*A)	160	l/sec	

Conquel Consulting						Sheet	5 of 7
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section MM - JOAL 2 CH167 (Low point 100YR Overflows JOAL)

Channel depth	0.1	m	
Overland channel slope (m/m)	0.03	m/m	
Cross section area (A)	0.896	m^2	
Wetted perimiter (P)	14.646	m	
Hydraulic radius (=A/P)	0.061		
Mannings n	0.013	Chipseal or Concrete Finish	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.072	m/sec	
Overland flowpath discharge (Q) (=V*A)	1857	l/sec	100yr Flow (TP108 Calcs) 1.328 m3/s
Traffic Accessibility Check			0.21 m2/sec
Complies Austroads Residential			<0.35 m2/sec

Section NN - Flowpath through site

Channel depth	0.45	m	
Overland channel slope (m/m)	0.026	m/m	
Cross section area (A)	1.046	m^2	
Wetted perimiter (P)	3.629	m	
Hydraulic radius (=A/P)	0.288		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.347	m/sec	100yr Flow (TP108 Calcs) 2.353 m3/s
Overland flowpath discharge (Q) (=V*A)	2455	l/sec	

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Section OO - JOAL 3 CH86 (Low point 100YR Overflows JOAL)

Channel depth	0.12	m	
Overland channel slope (m/m)	0.03	m/m	
Cross section area (A)	0.82	m^2	
Wetted perimiter (P)	8.006	m	
Hydraulic radius (=A/P)	0.102		
Mannings n	0.013	Chipseal or Concrete Finish	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.921	m/sec	100yr Flow (TP108 Calcs) 2.353 m3/s
Overland flowpath discharge (Q) (=V*A)	2395	l/sec	
Traffic Accessibility Check			0.35 m2/sec
Complies Austroads Residential			<0.35 m2/sec

Conquel Consulting					Sheet	6 of 7	
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

Section PP - Flowpath through site

Channel depth	0.4	m	
Overland channel slope (m/m)	0.02	m/m	
Cross section area (A)	1.35	m^2	
Wetted perimiter (P)	4.363	m	
Hydraulic radius (=A/P)	0.309		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	2.158	m/sec	
Overland flowpath discharge (Q) (=V*A)	2914	l/sec	100yr Flow (TP108 Calcs) 2.926 m3/s

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Section QQ - JOAL 1 CH130

Channel depth	0.3	m	
Overland channel slope (m/m)	0.033	m/m	
Cross section area (A)	0.273	m^2	
Wetted perimiter (P)	1.915	m	
Hydraulic radius (=A/P)	0.143		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	1.655	m/sec	100yr Flow (TP108 Calcs) 0.27 m3/s
Overland flowpath discharge (Q) (=V*A)	452	l/sec	

Section RR - JOAL 1 CH190

Channel depth	0.35	m	
Overland channel slope (m/m)	0.039	m/m	
Cross section area (A)	0.373	m^2	
Wetted perimiter (P)	2.246	m	
Hydraulic radius (=A/P)	0.166		
Mannings n	0.030	Grass Swale 1 in 3 sides	
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	1.991	m/sec	100yr Flow (TP108 Calcs) 0.605 m3/s
Overland flowpath discharge (Q) (=V*A)	743	l/sec	

Conquel Consulting						Sheet	7 of 7
Job Title	39 Riddell Road, Kerikeri						
Calc Title	Mannings 100yr Flowpath Calculation						
Job Number	10401						
Author	GB	Checked	TS	Date	28/11/2025	Rev	A

JOAL 1 - 100yr overflow Existing Pond

Channel depth	0.24	m	
Overland channel slope (m/m)	0.03	m/m	
Cross section area (A)	2.78	m^2	
Wetted perimiter (P)	14.272	m	
Hydraulic radius (=A/P)	0.195		
Mannings n	0.013		
Velosity $V = R^{(2/3)} S^{(1/2)}/n$	4.482	m/sec	100yr Flow (TP108 Calcs) 11.66 m3/s
Overland flowpath discharge (Q) (=V*A)	12460	l/sec	

Traffic Accessibility Check	1.08	m2/sec
Austroads Residential	<0.35	m2/sec
Austroads Industrial/Trucks	<0.8	m2/sec
AustRoads Depth Flow	<0.3	m

Note: Existing Scenaro to house on 39 Riddell Road has been improved from existing with longer shallower spillway to lower velocity and flood depth of crossing
Warning signs to be installed at crossing point

Peak Water Level at Pond	
Spillway Invert	71
100YR water level	71.24
Existing Pipe Outlet	70.46
Depth Pond (Spillway)	0.54
Peak Depth Pond	0.78

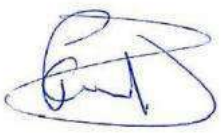
DOCUMENT CONTROL RECORD

Client:	Taraire Tahi Ltd
Project description:	Site Suitability Geotechnical report
Client address:	39 Riddell Road, Kerikeri
Date of issue:	Thursday, 6 November 2025
Status:	Issued

Originator

Emily Thompson
Civil & Geotechnical Engineer
BE (Hons)

Reviewer/ Approved for issue:



P. Cook
Chartered Professional Geotechnical Engineer
MACENZ, CMEngNZ, MInstD, CPEng, IntPE (NZ),
BE (Hons), Dip Ag.

Office of origin:	Whangārei
Telephone:	09 438 9529
Contact email:	ccl@coco.co.nz

Version	Date	Comment	By
VERSION 1	6/11/2025	Approved	P. Cook

Table of Contents

1. Executive Summary 5
2. Introduction 6
2.1. Relevant Documentation 6
2.2. Building Code – B1 Good ground definition 6
3. Desktop Study 7
3.1. Site Description 7
3.2. Proposed Development 7
3.3. Published Geology 7
3.4. Hazards 8
4. Ground Investigation 10
4.1. Site walkover observations 10
4.2. Hand Auger Investigations 10
4.3. Scala Penetrometer Investigations 11
4.4. Water Table 13
4.5. Soakage Test – Falling Head Percolation Test 13
5. Geotechnical Assessment 14
5.1. Site Subsoil Profile 14
5.2. Site Subsoil Classification 16
5.3. Expansive soils assessment 16
5.4. Foundation assessment 16
5.4.1. Shallow foundation 17
5.4.1.1. Lots 1-3, 5 - 15,18 17
5.4.1.2. Lot 25-28 17
5.4.1.3. Lot 16,17,19-24,29,30 17
5.4.2. Pile foundation (All Lots) 17
5.4.3. Liquefaction 18
5.4.4. Soil Permeability 18
5.4.5. CBR for Roading 18
5.4.6. Earthworks 18
6. Conclusions 20
7. Limitations 22
Appendix 1: Site Testing Plan 23

Appendix 2: Provided Proposed Plans 24
Appendix 3: Testing Results 25

1. Executive Summary

Site Classification:

NZ Building Code Expansive Soil Class	H – Highly Expansive Soils
AS/NZS 1170.5 Soil Class	C – Shallow soil sites

Bearing Bearing Capacity Summary:

Depth to 200kPa Uncorrected Ultimate Bearing Capacity:	0.3 mbgl
Depth to 300kPa Uncorrected Ultimate Bearing Capacity:	1.0 mbgl

Site Foundation Options:

Shallow Foundations:	Stiffened slab (i.e. RibRaft) foundation can be designed for a UBC of 200 kPa or 300 kPa UBC if founded a minimum of 0.3 m or 1.0m below the existing ground level, below any topsoil, respectively. (Dependant on area) The stiffened slab should be specifically designed in accordance with NZ Building Code Clause B1 for Class 'H' soils for a characteristic surface movement of 78 mm.
Pile Foundations:	Specifically designed piles foundations embedded to a minimum depth of 1.5 mbgl, adhering to NZ Building code B1/VM2. Pile foundation design should be carried out in accordance with NZ Building Code B1/VM2 and will require specific engineering design by a suitably qualified engineer.

2. Introduction

Cook Costello has been engaged by Taraire Tahi Ltd to provide a Geotechnical Report for use in a resource consent for the Far North District Council.

This report provides a geotechnical assessment for the proposed subdivision of located at 39 Riddell Road, Kerikeri.

A site testing plan is attached as Appendix 1, showing the property boundaries and associated site investigations.

2.1. Relevant Documentation

- AS 2870: 2011 - Construction of residential slabs and footings
- NZS 3604: 2011 - Timber-framed buildings
- NZS 1170.5:2005 – Structural design actions – Part 5: Earthquake actions
- NZS 4431:2022 – Engineered fill construction for lightweight structures
- NZS 4402:1986 - Methods of testing soils for civil engineering purposes
- Whangarei District Council: GIS Maps
- Northland Regional Council: GIS Maps
- Resource Management Act 1991
- GD07
- NZBC E1/VM1
- NZBC B1/AS1 & B1/VM2

2.2. Building Code – B1 Good ground definition

The requirement for specific engineer design is dependent on whether or not the site subsoils fall within the NZS3604:2011 & B1/AS1 definition of 'good ground'. 'Good Ground' – means any soil or rock capable of permanently withstanding an ultimate bearing pressure of 300 kPa (i.e. a dependable bearing capacity of 150 kPa using a reduction factor of 0.5) but excludes;

a) Potentially compressible ground such as topsoil, soft soils such as clay which can be moulded easily in the fingers, and uncompacted loose gravel which contains obvious voids,

b) Expansive soils being those that have a liquid limit of more than 50% when tested in accordance with NZS 4402 Test 2.2 and linear shrinkage of more than 15% when tested from the liquid limit in accordance with NZS 4402 Test 2.6 and,

c) Any ground which could foreseeably experience a movement of 25 mm or greater for any reason including one or a combination of the following: land instability, ground creep, subsidence, seasonal swelling and shrinking, frost heave, changing groundwater level, erosion, dissolution of soil in water, and effects of tree roots.

3. Desktop Study

3.1. Site Description

The property at 39 Riddell Road, Kerikeri, has a legal description of Lot 2 DP 543664. The property currently has 2 dwellings. The balance area is mostly covered with grassland and vegetation on the north-eastern side of the property. The property has a total survey area of 10.6 ha. It is sloping at various angles across the site, ranging from 2-8˚ considered to be gently sloping. The approximate site boundary is shown in Figure 1.

Figure 1: Map showing the property and the property boundary.

3.2. Proposed Development

It is proposed that the property be subdivided into 30 lots. Plans of the proposed lot layout by Conquel Consulting are provided in Appendix 2.

3.3. Published Geology

The GNS Science online geology map defines the underlying geology of the site as being Kerikeri Volcanic Group in the north of the property, consisting of basalt lava, volcanic plugs and minor tuff.

The southern side of the property is mapped as Waipapa Group Sandstone and siltstone, consisting of massive to thin-bedded, lithic volcaniclastic metasandstone and argillite, with tectonically enclosed basalt, chert and siliceous argillite.

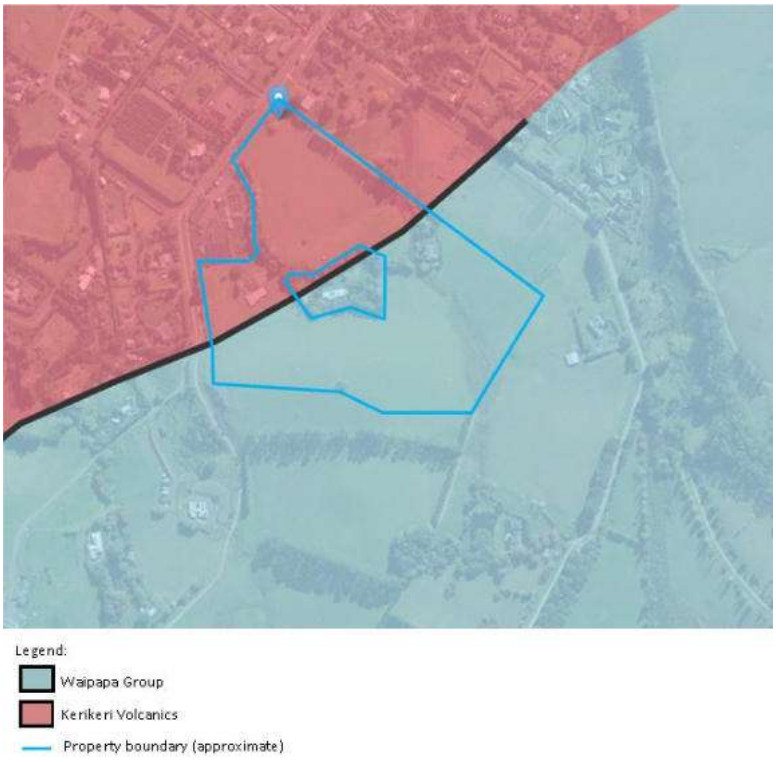


Figure 2: 1:250k GNS Geological Map.

The soil type of the property is mapped on the Northland Regional Council's Soils factsheet viewer as Kerikeri friable clay belonging to the mature basalt volcanic soils (KE). Some areas may contain boulders formed by long-term erosion and weathering along the edges of old basalt flows. These soils can experience erosion, including sheet and rill erosion which is commonly associated with surface runoff of sloping terrain.

This property is also mapped as Hukerenui silt loam, old greywacke soils (Hkr). This soil type developed under kauri forest on ridge tops and lower slopes. These soils can experience sheet and split erosion along with gully erosion.

These are regionally scaled documents and should not be relied on for site-specific acceptance.

3.4. Hazards

The Northland Regional Council has information regarding the tsunami inundation zone, and river flood hazards. The Northland Regional Council has mapped the property as being in a safe tsunami inundation zone. The property is mapped as being outside any identified river flood hazard area, as seen in Figure 3. Far North District Council does not have any information regarding land instability. Based on local geological knowledge and engineering judgement of the Northland region, slope stability issues are considered unlikely at this site due to the underlying geology and generally low slope angles. Whangarei District Council has information regarding acid sulphate soils risk. The property is mapped as not having acid sulphate soils risk. The Far North District Council has information regarding

liquefaction potential and erosion-prone land. The property is mapped as unlikely liquefaction vulnerability or undetermined.

These are regionally scaled documents and should not be relied on for site-specific information.

Figure 3: River flood hazard, NRC hazard maps

4. Ground Investigation

A site visit was undertaken by a Cook Costello Geotechnical Engineer on 22nd October 2025. A ground investigation was undertaken across the site, with the following investigation points undertaken within the area of the proposed accommodation units:

- 12 no. Hand augers (HA01 - HA12) to determine the nature of near-surface soils
- 12 no. Scala penetrometer (SP01 - SP12) tests to determine the strength/stiffness of near-surface soils
- 2 no. Soakage tests.

The test locations are shown on the site investigation plan attached as Appendix 1. Full test results can be found in Appendix 3.

4.1. Site walkover observations

A site walkover was carried out by a Cook Costello geotechnical engineer on 21st October 2025. The following observations were noted:

- The site is gently sloping to flat.
- The lot is mostly covered in short grass with a few small plants and a few larger plants, which acts as a boundary for the paddock in some locations.
- No signs of instability were observed.
- Uneven ground was noted by cattle.
- A pipe was out, letting water into the proposed lots 14 and 18, causing saturated soils in this area

4.2. Hand Auger Investigations

The results from the hand auger investigation carried out at the site are summarised in Table 1. The location of the tests is shown in Appendix 1. For more detailed logs and testing results, refer to Appendix 3.

Table 1: Summary of Hand Auger results.

Test ID	Depth (mbgl)[1]	Groundwater depth (mbgl)	Test Results		
			(mbgl)	Soil Type	Undrained shear strength, Su (kPa
HA01	2.5 (Too Hard)	>2.5 (not encountered)	0.0 - 0.7	Clayey **GRAVEL**, brown. Soft, moist, low plasticity.	0.5m: N/A
			0.7 - 1.5	Silty **CLAY** with gravels, brown, mottled orange. Soft, moist, moderate plasticity.	1.0m: 198+ 1.5m:198+ 2.0m: 141/113 2.5m: 167/57

Test ID	Depth (mbgl)[1]	Groundwater depth (mbgl)	Test Results		
			(mbgl)	Soil Type	Undrained shear strength, Su (kPa
HA02	1.5 (Too Hard)	>1.5 (not encountered)	0 - 0.8	Silty **CLAY** with traces of gravels, dark brown. Very stiff, dry, low plasticity.	0.6m: 198+ 1.0m: 198+ 1.5m: 198+
HA03	2.0 (Too Hard)	>2.0 (not encountered)	0-1.5	Silty **CLAY**, brown, Stiff, moist, moderate plasticity.	0.5m:198+ 1.0m:198+
			1.5-1.85	Silty **CLAY** traces of gravels, light brown, stiff, moist, moderate plasticity.	1.5:198+
			1.85 - 2.0	Clayey **GRAVELS**, light grey, very stiff, moist, low plasticity.	
HA04	1.8 (Too Hard)	>1.8 (not encountered)	0-1.8	Clayey **SILT**, white with brown streaks. Stiff to very stiff, moist, moderate plasticity.	0.5m: 178/54 1.0m: 198+ 1.5m:198+
HA05	0.8 (Too Hard)	>0.8 (not encountered)	0 - 0.4	Clayey **SILT**, light grey with brown specks. Stiff, dry, moderate plasticity.	
			0.4 - 0.8	Silty **CLAY** with minor gravels, grey mottled brown, very hard, moist, high plasticity Gravels: brown, rounded, weak	0.5m: UTP
HA06	1.7 (Too Hard)	>1.7 (not encountered)	0 - 0.9	Clayey **SILT**, orangey brown. Stiff, moist, low plasticity	0.5m: 144/60
			0.9 - 1.7	Silty **CLAY**, yellowish light brown mottled light grey. Stiff, moist, moderate plasticity. colour lightening with depth.	1.0m: 156/60 1.5m: 171/96
HA07	1.5 (Too Hard)	>1.5(not encountered)	0-1.5	**SILT**, white mottled brown, stiff, moist, low plasticity.	0.5m: 167/48 1.0m: 134/31 1.5m:180/61
HA08	1.0 (Too Hard)	>1.0 (not encountered)	0-0.35	SILT with traces of rootlets and some gravels, grey, stiff, moist, low plasticity	0.5:106
			0.35-1.0	Clayey SILT, brown, very stiff to hard, dry, moderate plasticity	1.0:198+
HA09	2.3(Too Hard)	>2.3 (not encountered)	0-2.3	SILT with traces of fine sand, white mottled brown with streak of orange, stiff to very stiff, dry, low plasticity	0.5:178/47 1.0:185/50 1.5:156/48 2.0:198+
HA10	1.0(Too Hard)	>1(not encountered)	0-1.0	Silty CLAY, yellowish brown mottled grey, firm, moist, moderate plasticity	0.5:170/74 1.0:136/43
HA11	1.5 (Too Hard)	>1.5 (not encountered)	0-0.7	Clayey SILT, dark brown, stiff, moist, moderate plasticity	0.5:198+
			0.7-1.5	Silty CLAY with traces gravel and coarse sand, yellowish brown, stiff, moist, moderate plasticity Gravels: grey, weak, >2mm	1.0: NA 1.5: 153/85
HA12	1.5 (Too Hard)	>1.5 (not encountered)	0-1.5	Silty CLAY, yellowish light brown, stiff, moist, moderate plasticity	0.5:177/70 1.0:184/78 1.5:173

1. mbgl = meters below ground level

4.3. Scala Penetrometer Investigations

Scala penetrometer results show that an ultimate bearing capacity (UBC) is in excess of 200 kPa (100 kPa dependable) from approximately 0.3 m below the existing ground level across the site, below any

topsoil or fill. An ultimate bearing capacity is in excess of 300 kPa (150 kPa dependable) from approximately 1.0 m below the existing ground level, below any topsoil or fill. The results from the Scala penetrometer test carried out at the site are summarised in Table 3.

Uncorrected ultimate bearing capacities derived from Scala penetrometer tests were estimated using the procedure presented by M.J. Stockwell in the paper 'Determination of allowable bearing pressure under small structures (June 1977)'. Bearing capacities should be corrected for the proposed foundation dimensions once these are known.

Table 2: Summary of uncorrected ultimate bearing capacity identified at each SP location.

Test ID	Depth Below Ground (m)	Scala Penetrometer (blows/100mm)	Uncorrected Ultimate Bearing Capacity (kPa)
SP01	0.1	4	>300
SP02	0.1	2	>300
SP03	0.1	3	>300
SP04	0.2	2	>200
	0.8	3	>300
SP05	0.2	3	>300
SP06	0.1	2	>200
	0.3	3	>300
SP07	0.2	2	>200
	0.8	3	>300
SP08	0.1	2	>200
	0.3	3	>300
SP09	0.3	2	>200
	0.4	3	>300
SP10	0.1	2	>200
	0.4	3	>300
SP11	0.1	2	>200
	0.2	3	>300

Test ID	Depth Below Ground (m)	Scala Penetrometer (blows/100mm)	Uncorrected Ultimate Bearing Capacity (kPa)
SP12	0.1	2	>200
	1.0	3	>300

4.4. Water Table

The groundwater table (during early spring) was not encountered within the hand auger at a depth of 2.5 mbgl.

4.5. Soakage Test – Falling Head Percolation Test

Two falling head percolation tests were conducted by Cook Costello Geotechnical Engineers on 21st October 2025. The soakage tests and results represented in this report were carried out in accordance with 'Stormwater Soakage and Groundwater Recharge in the Auckland Region' Guideline Document 2021/007 Version 1 (GD07).

The percolation test results were used to analyse the hand auger holes capacity for soakage using Worksheet 1 of GD07. An additional analysis of the completed soakage test results was done in accordance with Section 9.0.2 of Building Code E1/VM1. Both sets of results are shown in Table 3.

Table 3: Soakage test results

Soakage Pit ID	Test Duration (min)	Hole Width (m)	Hole Depth (m)	Groundwater Level (mbgl)	Percolation Rate (L/min/m^2)		Percolation rate E1/VM1 Section 9.0.2 (mm/hr)[2]
					Tested Rate[1]	Factored Rate[1]	
HA01	240	0.1	1.5	>1.5	0.019	0.0073	47
HA12	240	0.1	1.5	>1.5	0.0042	0.0015	13

1 – Soakage Rate determined by GD07.
2 – Soakage Rate determined by Section 9.0.2 of Building Code E1/VM1.
3 – FoS determined using Consequences of failure Level 2 (1.5) and Testing Quality Level 3 (1.8) from GD07.

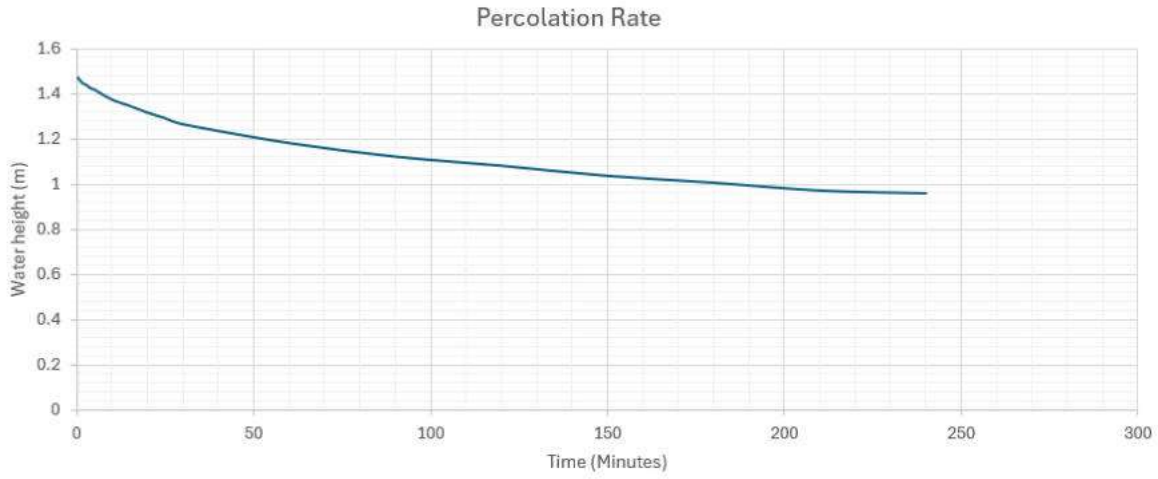


Figure 4 Hand Auger 1 Percolation test #2.

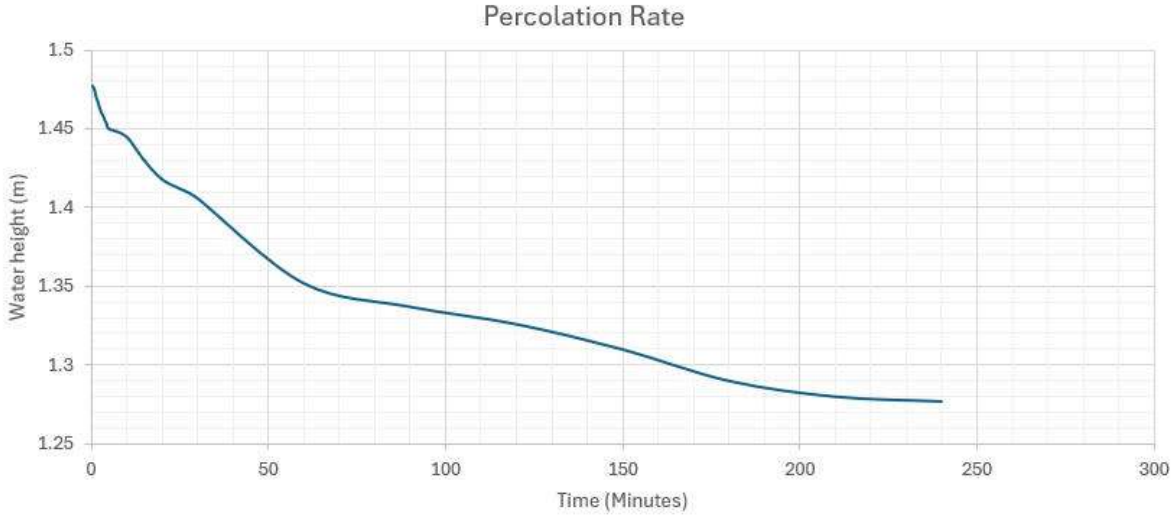


Figure 5: Hand Auger 12 Percolation Test #1.

5. Geotechnical Assessment

5.1. Site Subsoil Profile

The subsoil profile varies across the site. The northern side is dominated by Silty CLAY with gravel to approximately 2.5 m, which overlays completely weathered Kerikeri Volcanics (inferred). The southern side of the property is dominated by Clayey SILT, which completely overlays weathered Waipapa Group

For a basic geological interpretation based on shallow geotechnical investigations, refer to Table 4 and Table 5.

Table 4: Northern site Subsoil profile based on the shallow soil investigations.

Geologic Interpretation	Depth (m)
TOPSOIL	0 - 0.3
Silty CLAY with Gravels	0.3 - 2.5
Completely weathered Kerikeri Volcanics	> 2.5

Table 5: Southern site Subsoil profile based on the shallow soil investigations.

Geologic Interpretation	Depth (m)
TOPSOIL	0 - 0.3
Clayey SILT	0.3 - 3.0
Completely weathered Waipapa Group Sandstone and siltstone	> 3.0

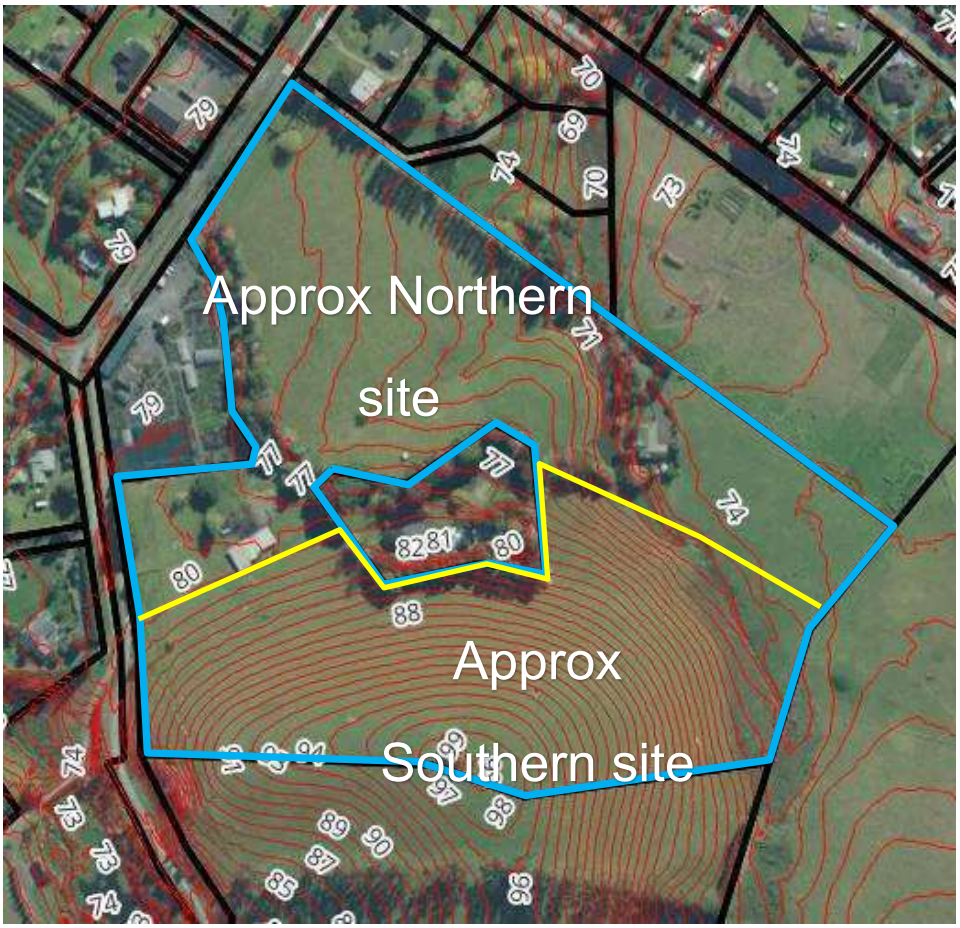


Figure 6:Northern and southern areas for soil descriptors

5.2. Site Subsoil Classification

The general soils encountered across the site are consistent with the site subsoil classification Class C – Shallow Soil sites as per NZS1170.5:2005.

The site is assumed to be Class C. Further investigation could be undertaken, however, to refine the subsoil classification.

5.3. Expansive soils assessment

Many soils located in the Northland region are considered to be expansive soils. There are three basic types of soil naturally occurring in the Northland area: sand, silt, and clay. Clay soils are generally classified as “expansive”. This means that a given amount of clay will tend to expand (increase in volume) as it absorbs water and it will shrink (lessen in volume) as water is drawn away. This action of seasonal shrink/swell of soils can have a significant impact on the foundations of structures and also on other components of developments such as services, claddings, windows, doors, roading etc. It is evident from historical reports and site inspections that the effects of expansive soils in the northland is a major problem.

The surficial soils observed during the field investigations are assumed to be highly expansive and are likely to be subject to shrink-swell effects. Therefore, it is considered that the building site does not meet the requirements for “Good Ground” as defined in the New Zealand Building Code, therefore, NZS3604 foundations are not suitable for this site. Foundations will require engineering design in accordance with NZ Building Code Clause B1 for Class ‘H’ (Highly Expansive soils). A specific design for expansive soils has been taken into account in the foundation design. No laboratory testing has been carried out, therefore, the Class H soils have been inferred based on our geotechnical field and desktop investigations.

Atterberg Limits, Linear Shrinkage, and Shrink–Swell testing can be conducted as part of the detailed design stage to better characterise the expansivity of the soils.

5.4. Foundation assessment

Where possible, each structure should adopt a single consistent type of foundation, either shallow foundations or piled, not a combination of both, to limit the effects of differential movement. Where multiple foundation types are required for a single structure, they should be designed to perform uniformly across the foundation plane to minimise differential movements resulting from settlement and expansive soils.

The expansive soils beneath the site have been classified as Class ‘H’ in accordance with the New Zealand Building Code B1/AS1 (Amendment 19). Foundations should be designed in accordance with NZ Building Code – B1 for a characteristic surface movement of 78 mm.

As required by Section B1/VM2 of the New Zealand Building Code Handbook, a strength reduction factor of 0.45 or 0.80 must be applied to all recommended geotechnical ultimate soil capacities in

conjunction with their use in factored design load cases for static and earthquake overload conditions, respectively.

5.4.1. Shallow foundation

Shallow foundations are suitable for the proposed building site. Shallow foundations can only be carried out if a flat building platform is constructed prior shallow foundation installation.

In order to mitigate the effects of expansive soils for a slab foundation, we recommend designing a stiffened concrete slab (e.g. RibRaft) specifically designed in accordance with NZ Building Code Clause B1 for Class 'H' soils for a characteristic surface movement of 78 mm. Further design will be needed at the detailed design stage.

5.4.1.1. Lots 1-3, 5 - 15,18

Scala penetrometer results show that an Ultimate Bearing Capacity (UBC) in excess of 200 kPa (100 kPa dependable) is available from approximately 0.1 m below the existing ground level, below any topsoil or fill. A UBC is in excess of 300 kPa (150 kPa dependable) from approximately 0.2 m below the existing ground level, below any topsoil or fill.
Further testing will be required during building consent phase, and the above design is only indicative.

5.4.1.2. Lot 25-28

Scala penetrometer results show that an Ultimate Bearing Capacity (UBC) in excess of 200 kPa (100 kPa dependable) is available from approximately 0.2 m below the existing ground level, below any topsoil or fill. A UBC is in excess of 300 kPa (150 kPa dependable) from approximately 0.3 m below the existing ground level, below any topsoil or fill.

Further testing will be required during building consent phase, and the above design is only indicative.

5.4.1.3. Lot 16,17,19-24,29,30

Scala penetrometer results show that an Ultimate Bearing Capacity (UBC in excess of 200 kPa (100 kPa dependable) is available from approximately 0.3 m below the existing ground level, below any topsoil or fill. A UBC is in excess of 300 kPa (150 kPa dependable) from approximately 1.0 m below the existing ground level, below any topsoil or fill.

Further testing will be required during building consent phase, and the above design is only indicative.

5.4.2. Pile foundation (All Lots)

Specifically designed pile foundations are suitable for the proposed building site.

In order to mitigate the effects of the potentially expansive soils, we recommend designing piles to be embedded a minimum of 1.5 m below the cleared ground level. At this depth, it is considered to be

below the effects of seasonal moisture variations that cause the expansive soils to shrink and swell, inducing uplift forces on the piles.

For shaft capacity and lateral capacity of piles, the upper 0.75 mbgl should not be relied upon to provide shaft resistance in tension and/or compression due to the presence of expansive soils, which may shrink away from the pile face.

It is not recommended to use driven piles due to presence of gravels encountered on site.

5.4.3. Liquefaction

Due to the site subsoil profile being dominated by cohesive soils, liquefaction is not considered to be an issue for the proposed development.

5.4.4. Soil Permeability

The soil permeability onsite is considered to be poor.

5.4.5. CBR for Roading

Based on the results of the Scala penetrometer testing, it is recommended that pavement design be undertaken using a subgrade California Bearing Ratio (CBR) value of 3% beneath the surface, following the removal of any topsoil.

In the northern area, subgrade conditions are expected to improve, with a CBR value of approximately 5% anticipated at a depth of around 0.4 m.

In contrast, the southern area is not expected to achieve a CBR value greater than 3% within the upper 1.0 m of the soil profile, and design parameters should be limited accordingly.

5.4.6. Earthworks

Any earthworks conducted at the site should be undertaken and tested in accordance with NZS4431:2022.

All engineered or structural hardfill should be placed in ≤ 300 mm lifts and be compacted to a minimum of 95% of maximum dry density, at no less than optimum moisture content. Compaction should be achieved using standard plant and methodology suitable for the imported material. A water source should be maintained on-site for moisture control. The fill must be tested and certified in accordance with NZS4431 if the thickness exceeds 300 mm and monitored by a suitably qualified engineer. Fill may be battered down to the natural ground at a maximum grade of 1V in 2.0H if possible. Alternatively, any compacted fill on-site should be retained by retaining structures.

Wherever filling or soft native ground is present at the foundation level, it should be undercut and replaced with approved compacted hardfill. Its suitability or otherwise as a bearing material beneath the floor slab should be determined on-site by the Engineer.

Compacted hard FILL beneath the building platform exceeding a depth of 300 mm will require testing and certification by a suitably qualified engineer.

All cuts should not be left exposed for a long period of time; cuts should be made efficiently in conjunction with the construction of retaining walls.

Where site-won fill is proposed to be used as hard FILL material, this material must be approved for use by a suitably qualified geotechnical engineer.

6. Conclusions

Geotechnical investigations indicate that the site is presently stable, and the subsoil properties have adequate strength parameters necessary for the proposed development, provided that the recommendations made in this report are followed.

The development will need to be carried out in accordance with proper engineering practice and the following guidelines:

1. Soils are assessed to be Highly Expansive, Class H soils as per NZ Building Code Clause B1. This means that the encountered clays may be prone to moderate volume changes (swelling and shrinking) that are directly related to changes in water content. Shrinkable soils are a significant risk to foundations. Expansive soils fall outside the definition of "good ground" according to NZS 3604:2011, therefore, specific foundation design is required for the site.
2. The site meets the definition of Class C – Shallow soil sites as per NZS1170.5.
3. Scala penetrometer testing shows the >200kPa uncorrected ultimate bearing capacity is generally available from the existing ground level to 0.3 mbgl across the site.
4. Scala penetrometer testing shows the >300kPa uncorrected ultimate bearing capacity is generally available below 1.0 mbgl across the site.
5. Shallow foundations
    a. Shallow foundations are a suitable option for the proposed development. If shallow foundations are chosen a retaining wall will be needed in the building consent process.
    b. Shallow foundations can be designed for an UBC of 200 kPa or 300 kPa if founded at a minimum of 0.3 m and 1.0 m, respectively, below the existing ground level and any topsoil.
    c. The shallow foundations such as a stiffened concrete slab (e.g. RibRaft) specifically designed in accordance with NZ Building Code Clause B1 for Class 'H' soils for a characteristic surface movement of 78 mm are suitable and recommended for the proposed lot.
6. Pile Foundation Recommendations
    a. Specifically designed timber piles embedded to a minimum depth of 1.5 mbgl is a suitable foundation option for the site and will mitigate the effects of expansive soils.
    b. The lateral and shaft capacity of the upper 0.75 mbgl should not be relied upon to provide resistance due to the presence of expansive soils.
7. Subgrade CBR of 3% is recommended for the design of the proposed pavement systems, following the removal of any topsoil. Based on the scala penetrometer test results, CBR of approximately 5% is expected at a depth of around 0.4m in the northern area. It is not expected

achieve CBR value greater than 3% within the upper 1m of soil in the southern area, and design parameters should be limited accordingly.

8. Any earthworks conducted at the site should be undertaken and tested in accordance with NZS4431:2022. Compacted hardfill beneath the building platform exceeding a depth of 300mm will require testing and certification by a suitably qualified engineer.
9. All work should be carried out under the guidance of a Chartered Professional Engineer with relevant geotechnical experience.

7. Limitations

This report has been prepared for the benefit of Taraire Tahi Ltd as our client(s) with respect to an investigation of the proposed development and the Far North District Council's approval of the proposal as defined in the brief. It shall not be relied upon for any other purpose. The reliance by other parties on the information or opinions contained in this report shall, without our prior review and agreement in writing, be at such parties' sole risk.

Opinions and judgments expressed herein are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions. Where opinions or judgments are to be relied on, they should be independently verified with appropriate legal advice. Any recommendations, opinions, or guidance provided by Cook Costello in this report are limited to technical engineering requirements and are not made under the Financial Advisers Act 2008.

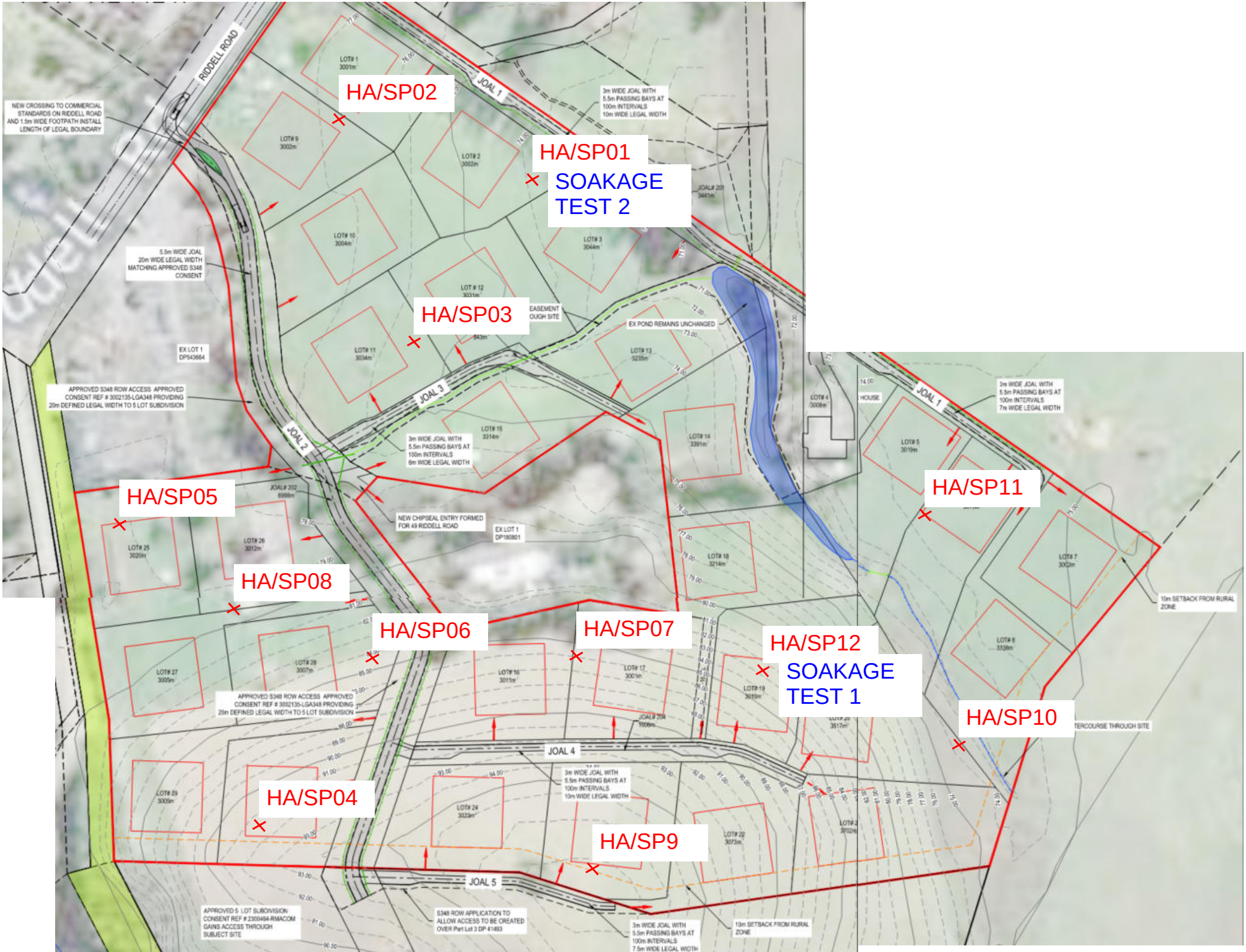
Recommendations and opinions in this report are based on data from testing and observations undertaken on-site. The nature and continuity of subsoil conditions away from the tests are inferred and it must be appreciated that actual conditions could vary considerably from the assumed model.

During excavation and construction, the site should be examined by a Cook Costello Engineer or Engineering Geologist to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. It is possible that the nature of the exposed subsoil may require further investigation and modification of the design based on this report. In any event, it is essential that the firm is notified if there is any variation in subsoil conditions from those described in the report as it may affect the design parameters recommended in the report.

Cook Costello has performed the services for this project in accordance with the standard agreement for consulting services and current professional standards for environmental site assessment. No guarantees are either expressed or implied.

There is no investigation that is thorough enough to preclude the presence of materials at the site which presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable now may in the future become subject to different regulatory standards which cause them to become unacceptable and require further remediation for this site to be suitable for the existing or proposed land use activities.

Appendix 1: Site Testing Plan


HA/SP02
HA/SP01
SOAKAGE TEST 2
HA/SP03
HA/SP05
HA/SP08
HA/SP06
HA/SP07
HA/SP11
HA/SP12
SOAKAGE TEST 1
HA/SP10
HA/SP04
HA/SP9
RIDDELL ROAD
JOAL 1
JOAL 2
JOAL 3
JOAL 4
JOAL 5
NEW CROSSING TO COMMERCIAL STANDARDS ON RIDDELL ROAD AND 1.5m WIDE FOOTPATH INSTALL LENGTH OF LEGAL BOUNDARY
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 10m WIDE LEGAL WIDTH
5.5m WIDE JOAL 20m WIDE LEGAL WIDTH MATCHING APPROVED S348 CONSENT
EX LOT 1 DP543664
APPROVED S348 ROW ACCESS APPROVED CONSENT REF # 3002135-LGA348 PROVIDING 20m DEFINED LEGAL WIDTH TO 5 LOT SUBDIVISION
EASEMENT OUGH SITE
EX POND REMAINS UNCHANGED
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 6m WIDE LEGAL WIDTH
NEW CHIPSEAL ENTRY FORMED FOR 49 RIDDELL ROAD
EX LOT 1 DP180801
HOUSE
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 7m WIDE LEGAL WIDTH
10m SETBACK FROM RURAL ZONE
APPROVED S348 ROW ACCESS APPROVED CONSENT REF # 3002135-LGA348 PROVIDING 20m DEFINED LEGAL WIDTH TO 5 LOT SUBDIVISION
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 10m WIDE LEGAL WIDTH
APPROVED 5 LOT SUBDIVISION CONSENT REF # 2300464-RMACOM GAINS ACCESS THROUGH SUBJECT SITE
S348 ROW APPLICATION TO ALLOW ACCESS TO BE CREATED OVER Part Lot 3 DP 41493
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 7.5m WIDE LEGAL WIDTH
10m SETBACK FROM RURAL ZONE
TERCOURSE THROUGH SITE

Appendix 2: Provided Proposed Plans

FOR REVIEW

NEW CROSSING TO COMMERCIAL STANDARDS ON RIDDELL ROAD

NEW CROSSING TO COMMERCIAL STANDARDS ON RIDDELL ROAD AND 1.5m WIDE FOOTPATH INSTALL LENGTH OF LEGAL BOUNDARY

RIDDELL ROAD

JOAL 1

3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 10m WIDE LEGAL WIDTH

LOT# 1 3001m²

LOT# 9 3002m²

LOT# 2 3002m²

LOT# 10 3004m²

LOT# 3 3044m²

JOAL# 201 3441m²

5.5m WIDE JOAL 20m WIDE LEGAL WIDTH MATCHING APPROVED S348 CONSENT

LOT # 12 3031m²

EXISTING STORMWATER EASEMENT MAINTAINED THROUGH SITE

JOAL# 203 943m²

EX POND REMAINS UNCHANGED

LOT# 11 3034m²

LOT# 13 3235m²

EX LOT 1 DP543664

APPROVED S348 ROW ACCESS APPROVED CONSENT REF # 3002135-LGA348 PROVIDING 20m DEFINED LEGAL WIDTH TO 5 LOT SUBDIVISION

JOAL 3

JOAL 2

LOT# 15 3314m²

LOT# 14 3391m²

3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 6m WIDE LEGAL WIDTH

JOAL# 202 6988m²

NEW CHIPSEAL ENTRY FORMED FOR 49 RIDDELL ROAD

EX LOT 1 DP180801

LOT# 25 3020m²

LOT# 26 3012m²

LOT# 18 3214m²

77.00 76.00 75.00 74.00 73.00 72.00 71.00 72.00 71.00 72.00 73.00 74.00 75.00 76.00 77.00 78.00 79.00 80.00

NOTES

1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. Origin of levels = sm xxxx so xxxx(xxxx) published rl=xx.xx, sourced from the linz digital geodetic database.
5. Boundaries are subject to final survey.

LEGEND

- EX BDY
- PR BDY
- EX EASEMENT
- RT RT REFERENCE TITLE
- PR EASEMENT
- EX WATERCOURSE
- EX WATERCOURSE
- PR 30x30 PLATFORM
- PR LOT ACCESS

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Concept Layout
Sheet 1 of 3

No.	Revision (Description)	Name	Date
-	-	-	-

Surveyed		KM	09/25
Designed		DESBY	DESDATE
Drawn		DRA	DRADATE
Checked		CHEC	CHECDATE
Project no.	10401		
Scale	1:1000 @ A3		
Cad file	10401 RIDDELL RC.DWG		
Drawing no.	C1501	Rev	revno.

FOR REVIEW

EX LOT 1
DP543664

LOT# 11
3034m²

3031m²

JOAL# 203
943m²

LOT# 13
3235m²

LOT# 4
3008m²

JOAL 3

LOT# 15
3314m²

LOT# 14
3391m²

JOAL# 202
6988m²

LOT# 25
3020m²

LOT# 26
3012m²

JOAL 2

EX LOT 1
DP180801

5.5m WIDE JOAL
20m WIDE LEGAL WIDTH
MATCHING APPROVED S348
CONSENT

LOT# 18
3214m²

LOT# 27
3005m²

LOT# 28
3007m²

APPROVED S348 ROW ACCESS APPROVED
CONSENT REF # 3002135-LGA348 PROVIDING
20m DEFINED LEGAL WIDTH TO 5 LOT SUBDIVISION

LOT# 16
3011m²

LOT# 17
3001m²

LOT# 19
3019m²

LOT# 20
3517m²

JOAL# 204
1608m²

JOAL 4

3m WIDE JOAL WITH
5.5m PASSING BAYS AT
100m INTERVALS
10m WIDE LEGAL WIDTH

LOT# 29
3005m²

LOT# 30
3006m²

LOT# 24
3023m²

LOT# 23
3078m²

LOT# 22
3073m²

LOT# 21
3702m²

JOAL 5

APPROVED 5 LOT SUBDIVISION
CONSENT REF # 2300464-RMACOM
GAINS ACCESS THROUGH
SUBJECT SITE

S348 ROW APPLICATION TO
ALLOW ACCESS TO BE CREATED
OVER Part Lot 3 DP 41493

3m WIDE JOAL WITH
5.5m PASSING BAYS AT
100m INTERVALS
7.5m WIDE LEGAL WIDTH

10m SETBACK FROM RURAL
ZONE

NOTES
1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. Origin of levels = sm xxxx so xxxx(xxxx)
   published rl=xx.xx, sourced from the linz digital geodetic database.
5. Boundaries are subject to final survey.

LEGEND
- EX BDY
- PR BDY
- EX EASEMENT
- RT RT REFERENCE TITLE
- PR EASEMENT
- EX WATERCOURSE
- EX WATERCOURSE
- PR 30x30 PLATFORM
- PR LOT ACCESS

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi
Limited
Riddell Road
Kerikeri

Proposed
Concept Layout
Sheet 2 of 3

No.	Revision (Description)	Name	Date
-	-	-	-

Surveyed		KM	09/25
Designed		DESBY	DESDATE
Drawn		DRA	DRADATE
Checked		CHEC	CHECDATE
Project no.	10401		
Scale	1:1000 @ A3		
Cad file	10401 RIDDELL RC.DWG		
Drawing no.	C1502	Rev	revno.

FOR REVIEW

N

LOT # 12
3031m²

JOAL# 203
943m²

LOT# 13
3235m²

JOAL 3

LOT# 15
3314m²

LOT# 14
3391m²

EX LOT 1
DP180801

LOT# 18
3214m²

LOT# 16
3011m²

LOT# 17
3001m²

JOAL# 204
1608m²

JOAL 4

LOT# 24
3023m²

LOT# 23
3078m²

LOT# 22
3073m²

JOAL 5

LOT# 19
3019m²

LOT# 20
3517m²

LOT# 21
3702m²

EX POND UNCHANGED

LOT# 4
3008m²

EX HOUSE

JOAL 1

3m WIDE JOAL WITH
5.5m PASSING BAYS AT
100m INTERVALS
7m WIDE LEGAL WIDTH

LOT# 5
3019m²

LOT# 6
3075m²

LOT# 7
3002m²

LOT# 8
3338m²

10m SETBACK FROM RURAL ZONE

EX WATERCOURSE THROUGH SITE

71.00 72.00 73.00 74.00 75.00 76.00 77.00 78.00 79.00 80.00 81.00 82.00 83.00 84.00 85.00 86.00 87.00 88.00 89.00 90.00 91.00 92.00 93.00 94.00

NOTES
1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. Origin of levels = sm xxxx so xxxx(xxxx)
   published rl=xx.xx, sourced from the linz digital geodetic database.
5. Boundaries are subject to final survey.

LEGEND
- EX BDY
- PR BDY
- EX EASEMENT
- RT — RT REFERENCE TITLE
- PR EASEMENT
- EX WATERCOURSE
- EX WATERCOURSE
- PR 30x30 PLATFORM
- PR LOT ACCESS

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Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Concept Layout
Sheet 3 of 3

No.	Revision (Description)	Name	Date
-	-	-	-

Surveyed		KM	09/25
Designed		DESBY	DESDATE
Drawn		DRA	DRADATE
Checked		CHEC	CHECDATE
Project no.	10401		
Scale	1:1000 @ A3		
Cad file	10401 RIDDELL RC.DWG		
Drawing no.	C1503	Rev	revno.

Appendix 3: Testing Results

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA01		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL (SILT) with some rootlets, brown, moist, low plasticity		-
0.2-0.7		Clayey GRAVELS, brown, soft, moist, moderate plasticity Gravels: Red, scoria, >10mm		NA
0.7-1.5		Silty CLAY with gravels, brown mottled orange, soft, moist, moderate plasticity Gravels: white, very weak, 3mm		1.0 m:198+ 1.5m:198+
1.5-2.5		Silty CLAY with minor gravels, brown mottled orange brown, soft, moist, high plasticity Gravels: grey, weak, 1mm		2.0 m:141/113 2.5 m:167/57
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	SP
Date:	22/10/2025	**Logger:**	SP
Borehole No.:	HA02		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.45		TOPSOIL (SILT) with minor rootlets, dark brown, firm, dry, low plasticity		-
0.5-0.8		Silty CLAY with traces of gravels, dark brown, very stiff, dry, low plasticity Gravels: small, rounded, brown, weak		0.6 m:198+
0.8-1.5		Silty CLAY with traces of gravels, brown, very stiff, dry, low plasticity Gravels: small, rounded, brown, weak		1.0 m:198+ 1.5 m:198+
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA03		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL (SILT) with some rootlets, brown, moist, low plasticity		-
0.2-1.5		Silty CLAY, brown, stiff, moist, moderate plasticity		0.5 m:198+ 1.0 m:198+
1.5-1.85		Silty CLAY traces of gravels, light brown, stiff, moist, moderate plasticity		1.5 m:198+
1.85-2.0		Clayey GRAVELS, light grey, very stiff, moist, low plasticity		
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil	
Fill	
Clay	
Silt	
Sand	
Gravel	
Peat	
Rock	

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA04		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL (Clayey SILT, grey, stiff, dry, low plasticity)		-
0.2-1.65		Clayey SILT, light brown mottled white, stiff to very stiff, moist, medium plasticity		0.5 m: 178/54
1.65-1.8		Clayey SILT, white with brown streaks, stiff to very stiff, moist, medium plasticity		1.0 m:198+ 1.5 m:198+
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil	
Fill	
Clay	
Silt	
Sand	
Gravel	
Peat	
Rock	

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	SP
Date:	22/10/2025	**Logger:**	SP
Borehole No.:	HA05		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL(Clayey SILT with traces of rootlets, brownish black, firm, moist, high plasticity)		-
0.2-0.4		Clayey SILT, light grey with brown specks, stiff, dry, moderate plastcity		0.5m: UTP
0.4-0.8		Silty CLAY with minor gravels, grey mottled brown, very hard, moist, high plasticity Gravels: brown, rounded, weak		
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA06		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.3		TOPSOIL (SILT), dark brown, soft, low plasticity		-
0.3-0.9		Clayey SILT, orangey brown, stiff, moist, low plasticity		0.5 m: 144/60
0.9-1.7		Silty CLAY, yellowish light brown mottled light grey, stiff, moist, moderate plasticity colour lightening with depth		1.0 m:156/60 1.5 m:171/96
		End of Hand Auger (Too Hard To Retrieve)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA07		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.3		TOPSOIL (Peaty SILT), grey, firm, moist, low plastcity		-
0.3-1.0		SILT, brown, stiff, moist, low plasticity		0.5m:167/48 1.0m:134/31
1.0-1.5		SILT, white mottled brown, stiff, moist, low plasticity		1.5m:180/61
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil	
Fill	
Clay	
Silt	
Sand	
Gravel	
Peat	
Rock	

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BOREHOLE LOG AND TEST SHEET

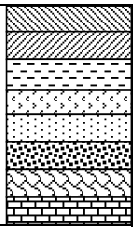
NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	SP
Date:	22/10/2025	**Logger:**	SP
Borehole No.:	HA08		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL (SILT with some organics), grey, firm, moist,high plastcity		-
0.2-0.35		SILT with traces of rootlets and some gravels, grey, stiff, moist, low plasticity		0.5 m:106
0.35-1.0		Clayey SILT, brown,very stiff to hard,dry, moderate plasticity		1.0 m:198+
		End of Hand Auger (Too Hard)		

Remarks: Residual Su at 0.5 m because scala penetration done before hand auger

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock



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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA09		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.35		TOPSOIL (SILT) with some rootlets, brown, moist, low plasticity		-
0.35-0.7		SILT with traces of rootlets, orangish with streaks of brown, stiff, dry, low plasticity		0.5 m:178/47
0.7-1.0		SILT with traces of fine sand, white mottled brown, stiff to very stiff, dry, low plastcity		
1.0-1.2		SILT with traces of fine sand, white mottled brown with streak of orange, stiff to very stiff, dry, low plastcity		1.0 m:184/50
1.2-1.5		SILT with traces of fine sand, white, stiff to very stiff, dry, low plastcity		1.5 m:156/48
1.5-2.3		Silt with minor sand, white oranger interbedded layers, very stiff, mosit, moderate plastcity		2.0 m:198
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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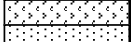
BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA10		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.2		TOPSOIL (SILT) with some rootlets,dark brown, moist, low plasticity		-
0.2-1.0		Silty CLAY, yellowish brown mottled grey, firm, moist, moderate plasticity		0.5m:170/74 1.0m:136/43
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil	
Fill	
Clay	
Silt	
Sand	
Gravel	
Peat	
Rock	

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	SP
Date:	22/10/2025	**Logger:**	SP
Borehole No.:	HA11		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength peak/ residual corrected (kPa)
0-0.3		TOPSOIL (SILT) with some rootlets brown, moist, low plasticity		-
0.2-0.7		Clayey SILT, dark brown, stiff, moist, moderate plasticity		0.5m:198+
0.7-1.5		Silty CLAY with traces gravel and coarse snad, yellowish brown, stiff, moist, moderate plasticity Gravels: grey, weak, >2mm		1.0m: NA 1.5m: 153/85
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil	
Fill	
Clay	
Silt	
Sand	
Gravel	
Peat	
Rock	

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BOREHOLE LOG AND TEST SHEET

NZGS December 2005

Ref.:	17857	**Page:**	1
Client:	Taraire Tahi	**Tested by:**	TW
Date:	22/10/2025	**Logger:**	TW
Borehole No.:	HA12		
Location:	39 Riddell Road, Kerikeri		
Drilling Method:	Hand Auger		

Depth (mbgl)	Legend	Soil Description	Water Level	Vane Shear Strength Peak/ residual corrected (kPa)
0-0.25		TOPSOIL (SILT) with some rootlets brown, moist, low plasticity		-
0.25-1.50		Silty CLAY, yellowish light brown, stiff, moist, moderate plasticity		0.5 m:177/70 1.0 m:184/78 1.5 m:173
		End of Hand Auger (Too Hard)		

Remarks:

Topsoil
Fill
Clay
Silt
Sand
Gravel
Peat
Rock

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Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

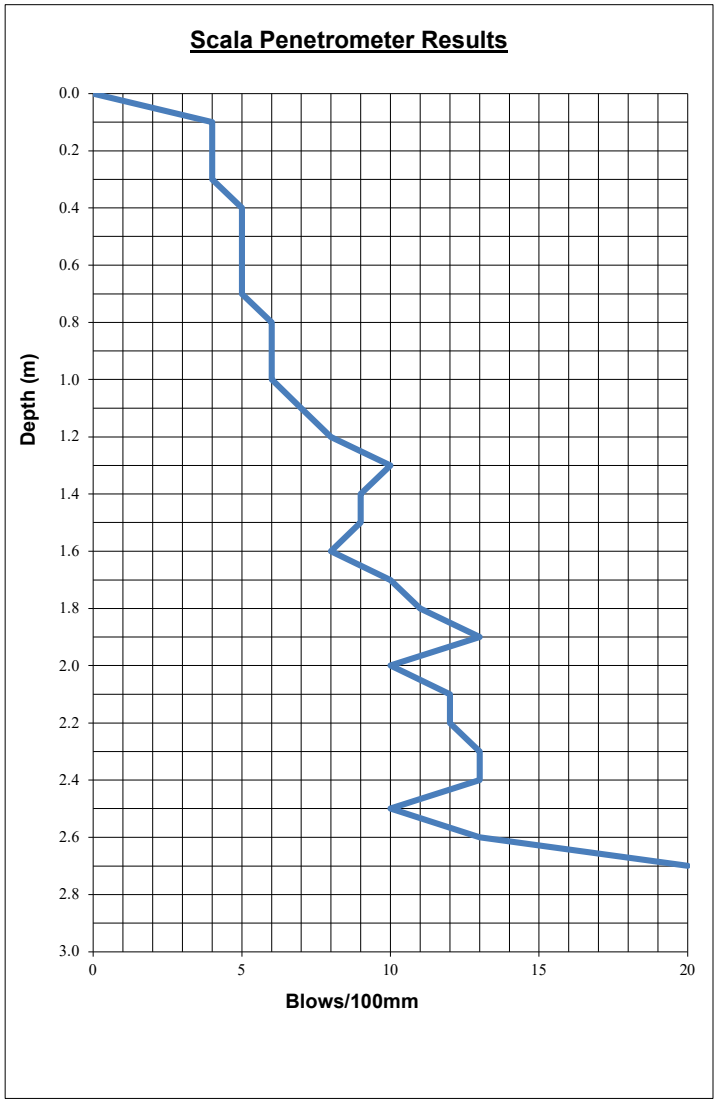
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP01

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
4	0.10
4	0.20
4	0.3
5	0.40
5	0.50
5	0.6
5	0.70
6	0.80
6	0.9
6	1.00
7	1.10
8	1.2
10	1.30
9	1.40
9	1.5
8	1.60
10	1.70
11	1.8
13	1.90
10	2.00
12	2.1
12	2.20
13	2.30
13	2.4
10	2.50
13	2.60
20	2.7
	2.80
	2.90
	3.0



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Whangarei
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F 64 9 4304282
E ccl@coco.co.nz

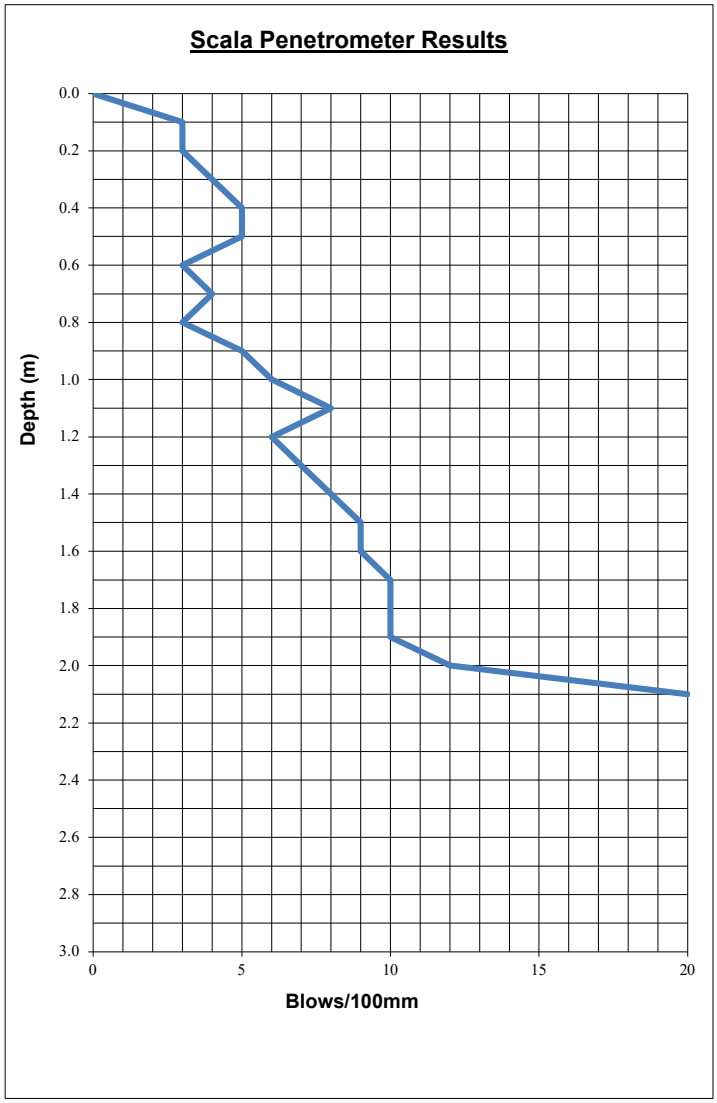
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP02

Tested by: TW
Logged by: TW

blows/100 mm	depth (m)
0	0.0
3	0.10
3	0.20
4	0.3
5	0.40
5	0.50
3	0.6
4	0.70
3	0.80
5	0.9
6	1.00
8	1.10
6	1.2
7	1.30
8	1.40
9	1.5
9	1.60
10	1.70
10	1.8
10	1.90
12	2.00
20	2.1
	2.20
	2.30
	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



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Whangarei
P 64 9 4389529
F 64 9 4304282
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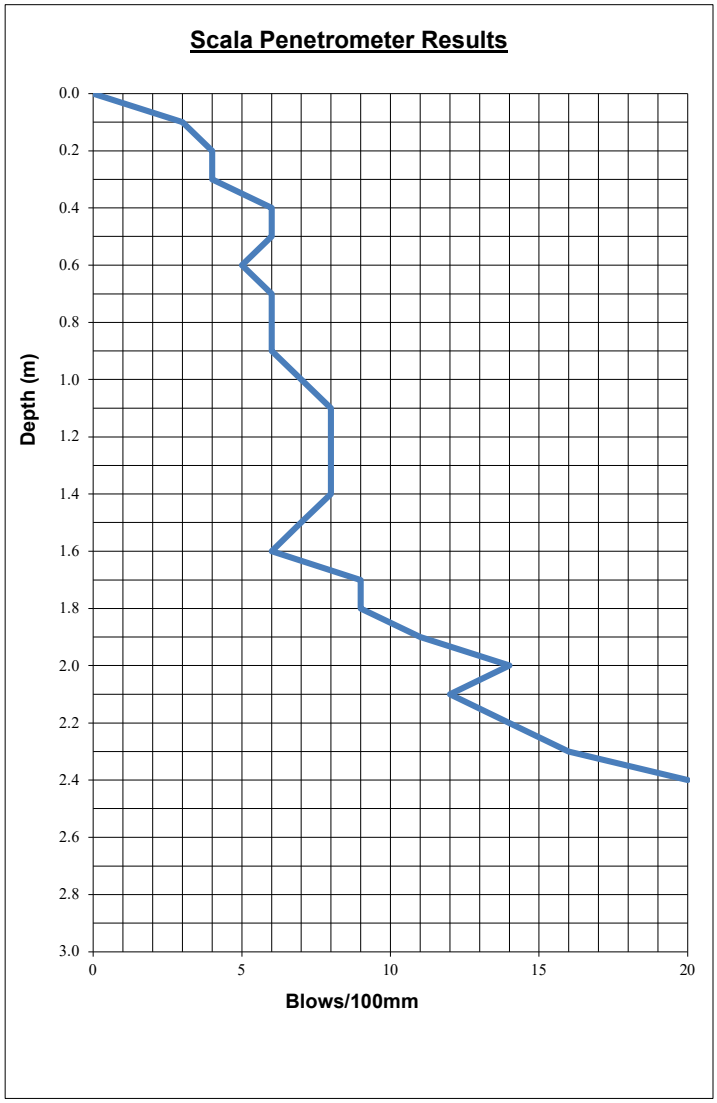
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP03

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
3	0.10
4	0.20
4	0.3
6	0.40
6	0.50
5	0.6
6	0.70
6	0.80
6	0.9
7	1.00
8	1.10
8	1.2
8	1.30
8	1.40
7	1.5
6	1.60
9	1.70
9	1.8
11	1.90
14	2.00
12	2.1
14	2.20
16	2.30
20	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



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Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

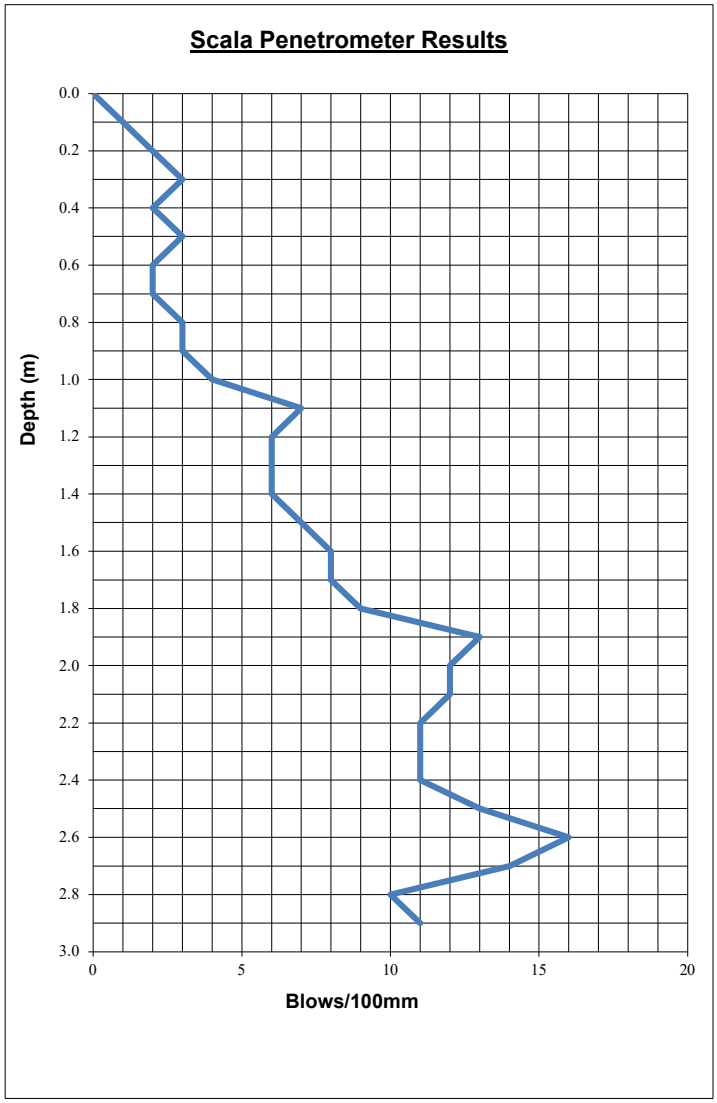
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP04

Tested by: TW
Logged by: TW

blows/100 mm	depth (m)
0	0.0
1	0.10
2	0.20
3	0.3
2	0.40
3	0.50
2	0.6
2	0.70
3	0.80
3	0.9
4	1.00
7	1.10
6	1.2
6	1.30
6	1.40
7	1.5
8	1.60
8	1.70
9	1.8
13	1.90
12	2.00
12	2.1
11	2.20
11	2.30
11	2.4
13	2.50
16	2.60
14	2.7
10	2.80
11	2.90
	3.0



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2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

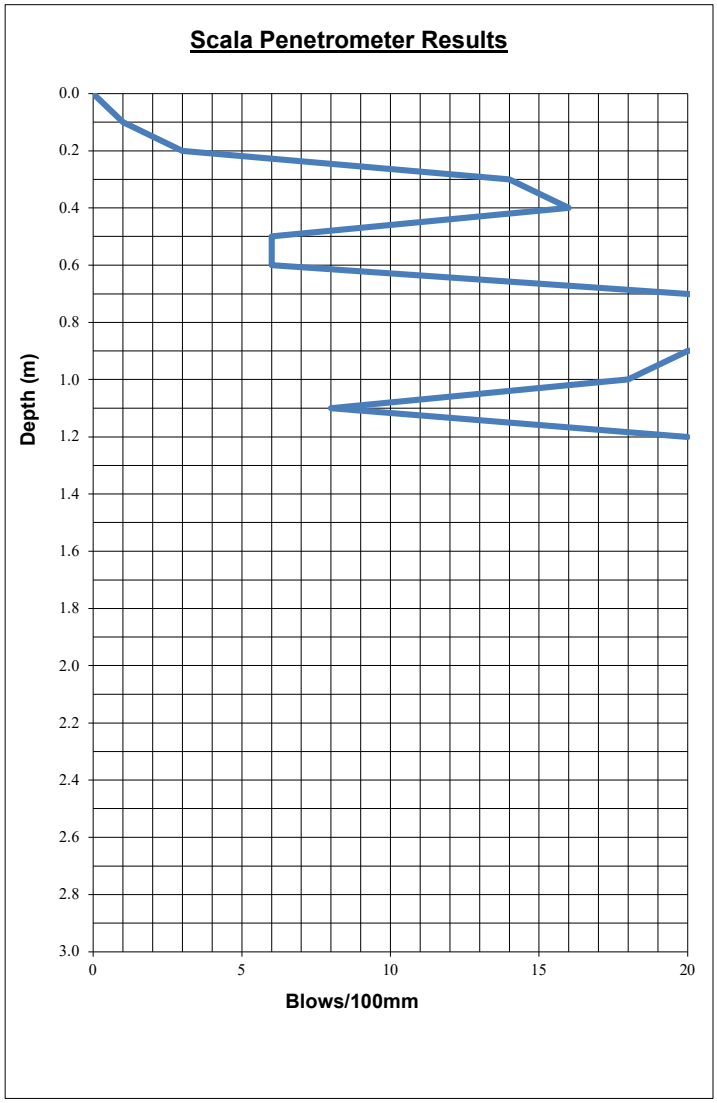
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP05

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
1	0.10
3	0.20
14	0.3
16	0.40
6	0.50
6	0.6
20	0.70
28	0.80
20	0.9
18	1.00
8	1.10
20	1.2
	1.30
	1.40
	1.5
	1.60
	1.70
	1.8
	1.90
	2.00
	2.1
	2.20
	2.30
	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



Consulting Engineers
cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

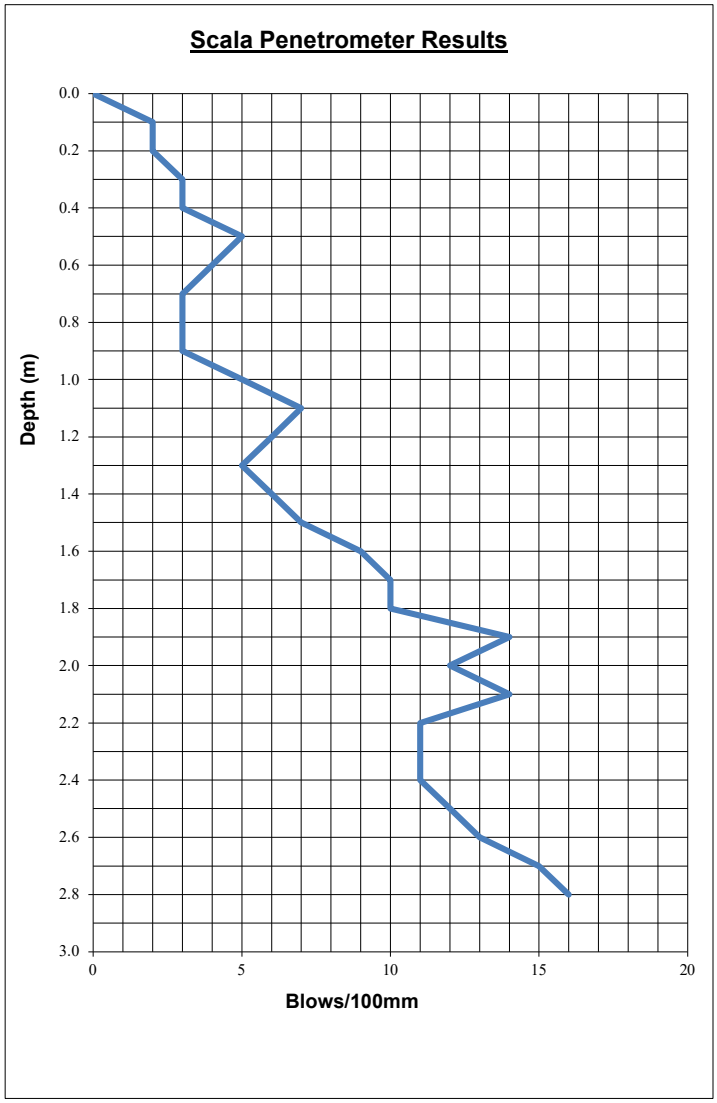
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP06

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
2	0.10
2	0.20
3	0.3
3	0.40
5	0.50
4	0.6
3	0.70
3	0.80
3	0.9
5	1.00
7	1.10
6	1.2
5	1.30
6	1.40
7	1.5
9	1.60
10	1.70
10	1.8
14	1.90
12	2.00
14	2.1
11	2.20
11	2.30
11	2.4
12	2.50
13	2.60
15	2.7
16	2.80
	2.90
	3.0



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cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP07

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
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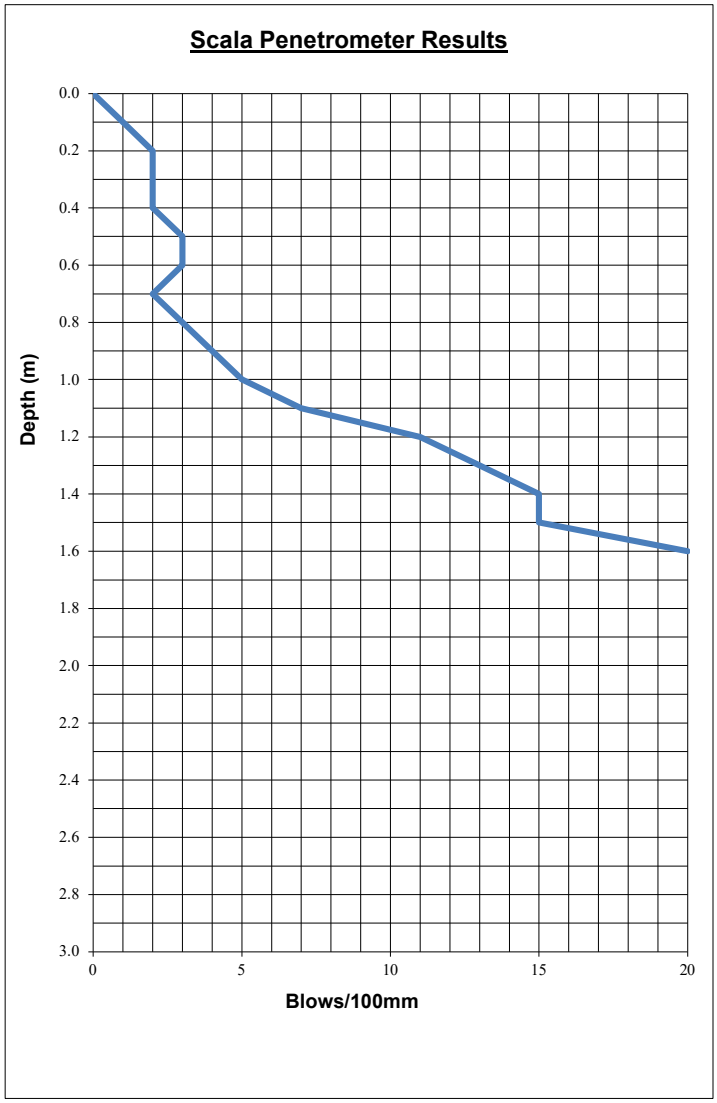
1	0.10
2	0.20
2	0.3
2	0.40
3	0.50
3	0.6
2	0.70
3	0.80
4	0.9
5	1.00
7	1.10
11	1.2
13	1.30
15	1.40
15	1.5
20	1.60
	1.70
	1.8
	1.90
	2.00
	2.1
	2.20
	2.30
	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



Consulting Engineers
cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

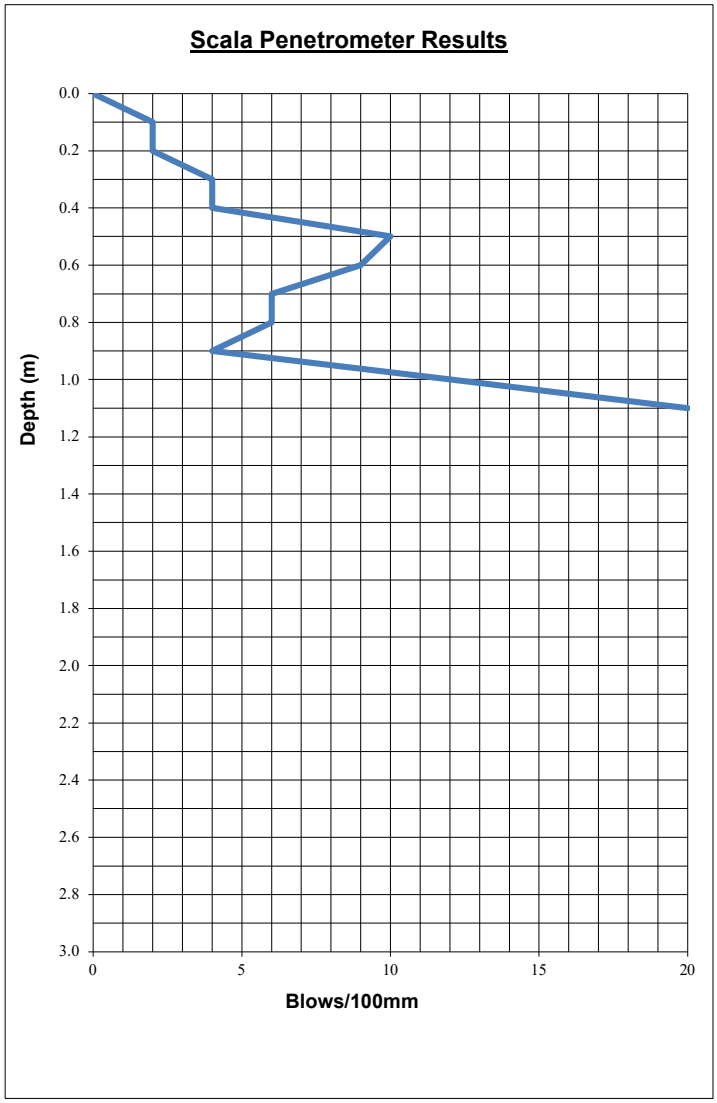
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP08

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
2	0.10
2	0.20
4	0.3
4	0.40
10	0.50
9	0.6
6	0.70
6	0.80
4	0.9
12	1.00
20	1.10
	1.2
	1.30
	1.40
	1.5
	1.60
	1.70
	1.8
	1.90
	2.00
	2.1
	2.20
	2.30
	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



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Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

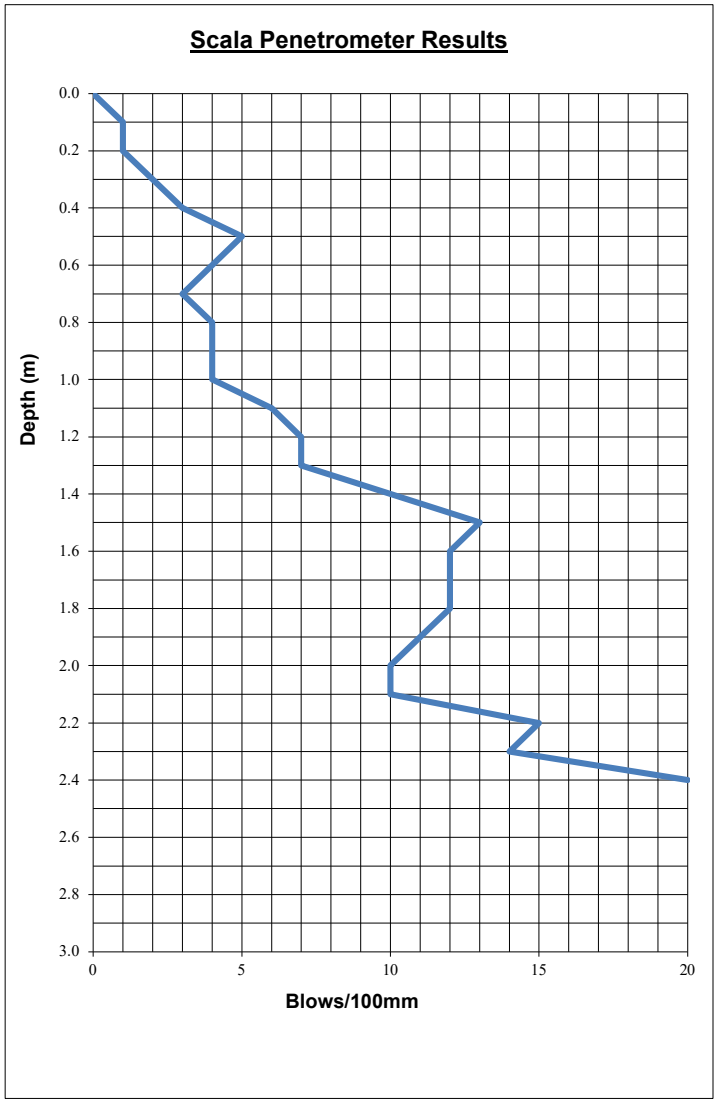
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP09

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
1	0.10
1	0.20
2	0.3
3	0.40
5	0.50
4	0.6
3	0.70
4	0.80
4	0.9
4	1.00
6	1.10
7	1.2
7	1.30
10	1.40
13	1.5
12	1.60
12	1.70
12	1.8
11	1.90
10	2.00
10	2.1
15	2.20
14	2.30
20	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



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cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

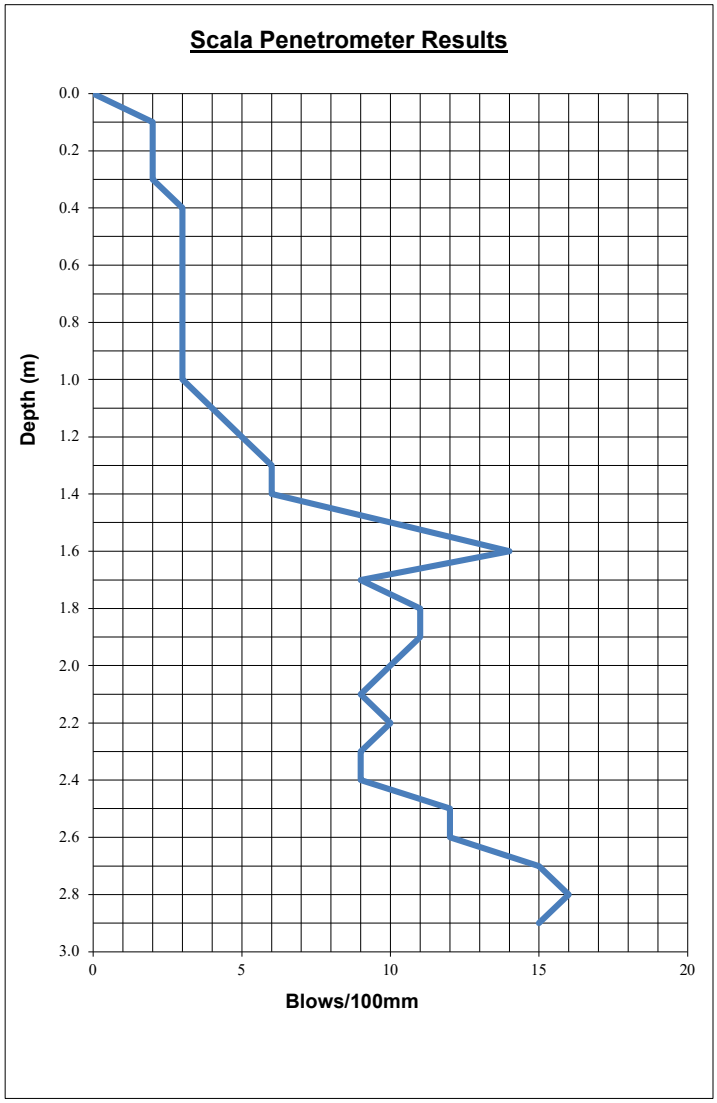
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP10

Tested by: TW
Logged by: TW

blows/100 mm	depth (m)
0	0.0
2	0.10
2	0.20
2	0.3
3	0.40
3	0.50
3	0.6
3	0.70
3	0.80
3	0.9
3	1.00
4	1.10
5	1.2
6	1.30
6	1.40
10	1.5
14	1.60
9	1.70
11	1.8
11	1.90
10	2.00
9	2.1
10	2.20
9	2.30
9	2.4
12	2.50
12	2.60
15	2.7
16	2.80
15	2.90
	3.0



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cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

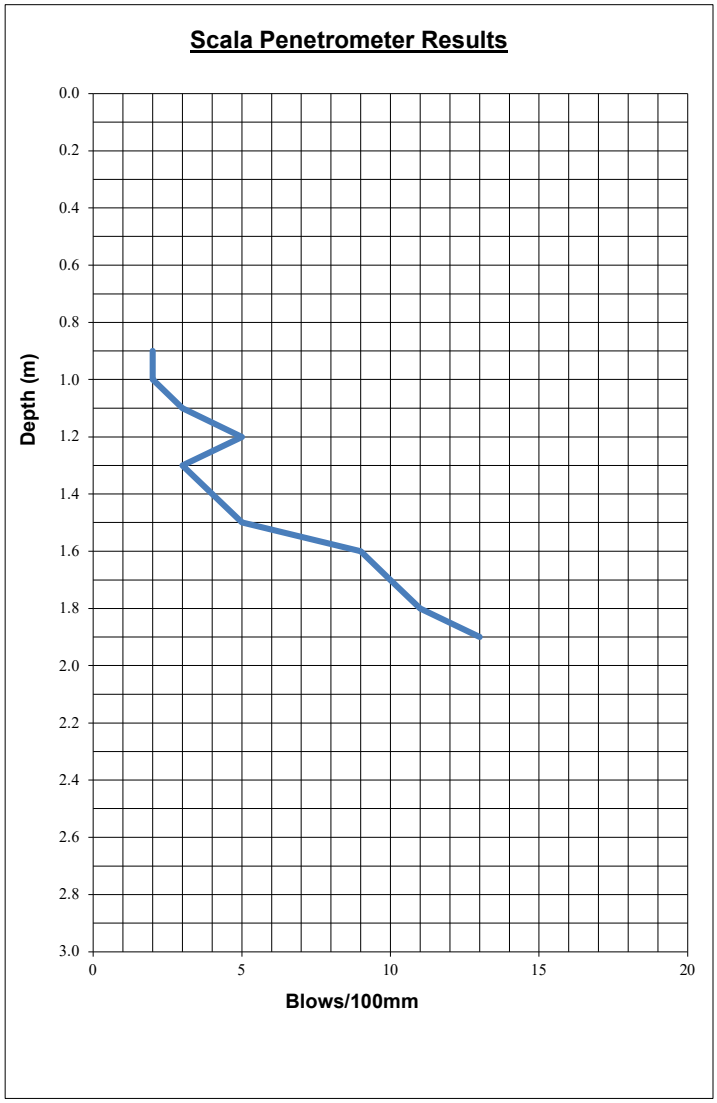
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP10.1 (Base of Hand auger)

Tested by: TW
Logged by: TW

blows/100 mm	depth (m)
	0.0
	0.10
	0.20
	0.3
	0.40
	0.50
	0.6
	0.70
	0.80
2	0.9
2	1.00
3	1.10
5	1.2
3	1.30
4	1.40
5	1.5
9	1.60
10	1.70
11	1.8
13	1.90
	2.00
	2.1
	2.20
	2.30
	2.4
	2.50
	2.60
	2.7
	2.80
	2.90
	3.0



Consulting Engineers
cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

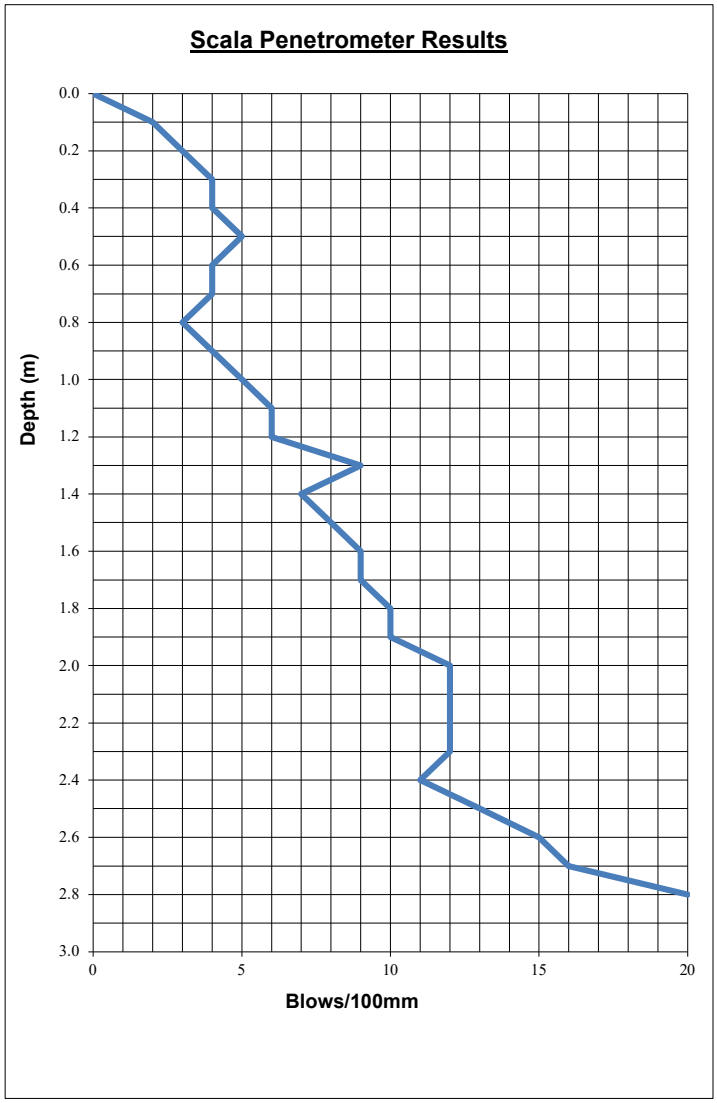
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP11

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
2	0.10
3	0.20
4	0.3
4	0.40
5	0.50
4	0.6
4	0.70
3	0.80
4	0.9
5	1.00
6	1.10
6	1.2
9	1.30
7	1.40
8	1.5
9	1.60
9	1.70
10	1.8
10	1.90
12	2.00
12	2.1
12	2.20
12	2.30
11	2.4
13	2.50
15	2.60
16	2.7
20	2.80
	2.90
	3.0



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cook | costello

Norfolk House
2 Norfolk Street
Whangarei
P 64 9 4389529
F 64 9 4304282
E ccl@coco.co.nz

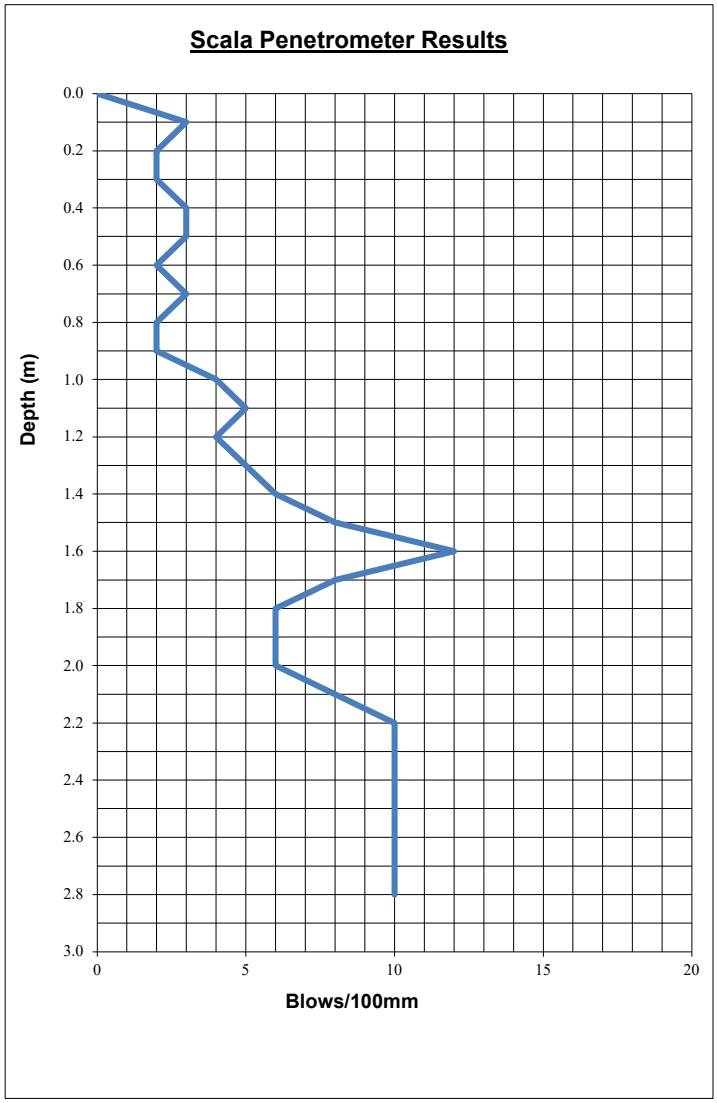
DYNAMIC CONE (SCALA) PENETROMETER

Test 23 / NZS 4402 : 1988 Test 6.5.2

Job: 17857
Client: Taraire Tahi Ltd
Date: 21/10/2025
Location: 39 Riddell Road, Kerikeri
Scala No.: SP12

Tested by: SP
Logged by: SP

blows/100 mm	depth (m)
0	0.0
3	0.10
2	0.20
2	0.3
3	0.40
3	0.50
2	0.6
3	0.70
2	0.80
2	0.9
4	1.00
5	1.10
4	1.2
5	1.30
6	1.40
8	1.5
12	1.60
8	1.70
6	1.8
6	1.90
6	2.00
8	2.1
10	2.20
10	2.30
10	2.4
10	2.50
10	2.60
10	2.7
10	2.80
	2.90
	3.0



Attenuation Report

Taraira Tahi Ltd

Lot 2 DP 543664

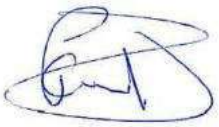
39 Riddell Road

Kerikeri

Project Number: 17857

Date: 9/12/2025

DOCUMENT CONTROL RECORD

Client:	**Taraire Tahi Ltd**
Project description:	Attenuation report
Site Adress:	39 Riddell Road, Kerikeri
Date of issue:	Tuesday, 9 December 2025
Status:	Issued
Originator:	 **Emily Thompson** Civil/Geotechnical Engineer BE(Hons)
Office of Origin:	Auckland
Reviewed:	 **P. J. Cook** Chartered Professional Engineer MACENZ, CMEngNZ, MInstD, CPEng, IntPE (NZ) BE (Hons), Dip Ag.
Office of origin:	Whangārei
Telephone:	09 373 5357
Contact email:	ccl@coco.co.nz

Approved:

Version	Date	Comment	By
0.1	09/12/2025	Draft	E. Thompson
0.2	09/12/2025	Reviewed	P. Cook

Table of Contents

Introduction 4
1.1. Relevant Documentation 4
2. Site Description 5
3. Attenuation 6
3.1. Modelling 6
3.2. Results 8
3.3. Attenuation Reduction: 9
Appendix 10

List of Figures

Figure 1: Map showing the property and the property boundary. 5
Figure 2: Mike+ Model Diagram. 7

List of Tables

Table 1: Attenuation Scenarios 6
Table 2: Example catchment analysis for pre and post development for a 300m^2 roof area and 300m^2. 7
Table 3: Pre and Post-development (attenuated) discharge (l/s) and orifice sizes and heights. 8
Table 4: Soakage test results 9

Introduction

Cook Costello has been engaged by Taraire Tahi Ltd to provide a Geotechnical Report for use in a resource consent for the Far North District Council.

This report provides a geotechnical assessment for the proposed subdivision located at 39 Riddell Road, Kerikeri.

A site testing plan is attached as Appendix 1, showing the property boundaries and associated site investigations.

This report considers the following aspects of site development:

- Site Description
- Attenuation Calculations
- Stormwater culvert and swale sizing
- Wastewater effluent examples
- Engineering Discussion and Recommendations

1.1. Relevant Documentation

- FNDC ES 2023
- TP108
- NRC proposed Regional Plan for Northland
- AS/NZS 1547:2012
- NZBC E1

2. Site Description

The property at 39 Riddell Road, Kerikeri, has a legal description of Lot 2 DP 543664. The property currently has 2 dwellings. The balance area is mostly covered with grassland and vegetation on the north-eastern side of the property. The property has a total survey area of 10.6 ha. It is sloping at various angles across the site, ranging from 2-8˚, considered to be gently sloping. The approximate site boundary is shown in Figure 1. There is a ponding along the mid-northern boundary, which collects water and outlets to the north, where the stormwater eventually reaches the Kerikeri inlet.

Figure 1: Map showing the property and the property boundary.

It is proposed to subdivide the property into 30 Lots. Each Lot will be required to attenuate any impervious area that is added. Stormwater attenuation will be required to reduce stormwater runoff into the council system and local secondary flowpaths. The site is located in the mid to upper catchment that ultimately flows through Kerikeri, therefore it is required to attenuate the 50%, 20% and 1% AEP climate change-modified storm events to less than 80% of the pre-existing runoff levels to prevent existing flooding from being exacerbated.

3. Attenuation

The stormwater attenuation assessment needs to be in accordance with the Far North District Council 2023 Engineering Standards. Of particular relevance is the requirement to reduce stormwater runoff from the increase in impervious area for the design events (5yr & 100yr ARI) plus climate change (+20% rainfall depth) to 80% of the predevelopment discharge without climate change. The stormwater analysis has been conducted with a desktop study and a hydrological model built using the modified SCS method, in accordance with NRCS TR-55 Type 1A rainfall distribution, as per FNDC ES. Rainfall data sourced from NIWA HIRDS. Model parameters are detailed below.

The calculations below were based on various roof areas and the maximum allowable hardstand areas, where runoff is not collected.

3.1. Modelling

The total area for each lot is approximately 3000 m^2, of which all of the land is grassed or vegetated.

Five different scenarios have been calculated in order to provide a simple solution for any future development, depending on house sizing and desired hardstanding areas.

Scenario	Roof area (m^2)	Hardstanding area (m^2)	Permeable area (m^2)
1	185	185	2630
2	200	200	2600
3	225	225	2550
4	250	250	2500
5	300	300	2400

Table 1: Attenuation Scenarios

Hardstand areas have been back calculated to the approximate maximum area that the roof collection would be able to over attenuate without causing a significant increase in maintenance requirements by restricting the orifice. It is assumed that the hardstand areas will not be collected, and all tanks are above ground.

Catchment		Area *(m^2)*	CN	ToC *(min)*	Ia *(mm)*
Pre-Development Areas	Grassed area	3000	80	10	5
	Impervious area	0	98	10	0

Post-Development Areas	Roof area	180-300	98	10	0
	Paved area	180-300	98	10	0
	Grassed area	2400	80	10	5

Table 2: Example catchment analysis for pre and post development for a 300m² roof area and 300m².

All areas which do not change from pervious to impervious, or vice versa, were not taken into account in the model and calculations.

It is proposed to over-attenuate the proposed roof area to account for the other impervious areas on site, then discharge into a level dispersion trench within the lot.

Stormwater analysis has been conducted with a desktop study, and a hydrological/hydraulic model (Figure 2) has been built using the MIKE+ 2024 software. Hydrological model methods follow the SCS Generalised Method as described in "Technical Publication 108, Guidelines for Stormwater Runoff Modelling in the Auckland Region". Rainfall depth and intensity data are sourced from NIWA HIRDS4 (historical data*1.2) for the site-specific area being assessed.

Mitigation of rainfall for the period of 24 hours for 5-year, 10-year and 100-year storm events has been assessed. These respectively have 24-hour rainfall depths of 187, 220, and 335 mm.

Curve numbers were determined for Type D soils as per our assessment, and sourced from FNDC ES table 4-3. While typically Kerikeri Volcanics is placed in the Type C soils, it was determined that the soakage for the soils was more indicative of a class D soil.

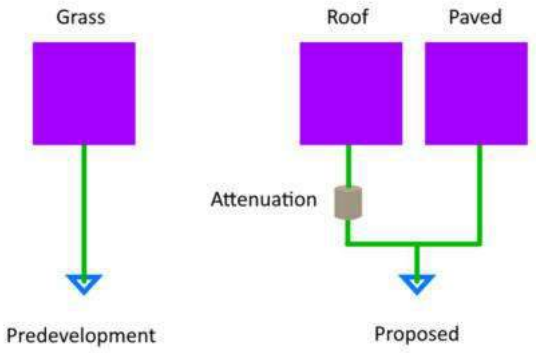


Figure 2: Mike+ Model Diagram.

3.2. Results

A 30,000L tank, of 3.5m diameter, was used for the calculations. Alternative tank configurations may be implemented, but these will require recalculations of orifice outlet sizing and dimensions. The orifice sizes and height for the tank are shown below in Table 3.

Scenario	Total Area (m^2)	Event	Orifice Height (m)	Orifice Size (mm)	Water Level (m)	Volume (m^3)
1	370	5 yr	0.00	18	0.62	5.97
		10 yr	0.62	34	0.80	7.70
		100 yr	N/A	N/A	1.16	11.16
2	400	5 yr	0.00	18	0.69	6.64
		10 yr	0.69	34	0.89	8.56
		100 yr	N/A	N/A	1.29	12.41
3	450	5 yr	0.00	18	0.81	7.79
		10 yr	0.81	38	1.02	9.81
		100 yr	N/A	N/A	1.43	13.76
4	500	5 yr	0.00	18	0.93	8.95
		10 yr	0.93	38	1.17	11.26
		100 yr	N/A	N/A	1.65	15.87
5	600	5 yr	0.00	20	1.04	10.01
		10 yr	1.04	38	1.33	12.80
		100 yr	N/A	N/A	1.93	18.57

Table 3: Pre and Post-development (attenuated) discharge (l/s) and orifice sizes and heights.

The bottom orifice outlet should be located in a location that leaves room for some solids to settle out. Often this will require atleast 150mm of separation between the lower orifice and the bottom of the tank.

The hydraulic modelling results indicate that this arrangement will attenuate the peak runoff for the analysed storm events, resulting in a lower runoff than the current site arrangement. A summation of these results is presented in the figures in the Appendices.

It is noted that the tanks, in most cases, can be used for other purposes such as firefighting volume or potable water as long as the requirements are met. For example, the allowed firefighting volume is always available.

3.3. Attenuation Reduction:

Attenuation requirements can be reduced by reducing the impermeable area on-site.

Soakage

Soakage has been reviewed as part of the geotechnical investigation onsite, and it is considered poor. The results of the soakage tests are shown below in Table 4

Table 4: Soakage test results

Soakage Pit ID	Test Duration (min)	Hole Width (m)	Hole Depth (m)	Groundwater Level (mbgl)	Percolation Rate (L/min/m^2)		Percolation rate E1/VM1 Section 9.0.2 (mm/hr)[2]
					Tested Rate[1]	Factored Rate[1]	
HA01 (Kerikeri volcanics in the Northern site)	240	0.1	1.5	>1.5	0.019	0.0073	47
HA12 (Waipapa group in the Southern site)	240	0.1	1.5	>1.5	0.0042	0.0015	13

1 – Soakage Rate determined by GD07.
2 – Soakage Rate determined by Section 9.0.2 of Building Code E1/VM1.
3 – FoS determined using Consequences of failure Level 2 (1.5) and Testing Quality Level 3 (1.8) from GD07.

Due to the poor soakage ability of the soils, it is not recommended for soakage to be a main source of attenuation reduction.

Permeable surfaces

Permeable pavers, gravel areas or Timber decks are great ways to reduce the total area of impermeable surfaces. The following pervious pavement technologies are available:

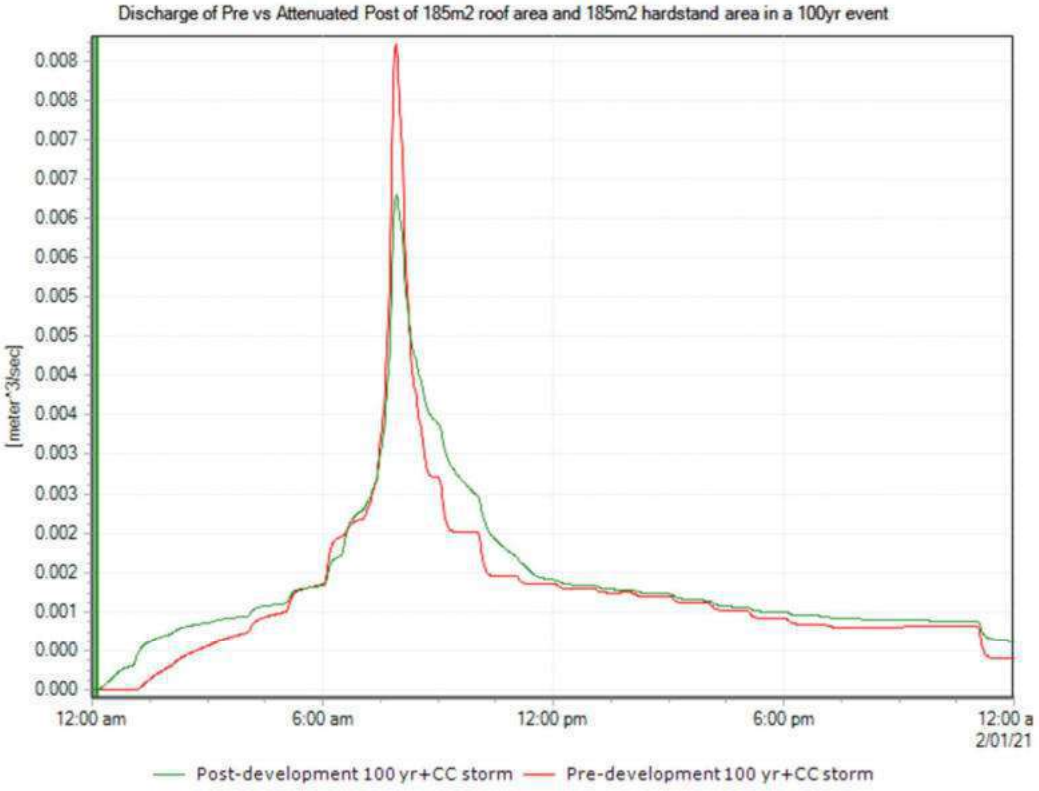
- Interlocking concrete block paving with permeable gaps between pavers
- Interlocking permeable concrete block paving
- Concrete grid pavers, e.g. Gobi Blocks
- Reinforced gravel or turf (plastic grid pavers or roll out Sureflex grass protection)
- Grasscrete or Grasspaver products

It is important to note that design constraints, as noted in Auckland Council's Guidance Document 01 (GD01) should be considered when adopting permeable paving as well as considering long-term maintenance and life of these products.

Appendix

Mike + Outputs

Scenario	Total impervious Area (m²) (50% collected)	Event	Attenuated Outflow (m³/s)	Attenuation Goal (Pre devopment ×0.8)	Percentage of Pre flows (%)	Orifice Height (m)	Orifice Size (mm)	Water Level (m)	Volume (m³)
1	370	5 yr	0.0024	0.0024264	79.67%	0.00	18	0.62	5.97
		10 yr	0.0038	0.0038616	79.39%	0.62	34	0.80	7.70
		100 yr	0.0063	0.0065672	76.02%	N/A	N/A	1.16	11.16
2	400	5 yr	0.0026	0.002624	79.16%	0.00	18	0.69	6.64
		10 yr	0.0041	0.004176	78.54%	0.69	34	0.89	8.56
		100 yr	0.0068	0.0071016	75.33%	N/A	N/A	1.29	12.41
3	450	5 yr	0.0029	0.0029536	78.49%	0.00	18	0.81	7.79
		10 yr	0.0047	0.00470	79.79%	0.81	38	1.02	9.81
		100 yr	0.0078	0.0079928	77.07%	N/A	N/A	1.43	13.76
4	500	5 yr	0.0032	0.003284	77.90%	0.00	18	0.93	8.95
		10 yr	0.0052	0.005224	79.27%	0.93	38	1.17	11.26
		100 yr	0.0085	0.00888472	76.20%	N/A	N/A	1.65	15.87
5	600	5 yr	0.0039	0.003944	79.26%	0.00	20	1.04	10.01
		10 yr	0.0062	0.006273456	78.32%	1.04	38	1.33	12.80
		100 yr	0.0101	0.0106928	74.46%	N/A	N/A	1.93	18.57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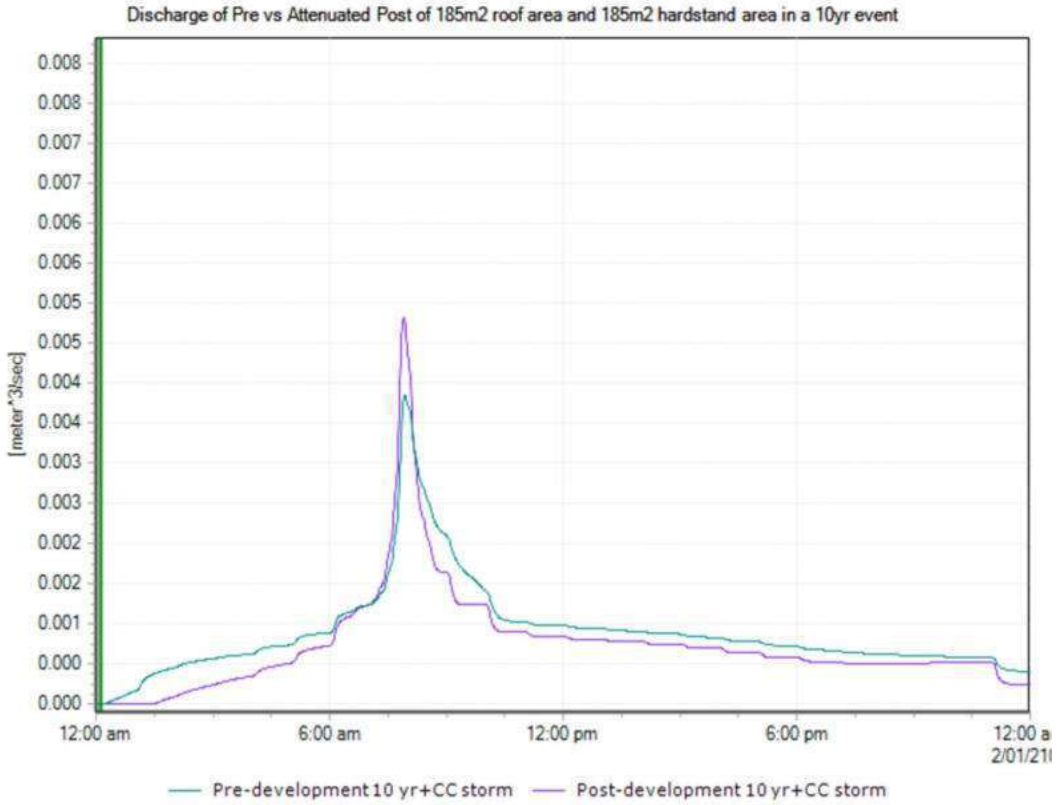
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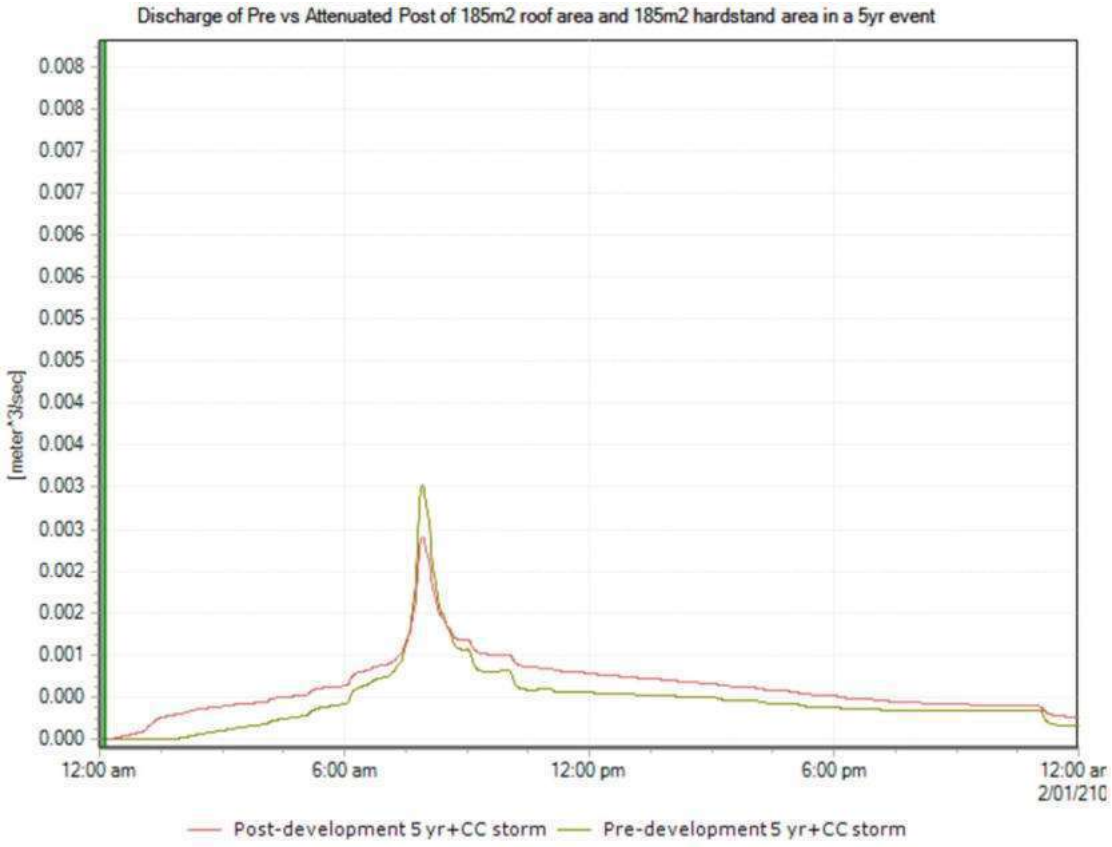
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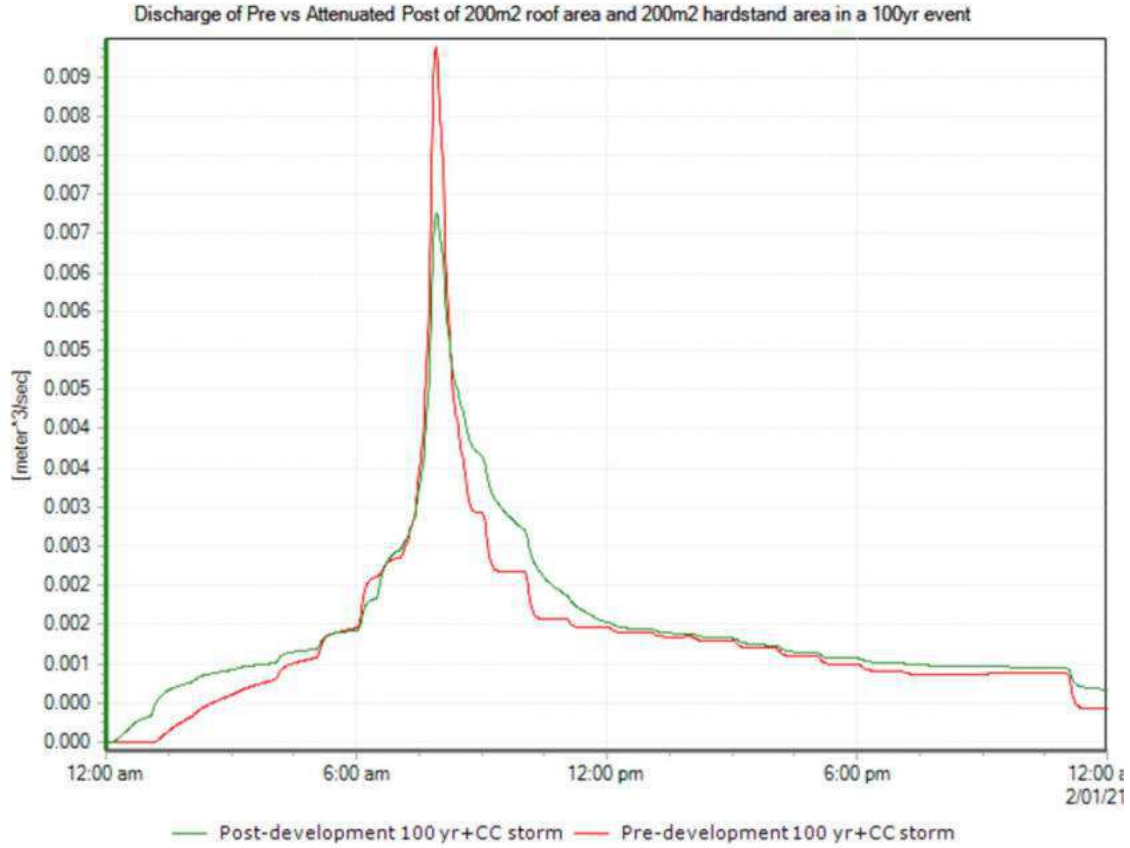
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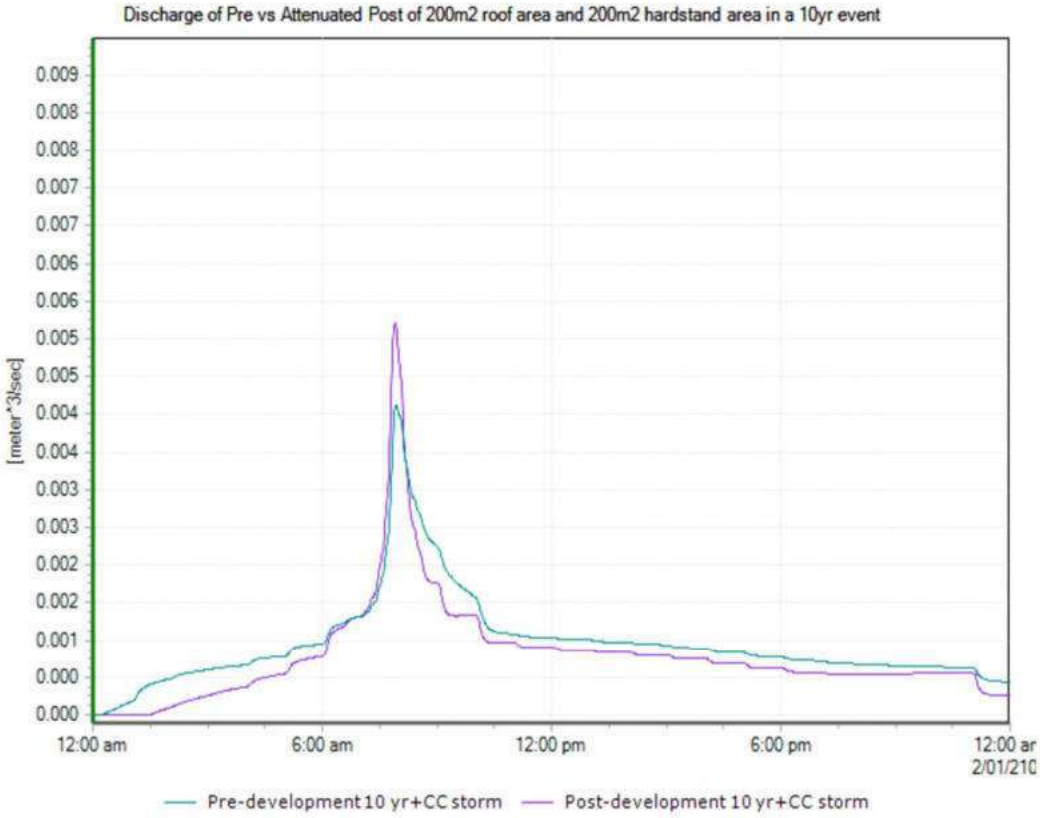
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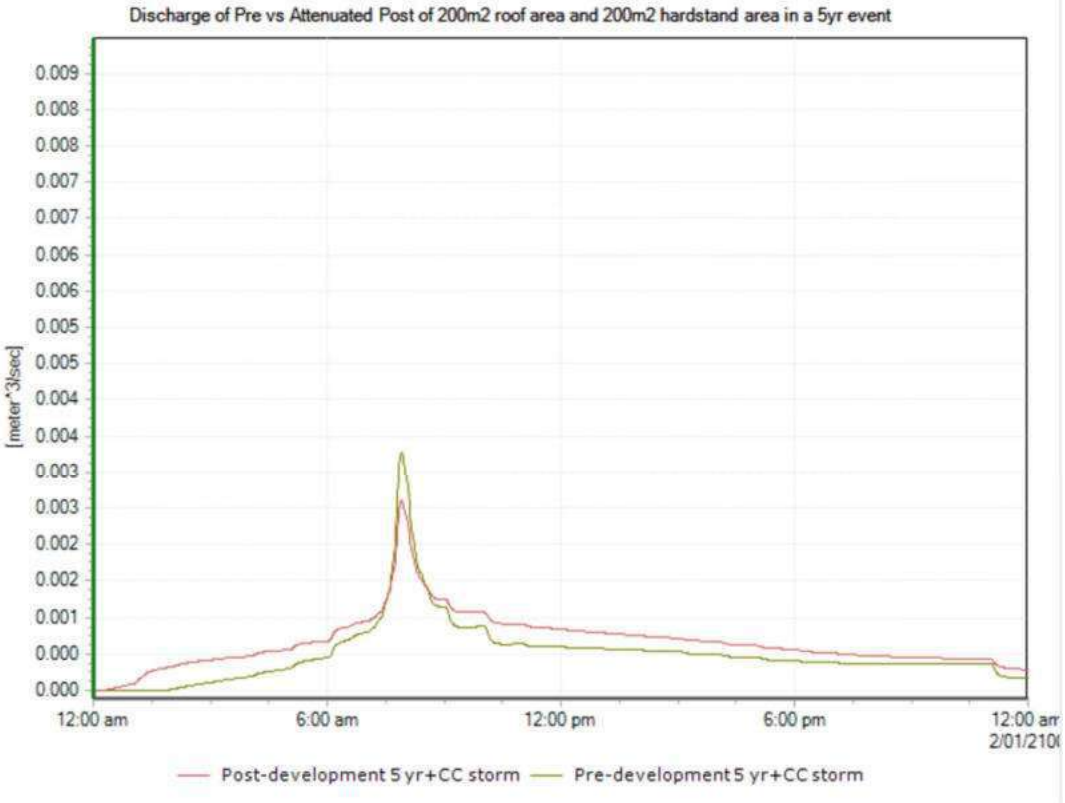
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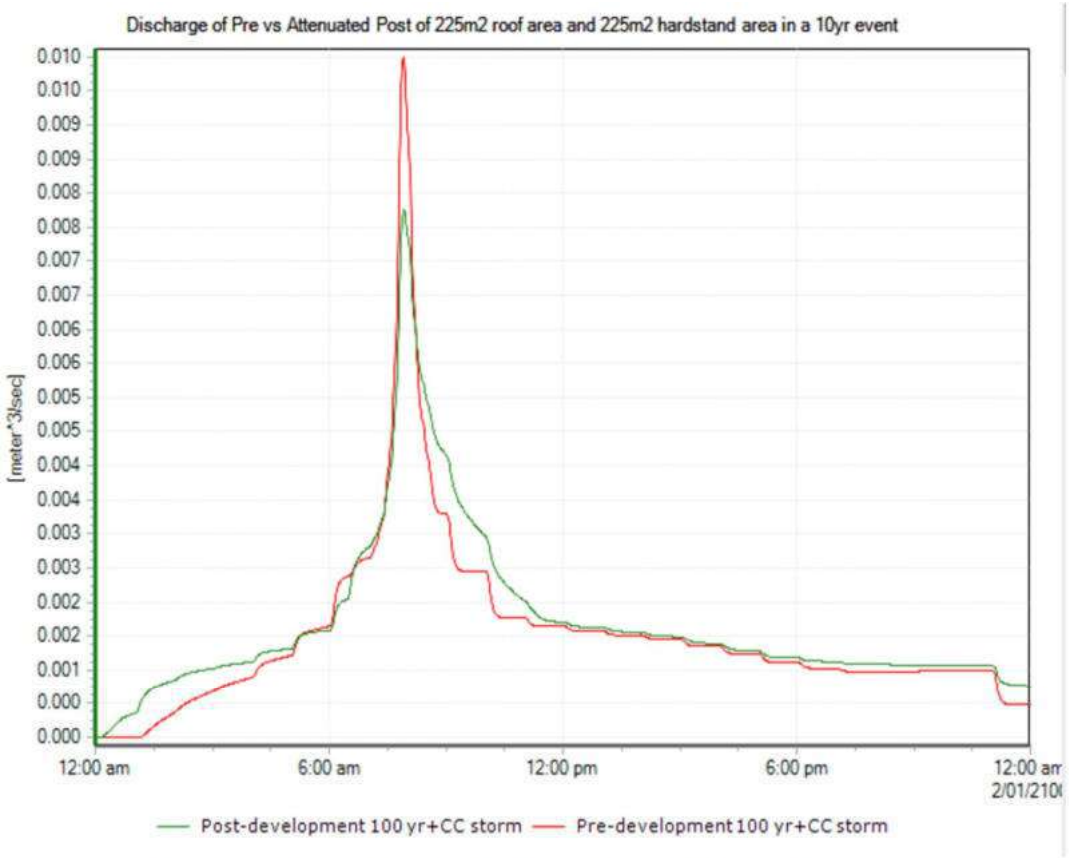
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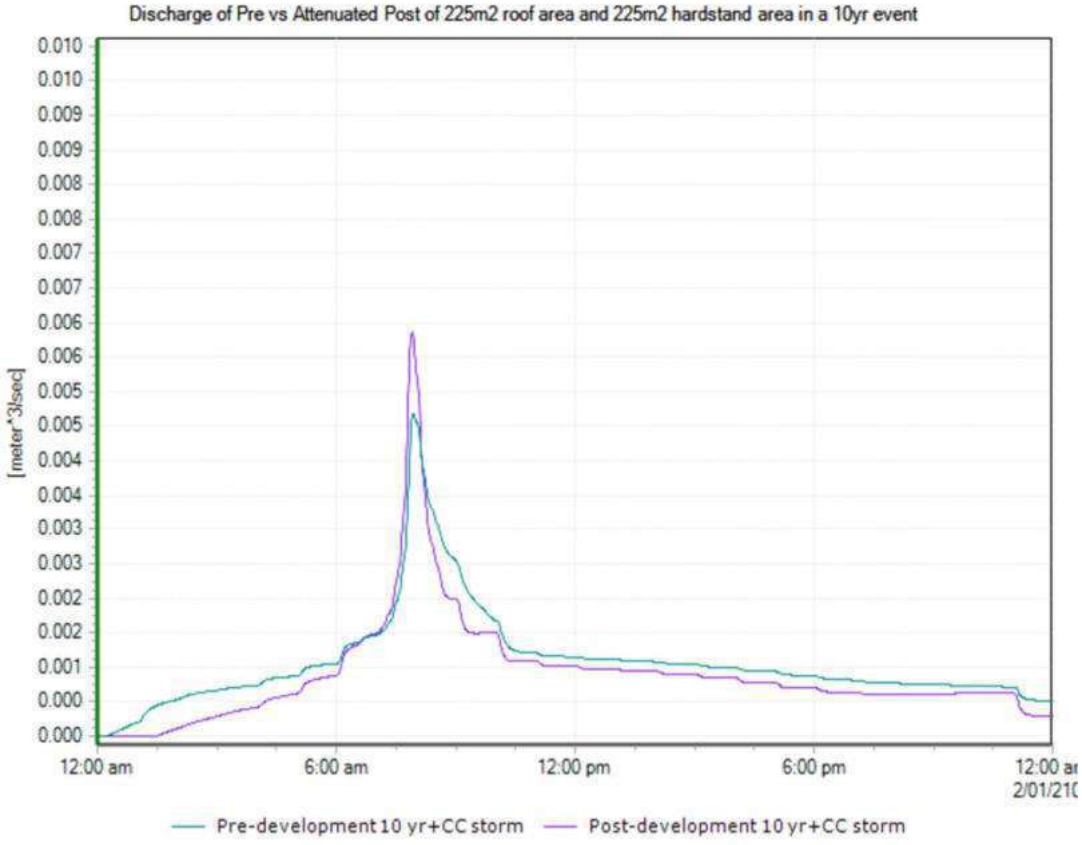
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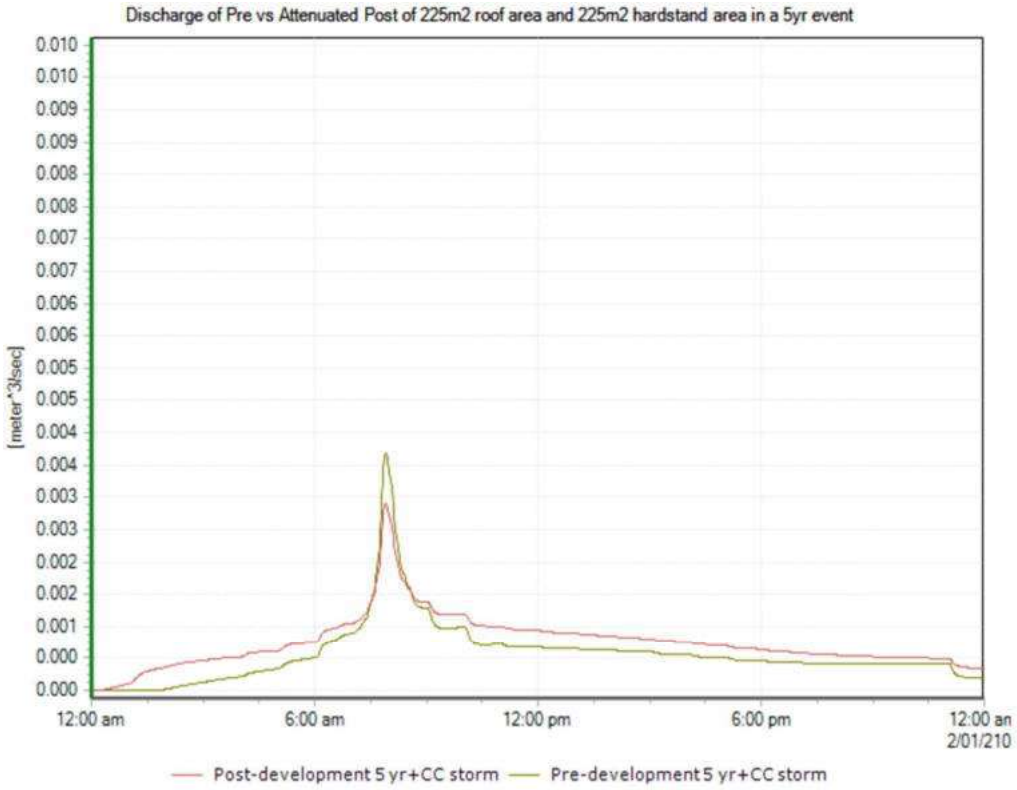
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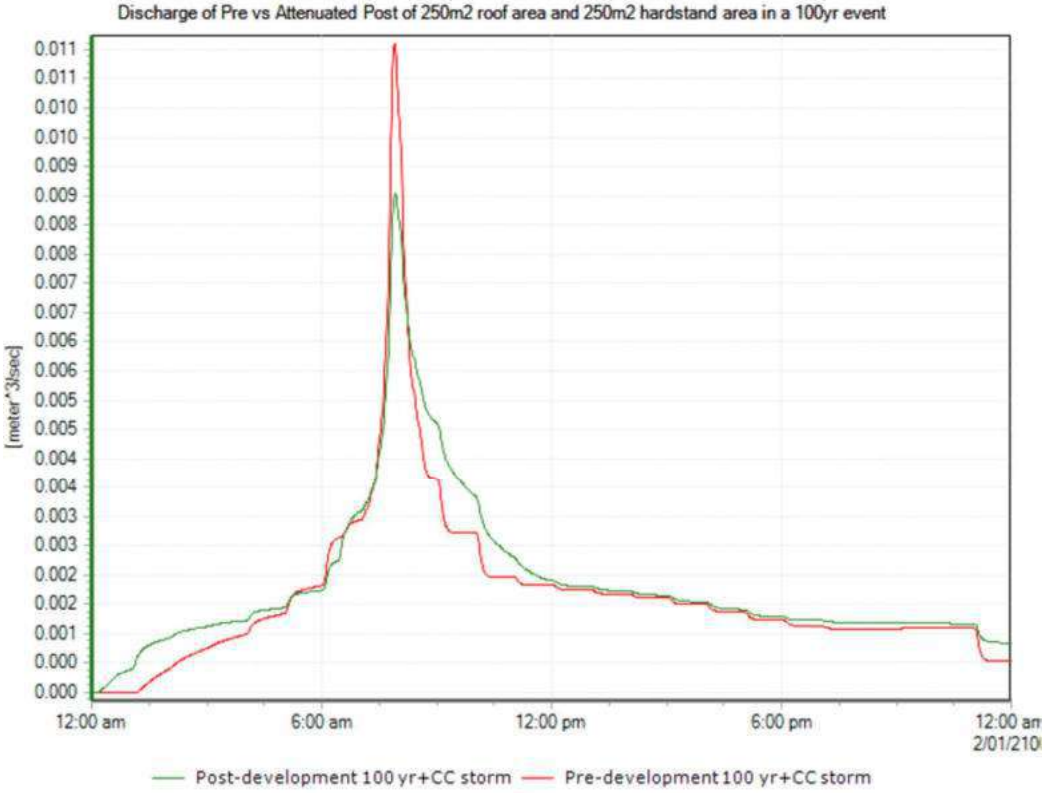
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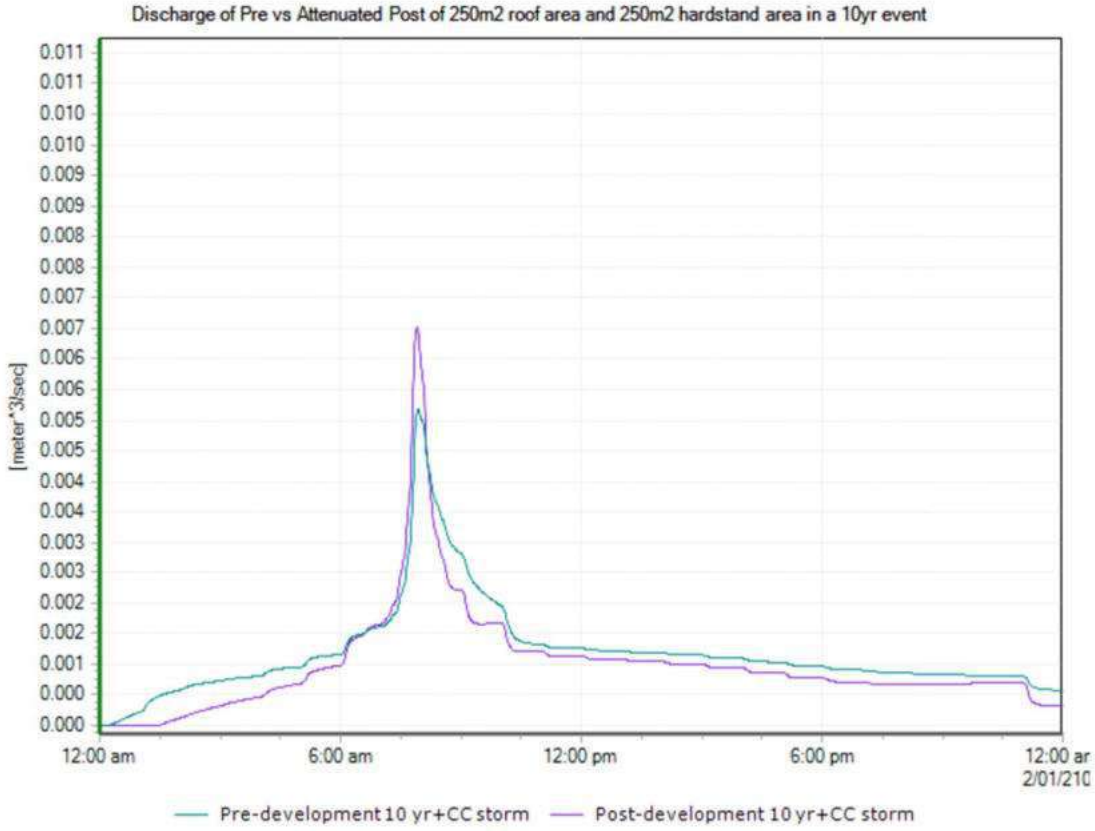
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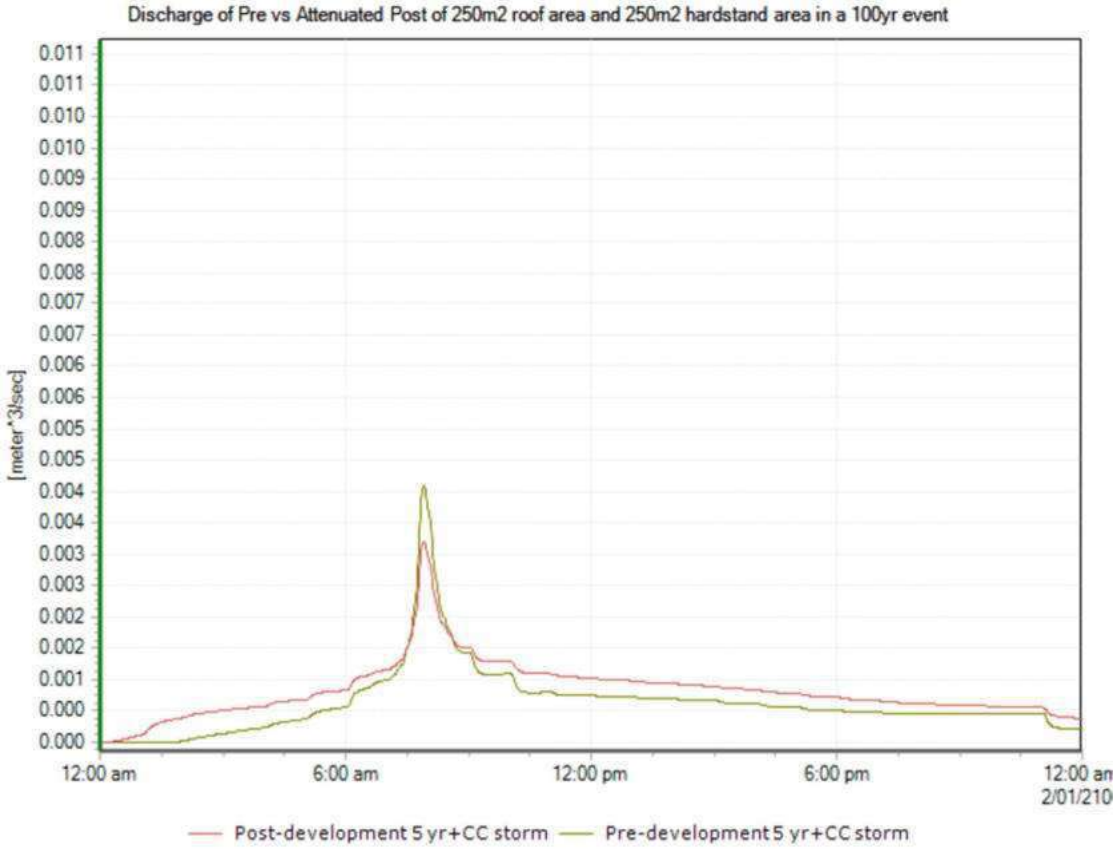
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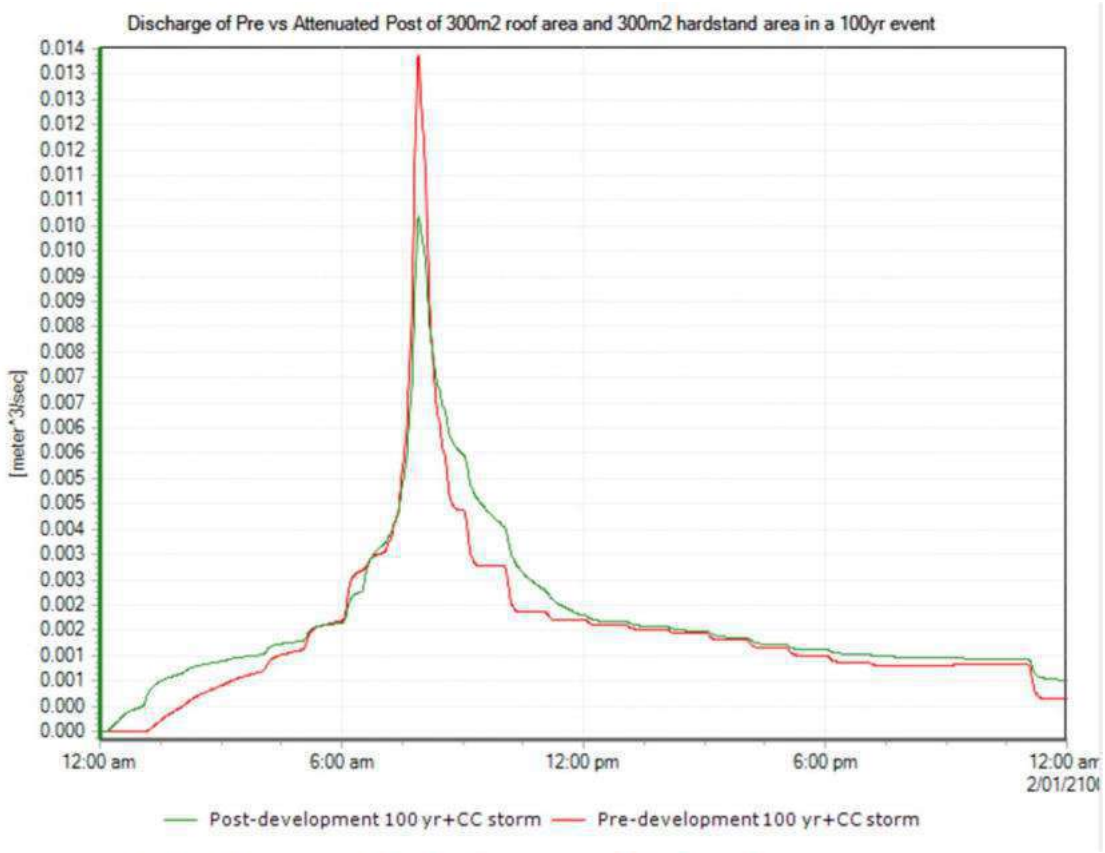
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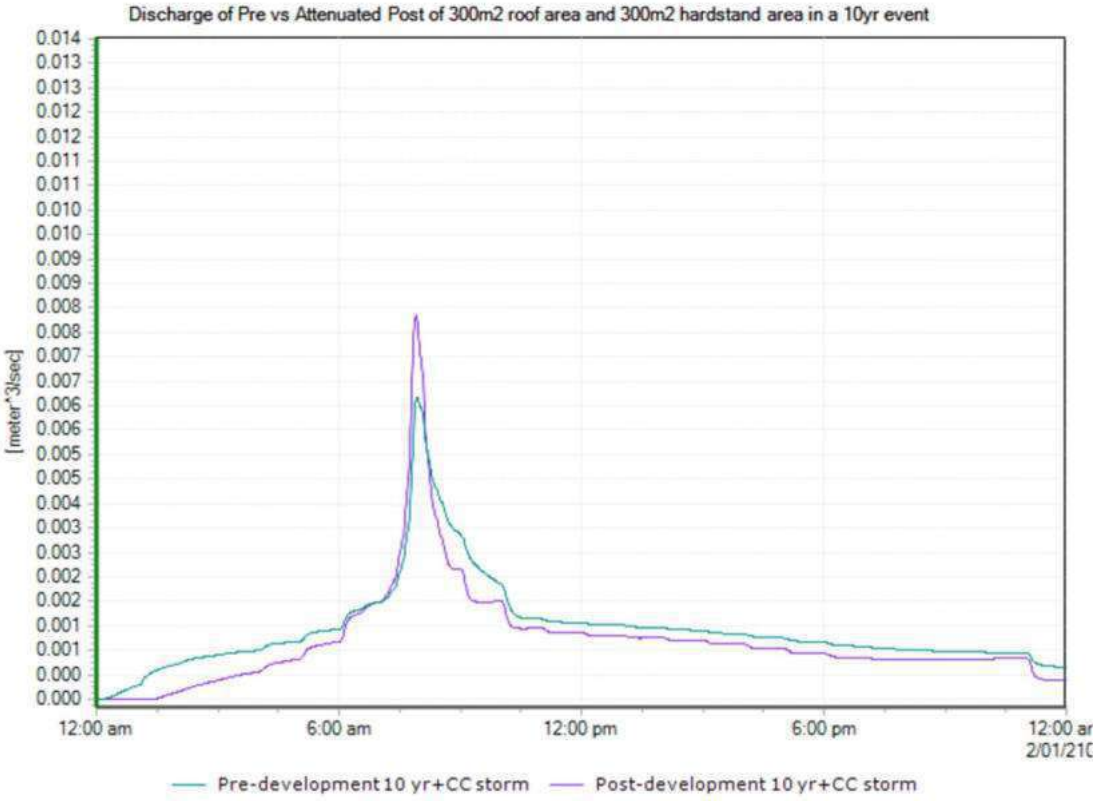
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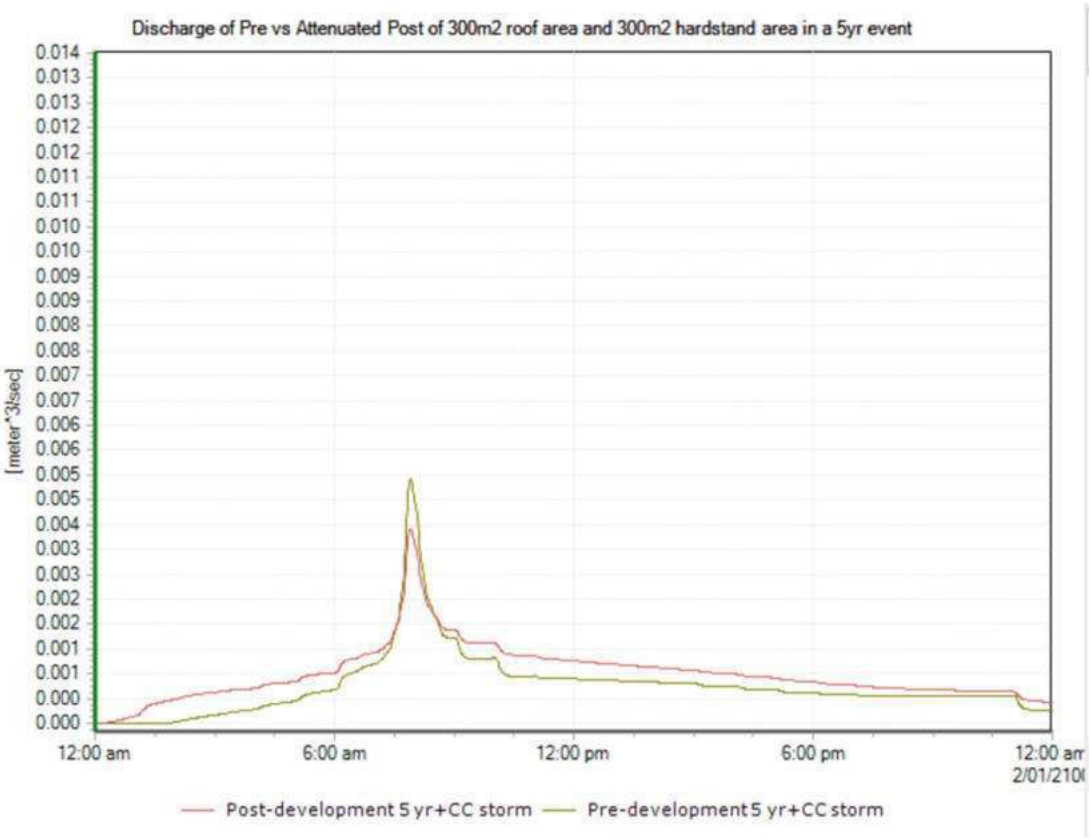
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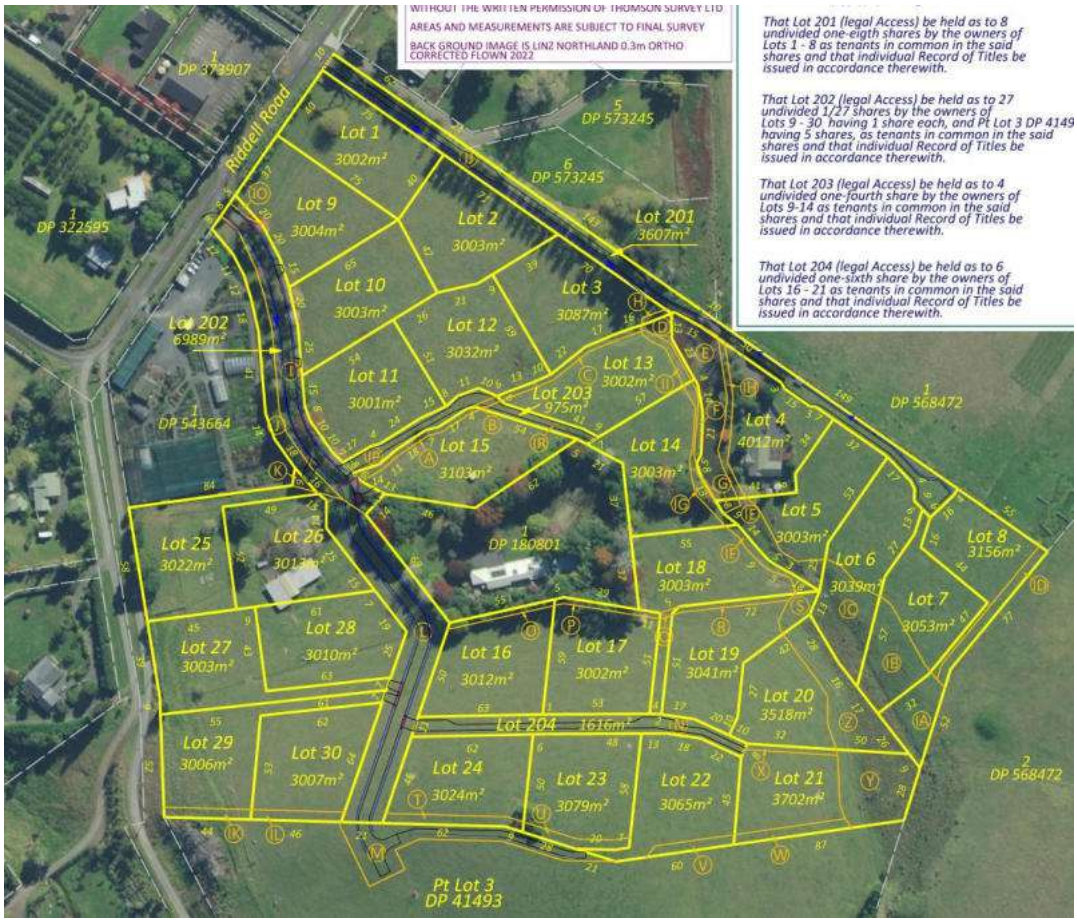
Engineering Outcomes, Limited
132 Beach Road
PO Box 3048,
Onerahi
Whangarei
New Zealand
Telephone 09 436 5534
Mobile 027 472 0945
E-mail info@e-outcomes.co.nz

SUBDIVISION
LOT 2 DP 543664
RIDDELL RD, KERIKERI

ASSESSMENT OF TRAFFIC EFFECTS



Prepared by Engineering Outcomes Ltd
22 January 2026

Table of Contents

1. THE PROPOSAL 1

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS 1

3. ACCESS AND THE EXISTING ROAD NETWORK 1

4. COUNCIL STANDARDS 5

5. TRAFFIC 6

5.1 TRAFFIC ON PUBLIC ROADS 6
5.2 TRAFFIC GENERATION 6
5.3 CRASHES 6

6. ASSESSMENT OF TRAFFIC EFFECTS AND PROPOSED MITIGATION MEASURES 6

6.1 WIDTH OF ACCESSES AND RIDDELL ROAD 6
6.2 THE SHEPHERD ROAD/RIDDELL ROAD INTERSECTION 8
6.3 OTHER MATTERS 8

7. FAR NORTH DISTRICT PLAN – ASSESSMENT CRITERIA 9

APPENDIX A: SUBDIVISION PLAN 11

FIGURE 1. A SUITABLE WARNING AND SPEED ADVISORY SIGN FOR JOAL 201.7

1. THE PROPOSAL

The proposal is a subdivision of Lot 2 DP 543664 on Riddell Road Kerikeri, Northland into thirty residential allotments.

It is described in plans by Thomson Survey that are reproduced in Appendix A.

This report is a traffic engineering assessment of the proposal including recommended mitigation.

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Overall, with the mitigation measures proposed and as shown in Photos 6 to 8, it is concluded that the traffic effects of the proposal will be well managed such that the associated risks are well within acceptable limits and the traffic effects will be less than minor.

In particular, Riddell Road between the site and Shepherd Road, while narrower than the width specifications of the *Far North district plan,* will still be fit-for purpose even with the additional traffic generated by the proposal, which is estimated at 200 to 220 additional movements on an average day at full development.

In fact, any general widening of Riddell Road and/or wider accesses, is likely to be counter-productive. Recent research into the influence of road width on harm found that the rate of harm on sealed roads in the width range of Riddell Road increases with increasing width.

Even with the subdivision, Riddell Road will also not carry an unusual level of traffic for a sealed road of this width. In fact, with the work proposed, it will generally be superior to most roads close to its width.

Warning and speed advisory signage is recommended on JOALs 201 and 202 to reinforce the importance of low speeds.

3. ACCESS AND THE EXISTING ROAD NETWORK

Access is proposed by way of two new shared vehicle accesses, both of which will be sealed and will coincide with existing driveways and their existing crossings. JOAL 202, on Lot 202, leads to all but eight lots and Lot 1 DP 180801. It is proposed to connect to the southeastern side of Riddell Road 480 metres from Shepherd Road. Another eight lots lead to JOAL 201 which is on Lot 201 and connects to the southeastern side of Riddell Road at 390 metres.

JOAL 202 is proposed to have a 6.0 metre wide carriageway throughout. JOAL 201 is proposed to provide only a single effective lane but with regular passing bays[1], full forward visibility between passing bays and minimum sight distance of 30 metres from all driveway connections[2]. Speed advisory signs are proposed on both JOALs 201 and 202 as shown in Figure 1 (page 7).

Riddell Road is sealed and straight with a mostly unkerbed[3] carriageway ranging from 4.8 to 6.0 metres wide, although most is no wider than 5.0 metres. Full forward sight distance is available throughout the entire 480 metres between JOAL 202 and Shepherd Road.

[1] At intervals of no more than 90 metres including immediately off the Riddell Road crossing.
[2] Suitable for an operating speed of 30 km/hr.
[3] The only exception being the first 50 metres.

Riddell Road forms a priority route with Shepherd Road, which it joins 710 metres from Cobham and Kerikeri Inlet Roads[4]. Its catchment includes sixty-four existing dwellings, a plant production operation with retail, a Brethryn church hall and several vacant lots. There is one dwelling on the subject site and one on Lot 1 DP 180801.

Shepherd Road is kerbed and 8.2 metres wide. Both roads have a footpath on one side[5], which provides a continuous pathway between the site and the Kerikeri CBD.

The Shepherd Road/Riddell Road intersection is a give-way controlled tee intersection with a single carriageway light. There is a crest on the western approach to the intersection, so advance warning of it from that part of Shepherd Road is poor. The section of Shepherd Road that forms the side road is in line with its western section, so there is potential for exits from that section at speed and in conflict with vehicles on the priority route. An advance warning sign, of the give-way control on the eastern section of Shepherd Road, is proposed to address this, see Photo 8.

Warning signs are also proposed on the other two approaches to the Riddell Road/Shepherd Road intersection as shown in Photos 6 and 7. Both warn of the sharp bend on the priority route, which is considered to be out of context with the straights in both directions and, for west (Riddell Road) bound traffic, is partially hidden by a crest.

The Shepherd Road/Cobham/Kerikeri Inlet Road intersection is also a give-way controlled tee intersection with a right-turn bay on the priority route and excellent visibility.

Both Riddell Road and Shepherd Road have the status of secondary collector road in the One Network Framework. The speed limit on both roads is 40 km/hr and that on Cobham Road is 50 km/hr.

Photo 1. The existing driveway that will be used for JOAL 202, viewed from the northwestern side of Riddell Road.

[4] Shepherd Road also continues eastwards as a give-way controlled side road. Cobham and Kerikeri Inlet Roads are part of the same route between Kerikeri and Kerikeri Inlet.
[5] With a short length of Riddell Road, northeast of the site, having footpaths on both sides.

Photo 2. Looking northeast along Riddell Road from the connection point for JOAL 202 (at 480 metres) Full sight distance is available over the crest and is more than 200 metres.

Photo 3. Looking southwest along Riddell Road from JOAL 202. Sight distance is more than 100 metres and the operating speed approaching this direction is barely 30 km/hr because of a sharp bend 100 metres southwest of this point. As such, the sight distance is greater than the highest standard applicable to safety – the safe intersection standard. The flag and sign at upper left are at the entrance to Kerikeri plant production.

Photo 4. The existing driveway connection that will become JOAL 201.

Photo 5. A panorama of Riddell Road from southwest (left) to northeast, viewed from the existing driveway connection that will become JOAL 201. The driveway at upper left is for the Brethryn church hall, the others are for single dwellings.

Photo 6. Looking north along Riddell Road towards Shepherd Road, with a depiction of a recommended chevron warning sign and speed advisory. The bend on this (priority) route has a safe speed slightly below 30 km/hr.

Photo 7. Looking east along Shepherd Road towards Riddell Road with a depiction of a proposed warning sign. This will address the effect of the crest in Shepherd Road on this approach, which masks the intersection until drivers are barely 100 metres from it. [A chevron warning sign, as shown in Photo 6 for another approach, is not suitable opposite this approach because of the alignment of Shepherd Road through the intersection.]

Photo 8. Looking east along Shepherd Road towards Riddell Road with a depiction of a proposed warning sign (with "40 m" supplementary panel). Note how Shepherd Road continues in the same direction beyond the intersection.

4. COUNCIL STANDARDS

Riddell Road currently leads to more than seventy dwelling-equivalents and there are several large blocks (including the subject site) and a number of vacant titles in its catchment. The site is in rural zones in both the operative and proposed district plans[6]. The catchment of Riddell Road is in both rural and urban zones in the operative district plan, but entirely rural-residential in the proposed district plan.

The council's width standards for rural access and public roads are given in Appendix 3B-1 of the operative district plan. For rural roads leading to more than 15 household equivalents, those specify a sealed and kerbed carriageway 6.5 metres wide[7] and a legal corridor width of 20 metres. For roadways in rural zones leading to between 5 and 8 household equivalents, Appendix 3B-1 specifies a carriageway 5.0 metres wide and a legal corridor width of 7.5 metres, plus the sealing of sections steeper than 20%.

Neither footpaths nor lighting are specified for rural roads or private access.

[6] Specifically Rural Living and Rural Residential respectively.
[7] Wider if there is significant use by cyclists, which is neither apparent nor expected on this route.

5. TRAFFIC

All vehicle movements are one-way movements whether an entry or exit or a movement in one direction along public roads.

5.1 Traffic on public roads

The most recent counts on Riddell Road were in 2022 and 2025, with the higher count registering 470 movements per day. A 2025 count was well below that, but it is not known where on the road the count was conducted.

The traffic on this part of Shepherd Road is estimated to at close to 1,700 movements on an average day[8].

5.2 Traffic generation

The traffic intensity of the thirty lots, when calculated in accordance with the *Far North district plan* Appendix 3A, is 300 movements per day.

Based on the recent count on Riddell Road and another no-exit road in Kerikeri (Hall Road prior to the Arvida retirement village), this is considered higher than the expected traffic generation. On those roads, this averages a little under 7 movements per dwelling on average day and is expected to be mirrored in the subject subdivision, for total generation in the range 200 to 220 movements per day.

5.3 Crashes

The *CAS* database of crashes reported to the Police has been searched on Riddell Road and Shepherd Road as far as Cobham Road, since the start of 2020. The only reported crashes were losses of control of single vehicles and not one has been reported anywhere on either Riddell Road or its intersection with Shepherd Road. In fact, not a single crash of any type has been reported at that intersection since at least the start of 2015.

6. ASSESSMENT OF TRAFFIC EFFECTS AND PROPOSED MITIGATION MEASURES

The focus of this section is the width of Riddell Road and the two main JOALs, plus the intersection of Riddell Road with Shepherd Road.

6.1 Width of Accesses and Riddell Road

Recent peer-reviewed research[9] into the influence of road width on harm, which included sealed roads across almost all of north island of New Zealand, determined the rate of harm[10] across road width ranges that include the width of both accesses and Riddell Road[11].

[8] Mobile Road.

[9] Dean R Scanlen (2024) *How is Road Width Related to Harm?* Presented to the Engineers NZ Transportation Group conference in June 2024.

[10] Taken to be the "social cost" of crashes as given in the *Monetised benefits and costs manual* version 1.6 Tables A32 to A34, then standardised by vehicle kilometres travelled. Social cost is the best-known representation of the harm caused by road crashes and trauma.

[11] This includes JOAL 201, which provides a single effective lane with passing bays. The study used a crash search over a very recent 5 calendar year period – 2018 to 2022.

That study found that:

- The rate of harm on sealed roadways with two effective lanes[12] increases steadily and significantly with increasing width and, as such;
- upgrading to the full council standard, including sealing, would result in a higher rate of harm than that on the proposed accesses and existing road.

The research also found significant lengths of urban roads with widths similar to Riddell Road but that carry more traffic, including more than 8 kilometres of such roads in the Northland region alone. The research did not investigate the reasons for the effect it found, but that is very likely a result of the higher vehicle speeds that wider roadways both enable and encourage.

As such, it is concluded that the risks associated with the additional traffic on Riddell Road will be well within acceptable limits and the associated effects will be less than minor.

The narrow JOAL 201 along with the alignment of JOAL 202 will almost certainly ensure that speeds are maintained below the safe-system threshold for vulnerable road users. As such, the JOALs will provide a safe and suitable environment for people on foot. The risk of serious harm from car-on-car collisions is extremely low, likely negligible.

Even so, to reinforce the importance of low speeds, advisory signs are proposed on both JOAL 201 and 202. Figure 1 shows a suitable such sign for JOAL 201, with 30 km/hr considered a more suitable speed advisory for JOAL 202[13].

Figure 1. A suitable warning and speed advisory sign for JOAL 201.

With these signs, it is concluded that the proposed accesses will be suitable and fit-for-purpose at their proposed widths, despite the additional traffic as a result of the subdivision, and that the effects of the traffic will be less than minor.

[12] Greater than 4.4 metres wide.

[13] Being private accesses, the advisory speed is not enforceable, but is still considered important to remind users, especially those unfamiliar with the accesses, of the appropriate speeds.

6.2 The Shepherd Road/Riddell Road intersection

The key risk in relation to this intersection is conflict between westbound vehicles on Shepherd Road, which are required to give way to other vehicles on the priority route - Shepherd Road (west) and Riddell Road. There is a minor visibility restriction in relation to the non-priority (eastern) leg of Shepherd Road, due to a crest a short distance west of this intersection[14], and the subdivision is expected to increase the traffic on the priority route. That is also a risk for single vehicles with the tight bend on the priority route through the intersection, which has a safe speed slightly below 30 km/hr.

Given the absence of crashes of any type at this intersection and bend since at least the start of 2015, warning signage is considered adequate to address the key issues at the intersection and is recommended. Those are depicted in Photos 6 to 8.

No turn treatment is warranted at the intersection. This is because virtually all exits from the priority route are west to east movements on Shepherd Road which does not actually involve a turn and for which vehicles do not even need to slow down[15], so is acceptable.

6.3 Other Matters

The capacity of all intersections that this proposal increases traffic on is well above the expected demand on them even at full development of the subdivision. The Cobham Road/Shepherd Road intersection is potentially the most affected, but a large proportion of exits from Shepherd Road are left turns. Those typically have at least 3 times the capacity of right turns and the traffic on the priority route is nowhere near the level that would result in congestion even for right turns.

No turn treatment is warranted for the subdivision accesses on Riddell Road[16]. There is s right-turn bay on the Cobham Road/Shepherd Road intersection.

The remainder of the road routes between the site and all common destinations, including, Kerikeri, Paihia, Kawakawa, Whangarei and Auckland, are sealed and of a standard that can easily cope with the relatively small level of additional traffic from this proposal.

[14] Specifically, sight distance of 107 metres ahead of the limit lines. That is considered minor because it is well above the safe-stopping standard for an operating speed 10 km/hr above the speed limit in this locality.
[15] Because, being a left turn, those vehicles are not in conflict with any other traffic.
[16] Far North district council engineering standards 2023 s3.2.27.

7. FAR NORTH DISTRICT PLAN – ASSESSMENT CRITERIA

There are three sets of criteria in the plan relevant to traffic management and access. Only the Property Access criteria in Section 15.1.6C.4.1 are relevant.

Criterion (a) Adequacy of sight distances… .

There are no sight distance restrictions in relation to the site accesses. The minor sight distance restriction in relation to Shepherd Road, near its intersection with Riddell Road, will be addressed by the proposed signage and, in any event, has not resulted in any crashes for more than 10 years.

Criterion (b) Any current traffic safety or congestion problems in the area.

There are no known safety or congestion problems in the area. The mitigation addresses the locations in which safety issues are most likely to arise.

Criterion (c): Any foreseeable future changes in traffic patterns in the area.

No significant projects or road links are planned that might significantly change the patterns of traffic in this vicinity.

Criterion (d): Possible measures or restrictions on vehicle movements in and out of the access.

With the relatively light traffic in the locality, there is no need for restrictions on vehicle movements.

Criterion (e): The adequacy of the engineering standards proposed and the ease of access to and from, and within, the site.

Riddell Road does not meet the council's standards but with the proposed mitigation and for the reasons given in section 6, the road is concluded to be adequate and fit-for purpose even with the additional lots.

Criterion (f): The provision of access for all persons and vehicles likely to need access to the site, including pedestrian, cycle, disabled, vehicular.

The proposed connection arrangement will ensure adequate access to all lots for all transport modes. Pedestrian traffic is well catered for and cyclists will be able to enter the site safely by way of the access and vehicle crossing connection.

Criterion (g): The provision made to mitigate the effects of stormwater runoff, and any impact of roading and access on waterways, ecosystems, drainage patterns or the amenities of adjoining properties.

The accesses are already formed, so their completion will not increase any natural hazards.

Criterion (h) relates to sites with a road frontage on Kerikeri Road so is not relevant.

Criterion (i) The provisions of the roading hierarchy, and any development plans of the roading network.

No significant projects or road links are planned that might significantly change the patterns of traffic in this vicinity.

Criterion (j) relates to alternative access for car parking and vehicle loading in business zones and is not relevant.

Criterion (k) Any need to require provision to be made in a subdivision for the vesting of reserves for the purpose of facilitating connections to future roading extensions to serve surrounding land; future connection of pedestrian accessways from street to street; future provision of service lanes; or planned road links that may need to pass through the subdivision; and the practicality of creating such easements at the time of subdivision application in order to facilitate later development, so is not relevant.

Also Criterion (l) Enter into agreements that will enable the Council to require the future owners to form and vest roads when other land becomes available (consent notices shall be registered on such Certificates of Title pursuant to Rule 13.6.7).

There is nothing to be gained by facilitating access to areas outside the site using the mechanisms described. The land beyond the site is not zoned for residential development in either the operative or proposed district plans.

Criterion (m) With respect to access to a State Highway that is a Limited Access Road, the effects on the safety and/or efficiency on any State Highway and its connection to the local road network and the provision of written approval from the New Zealand Transport Agency.

The site does not lead directly to a State highway that is a Limited Access Road.

Appendix A

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AREAS AND MEASUREMENTS ARE SUBJECT TO FINAL SURVEY

BACK GROUND IMAGE IS LINZ NORTHLAND 0.3m ORTHO CORRECTED FLOWN 2022

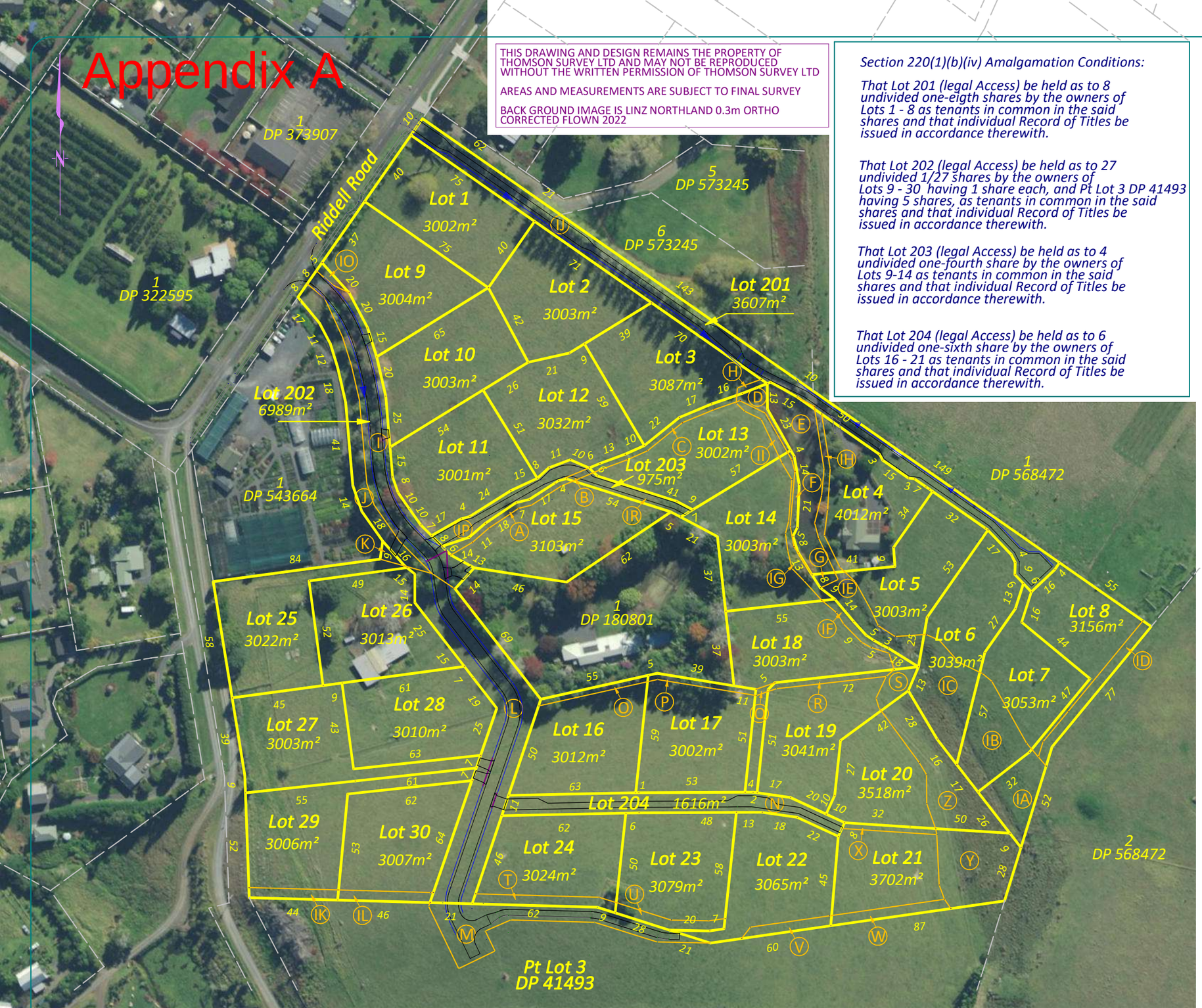
Section 220(1)(b)(iv) Amalgamation Conditions:

That Lot 201 (legal Access) be held as to 8 undivided one-eigth shares by the owners of Lots 1 - 8 as tenants in common in the said shares and that individual Record of Titles be issued in accordance therewith.

That Lot 202 (legal Access) be held as to 27 undivided 1/27 shares by the owners of Lots 9 - 30 having 1 share each, and Pt Lot 3 DP 41493 having 5 shares, as tenants in common in the said shares and that individual Record of Titles be issued in accordance therewith.

That Lot 203 (legal Access) be held as to 4 undivided one-fourth share by the owners of Lots 9-14 as tenants in common in the said shares and that individual Record of Titles be issued in accordance therewith.

That Lot 204 (legal Access) be held as to 6 undivided one-sixth share by the owners of Lots 16 - 21 as tenants in common in the said shares and that individual Record of Titles be issued in accordance therewith.



EXISTING EASEMENTS

PURPOSE	SHOWN	SERVIENT TENEMENT	CREATING DOCUMENT
RIGHT OF WAY, TELECOMMUNI-CATIONS, ELECTRICITY & CONVEY WATER	I	LOT 202	D195228.4
RIGHT TO DRAIN WATER	I J	LOT 202	11800870.3
	K	LOT 25	
	A	LOT 15	
	B	LOT 203	
	C D	LOT 13	
	E	LOT 4	
	F	LOT 14	
	G	LOT 5	

MEMORANDUM OF EASEMENTS

PURPOSE	SHOWN	SERVIENT TENEMENT	DOMINANT TENEMENT
RIGHT OF WAY, TELECOMMUNI-CATIONS, ELECTRICITY & WATER SUPPLY	M	Pt LOT 3 DP 41493	LOTS 22 - 24

REFER TO SHEET 2 FOR FURTHER EASEMENTS

Optional Staging

Stage 1: Lots 1 - 8, Lot 201, & Balance

Stage 2: Lots 9 - 30, Lots 202 - 204, & Easement M

AREAS SHOWN IK,IL,T,U,V,W,Y,IA,ID, IB,Z,IC,S,IF,IE,IG,IH,II,& H ARE TO BE SUBJECT TO VEGETATION PROTECTION

This drawing has been prepared solely for the use intended by the client stated on the plan, and must not be used for any other purpose. Thomson Survey Ltd accepts no responsibility for this plan, or any data contained on this plan, to be used for any other purpose.

This plan and accompanying report(s) have been prepared for the purpose of obtaining a Resource Consent only and for no other purpose. Use of this plan and/or information on it for any other purpose is at the user's risk.

0 20 40 80 120 160 200m

THOMSON SURVEY LIMITED
315 Kerikeri Rd
P.O. Box 372 Kerikeri
Email: kerikeri@tsurvey.co.nz
Ph: (09) 4077360 Fax (09) 4077322
Registered Land Surveyors, Planners & Land Development Consultants

Proposed Subdivision of Lot 2 DP 543664 & Easement over Pt Lot 3 DP 41493

39 Riddell Road, Kerikeri

PREPARED FOR: Taraire Tahi Ltd

	Name	Date
Survey		
Design		
Drawn	SL	15.12.25
Approved		
Rev		

ORIGINAL

SCALE 1:2000 SHEET SIZE A3

10825 Scheme 1.LCD

Surveyors Ref. No: 10825

MEMORANDUM OF EASEMENTS IN GROSS

PURPOSE	SHOWN	SERVIENT TENEMENT	GRANTEE
RIGHT TO DRAIN WATER	A	LOT 15	Residents Association (to be established at issue of titles)
	B	LOT 203	
	C D	LOT 13	
	E	LOT 4	
	F	LOT 14	
	G	LOT 5	
	O	LOT 16	
	P	LOT 17	
	Q	LOT 18	
	R S	LOT 19	
	X Y	LOT 21	
	IJ	LOT 201	
	IO,I,J,K,L	LOT 202	
	N	LOT 204	
Right to Convey Electricity	IJ	LOT 201	Top Energy Ltd
	IO,I,J,K,L	LOT 202	
	M	Pt LOT 3 DP 41493	
	IP,B IR	LOT 203	
	N	LOT 204	
Right to Convey Tele-comunications	IJ	LOT 201	Chorus NZ Ltd
	IO,I,J,K,L	LOT 202	
	M	Pt LOT 3 DP 41493	
	IP,B IR	LOT 103	
	N	LOT 104	

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Email: kerikeri@tsurvey.co.nz
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Survey		
Design		
Drawn	*SL*	*15.12.25*
Approved		
Rev		

ORIGINAL
SCALE *1:2000*
SHEET SIZE *A3*
10825 Scheme 1.LCD

Surveyors Ref. No: *10825*

Sheet 2 of 2

EROSION & SEDIMENT CONTROL PLAN

39 Riddell Road, Kerikeri

Prepared for:

Taraire Tahi Limited

January 2026

conquel CONSULTING

PROJECT INFORMATION

CLIENT:	Taraire Tahi Limited
PROJECT:	10401

DOCUMENT CONTROL

DATE OF ISSUE:	19/01/2026
REVISION	A
AUTHOR	Glen Bellingham Director
REVIEWED BY	Tony Smith Senior Engineer CMEngNZ, CPEng

REVISION HISTORY

DATE:	REVISION	AUTHOR	REVIEWED
19/01/2026	A	GB	TS

Contents

PROJECT INFORMATION 2
DOCUMENT CONTROL 2
REVISION HISTORY 2
1. INTRODUCTION 1
1.1. Background 1
1.2. Proposed Works 2
1.3. Purpose and Scope 2
2. SITE DESCRIPTION 3
2.1. Legal Description 3
2.2. Existing Site Description 3
2.3. Existing Land Use 4
2.4. Topography 4
2.5. Receiving Environment 5
3. PRINCIPLES OF EROSION AND SEDIMENT CONTROL 6
4. EROSION CONTROLS 7
4.1. Timing of Earthworks 7
4.2. Site Access Points 7
4.3. Limiting Site Length 7
4.4. Minimise Exposed Areas 7
4.5. Stabilisation and Reinstatement 7
4.6. Dust Control 7
4.7. Stockpiling 8
5. SEDIMENT CONTROLS 9
5.1. Dirty Water Bunds 9
5.2. Decanting Earth Bunds and Sediment Retention Ponds 9
5.3. Flocculation 9
5.4. Silt Fences and Super Silt Fences 10
6. STAGING OF WORKS AND SPECIFIC ESC METHODOLOGIES 11
6.1. Preparation 11
6.2. Indicative Staging 11
6.2.1 Upper (southern) area 11
6.2.2 Lower (northern) area 12
6.3. Stream Protection 12
7. OTHER SITE-SPECIFIC CONSIDERATIONS 13

7.1. Contamination 13
7.2. Dewatering 13
7.3. Works within a Flood Plain 13
8. ESC MONITORING AND MAINTENANCE 14
9. DISCOVERY 15
10. APPENDICES 16

1. INTRODUCTION

1.1. Background

Conquel Consulting Limited (Conquel) has been commissioned by Taraire Tahi Limited to prepare an Erosion and Sediment Control Plan (ESCP) for resource consent to undertake future earthworks at their 39 Riddell Road property in Kerikeri (the Site).

This report forms part of a suite of reports prepared to describe the future Site development and assess potential effects. The works are described in the Resource Consent drawings and the following reports:

- Geotechnical Factual Report.
- Geotechnical Interpretive Report.
- Ecology Assessment.
- Land Contamination Assessment.
- Civil and Stormwater Assessment.

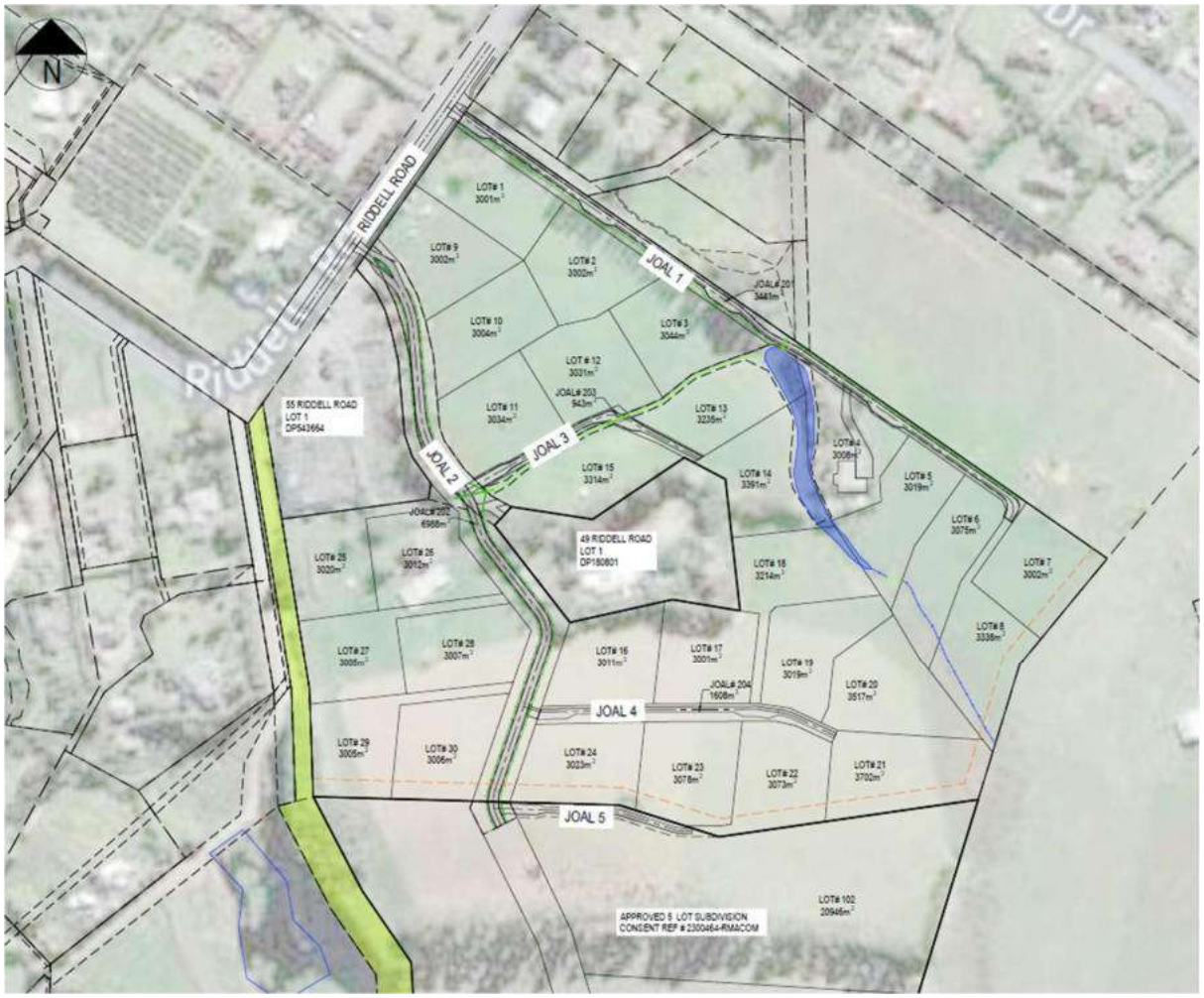

Figure 1: Site Plan

1.2. Proposed Works

The proposed development consists of the following:

- 30 Residential Lots (29 new titles).
- Private road network and shared accessways through the site.
- Earthworks sufficient to create the proposed roads, shared accessways and any works required for bulk servicing. Building consents will cover individual works for residential sites and building construction.
- Stormwater discharge considering pre to post development attenuation will be detained using rainwater re-use tanks for each dwelling, with an overflow discharging to swales alongside accessways.
- Flood modelling has been completed for the whole site and accessways and buildings have been located off overland flow paths and hazards.
- Individual sites will be supplied potable water from roof-fed tanks for consumption and fire supplies.
- Wastewater systems will be required for each lot using on-site decentralised wastewater treatment and disposal to ground, using TP58 design parameters, based upon soil characteristics as summarised in geotechnical investigation report and lodged as part of individual lot Building Consent applications. An example wastewater design for Lot 4 (replacement disposal field, as the existing field is located within proposed Lot 5) is attached to show how constrained sites (as shown on plan C5000) can be serviced for wastewater.

The above works will be constructed in a single construction stage. Refer to scheme and engineering plans for full details.

1.3. Purpose and Scope

The purpose of the ESCP is to outline how earthworks associated with the project can be managed to effectively mitigate any potential sediment discharge risk and avoid adverse impacts on the environment from land disturbance activities during construction.

2. SITE DESCRIPTION

2.1. Legal Description

Applicant	Taraire Tahi Limited
Address	39 Riddell Road, Kerikeri
Legal Description	Pt Lot 2 DP 41493
Site Area	Total area of 10.6185Ha
District Plan	Far North District Council
Current Use	Grazed land
Zoning	Rural Living under the current District Plan

2.2. Existing Site Description

The existing site is located to the south of Riddell Road, located approx. 2.2km south of central Kerikeri, which provides primary access into the site and to 49 Riddell Road, contained within the site. The access laid out between two rows of mature trees and underplanting is metalled and in good condition, while the subject property is in pasture.

The site is northerly in aspect, having rolling to moderate slopes in places and one central valley, leading to an established decorative pond. The southern boundary contains an elevated knob, which lies at approx. 100m RL, (approx. 20m above the pond) which provides elevated sightlines across Riddell Road and towards Kerikeri.

The pond adjacent to 49 Riddell Road, which contains the primary watercourse, gives way to a wide shallow flowpath discharging to the north-east at approx. 70m RL.

A subdivision approval in 2021 (2300464-RMACOM) created a right-of-way easement across the subject site to the land to the south (Pt Lot 3 DP 41493). The accessway will be formed and sealed along proposed JOAL 2 as part of this development.

Figure 2. Existing Site Plan

2.3. Existing Land Use

Apart from the existing dwelling at 39 Riddell Road and an accessway which leads into the site and also serves 49 Riddell Road, the site is in mature pasture, with well-established mature plantings.

2.4. Topography

The site is gently graded at the road frontage, descending to an overland flow path at the centre-east boundary at 70m RL before rising in a rolling profile to a knob at the south boundary at approx. 100m RL.

2.5. Receiving Environment

The site is located approx 2km south-west of permanent water flow (Wiroa Stream) and as no observed permanent flow is identified, the site does not have limitations of minimum flows or fish passage.

All receiving aquatic environments have the potential to be affected by sediment runoff during construction works. Sediment suspended in water can clog fish gills within the stream or limit light penetration, effecting various plant or algal species. Once settled, additional sediment loading can smother benthic organisms or coat the leaves of plants for which ESCP measures will provide protection.

3. PRINCIPLES OF EROSION AND SEDIMENT CONTROL

The key principles to be employed for an ESCP are to undertake land disturbing activities in a manner that reduces the potential for erosion of bare soils to occur (erosion control) and to employ treatment devices to treat all sediment laden water, prior to discharging from the site (sediment control). The 10 basic principles of erosion and sediment control taken from Auckland Council's Guidance Document 005: Erosion and Sediment Control ('GD05', 2016) will be applied to each of the defined scenarios (as applicable) and are outlined for completeness as follows:

- Minimise Disturbance: Only work those areas required for construction to take place;
- Stage Construction: Carefully plan works to minimise the area of disturbance at any one time;
- Protect steep slopes: Where steep slopes exist within the works area, ensure that these are protected as steep slopes are prone to erosion;
- Protect Watercourses: Map all water bodies before works commence;
- Stabilise exposed areas rapidly, by sewing new seed or mulch cover;
- Install perimeter controls: Divert clean water away from areas of disturbance and divert runoff from areas disturbed to sediment control measures;
- Employ detention devices: Treat runoff by methods that allow sediment to settle out;
- Make sure the ESCP evolves: As construction progresses and the nature of land disturbing activities change, the ESCP needs to be modified to reflect the changing conditions on the site;
- Assess and adjust: Inspect, monitor and maintain control measures, and;
- Use trained and experienced contractors

A Site-Specific Erosion and Sediment Control Plan (SSESCP) prepared by the Contractor or their delegate is a requirement of any future conditions of consent will be developed and maintained in accordance with GD05.

This document will include methods for confirmation that areas have been stabilised by way of established grass sward (to 80% coverage), paved surface construction and similar methods to allow for the staged clean out and removal of ESCP measures.

4. EROSION CONTROLS

4.1. Timing of Earthworks

The contractor shall endeavour to complete earthworks during the earthwork season (generally 1st October – 30th April). Should earthworks be required outside this period the contractor will apply to Council for permission to complete works outside this period, following the standard winter works approval process.

4.2. Site Access Points

A stabilised entranceway is present at both site entryways on Riddell Road. These are for 39 Riddell Road (JOAL1 location) and 49 Riddell Road (JOAL2 location). Construction will predominantly be accessed from JOAL2.

These access points will be maintained in accordance with GD05 standards, before being replaced as formed and sealed entranceways as per FNDC S/6.

Any sediment tracked or deposited on paved areas from machinery and vehicles leaving the site will be removed at the end of each workday as required. Sediment is to be removed using dry methods only (such as brooms and shovels) to avoid sediment entering the stormwater network via catchpits.

4.3. Limiting Site Length

Disturbance of long slopes increases the potential for water travelling across the site to cause erosion and generate sediment. Limiting the length of exposed slopes is an effective way of reducing the volume of sediment created during works and minimising sediment loss. Given the flat nature of the northern portion of this site and staged filling is anticipated,

JOAL2 ascends a slope of appro 11% over 20m. Earthworks for JOAL2 will be made over a limited number of days to remove topsoil, form the accessway and then to place aggregate to limit sediment generation. The limited volume of earthworks on slopes over the site length will minimise erosion.

4.4. Minimise Exposed Areas

Where possible works are to be undertaken in a staged manner to minimise the area of disturbance at any one time. By progressively stabilising the site with aggregate, geotextile cloth or hay mulch and grass seed where appropriate, the erosion potential of the site is limited.

4.5. Stabilisation and Reinstatement

Prior to the removal of all erosion and sediment controls, all exposed areas are to be permanently stabilised. This can be achieved through the construction of finalised hardfill or impervious surfaces, or through topsoiling, planting and obtaining at least 80% grass sward development. Prior to this, all controls are to remain in place and to be continually maintained.

4.6. Dust Control

Dust will be controlled by water spray as required. Water for dust control purposes will be sourced from the available Kerikeri Irrigation supply on site, dependent on water availability and any restrictions on use at the time of works. Dust management will need to comply with permitted activity conditions of the District Plan.

4.7. Stockpiling

All stockpiling of materials is to be carried out in a controlled manner within the catchment of a sediment retention device. If a temporary stockpile is o remain on-site at the end of a workday outside of a control device catchment, temporary stabilisation with geotextile fabric, hay mulch or a similar control is to be considered.

5. SEDIMENT CONTROLS

Limiting the generation of sediment on site through effective mitigation of erosion should be considered the primary approach on site as opposed to relying on sediment control devices. However, the following sediment control mechanisms will be implemented during works to provide treatment capacity for the volumes of sediment laden discharge that may be generated during earthworks.

5.1. Dirty Water Bunds

In order to convey water from within the active works area to treatment devices, earth bunds are to be constructed around the perimeter of earthworks areas.

These bunds function by both retaining and conveying sediment-laden water within the works area and keeping clean water outside of the works area to reduce the load on treatment devices. Clean water diversion bunds will discharge to nominated overland flow paths, clear of sediment retentions ponds (SRP) and silt fencing.

Each bund is to be sized adequately to carry flow from a 5% AEP event plus a freeboard of 300mm as per GD05 standards. Dirty water bunds are only to be decommissioned once all disturbed areas above the bund have been fully stabilised. A schematic showing the basic design criteria of a dirty water bund is shown in Figure 6.

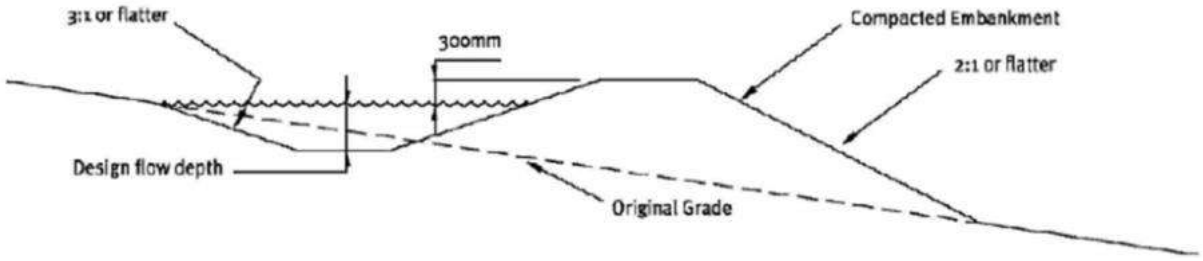

Figure 6: Cross section of a dirty water bund (Source: Auckland Council Guideline Document 2016/005).

5.2. Decanting Earth Bunds and Sediment Retention Ponds

SRPs and decanting earth bunds (DEBs) may be implemented throughout the site during works to provide treatment of dirty water discharges. Should either retention device be proposed in the Contractor's SSESCP they will be designed in accordance with GD05 standards. This includes a minimum volume equivalent to 2% of the contributing catchment area, floating T-Bar decants and stabilised emergency spillways and discharge points. All final design details are to be provided in the Contractor's SSESCP.

Further detail of a proposed SRP and DEB arrangement is provided in Section 6 and Appendix A.

5.3. Flocculation

The selected contractor will obtain bench testing of the ideal flocculant and proportion prior to establishing on site. The testing shall include both topsoil and sub-soil materials that will be encountered during the earthworks process.

Chemical flocculation will be used in all SRPs and DEBs, if constructed, to improve their sediment removal efficiency. This flocculation will be with a rain activated dosing system. All flocculation methodology and dosing rates will be detailed in a Flocculation Management Plan (FMP), as required by condition of consent. This approach will allow the appointed contractor to size their flocculation devices specifically to their constructed devices, as detailed in their SSESCP. Provided appropriate levels of treatment are achieved within the SRP, treated water may be discharged to the permanent watercourse that runs across the north-eastern boundary of the site.

5.4. Silt Fences and Super Silt Fences

Silt fences or super silt fences may be installed across the contour to slow sheet flow and impound sediment from small catchment areas. Heavy machinery operation and earthworks will not occur on the downhill side of silt fences unless it is undertaken following a strict cut and cover methodology for small work areas only. Silt fences and super silt fences will be installed in accordance with GD05 and will remain in place until either accessways have aggregate surface or grassed areas achieve 80% sward development is achieved within their contributing catchment.

6. STAGING OF WORKS AND SPECIFIC ESC METHODOLOGIES

6.1. Preparation

We anticipate that contractors' SSESCP will commence with all silt fencing and then to include the construction of primary accessways ending in the establishment of aggregate surface.

It is they expected that the cut to fill works required to create the proposed final design landform will be undertaken in a staged manner, reducing the area of exposed soils at one time. This will both limit the risk of a discharge of sediment-laden water from the site by reducing the potential for soil erosion and increase the efficiency of sediment control devices by reducing the volumes of water requiring treatment at one time.

An indicative staged approach with ESC considerations is detailed below and in Appendix A. Further detail of both the approach taken to progressively stabilise fill areas and calculations to support any changes to the size of retention devices are to be outlined in a SSESCP prior to works starting.

Dirty water bunds will be constructed around the stockpile area initially to direct stormwater to retention devices.

This SRP detail is provided in Appendix A, sized to cater for the active works area. The size of the pond may be adjusted through staging of works and progressive stabilisation. The details of any changes to the size or position of these SRPs, along with supporting calculations of retention capacity are to be outlined in a SSESCP prior to works starting.

All SRPs are to be constructed in accordance with GD05 guidelines with a minimum volume equivalent to 2% of the contributing catchment area, and will include appropriately sized forebay and retention areas, a floating T-bar decant system and stabilised emergency spillways and discharge points. Further details of the design criteria of an SRP and T-bar system are included in Appendix A.

6.2. Indicative Staging

6.2.1 Upper (southern) area

Initial earthworks to strip topsoil to expose soil within the sloped areas of cut for JOAL's 2, 4 and 5, will be stockpiled within lots 17 & 18 within silt fencing. The proposed bulk fill area for surplus cut over fill within lots 27 to 30 will be stripped and topsoil also placed on lots 17 & 18.

A sediment retention pond (SRP) will be formed on Lot 25, and discharge to a water table along the adjacent right of way west of the site. This facility will be maintained until grass sward development across lots 27 to 30 is achieved and thereafter backfilled.

An SRP will be formed on Lot 20 to cover the area exposed to construct JOAL's 4 and 5. This will decant to the overland flow path along the base of the wetland valley shape. This facility will be maintained until accessway stabilisation and grass sward development across JOAL's 4 and 5 and Lots 16 to 19 is achieved and thereafter backfilled.

Cut to fill operations from the southern, sloping area of the site, will remove surplus soil from JOAL's 2, 4 and 5 and place this as engineered fill within lots 27 to 30. Once geotechnical testing has confirmed the soil compaction to design parameters (to form part of a Geotechnical Completion

Report (GCR) upon completion), topsoiling and grassing will then be undertaken, with temporary stabilisation aids used as required.

6.2.2 Lower (northern) area

Initial earthworks to strip topsoil to expose soil within the gently contoured areas of cut for JOAL's 1, 2 and 3 will be stockpiled within lot 11 within silt fencing.

A sediment retention pond (SRP) will be formed on Lot 3, which will discharge to the decorative pond along the north-east area of the site. This facility will be maintained until aggregate stabilisation and 80% grass sward development across JOAL's 1, 2 and 3 is achieved and thereafter backfilled.

No bulk cut to fill operations are proposed within the northern, gently sloping area of the site. Once geotechnical testing has confirmed the soil compaction to design parameters to form part of a Geotechnical Completion Report (GCR) upon completion. Topsoiling and grassing will then be undertaken, with temporary stabilisation aids used as required.

6.3. Stream Protection

A key consideration for the management of works is the protection of the natural wetland and decorative pond that runs along the central-east portion of the site. No works are to be undertaken within the watercourse, apart from the removal of a culverted crossing within the wetland extents.

7. OTHER SITE-SPECIFIC CONSIDERATIONS

7.1. Contamination

Soil and groundwater contamination has not been identified on the site. No site-specific soil contaminations risks require construction activities are required. If during works, any unknown material is discovered, this shall be brought to the attention of the Engineer.

7.2. Dewatering

While it remains unlikely, isolated dewatering may be required during works, dewatering of stormwater can be undertaken by pumping water directly to an SRP to encourage sedimentation and passive discharge through this device. Alternatively the appointed contractor can dewater through an approved dewatering treatment device, such as a 'turkey's nest', dewatering bag, baffled bin or lamella clarifier. Monitoring of any dewatering will occur while in progress to ensure it does not result in sediment discharge to the receiving drain.

7.3. Works within a Flood Plain

While neither FNDC and NRC web sites list any areas within the site are located within a flood plain, we will provide vigilance to overland flow paths. No works are proposed within the flood plain modelled in the 100 yr flood path.

Within three routes, existing and proposed overland flowpaths are to be formed. These are shown on plan C1500 running west to east:

Flowpath 1, receiving runoff from 55 Riddell Road, traverses lot 26, JOAL 2 before passing through 15 and 13 before discharging into the decorative pond;

Flowpath 2, received water from below JOAL 4 and those lot north, and routes along lots 16 to 19 before discharging to the natural wetland, and;

Flowpath 3, received water from lots 21 to 24 and coveys this along the northern boundary of Lot 21, before discharging to the natural wetland.

Carrying out works during a dry weather window and adopting a cut and cover methodology where possible the risk associated with working in this area can be minimised. Reducing the exposed areas within the flood plain is a key consideration for this part of the proposed works, along with effective contingency planning to enable the site to be temporarily stabilised quickly in the event of inclement weather.

8. ESC MONITORING AND MAINTENANCE

The following monitoring and maintenance activities shown in Table 1 are recommended as a minimum for the site. This table provides several aspects of ESC that the Site Manager will assess regularly to ensure ESC measures are optimised. Final maintenance and monitoring will be detailed in the Contractor's SSESCP.

Table 1: General Inspection and Maintenance Requirements.

Control Type	Inspection and Maintenance Requirements	Frequency
Weather Forecast	▪ Check forecast provider for rainfall forecasts ▪ Undertake a pre-check of the site controls prior to any large rainfall events (>20mm/24hrs).	Daily during operations
Dirty water diversion bunds	▪ Inspect for scour and repair as required. ▪ Remove any accumulated sediment where there is a risk of overtopping. ▪ Check for damage from machinery and repair as necessary.	Weekly and following rainfall events
Silt fences	▪ Check that silt fences are toed-in correctly. ▪ Check for tears and other damage – fix if required. ▪ Any areas of collapse, decomposition or ineffectiveness are to be replaced immediately. ▪ Remove silt build ups when bulges develop or when deposition reaches 30% of the silt fence height.	Weekly
Monitoring of Sediment Discharge	▪ Check whether erosion and sediment devices are operating as designed via checking water clarity in devices and receiving waterways. ▪ Inspect areas of earthworks and identify whether additional erosion and sediment control measures are necessary. ▪ Determine whether excessive sediment is discharging to roadways, land, or watercourses and remediate immediately.	Prior and during rainfall events and weekly
Sediment Retention Ponds and Decanting Earth Bunds	▪ Check clarity of discharge to ensure the device is functioning efficiently. ▪ Check inlets and outlets for any signs of scour or erosion – repair or replace stabilising materials as required. ▪ Maintain volume capacity by removing accumulated sediment as required.	Weekly

Stabilised Entranceway	▪ Inspect the stabilised accessway and top up with clean aggregate if required. ▪ Inspect Riddell Road and ensure surfaces are not having sediment tracked onto them – sweep if required. ▪ Inspect any structure used to trap sediment from the stabilised entranceway.	Daily during operations
Stabilising Areas	▪ Check that all stabilised areas have at least 80% cover before removing control devices. ▪ Identify areas that require stabilisation and remedy.	Daily during operations.
Flocculant	Check flocculant device for damage and proper function – repair as required. Adjust levels of flocculant based on observations of discharging water as outlined in the Flocculant Management Plan.	Daily during operations.

9. DISCOVERY

We consider that as construction activities get underway, that it remains possible that a discovery of items or artifacts may occur. The contractor shall refer to Heritage NZ documents: Accidental Discovery Protocol (ADP) and AGS 8 - Koiwi Tangata/Human Remains Guidelines as attached.

10. APPENDICES

Appendix A – ESC Schematics

N

REFER PLAN C2001

REFER PLAN C2004

REFER PLAN C2002

REFER PLAN C2003

RIDDELL ROAD

55 RIDDELL ROAD
LOT 1
DP543664

49 RIDDELL ROAD
LOT 1
DP180801

LOT# 1
LOT# 2
LOT# 3
LOT# 4
LOT# 5
LOT# 6
LOT# 7
LOT# 8
LOT# 9
LOT# 10
LOT# 11
LOT# 12
LOT# 13
LOT# 14
LOT# 15
LOT# 16
LOT# 17
LOT# 18
LOT# 19
LOT# 20
LOT# 21
LOT# 22
LOT# 23
LOT# 24
LOT# 25
LOT# 26
LOT# 27
LOT# 28
LOT# 29
LOT# 30

JOAL 1
JOAL# 201
JOAL 2
JOAL# 202
JOAL 3
JOAL# 203
JOAL 4
JOAL# 204
JOAL 5

NOTES

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9. Contours are at 1m intervals.

LEGEND

- EX BDY
- PROP BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR SITE EXTENT
- PR EASEMENT
- EX WATERCOURSE
- EX FLOWPATH
- EX BUILDING
- EX POND
- EX-NATURAL WETLAND
- PR-FLOWPATH 100YR
- PR-10m RIPARIAN SETBACK
- PR-EXTENT 100YR
- PROP EXTENT WORK
- PROP CLEANWATER
- PROP DIRTYWATER
- PROP SILT FENCE
- PROP STOCKPILE
- PROP DECANT
- PROP DECANT BAR

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

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Riddell Road
Kerikeri

Overview Proposed Earthworks and Sediment Control Plan

No.	Revision (Description)	Name	Date
A	Resource Consent	GB	12/25
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Designed		GB	09/25
Drawn		GB	09/25
Checked		TS	11/25

Project no.	10401		
Scale	1:2000 @ A3		
Cad file	10401 RC EARTHWORKS.DWG		
Drawing no.	C2000	Rev	A

N

EXISTING CROSSING USED AS STABILISED ENTRANCE FOR ACCESS TO SITE

EXISTING CROSSING USED AS STABILISED ENTRANCE FOR ACCESS TO SITE

RIDDELL ROAD

WORKS WITHIN EXISTING ACCESSWAY AREA TO BE COMPLETED AS FOLLOWS:

1. CONTRACTOR TO PROGRESSIVELY TRIM AND METAL SECTIONS IN MAXIMUM LENGTH OF 40m PER DAY
2. SWALES SHALL BE FORMED AS PART OF TRIMMING AND USED AS DIRTY WATER DRAINS
3. WORKS SHALL ONLY BE UNDERTAKEN WHEN FORECAST SHOWS NO RAIN FOR 3 CONSECUTIVE DAYS OR MORE

CATCHMENT 1
2304m2

JOAL 1

CLEANWATER CUTOFF BUND ALONG HIGHSIDE OF WORKS

LOT# 1

LOT# 9

LOT# 2

TOPSOIL STOCKPILE

CARE TAKEN WORKING UNDER EXISTING TREES ON DRIVEWAY

PROPOSED DEB 1
VOLUME (BASED 2% OF CA) = 46.42m3
BASE POND DIMENSIONS = 2.3m x 7m
BASE DEPTH = 1m
DECANT = 31 Holes

LOT# 10

LOT# 3

JOAL # 204

SWALE TRIMMING SHALL BE COMPLETED IN 20m SECTIONS STARTING AT LOWEST POINT AND WORKING UPWARDS ONLY WHEN FORECAST IS FOR 3 OR MORE CONSECUTIVE DAYS OF NO RAIN EACH SECTION SHALL BE TRIMMED/TOPSOILED AND STABILISED WITH COCONUT MATTING WITH SILT FENCE INSTALLED BELOW EACH SECTION BEFORE STARTING NEXT SECTION

PROPOSED SWALE FOR ACCESSWAY TO ACT AT DIRTY WATER CUTOFF FILTER SOCK INSTALLED AT 10m CENTRES TO ACT AS CHECK DAMS

55 RIDDELL ROAD
LOT 1
DP543664

JOAL 2

CLEANWATER CUTOFF BUND ALONG HIGHSIDE OF WORKS

LOT# 11

SILT FENCE ABOVE SWALE

CATCHMENT 5
542m2

CATCHMENT 8 (SWALE)
519m2

LOT# 13

CATCHMENT 4
1807m2

JOAL 3

JOAL # 203

CATCHMENT 4
257m2

TOPSOIL STOCKPILE FOR SWALE

2m WIDE x 0.2m HIGH GAP65 RAISED TABLE TO CUTOFF CATCHMENT AND DIVERT FLOW TO THE EAST

LOT# 14

PROPOSED CULVERT TO BE INSTALLED AS SWALE IS TRIMMED TO PROVIDE STABILISED ACCESS

LOT# 15

CATCHMENT 6 (SWALE)
505m2

TOPSOIL STOCKPILE FOR SWALE

JOAL # 202

49 RIDDELL ROAD
LOT 1
DP180801

CATCHMENT 9
828m2

SILT FENCE TO LOW SIDE OF PROP SWALE

LOT# 25

LOT# 26

LOT# 18

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conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

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Riddell Road
Kerikeri

Proposed Earthworks and Sediment Control
Sheet 1 of 4

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Drawn		GB	09/25
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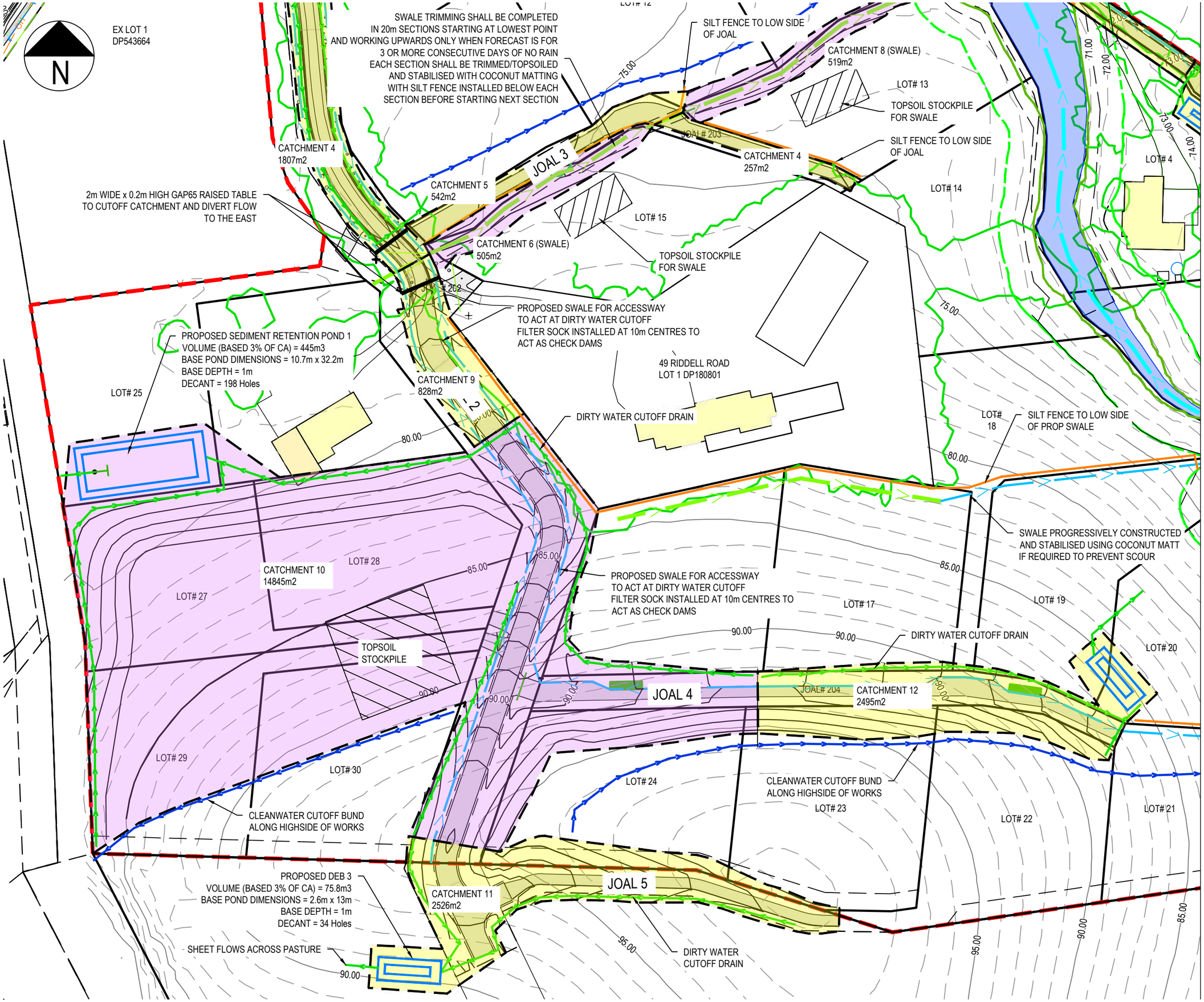
Cad file	10401 RC EARTHWORKS.DWG		
Drawing no.	C2001	Rev	A



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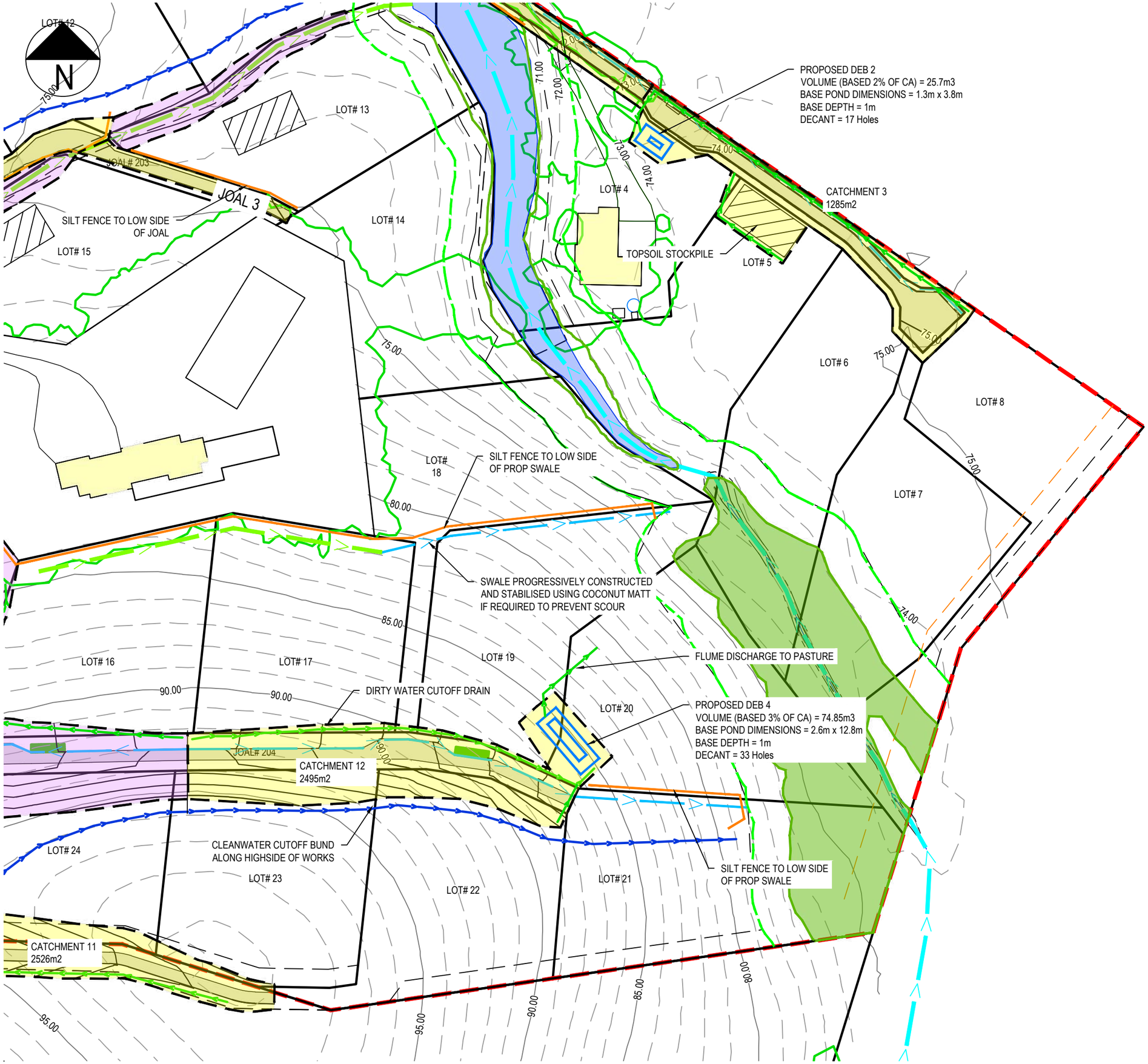

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Phone: +64224914223

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Proposed Earthworks and Sediment Control

Sheet 3 of 4

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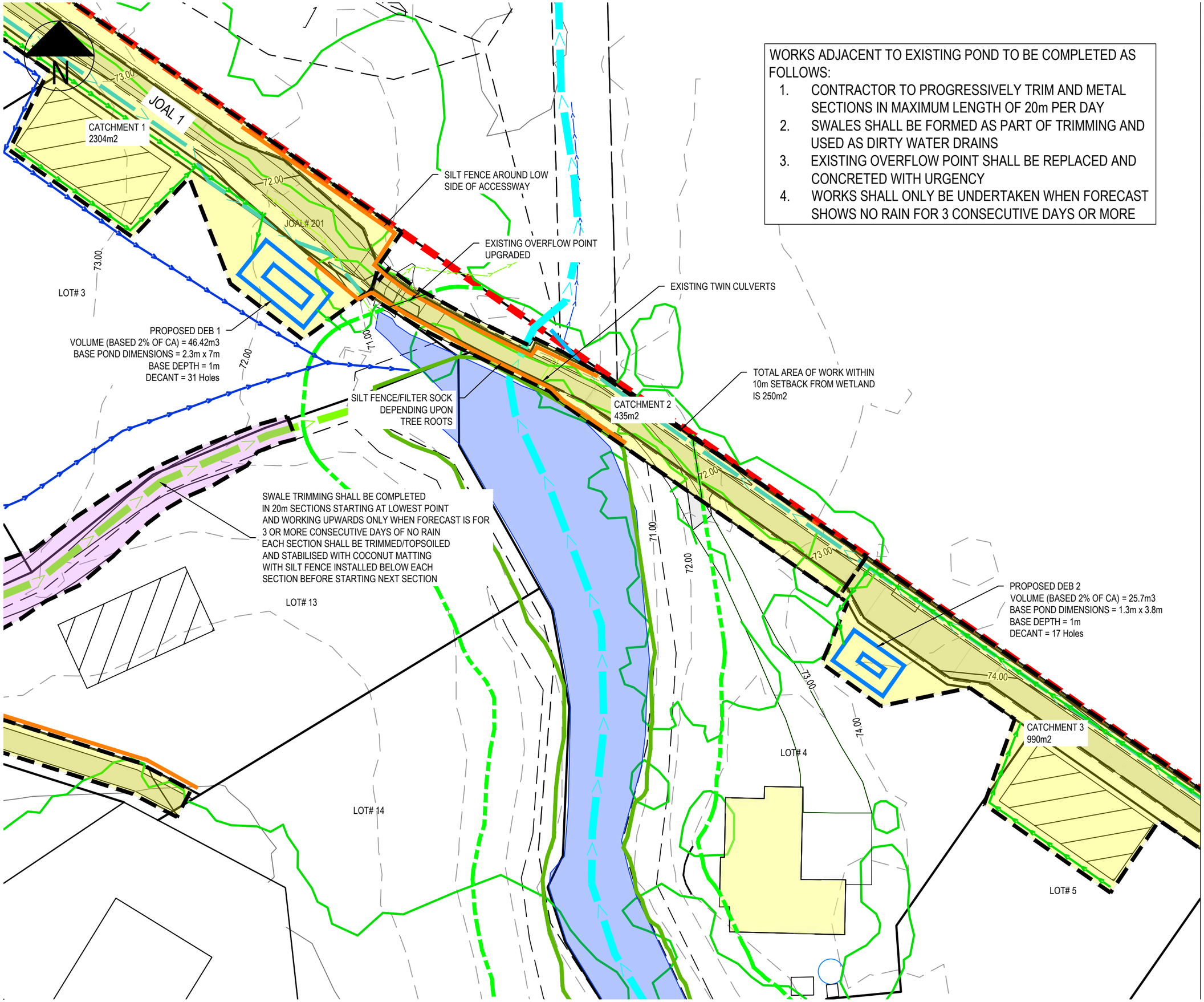

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Contact: admin@conquel.co.nz
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Project no.	10401		
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Cad file	10401 RC EARTHWORKS.DWG		
Drawing no.	C2004	Rev	A

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- PR MINOR CONTOUR
- PROP EXTENT WORK

Cut/Fill Table			
Number #	Minimum Elevation	Maximum Elevation	Color
1	-3.000	-2.000	
2	-2.000	-1.000	
3	-1.000	0.000	
4	0.000	1.000	
5	1.000	2.000	
6	2.000	3.000	
7	3.000	4.013	

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Proposed
Cut to Fill Plan
Sheet 1 of 3

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Project no.	10401		
Scale	1:1000 @ A3		
Cad file	10401 RC EARTHWORKS.DWG		
Drawing no.	C2101	Rev	A

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Project no.	10401		
Scale	1:1000 @ A3		
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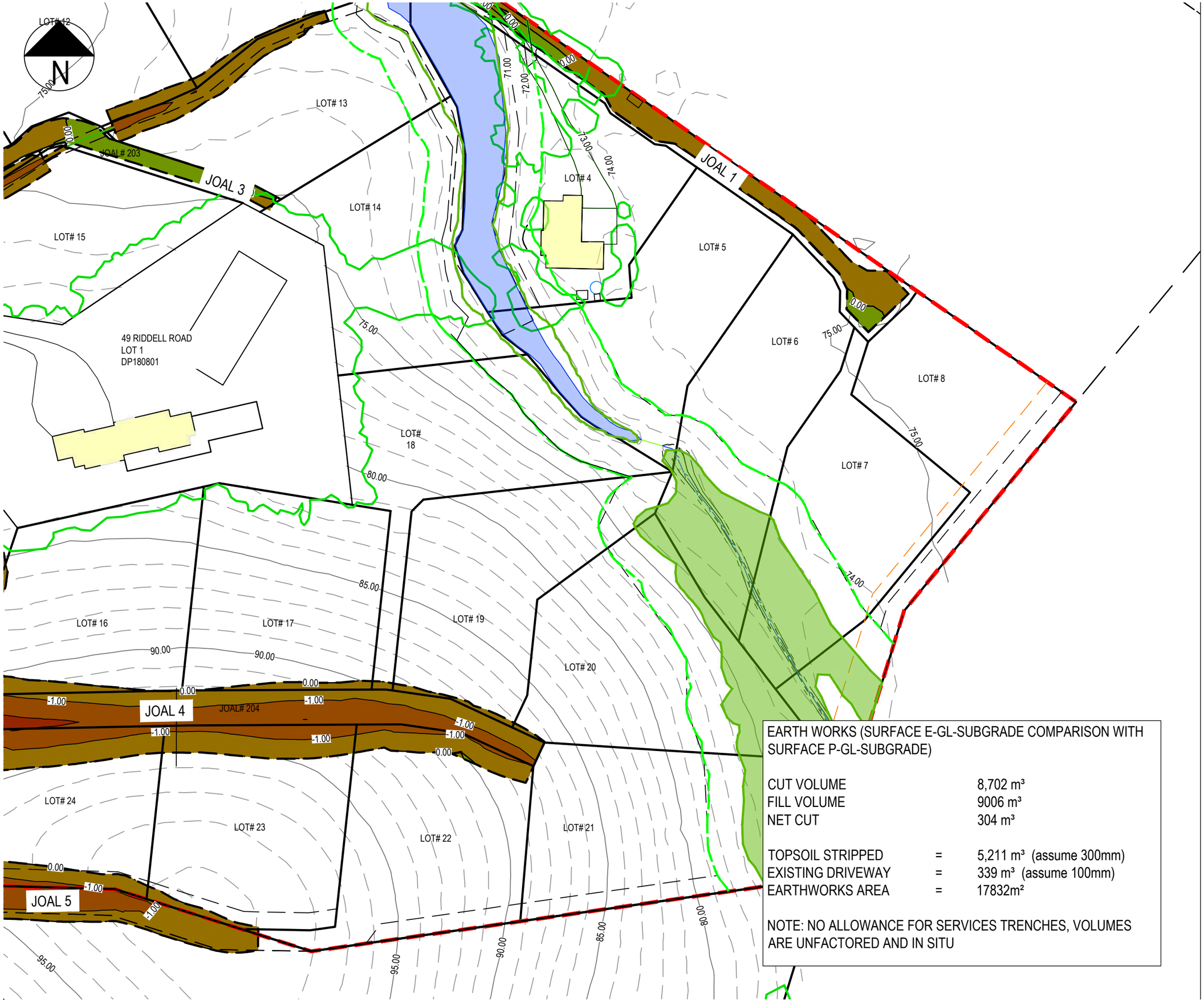
Drawing no.	C2102	Rev	A



EARTH WORKS (SURFACE E-GL-SUBGRADE COMPARISON WITH SURFACE P-GL-SUBGRADE)

CUT VOLUME		8,702 m³
FILL VOLUME		9006 m³
NET CUT		304 m³
TOPSOIL STRIPPED	=	5,211 m³ (assume 300mm)
EXISTING DRIVEWAY	=	339 m³ (assume 100mm)
EARTHWORKS AREA	=	17832m²

NOTE: NO ALLOWANCE FOR SERVICES TRENCHES, VOLUMES ARE UNFACTORED AND IN SITU

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Cut/Fill Table

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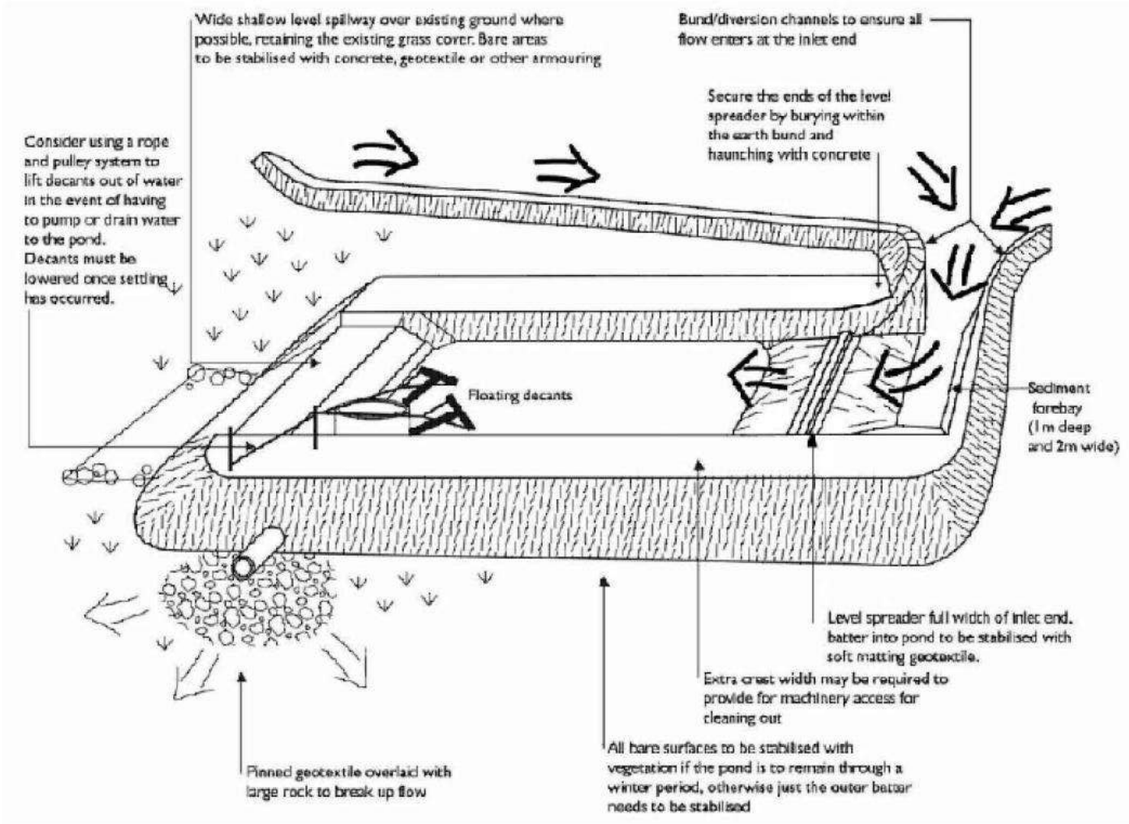

Figure 64: Schematic of a sediment retention pond

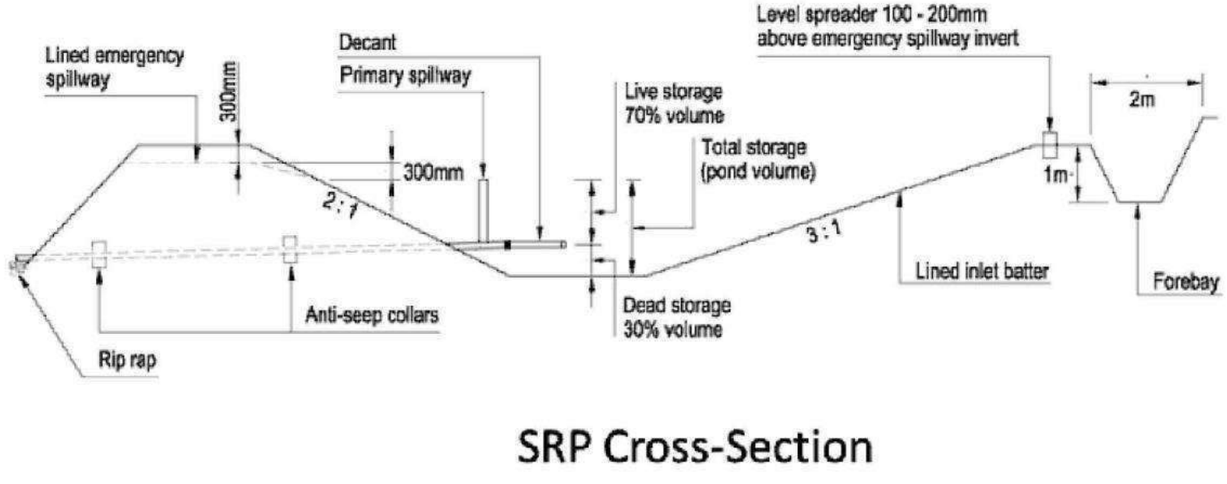

Figure 65: A sediment retention pond cross-section

NOTES

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6. Contractor shall provide asbuilt of working sediment control devices and confirmation of pond/decent volumes to engineer.
7. Sediment control to comply with GD05 standards.

LEGEND

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conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

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No.	Revision (Description)	Name	Date
A	Resource Consent	GB	12/25
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Designed		TS	12/25
Drawn		GB	12/25
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Cad file	10401 GD05 SEDIMENT DETAILS.DWG		
Drawing no.	C2300	Rev	A

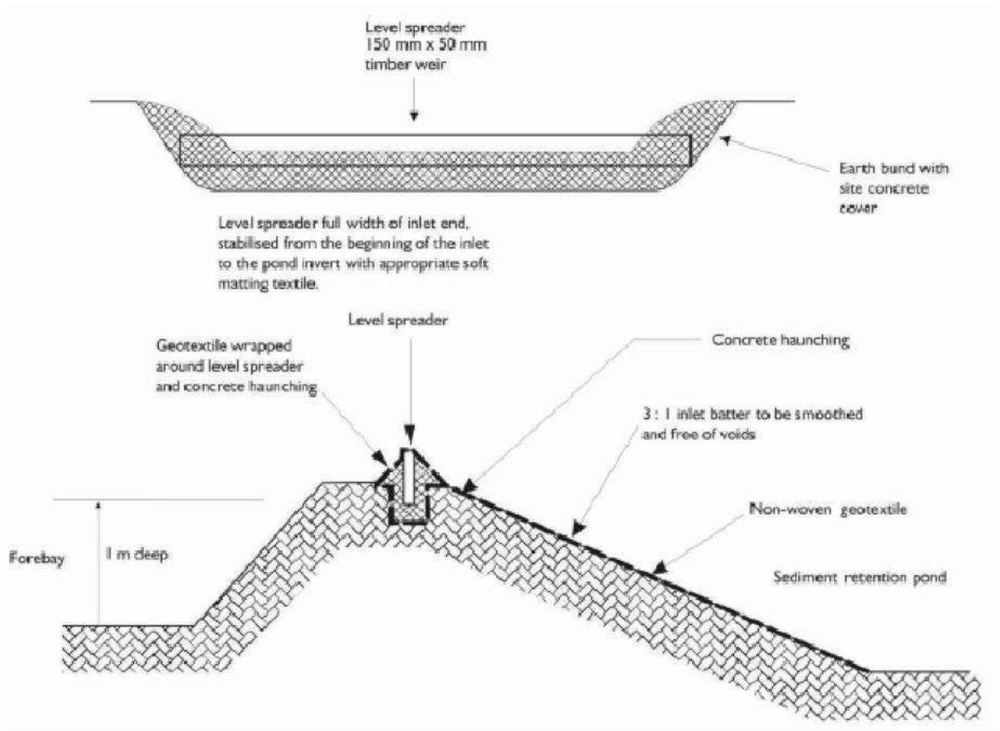

Figure 69: Level spreader

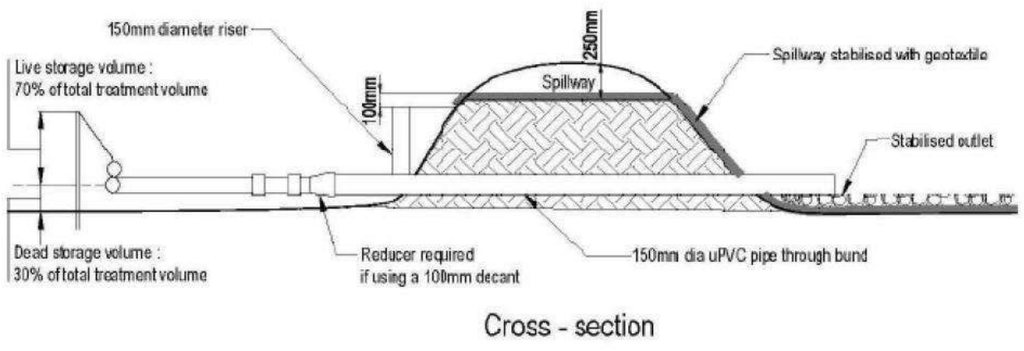

Figure 78: Decanting earth bund

NOTES

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conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

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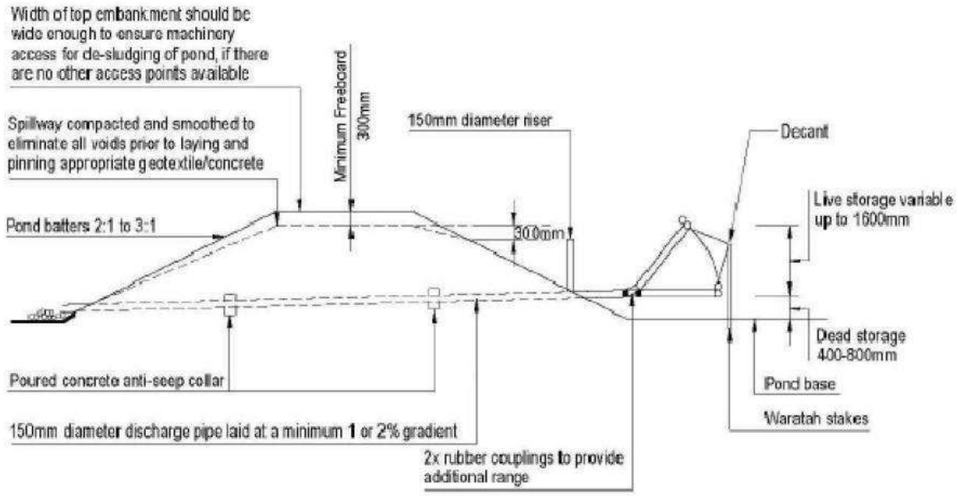

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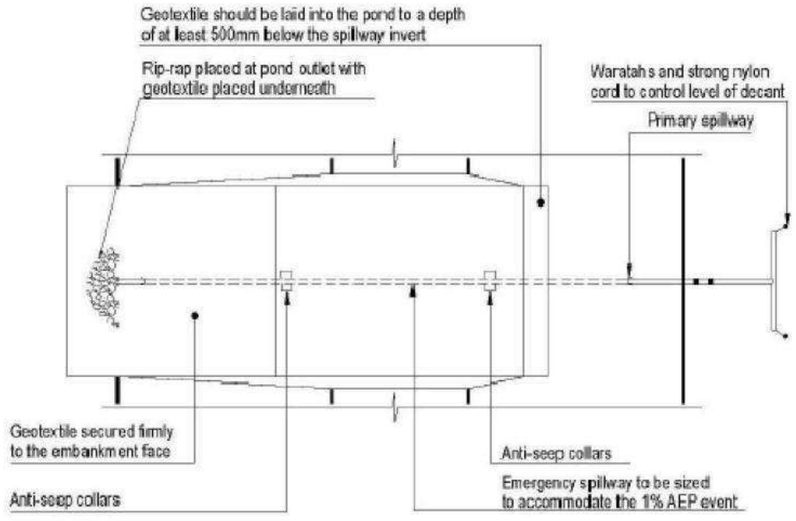
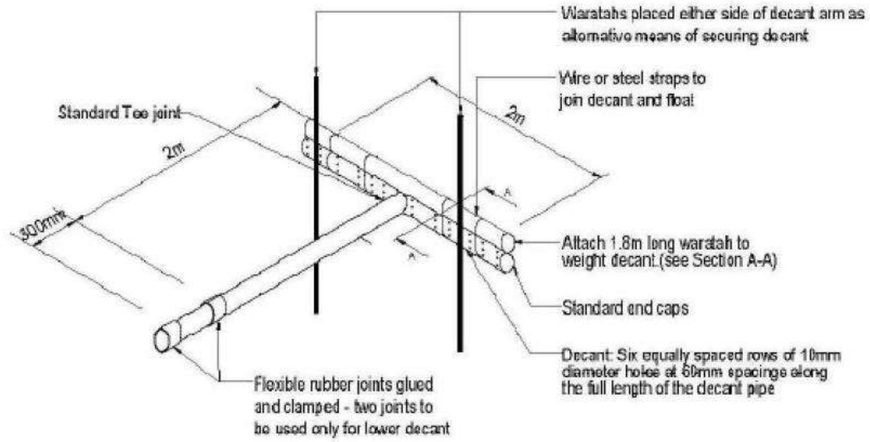


Plan

Figure 71: Sediment retention pond for <1.5 ha catchment



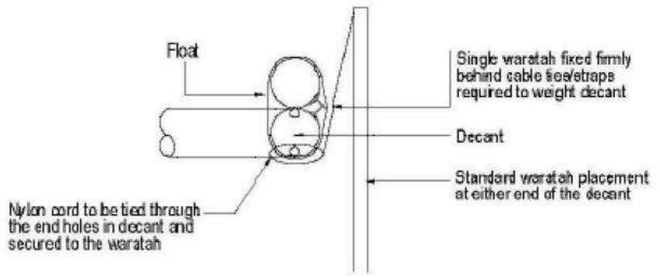


Figure 66: Schematic of standard T-bar design

NOTES

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2. It is the contractors responsibility to locate all services that may be affected by their operations.
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conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
Kerikeri

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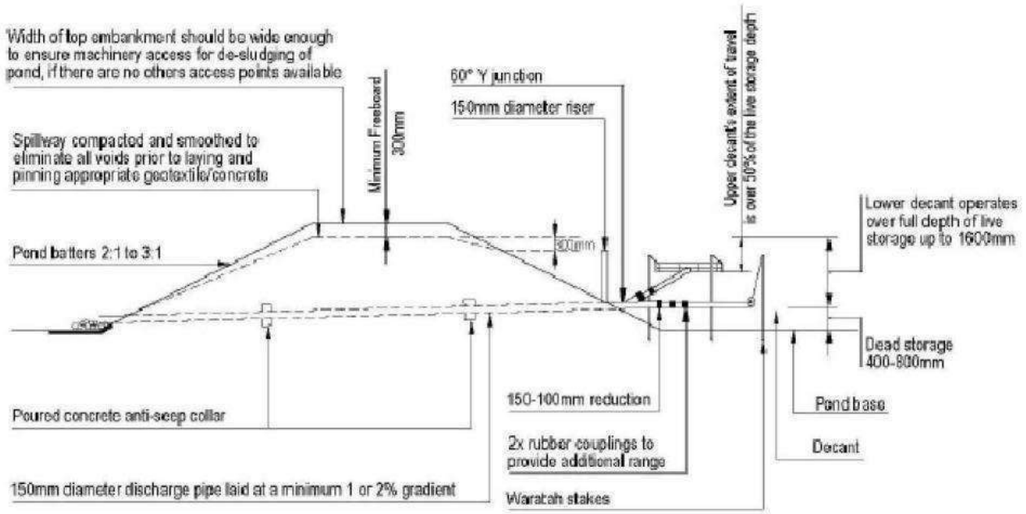

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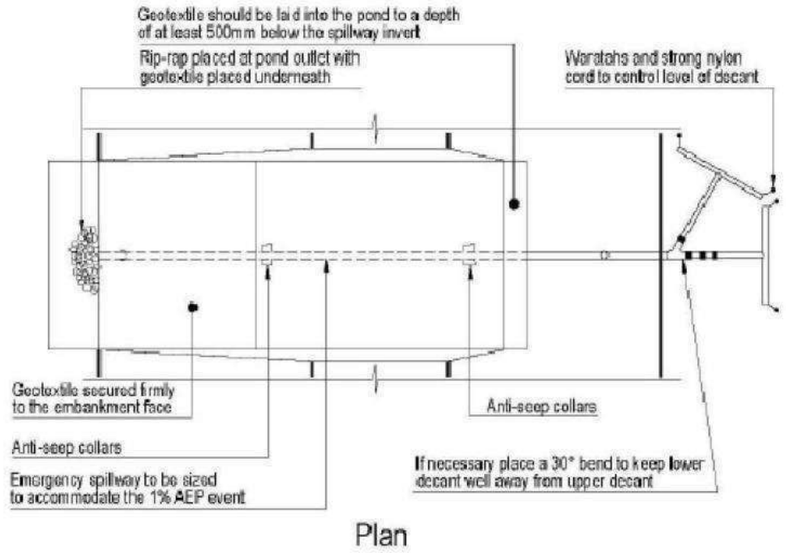

Plan

Figure 72: Sediment retention pond for 1.5 to 3 ha catchment

NOTES

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2. It is the contractors responsibility to locate all services that may be affected by their operations.
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conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64224914223

Taraire Tahi Limited
Riddell Road
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Designed		TS	12/25
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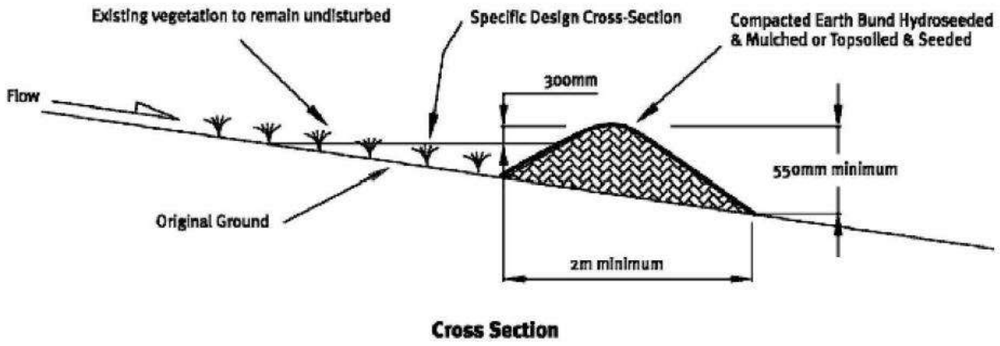

Figure 16: Cross-section of clean water diversion

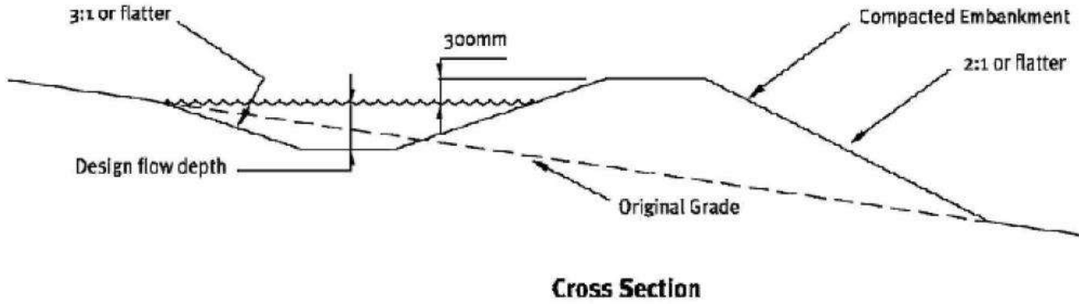

Figure 18: Cross-section of a dirty water diversion

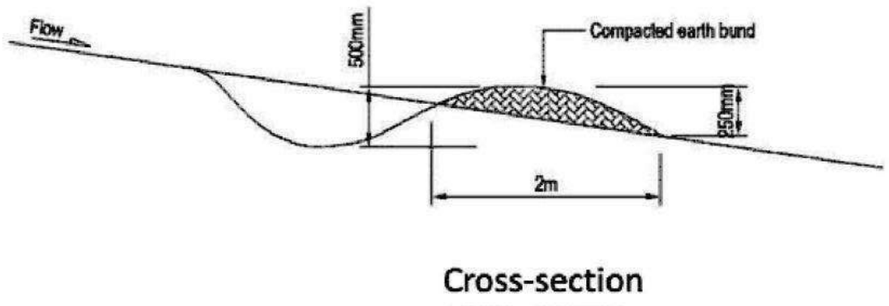

Figure 23: Contour drain cross-section

Table 4: Contour drain spacing

Slope of site (%)	Spacing (m) of contour drains
Less than 5%	50
5 - 10%	40
10 - 15%	30
15 - 30%	20

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Contact: admin@conquel.co.nz
Phone: +64224914223

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Checked		TS	12/25

Project no.	10401		
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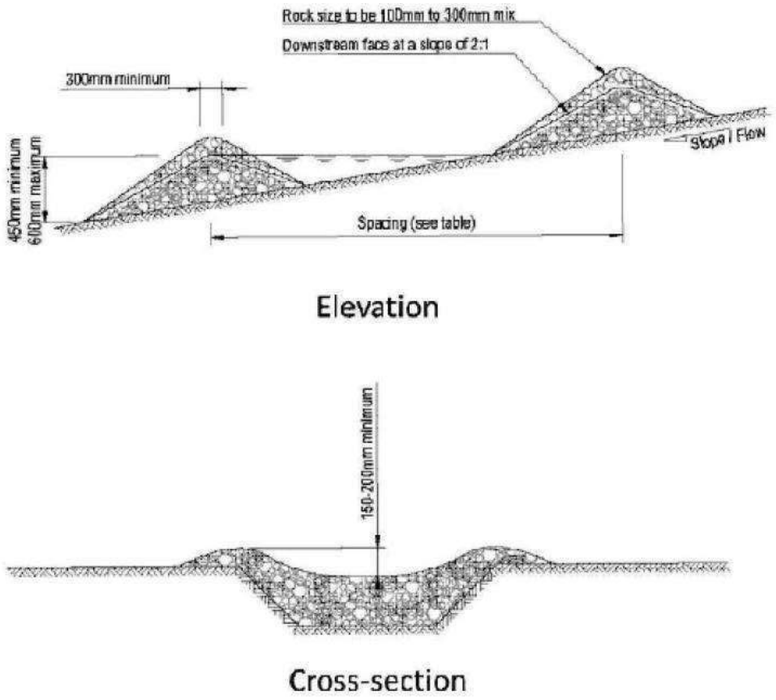

Figure 28: Rock check dam

Table 5: Positioning of check dams

Slope of site (%)	Spacing (m) between dams with a 450 mm centre height	Spacing (m) between dams with a 600 mm centre height
Less than 2%	24	30
2 - 4%	12	15
4 - 7%	8	11
7 - 10%	5	6
>10%	Unsuitable - use stabilised channel or specific engineered design	Unsuitable - use stabilised channel or specific engineered design

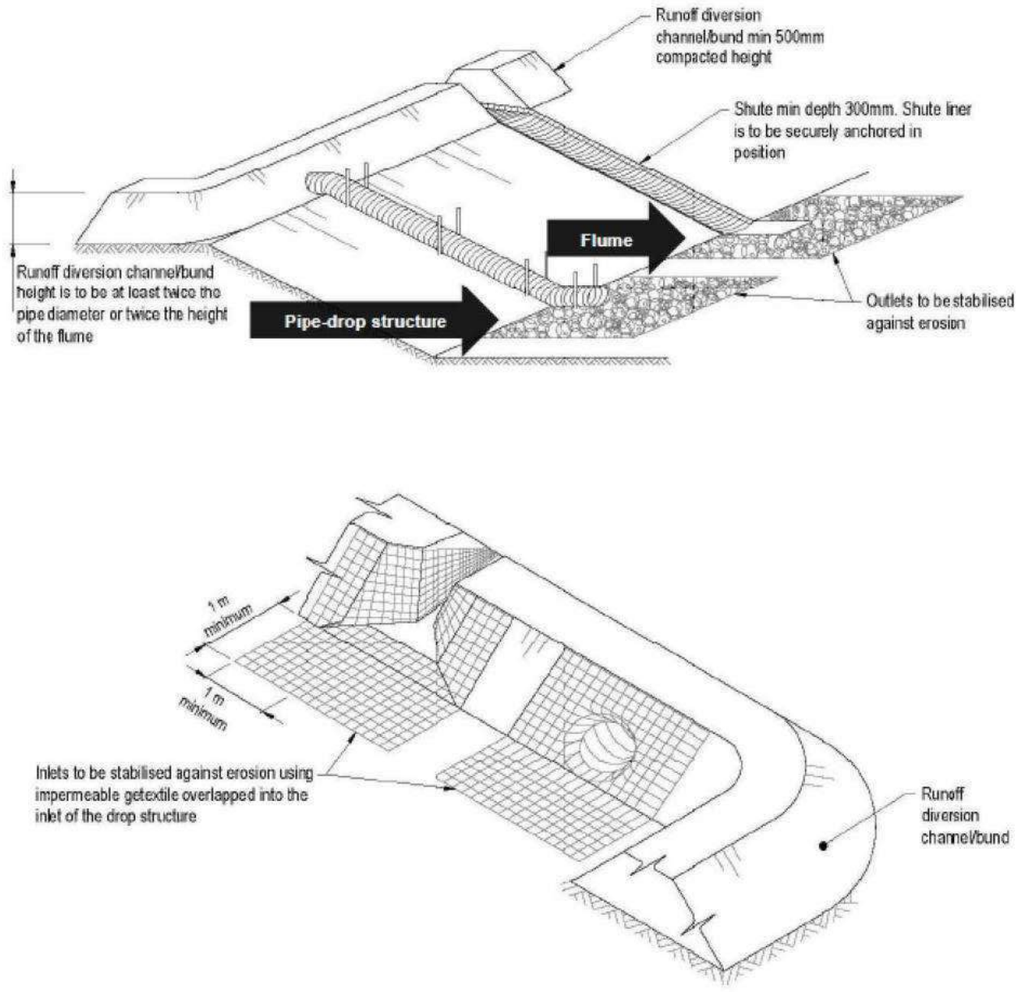

Figure 32: Pipe-drop structure and flumes

Table 6: Sizing criteria for pipe-drop structures

Pipe diameter (mm)	Maximum catchment area (ha)
150 mm	0.05 ha
300 mm	0.20 ha
450 mm	0.60 ha
600 mm	1.00 ha
Specific design required	>1.00 ha

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Contact: admin@conquel.co.nz
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Riddell Road
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Designed		TS	12/25
Drawn		GB	12/25
Checked		TS	12/25

Project no.	10401		
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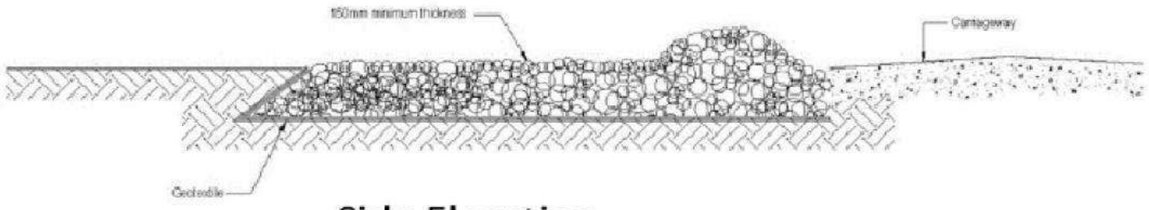
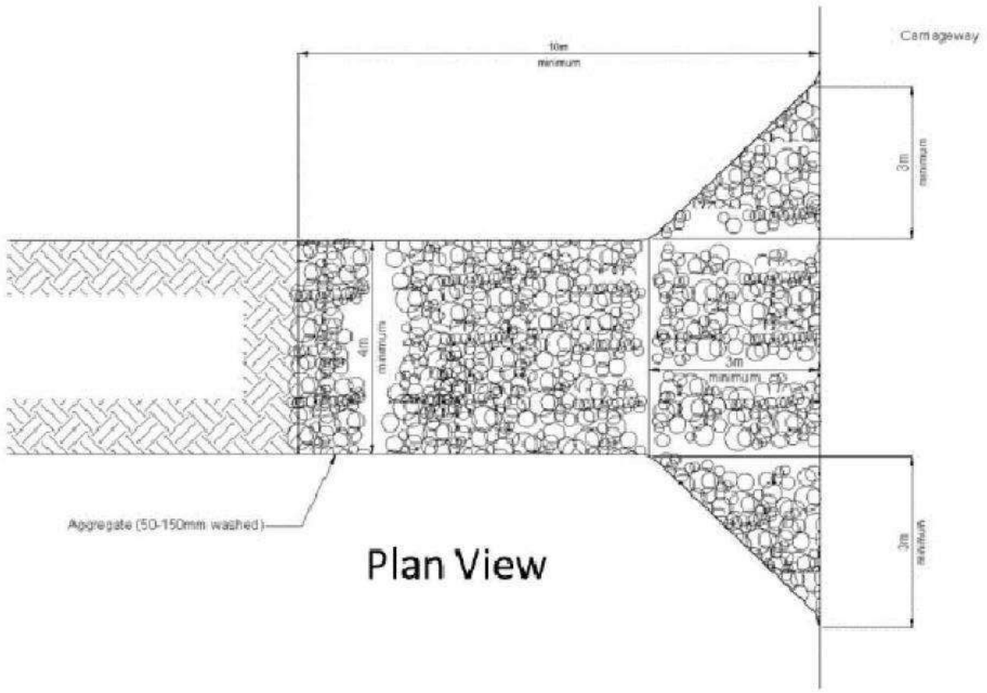
Drawing no.	C2305	Rev	A



Side Elevation



Plan View

Figure 35: **Stabilised entranceway**

Table 8: Stabilised entranceway specifications

Design parameter	Specification
Aggregate size	50 - 150 mm washed aggregate
Minimum thickness	150 mm
Minimum length	10 m
Minimum width	4 m

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Phone: +64224914223

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Drawn		GB	12/25
Checked		TS	12/25

Project no.	10401		
Scale	NTS		
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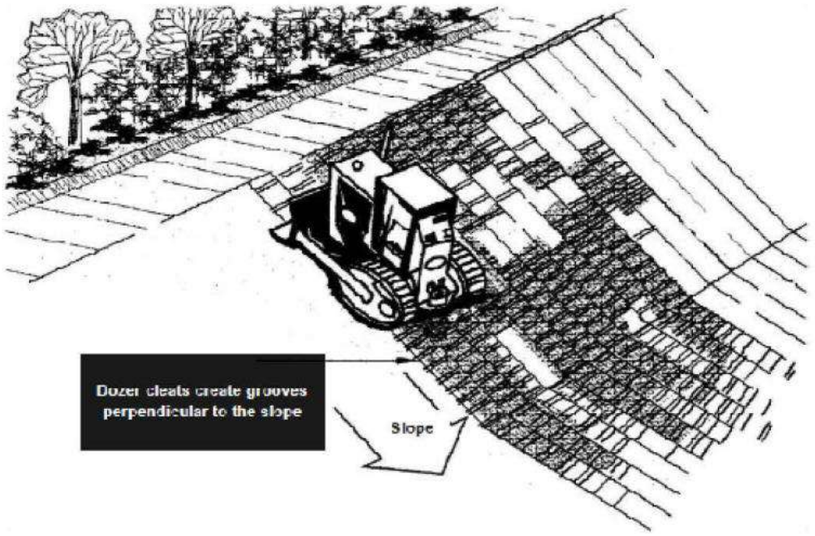

Figure 40: Surface roughening

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Phone: +64224914223

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Checked		TS	12/25

Project no.	10401		
Scale	NTS		
Cad file	10401 GD05 SEDIMENT DETAILS.DWG		
Drawing no.	C2307	Rev	A

Appendix B – Discovery Protocol (Heritage NZ)

Accidental Discovery Protocol (ADP)

From Heritage New Zealand Pouhere Taonga

Prior to the commencement of any works, a copy of this ADP should be made available to all contractors working on site.

Under the *Heritage New Zealand Pouhere Taonga Act 2014* an archaeological site is defined as a place associated with pre-1900 human activity, where there may be evidence relating to the history of New Zealand. Over 12,000 archaeological sites have been recorded in Northland, and more are identified on a regular basis.

For Maori sites (the most common site types in Northland), the largest and most obvious site types are pa, pits and terraces. However, evidence may be of a smaller nature, in the form of bones, shells, charcoal, burnt stone etc; a midden is an archaeological rubbish tip, in which many of these items can be found consolidated together. Evidence of disturbance of a midden can be a scattering of shell across a wide area; this can be confusing if it is near a beach. Pieces of obsidian or chert, together with stone tools, may also be recovered.

In later sites of European origin artefacts such as bottle glass, iron/metal, crockery etc. may be found, or evidence of old foundations, wells, drains or similar structures.

Burials/koiwi tangata may be found from any period.

Some examples:

Shell midden

Historic bottle

Animal bone

Archaeological stratigraphy

A flight of pits in forest

Shell midden uncovered in road scraping

In the event of an "accidental discovery" of archaeological material the following steps must be taken:

1. All work on the site will cease immediately. The contractor/works supervisor will shut down all equipment and activity.
2. The contractor/works supervisor/owner will take immediate steps to secure the site (tape it off) to ensure the archaeological remains are undisturbed and the site is safe in terms of health and safety requirements. Work may continue outside of the site area.
3. The contractor/works supervisor/owner will notify the Area Archaeologist of Heritage New Zealand – Pouhere Taonga (Northland Office), tangata whenua and any required statutory agencies[1] if this has not already occurred.
4. Heritage New Zealand – Pouhere Taonga advise the use of a qualified archaeologist who will confirm the nature of the accidentally discovered material.
5. If the material is confirmed as being archaeological, under the terms of the *Heritage New Zealand Pouhere Taonga Act* 2014, the landowner will ensure that an archaeological assessment is carried out by a qualified archaeologist, and if appropriate, an archaeological authority is obtained from Heritage New Zealand – Pouhere Taonga before work resumes.
6. If burials, human remains/koiwi tangata are uncovered, steps 1 to 3 above must be taken and the Area Archaeologist of Heritage New Zealand – Pouhere Taonga, the New Zealand Police and the Iwi representative for the area must be contacted immediately. The area must be treated with discretion and respect and the koiwi tangata/human remains dealt with according to law and tikanga.
7. Works at the site area shall not recommence until an archaeological assessment has been made, all archaeological material has been dealt with appropriately, and statutory requirements met. All parties will work towards work recommencement in the shortest possible timeframe while ensuring that archaeological and cultural requirements are complied with.

ADVICE TO ALL CONTRACTORS/SITE WORKERS/OWNERS:-

IF IN DOUBT, STOP AND ASK; TAKE A PHOTO AND SEND IT TO THE AREA ARCHAEOLOGIST

Contact details for the Area Archaeologist in Northland is:

James Robinson, Regional Archaeologist
Heritage New Zealand – Pouhere Taonga
PO Box 836, Kerikeri 0245
PH: (64 9) 407 0470 - DDI. (64 9) 407 0473 - MOBILE 027 249 0864
jrobinson@heritage.org.nz

[1] For example, the New Zealand Police in the event that human remains are found.

ECOLOGICAL ASSESSMENT PERTAINING TO A PROPOSED SUBDIVISION

at

39 Riddell Road, Kerikeri

Lot 2 DP 543664

December 2025

RURAL DESIGN SINCE 1984

CONTENTS

1.0 INTRODUCTION 4

2.0 FIELD SURVEY METHODOLOGY 5

2.1 Habitat Survey 6

2.1.1 Wetland Assessment 6

2.2 Fauna Survey 7

3.0 ECOLOGICAL CONTEXT 7

3.1 Kerikeri Ecological District 7

3.2 Site Background 8

3.3 Changes in Land Use 11

3.4 Protected Natural Areas 14

4.0 RESULTS 15

4.1 Habitat Types 15

4.1.1 Persicaria herbfield wetland 16

4.1.2 Isolepis prolifera wetland 18

4.1.3 Juncus wetland 19

4.1.4 Modified Manuka fen wetland 20

4.1.5 Wider Site - Exotic pasture and shelterbelts 22

4.2 Aquatic diversity 23

4.4 Avifauna 24

4.5 Herpetofauna 25

4.6 Chiroptera (Bats) 27

5.0 PROPOSED WETLAND ENHANCEMENT AREA 27

5.1 Riparian Buffer Planting – 4,315 m^2 29

6.0 ANIMAL PEST MANAGEMENT & WEED CONTROL 30

6.1 Pest Animal Management 30

6.2 Pest Plant Management 31

7.0 POTENTIAL EFFECTS 31

7.1 Increased Human Disturbance 33

7.2 Predation by Domestic Pets 34

7.3 Increased Invasion of Pest Species 34

7.4 Earthworks & Sedimentation 35

7.5 Wastewater Management 35

7.6 Stormwater Management 36

7.7 Noise 37
7.8 Light 38
7.9 Fire 38
8.0 NATIONAL POLICY STATEMENTS 38
8.1 National Policy Statement for Freshwater Management (NPS- FM) 38
8.2 National Policy Statement for Indigenous Biodiversity (NPS-IB) 40
9.0 CONCLUSION 41
10.0 REFERENCES 43
APPENDIX 1 – DEVELOPMENT FOOTPRINT & ASSOCIATED SETBACKS 44
APPENDIX 2 – PROTECTION & PLANTING PLAN 45

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1.0 INTRODUCTION

Taraire Properties ('the Client') proposes to conduct a 30-lot (29 additional) subdivision at 39 Riddell Road Road (Lot 2 DP 543664), Kerikeri ('the subject site'). Rural Design 1984 Limited (RDL) has been engaged by the Client to undertake an Ecological Assessment to identify and assess existing ecological values of the site, and outline opportunities, constraints and potential mitigation strategies associated with the proposed development proposal. This Ecological Assessment report has been prepared for use in a resource consent application for the Far North District Council.

The site is situated approximately 1.7 km southeast of Kerikeri town centre and accessed from Riddell Road (Figure 1). The subject site is approximately 10.6189 ha in size and is zoned as 'Rural Living' under the Far North District Council District Plan (Operative).

The site consists primarily of pastoral land and generally slopes toward the northeast with a natural inland wetland occupying the lower elevations and follows a similar drainage orientation. It is proposed to develop 30 lots and the associated accessways as shown on the proposed Scheme Plan prepared by Thomson Survey (Figure 2).

Figure 1: Showing the subject site in relation to Kerikeri

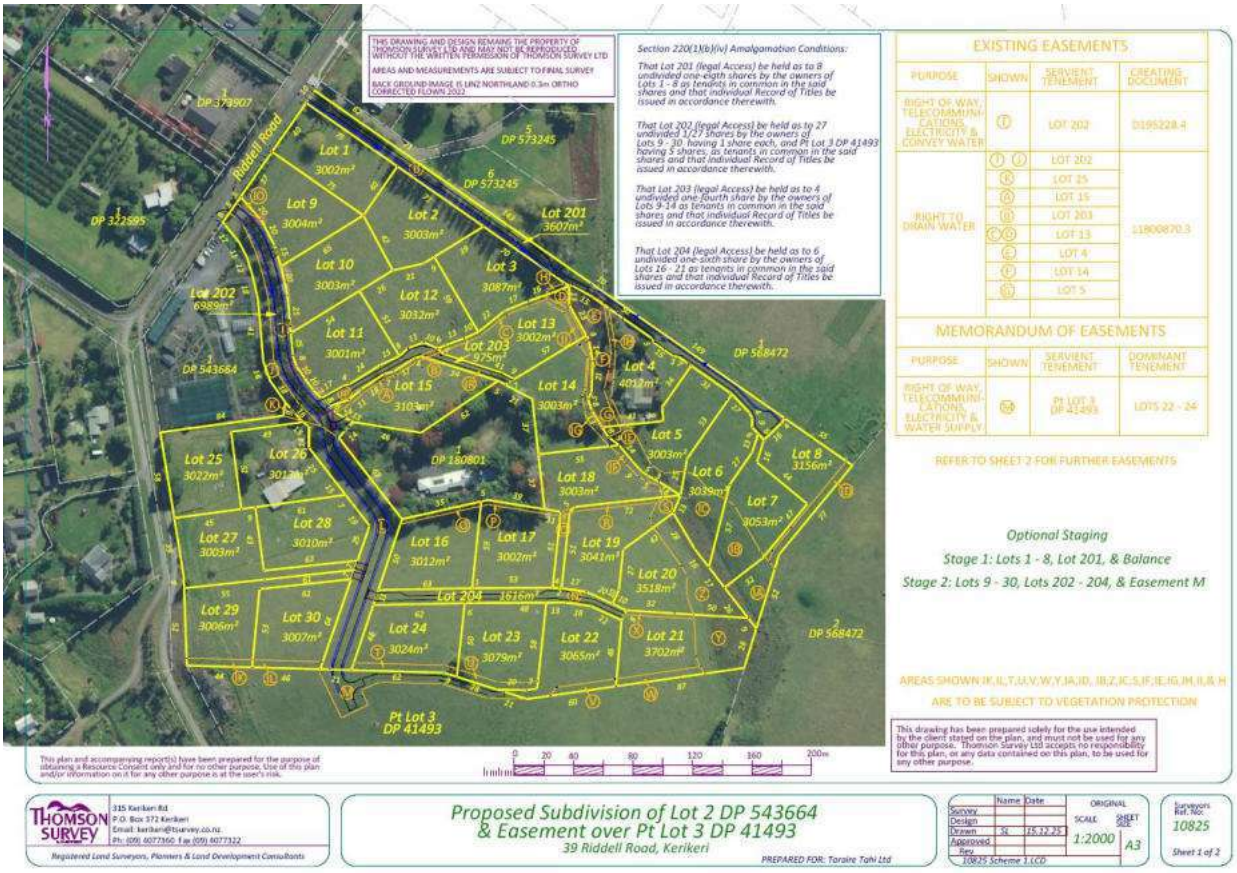

Figure 2: Scheme Plan for the proposed development at 39 Riddell Road

2.0 FIELD SURVEY METHODOLOGY

The site and surrounding area were visited on 22nd of October 2025. The recommended areas for protection and natural features have been surveyed by Rural Design using a GPS unit (Trimble TDC600) and the details shall be correlated with the survey plans prepared by Thompson Survey LTD.

Field surveys were undertaken over the entirety of the site. Natural land patterns were observed, and a comprehensive field assessment was conducted, including detailed botanical and avifauna surveys. A diurnal habitat search for herpetofauna and visual root assessment for chiroptera were conducted during survey visits, this data was further supplemented with data from DOC Bioweb database, and Kerikeri ED PNA programme report.

An additional 'desktop' review of different data sources was undertaken to further the understanding of the wider ecological patterns and local species of significance, and the connection of these species with recommendations for ecological enhancement of the subject property. Former and current ecosystem types were considered from an ecological context.

2.1 Habitat Survey

The habitat survey consisted of walking throughout the subject site and observing the vegetation types within and around the immediate area of the development footprint. When a distinct vegetation type or ecological feature was observed, GPS points were taken to denote its location and approximate area size. The various observed habitat types are typical of a highly modified pastoral environment are described in Section 4.1 of this report. These vegetation types were then extrapolated to ArcGIS Pro 3.0 where a georeferenced map was then created.

2.1.1 Wetland Assessment

For wetland delineation protocols in the field, the NPS-FM refers to the Ministry for the Environment (MfE) 'Wetland Delineation Protocols' (2020), which are based on the 'Vegetation Tool' for wetland delineation in New Zealand (Clarkson 2013) to determine the status of wetlands. These rely on the presence or absence of hydrophytic vegetation as being the dominant vegetation type (Figure 3). The list of hydrophytes used in this assessment are as per the most recently revised list (Clarkson et al. 2021). In addition, we considered Singers et al. (2017) to determine the ecological value and significance of any wetland area.

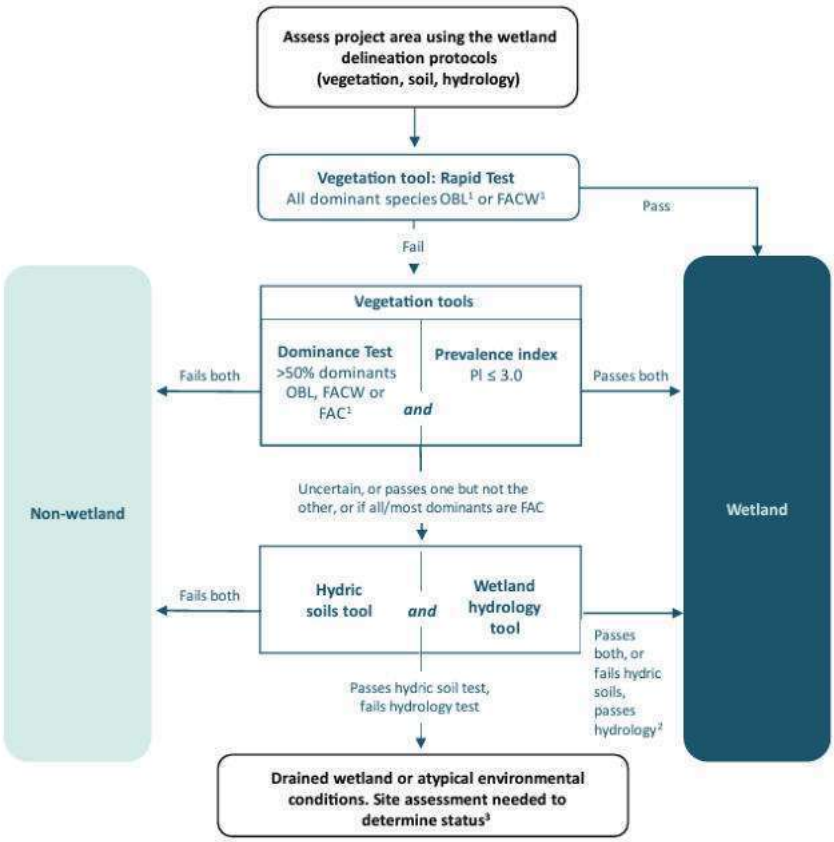

Figure 3: Flow chart for hydrophytic (wetland) vegetation determination. Wetland indicator status abbreviations: FAC=facultative; FACW=facultative wetland; OBL=Obligate wetland

2.2 Fauna Survey

Avifauna, herpetofauna and chiroptera were surveyed as a part of the Ecological Assessment. The weather during the site wide survey was warm (23°C) and sunny (10% cloud cover) with light winds (Beaufort Scale 1). No quantitative lizard survey was undertaken although a diurnal herpetofauna search was conducted on site, which involved checking beneath dense vegetation, logs, boulders and man-made objects. Any potential habitat on site that would be viable for herpetofauna to use for breeding, foraging or sheltering was also noted during the site visit. Avifauna species were observed on the subject site via opportunistic observations during the field survey. A passive acoustic was not deployed to capture nocturnal birdcalls. As such, the avifauna survey should be used as indicative only. No qualitative fish survey was carried out during site visits due to insufficient water levels within the watercourses. The survey was therefore solely reliant on supplementary material including online databases and previous surveys within the wider catchment conducted by RDL during previous projects. During the site walkover, a visual assessment for potential roost sites were undertaken for potential chiroptera habitat. Trees on site were assessed for their potential to support bat roosts which comprised of a ground based visual inspection using binoculars to identify any features potentially suitable for roosting bats. Such features may include holes, frost cracks, deadwood, knot holes and limb wounds. It was deemed that no viable mature trees within the remnant riparian corridor had the potential to currently provide suitable roosting features for bat communities. Furthermore, the quality of the onsite waterbodies does not readily provide for good foraging grounds. Therefore, no presence/absence survey using an Automatic Bat Monitor (ABM) was undertaken. As such, the presence or absence of the species cannot be accurately quantified.

3.0 ECOLOGICAL CONTEXT

3.1 Kerikeri Ecological District

The subject site is situated within the Kerikeri Ecological District (Northland Conservancy) and is abounded by the Whangaroa Ecological District (ED) to the north, the Kaikohe ED to the west, and both the Whangaruru and Tangihua EDs to the south. The Kerikeri ED covers 67,600 hectares centred on the northern and central Bay of Islands in the Far North Region. Kerikeri Ecological District is composed of 21% of natural areas, mainly consisting of forest (31%) and shrubland (52%) habitats with the remaining natural areas consisting of estuarine (7%), freshwater wetlands (4%) and island habitats (6%).

A high degree of fragmentation is a feature of many of the habitats in the Kerikeri ED due to the long history of human occupation and with that the associated modification and degradation

of indigenous habitats. In the past, much of the Kerikeri ED was dominated by broadleaf-podocarp-kauri forest, which has been extensively cleared. The scattered fragments of remnant indigenous vegetation provide an important stepping-stone and corridor habitat both for indigenous flora and fauna. The quality of remaining natural areas and indigenous fauna has also been compromised by agricultural practices, invasion and associated negative impacts of pest plant and animal species.

Transitional ecotone sequences have been severely compromised in the Kerikeri Ecological District. Drainage of wetlands and clearance of indigenous habitat types for the use of pastoral grazing, agricultural intensification and human settlement have severely compromised the distribution of larger transitional ecotone sequences. Wetlands are now a very rare habitat type in the Kerikeri ED. There are so few remaining that all are significant.

3.2 Site Background

The property is located on the fringe of the Kerikeri township. The subject site is predominantly a pastoral grazing unit and contains minimal indigenous vegetation. The site contains windbreaks (poplus sp.) and ornamental plantings along a driveway in the northwestern aspect. The site also contains a natural inland wetland feature with can be teased out into four wetland habitat types; these being a *Persicaria* herbfield wetland, *Isolepis prolifera* wetland, *Juncus* wetland and a modified manuka fen wetland (Figure 5). These wetlands holds the majority of the significant ecological value on the subject site, though stock access has resulted in degradation overtime through pugging, grazing, and high nutrient input. The wetland system is feed into via water shed from the surrounding pastoral landscape as well as a small spring within the southeastern aspect. Part of the northern most onsite natural inland wetland is classified as a water easement, however, for avoidance of doubt these features are nonetheless considered natural inland wetlands. The wetland system feeds into an offsite wetland feature which eventually discharges into the Wairoa stream, which in turn flows into the Kerikeri Inlet. It is thought that restoring and rehabilitating the onsite natural inland wetland would provide ecosystem services both onsite and to the immediate surrounds.

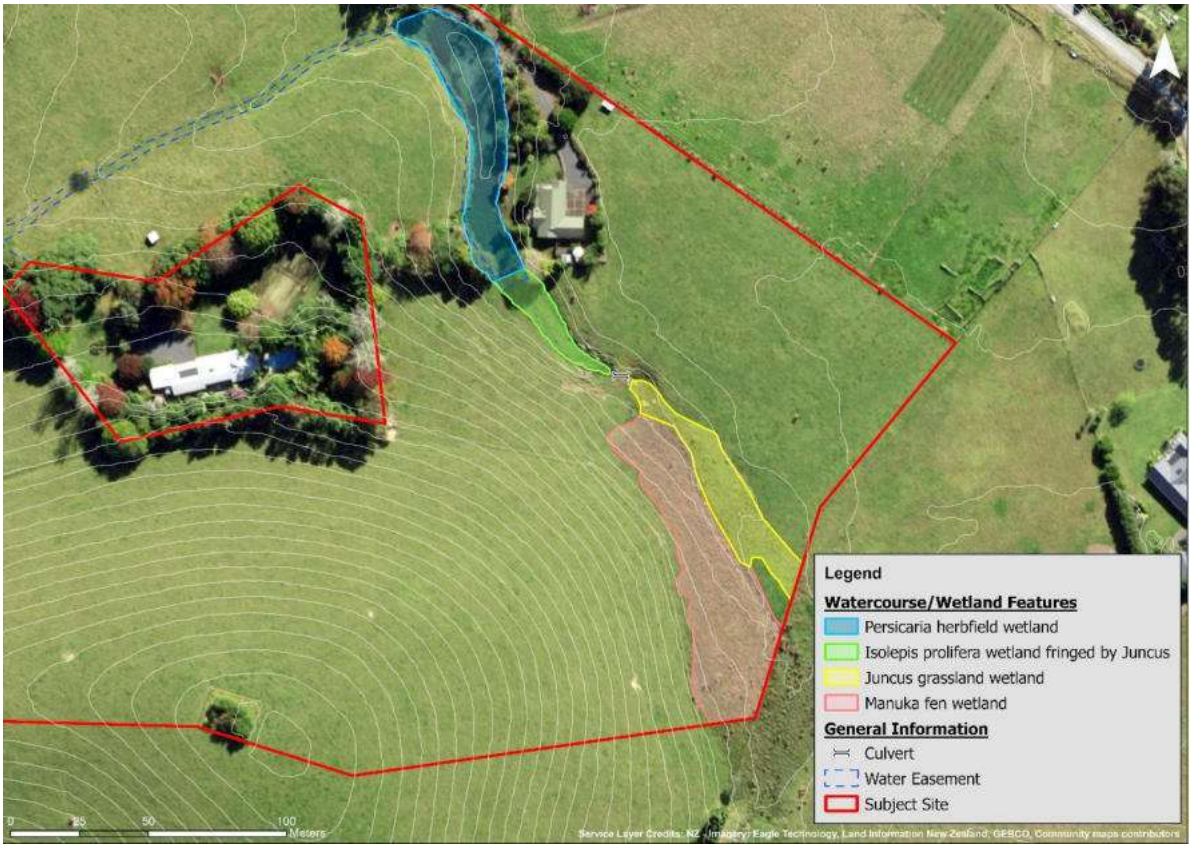

Figure 4: Showing the natural features of the site

The geology of the northwestern aspect of the site is dominated by the "Kerikeri Volcanic Group Late Miocene basalt of Kaikohe - Bay of Islands Volcanic Field" which is composed of basalt lava, volcanic plugs and minor tuff (GNS 2023). The geology of the southeastern aspect of the site is dominated by the "Waipapa Group sandstone and siltstone- Waipapa Composite Terrane" which is composed of ithic volcaniclastic metasandstone, argillite, basalt and chert (GNS 2023). Within the southern aspect, the site is composed of orthic oxidic soils which are clayey and dominated by crystalline aluminium and iron oxides. Towards the northern aspect, the site is composed of yellow ultic soils which are clayey and strongly acidic soils dominated by Kaolin and vermiculite minerals. The site is gently undulating in nature with a general slope to the northeast (Figure 5).

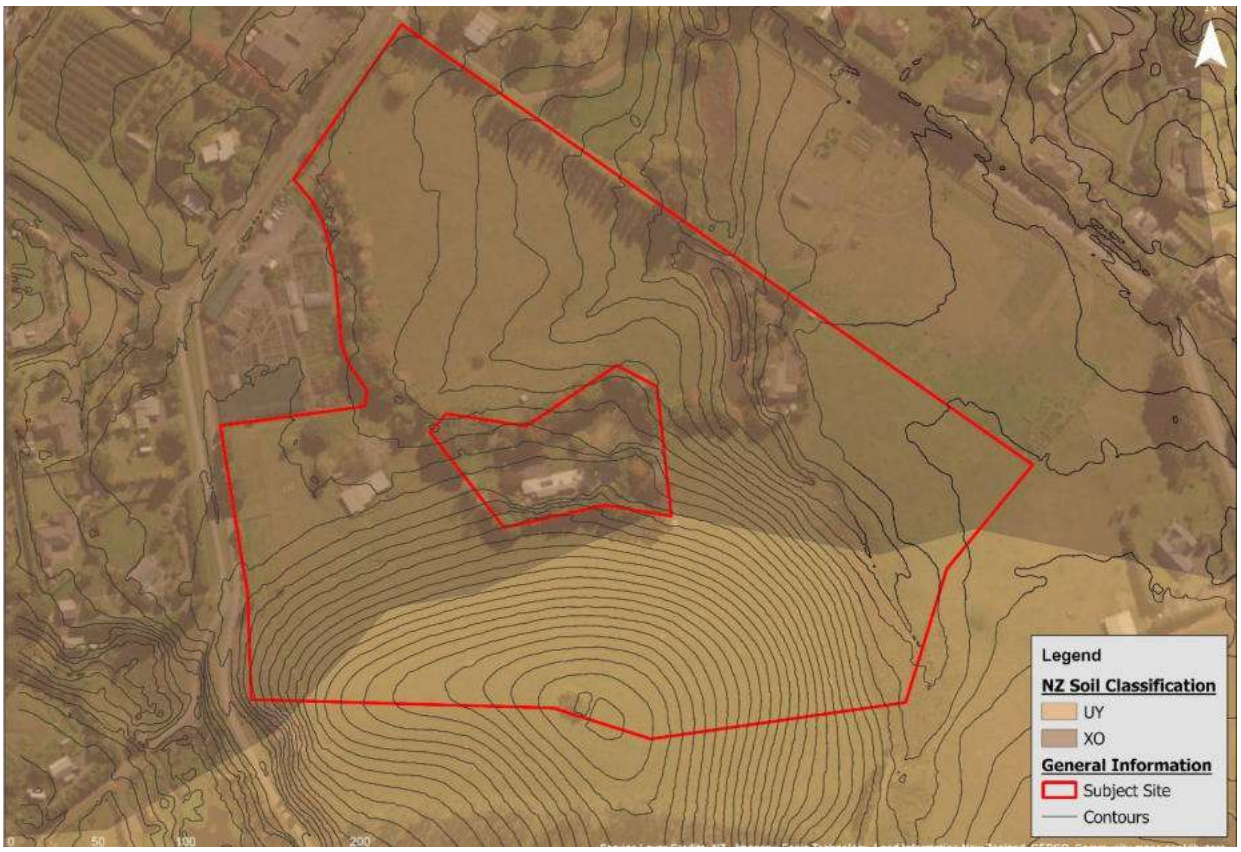

Figure 5: Showing the slope and soil classification of the site

The subject site is composed of a single Threatened Environments Classification Under Land Environments of New Zealand (LENZ) (Figure 6). Majority of the site falls within the 'Category 2 Threatened Land Environment', where 10-20% of indigenous cover remains and none is protected as of 2012. It is considered that Indigenous biodiversity in these environments have been severely reduced, and remaining habitats are sparsely distributed in the landscape. A small section within the southern aspect falls within 'Category 6 Threatened Land Environment', where >30% of indigenous cover remains and >20% is protected as of 2012. The southern most area of the subject site falls within the 'Category 3 Threatened Land Environment', where 20-30% of indigenous cover remains and none is protected as of 2012. This LENZ Classification is reflective of the historic land use of the site. The freshwater ecosystem, although currently highly degraded, has tremendous opportunities for native rehabilitation and represents an opportunity to protect land which has some of the lowest legal protection in the area.

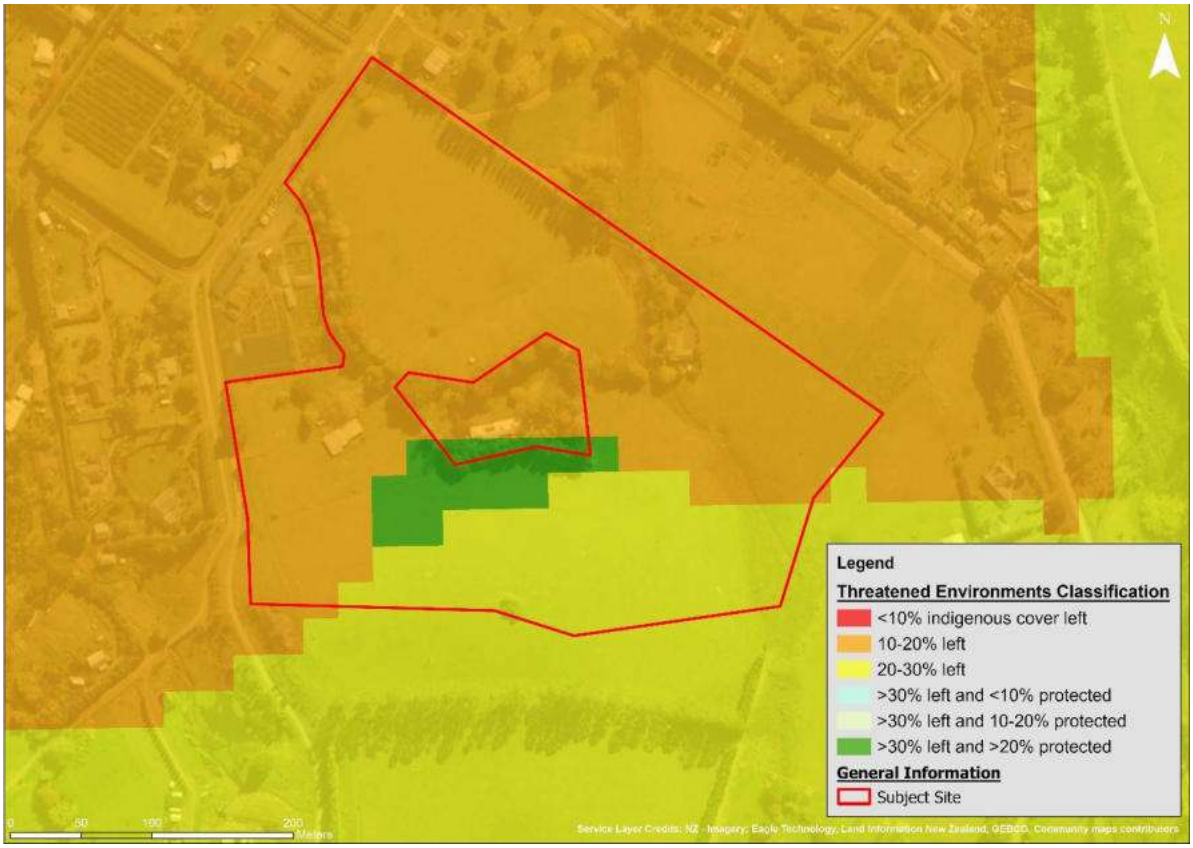

Figure 6: Showing the Threatened Environment Classification for New Zealand within the subject site and surrounds

3.3 Changes in Land Use

The subject site at present day is largely modified from its original ecosystem type. According to Auckland Council 'Potential Ecosystem Extent' layer (accessed July 2024) based on Singers & Rogers (2014) the site and immediate surrounds prior to initial land clearance (Figure 7) are likely to have been dominated by an ecosystem type representative of coastal taraire, tawa podocarp forest (WF9) across majority of the site grading into kauri, podocarp, broadleaved forest towards the southern aspect of the site.

Agricultural activities have dramatically modified the native vegetation and hydrology paths through the removal of trees, channelized drainage, dams and intensive earth moving. The site and its surrounds have in the most part been drained for agricultural purposes and indigenous habitats have been largely reduced to small remnants.

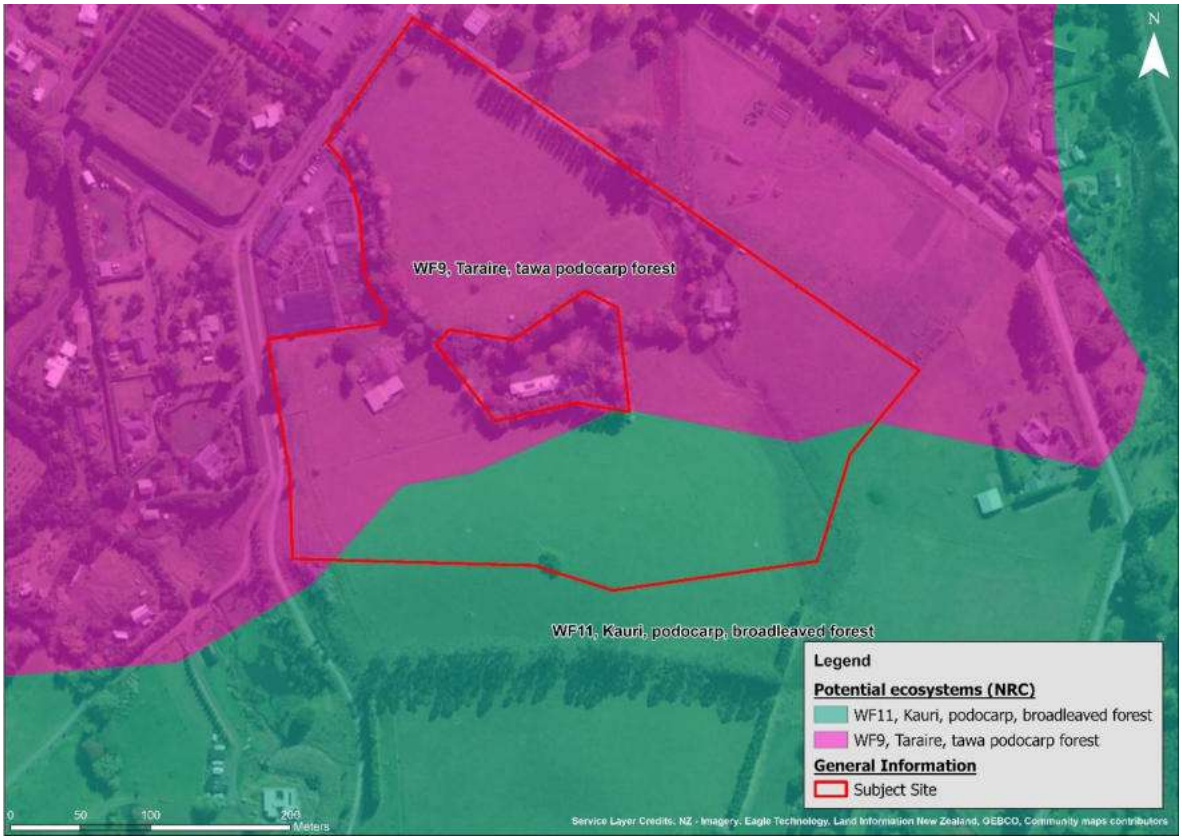

Figure 7: Showing the potential historic ecosystem habitat onsite and surrounds

By analysing historic aerial imagery from Retrolens, it is apparent the subject site and surrounds had already been cleared of native vegetation and converted into a pastoral grazing unit/farmland prior to 1963 (Figure 8). At this time, the remaining natural features included windbreaks along the northeastern cadastral boundary as well as a clear pattern of hydrophytic vegetation indicating a natural inland wetland within the lower contours. By 1981, the site remains largely the same apart from a small section of vegetation clearance evident in the northern aspect of the natural inland wetland (Figure 9). As of present day, an additional residential dwelling has been built. Channelization and damming of water has resulted in the northern area of natural inland wetland having areas of open water. Clearance of windbreak vegetation has occurred within the eastern aspect, whilst additional ornamental planting has occurred along a shared driveway and around the northern wetland riparian margins (Figure 10).

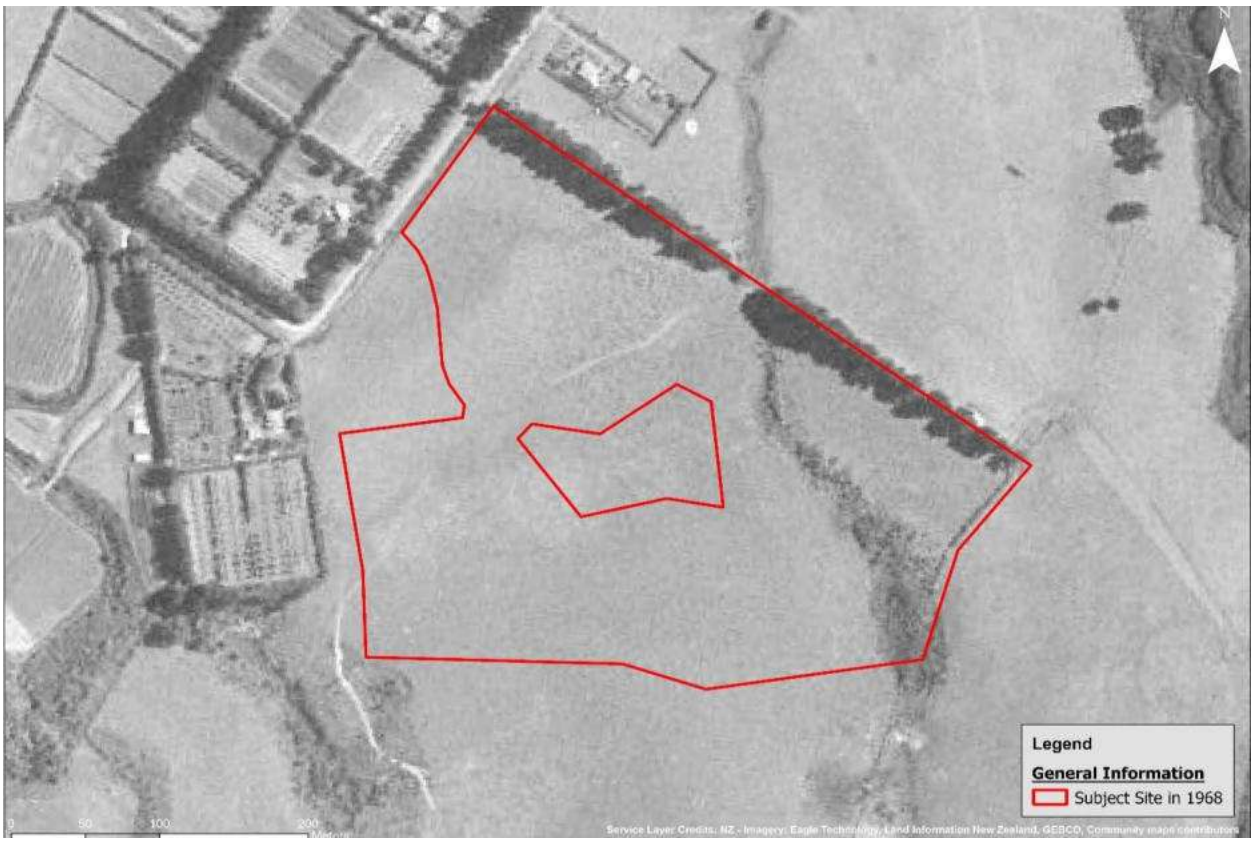

Figure 8: Showing the subject site and surrounds in 1963 (Source: Retrolens)

Figure 9: Showing the subject site and surrounds in 1981 (Source: Retrolens)

Figure 10: Showing the subject site and surrounds in the most recent aerial imagery for Northland (Source: NRC)

The site in its current state is considered a pastoral grazing unit and is used as such. Common exotic pastoral herb and grass species were noted throughout the site alongside exotic shelterbelt trees and pest plant species. The most notable natural feature being the natural inland wetland which is mixed exotic and native dominated. The natural inland wetland feature is proposed to be retained and expanded upon as part of the subdivision proposal with revegetation planting buffering the riparian margins.

3.4 Protected Natural Areas

Given the agricultural nature of the subject site and surrounds, very little indigenous vegetation and Protected Natural Areas (PNA's) as designated in the Natural Areas of Kerikeri Ecological District Reconnaissance Survey Report (Conning and Miller 1999) remain within the vicinity of the subject site (Figure 11). The closest designated PNA is Pukewhau (P05/078) which is located approximately 1 km southeast of the subject site. This PNA is a representative site for tanekaha-kanuka-towai forest and tall manuka-kanuka-towai shrubland vegetation types; as well as being one of only four sites in the Kerikeri ED with rimu-totara forest and the only site in the Kerikeri ED with taraire-tawa forest. The site is known to support regionally significant species such as pied tit (*Petroica macrocephala*) as well as threatened species such as North Island

Brown Kiwi (*Apteryx mantelli*). Other nearby PNA's include Puketotara Road Alluvial Remnant (P05/090), Kerikeri Airport Gumland (P05/103), Puketona Reserve (P05/077), Waitangi Wetlands and Environs (P)5/079), and Kerikeri River Basin Remnants (P05/086).

Figure 11: Map showing the subject site, Protected Natural Areas as identified in Manning 2001

4.0 RESULTS

4.1 Habitat Types

The site occurs within the sub-humid macroclimatic zone (Singers & Rogers, 2014), although it has been significantly altered through historic farming practices and currently contains only a handful of representative examples of indigenous species. All vegetation types were ground-truthed using a handheld GPS and mapped using ArcGIS Pro 3.0.

Specifically, the site is largely considered pastoral land with exotic shelterbelts and ornamental plantings as well as a natural inland wetland feature (Figure 12). The natural inland wetland is separated into two hydrologically connected areas by an existing culvert and farm race. The northernmost area of natural inland wetland can be classified into two wetland habitat types; these being a *Persicaria* herbfield wetland and *Isolepis prolifera* wetland. The southernmost

area of natural inland wetland can also be classified into two wetland habitat types; these being a *Juncus* wetland and a modified manuka fen wetland.

For avoidance of doubt, the wetland areas identified within this report meet the definition of a 'wetland' as defined under the RMA (1991), and the definition of a 'natural inland wetland' as defined under NPS-FM (2020). Where necessary these have been further classified in general accordance with Singers et al. (2017). The onsite wetland habitats are identified under Figure 12, with the *Persicaria* herbfield wetland feature being identified as W1. The *isolepus prolifera* wetland feature being identified as W2, *Juncus* wetland as W3, and manuka fen wetland as W4.

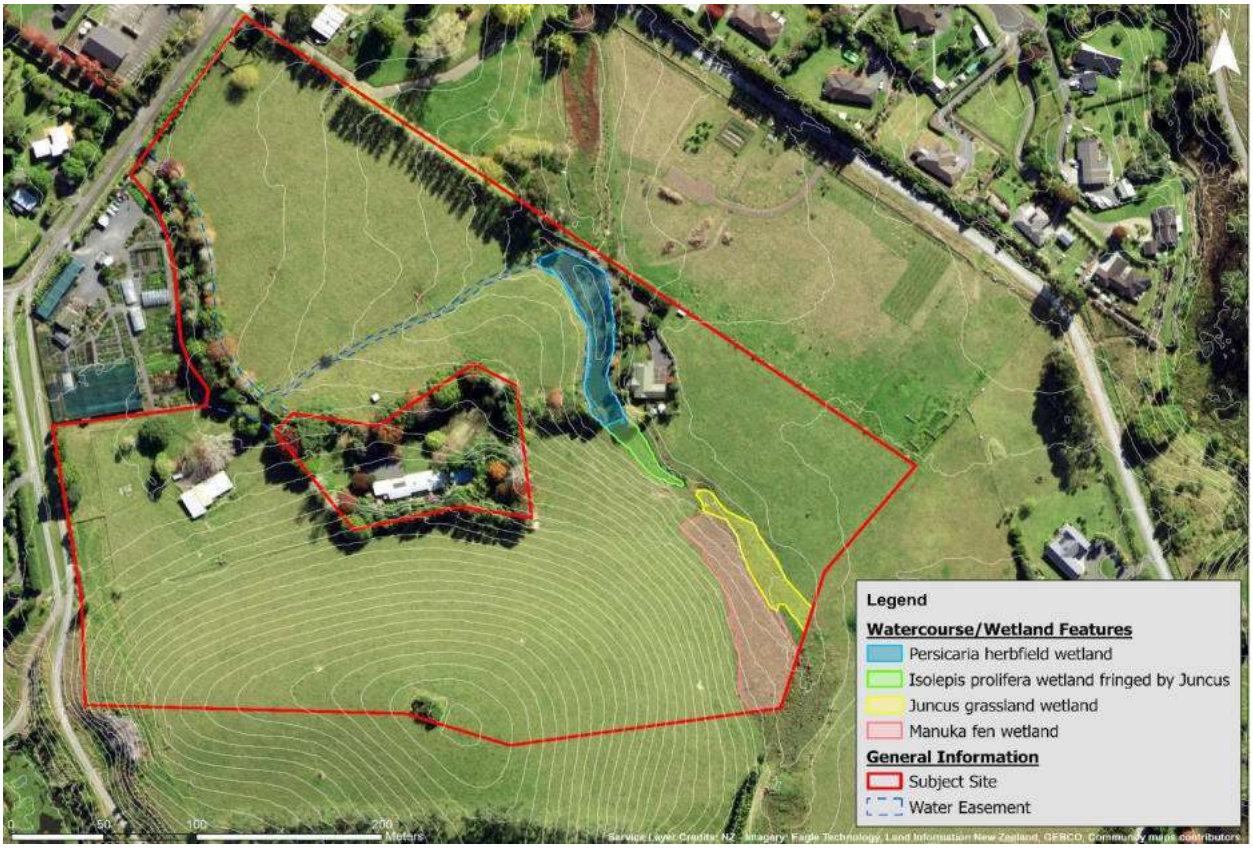

Figure 12: Showing the natural features of the subject site

4.1.1 Persicaria herbfield wetland

W1 is primarily dominated by *Persicaria dicipiens* occupying the interior of the wetland feature. Species noted fringing the wetland and throughout include *paspalum distichum*, creeping jenny (*Lysimachia nummularia*), broom sedge (*Carex scoparia*), *Juncus microcephalus, Isolepis prolifera,* and the invasive yellow flag iris (*Iris pseudacorus*)(Figure 13, Figure 14). There is an area of open water within the deepest section of the natural inland wetland.

Although not observed directly within the wetland, a range of exotic/pest species alongside native ornamental plantings were observed including scattered cabbage tree (*Cordyline*

australis), flax (*Phormium tenax*), blood root (*Wachendorfia thyrsiflora*), *Strelitzia spp.,* swamp cypress (*Taxodium distichum*), and wild ginger (*Hedychium gardnerianum*).

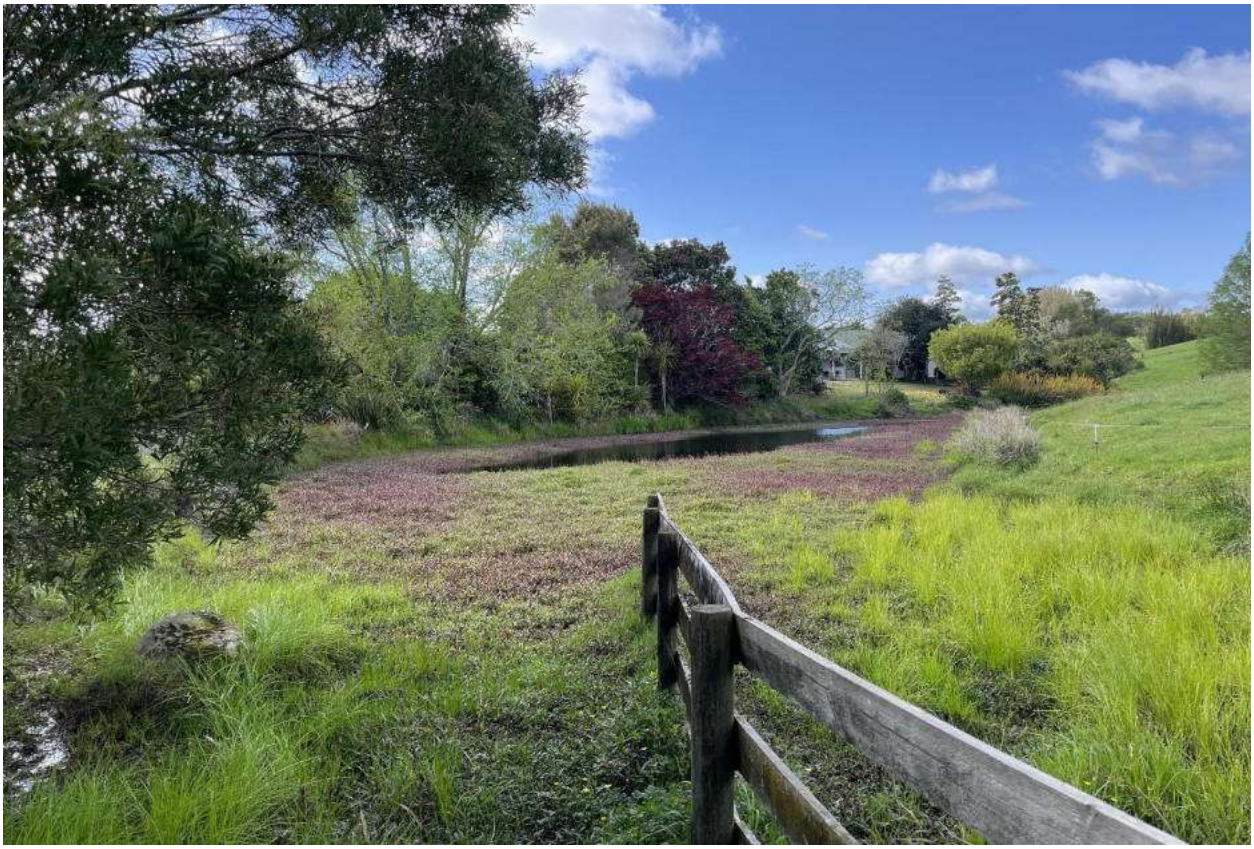

Figure 13: Showing the Persicaria herbfield wetland identified as W1

Figure 14: Showing the Persicaria herbfield wetland (W1) grading into and adjoining the Isolepis prolifera wetland (W2)

4.1.2 Isolepis prolifera wetland

W2 directly adjoins and feeds into the *Persicaria* herbfield wetland identified as W1. There is a swift transition between W1 and W2 likely corresponding to a slight change in elevation and water depth. W2 is dominated by *Isoplepis prolifera* within the interior of the wetland and is fringed by species such as *Juncus effusus.*

W2 is dissected by an existing farm race with a culvert, maintaining its hydrological connection with W3 and W4 in the southern aspect.

Figure 15: Showing the Isolepis prolifera wetland (W2)

4.1.3 Juncus wetland

W3 forms part of the southernmost wetland onsite and is separated from W2 via an existing farm race and culvert. W3 fringes W4, though it is representative of a more typical pastoral wetland with species such as soft rush (*Juncus effusus*), *Isoplepis prolifera, Persicaria decipiens, Lotus pedunculatus,* creeping buttercup (*Ranunculus repens*), Yorkshire fog (*Holcus lanatus*), creeping bent (*Agrostis stolonifera*), Mercer grass (*Paspalum distichum*), water purslane (*Ludwigia palustris*) and water starwort (*Callitriche stagnalis*). W3 has permanently wet soils, with the water table having been encountered 30 cm below the surface during hand augering. Wetland adapted fauna occupy this area, with dragonfly (*Odonata sp.*) having been observed.

Figure 16: Showing the Juncus wetland (W3) in the foreground with part of the modified manuka fen wetland (W4) in the background.

4.1.4 Modified Manuka fen wetland

W4 forms part the southernmost wetland onsite and is representative of a modified manuka fen (WL12) wetland, albeit degraded from continual stock access. The wetland appears to be feed by a combination of water shed from the surrounding pastoral landscape, as well as a small spring in the northeast facing slope.

This wetland contains abundant sphagnum moss (*Sphagnum falcatulum*), common orange nut sedge (*Machaerina rubginosa*) and occasional *Machaerina teretifolia* with sharp spike sedge (*Eleocharis acuta*) and swamp millet (*Isachne globosa*).

Scattered throughout the wetter seepages, forked sundew (*Drosera binata*), *Gonocarpus micranthus, Juncus planifolius,* dwarf bog rush (*Schoenus maschalinus*) and *Schoenus apogon* were most common on isolated islands of sphagnum moss induced by cattle pugging. Interspersed between the dominant species were exotic species such as sweet vernal (*Anthoxanthum odoratum*), Yorkshire fog (*Holcus lanatus*), Vasey grass (*Paspalum urvillei*) and South American rush (*Juncus microcephalus*)

A few remnant manuka (*Leptospermum scoparium*) were observed within the wetland; which is likely representative of the historical canopy. Overall, this wetland has a unique and ecologically significant indigenous species assemblage. It is waterlogged and spongy underfoot with peaty, acidic soils and is representative of a fen wetland which is further assessed as a significant wetland under the Northland Regional Plan (NRC, 2024).

Figure 17: Showing part of the modified manuka fen wetland identified as W4

Figure 18: Showing the modified manuka fen (WL12) wetland identified as W4

4.1.5 Wider Site - Exotic pasture and shelterbelts

The wider site is largely considered a pastoral grazing unit and is used as such. Common exotic pastoral herb and grass species were noted throughout the site. Exotic shelterbelts and ornamental plantings were observed along the existing driveways and around the existing dwelling. None of these areas of vegetation have been designated under the provisions of either the Proposed Regional Plan for Northland or Far North District Plan (Operative). It is important to note that any native vegetation onsite intermixed with the exotic shelterbelts and ornamental plantings were sparse and or inundated with pest weed species, making it impractical to classify its ecosystem type.

Figure 19: Showing the subject sites pastoral landscape and the northwestern shelterbelt/ amenity plantings

Figure 20: Showing some small stands of mixed exotic/native trees near W1 and W2

4.2 Aquatic diversity

A quantitative search of the New Zealand Freshwater Fish Database (NZFFD, accessed November 2025) revealed records of 6 native/endemic fish and 3 native invertebrate species (Table 1) within the Wairoa Stream catchment.

Table 1: Freshwater fish and invertebrate species recorded within the Wairoa Stream catchment (Source: Niwa 2024)

Scientific name	Common name	Conservation status
Anguilla australis	Shortfin eel	Endemic and Not Threatened
Anguilla dieffenbachia	Longfin eel	Native & Declining (At risk)
Echyridella menziesi	Freshwater mussel	Native & Declining (At risk)
Galaxias fasciatus	Banded kokopu	Endemic and Not Threatened
Gobiomorphus basalis	Cran's bully	Native and Not Threatened
Gobiomorphus cotidianus	Common bully	Native and Not Threatened
Gobiomorphus huttoni	Redfin bully	Native and Not Threatened
Paranephrops spp.	Koura	Native & Declining (At risk)
Paratya curvirostris	Freshwater shrimp	Native and Not Threatened

The records show that three Native & 'At Risk – Declining' aquatic fauna species have been previously recorded within the Wairoa Stream, which the onsite stream features eventually flow

into. Given the characteristics of the waterbodies onsite and subject site's position in the uppermost catchment for this stream, it's unlikely that the streams would be inhabited by any 'Threatened' or 'At Risk' aquatic species. To elaborate, the likely channelization of the wetland systems onsite does not lend to the natural formation of pools and overhangs which many native New Zealand fish species need for shelter and hunting. Canopy cover is essential for many freshwater fish species such as the banded kokopu, and although some exists in the way of overhanging swamp cypress, much of the wider system is exposed, and very little in the way of native canopy cover exists. The lack thereof means less shelter, shade, food and temperature control for the stream. With that being said, some limited suitable habitat for native ichthyofauna, namely eels, is present on site possibly within the *Persicaria* herbfield wetland.

In its current state, the ecological value for the onsite waterbodies is considered to be **low**. Although the system fulfils habitat requirements for some indigenous fish and invertebrate species, parts of the onsite wetland system is inundated with exotic species, has no overhead canopy and is open to stock browse. It is anticipated that the onsite natural inland wetlands will receive ecological enhancement and value enrichment through native revegetation planting in perpetuity. Generally, the species likely on site are known to be good climbers, able to navigate over/around in-stream barriers such as raised culverts, dams, etc. It is important that as a part of site development work, a sediment reduction plan is enforced to ensure as little sediment as possible enters the onsite watercourses. Good connectivity must remain between the site and the Kerikeri Inlet catchment for the on-site species to access the site.

4.4 Avifauna

Avifauna species were observed on the subject site via opportunistic observations during the site visit on the 22nd of October 2025, with a comprehensive bird species list outlined in Table 1 below. The diversity of birds observed on the subject site was **low-moderate** with 5 native/endemic and 5 introduced species (Table 2). These species identified onsite are representative of a highly modified rural landscape. No 'Threatened', 'At Risk' or 'Regionally Significant' species was observed onsite; with avifauna likely utilising the site being highly mobile, mostly exotic and common. Overall, it was deemed that the site in its present condition provides **low-moderate** ecological services for native avifauna but overall, the native species observed represents **low** ecological value.

Table 2: Showing the avifauna species observed onsite during bird surveys in October 2025 – conservation status as per Robertson et al. 2021

Introduced		
Scientific name	**Common name**	**Conservation status**
Acridotheres tristis	Common myna	Not threatened
Fringilla coelebs	Chaffinch	Not threatened
Passer domesticus	House sparrow	Not threatened
Turdus merula	Eurasian blackbird	Not threatened
Turdus philomelos	Song thrush	Not threatened
Native/Endemic		
Porphyrio melanotus	Pukeko	Not threatened
Rhipidura fuliginosa	New Zealand fantail	Not threatened
Tadorna variegata	Paradise shelduck	Not threatened
Todiramphus sanctus	Sacred kingfisher	Not threatened
Zosterops lateralis	Silvereye	Not threatened

4.5 Herpetofauna

A diurnal habitat search, inspecting areas likely to be utilized by native lizards for sheltering or foraging (e.g. beneath dense vegetation, logs, boulders, and manmade objects) was conducted. In short, no native herpetofauna was noted on the subject property, likely associated with the general lack of lizards in the wider area, the presence of pest mammalian species, the generally fragmented habitat in the wider area, the weather conditions and the time of the season. It should be noted that the herpetofauna search would not be considered quantitative and therefore would not be able to definitively determine the presence / absence of native lizard species within the riparian corridor area.

A further desktop analysis was conducted which examined multiple datasets of herpetofauna records. Records held in the PNAP Report (Conning and Miller 1999) indicate that the only locations where native lizard species including McGregor's skink (*Cyclodina macgregori*), Duvaucel's gecko (*Hoplodactylus duvaucelii*), moko skink (*Oligosoma moco*) and Suter's skink (*Oligosoma suteri*) are present in this Ecological District are on the offshore islands. A search of DOC's BioWeb database returned a record of Northland green gecko (*Naultinus grayii*) recorded in 2009, within the Kerikeri River basin, approximately 2.9 km north of the subject site (Figure 21). DOC's BioWeb database also revealed a record of green turtle (*Chelonia mydas*) 2.3 km northeast of the subject site within the Kerikeri Inlet. Records from iNaturalist database within 5 km of the site revealed copper skink (*Oligosoma aeneum*) observations 2.3km northeast of the subject site.

It is likely that the only herpetofauna species present is rainbow skink (*Lampropholis delicata*). Rainbow skinks arrived in New Zealand in the late 1960s, but only became classified as an 'Unwanted Organism' in recent years and removed from the Wildlife Act in 2010 (DOC 2015). Rainbow skinks, once identified, can be trapped and disposed of however no known way to fully eradicate these species has been suggested, while their spread can be prevented by taking extreme care when moving objects, especially potting mix in potted plants (known to be favoured breeding habitat for rainbow skinks) which should be checked for eggs prior to relocation and planting works (Wairepo 2015).

As mentioned, it is unlikely that herpetofauna are utilizing the site given the lack of habitat or continuity within the wider area. Therefore, it is not anticipated that the development would have any impact on native herpetofauna. The current ecological value for native herpetofauna is therefore considered to be **low**. This is associated with a long history of disturbance, land clearance, predation by common pest animals and habitat fragmentation. It is deemed that an integrated pest management plan and revegetation planting will significantly improve the site's potential to support viable herpetofauna populations. Deadwood (both standing and lying) should be retained and building log piles of felled timber, where possible, is advised. To further enhance lizard habitat in the area planting trees and shrubs that flower close to the ground and with that bring insects and flies within the reach of native lizards would be beneficial.

Figure 21: Showing the DOC Bioweb records within 5 km of the site

4.6 Chiroptera (Bats)

New Zealand has two extant native bat species, the long-tailed bat (*Chalinolobus tuberculatus*) and the lesser short-tailed bat (*Mystacina tuberculata*), both of which are endemic microbat species. Long-tailed bats is listed as 'Threatened - Nationally Critical' (Donnell et al. 2017). Native bats are 'absolutely protected' under the Wildlife Act (1953). A search through the DOC database returned zero sightings of any bat species within a 5 km radius.

Bats are a highly mobile species, however given the lack of contiguous forest, the current poor water quality onsite, the presence of exotic mammalian predators on site, the lack of suitable trees for roosting, the presence of many pest plant species and the generally small habitat availability on site, it is highly unlikely that long-tailed bats use the property for roosting or foraging. Therefore, it is considered that the current ecological value for chiroptera on site is **low**. It is possible that, over time, the subject site could provide for suitable habitat for bat populations via the protection, enhancement and restoration of the freshwater waterbodies found on site, which would promote emergent aquatic insect prey for foraging, freshwater for drinking, and provide linear landscape corridors for movement and navigation to the wider area.

5.0 PROPOSED WETLAND ENHANCEMENT AREA

As part of the site development works, it is proposed that the site's waterbody features are legally protected and appropriately enhanced (Figure 22). Enhancement should take place in the form of weedy species removal with appropriate native species replacement as well as revegetation planting of the riparian margins. The proposed wetland enhancement area has been mapped using a GPS and analysed using ArcGIS Pro 3.0.

It is proposed to protect this area via conservation covenant protection which should stipulate that ongoing pest plant and pest animal control be conducted alongside native revegetation planting. Riparian enhancement via revegetation planting is proposed to occur within a 10m buffer around the natural inland wetland features and within 3m buffer around the *Persicaria* herbfield wetland feature (W1) which is recognised as a water easement.

It should be noted that the brunt of the environmental restoration work onsite comes in the way of pest plant and animal management, stock exclusion, and enhancement planting, and as such it is recommended that an Ecological Management Plan be developed as a condition of consent. This will ensure that pest animals and plants are effectively managed both initially and in perpetuity, while also ensuring that suitable stock-exclusion measures are implemented and that the revegetation planting uses appropriate species at the correct densities. The

proposed plantings seek to protect, expand and enhance the existing natural inland wetland area on the subject site through the reduction of edge effects reduce sedimentation runoff that is characteristic of the site's topography and therefore should improve the overall water quality of the onsite wetlands. The planting largely stands to help facilitate uninterrupted movement of species using the watercourses on and off site and provides for a steppingstone feature for mobile fauna moving through the wider area.

Plant species, grade, spacing and numbers shall be confirmed within an Ecological Management Plan as a condition of Resource Consent. The species selected should be mixture of pioneer nursery crop and species that provide food for native fauna within the proposed covenant protection planting area. Plant species selection should also consider the relevant type of vegetation that formerly existed on and adjacent to the site; historically this being a WF11 Kauri, podocarp, broadleaf forest. These forest types typically include (but are not limited to) kauri, rimu, tōtara, miro, tanekaha, kahikatea as well as taraire, tawa, pūriri, pukatea and rewarewa and should where possible be included in the revegetation planting regime. Weight should also be appointed to W4's currently ecological trajectory, this being manuka fen wetland (WL12).

The immediate riparian margins of the stream and onsite pond should be planted with native hydrophytic vegetation such as *Carex lessoniana*, *Carex virgata*, and *Machaerina articulata*. The proposed plant species list for the revegetation planting will focus on introducing a high proportion of flower and fruit bearing species to enhance the overall ecological significance of the plantings and provide all-year-round food supply for a number of species, but in particular, avifauna and herpetofauna.

It is expected to achieve native canopy closure in approximately 4-5 years' time. Ensuring canopy closure as quickly as possible is vital. Canopy closure will allow for pest plant suppression, and a closed canopy is more likely to attract native avifauna, herpetofauna, ichthyofauna, and invertebrates and therefore will increase the ecological value of the revegetation plantings. It is expected that within 4-5 years' time the buffer and connectivity planting will provide for significant benefits including reducing edge effects of the riparian remnants, allowing for a more structurally complex core area to develop, and enhancing ecological corridor connectivity between remnant riparian areas.

Total Proposed Covenant Area – 1.0095 ha

- Riparian Buffer Planting – 4,315 m^2

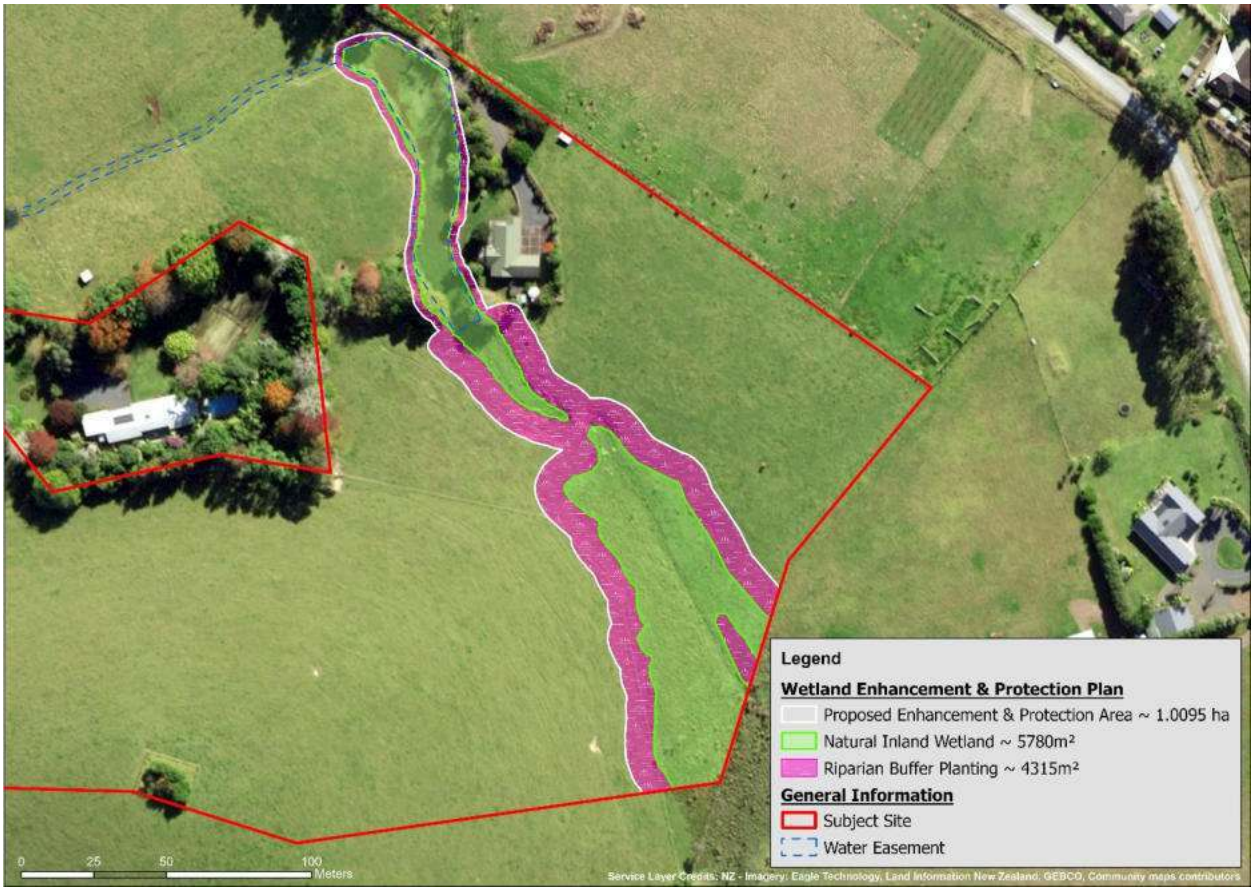

Figure 22: Showing the proposed ecological protection area with riparian buffer planting throughout

5.1 Riparian Buffer Planting – 4,315 m^2

Riparian buffer planting will consist of 4315 m^2 of planting along the margin of the natural inland wetlands contained within the subject site; this includes a 10m planted buffer around the natural inland wetlands and a 3m planted buffer around the natural inland wetland classified as a water easement. These areas at present considered pastoral in nature. The primary aim of planting in these wet areas is to restore the riparian margins of the natural inland wetlands, which eventually flows into the Wairoa Stream. Invasive exotic pest plant species shall be removed within the proposed conservation covenant area. Planting in these areas will undertake functions including but not limiting to stabilizing the stream banks, filtering sediments, preventing runoff, generally improve water quality and to provide a buffer between the proposed development area and the wetland habitats on site. The planting will in effect replace noxious weeds found on site and help to restore the natural characteristics of the onsite watercourse system. This will also have beneficial impacts to the lower catchments and tributaries that this system feeds into off-site by filtering water and suppressing exotic pest plant seed dispersal downstream.

Plant spacing will vary, where areas that already contain native vegetation can be more widely spaced and infilled, and areas that do not contain native vegetation should be more tightly

clustered. In general, hydrophytic vegetation proposed to be planted around the waterways should be tightly clustered. Tight spacing encourages quicker canopy closure which will suppress weeds.

The plant numbers, species selection, spacing, etc. will be confirmed post consent within an Ecological Management Plan written for the site as a condition of consent.

6.0 ANIMAL PEST MANAGEMENT & WEED CONTROL

6.1 Pest Animal Management

Although not observed during site visits, it is likely that common mammalian pest species are present on the site, including Norway rat (*Rattus norvegicus*), possums (*Trichosurus vulpeca*), ship rat (*Rattus rattus*), brown hare (*Lepus europaeus occidentalis*), European rabbit (*Oryctolagus cuniculus*), mustelids (*Mustela* spp.), wild cat (*Felis catus*) and hedgehog (*Erinaceus europaeus*). A thorough monitoring program can be developed with the Ecological Management Plan as a condition of consent for the identification, control and monitoring of pest animals over time.

A control programme including a combination of trapping and poisoning should be enforced on the subject site. The programme will target key pests that threaten these values:

a. Stoats (and rats, hedgehogs) with DOC 200 traps
b. Possums with traps
c. Rats through toxins
d. Rabbits through toxins
e. Feral cats with traps

The tools that should be used will be to accepted NZ best practice standards but will also include an adaptive management approach (also best practice) to take account of knowledge learnt while doing the work and the changing use of the property i.e. replacement of grazed pasture with native revegetation.

Possums and rodents disrupt ecological processes therefore can impact entire forest ecosystems (Cowan, 2001). Possums are selective feeders and deplete species like pohutukawa (*Metrosideros excelsa*), rata (*Metrosideros robusta*) and kohekohe (*Dysoxylum spectabile*) and interfere with flowering and fruiting periods. This subsequently can have negative impacts on seed dispersers such as New Zealand pigeon. Meanwhile rodents can have severe negative impact on populations of invertebrates, lizards, some birds. Possums and

rodents also feed on seeds and seedlings on the ground, therefore depleting food availability for native fauna.

Goats, pigs, rabbits, hares, and grazing livestock can impact on native plant assemblages and native regeneration generally. Where livestock are allowed to graze in forest remnants and riparian areas, it results in the destruction of vegetation preventing regeneration as well as negatively impacting riparian and aquatic habitats.

Mustelids (ferret, stoat, and weasel), cats and uncontrolled dogs can have severe negative impacts on a variety of native species. For ground nesting birds to breed successfully, effective control of mustelids and rats is key.

Introduced lizards, such as rainbow skink, could have adverse effects on indigenous fauna but their impacts are generally less known than those of introduced mammals.

6.2 Pest Plant Management

Weeds identified under the National Pest Accord or those known to pose a potential invasive threat were recorded. As mentioned, the proposed ecological enhancement area in its current state is contains plants which are considered 'Sustained Control' noxious weeds under the NRC, including wild ginger and gorse. Currently, landowners are not required to control these pest plants, however this can/will be made mandatory as a condition of consent when applying the proposed conservation covenant protection around the permanent stream feature. It should also be noted that yellow flag iris, which is considered a 'eradication plant' under the NRC, was recorded within the subject site and thus requires substantial control efforts likely in conjunction with NRC. Intensive control efforts are already underway on the adjoining property.

It is expected that an Ecological Management Plan is drawn up and addresses these matters in more detail as a condition of consent. This plan will include the identification of weeds, control techniques and ongoing monitoring to ensure total eradication of weed species over the entire subject property.

7.0 POTENTIAL EFFECTS

Based on the site visit and desktop research conducted, the site's overall ecological values are assessed as **low-moderate**. With the most significant ecological features being the wetland features including the *Persicaria* herbfield wetland, *Isolepis prolifera* wetland, *Juncus* wetland and the modified manuka fen wetland. Though these natural inland wetlands are considered degraded, they contain a significant proportion of native species alongside a range of exotic species. In its current state the natural inland wetlands onsite are subject to significant stock

browse resulting in a stunted successional state. Fauna species utilising the site are highly mobile, mostly exotic and common. Currently, no suitable habitat is present on site or for any 'At Risk' or 'Threatened' avifauna, herpetofauna, ichthyofauna or chiroptera. The wetland features themselves are unlikely to be inhabited by any 'Threatened' or 'At Risk' aquatic species, though climbers such as longfin eel may occasionally be present within the wider stream system. The riparian vegetation values are of low quality given the dominance of common and exotic pastoral species; however, it is proposed to enhance these areas via weed control and appropriate revegetation planting.

Given the site does contain some susceptible waterbodies, consideration needs to be given to the potential adverse effects associated with the development of the site. It is thought that these impacts can be appropriately avoided or mitigated through comprehensive planning controls, appropriate setbacks and the development of an Ecological Management Plan which focuses on the protection and enhancement of natural features on site and surrounds (Figure 23).

Figure 23: Showing the appropriate setbacks from wetland systems

Generally, the potential adverse effects can be divided into negative effects resulting from:

- Direct effects - resulting from physical development of the application area including land clearance, earthworks, construction, stormwater, etc.
- Secondary effects - resulting from increased activities and habitat modifications within the application area and the surrounding area, following proposed development.
- Cumulative effects - resulting from future development that might occur, and additional to the effects that can be expected to have already occurred as a result of development of the wider area which will also increase in the future.

During the construction phase of the proposed works, the adverse impacts of the development will comprise habitat loss and potential disturbance of the existing habitats on site. It is understood that the new dwellings as a result of the development of this site will occur over rural land. The species that utilize this habitat (e.g. pukeko) are highly mobile and common. During the operational phase of the proposed works, adverse impacts will comprise potential increased levels of disturbance through increased levels of lighting, noise and human presence. Restoring the waterbodies onsite with pest plant control and revegetation planting will more than offset the operational phase of the works.

When addressing cumulative effects, there are a number of practical and policy barriers to be considered. It is difficult to predict and assess cumulative effects with a high degree of certainty due to complex ecological interactions, the lack of environmental baseline data, and the scale and timeframes at which District Council's plan. However, consideration of existing and reasonably foreseeable activities must be given to ensure that standalone effects of the proposal will not result in 'tipping the balance' in the wider ecological context.

7.1 Increased Human Disturbance

The proposal is reflective of the surrounding land use which has become increasingly developed since the early 2000's. Additional people in the area could potentially have an impact on the wildlife in the area through disturbance of feeding, breeding and nesting areas for birds, unless appropriate management measures and controls are put in place. The subject site itself is not thought to provide significant breeding or nesting habitat for any 'Threatened' avifauna, due to significant anthropogenic modification and disturbance by current land use activities. This may change through the protection and rehabilitation of remnant indigenous vegetation and associated riparian habitats.

Given that the proposed new lots are situated within a rural grazing unit, the expected impacts of increased human disturbance of any native nesting or breeding birds protected under the

Wildlife Act 1984 is assessed as negligible. As mentioned in section 4.4, no 'Threatened', 'At-Risk' or 'Regionally Significant' species were noted to be onsite, with a vast majority of avifauna noted onsite being introduced. Nonetheless ongoing monitoring of the proposed Ecological Enhancement area should ensure that if any 'Threatened' or 'At Risk' fauna is noted, appropriate actions are taken to protect these species, including (but not limited to) the creation of an exclusion zone till the nest has failed or successfully fledged.

7.2 Predation by Domestic Pets

Domestic pets are some of the main predators for native fauna species, in particular avifauna and herpetofauna. Other more uncommon domestic pets include mustelids (e.g., stoats and ferrets) which are known predators of indigenous herpetofauna as well as birds and their eggs. Wild mustelids, while common within the area, are prohibited from being kept as pets in New Zealand, therefore an increased abundance of mustelids as a part of the subdivision process poses a lower risk. Given that the proposal is for a 30-lot (29 additional) subdivision, it is recommended to put strict bans on certain pet animals. To reduce the potential impacts of domestic pet predation of susceptible native fauna, it is proposed that the keeping of cats, mustelids (ferret, stoat, weasel) and other species potentially regarded as threats to the existing biodiversity values (e.g., pet rabbits, rats, aquatic turtles and pet fish) is prohibited for the new development, while dogs can be managed through appropriate controls (secured containment).

In addition, as a part of the enhancement proposal, establishment of a comprehensive animal pest control programme within the subject site is proposed. While pest animals are likely to be present within the wider area, pest animal control on site will have positive flow on effects on the protection of native avifauna. All the above will ensure the effects of increased disturbance pressure are at least partly offset.

7.3 Increased Invasion of Pest Species

Whilst the subject site and surrounds contains some invasive pest plant species, the proposed development could become another source of pest weeds through planting of exotic plants within garden areas or as screen planting. Dumping of garden waste is also an aspect which should be considered. It is believed that this can addressed through appropriate controls such as prohibiting the cultivation of invasive weed species listed under the National Pest Plant Accord (NPPA) and Northland Regional Pest Management Strategy (NRPMS).

7.4 Earthworks & Sedimentation

As described within the Geotechnical & Civil Site Suitability Report prepared by Cook Costello, it is understood that a level of earthworks will be required to form accessways, walkways, parking, and building platforms within the proposed development area.

From an ecological perspective, earthworks associated with the development of the site have the potential to result in sediment runoff into the identified onsite waterbodies. Earthworks, where they are to occur in close proximity to the onsite watercourses, will have to abide by strict sediment control measures to avoid adverse ecological effects. All earthworks are outside of the relevant NRC and FNDC setbacks. The addition of fine sediment to stream environments during construction phase of the development has the potential to alter water chemistry, increase turbidity and decrease light penetration that affects primary production and feeding for some fish species. The deposition of sediment can also smother instream surfaces and decrease the amount of suitable habitat available for benthic invertebrates.

Based on the Scheme Plan provided by Thomson Survey, no earthworks appear to be within close proximity to any identified watercourses. It is proposed that all earthworks on site are carried out in accordance with best practice erosion and sediment control plans. The proposed controls are to be constructed and maintained in accordance with Auckland Council's GD05/2016 document (superseding TP90) which Northland Regional Council deems to be applicable in the Northland region. Appropriate setbacks from waterways and where appropriate sediment retention fencing should ensure that any sediment/erosion related effects on water quality and habitat in the downstream-receiving environment will be negligible (i.e., minimal sediment mobilization). With the implementation of appropriate silt controls during the construction phase, the effects of earthworks on water quality in the receiving environment during construction will be avoided and the overall level of effect is assessed as **less than minor**.

7.5 Wastewater Management

The wastewater disposal plan prepared by Conquel Consulting indicate that a number of onsite wastewater treatment systems will be utilized as a part of the development. Secondary wastewater field discharges do not require consent under Regulation 54 of the NES-F, and therefore there are no consenting obligations for the installation and maintenance of the wastewater disposal field in respect to the NES-F. Based on the wastewater disposal plan prepared by Conquel Consulting, there is adequate space within the new allotments for an appropriately designed secondary wastewater system to be installed outside of all relevant regional and national setback requirements, including the NRC 15m wastewater setback (Figure 24). These wastewater treatment and disposal systems will be in accordance with

Auckland Council's GD-06 document. Preliminary wastewater assessment suggest that an aerated wastewater treatment systems (AWTS) or equivalent with disposal via subsurface drip irrigation is suitable for this site.

Overall, it is proposed that the wastewater disposal fields setback distance from onsite watercourses on site and immediate surrounds will be compliant with NRC provisions. It is understood that all wastewater management and wastewater discharge quality are to meet Far North District Council's required standards. If wastewater management is implemented to industry standards and follow appropriate setbacks from waterbodies, wastewater related effects are expected to be **less than minor** to the receiving environment.

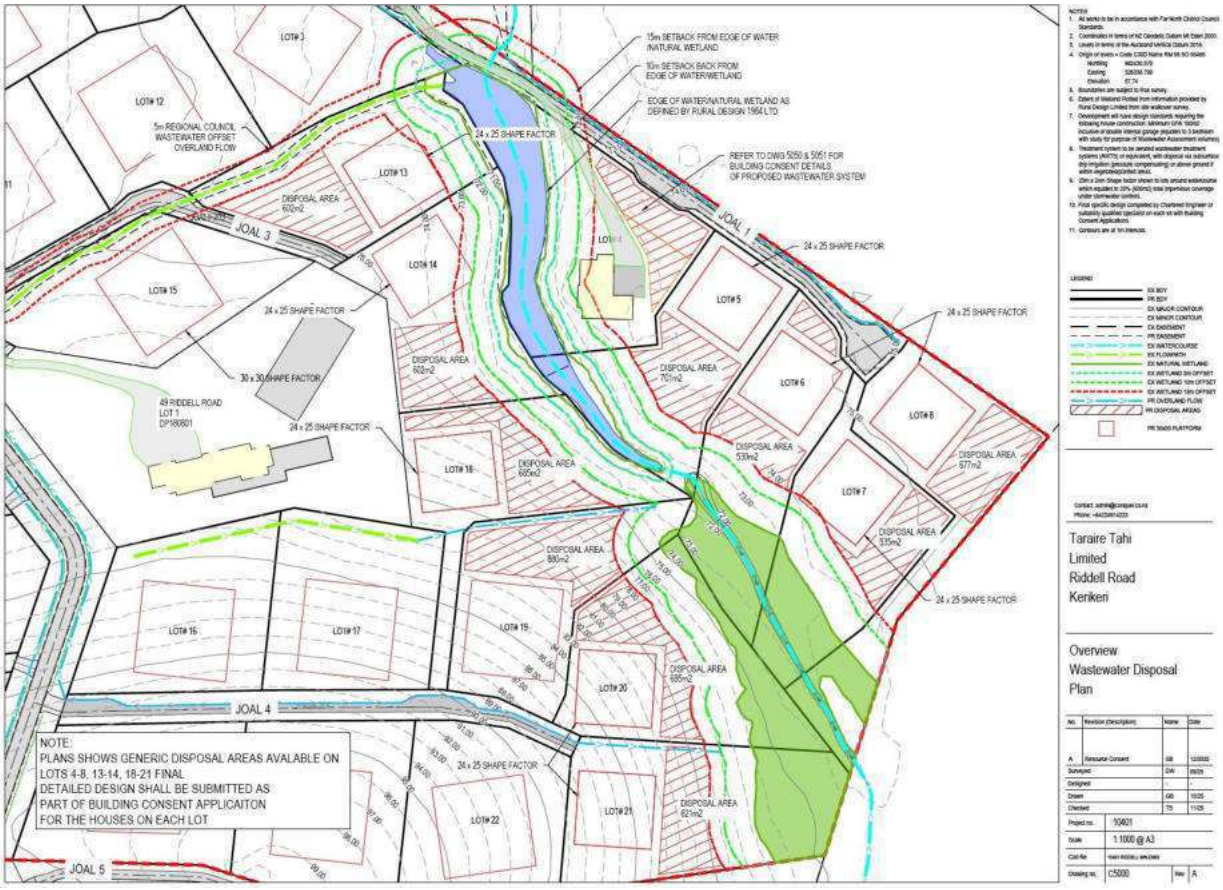

Figure 24: Showing the wastewater disposal plan prepared for the site by Conquel Consulting

7.6 Stormwater Management

Discharges of contaminants to freshwater can severely impact ecosystem health values through acute (short-term) effects and chronic (long-term) effects. The cumulative effects of multiple contaminants being discharged to an aquatic environment may also be highly

significant; some contaminants discharged in isolation may have little influence on ecosystem health but when discharge alongside other contaminants, can have serious consequences.

Regarding stormwater management, further stormwater design shall be determined at the building consent stage once final impervious areas are known. Specific design must adhere to Far North District Council's standards. Preliminary stormwater assessments suggest the construction of a riprap stormwater outlet outside the relevant NRC 10m wetland setback.

From an ecological perspective, above ground waterbodies were noted within 100m from proposed new allotments. The establishment of the stormwater infrastructure is anticipated to involve some minor earthworks and will result in some additional hydrologic inputs, that may be diverted towards the onsite stream system. Due to the increase in impervious surface associated with the site's development, the overall volume of water entering the wider aquatic environments is expected to increase to a negligible level, which will improve hydrologic inputs to onsite freshwater system to a negligible degree. A greater volume of water entering the system will likely positively support habitat provision for aquatic fauna such as fish and invertebrates. Additionally, the proposed riparian buffer plantings on site will provide further reduction in the total runoff from the site entering the watercourses both on and off the subject site.

It is understood that stormwater infrastructure will be designed in accordance with relevant Far North District Council's and NZ engineering standards including discharge rates, water quality and clearance setbacks. Any works near the waterbodies (or their margins) identified within the body of this report will have to abide by strict sediment controls to ensure that the release of fine sediment into the stream during construction phase is minimised. Therefore, if stormwater management is implemented to industry standards and follow appropriate setbacks from waterbodies, the potential adverse effects relating to the implementation of the proposed stormwater network are deemed **less than minor.**

7.7 Noise

Increases of anthropogenic noise has the potential to negatively affect bird fitness as it may interfere with communication and for instance, decrease predator detection or breeding activity. Regular exposure to high levels of anthropogenic noise may cause changes in bird communities and influence local distribution patterns. There are extremely limited number of studies investigating the impacts of changes in anthropogenic noise on bird fitness and breeding success in New Zealand. Factors that should be taken into consideration when assessing likely impacts of anthropogenic noise on bird species should be directly related to the nature of the proposed development project. It is thought that anthropogenic pressures

will be minimised long-term with the removal of stock and the revegetation planting of riparian margins, which will offset any increased noise levels from new dwellings; especially considering the revegetation buffer planting proposed which will act as a natural noise barrier. Therefore, the proposed development is likely to contribute to increased noise levels in the proposed covenant area to a '**negligible**' level.

7.8 Light

The potential adverse effects from light on the surrounding habitats and species using these areas should be considered. Many New Zealand avifauna, herpetofauna and insects are fully or partially nocturnal. Introduction of increased unrestricted light levels within the area are likely to disrupt species movements. Impacts may relate to changes in flight patterns, extension of "day-light" hours through introduction of streetlights which has been shown to affect timing of mating behaviours and reproduction in birds. Invertebrates may also be negatively affected through disorientation, and thus may cause changes in species movements within the wider landscape. The potential impacts of the effects of artificial lighting can be significantly minimised through the use of using appropriate lighting with longer wavelengths, at the orange-red end of spectrum. Given the size of the proposed development, the increase in daylight hours through introduction of artificial light is '**negligible'** and will not affect the main areas proposed for covenant protection on site due to the distance between the development footprint and covenant area.

7.9 Fire

Fire risk must be considered when introducing dwellings into rural areas due to the presence of highly flammable species such as gorse. If any landscape plantings are proposed to be carried out within the new lots, it is proposed that only low flammability species are planted where they occur within a 10 m radius from the house footprint to reduce fire risk. It is understood that no vegetation is proposed to be located within 10 m of any house footprint therefore the effects of increased likelihood of fire events are expected to be '**negligible**' to the receiving environment.

8.0 NATIONAL POLICY STATEMENTS

8.1 National Policy Statement for Freshwater Management (NPS- FM)

New Zealand has historically lost most of its wetland extent. Those remaining are rare and valuable ecosystems. The Essential Freshwater package, including the National Environmental Standards for Freshwater (NES-F), Freshwater National Policy Statement for Freshwater

Management (NPS-FM) and Stock Exclusion Regulations, that came into force in September 2020 introduced strong new policies and regulations to protect natural wetlands on a national scale.

The NPS-FM sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The NPS-FM directs Regional Councils, in consultation with their communities to set objectives for the state of freshwater bodies in their regions and to set limits on resource use to meet these objectives. The core intent of the policies in the NPS-FM is to provide stronger protection for freshwater bodies and wetlands. It also places a statutory responsibility on territorial and consenting authorities to give effect to Te Mana o te Wai by prioritizing the health and wellbeing of our waterways. With respect to Te Mana o te Wai, the hierarchy of obligations for consenting authorities are; first, to prioritise the health and well-being of water bodies and freshwater ecosystems; second, the health needs of people (such as drinking water); and third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The core intent of the policies in the new NPS-FM is to provide stronger protection for freshwater bodies and wetlands. The NPS-FM sets out 15 policies for the management of freshwater in New Zealand. While all the policies are relevant, we draw attention to the following relating to this proposal:

Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

> The proposal involves protection and enhancement of aquatic ecosystems within the boundaries of the subject site. It also provides protection and enhancement of habitat for instream fauna. Pest plant management will allow for natural regeneration to take place once more, and with that enhance canopy cover for the wetlands. This will help to moderate water temperatures, act as an important food source by increasing invertebrates for aquatic organisms, reduce sedimentation, and form an important buffer for diffuse pollution from the surrounding landscape.

Policy 5: Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.

> Currently the natural inland wetland system flowing through the subject site and the wider upper catchment area of the Wairoa stream catchment are subject to diffuse

pollution sources notably from farming practices with enhanced levels of sediment and nutrient run-off. The protection of upper catchments by way of pest plant and animal management are example of insuring that the health and well-being of the degraded waterbodies identified onsite are improved.

Policy 9: The habitats of indigenous freshwater species are protected.

The proposal involves protection of freshwater ecosystems within the riparian corridor area on the subject site, and with that the protection of any freshwater species contained within these habitats. The proposal seeks pest plant and animal control, which will result in increased habitat quality indigenous freshwater species.

In relation to the proposed development of the subject site, we consider that full effect has been given to NPS-FM through seeking to protect and enhance the aquatic features identified within the boundaries of the site. Any potential adverse effects on freshwater environments as part of site development works can be appropriately avoided, minimised or mitigated. RDL does not consider that site development works would adversely affect the freshwater quantity and quality both on site and within the wider Wairoa stream/ Kerikeri inlet catchment if best practice integrated design principles, erosion and sediment control guidelines are followed.

8.2 National Policy Statement for Indigenous Biodiversity (NPS-IB)

The National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023) is a policy framework designed to address the conservation and protection of the country's unique indigenous biodiversity, including native species, ecosystems, and habitats. The primary aim of NPS-IB is to halt the loss of indigenous biodiversity across NZ. While all the policies are relevant, we draw attention to the following relating to this proposal:

Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity.

The proposal provides for the protection, restoration and enhancement of the site's most ecologically significant features. This includes revegetation planting and pest plant and animal control. It has been assessed that any potential adverse effects of the subdivision proposal can be sufficiently avoided/mitigated through mitigation measures and ecological design principles described within this report as well as appropriate planning and development controls.

Policy 7: SNAs are protected by avoiding or managing adverse effects from new subdivision, use and development.

No indigenous vegetation clearance is proposed as part of the subdivision proposal and all indigenous biodiversity values on site will be maintained or enhanced and protected in perpetuity. No loss of indigenous biodiversity within the subject site is anticipated as part of this subdivision application.

Policy 13: Restoration of indigenous biodiversity is promoted and provided for.

The proposal provides for the protection of existing areas of ecological significance and enhancing these features and offering permanent protection through conservation covenant provisions as part of the subdivision proposal.

In conclusion it is considered that the application gives full effect to the policies and objective of the relevant National Policy Statements.

9.0 CONCLUSION

Based on a site survey visit conducted on the 22nd of October 2025, it was considered that the subject site contains a series of aquatic habitats that have likely been historically anthropogenically modified. A wetland delineation assessment was carried out during a site visit, and according to MfE (2020) protocols, multiple areas on the subject site were determined to be representative of a 'natural inland wetland' as defined under the NPS-FM (2020).

This Ecological Assessment Report has been prepared to assess the existing ecological baseline setting of the site and provide detail regarding proposed protection and enhancement areas. It is proposed that the onsite existing natural inland wetland features and proposed revegetated riparian margins are protected and enhanced via covenant protection. Pest plant and animal control, coupled with the buffer planting and stock exclusion through fencing will enhance the ecological significance of the existing natural inland wetland habitats on site. An Ecological Management Plan, recommended as a condition of consent, shall address these matters in further detail.

The proposed ecological protection and restoration of the site's indigenous ecosystems, within the proposed wetland protection area and buffer planting, has been designed to create integrated vegetated corridors that serve as stepping stone habitats for mobile fauna. These linkages will enhance connectivity within the wider landscape and across a predominantly hostile agricultural matrix. The proposed protection area and buffer planting will form a contiguous stretch of native vegetation, safeguarding key ecological features, such as all

onsite watercourse, and supporting species dispersal and integrated catchment management.

Full consideration must be given to the consenting obligations associated with the site's development, in accordance with both the NPS-FM and the NES-F. In addition, consideration shall be given to the rules relating to wastewater treatment setbacks from waterbodies as identified under Rule C.6.1.3 of the Proposed Regional Plan for Northland.

In conclusion, it is considered that any potential adverse effects of the subdivision proposal can be secured through mitigation measures and design principles described in this report and associated specialist reporting prepared for the development proposal, as well as appropriate planning and development controls. Provided that they are implemented successfully, development of the site would be in conformity with relevant planning policy and would result in protection and enhancement of the riparian areas identified on site.

Report Prepared by:

Jack Warden
Senior Ecologist
BAppSci – Maj Biodiversity Management
Rural Design 1984 Ltd

Cedar Schlotfeldt

Junior Ecologist

BSc, PGDipSci (Maj Biological Science)

Rural Design 1984 Ltd

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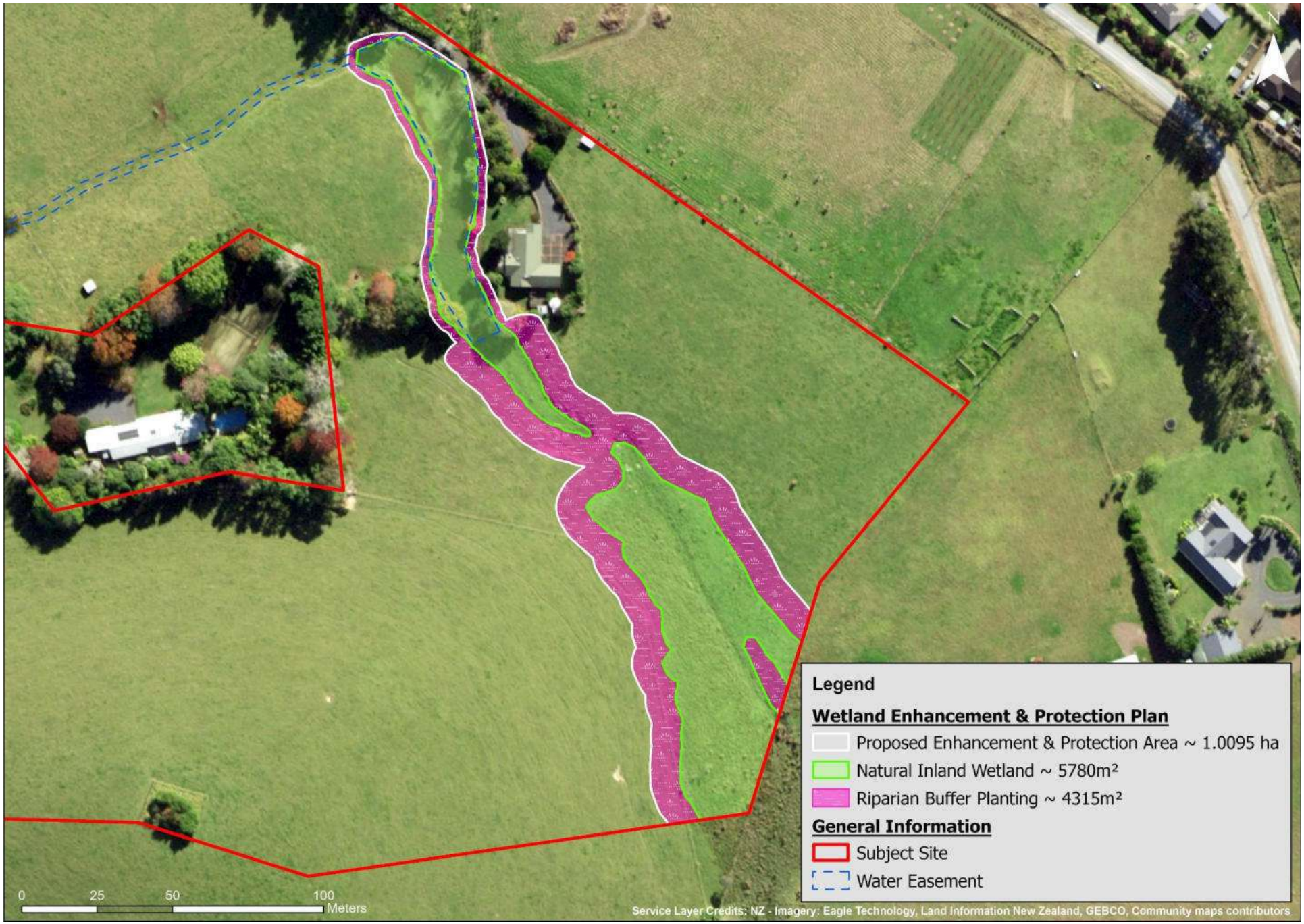
APPENDIX 1 – DEVELOPMENT FOOTPRINT & ASSOCIATED SETBACKS

APPENDIX 2 – PROTECTION & PLANTING PLAN



KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain (T16)
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1500

0 50 150 m

HAWTHORN
Landscape Architects

8/12/2025

Overall Landscape Plan

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
1.0	B

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N

LOT 1

LOT 9

LOT 2

LOT 10

LOT 3

JOAL 201

LOT 12

POND

LOT 11

LOT 13

JOAL 203

LOT 4

LOT 15

LOT 14

JOAL 202

LOT 25

LOT 26

LOT 18

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- T16 Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1000

0 25 50 m

HAWTHORN
Landscape Architects

8/12/2025

Enlarged Landscape Plan

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
2.0	B

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N

LOT 12

POND

LOT 11

LOT 13

JOAL 203

LOT 4

LOT 15

LOT 14

JOAL 202

LOT 25

LOT 26

LOT 18

LOT 27

LOT 28

LOT 16

LOT 17

LOT 19

JOAL 204

LOT 29

LOT 30

LOT 24

LOT 23

LOT 22

JOAL 205

Rural boundary planting refer to Drawing 4.0

Trees along main access Drive (JOAL 202) refer to drawing 3.1 & 3.2

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1000

0 25 50 m

HAWTHORN
Landscape Architects

8/12/2025

Enlarged Landscape Plan

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
2.1	B

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N

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- T16 Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1000

0 25 50 m

HAWTHORN
Landscape Architects

8/12/2025

Enlarged Landscape Plan

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
2.2	B

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N

Stone Entrance wall's

Existing trees to retain along eastern side of boundary

Post & rail fence

Specimen trees

11-Pyke

Existing Oak tree

LOT 1

Low hedge

Riddell Road

Stone Entrance wall's

LOT 9

T59

T58

T56

T55

T54

LOT 2

T53

T52

T51

T65

LOT 10

Scale@ A3: 1:500

0 25 m

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- T16 Existing trees to retain

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Pyke	11	Pyrus calleryana 'Kea''	Ornamental Pear	PB95

Reference Imagery:

Gateway

Post & Rail Fence

Ornamental Pear Trees

HAWTHORN
Landscape Architects

8/12/2025

Entrances and Riddell Road Boundary

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
3.0	B

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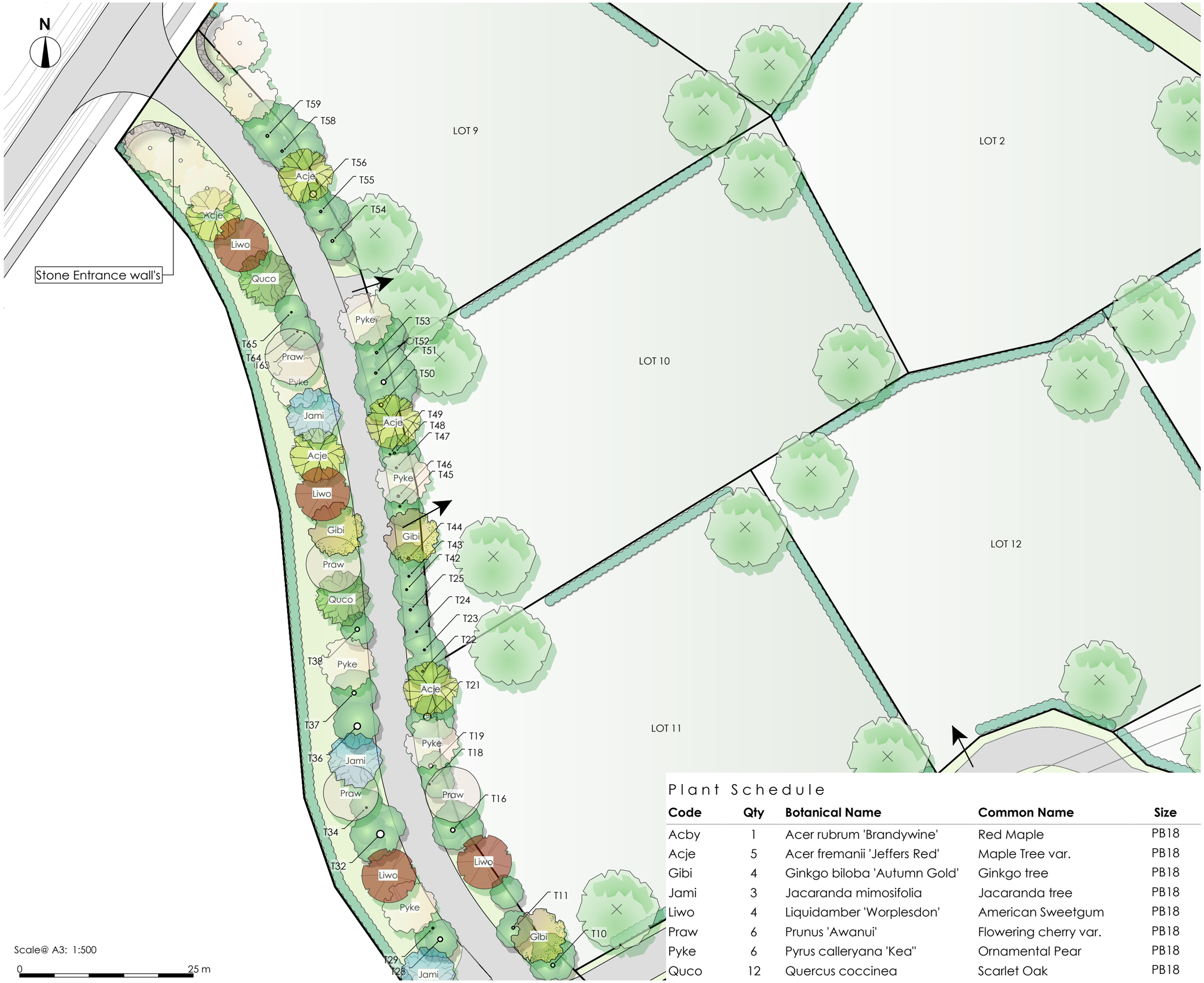

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- T16 Existing trees to retain

Notes:
Along JOAL 202 remove trees not being retained, including grinding stumps to below the ground level.

Remove the existing Agapanthus from under the trees. Smooth off the ground levels with additional weed free top soil to enable lawn area under remaining trees along roadside.

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Acby	1	Acer rubrum 'Brandywine'	Red Maple	PB18
Acje	5	Acer fremanii 'Jeffers Red'	Maple Tree var.	PB18
Gibi	4	Ginkgo biloba 'Autumn Gold'	Ginkgo tree	PB18
Jami	3	Jacaranda mimosifolia	Jacaranda tree	PB18
Liwo	4	Liquidamber 'Worplesdon'	American Sweetgum	PB18
Praw	6	Prunus 'Awanui'	Flowering cherry var.	PB18
Pyke	6	Pyrus calleryana 'Kea''	Ornamental Pear	PB18
Quco	12	Quercus coccinea	Scarlet Oak	PB18

Scale@ A3: 1:500

0 25 m

HAWTHORN
Landscape Architects

8/12/2025

Trees along Main Access Drive (JOAL 202)
(to retain or remove)

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
3.1	B

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KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- T16 Existing trees to retain

Notes:
Remove trees not being retained, including grinding stumps to below the ground level.

Remove the existing Agapanthus from under the trees. Smooth off the ground levels with additional weed free top soil to enable lawn area under remaining trees along roadside.

Scale@ A3: 1:500

0 25 m

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
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HAWTHORN
Landscape Architects

8/12/2025

Trees along Main Access Drive (JOAL 202)
(to retain or remove)

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
3.2	B

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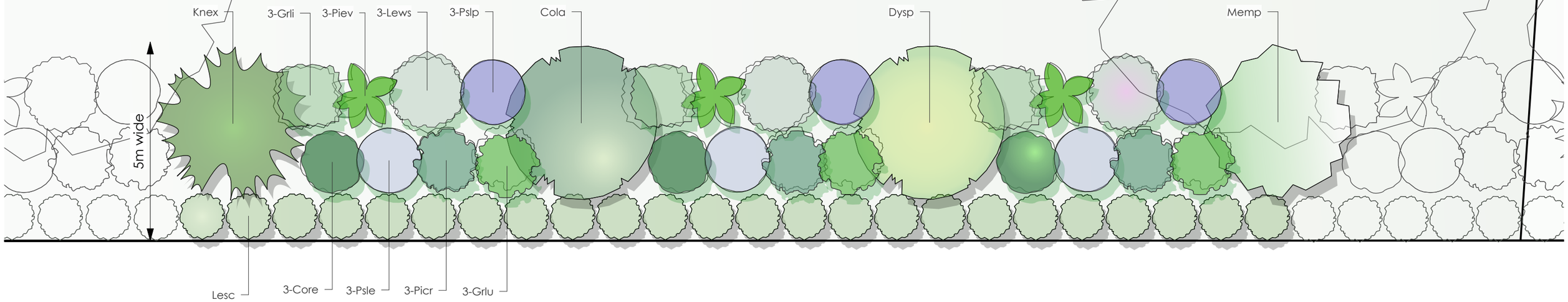
N

Repeating Pattern - Rural Buffer Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Cola	1	Corynocarpus laevigatus	Karaka	PB8
Core	3	Coprosma repens	Tuapata	PB5
Dysp	1	Dysoxylum spectabile	Kohekohe	PB8
Grli	3	Griselinia littoralis 'Broadway Mint'	Griselinia	PB5
Grlu	3	Griselinia lucida	Broadleaf	PB5
Knex	1	Knightia excelsa	Rewarewa	PB8
Lesc	25	Leptospermum scoparium	Manuka	PB5
Lews	3	Leptospermum 'Wiri Sandra'	Pink fl.	PB5
Memp	1	Metrosideros 'Maori Princess'	Pohutukawa	PB8
Picr	3	Pittosporum crassifolium	Karo	PB5
Piev	3	Pittosporum eugenioides Variegata	Lemonwood	PB5
Psle	3	Pseudopanax lessonii	Five finger	PB5
Pslp	3	Pseudopanax lessonii Purpurea	Burgundy foliage	PB5

Repeating pattern along southern and eastern boundary



Overall Rural Buffer Plant Numbers

Code	Qty	Botanical Name
Cola	11	Corynocarpus laevigatus
Core	43	Coprosma repens
Dysp	11	Dysoxylum spectabile
Grli	43	Griselinia littoralis 'Broadway Mint'
Grlu	129	Griselinia lucida
Knex	13	Knightia excelsa
Lesc	334	Leptospermum scoparium
Lews	43	Leptospermum 'Wiri Sandra'
Memp	11	Metrosideros 'Maori Princess'
Picr	43	Pittosporum crassifolium
Piev	129	Pittosporum eugenioides Variegata
Psle	129	Pseudopanax lessonii
Pslp	129	Pseudopanax lessonii Purpurea

Scale@ A3: 1:100

0 5 10 m

HAWTHORN
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8/12/2025

Rural Boundary Buffer Planting

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
4.0	B

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Trees To Retain Along The Main Entrance Road (JOAL 202)

Left Hand Side of Main Drive (going in):

T59 — Liquidamber
T58 — Red oak
T56 -Banksia
T55 — English Oak
T54 — Pittosporum
T52 — Gleditsia
T51 Red Oak
T48 Poplar
T45 — Oak
T44 — Melia
T43 — Poplar
T42 — Titoki
T23 Magnolia
T22 — Pin oak
T21 — Acmena
T19 — Robinia
T18 -titoki
T16 — Oak
T11a Magnolia (unlabelled)
T11 — Cedar
T10 — Oak
T6 & 7 — Cedars

Right hand side of drive (going in)

T65 — Oak
T 63 — Oak
T38 — Magnolia
T37 — Poplar
T36 — Linden
T34 — Acmenia
T32 — Linden
T28 — Gum
T15- Macadamia nut
T5 — Cedar
T3 — Pittosporum
T4 — Pohutukawa

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Tree Schedule

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
5.0	A

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Plant Palette

Hedges - Suitable for tall hedges (above 1.2m)

Camellia sasanqua Setsugekka

Coprosma repens

Eugenia ventenatii

Feijoa species

Ficus Tuffy

Griselinia littoralis

Leptospermum ‘Red Ensign’

Leptospermum ‘Wiri Sandra’

Michelia figo

Myrsine australis

Pittosporum Limelight

Pittosporum ralphii Stephens Island

Podocarpus totara ‘Matapouri Blue’

Pseudopanax ‘Cyril Watson’

Pseudopanax lessonii

Metrosideros ‘Fiji Fire’

HAWTHORN
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8/12/2025

Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.0	A

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Hedges - Suitable for lower hedges (below 1.2m)

Camellia sasanqua ‘Early Pearly’

Choisya ternata

Corokia ‘Geenty’s Ghost’

Corokia ‘Geenty’s Green’

Hebe ‘Blue Gem’

Hibiscus rosa sinensis

Loropetalum ‘Plum Gorgeous’

Pittosporum ‘Golf Ball’

Tibouchina ‘Peace Baby’

Rosmarinus ‘Tuscan Blue’

HAWTHORN
Landscape Architects

8/12/2025

Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.1	A

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Plant Palette

Specimen Trees - Deciduous - Small

Acer palmatum ‘Beni Otake’

Acer palmatum ‘Bloodgood’

Acer palmatum ‘Senkaki’

Cercis ‘Forest Pansy’

Cercis ‘Hearts of Gold’

Diospyros fuyu

Lagerstroemia Kimono

Lagerstroemia ‘St Emillion’

Magnolia ‘Black Tulip’

Pyrus calleryana Candelabra

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Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
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Drawing	Rev
6.2	A

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Specimen Trees - Deciduous - Large

Acer fremanii ‘Jeffers Red’

Acer rubrum ‘Brandywine’

Albizia julibrissian ‘Red Silk’

Ginkgo biloba ‘Autumn Gold’

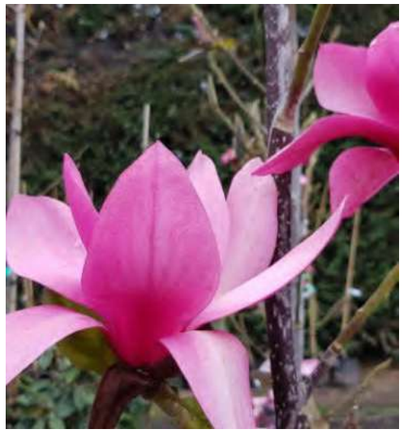
Gleditsia ‘Ruby Lace’

Gleditsia ‘Sunburst’

Jacaranda mimosifolia

Liquidamber ‘Worplesdon’

Magnolia ‘Felix Jury’



Magnolia ‘Strawberry Fields’

Magnolia Brixton Belle

Nyssa sylvatica

Prunus Awanui

Pyrus calleryana ‘Aristocrat’

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Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.3	A

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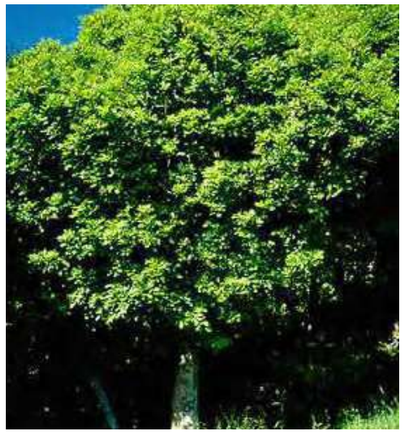
Specimen Trees - Evergreen - Native

Alectryon excelsus

Corynocarpus laevigatus



Dysoxylum spectabile

Knightia excelsa

Meryta sinclairii

Metrosideros ‘Fiji’

Metrosideros ‘Maori Princess’

Metrosideros ‘Springfire’

Sophora tetraptera

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8/12/2025

Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.4	A

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Specimen Trees - Evergreen - Exotic

Acacia baileyana Purpurea

Alnus jorullensis

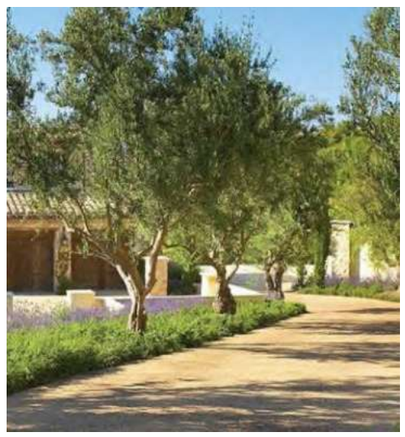
Brachychiton acerifolius

Cunonia capensis

Hymenosporum flavum

Magnolia ‘Little Gem’

Michelia ‘Fairy Blush’



Olea europaea

Stenocarpus sinuatus

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Landscape Architects

8/12/2025

Plant Palette

Taraire Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.5	A

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Appendix 12

Written Approval

Far North District Council

NOTICE OF WRITTEN APPROVAL

Written Approval of Affected Parties in accordance with Section 95E of the Resource Management Act

PART A – To be completed by Applicant

Applicant/s Name:	Taraire Tahi Limited
Address of proposed activity:	39 Riddell Road, Kerikeri
Legal description:	Lot 2 Deposited Plan 543664
Description of the proposal (including why you need resource consent):	Refer to attached Planning Summary of Proposal from Thompson Survey for full details
Details of the application are given in the attached documents & plans (list what documents & plans have been provided to the party being asked to provide written approval):	1. Thompson Survey - Summary of Planning Assessment 2. Hawthorn Landscape Architects - Landscape Plans 3. Conquel Consultants - Engineering Summary and Plans 4. Rural Design - Ecological Assessment and Plans 5. 6.

Notes to Applicant:

1. Written approval must be obtained from all registered owners and occupiers.
2. The **original copy** of this signed form and **signed plans and accompanying documents** must be supplied to the Far North District Council.
3. The amount and type of information provided to the party from whom you seek written approval should be sufficient to give them a full understanding of your proposal, its effects and why resource consent is needed.

PART B – To be completed by Parties giving approval

Notes to the party giving written approval:

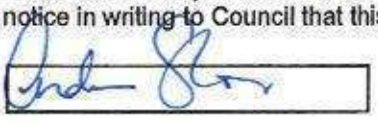
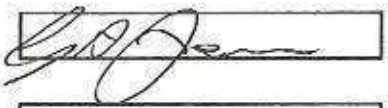
1. If the owner and the occupier of your property are different people then separate written approvals are required from each.
2. You should only sign in the place provided on this form and accompanying plans and documents if you **fully understand** the proposal and if you **support** or have **no opposition** to the proposal. Council will not accept conditional approvals. If you have conditions on your approval, these should be discussed and resolved with the applicant directly.
3. Please note that when you give your written approval to an application, council cannot take into consideration any actual or potential effects of the proposed activity on you unless you formally withdraw your written approval **before** a decision has been made as to whether the application is to be notified or not. After that time you can no longer withdraw your written approval.
4. Please sign and date all associated plans and documentation as referenced overleaf and return with this form.
5. If you have any concerns about giving your written approval or need help understanding this process, please feel free to contact the duty planner on 0800 920 029 or (09) 401 5200.

Full name/s of party giving approval:	Andrew John Stone and Gillian Ann Jones
Address of affected property including legal description	49 Riddell Road, Kerikeri Lot 1 Deposited Plan 180801
Contact Phone Number/s and email address	Daytime: 021 622 166 email: andrewstone@orcon.net.nz

I am/we are the OWNER(S) / OCCUPIER(S) of the property (circle which is applicable)

*Please note: in most instances the approval of **all** the legal owners and the occupiers of the affected property will be necessary.*

1. I/We have been provided with the details concerning the application submitted to Council and understand the proposal and aspects of non-compliance with the Operative District Plan.
2. I/We have signed each page of the plans and documentation in respect of this proposal (these need to accompany this form).
3. I/We understand and accept that once I/we give my/our approval the Consent Authority (Council) cannot take account of any actual or potential effect of the activity and/or proposal upon me/us when considering the application and the fact that any such effect may occur shall not be relevant grounds upon which the Consent Authority may refuse to grant the application.
4. I/We understand that at any time before the notification decision is made on the application, I/we may give notice in writing to Council that this approval is withdrawn.

Signature		Date	23/01/2026
Signature		Date	23/01/2026
Signature		Date	
Signature		Date	

A.J.S.

SUMMARY OF PROPOSAL BY THOMPSON SURVEY

AT 39 RIDDELL ROAD, KERIKERI

PROPOSED 30 LOT RURAL RESIDENTIAL SUBDIVISION, CARRIED OUT IN 2 STAGES

APPLICANT:

Taraire Tahi Limited

The proposed development consists of the following:

- 30 Residential Lots (29 new titles).
- The development will be staged such that Stage 1 will create Lots 1-8 and jointly owned access lot (JOAL) to provide access to all (this stage includes Lot 4 containing the application site's existing dwelling); and Stage 2 will create the balance Lots 9-30 with four more JOALs to provide access.
- Private road network and shared accessways through the site.
- Earthworks sufficient to create the proposed roads, shared accessways and any works required for bulk servicing. Building consents will cover individual works for residential sites and building construction.
- Erosion and sediment control plans have been drafted, (to ensure that measures are in place to retain and settle out sediment from rainfall-runoff events, which will be updated once a contractor is selected.
- Stormwater discharge considering pre to post development attenuation will be detained using rainwater re-use tanks for each dwelling, with an overflow discharging to swales alongside accessways. Building Consent will be applied for private drainage.
- Flood modelling has been completed for the whole site and accessways and buildings have been located clear of overland flow paths and hazards.
- Water supply of potable water for consumption and fire supplies will be made from from roof-fed tanks.
- Wastewater systems will be required for each lot using on-site decentralised wastewater treatment and disposal to ground, using TP58 design parameters, based upon soil characteristics as summarised in geotechnical investigation report and lodged as part of individual lot Building Consent applications.

- Power and communications services have been confirmed as available, and subject to confirmation as part of the detailed design phase.

- The development will be subject to a Landscaping Plan, to be maintained in perpetuity once established.

- The development includes enhancement and permanent protection of an existing wetland system.

Reasons consent is required

13.7.2.1, Table 13.7.2.1: Minimum Lot Sizes

The lots are larger than 3,000m² but smaller than 4,000m². This results in a discretionary activity subdivision consent being required.

12.3.6.1.2 (a) and 12.3.6.2.1 (b) – Excavation/filling

Subdivision site works will necessitate over 9,000m³ excavation /filling. Consent is required for breaches of the Operative District Plan's permitted and restricted discretionary excavation & filling volume thresholds, resulting in discretionary activity land use consent being required. The ODP provides for such consent to be incorporated into the subdivision consent.

12.7.6.1.4 wastewater systems' setback from a wetland

This rule requires a 30m setback from a wetland for any part of an on-site wastewater treatment and disposal system. This setback is more than what is required now in the Regional Plan, the document that determines permitted activity status for domestic effluent treatment and disposal. Whilst every lot can meet the Regional Plan's permitted setback distance, not all can meet the 30m setback. Consent is therefore required pursuant to 12.7.6.1.4 for those lots adjacent to the wetland, as a discretionary activity.

15.1.6C.1.1 parts (a), (c) and (d) and Appendix 3B-1 – Access standards

In addition the jointly owned access lots, designed to get the best engineering outcome in terms of physical design, will breach several of the ODP's access rules.

JOAL 2 will serve well over 8 titles and should therefore be vested public road. The preference is to keep the road private. It will be 20m legal width with 6m wide sealed carriageway width. The fact that it remains private breaches permitted activity rules.

JOALs 1 and 4 are proposed to be 3m with passing bays as opposed to the 5m carriageway width specified in Appendix 3B-1.

JOAL 3, at only 6.45m legal width, is less than the required 7.5m legal width, breaching Appendix 3B-1. It can accommodate the required carriageway width.

8.7.5.1.5 and 8.7.5.2.2 (stormwater management – impermeable surface coverage)

The existing impermeable surface to be within Lot 4, with reduced area to existing title area, will result in a breach of the Stormwater Management rule as it applies to that lot.

The application will include breaches of impermeable surface coverage for all lots up to the 20% controlled activity lot area coverage. Stormwater management and attenuation has been designed accordingly.

In addition, the impermeable surface coverage within the JOALs will breach permitted and controlled activity standards given the nature of JOALs (providing all weather access).

8.7.5.1.13 (building coverage)

The permitted building coverage applying to the zone is 10%. It is felt that this is too restrictive for lots of 3,000m² area, particularly when dwellings often have ancillary buildings associated with them. Consent is sought for all lots to have up to 12.5% building coverage.

Regional Plan

Consent required for a breach of earthworks permitted threshold of 5,000m² exposed earth at any one time.

Lapse period

Given the staging and the time it may take a new lot owner to eventually build on a lot, an extended lapse period of 7 years (as opposed to the statutory 5 years) is being requested.

Attachments

1. Scheme Plans;
2. Overall Landscape Plan;
3. Summary engineering information & plans;
4. Summary of Ecological Assessment, including plans

12 January 2026

49 Riddell Road

Email: andrewstone@orcon.net.nz

Attn: Andrew Stone & Gillian Jones

SUBJECT: 39 Riddell Road, Kerikeri –Resource Consent Summary

Dear Andrew and Gillian,

We appreciate the discussions to date and the input on the final layout of the proposed development, we have attached a copy of documents to be lodged for Resource Consent application with the Far North District Council.

Executive Summary:

We have since then developed designs to a detailed design stage, and would like to present the attached documents, covering the following elements: earthworks, erosion and sediment control, stormwater conveyance, attenuation, treatment and disposal, wastewater treatment and disposal, and water supply for potable and fire supply use.

Earthworks:

We propose that limited cut to fill operations are performed within effective erosion and sediment control practices (ESCP), to create jointly owned accessways and to present buildable lots, where fill is to be placed.

Discovery practices will be addressed by the contractor to alert the team to any aspect, object or remains that meets trigger under Heritage NZ guidelines (AGS8 Kolwi Tangata, dated Aug 2014). No disturbance will occur to the man-made decorative pond and upstream wetland area.

We can confirm that no soil is proposed to be removed from the site,

ESCP measures will be installed by the selected contractor, with careful consideration to rainfall-runoff routes during construction and while grass is growing to stabilise the lots. The topsoil will be stripped only where needed, before stockpiling in nominated locations clear of rainwater-runoff.

Roading:

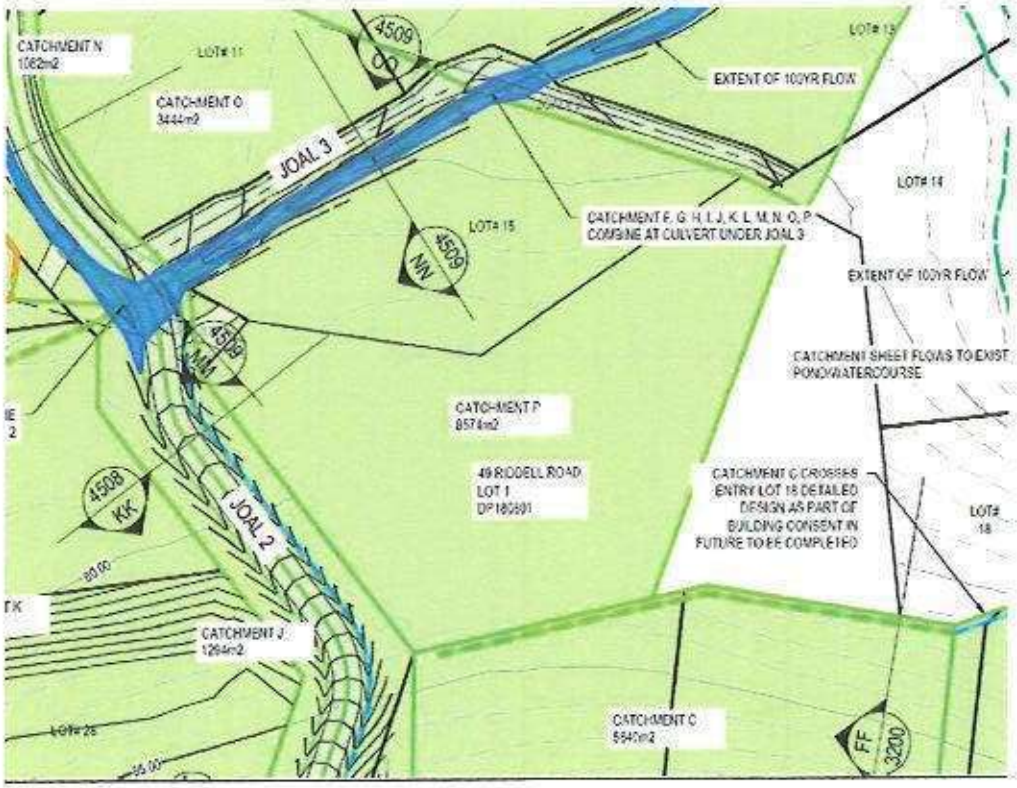
A privately owned network of jointly owned accessways will be trimmed into the existing topography to form safe gradients and access throughout the site. JOAL 2 will maintain and enhance the existing planting under arborist direction trees removed and trimmed as part of this operation.

Overland Flowpaths and Flooding

Engineering design has focused on maintaining existing flow paths and keeping lots and buildable areas clear from these, specific attention has been made to improve the existing cutoff drain located along the western and southern boundary of your property.

Its proposed to build new swale along the southern boundary protected within an easement for perpetuity, while JOAL 2 swale cuts off any flow from the south. These are designed to divert flows up to and including the 100yr event (+ Climate Change).

Refer Figure below for overland flowpaths and attached engineering drawings for full details.



Ecological Assessment

A detailed report was commissioned and completed by Rural Design Limited which identified existing wetlands on the property. These will be planted with native vegetation, have pest and invasive weed management implemented and protected by legal convents on the title of respective properties.

These Covenants will require the continued maintenance of these covenanted areas.

Conquel Consulting Ltd
Unit 4B/24 Market Place, Auckland CBD 1010
Phone: 022 491 4223 **Email:** admin@conquel.co.nz

Stormwater:

Stormwater treatment will be provided by way of swales and rain gardens from paved trafficable surfaces. All lots will have on-site stormwater mitigation to limit discharge to 80% of pre-development flows for the 5, 10 and 100 yr events.

Lots 16 & 17 located above your property have a swale along the bottom of lots which will divert water discharged from the dispersal trench.

Revegetation of ecological areas will occur to reduce coverage in post-development scenario while providing improved habitat for Fura and fauna.

We have attached copies of the proposed engineer plans showing these controls.

Wastewater:

All lots will have decentralised, on-site wastewater collection and treatment using secondary treatment, before disposal to ground. The lots have been assessed as having sufficient space for a dwelling and garage, a treatment plant and disposal areas via sub-surface drip emitters, located outside a 15m buffer to the man-made decorative pond and wetland feature.

We have provided an example of the wastewater treatment and disposal system placement, for the dwelling located on Lot 4.

Water supply:

We propose that all dwellings will utilise rainwater fed water tanks for both fire supply and domestic consumption.

An example of the tank interconnection and discharge is attached.

Summary:

We appreciate the open discussions to date on the project and the subsequent development of the final concept for Resource Consent Lodgement.

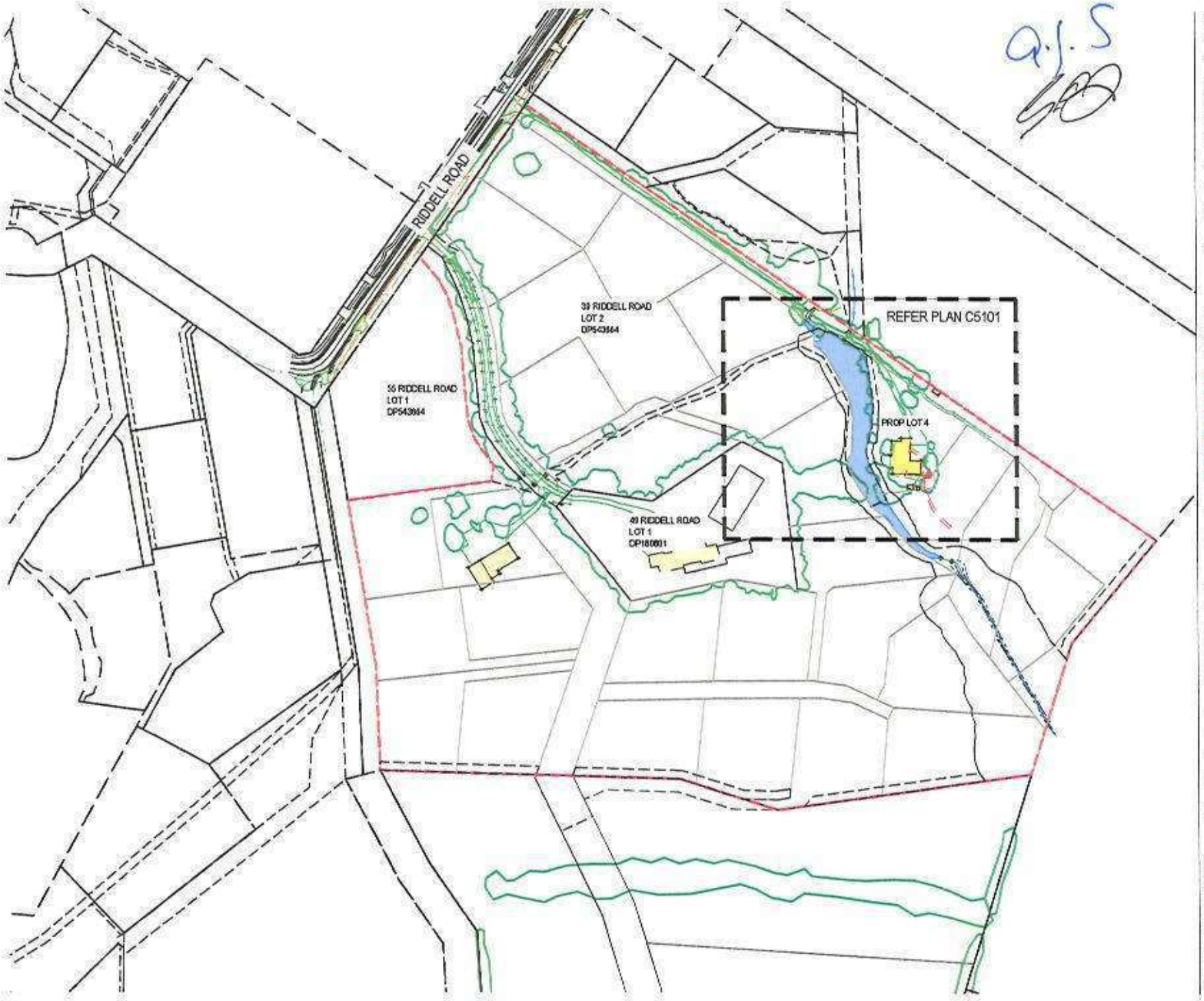
We have attached

Regards

Glen Bellingham, Director

Conquel Consulting Ltd

Conquel Consulting Ltd
Unit 4B/24 Market Place, Auckland CBD 1010
Phone: 022 491 4223 **Email:** admin@conquel.co.nz



G.J. S

NOTES

1. All bends and connections to be no more than 45°
2. All connections to existing drains shall be carried out by a licensed drainlayer/plumber
3. Drainage shall comply with E1/AS1 building code for stormwater
4. All roofs to have rainwater goods installed
5. All stormwater drains shall be uPVC to AS/NZS 1260
6. All wastewater shall comply with AS/NZS 3500.2 : 2021 and/or G13 building code
7. Refer to hydraulic engineers drawings for building plumbing beyond that shown and refer to sheet plan notes
8. All pipework to be DN100 grade unless otherwise stated
9. Drain from all roofs to be laid at the correct fall to avoid ponding and backing up
10. Pipe is to be laid in accordance with hydraulic engineers and all levels shall be double checked before construction starts
11. All clean outs shall have a minimum 200mm diameter x 300 head to ground level cover for landscaped and pavement over the top
12. Existing Private Drainage layout plan shown building, culvert 600DN grading to the CSD/STRM unscreened manhole dwelling including wastewater and stormwater disposal
13. Contractor to allow to locate and confirm location of private drainage before starting work onsite

LEGEND

- EX BDY
- PROP FUTURE BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- EX STORMWATER
- EX WASTEWATER
- EX NATURAL WETLAND
- EX WETLAND 5m SETBACK
- EX WETLAND 10m SETBACK
- EX WETLAND 15m SETBACK
- EX HOUSE
- EX SWIMPOND
- PR WASTEWATER
- PR PRIMARY DISPOSAL
- PR RESERVE DISPOSAL
- PR OUTFLOW DRAIN

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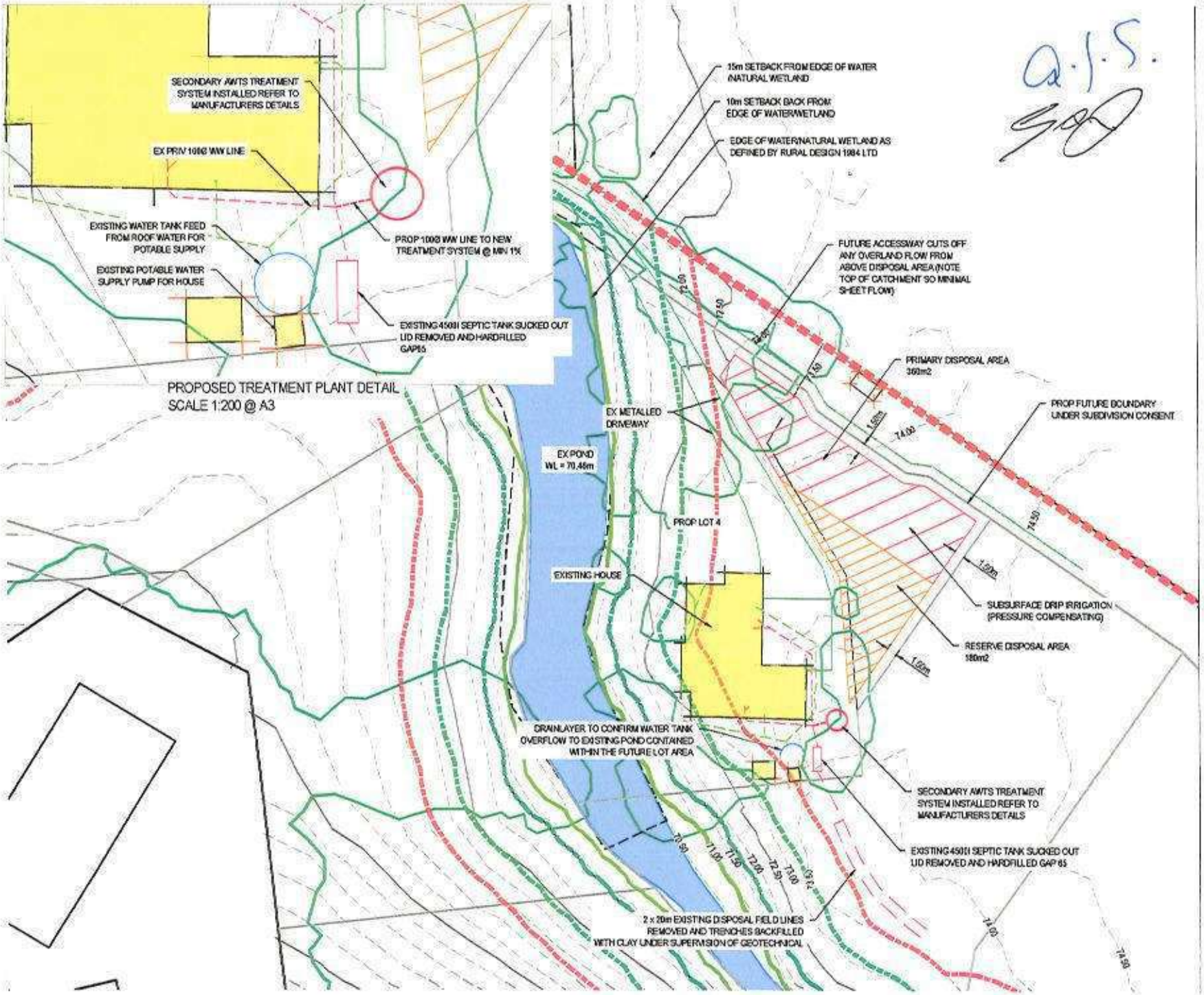
Taraire Tahi Limited
Riddell Road
Kerikeri

Overview Proposed Lot 4 Wastewater Plan

No.	Revision Description	Name	Date
A	Building Consent	GB	11/25
Surveyed		NW	09/25
Designed		TT	11/25
Drawn		GB	11/25
Checked		GB	11/25
Project no.	10401		
Scale	1:2000 @ A3		
Grid No.	[illegible]		
Drawing no.	C5050	Rev	A



Q.1.5.

GD

NOTES

1. All bends and connections to be no more than 45°.
2. All connections to existing drains shall be carried out by a licensed drain layer / plumber.
3. Drainage lines are to be laid to N.Z.W.S.P. building code for storm water.
4. All pipework shall have half squares installed.
5. All waste water drains shall be uPVC to AS/NZS 1260.
6. Wastewater shall comply in full with AS/NZS 1547:2012 and/or G13 building code.
7. Refer to hydraulic engineers drawings for building plumbing beyond that shown including down pipe sizes.
8. All pipes shall be SN8 grade unless otherwise stated.
9. Drainlayer shall locate and confirm connection point before starting building works.
10. Pump to be used in consultation with hydraulic engineer and all sewers shall be clarified before construction starts.
11. All chamber lids shall have a minimum 300mm clearance and 350 bored to provide sufficient cover for landscape and pavement over the top.
12. Existing Private Drainage layout plotted from Building Consent 100151 plotted on the 12/08/2010 and covered the whole dwelling including roof water and stormwater disposal.
13. Contractor shall locate and confirm location of private drainage before starting work onsite.

LEGEND

- EX SEWER
- EX MINOR CONTOUR
- EX STORMWATER
- EX WASTEWATER
- EX NATURAL WETLAND
- EX WETLAND 15m SETBACK
- EX HOUSE
- EX SW POND
- PR WASTEWATER
- PR CUTOFF DRAIN

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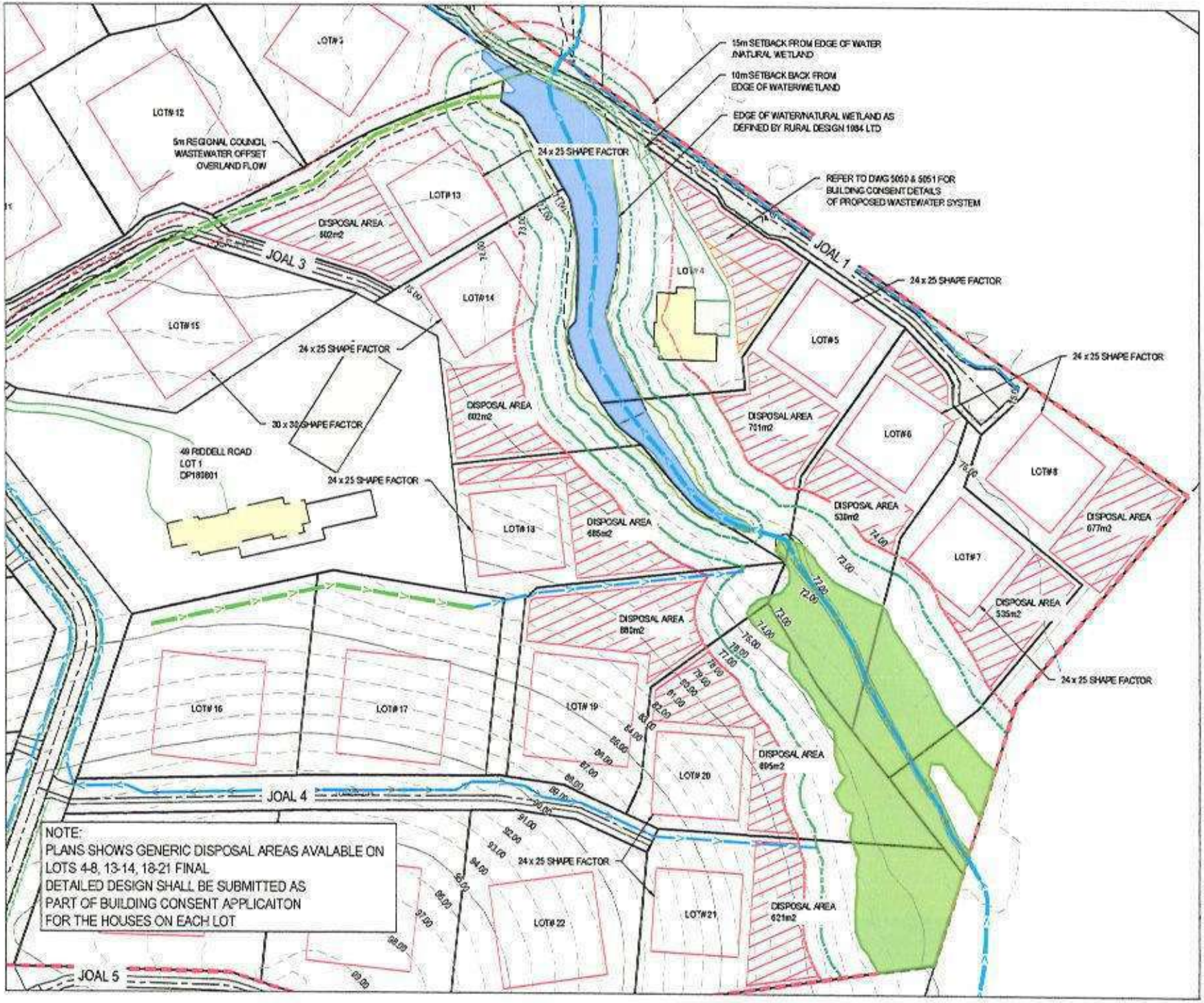
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Lot 4
Wastewater System
Plan

No	Revision Description	Name	Date
A	Building Consent	GB	11/25
Surveyed		KM	09/25
Designed		TS	11/25
Drawn		GB	11/25
Checked		GB	11/25
Project no:	10601		
Scale:	1:500 @ A3		
Drawing no:	C5051	Rev	A



NOTES

1. All work to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum MB Elev 2000
3. Levels in terms of the Auckland Vertical Datum 1946
4. Origin of levels = Code 1000 Mark RM 01 10 55405
   Northing 6040520
   Easting 2500700
   Elevation 12.74
5. Boundaries are subject to final survey
6. Extent of Wetland Buffer from information provided by Rural Design Ltd and final on site wetland survey
7. Development will have design standards requiring the following floors constructed a Minimum 12.74 1.0m (2 minimum of double internal storage (equates to 2 bedrooms with capacity for purpose of Wastewater Assessment volumes)
8. Treatment system to be aerated wastewater treatment system (AWTS) or equivalent, with disposal via subsurface drip irrigation (pressure compensating) or above ground (if within vegetated/wetland zone)
9. 20m x 24m Shape factor system is sub-surface and replacement equivalent (100% DOSAC) including reserve coverage and contingency areas.
10. Final specific design completed by Chartered Engineer or suitably qualified experienced person for each Building Consent Application
11. Contours are at 1m intervals

LEGEND

- EXBDY
- PR SDY
- EXMAJOR CONTOUR
- EXMINOR CONTOUR
- EXEASEMENT
- PR EASEMENT
- EX WATER COURSE
- EX FLOWPATH
- EX NATURAL WETLAND
- EX WETLAND 2m OFFSET
- EX WETLAND 10m OFFSET
- EX WETLAND 15m OFFSET
- PR OVERLAND FLOW
- PR DISPOSAL AREAS
- PR 30x30 PLATFORM

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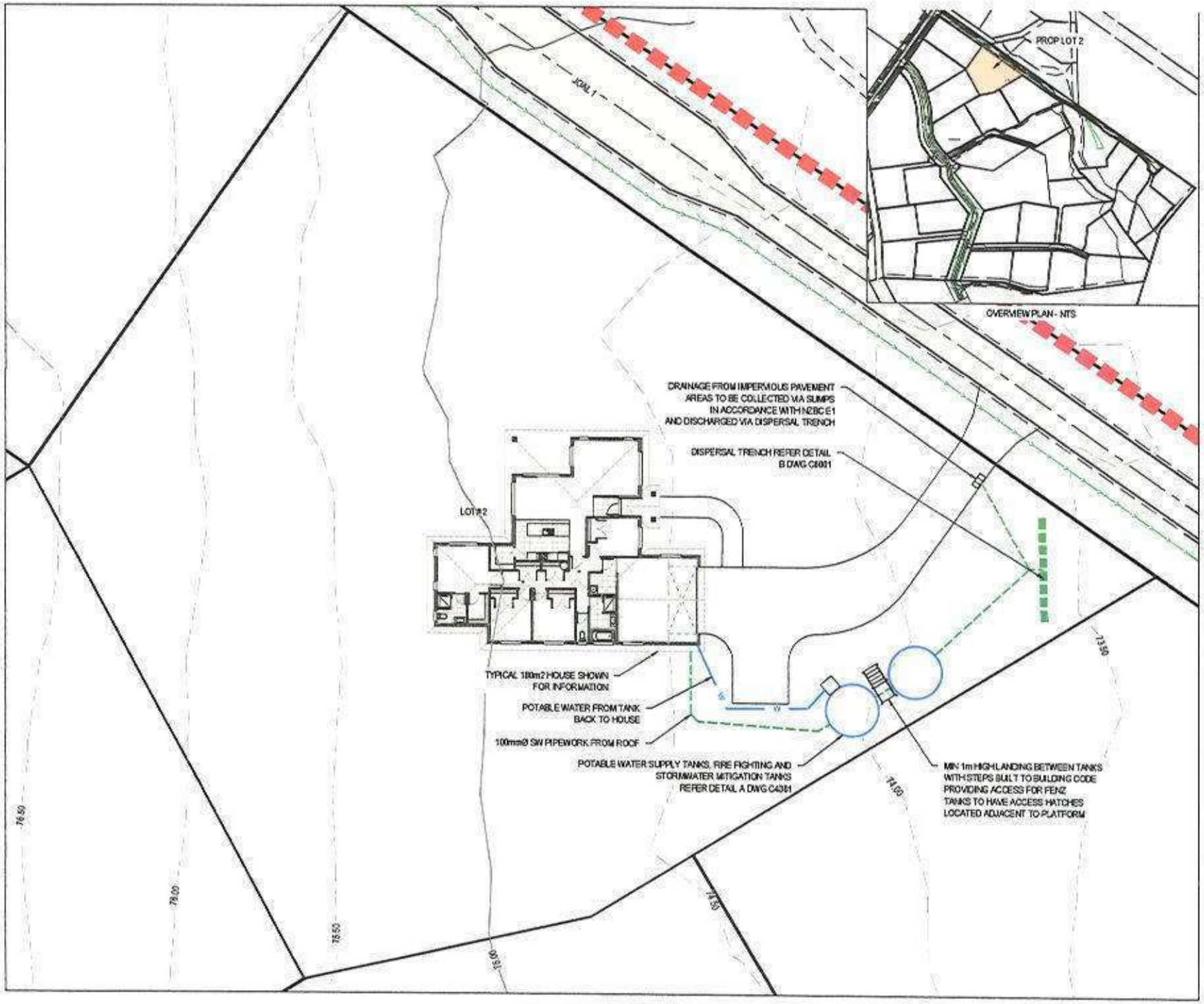
Contact: admin@conquel.co.nz
Phone: +64 9 404 0330

Taraire Tahi Limited
Riddell Road
Kerikeri

Overview
Wastewater Disposal
Plan

No	Revision / Description	Name	Date
A	Resource Consent	GB	17/05/05
Surveyed		DM	05/05
Designed		-	-
Drawn		GB	15/05
Checked		TJ	17/05

Project no	10401
Scale	1:1000 @ A3
Drawing no	C5000
Rev	A



Notes

1. All works to be in accordance with Far North Council Standards
2. It is the contractors responsibility to locate any underground services prior to the commencement of works
3. All bends and connections to be no more than 45°
4. All connections to existing council shall be carried out by a licensed drain layer/plumber
5. Drainage shall comply with E1/AS1 building code for stormwater
6. All catchpits shall have ball type inserts installed
7. All roofs water drains shall comply with NZS 3604:2011
8. Wastewater shall comply with AS/NZS 3500.2 - 2003 and/or G13 building code
9. Water systems shall comply with G12 Building Code
10. Fire fighting shall be in accordance with SNZ PAS 4509:2008
11. Future owners undertaking earthworks/construction will need to determine how the lighting volumes of pipework will be achieved in regard to:
   - 11.1 - 250m2 house or less needs 45kl tank, overflow requires 20m3 tank
   - 11.2 - Tanks need to be located immediately adjacent to dwelling building
   - 11.3 - Tanks to shall be no more than 1.2m above ground or the approved engineering plans
   - 11.4 - Static water sources on site within 100m maybe considered
   - 11.5 - Vehicle access to Council's and the vertical clearance

LEGEND

- EXISTING
- PROPOSED
- PRIVATE PRIVATE
- PROP STORMWATER
- PROP DISPOSAL TRENCH

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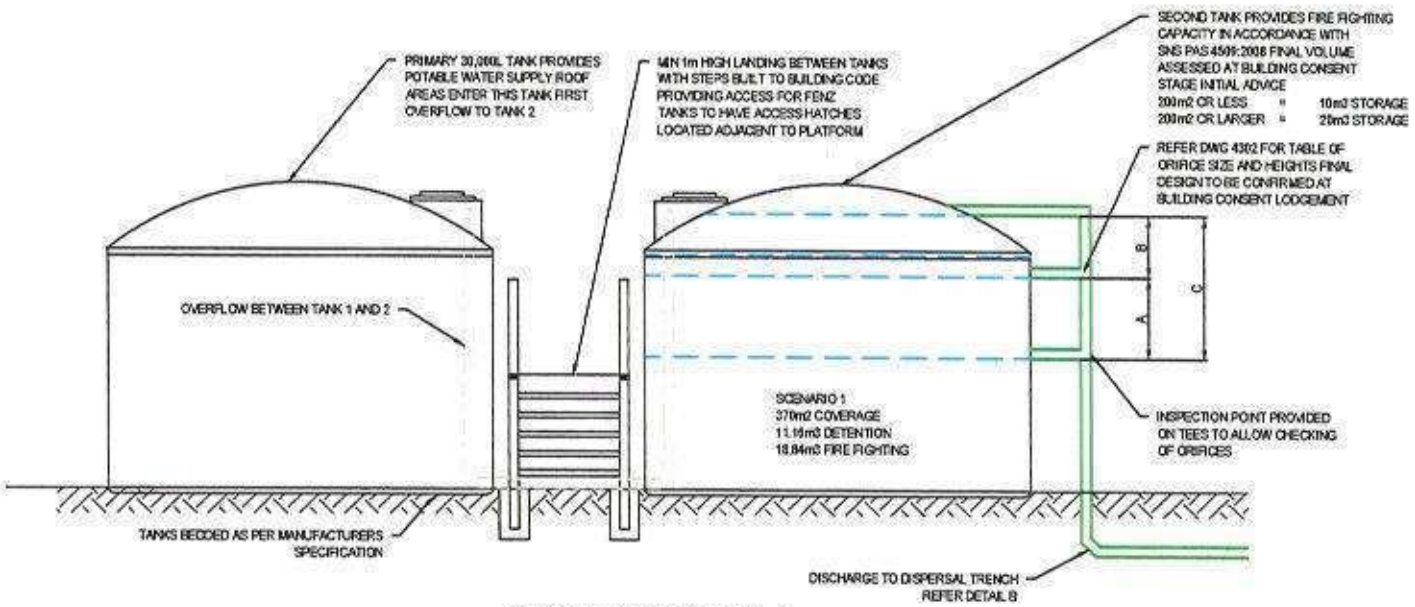
Taraire Tahi Limited
Riddell Road
Kerikeri

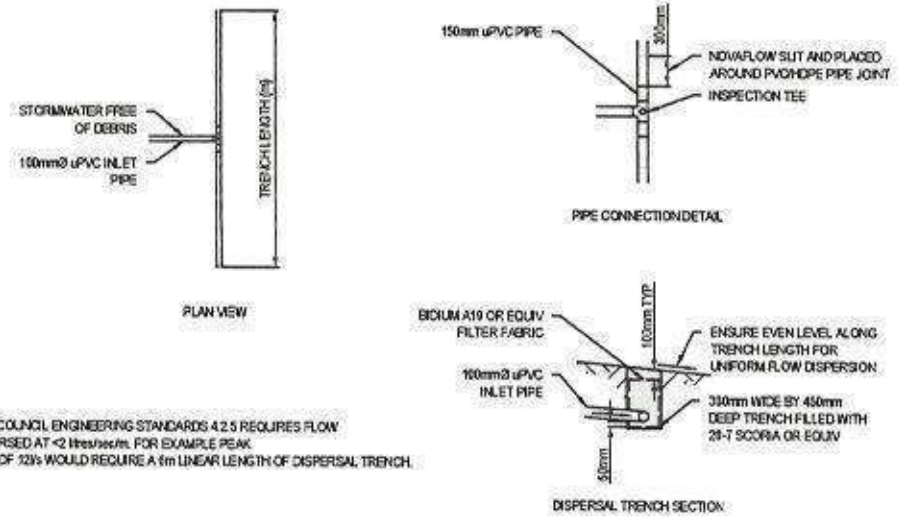
Proposed Typical Stormwater Mitigation Plan

No	Revision/Description	Name	Date
A	Revision Created	GD	03/25
Surveyed		KM	03/25
Designed		GD	03/25
Drawn		GD	03/25
Checked		TB	1/4/25

Project no.	10401
Scale	1:250 @ A3
Cad file	PROPOSED_SW MITIGATION.DWG
Drawing no.	C4300 Rev A



TYPICAL ATTENUATION DETAIL A
SCALE 1:50 @ A3



NOTE:
FAR NORTH COUNCIL ENGINEERING STANDARDS 4.2.5 REQUIRES FLOW TO BE DISPERSED AT <2 litres/sec/m. FOR EXAMPLE PEAK DISCHARGE OF 12l/s WOULD REQUIRE A 6m LINEAR LENGTH OF DISPERSAL TRENCH.

TYPICAL DISPERSAL TRENCH DETAIL B
SCALE 1:50 @ A3

Notes:
1. All work to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate any underground services prior to the commencement of works.
3. All levels and dimensions to be verified on site.
4. All connections to existing drains shall be carried out by a licensed drainlayer / plumber.
5. Drainage shall comply in full with E1/AS1 Building code for storm water.
6. All catchpits shall have half grid covers installed.
7. All waste water pipes shall be uPVC to AS/NZS 1260.
8. Wastewater shall comply in full with AS/NZS 1260:2 + 2000 under G13 Building code.
9. Water systems shall comply with G12 Building Code.
10. Fire fighting shall be in accordance with SNS PAS 4509:2008.
11. Future owners under building consent applications will need to determine land use/ lighting required. In general the following is required:
11.1 200m2 house or less needs 10m3 tank, over this requires 25m3 tank.
11.2 Tanks need to be located near wastewater for easy line building.
11.3 Tanks should be no more than 1.5m above ground or on approved sloping ground.
11.4 Water source of goods within 90m maybe considered.
11.5 Vehicle access of 3m wide with 4m vertical clearance.

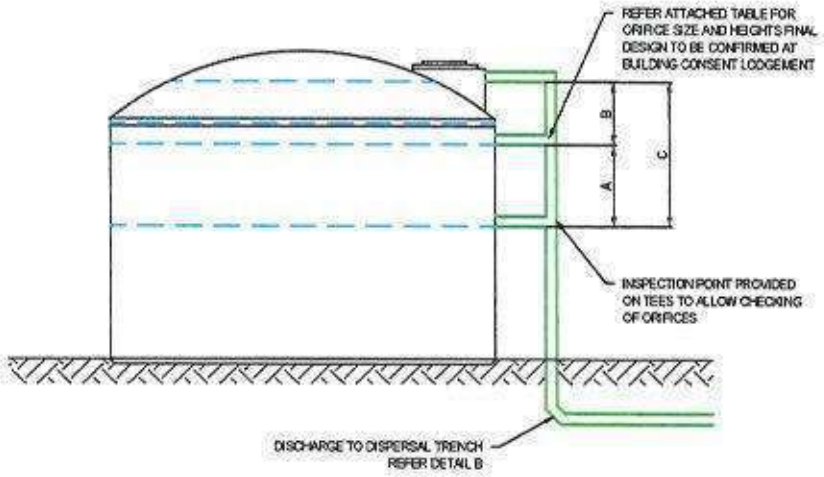
LEGEND
EXISTING
PROPOSED
PROP WATER LEVEL
PROP STORMWATER

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64 (0)9 401 0220

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Typical Stormwater Mitigation Details Plan

No.	Revision Description	Name	Date
A	Resource Consent	GB	10/05
Surveyed		MM	09/05
Designed		GB	09/05
Drawn		GB	09/05
Checked		TH	11/05
Project no.	10401		
Scale	Refer to Plan		
Cad file	[illegible]		
Drawing no.	C4301	Rev	A



TYPICAL ATTENUATION TANK DETAIL
SCALE 1:50 @ A3

Scenario	Total impervious Area (m^2) (50% collected)	Event	Dimension	Orifice Height (m)	Orifice Size (mm)	Water Level (m)	Volume (m3)
1	370	5 yr	A	0.00	18	0.62	5.97
		10 yr	B	0.62	34	0.80	7.70
		100 yr	C	N/A	N/A	1.16	11.16
2	400	5 yr	A	0.00	18	0.69	6.64
		10 yr	B	0.69	34	0.89	8.56
		100 yr	C	N/A	N/A	1.29	12.41
3	450	5 yr	A	0.00	18	0.81	7.79
		10 yr	B	0.81	38	1.02	9.81
		100 yr	C	N/A	N/A	1.43	13.76
4	500	5 yr	A	0.00	18	0.93	8.95
		10 yr	B	0.93	38	1.17	11.26
		100 yr	C	N/A	N/A	1.65	15.87
5	600	5 yr	A	0.00	20	1.04	10.01
		10 yr	B	1.04	38	1.33	12.80
		100 yr	C	N/A	N/A	1.93	18.57

REFER TO COOK COSTELLO ATTENUATION REPORT
"LOT 2 DP 543664 39 RIDDELL ROAD, KERIKERI"
PROJECT NUMBER 17857 DATED 9/12/2025

Notes

1. All works to be in accordance with Far North Council Standards.
2. Pipe layout indicative, responsibility to locate any unknown services prior to the commencement of works.
3. All bends and connections to be no more than 45°.
4. All connections to existing drains shall be carried out by a licensed drainlayer/plumber.
5. Drainage shall comply with Table E1/AS1 sizing guide for stormwater.
6. All sealing to be flow half pipe to crown.
7. All roof water drains shall be uPVC to AS/NZS 1260.
8. Wastewater shall comply in full with AS/NZS 3500.2 - 2003 and NZ G13 Building code.
9. Water systems shall comply with G12 Building Code.
10. Fire fighting shall be in accordance with SNZ PAS 4509:2008.
11. Prior to the issue of building consent application will need to determine how fire fighting volumes are generated for the dwelling required.
    11.1. 2000L2 tanks or one needs 10 m3 tank, over the required 20 m3 tank.
    11.2. Tanks need to be located a minimum of 6m away from a building.
    11.3. Tanks to shall be no more than 1.5m above ground or on approved coupling installed.
    11.4. Static water reserve on pads within 90m reserve considered.
    11.5. Vehicle access of 3m width and 4m vertical clearance.

LEGEND

EXISTING
PROPOSED
PROP WATER LEVEL
PROPERTY BOUNDARIES

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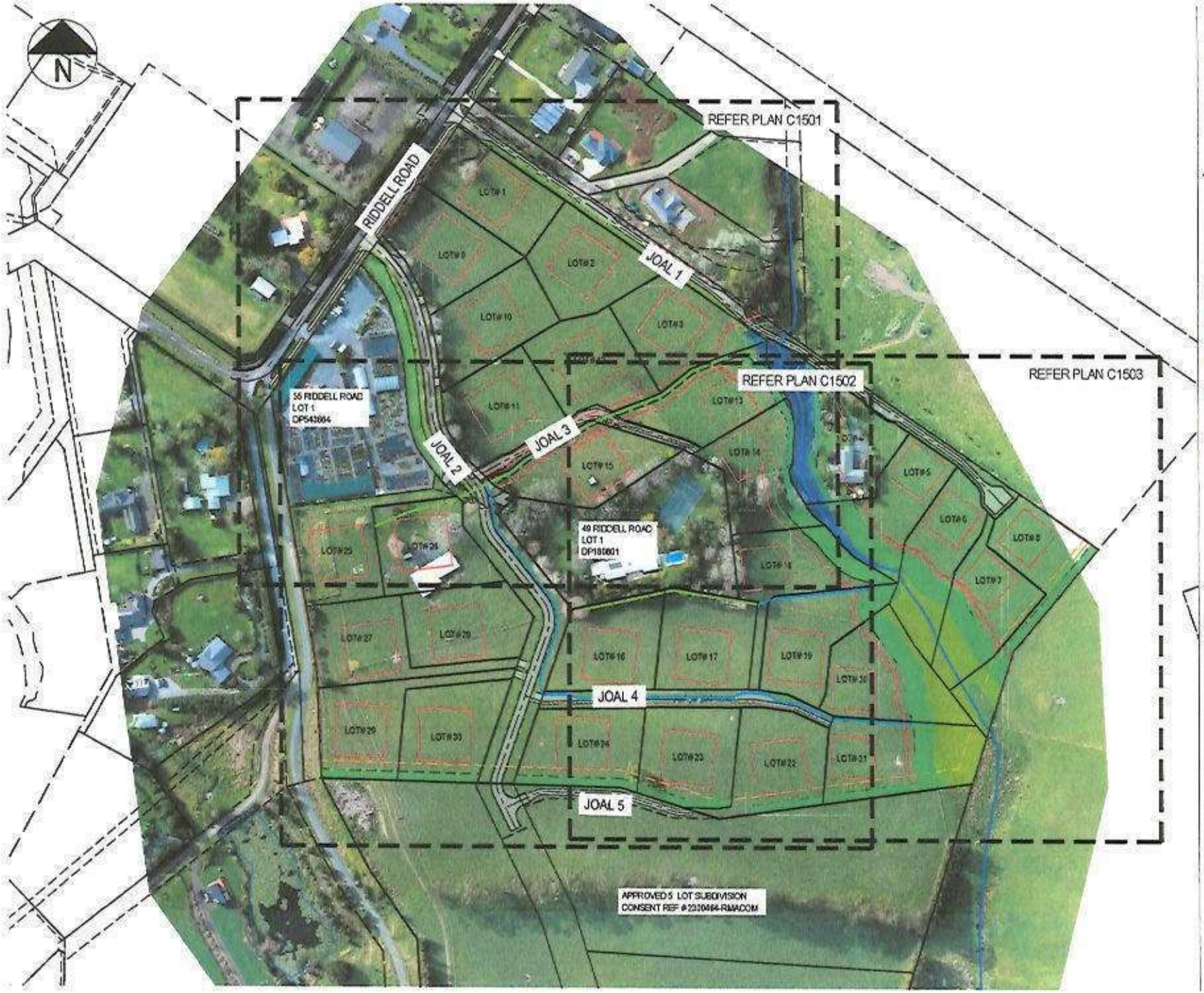
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Typical Stormwater Mitigation Details Plan

No	Revision / Description	Name	Date
A	Resource Consent	GB	10/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TB	11/25
Project no	10401		
Scale	Refer to Plan		
Drawing no	C4302	Rev	A



NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 1949 (2000)
3. Levels in terms of the Auckland Vertical Datum 2016
4. Contours are at 1m intervals

a.f.s.

LEGEND
EX BDY
PR BDY
EX EASEMENT
EX MAJOR CONTOUR
EX MINOR CONTOURS
PR MAJOR CONTOUR
PR MINOR CONTOURS
PR SITE EXTENT
PR EASEMENT
EX WATERCOURSE
EXT FOOTPATH
EX BUILDING
EX POND
EX NATURAL WETLAND
PR FOOTPATH (VEH)
PR 5m RMA SETBACK
PR 10m RIPARIAN SETBACK
PR 20m RIPARIAN SETBACK
PR EXTENT WORKS
PR RIPARIAN PLANTING
PR NATURAL PLANTING
PR BUILD PLATFORM
PR LOT ACCESS

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64 (0)9 814 4222

Taraire Tahi Limited
Riddell Road
Kerikeri

Overview Proposed Concept Layout Plan

No	Revision Description	Name	Date
A	Resource Consent	GB	11/25
Surveyed		KM	09/25
Designed		GB	11/25
Drawn		GB	11/25
Checked		TB	11/25
Project no.	10401		
Scale	1:2000 @ A3		
Grid ref.			
Drawing no.	C1500	Rev	A

NOTES

1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 1949 2000
3. Levels in terms of the Auckland Vertical Datum 2016
4. Contours are at 1m intervals

LEGEND

- EX BDY
- PR BDY
- EX EASEMENT
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR SITE EXTENT
- PR EASEMENT
- EX RIVER/CREEK
- EX FLOW PATH
- EX BUILDING
- EX POND
- EX NATURAL WETLAND
- PR FLOW PATH / BDRY
- PR 5m AWA SETBACK
- PR 5m RIPARIAN SETBACK
- PR 10m WETLAND SETBACK
- PR EXTENT WDYR
- PR 5m RIPARIAN PLANTING
- PR 10m WETLAND PLANTING
- PR 5m RURAL PLANTING
- PR SWALE PLATFORM
- PR LOT ACCESS

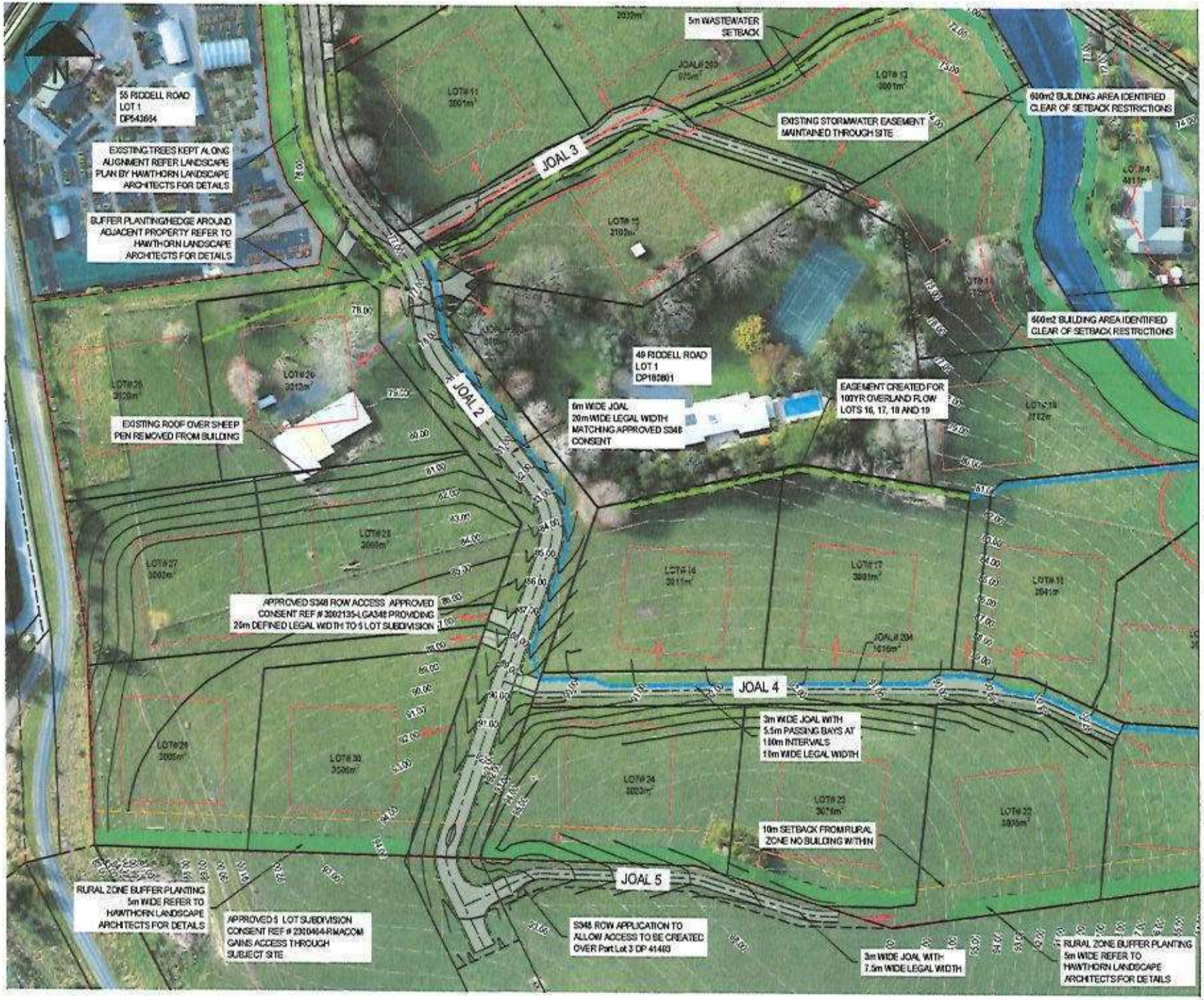
conquel CONSULTING

Contact: ed.wang@conquel.co.nz
Phone: +64(0)21 1422 03

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Concept Layout
Sheet 1 of 3

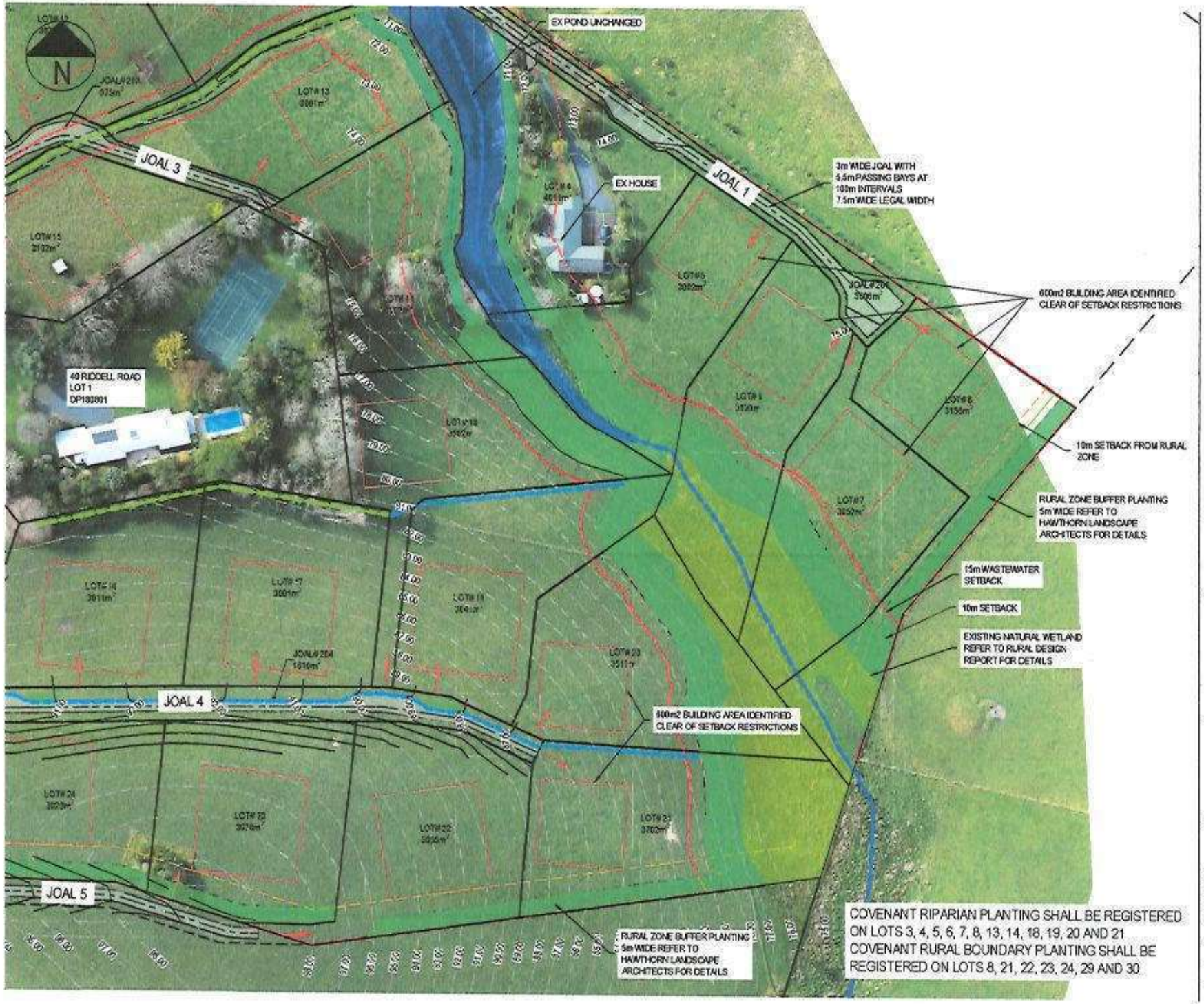
No.	Description (Description)	Name	Date
A	Resource Consent	GB	10/25
Surveyed		KM	09/25
Designed		GB	10/25
Drawn		GB	10/25
Checked		TS	10/25
Project no.	10401		
Scale	1:1000 @ A3		
Cad file	RIDDELL RD CONCEPT.DWG		
Drawing no.	C1501	Rev	A



Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Concept Layout
Sheet 2 of 3

No.	Revision / Description	Name	Date
A	Resource Consent	GD	12/05
Surveyed		KM	09/05
Designed		GD	11/05
Drawn		GD	11/05
Checked		TD	11/05
Project no.	10401		
Scale	1:1000 @ A3		
Datum	[illegible]		
Drawing no.	C1502	Rev	A



NOTES

1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum MG Eden 2000
3. Levels in terms of Tier 4a Collect Vertical Datum 2016
4. Contours are at 1m intervals

LEGEND

EX BDY
PR BDY
EX EASEMENT
EX MAJOR CONTOUR
EX MINOR CONTOUR
PR MAJOR CONTOUR
PR MINOR CONTOUR
PR LOT LOCATION
PR EASEMENT
EX WATER RESOURCE
EX FLOWPATH
EX BUILDING
EX POND
EX NATURAL WETLAND
PR FLOWPATH (OW)
PR 15m WW SETBACK
PR 10m RIPARIAN SETBACK
PR 5m RIPARIAN SETBACK
PR EXTENT (OW)
PR 5m RIPARIAN PLANTING
PR 10m RIPARIAN PLANTING
PR 5m RURAL PLANTING
PR 300m2 PLATFORM
PR LOT ACCESS

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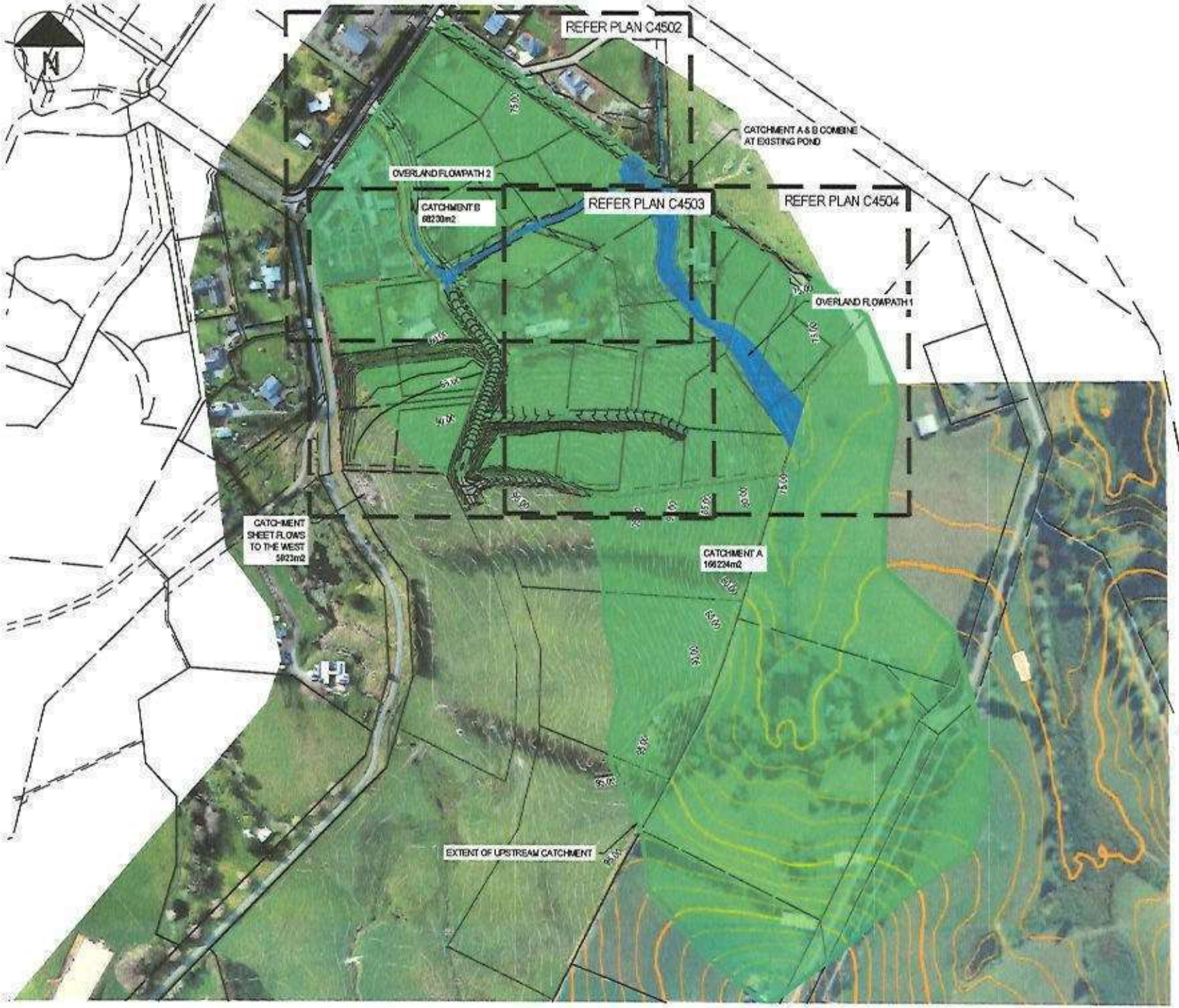
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Concept Layout
Sheet 3 of 3

No.	Revisions/Description	Name	Date
A	Resource Consent	GB	02/25
Surveyed		HW	09/25
Designed		GB	11/25
Drawn		GB	11/25
Checked		PS	11/25
Project no.	10401		
Scale	1:1000 @ A3		
Cad file			
Drawing no.	C1503	Rev	A



NOTES

1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 1949 Eden 2000
3. Levels are in terms of Auckland Vertical Datum 1946
4. Original levels - Cadastral Survey Ref SO 57405
   - Northing: 6026557.670m
   - Easting: 2701224.700m
   - Elevation: 52.774m
5. Contours are at 0.5m intervals

LEGEND

- EXISTING
- PROPOSED
- EASEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPERTY EXTENT
- EXISTING STORMWATER
- PROPOSED STORMWATER
- EXISTING SWALE
- EXISTING FLOWPATH 100YR
- PROPOSED FLOWPATH 100YR
- PROPOSED 100YR FLOOD
- PROPOSED CATCHMENT

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Contact: admin@conquel.co.nz
Phone: +64 (0) 9 407 4233

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100yr Overall Coverage and Flowpath Plan

No.	Revision / Description	Name	Date
A	Resource Consent	GB	11.05
Surveyed		DW	09.05
Designed		-	-
Drawn		GB	09.05
Checked		TS	11.05
Project no.	10401		
Scale	1:3000 @ A3		
Cad file	[illegible]		
Drawing no.	C4501	Rev	A

NOTES

1. All work to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 64 Even 2000
3. Levels in terms of the Auckland Vertical Datum 2016
4. Origin of levels = [illegible] published previously, created from the latest digital geodetic database
5. Boundaries are subject to final survey

G.I.S.

LEGEND

- EXBDY
- PR LDY
- EXEASEMENT
- EXMINOR CONTOUR
- EXMINOR CONTOUR
- PR SITE EXTENT
- EXSTORMWATER
- PR STORMWATER
- EXPSP SW41
- EXFLOW DIRECTION
- PR FLOWPATH 100YR
- PR EXTENT 100YR
- PR 100YR FLOOD
- PR SW CATCHMENT

conquel CONSULTING

Contact: admin@conquel.co.nz

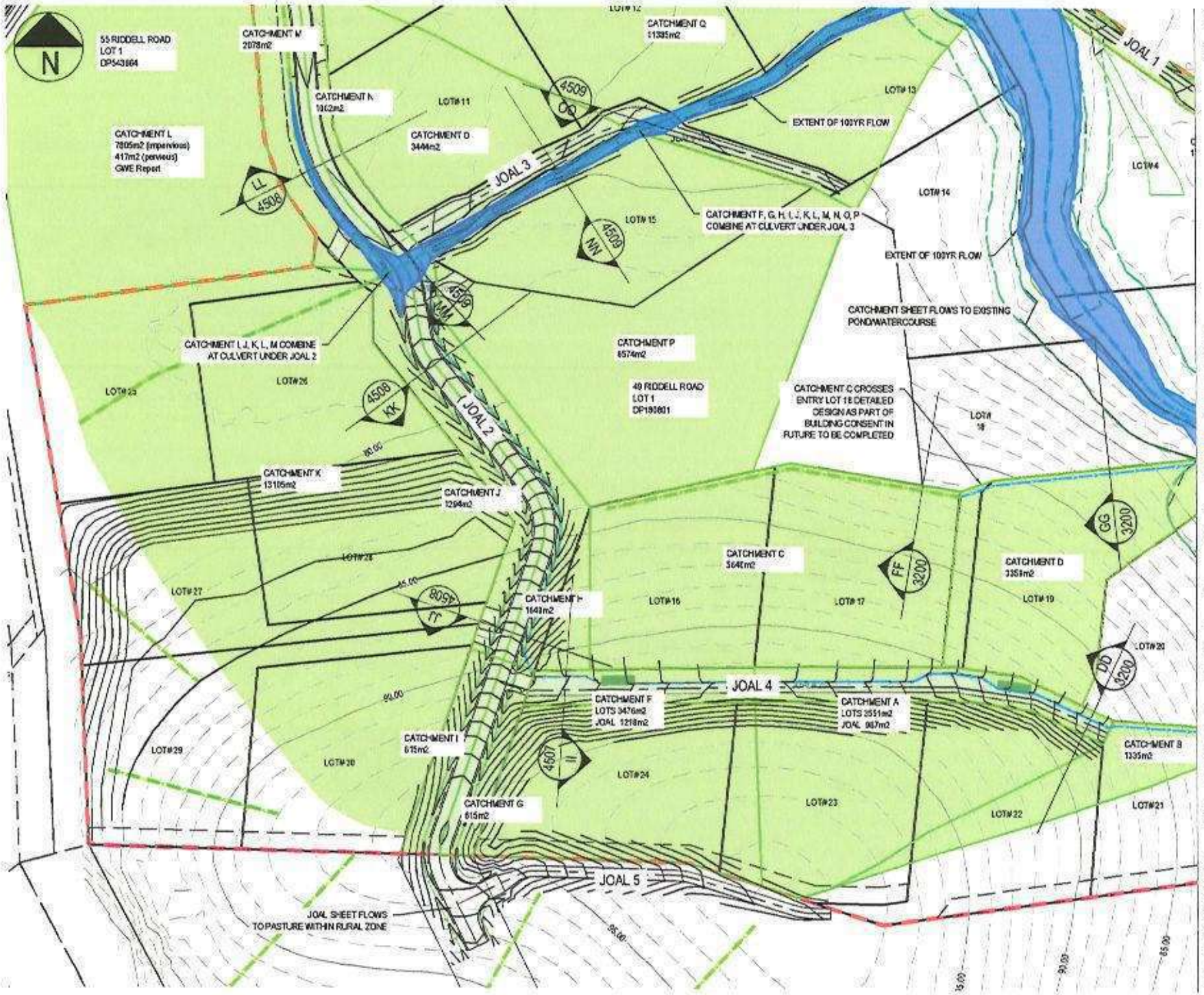
Phone: +64 (0)9 951 6655

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Catchment and Flowpath Plan

No	Revision Description	Name	Date
A	Resource Consent	GB	11.05
Surveyed		DW	09.05
Designed		-	-
Drawn		GB	09.05
Checked		TG	11.05

Project no.	10401
Scale	1:1000 @ A3
Cad file	[illegible]
Drawing no.	C4502 Rev A


55 RIDDELL ROAD
LOT 1
DP543864
CATCHMENT M
2078m2
CATCHMENT N
1062m2
CATCHMENT L
7805m2 (impervious)
417m2 (pervious)
GWE Report
CATCHMENT O
1135m2
CATCHMENT D
3444m2
JOAL 3
JOAL 1
EXTENT OF 100YR FLOW
CATCHMENT F, G, H, I, J, K, L, M, N, O, P
COMBINE AT CULVERT UNDER JOAL 3
CATCHMENT L, J, K, L, M COMBINE
AT CULVERT UNDER JOAL 2
CATCHMENT P
8574m2
CATCHMENT SHEET FLOWS TO EXISTING
POND/WATERCOURSE
49 RIDDELL ROAD
LOT 1
DP193801
CATCHMENT C CROSSES
ENTRY LOT 18 DETAILED
DESIGN AS PART OF
BUILDING CONSENT IN
FUTURE TO BE COMPLETED
JOAL 2
CATCHMENT K
13105m2
CATCHMENT J
1294m2
CATCHMENT H
1643m2
CATCHMENT C
564m2
CATCHMENT D
3358m2
JOAL 4
CATCHMENT F
LOTS 3476m2
JOAL 1218m2
CATCHMENT A
LOTS 2551m2
JOAL 967m2
CATCHMENT I
615m2
CATCHMENT G
615m2
CATCHMENT B
1335m2
JOAL 5
JOAL SHEET FLOWS
TO PASTURE WITHIN RURAL ZONE
LOT#11
LOT#12
LOT#13
LOT#14
LOT#15
LOT#16
LOT#17
LOT#18
LOT#19
LOT#20
LOT#21
LOT#22
LOT#23
LOT#24
LOT#25
LOT#26
LOT#27
LOT#28
LOT#29
LOT#30
LOT#4
4509 OO
LL 4508
4509 NN
4509 MM
4508 KK
4508 JJ
4508 II
FF 3200
GG 3200
DD 3200
NOTES
1. All works to be in accordance with Auckland District Council Standards
2. Coordinate system is NZ Geodetic Datum Mt Eden 2000
3. Levels are to the Auckland Vertical Datum 2016
LEGEND
EXISTING
PROPOSED
EASEMENT
EXISTING CONTOURS
PROPOSED CONTOUR
PROPOSED EXTENT
EXISTING STORMWATER
PROPOSED STORMWATER
EXISTING SWALE
EXISTING DIRECTION
PROPOSED FLOWPATH
PROPOSED EXTENT
PROPOSED FLOOD
PROPOSED CATCHMENT
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Taraire Tahi Limited
Riddell Road
Kerikeri
Proposed Catchment
and Flowpath
Plan
Project no 10401
Scale 1:1000 @ A3
Drawing no C4503
Rev A

NOTES:
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum NZ Elev 2000
3. Levels in terms of the Auckland Vertical Datum 1946

Q.J.S.

LEGEND
EXISTING
PROPOSED
EX EASEMENT
EX MAJOR CONTOUR
EX MINOR CONTOUR
PROPOSED CUT/FILL
EX STORMWATER
PR STORMWATER
RIPRAP SWALE
OUTFLOW DIRECTION
PR FLOWPATH (DEPTH)
PR EXTENT 100YR
PR 100YR FLOOD
PR SW CATCHMENT

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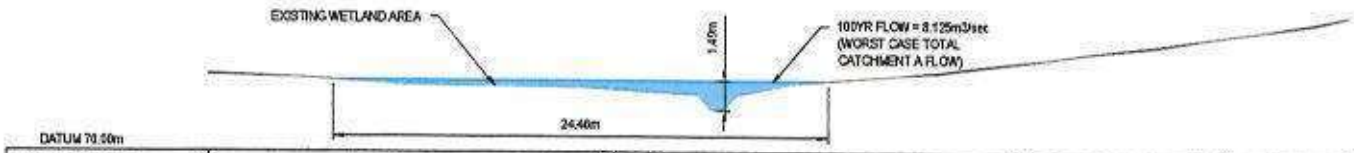
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Catchment and Flowpath Plan

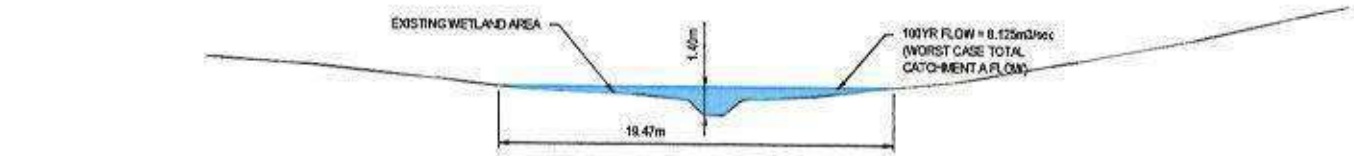
No	Revision Description	Name	Date
A	Resource Consent	GS	11/05
Surveyed		DW	09/05
Designed		-	-
Drawn		GS	09/05
Checked		TS	11/05
Project no.	10401		
Scale	1:1000 @ A3		
Drawing no.	C4504	Rev	A



DATUM 70.00m

EXISTING LEVELS	73.65			73.14			74.53		76.91
DESIGN LEVELS	73.65			73.14			74.53		76.91
CUT/FILL	0.00			0.00			0.00		0.00
CHAINAGE	0.00			20.00			40.00		56.28

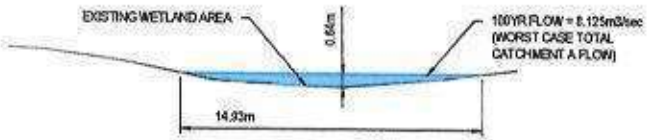
SECTION AA - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



DATUM 68.00m

EXISTING LEVELS	74.07			72.35			73.58		77.00
DESIGN LEVELS	74.07			72.35			73.58		77.00
CUT/FILL	0.00			0.00			0.00		0.00
CHAINAGE	0.00			20.00			40.00		56.28

SECTION BB - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



DATUM 68.00m

EXISTING LEVELS	73.53			71.84			17.48		
DESIGN LEVELS	73.53			71.84			17.48		
CUT/FILL	0.00			0.00			0.00		
CHAINAGE	0.00			20.00			36.45		

SECTION CC - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION

NOTES

1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum 1949 Eastings 2000
3. Levels are in terms of One Auckland Vertical Datum 2016

Q.I.S.

LEGEND

EXISTING
PROPOSED
EXISTING CONTOURS
EXISTING PROFILE
PROPOSED PROFILE
50 YEAR FLOW
100 YEAR FLOWPATH

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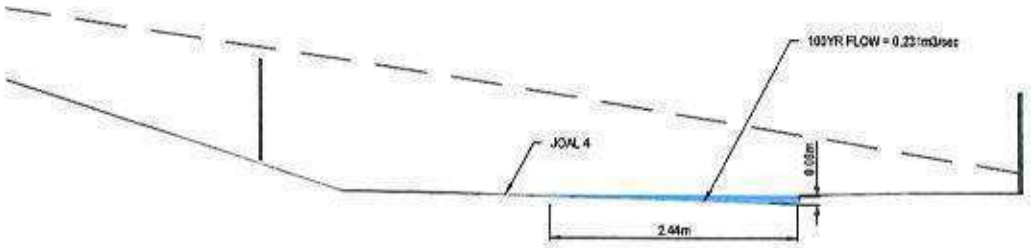
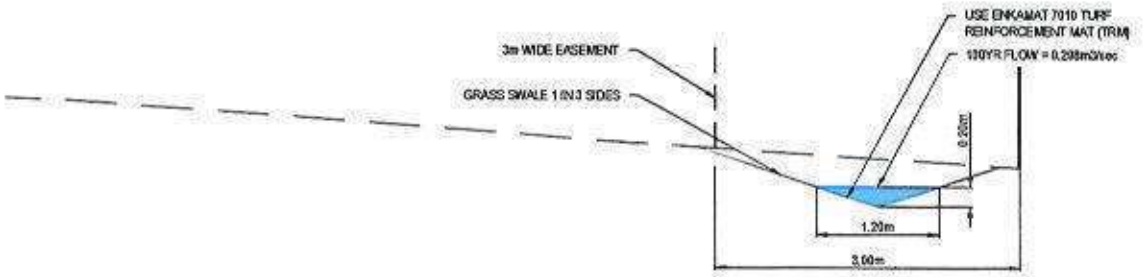
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100YR
Cross Sections
Plan

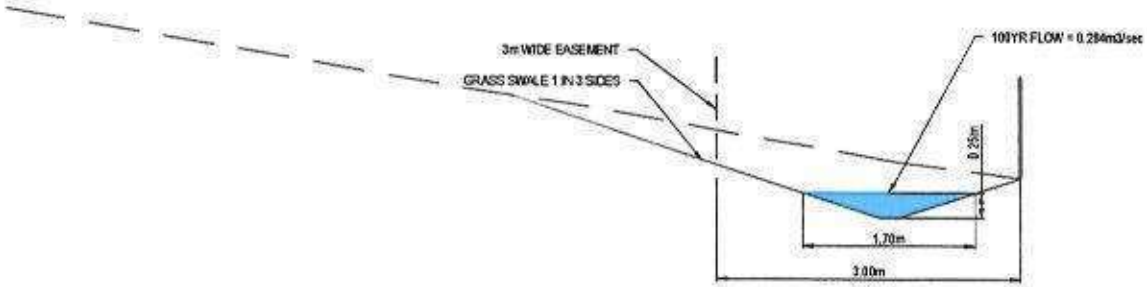
No.	Revisions / Description	Name	Date
A	Resource Consent	GB	11/25
Surveyed		DM	03/25
Designed		-	-
Drawn		GB	09/25
Checked		TD	11/25
Project no.	10401		
Scale	Refer to Drawing		
Cad file			
Drawing no.	C4505	Rev	A



SECTION DD - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



SECTION EE - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



SECTION FF - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION

NOTES
1. All works to be in accordance with Far North District Council Standards.
2. Coordinates are in terms of NZ Geodetic Datum 2000.
3. Levels are in terms of the Auckland Vertical Datum 2016.

Q.S.

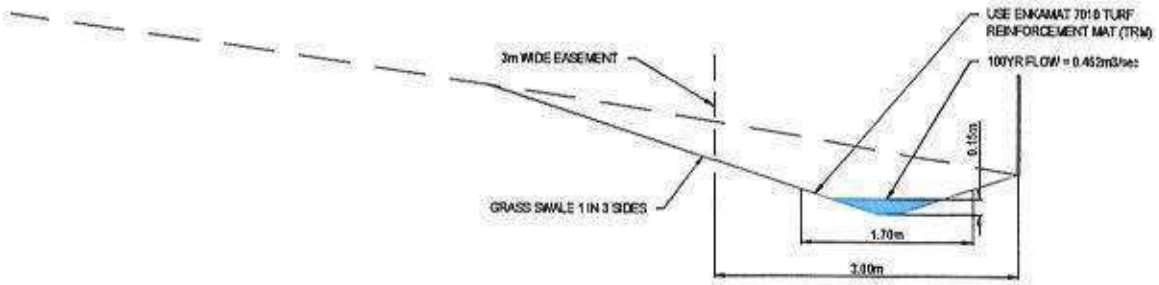
LEGEND
EXIDIV
PRIDIV
EXEASEMENT
EXCLPSOFILE
PRCL PROFILE
PR WL EQVN
PR 100YR FLOWPATH

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64 (0)9 815 8322

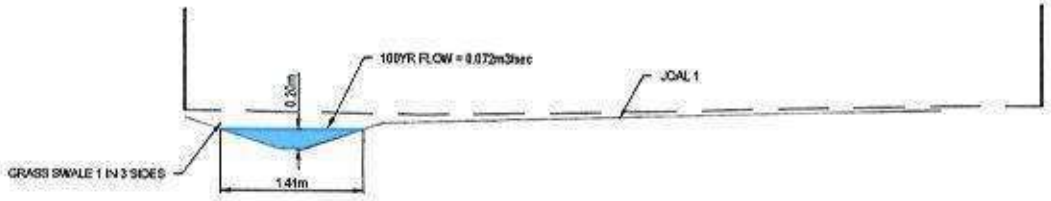
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100YR
Cross Sections
Plan

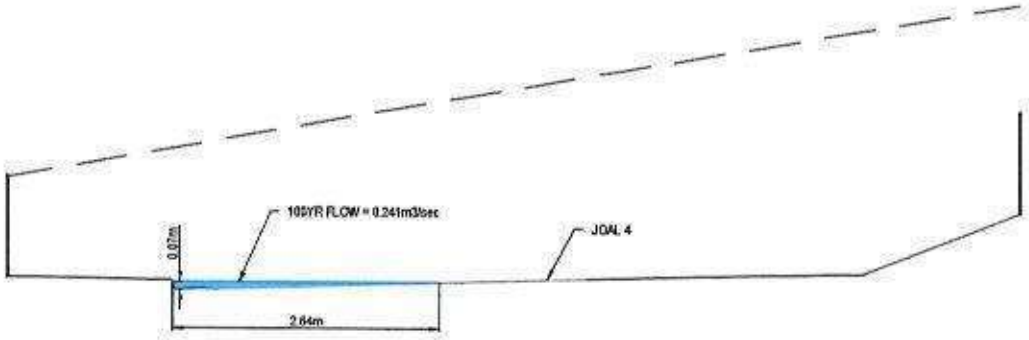
No.	Revision / Description	Name	Date
A	Resource Consent	GB	10/05
Surveyed		DM	05/05
Designed		-	-
Drawn		GB	09/05
Checked		TS	11/05
Project no.	10401		
Scale	Refer to Drawing		
Datum			
Drawing no.	C4506	Rev	A



SECTION GG - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



SECTION HH - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4504 FOR LOCATION



SECTION II - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum/Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 1946

LEGEND
EXIST
PROP
EASEMENT
EXIST PROFILE
PROP PROFILE
PROP 100YR
PROP 100YR FLOWPATH

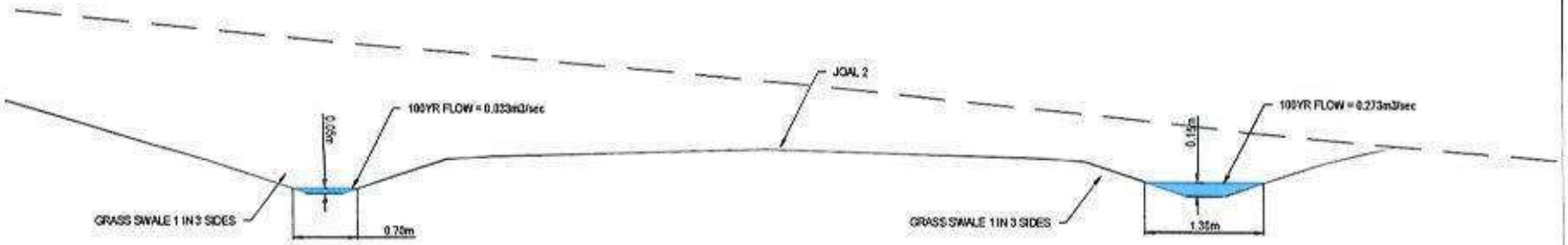
conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: 09 408 1425

Taraire Tahi Limited
Riddell Road
Kerikeri

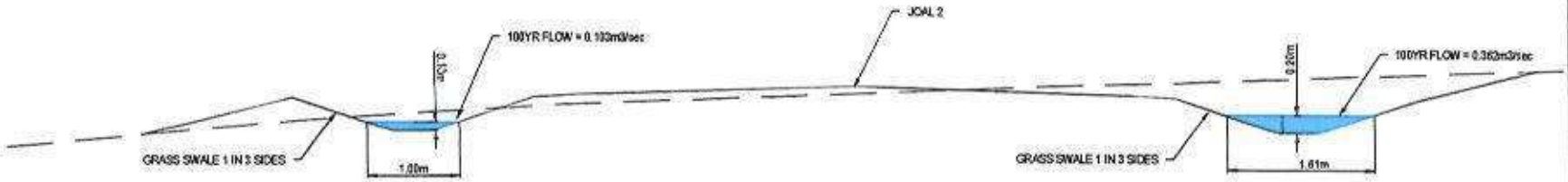
Proposed 100YR
Cross Sections
Plan

No.	Revision Description	Name	Date
A	Resource Consent	GS	11.25
Surveyed		DW	09.25
Designed		-	-
Drawn		SB	09.25
Checked		TD	11.25

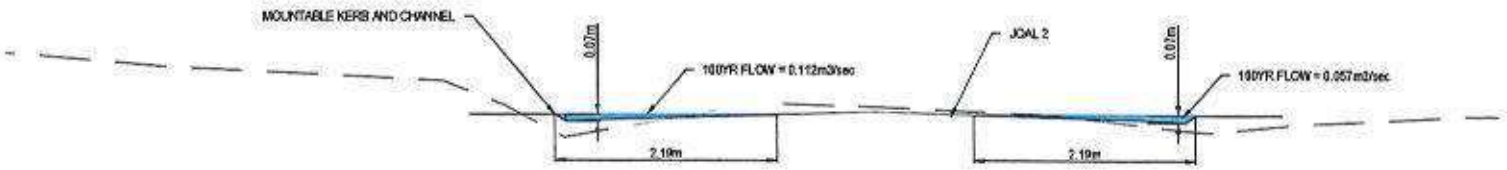
Project no.	10401
Scale	Refer to Drawing
Drawing no.	C4507
Rev	A



SECTION JJ - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION



SECTION KK - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION



SECTION LL - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION

NOTES:
1. All works to be in accordance with Far North District Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.

A.1.5.
5.8.0

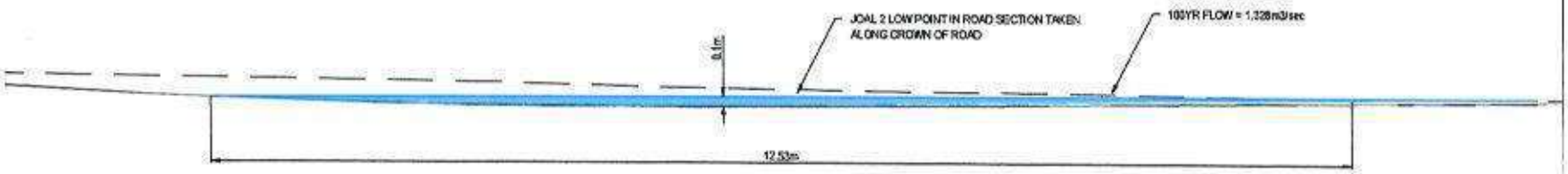
LEGEND
EX SW
PR SW
EASEMENT
EX GL PROFILE
PR GL PROFILE
PR WL 100YR
PR 100YR FLOWPATH

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: 0452 0414 0020

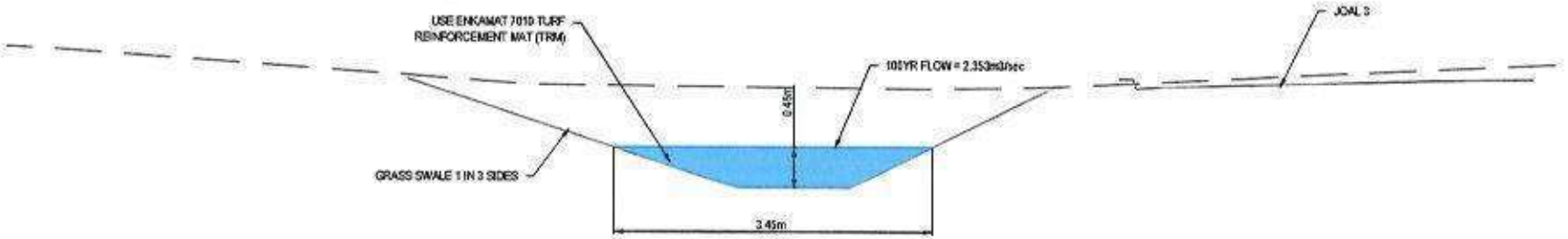
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100YR
Cross Sections
Plan

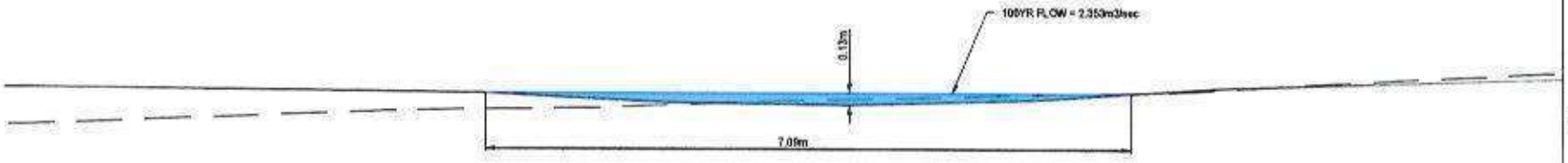
No	Revision / Description	Name	Date
A	Resource Consent	GB	11/25
Surveyed		BW	09/25
Designed		-	-
Drawn		GB	09/25
Checked		TB	11/25
Project no.	10401		
Scale	Refer to Drawing		
Datum	[illegible]		
Drawing no.	C4508	Rev	A



SECTION MM - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION



SECTION NN - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION



SECTION OO - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4503 FOR LOCATION

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 2016

a1-5

LEGEND
EXISTING
PUBCP
C/L EASEMENT
EXISTING C/L PROFILE
PROPOSED C/L PROFILE
PROPOSED SWALE
PROPOSED LOW POINT

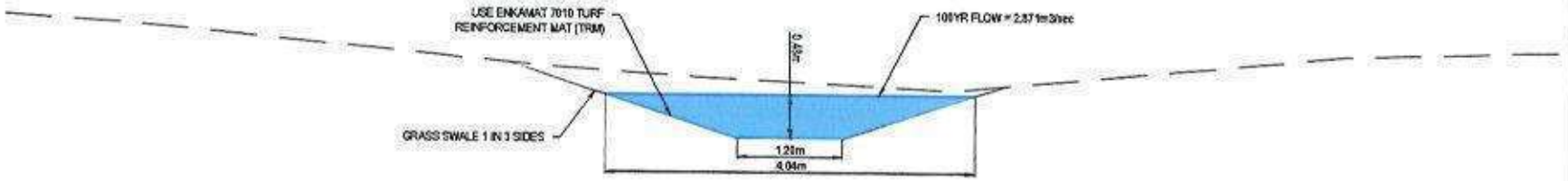
conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: +64(0)9 815 8322

Taraire Tahi Limited
Riddell Road
Kerikeri

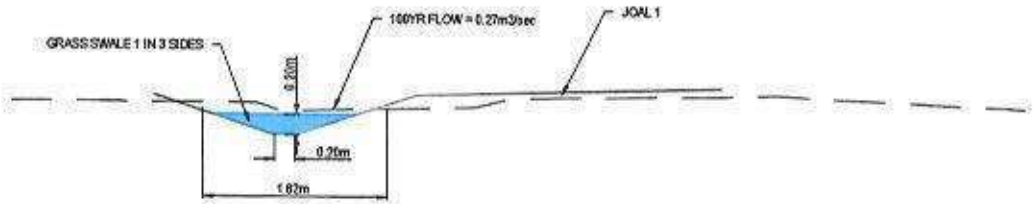
Proposed 100YR
Cross Sections
Plan

No	Revision Description	Name	Date
A	Resource Consent	GB	11/25
Surveyed		DW	09/25
Designed		-	-
Drawn		GB	09/25
Checked		TS	11/25

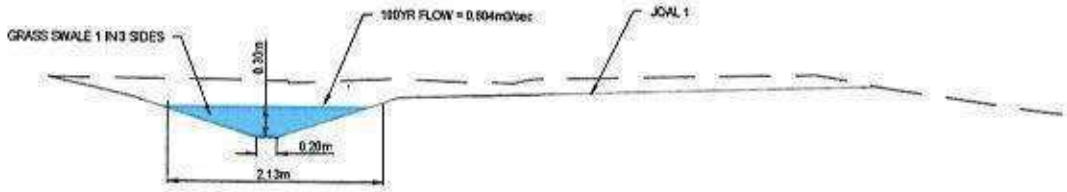
Project no:	10401
Scale:	Refer to Drawing
Cad file:	[illegible]
Drawing no:	C4509 Rev A



SECTION PP - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4502 FOR LOCATION



SECTION QQ - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4502 FOR LOCATION



SECTION RR - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4502 FOR LOCATION

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 1946

G.J.S.
SAO

LEGEND
EX KERB
PR KERB
EX CASEMENT
EX GL PROFILE
PR GL PROFILE
PR WC 100YR
PR 100YR FLOWPATH

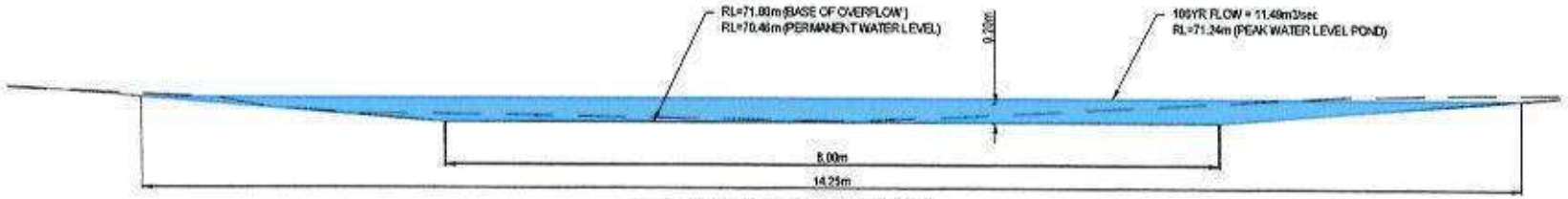
conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: (+64) 09 407 0572

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100YR
Cross Sections
Plan

No	Revision / Description	Name	Date
A	Resource Consent	GD	11/05
Surveyed		DM	05/05
Designed		-	-
Drawn		GD	05/05
Checked		TS	11/05

Project No	10401
Scale	Refer to Drawing
Cad file	refer to cad file location
Drawing No	C4510
Rev	A



SECTION SS - OVERLAND FLOWPATH
SCALE 1:50 @ A3
REFER DRAWING C4502 FOR LOCATION

NOTES
1. All works to be in accordance with the Northern Council Standards.
2. Coordinates in terms of NZ Geodetic Datum 49 (2000).
3. Levels in terms of the Auckland Vertical Datum 2016.

LEGEND
- EXISTING
- PROPOSED
- EXISTING EASEMENT
- EXISTING PROFILE
- PROPOSED PROFILE
- PROPOSED 100YR FLOWPATH

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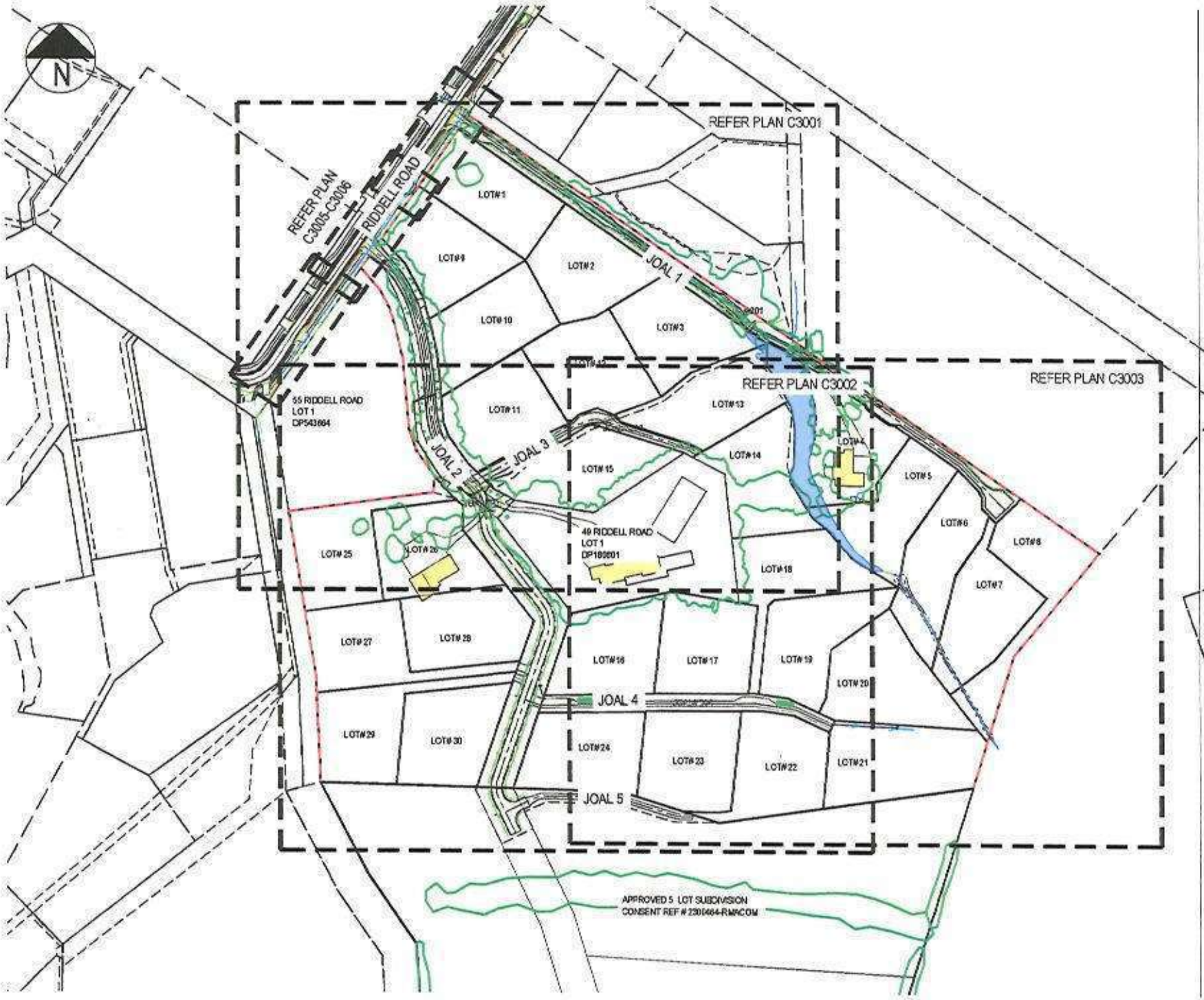
Contact address
Phone NUMBER

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed 100YR
Cross Sections
Plan

No.	Revision Description	Name	Date
A	Resource Consent	GE	11/25
Surveyed		DM	09/25
Designed		-	-
Drawn		GE	09/25
Checked		TE	11/25
Project no.	10401		
Scale	Refer to Drawing		
Call file			
Drawing no.	C4511	Rev	A



NOTES

1. All works to be in accordance with Far North Council standards.
2. Contractor to lay out using GPS the set out of the kerb levels where gradients are less than 1%.
3. The contractor is responsible to locate all services that may be affected by their operations.
4. The contractor shall comply with all relevant health and safety requirements.
5. The contractor shall obtain all necessary approval/s/safety certificates before commencing work under or near their services.
6. Final pavement design subject to confirmation tests on subgrade material.
7. Earthworks with coordinates of drainage points along road centreline to be supplied to the contractor prior to construction.
8. Refer to long section for finished centreline levels, refer to typical cross sections to obtain levels for other locations.
9. All dimensions are horizontal unless marked on kerb levels in accordance with specification.

LEGEND

- EXIST CONTOUR MAJOR
- EXIST CONTOUR MINOR
- EXISTING BUILDING
- PROPERTY
- EXISTING EASEMENT
- PROPOSED MAJOR
- PROPOSED MINOR
- PROPOSED EASEMENT
- PROPOSED ACCESSWAY
- PROPOSED PARKING AREA
- EXISTING STORMWATER
- PROPOSED STORMWATER
- PROPOSED KERB
- EXISTING DRIVE
- PROPOSED DRIVE SINGLE

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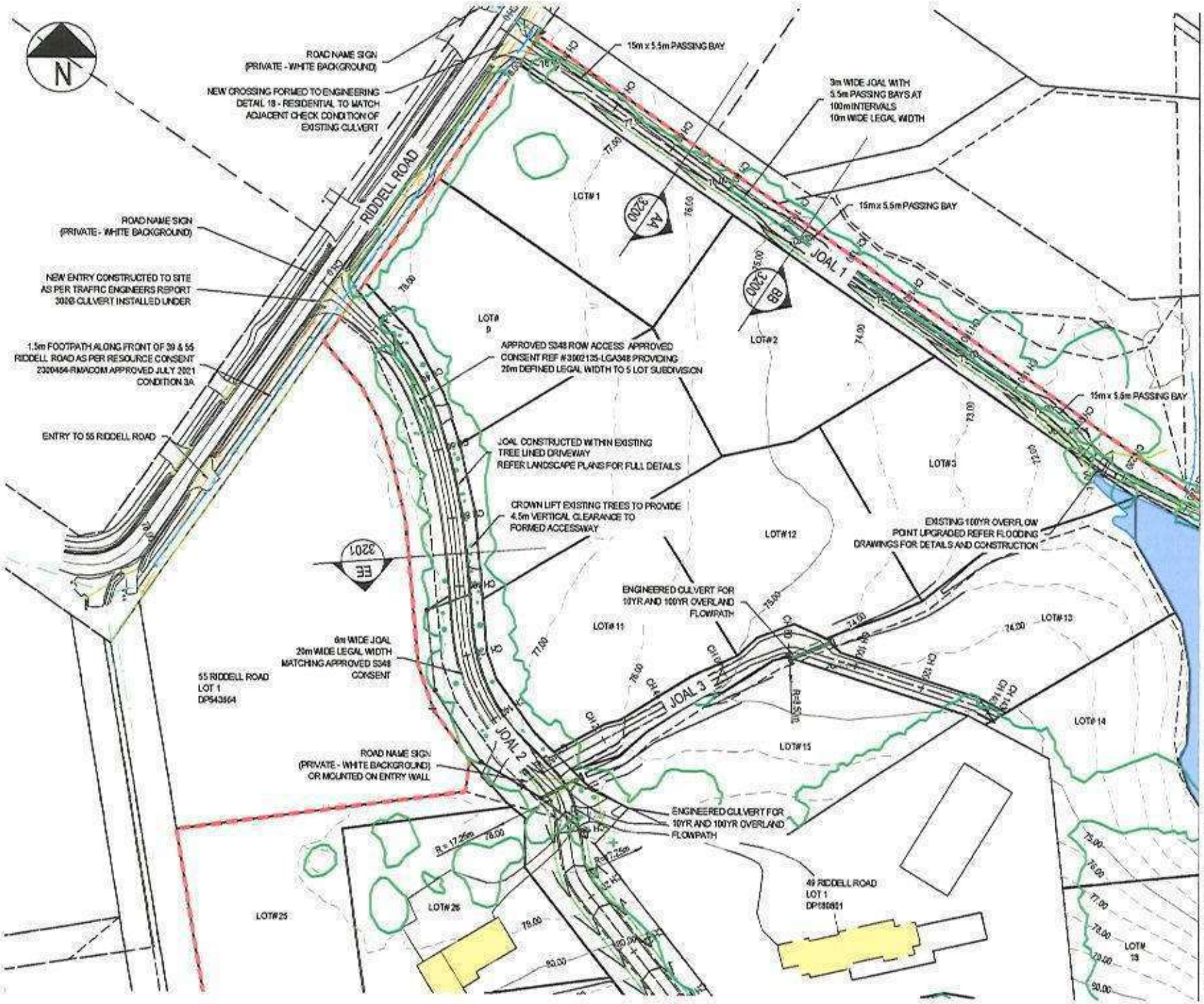
Taraire Tahi Limited
Riddell Road
Kerikeri

Overview Proposed Accessway Layout Plan

No	Revision Description	Name	Date
A	Resource Consent	GB	11/05
Surveyed		KV	09/05
Designed		GB	09/05
Drawn		GB	09/05
Checked		TS	11/05
Project no	10401		
Scale	1:2000 @ A3		
Datum	[illegible]		
Drawing no	C3000	Rev	A


N
ROAD NAME SIGN (PRIVATE - WHITE BACKGROUND)
NEW CROSSING FORMED TO ENGINEERING DETAIL 18 - RESIDENTIAL TO MATCH ADJACENT CHECK CONDITION OF EXISTING CULVERT
RIDDELL ROAD
15m x 5.5m PASSING BAY
3m WIDE JOAL WITH 5.5m PASSING BAYS AT 100m INTERVALS 10m WIDE LEGAL WIDTH
LOT# 1
15m x 5.5m PASSING BAY
JOAL 1
ROAD NAME SIGN (PRIVATE - WHITE BACKGROUND)
NEW ENTRY CONSTRUCTED TO SITE AS PER TRAFFIC ENGINEERS REPORT 300Ø CULVERT INSTALLED UNDER
1.5m FOOTPATH ALONG FRONT OF 39 & 55 RIDDELL ROAD AS PER RESOURCE CONSENT 2320464-RMACOM APPROVED JULY 2021 CONDITION 3A
ENTRY TO 55 RIDDELL ROAD
LOT# 9
APPROVED S348 ROW ACCESS APPROVED CONSENT REF #3902135-LGA348 PROVIDING 20m DEFINED LEGAL WIDTH TO 5 LOT SUBDIVISION
LOT# 2
JOAL CONSTRUCTED WITHIN EXISTING TREE LINED DRIVEWAY REFER LANDSCAPE PLANS FOR FULL DETAILS
15m x 5.5m PASSING BAY
LOT# 3
CROWN LIFT EXISTING TREES TO PROVIDE 4.5m VERTICAL CLEARANCE TO FORMED ACCESSWAY
LOT# 12
EXISTING 100YR OVERFLOW POINT UPGRADED REFER FLOODING DRAWINGS FOR DETAILS AND CONSTRUCTION
ENGINEERED CULVERT FOR 10YR AND 100YR OVERLAND FLOWPATH
LOT# 11
LOT# 13
6m WIDE JOAL 20m WIDE LEGAL WIDTH MATCHING APPROVED S348 CONSENT
55 RIDDELL ROAD LOT 1 DP543564
JOAL 3
JOAL 2
LOT# 14
LOT# 15
ROAD NAME SIGN (PRIVATE - WHITE BACKGROUND) OR MOUNTED ON ENTRY WALL
ENGINEERED CULVERT FOR 10YR AND 100YR OVERLAND FLOWPATH
49 RIDDELL ROAD LOT 1 DP580821
LOT# 25
LOT# 26
LOT# 16
NOTES
LEGEND
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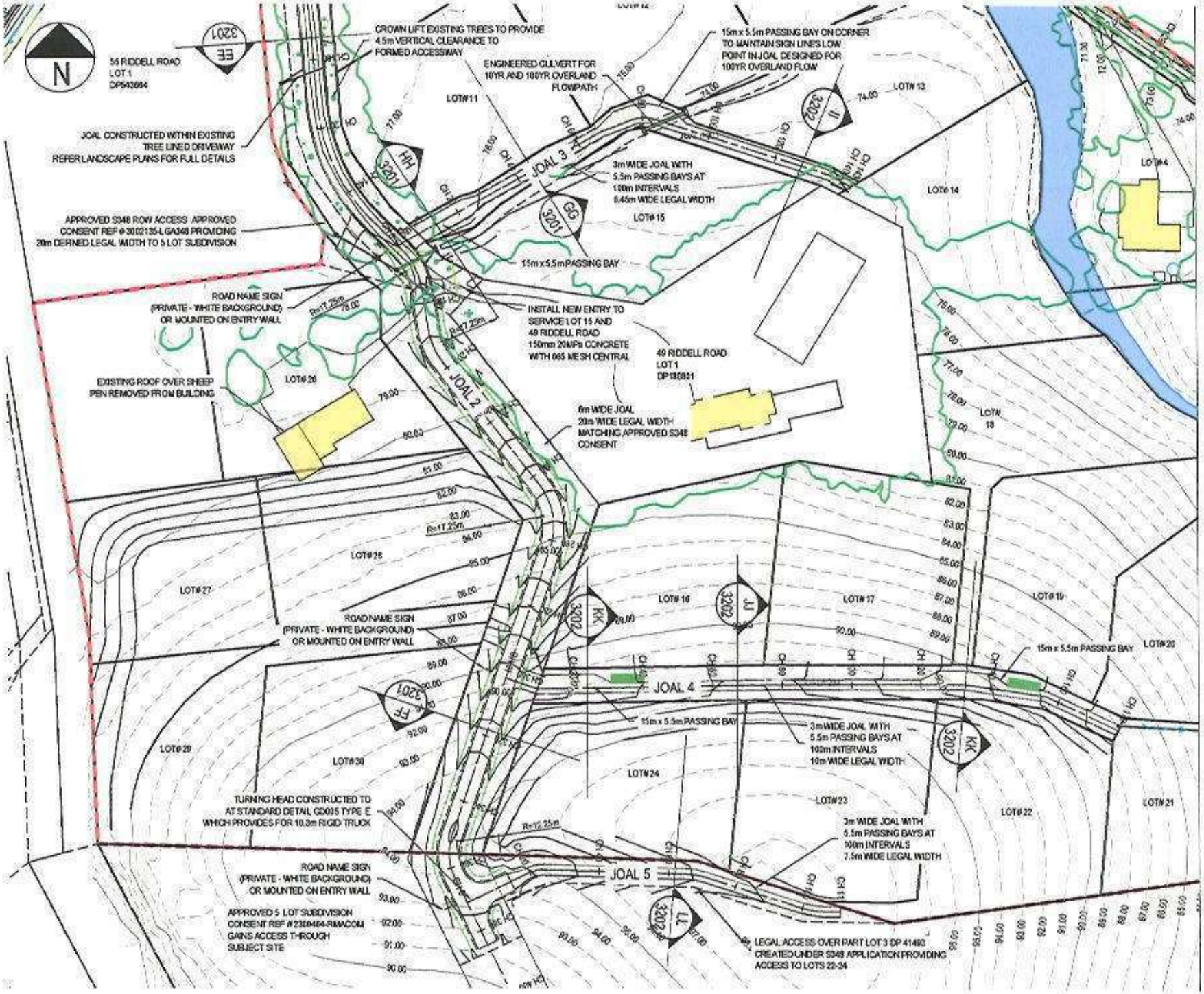
Taraire Tahi Limited
Riddell Road
Kerikeri
Proposed
Accessway Layout
Sheet 1 of 3
Surveyed
Designed
Drawn
Checked
Project no 10401
Scale 1:1000 @ A3
Drawing no C3001
Rev A



NOTES

1. All work to be in accordance with Far North's Council standards.
2. Contour plan is levels using GPS for subject of the work levels where gradients are less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by their operations.
4. The contractor is to comply with all relevant health and safety requirements.
5. The contractor shall obtain all necessary approvals from utility operators before commencing work under or near the services.
6. Final pavement design subject to geotechnical advice on subgrade material.
7. Detail schedule with overstrength of drainage on the stamp must be available to be supplied to the contractor prior to construction.
8. Refer to design plans for finished contour levels, refer to typical cross sections for all earthworks for other locations.
9. All roads shall have crossfall applied on both lanes in accordance with specification.

LEGEND

- EX BDY
- EX EASEMENT
- EX CONTOUR MAJOR
- EX CONTOUR MINOR
- EX TREE DRIPLINE
- PR BDY
- EX STL EXTENT
- PR CONTOUR MAJOR
- PR CONTOUR MINOR
- PR EASEMENT
- PR ACCESSWAY
- PR PAVEMENT
- EX STORMWATER
- PR STORMWATER
- PR SWALE
- EXPOSED SWAN
- PROP DROP SINGLE

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Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Accessway Layout
Sheet 2 of 3

No	Revision Description	Name	Date
A	Resource Consent	GS	10.25
Surveyed		MM	09.25
Designed		GS	09.25
Drawn		GS	09.25
Checked		TC	11.25

Project no.	10401
Scale	1:1000 @ A3
Drawing no.	C1002
Rev	A

NOTES

1. All works to be in accordance with Far North Council standards.
2. Grid sections to be set using GPS target set at the verge levels where grades are less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by their operations.
4. The contractor shall comply with all relevant health and safety requirements.
5. The contractor shall obtain all necessary approvals from utility operators before commencing work under or near their services.
6. Final pavement design subject to subbase testing on subgrade material.
7. Detail schedule with coordinates of drainage points using road centreline to be prepared by the contractor prior to construction.
8. Refer to long sections for finished centreline levels, refer to typical cross sections for subgrade levels for other locations.
9. All works shall meet landowners requirements where relevant in accordance with consent conditions.

LEGEND

- EXIST
- EASEMENT
- EXCONTOUR MAJOR
- EXCONTOUR MINOR
- EXTOP OF BANK
- PR BDY
- CENTR EXTENT
- PR CONTOUR MAJOR
- PR CONTOUR MINOR
- PR EASEMENT
- PR ACCESSWAY
- PR KERB & GUTTER
- EXSTORMWATER
- PR STORMWATER
- PR SWALE
- EXPROP SWSH
- PROP SWSP SPLAY

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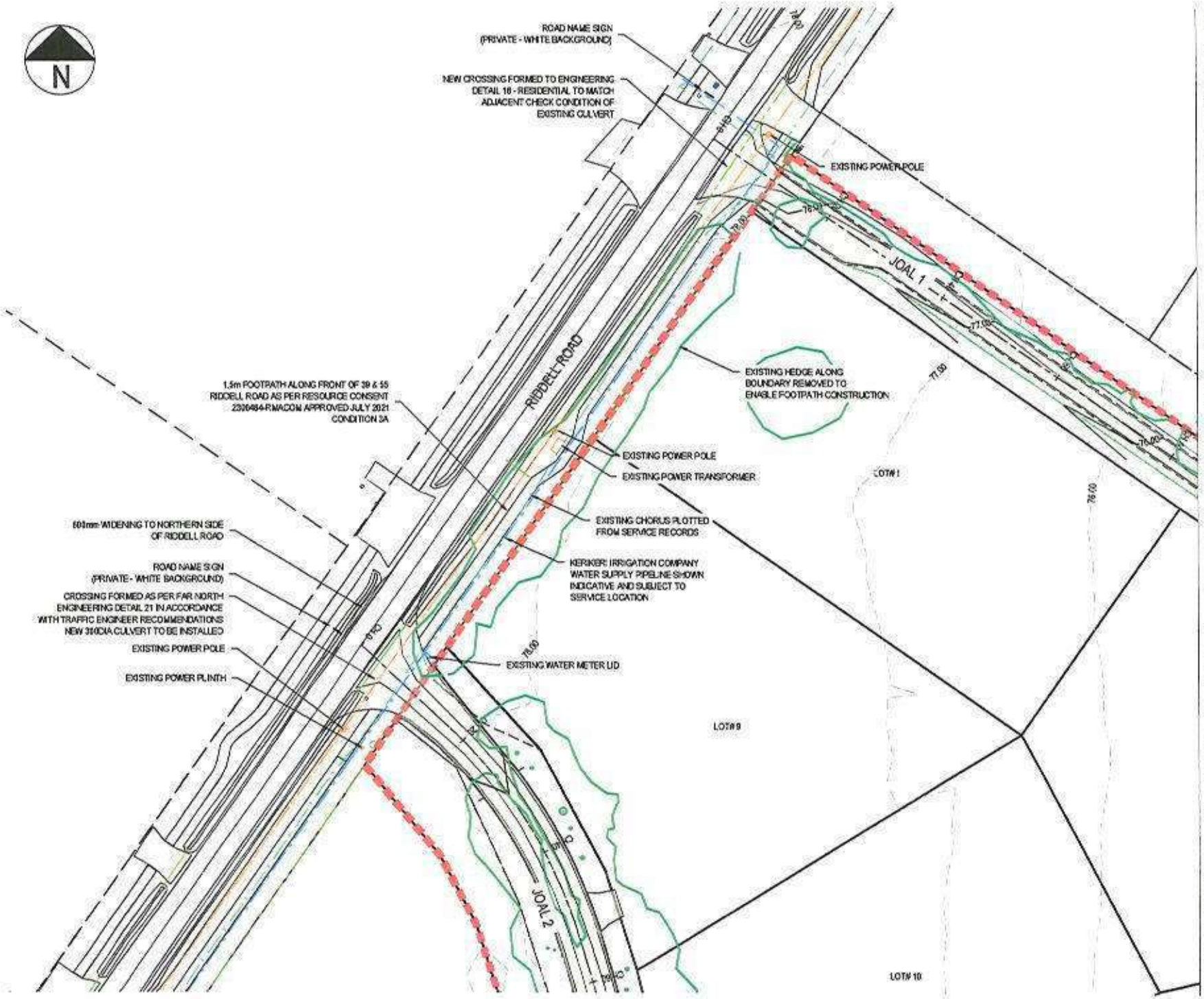
Contact: admin@conquel.co.nz
Phone: 0800 667 433

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Accessway Layout
Sheet 3 of 3

No	Revision Description	Name	Date
A	Revision Comment	GD	13/05
Surveyed		NM	05/05
Designed		GD	05/05
Drawn		GD	05/05
Checked		TC	11/05
Project no	10401		
Scale	1:1000 @ A3		
Cad file	kerikeri boundary.dwg		
Drawing no	C3003	Rev	A


N
ROAD NAME SIGN
(PRIVATE - WHITE BACKGROUND)
NEW CROSSING FORMED TO ENGINEERING
DETAIL 18 - RESIDENTIAL TO MATCH
ADJACENT CHECK CONDITION OF
EXISTING CULVERT
EXISTING POWER POLE
RIDDELL ROAD
JOAL 1
1.5m FOOTPATH ALONG FRONT OF 39 & 55
RIDDELL ROAD AS PER RESOURCE CONSENT
2300484-RMACOM APPROVED JULY 2021
CONDITION 3A
EXISTING HEDGE ALONG
BOUNDARY REMOVED TO
ENABLE FOOTPATH CONSTRUCTION
EXISTING POWER POLE
EXISTING POWER TRANSFORMER
LOT# 1
600mm WIDENING TO NORTHERN SIDE
OF RIDDELL ROAD
ROAD NAME SIGN
(PRIVATE - WHITE BACKGROUND)
CROSSING FORMED AS PER FAR NORTH
ENGINEERING DETAIL 21 IN ACCORDANCE
WITH TRAFFIC ENGINEER RECOMMENDATIONS
NEW 300DIA CULVERT TO BE INSTALLED
EXISTING POWER POLE
EXISTING POWER PLINTH
EXISTING CHORUS PLOTTED
FROM SERVICE RECORDS
KERIKERI IRRIGATION COMPANY
WATER SUPPLY PIPELINE SHOWN
INDICATIVE AND SUBJECT TO
SERVICE LOCATION
EXISTING WATER METER LID
LOT# 9
JOAL 2
LOT# 10
NOTES
LEGEND
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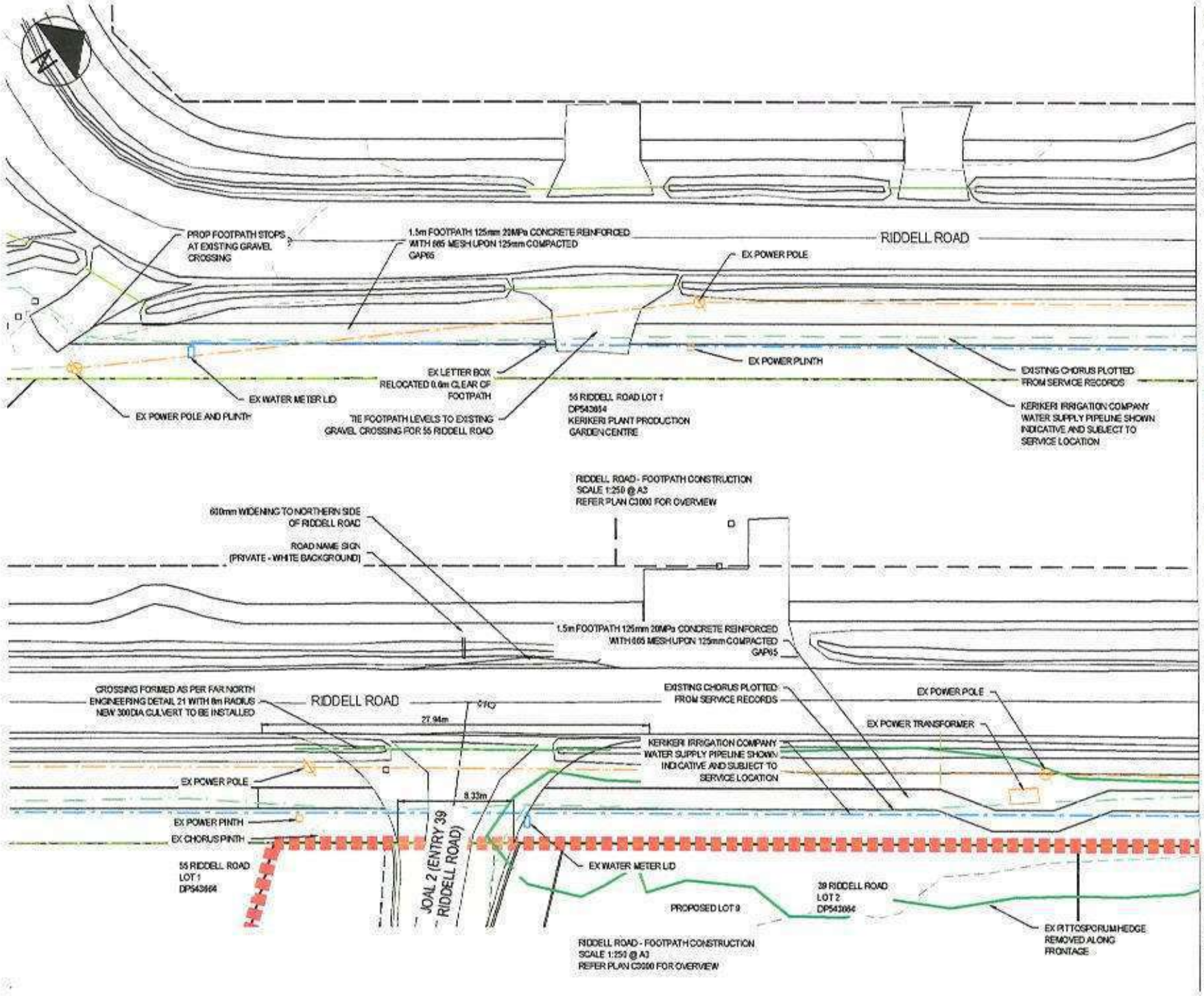
CONSULTING
Taraire Tahi Limited
Riddell Road
Kerikeri
Proposed
Riddell Road
Vehicle Crossings
Project no. 10401
Scale 1:500 @ A2
Drawing no. C3004
Rev A



NOTES

1. All works to be in accordance with Far North Council standards.
2. Contour levels taken using GPS for setting out of the kerb levels where gradients are less than 1%.
3. It is the contractors responsibility to locate all services that may be affected by their operations.
4. The contractor to comply with all relevant health and safety requirements.
5. The contractor to obtain all necessary approvals from utility operators before commencing work under or over their services.
6. Final pavement design subject to confirmation by an engineer approval.
7. Critical interfaces with construction of chamber levels using road centreline to be supplied to the contractor prior to construction.
8. Refer to engineers for required centreline levels, refer to typical cross sections to obtain levels for other locations.
9. All works shall have consistent gradients on kerb lines in accordance with specification.
10. Footpath to be constructed using Road id 20/623 Kerikeri Road as per approved Resource Consent 2000464-RMA/Consent dated July 2020 condition 20.

LEGEND

- EX BDY
- EX EASEMENT
- EX CONTOUR MAJOR
- EX CONTOUR MINOR
- EX TREE DRIPLINE
- PR BDY
- EXCUTE EXTENT
- PR CONTOUR MAJOR
- PR CONTOUR MINOR
- PR EASEMENT
- PR WOOD AWAY
- PR RAINGARDEN
- EX STORMWATER
- PR STORMWATER
- PR SWALE
- EXPROP SWMH
- PROP MH/CP SINGLE

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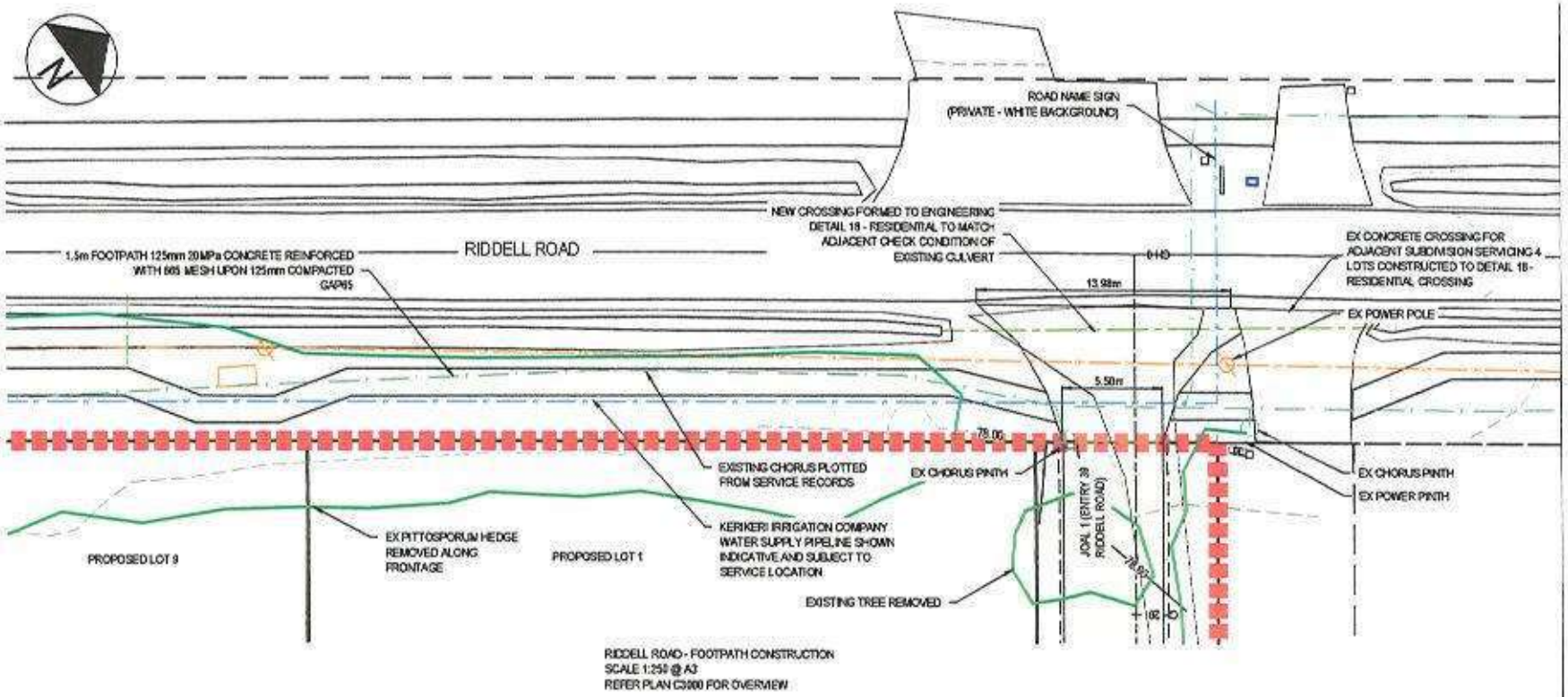
Contact: [illegible]
Phone: [illegible]

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Riddell Road
Footpath Extension

No	Revision Description	Name	Date
A	Resource Consent	GB	05/05
Surveyed		KH	07/05
Designed		GB	09/05
Drawn		GB	09/05
Checked		TS	11/05
Proved by	10401		
Scale	1:250 @ A3		
Datum	[illegible]		
Drawing no	C3005	Rev	A



NOTES

1. All works to be in accordance with Far North Council standards
2. Contractor to set out using GPS for set out of the kerb levels where gradients are not flat (1%
3. The Contractor shall be responsible to locate all services that may be affected by their operations
4. The contractor shall comply with all relevant health and safety requirements
5. The contractor shall obtain all necessary approvals from utility operators before commencing work, a copy of each to be received
6. Final pavement design subject to confirmation testing on subgrade material
7. Grade schedule with coordinates of chainage points along road centreline to be supplied to the contractor prior to construction
8. Refer to long sections for finished centreline levels, edge of kerb levels and catch pit cover levels for other locations
9. All dimensions have been verified on site by land surveyors in accordance with specification
10. Footpath to be constructed using front of 200 EXISTING Road to be approved Resource Consent 2000454-RMA/LUM approved 29 July 2021 condition 2a

LEGEND

- EX EDY
- EX EASEMENT
- EX CONTOUR MAJOR
- EX CONTOUR MINOR
- EX TREE OVERLINE
- PR EDY
- EX KERB OUTLET
- PR CONTOUR MAJOR
- PR CONTOUR MINOR
- PR EASEMENT
- PR ACCESSWAY
- PR PATH/GARDEN
- EX STORMWATER
- PR STORMWATER
- PR SWALE
- EX/PROP TANK
- PROP SW OP SINGLE

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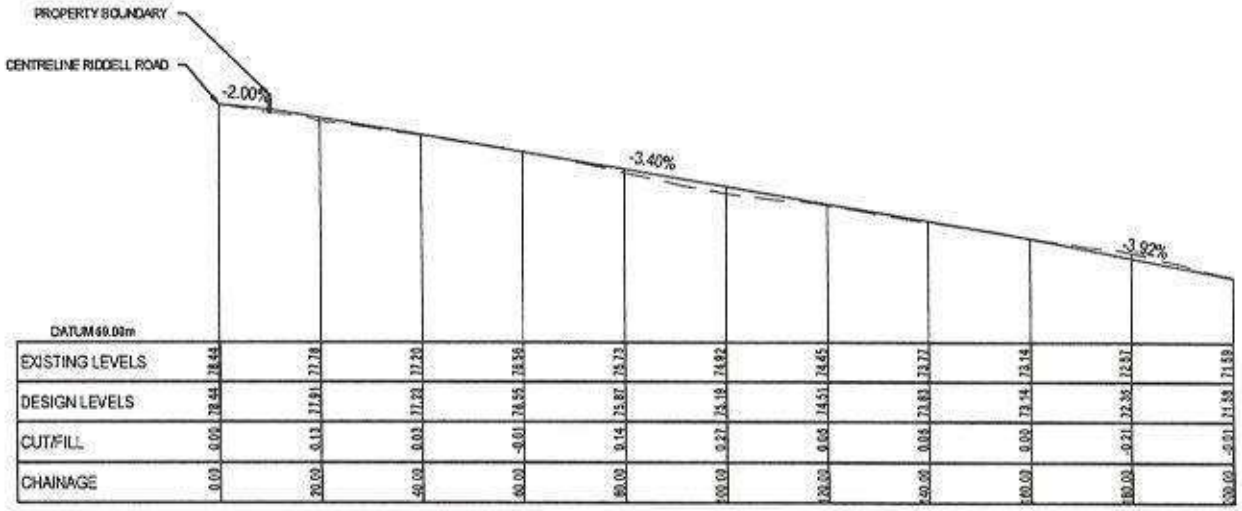
Contact address/phone/email

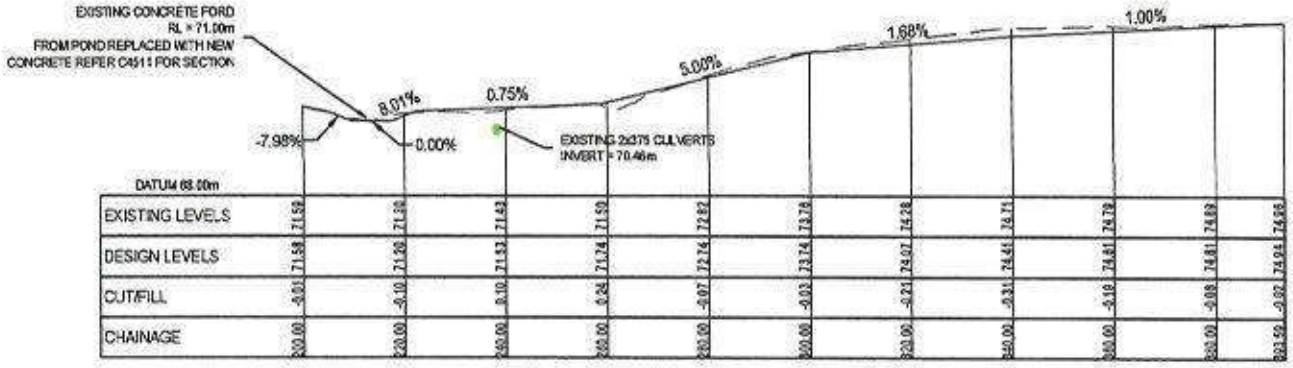
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Riddell Road
Footpath Extension

No	Revision Description	Name	Date
A	Resource Consent	GB	08/05
Surveyed		KM	08/05
Designed		GB	08/05
Drawn		GB	08/05
Checked		JD	11/05
Project no	18401		
Scale	1:250 @ A3		
Datum	[illegible]		
Drawing no	C3005	Rev	A



PROPOSED JOAL 1 - LONGSECTION CH 0 - 200
SCALE 1:1000 HORI 1:200 VERT @ A3



PROPOSED JOAL 1 - LONGSECTION CH 200 - 394
SCALE 1:1000 HORI 1:200 VERT @ A3

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 00 Epoch 2000
3. Levels in terms of the Auckland Vertical Datum 2016

LEGEND
EXISTING
PROPOSED
EXISTING PROFILE
PROPOSED PROFILE

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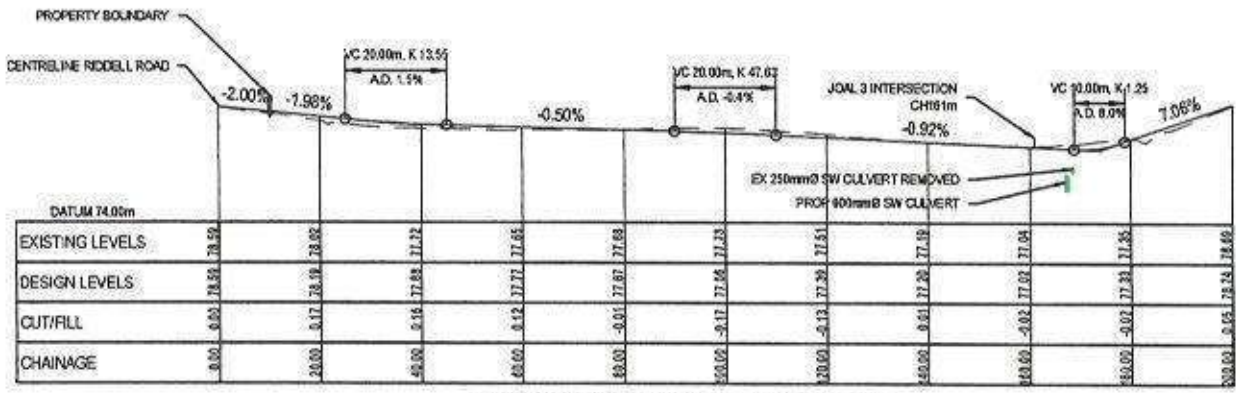
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Roading
Long Section
Sheet 1 of 5

No.	Revision Description	Name	Date
A	Resource Consent	GB	09/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TD	11/25
Project no	10401		
Scale	1:1000 @ A3		
Datum	Levels to Auckland Vertical Datum 2016		
Drawing no	C3100	Rev	A



PROPOSED JOAL 2 - LONGSECTION CH 00 - 200
SCALE 1:1000 HORI 1:200 VERT @ A3

NOTES
1. Allowance to be accepted in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 2016

G.J.S.

LEGEND
EXISTING
PROPOSED
EXISTING PROFILE
PROPOSED PROFILE

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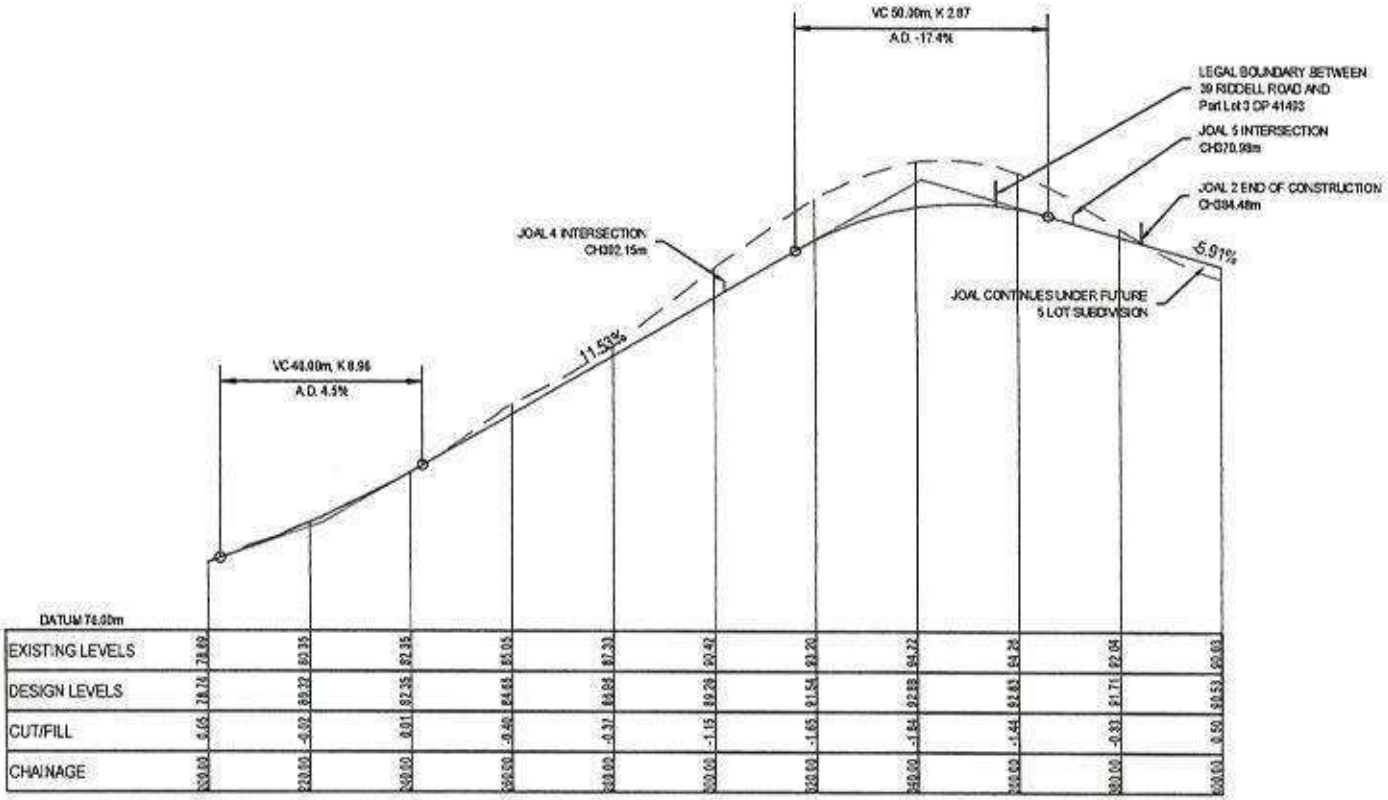
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Roading
Long Section
Sheet 2 of 5

No	Revision Description	Name	Date
A	Resource Consent	GB	12/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TB	11/25
Project No	10401		
Scale	1:1000 @ A3		
Drawing No	C3101	Rev	A



PROPOSED JOAL 2 - LONGSECTION CH200 - 400
SCALE 1:1000 HORI 1:200 VERT @ A3

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum 00 Easting 2000
3. Levels in terms of the Auckland Vertical Datum 2016

LEGEND
EXIST'G
PROP'D
EXIST'G PROFILE
PROP'D PROFILE

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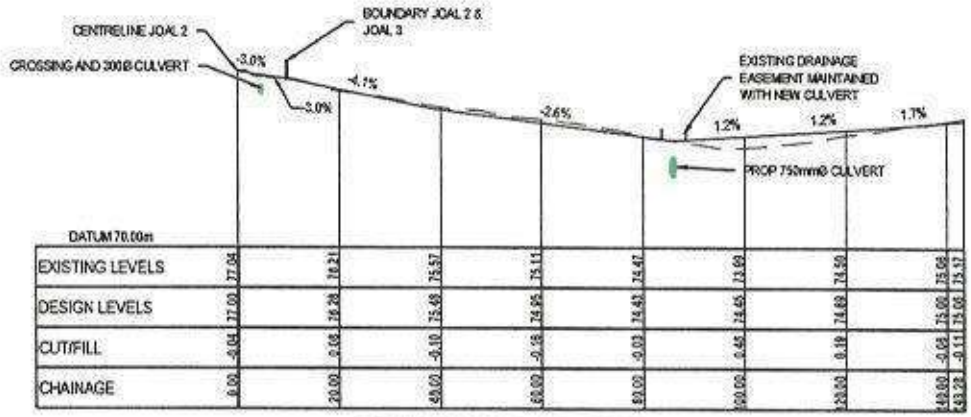
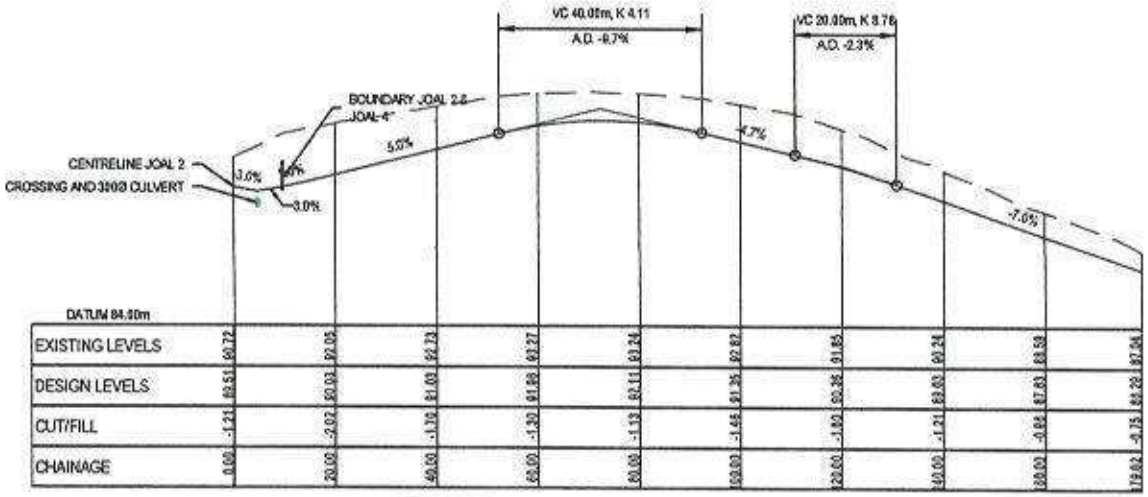
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Roading
Long Section
Sheet 3 of 5

No.	Revision Description	Name	Date
A	Resource Consent	GD	03/25
Surveyed		KM	03/25
Designed		GB	03/25
Drawn		GB	03/25
Checked		TS	11/25
Project no.	10401		
Scale	1:1000 @ A3		
Datum			
Drawing no.	C3102	Rev	A



PROPOSED JOAL 3 - LONGSECTION
SCALE 1:1000 HORI 1:200 VERT @ A3



PROPOSED JOAL 4 - LONGSECTION
SCALE 1:1000 HORI 1:200 VERT @ A3

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 2016

LEGEND
EXISTING
PROPOSED
EXISTING PROFILE
PROPOSED PROFILE

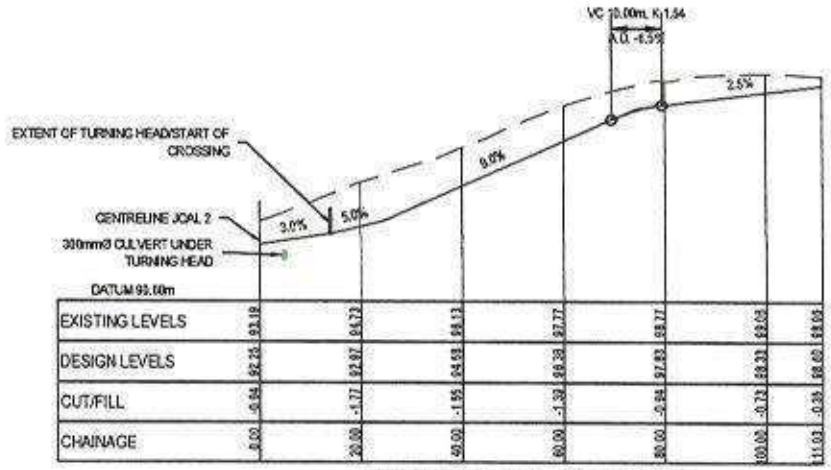
conquel CONSULTING
Contact: adam@conquel.co.nz
Phone: +64 [illegible]

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Roading
Long Section
Sheet 4 of 5

No.	Revision Description	Design	Date
A	Resource Consent	GB	07/25
Surveyed		KW	06/25
Designed		GB	06/25
Drawn		GB	06/25
Checked		TJ	11/25

Project no.	10401
Scale	1:1000 @ A3
Datum	[illegible]
Drawing no.	C3103 Rev A



PROPOSED JOAL 5 - LONGSECTION
SCALE 1:1000 HORI 1:200 VERT @ A3

NOTES

1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels are in terms of the Auckland Vertical Datum 2016

LEGEND

EXISTING
PROPOSED
EXISTING PROFILE
PROPOSED PROFILE

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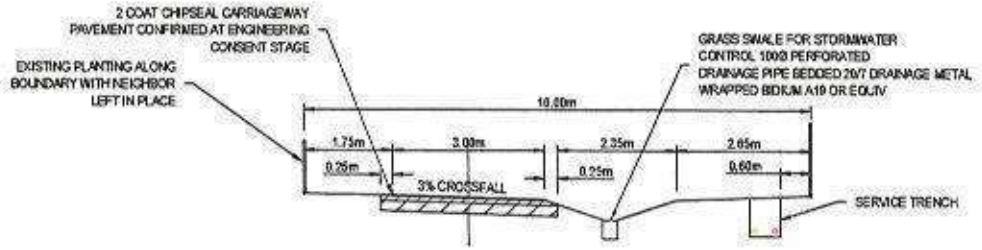
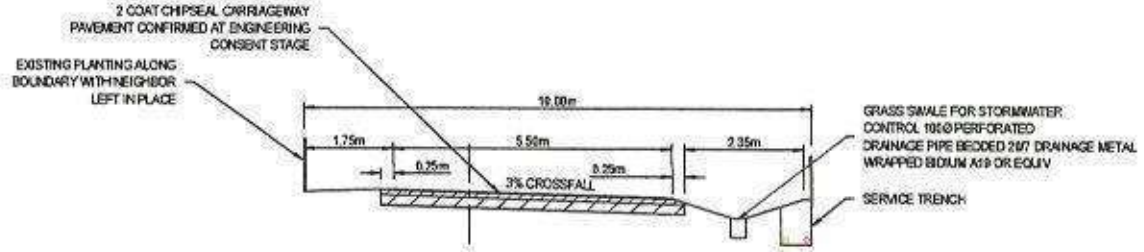
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Roading
Long Section
Sheet 5 of 5

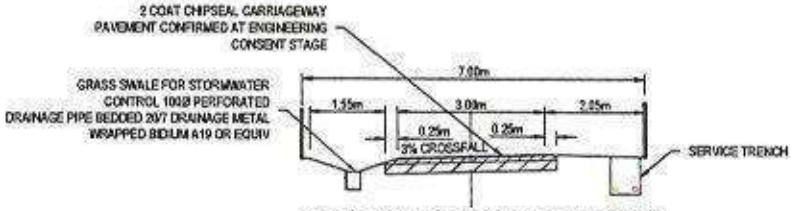
Rev	Revision Description	Name	Date
A	Resource Consent	GB	0905
Surveyed		KM	0905
Designed		GB	0905
Drawn		GB	0905
Checked		TS	1105
Project no	18401		
Scale	1:1000 @ A3		
Cad file			
Drawing no	C3104	Rev	A



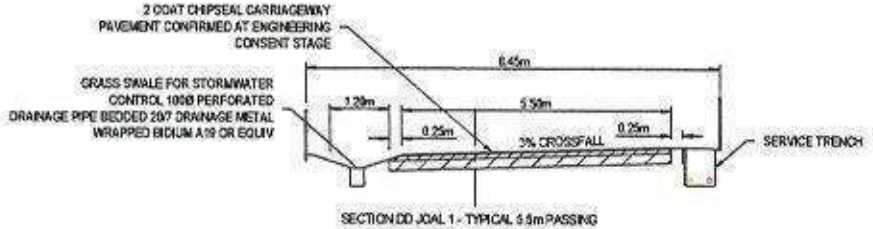
SECTION AA JOAL 1 - TYPICAL 3m CROSS SECTION
CH 30 - 180
1:100 @ A3



SECTION BB JOAL 1 - TYPICAL 5.5m PASSING BAY/ENTRY
CROSS SECTION CH 10 -30, 90-115, 180-210
1:100 @ A3



SECTION CC JOAL 1 - TYPICAL 3m CROSS SECTION CH 240 -280
1:100 @ A3



SECTION DD JOAL 1 - TYPICAL 5.5m PASSING
BAY CROSS SECTION CH 290 -315
1:100 @ A3

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 2016

LEGEND
EX EOV
PL EOV

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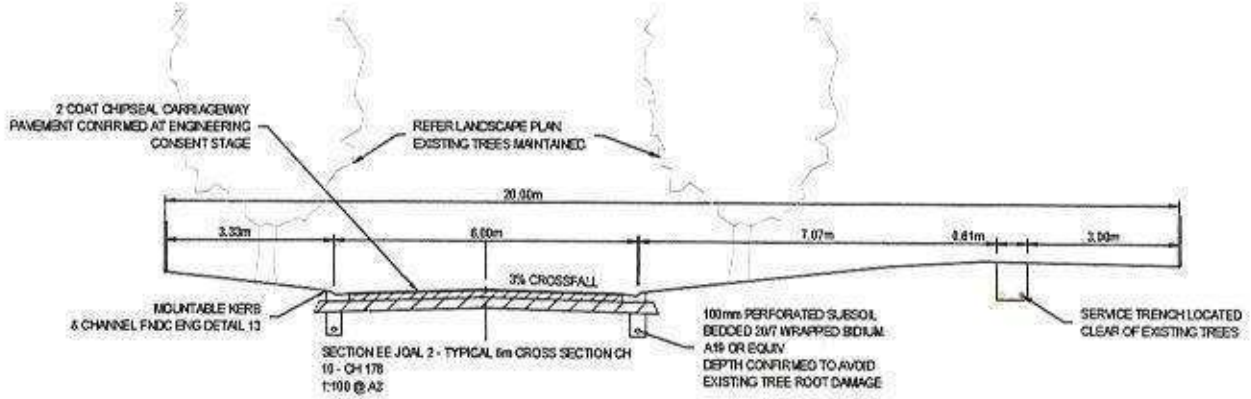
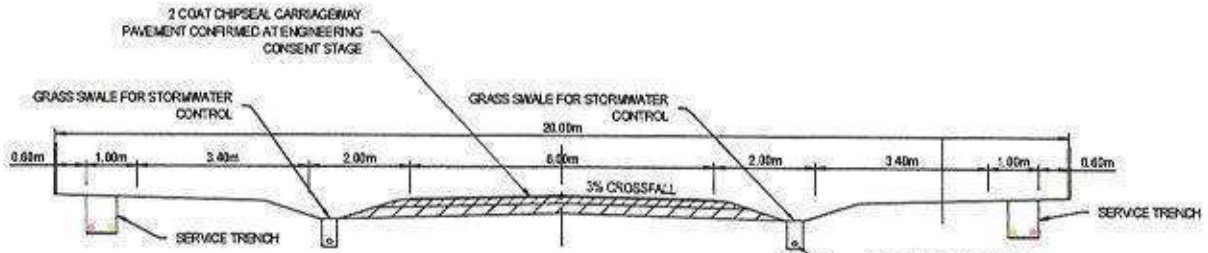
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Typical
Accessway Cross Sections
Sheet 1 of 3

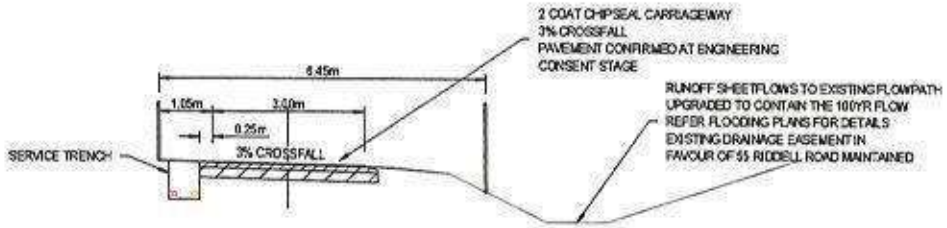
No.	Revision (Description)	Name	Date
A	Revision Consent	GD	10/05
Surveyed		KH	05/05
Designed		GD	05/25
Drawn		GD	05/05
Checked		TS	10/05
Project no.	10401		
Scale	Refer to drawing		
Grid for			
Drawing no.	C3200	Rev	A



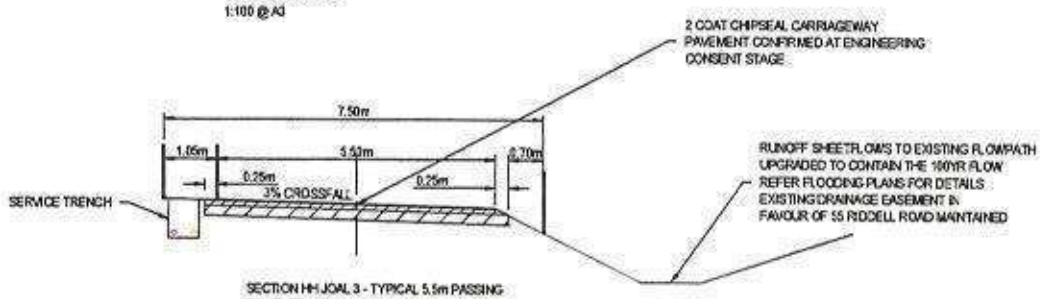
SECTION EE JOAL 2 - TYPICAL 6m CROSS SECTION CH
10 - CH 178
1:100 @ A3



SECTION FF JOAL 2 - TYPICAL 6m CROSS SECTION
CH 178 - CH 369
1:100 @ A3



SECTION GG JOAL 3 - TYPICAL 3m CROSS
SECTION CH 28 - 66
1:100 @ A3



SECTION HH JOAL 3 - TYPICAL 5.5m PASSING
BAY/ENTRY CROSS SECTION CH 6 - 28, 66 - 92
1:100 @ A3

NOTES
1. Allowance to be in accordance with Far North District Council Standards
2. Coordinates of terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 2016

LEGEND
EXISTING
PROPOSED

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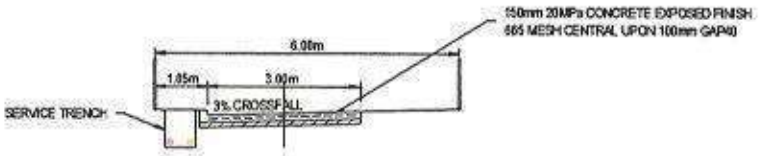
CONSULTING
Contact: admin@conquel.co.nz
Phone: +64 (0)9 261 4555

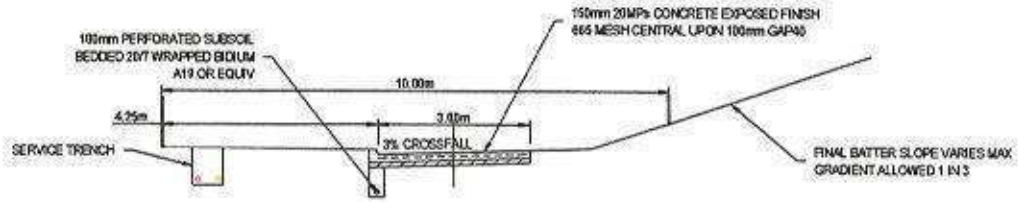
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Typical
Accessway Cross Sections
Sheet 2 of 3

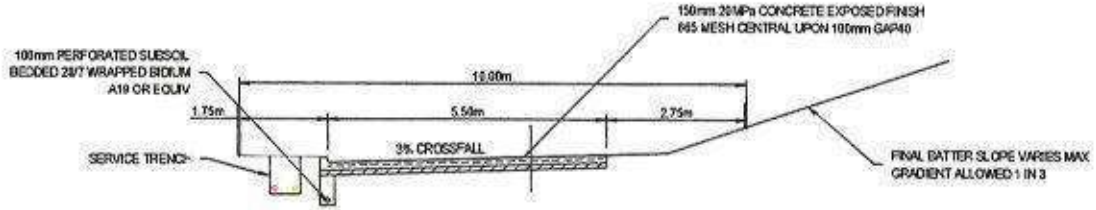
No	Revision / Description	Name	Date
A	Resource Consent	GD	03/05
Surveyed		KM	03/05
Designed		GD	03/05
Drawn		GD	03/05
Checked		TS	11/05
Project no.	10401		
Scale	Refer to drawing		
Datum	[illegible]		
Drawing no.	C3201	Rev	A



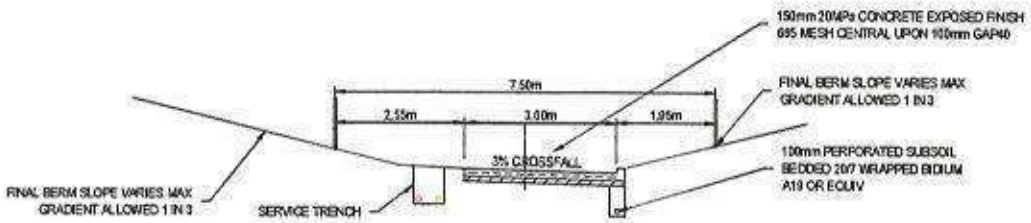
SECTION II JOAL 3 - TYPICAL 3m CROSS SECTION
CH 92 - 143
1:100 @ A3



SECTION JJ JOAL 4 - TYPICAL 3m CROSS SECTION CH 31 - 120, 145 - 179
1:100 @ A3



SECTION KK JOAL 4 - TYPICAL 5.5m PASSING
BAY/ENTRY CROSS SECTION CH 10 - 30, 120 - 145
1:100 @ A3



SECTION LL JOAL 5 - TYPICAL 3m CROSS SECTION
CH 10 - 113
1:100 @ A3

NOTES
1. All works to be in accordance with Far North District Council Standards
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum 1946

a.f.s.

LEGEND
EXISTING
PROPOSED

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Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Typical
Accessway Cross Sections
Sheet 3 of 3

No.	Revision Description	Name	Date
A	Resource Consent	GB	05/25
Surveyed		KW	05/25
Designed		GB	05/25
Drawn		GB	05/25
Checked		TG	11/25
Project no	10401		
Scale	Refer to drawing		
Cad file			
Drawing no	C3202	Rev	A

NOTES

1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant health and safety requirements.
4. The contractor shall obtain all necessary approval from utility operators before commencing work under or near their services.
5. Sediment control to shall be installed and operational before earthworks that occur in accordance with council standards.
6. Contractor shall provide adequate dewatering to avoid onsite erosion and contamination of groundwater volumes in equipment
7. Sediment control to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be contained prior to construction starting onsite. SRP and bore rainwater overlap devices installed. DCD shall be manually dosed after rainfall events.
9. Contours are at 1m intervals.

LEGEND

- EXBDY
- PROPBDY
- EXMINOR CONTOUR
- EXMAJOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR SITE EXTENT
- PR EASEMENT
- EXWATERCOURSE
- EXFLOWPATH
- EXBUILDING
- EX POND
- EX NATURAL WETLAND
- PR FLOWPATH (DWF)
- PR 10 m RIPARIAN SETBACK
- PR EXTENT WATER
- PROP EXTENT MIRE
- PROP CLEANWATER
- PROP DIRTYWATER
- PROP SILT FENCE
- PROP STABILISE
- PROP DECANT
- PROP DECANT BAR

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Taraire Tahi Limited
Riddell Road
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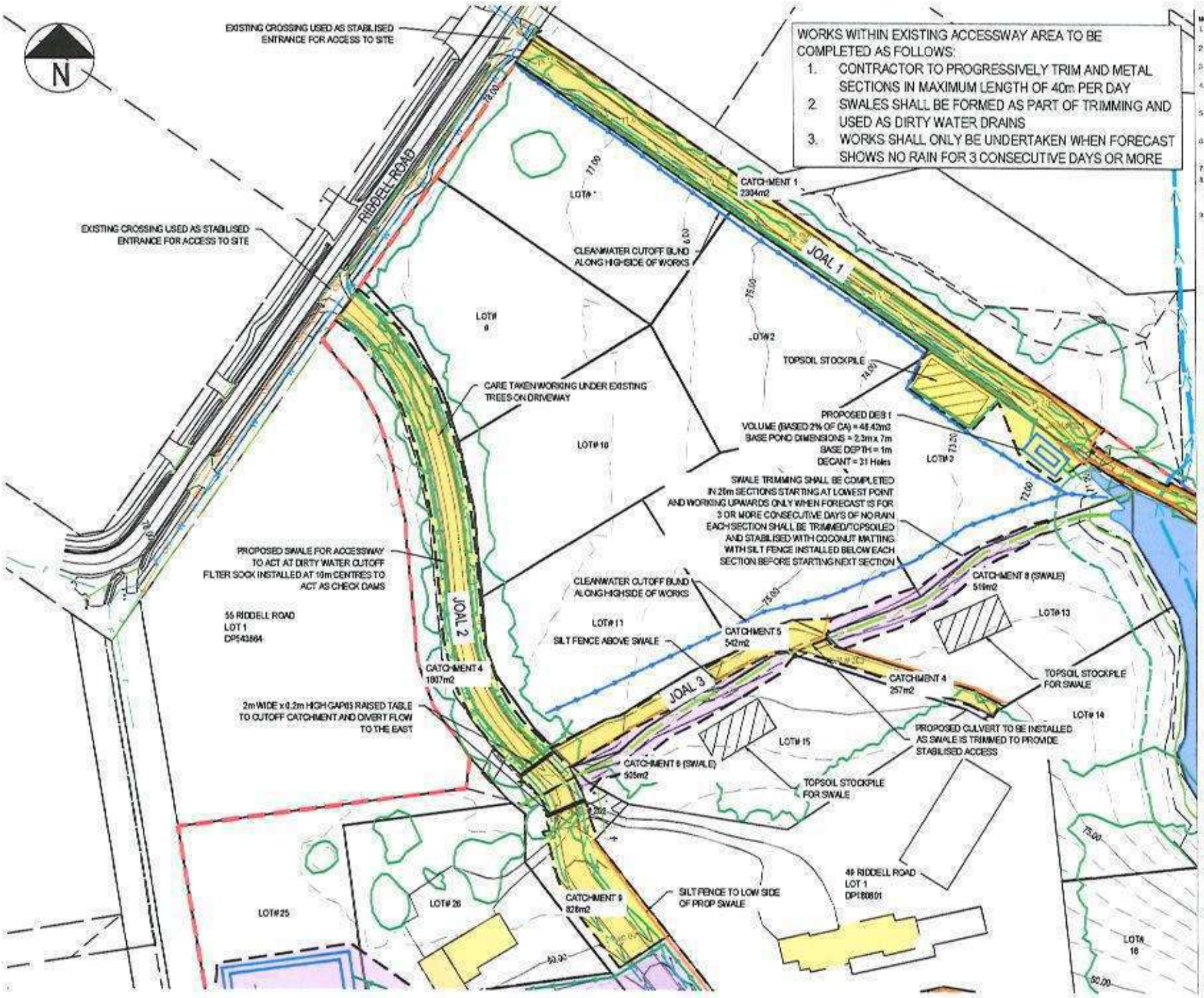
Overview Proposed Earthworks and Sediment Control Plan

No.	Revision (Description)	Name	Date
A	Resource Consent	KD	11/05
Surveyed		KD	09/05
Designed		CB	09/05
Drawn		CB	09/05
Checked		TS	11/05
Project no	10401		
Scale	1:2000 @ A3		
Datum	[illegible]		
Drawing no	C2000	Rev	A



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Riddell Road
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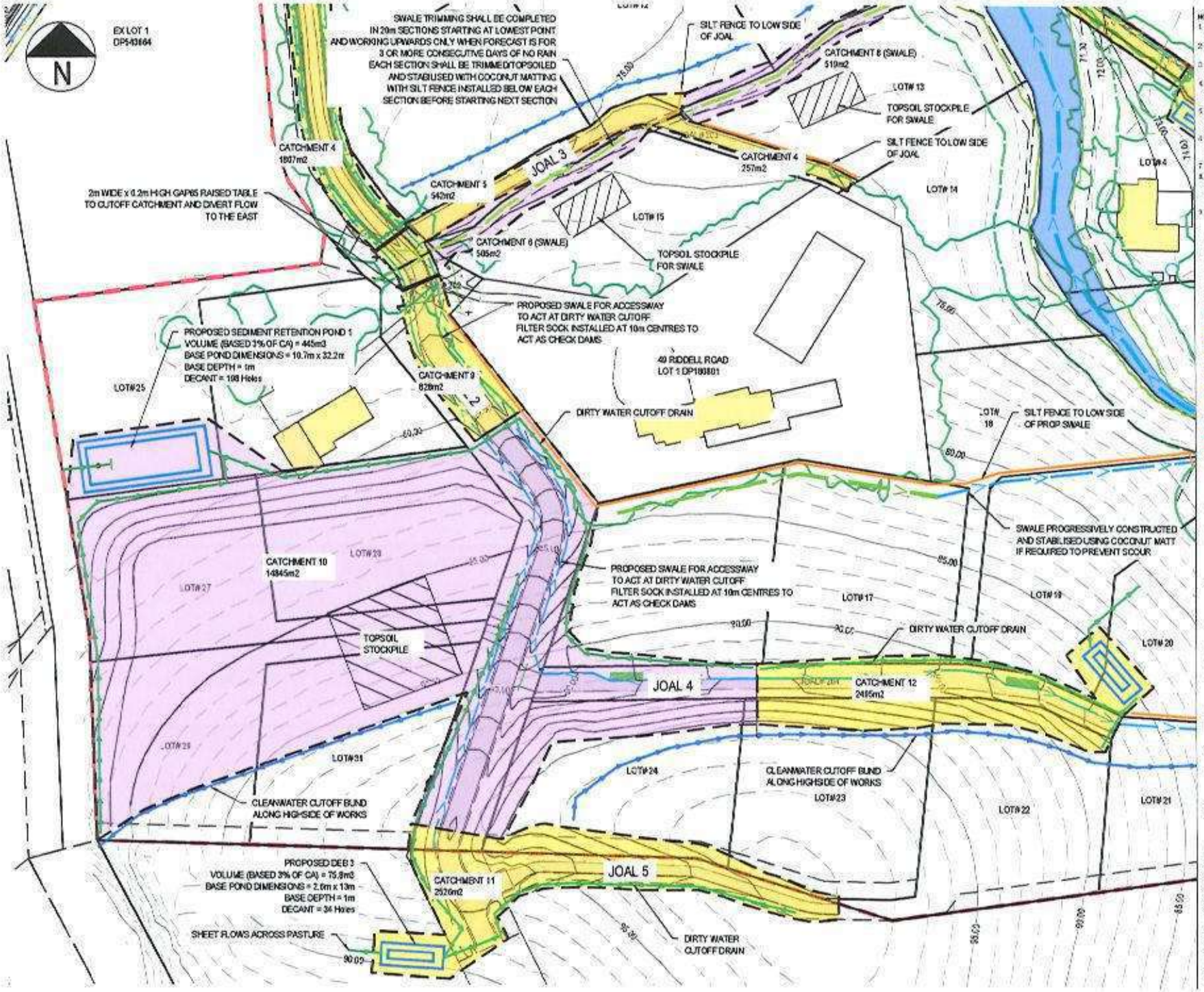
Proposed Earthworks and Sediment Control
Sheet 1 of 4

No	Revision Description	Name	Date
A	Resource Consent	GS	03/25

Surveyed	WW	03/25
Designed	GS	03/25
Drawn	GS	03/25
Checked	TS	11/25
Project no	10401	
Scale	1:1000 @ A3	
Drawing no	C2001	Rev A


N
EX LOT 1
DP543664
SWALE TRIMMING SHALL BE COMPLETED IN 20m SECTIONS STARTING AT LOWEST POINT AND WORKING UPWARDS ONLY WHEN FORECAST IS FOR 3 OR MORE CONSECUTIVE DAYS OF NO RAIN EACH SECTION SHALL BE TRIMMED/TOPSOILED AND STABILISED WITH COCONUT MATTING WITH SILT FENCE INSTALLED BELOW EACH SECTION BEFORE STARTING NEXT SECTION
SILT FENCE TO LOW SIDE OF JOAL
CATCHMENT 8 (SWALE)
519m2
LOT# 13
TOPSOIL STOCKPILE FOR SWALE
SILT FENCE TO LOW SIDE OF JOAL
CATCHMENT 4
1807m2
JOAL 3
CATCHMENT 5
542m2
CATCHMENT 4
257m2
LOT# 14
LOT# 4
2m WIDE x 0.2m HIGH GAP65 RAISED TABLE TO CUTOFF CATCHMENT AND DIVERT FLOW TO THE EAST
LOT# 15
CATCHMENT 6 (SWALE)
505m2
TOPSOIL STOCKPILE FOR SWALE
PROPOSED SWALE FOR ACCESSWAY TO ACT AT DIRTY WATER CUTOFF FILTER SOCK INSTALLED AT 10m CENTRES TO ACT AS CHECK DAMS
PROPOSED SEDIMENT RETENTION POND 1
VOLUME (BASED 3% OF CA) = 445m3
BASE POND DIMENSIONS = 10.7m x 32.2m
BASE DEPTH = 1m
DECANT = 108 Holes
49 RIDDELL ROAD
LOT 1 DP180801
LOT#25
CATCHMENT 9
828m2
DIRTY WATER CUTOFF DRAIN
LOT# 18
SILT FENCE TO LOW SIDE OF PROP SWALE
SWALE PROGRESSIVELY CONSTRUCTED AND STABILISED USING COCONUT MATT IF REQUIRED TO PREVENT SCOUR
CATCHMENT 10
14845m2
LOT#29
LOT#27
PROPOSED SWALE FOR ACCESSWAY TO ACT AT DIRTY WATER CUTOFF FILTER SOCK INSTALLED AT 10m CENTRES TO ACT AS CHECK DAMS
LOT# 17
LOT# 19
DIRTY WATER CUTOFF DRAIN
TOPSOIL STOCKPILE
JOAL 4
CATCHMENT 12
2485m2
LOT# 20
LOT#28
LOT#31
LOT#24
CLEANWATER CUTOFF BUND ALONG HIGHSIDE OF WORKS
LOT#23
LOT# 22
LOT# 21
CLEANWATER CUTOFF BUND ALONG HIGHSIDE OF WORKS
PROPOSED DEB 3
VOLUME (BASED 3% OF CA) = 75.9m3
BASE POND DIMENSIONS = 2.6m x 13m
BASE DEPTH = 1m
DECANT = 34 Holes
CATCHMENT 11
2926m2
JOAL 5
SHEET FLOWS ACROSS PASTURE
DIRTY WATER CUTOFF DRAIN
NOTES
1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant health and safety requirements.
4. The contractor shall obtain all necessary approvals from utility operators before commencing work under or over their services.
5. Sediment control shall be installed and maintained to control sediment discharges that exist in accordance with council standards.
6. Contractor shall provide details of existing sediment control devices and confirm on site adjustment requirements to engineer.
7. Sediment control to comply with GD01 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting on site. CRP shall have automatic dosing pump as installed. SCD must be manually dosed after rainfall events.
9. Contractor to verify all services.
LEGEND
EXTENT
PROP EXT
EX MAJOR CONTOUR
EX MINOR CONTOUR
PR MAJOR CONTOUR
PR MINOR CONTOUR
PROTECTION
PROPERTY
EX WATER COURSE
EX FLOWPATH
EXIST LONG
EX POND
EX NATURAL WETLAND
PR FLOWPATH LONG
PR 10m RIPARIAN SETBACK
PR EXTENT MAIN
PROP EXTENT WORK
PROP CLEANWATER
PROP DIRTY WATER
PROP SILT FENCE
PROP STOCKPILE
PROP DECANT
PROP DECANT BAR
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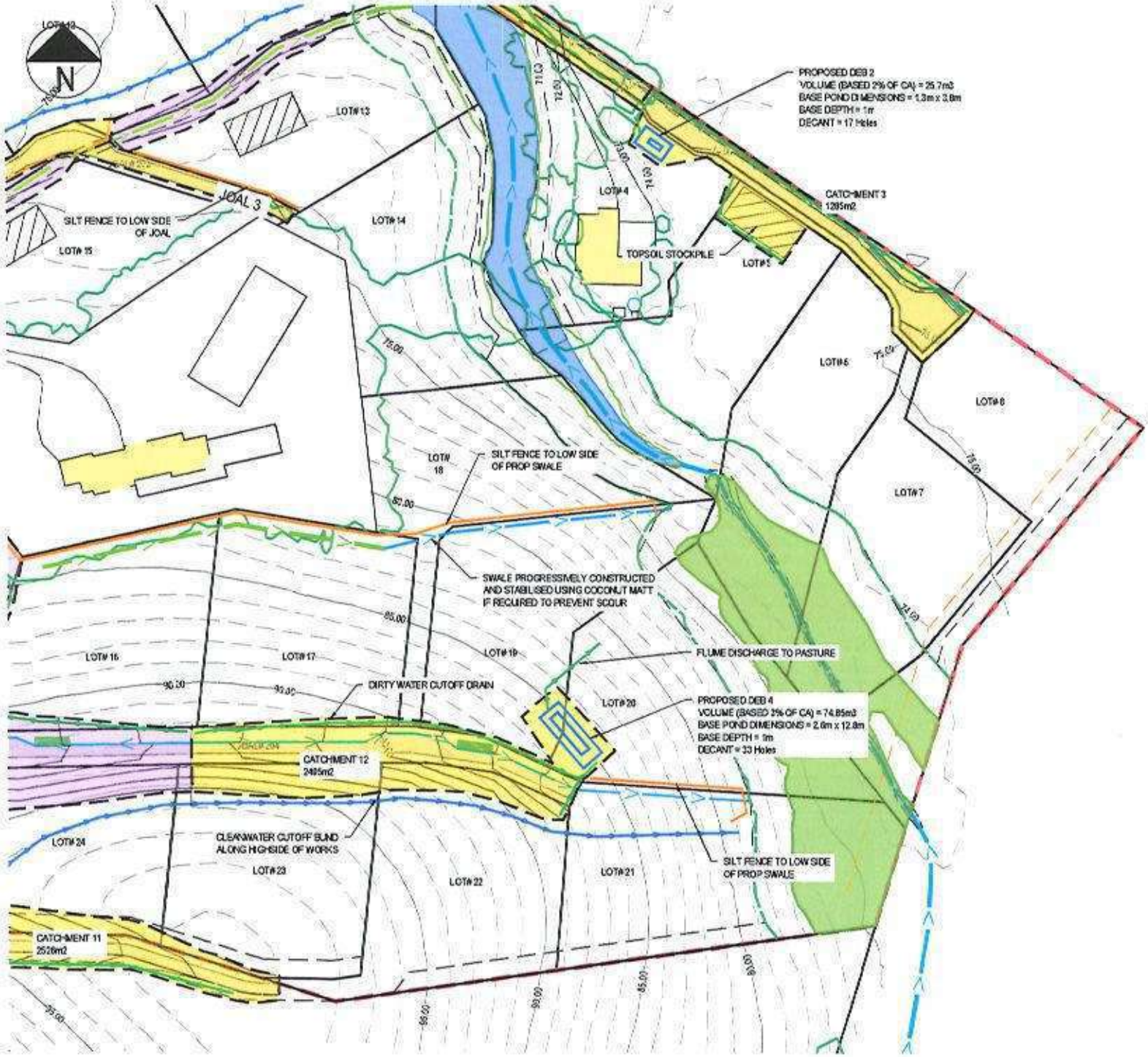
Taraire Tahi Limited
Riddell Road
Kerikeri
Proposed Earthworks and Sediment Control
Sheet 2 of 4
No. Revision (Description) Name Date
A Revision Comment GD 03/25
Surveyed GD 03/25
Designed GD 03/25
Drawn GD 03/25
Checked IS 11/25
Project no 10401
Scale 1:1000 @ A3
Drawing no C2002 Rev A



NOTES

1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant health and safety requirements.
4. The contractor shall obtain all necessary approval from utility providers before commencing work under or near their services.
5. Sediment control shall be inspected and maintained when rainfall is likely to occur in accordance with council standards.
6. Contractor shall provide a plan of the supply of bund control devices and confirmation of construction volumes to engineer.
7. Sediment controls to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting works. CTP shall have all specific design devices, volumes, DEB shall be manually dosed after rainfall events.
9. Contractor to verify all levels.

LEGEND

- EXBDY
- PROPBDY
- EXMAJOR CONTOUR
- EXMINOR CONTOUR
- PRMAJOR CONTOUR
- PRMINOR CONTOUR
- PR SITE EXTENT
- PR EASEMENT
- EXWATERCOURSE
- EXFLOWPATH
- EXBUILDING
- EXPOND
- EX NATURAL WETLAND
- PR FLOWPATH 300YR
- PR 100YR FLOOD EXTENT
- PR EXTENT 100YR
- PROP EXTENT WORK
- PROP CLEANWATER
- PROP DIRTY WATER
- PROP SILT FENCE
- PROP STOCKPILE
- PROP DECANT
- PROP DECANT BAR

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Taraire Tahi Limited
Riddell Road
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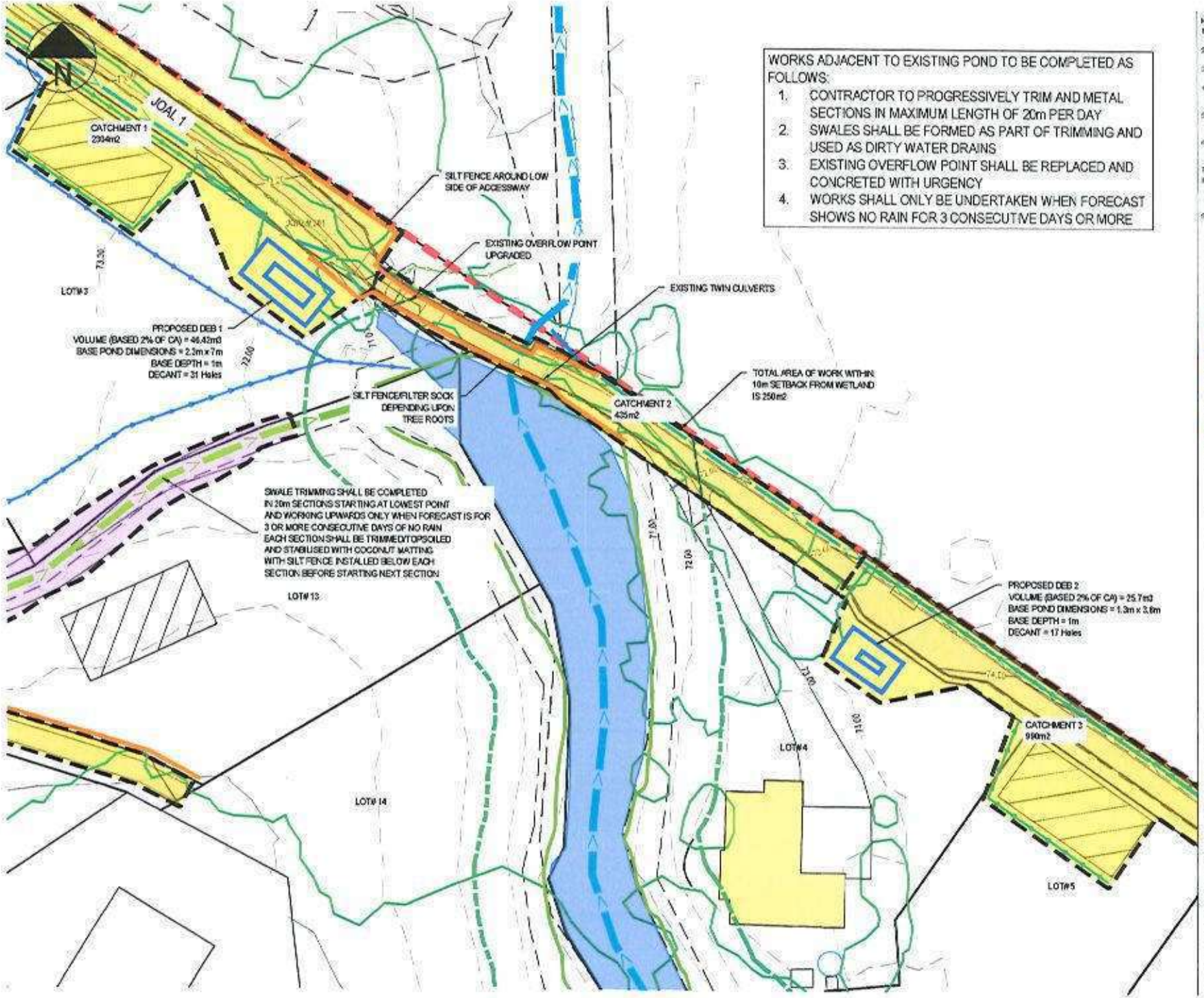
Proposed Earthworks and Sediment Control
Sheet 3 of 4

No	Revision Description	Name	Date
A	Resource Consent	GB	12/25

Surveyed	RM	09/25
Designed	GB	09/25
Drawn	GB	09/25
Checked	TJ	11/25
Project no	10401	
Scale	1:1000 @ A3	
Cad file	[illegible]	
Drawing no	C2003	Rev A



NOTES

1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all requirements and Safety requirements.
4. The contractor shall obtain all necessary approvals from utility operators before commencing work under or over their services.
5. Sediment control shall be installed and maintained prior to earthworks that could be undertaken in accordance with current standards.
6. Certified as shall remain on site at all times. Sediment control devices and construction of protective earthworks to engineer.
7. Sediment control to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting on site. SRP shall have permission to discharge treated/settled CCD shall be manually discharged at suitable events.
9. Contractor to all Traffic work.

LEGEND

- EXISTING
- PROPERTY
- EXISTING CONTOUR
- EXISTING CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PR SITE EXTENT
- PR EASEMENT
- EX WATERCOURSE
- EXT FLOWPATH
- EX BUILDING
- EX POND
- EX NATURAL WETLAND
- PR FLOWPATH 100YR
- PR 10m RIPARIAN SETBACK
- PR EXTENT 100YR
- PROP EXTENT WORK
- PROP CLEANWATER
- PROP DIRTYWATER
- PROP SILT FENCE
- PROP STOCKPILE
- PROP DECANT
- PROP DECANT BAR

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Contact: adam@conquel.co.nz
Phone: +64 (0) 9 408 1221

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Earthworks and Sediment Control

Sheet 4 of 4

No.	Revision Description	Name	Date
A	Resource Consent	GB	09/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TG	11/25

Project no	10401
Scale	1:500 @ A3
Cad file	
Drawing no	C2004
Rev	A

NOTES:

1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant health and safety requirements.
4. The contractor shall obtain all necessary approvals from utility operators before commencing work in the vicinity of their services.
5. Sediment control shall be installed and operational before earthworks start and in accordance with council standards.
6. Contractor shall provide access to roadway sediment control devices and confirmation of pond/decant volumes to engineer.
7. Sediment control to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting on site. SCP shall have automatic dosing devices installed. DCI shall be manually dosed after each event.
9. Contours are at 1m intervals.

LEGEND

- EX BDY
- PROP BDY
- EX MAJOR CONTOUR
- EX MINOR CONTOUR
- PR MAJOR CONTOUR
- PR MINOR CONTOUR
- PROPOSED WORKS

Cut/Fill Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-3.000	-2.000	
2	-2.000	-1.000	
3	-1.000	0.000	
4	0.000	1.000	
5	1.000	2.000	
6	2.000	3.000	
7	3.000	4.000	

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Contact: admin@conquel.co.nz
Phone: +64(0)9 4303

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Cut to Fill Plan
Sheet 1 of 3

No	Revision Description	Name	Date
A	Resource Consent	CB	12/25
Surveyed		KM	09/25
Designed		CB	09/25
Drawn		CB	09/25
Checked		TB	11/25
Project no	10401		
Scale	1:1000 @ A3		
Cad file	kerikeri cut to fill.dwg		
Drawing no	C2101	Rev	A

NOTES

1. All work to be in accordance with Far North Council standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant health and safety requirements.
4. The contractor shall obtain all necessary approvals from a utility owner(s) before commencing work, plant or over their services.
5. Sediment control shall be installed as required to control sediment discharge in accordance with council standards.
6. Contractor shall provide access to existing residential property owners and coordination of construction activities to neighbours.
7. Sediment control to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting on site. CMT shall have authorised discharge consent installed. DER shall be removed, cleaned after last rainfall events.
9. Contractor to visit site before work.

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED EARTHWORKS

Cut/Fill Table

Number #	Minimum Elevation	Maximum Elevation	Color
1	-3.000	-2.000	
2	-2.000	-1.000	
3	-1.000	0.000	
4	0.000	1.000	
5	1.000	2.000	
6	2.000	3.000	
7	3.000	4.000	

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Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Cut to Fill Plan
Sheet 2 of 3

No.	Revision Description	Name	Date
A	Resource Consent	GB	12/25

Surveyed	KM	09/25
Designed	GB	09/25
Drawn	GB	09/25
Checked	TS	11/25
Project no.	10401	
Scale	1:1000 @ A3	
Cad file		
Drawing no.	C2102	Rev A

EARTH WORKS (SURFACE E-GL-SUBGRADE COMPARISON WITH SURFACE P-GL-SUBGRADE)

CUT VOLUME		8,702 m³
FILL VOLUME		9006 m³
NET CUT		304 m³
TOPSOIL STRIPPED	=	5,211 m³ (assume 300mm)
EXISTING DRIVEWAY	=	339 m³ (assume 100mm)
EARTHWORKS AREA	=	17832m²

NOTE: NO ALLOWANCE FOR SERVICES TRENCHES, VOLUMES ARE UNFACTORED AND IN SITU

NOTES:
1. All works to be in accordance with Far North Council Standards.
2. It is the contractors responsibility to locate all services that may be affected by their operations.
3. The contractor shall comply with all relevant site and road safety requirements.
4. The contractor shall obtain all necessary approvals from utility operators before commencing any works on or over their services.
5. Sediment control shall be installed and operational before earthworks that could result in sediment discharge commence and shall be maintained in accordance with Council standards.
6. Contractor shall provide details of existing and proposed contour elevations and confirmation of predetermined setout points to engineer.
7. Sediment control to comply with GD05 standards.
8. Chemical Treatment Management Plan shall be completed prior to construction starting onsite. CTMP shall have reference to rainfall events and DED shall be manually dosed after rainfall events.
9. Contractor to set out the works.

LEGEND

- EXISTING
- PROPOSED
- EXISTING MAJOR CONTOUR
- EXISTING CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED EXTENT WORK

Cut/Fill Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-3.000	-2.000	
2	-2.000	-1.000	
3	-1.000	0.000	
4	0.000	1.000	
5	1.000	2.000	
6	2.000	3.000	
7	3.000	4.000	

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Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed
Cut to Fill Plan
Sheet 3 of 3

No.	Revision (Description)	Name	Date
A	Resource Consent	GB	19/05
Surveyed		NW	09/05
Designed		GB	19/05
Drawn		GB	09/05
Checked		TB	19/05
Project no	10401		
Scale	1:1000 @ A3		
Cad file			
Drawing no	C2103	Rev	A

a.f.s.

Notes

1. All works to be constructed in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum 1949 Zone 2000
3. Levels in terms of the Auckland Vertical Datum 1946
4. It is the contractors responsibility to locate all services that may be affected by their operations.
5. Pipe bedding: 0 - 90% granular bedding, 10 - 20% weak concrete bedding, greater than 20% weak concrete bedding. Pipes plus with cover bedded in concrete.
6. Each connection to be marked by a 50 mm x 50 mm treated pine stake extending 600 mm above ground level with the top painted. The marker post shall be placed at right angles to the centre line of pipe laying and extending from the connection to 100 mm below finished ground level. Connections shall be accurately dimensioned on "as built" plans.
7. Approved backfill only to be used in backfilling of all road crossings and vehicle crossings in council carriageways.
8. Heavy duty manhole lids and frames to be used on trafficked areas.
9. All manholes are to be 1050 mm Ø precast concrete unless shown otherwise.
10. All inspection shall be 675x450x1200 unless noted otherwise.
11. All catchpit inlets shall have min cover 1.0 m.
12. All lines to be abandoned shall be capped at each end and completely filled with grout.
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in unsealed areas.
15. Developer shall confirm all existing invert and confirm they match design at tie in level before starting works.
16. Private drainage plans comply with all with E1/AS1 Building code for storm water

LEGEND

EX BDY
PROP BDY
PR SW PUBLIC
PR SW PRIVATE
PR SW SUBSOIL
PR SW SWALE
PR RAINGARDEN
PR HANDFILL BACKFILL
CAPP OP S MH
PROP SW CP SINGLE
PROP SW CP DOUBLE
PR SW LOT CON
PR WW LOT CON

conquel CONSULTING

Contact: adrian@conquel.co.nz
Phone: +64 (0)9 445 4221

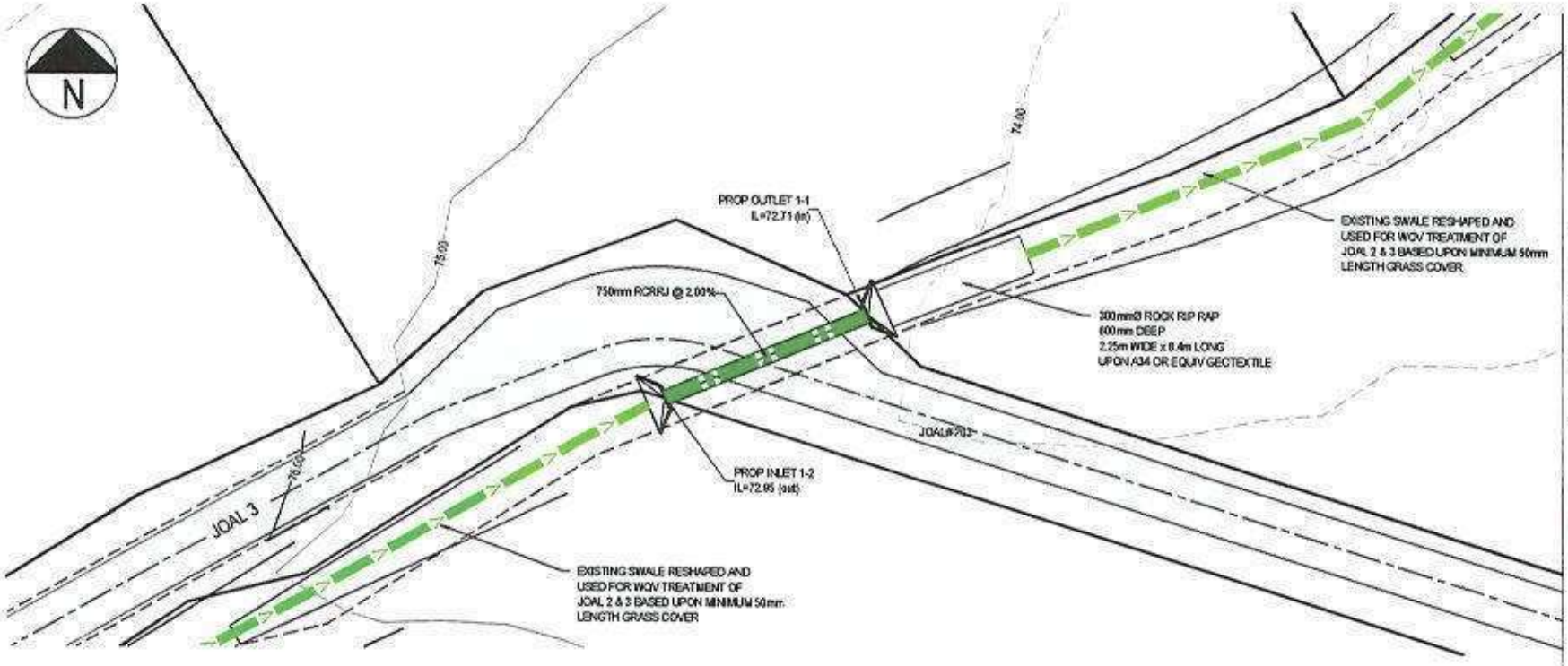
Taraire Tahi Limited
Riddell Road
Kerikeri

Overview Proposed Stormwater Layout Plan

No	Revision Description	Name	Date
A	Resource Consent	GB	12/25

Surveyed	KN	09/25
Designed	GB	09/25
Drawn	GB	09/25
Checked	TS	12/25

Project no	10401		
Scale	1:2500 @ A3		
Cad file			
Drawing no	C4000	Rev	A

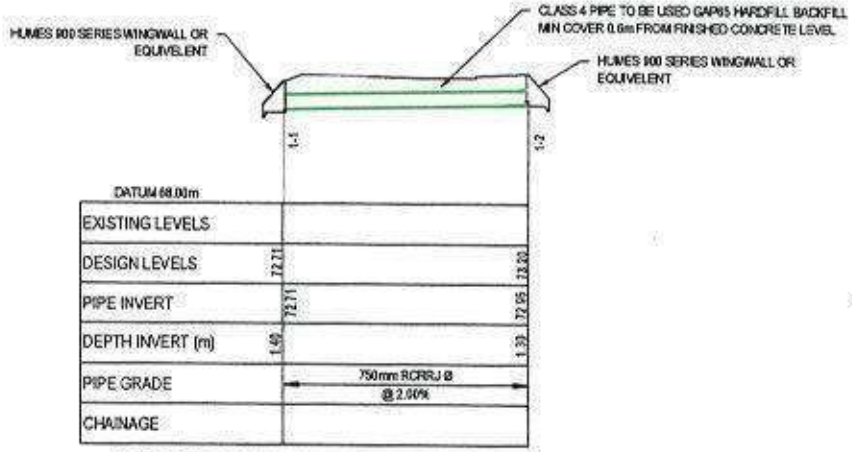


Notes

1. All works to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. The Contractor is responsible to locate all services that may be affected by their operations.
5. Pipe bedding: 0 - 10% granular bedding; 10 - 20% weak concrete bedding; greater than 20% weak concrete bedding. Pipe plus soil cover loads at Cl 2.6.1.
6. Earthworks shall be inside of the 0.5 m high 50 mm treated pine stake extending 600mm above ground level with 50 x 50 packed. Stakes marked with blue paint except for stakes marking the edge of open water, installed at the time of pipework and extending from the connection to 150mm below finished ground level. Connections shall be accurately referenced on "as built" plans.
7. Approved backfill to be used in backfilling of all road crossings and where crossings locations indicated.
8. Heavy duty manhole lids and frames to be used in trafficable areas.
9. All manholes are to be 1050 mm Ø precast concrete unless shown otherwise.
10. All concrete shall be 25 MPa/28 d/20 mm aggregate unless noted otherwise.
11. All catchpit lids to be 'open mesh' type.
12. All lines to be abandoned shall be sealed at each end and combinated with a small wall.
13. All uPVC pipework shall be SN8 unless shown otherwise.
14. All concrete pipe shall be Class 4 under pavement areas, Class 2 in berm and lots.
15. Drainage details within all existing streets and catchments may require design by Engineer before starting works.
16. Private Drainage shall comply in all with E1/AS1 building code handbook guide.

LEGEND

- EX RDY
- PROP RDY
- PR SW PUBLIC
- PR SW PRIVATE
- PR SW SWALE
- PR SW SWALE
- PR RAINGARDEN
- PR HARDFILL BACKFILL
- CL/PROP SWSH
- PROP SWCP SINGLE
- PROP SWCP DOUBLE
- PR SW LOT CON
- PR SW LOT CON



PROPOSED STORMWATER LONGSECITON 1-1 TO 1-2
SCALE 1:250 @ A3

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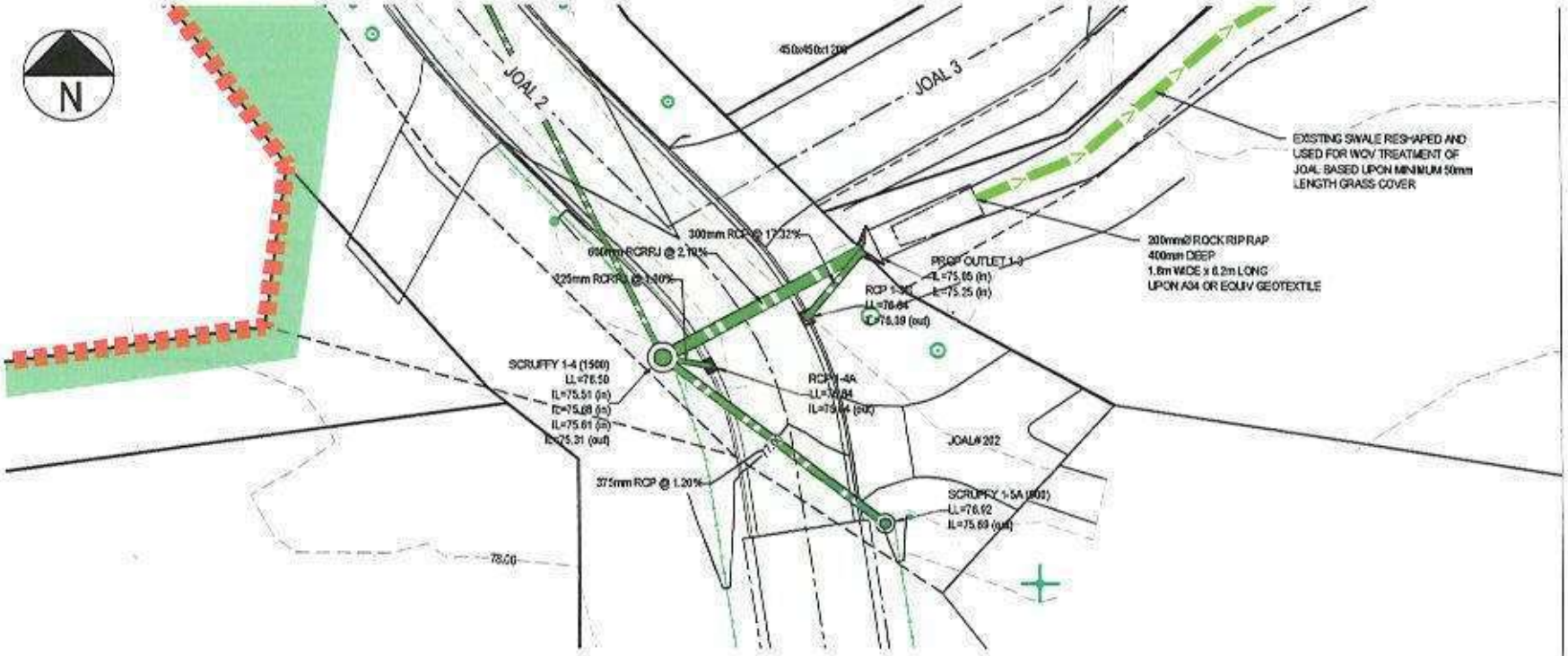
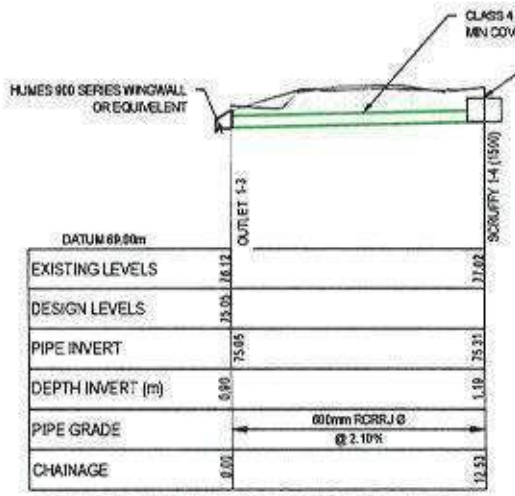
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater Drainage Plan Sheet 1 of 6

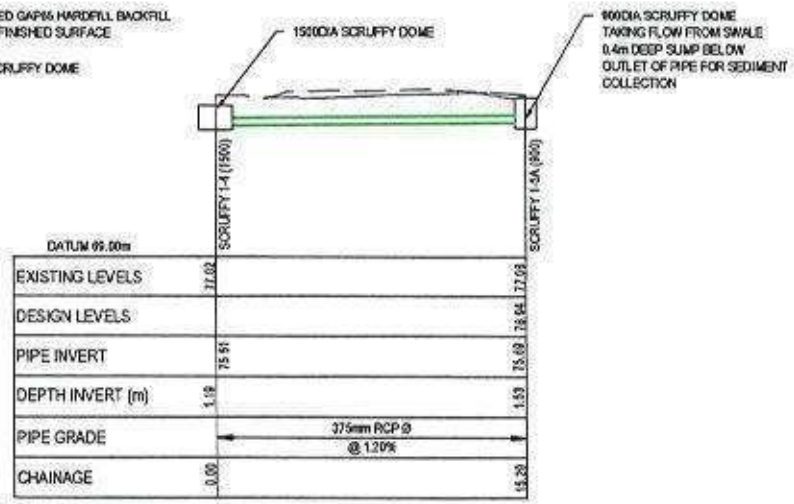
No.	Revision / Description	Name	Date
A	Resource Consent	CD	03/25
Surveyed		KM	03/25
Designed		CB	03/25
Drawn		CB	03/25
Checked		TS	12/25

Project no.	10401
Scale	1:250 @ A3
Cad file	CAD\10401DRAINAGE.DWG
Drawing no.	C4001 Rev A





PROPOSED STORMWATER LONGSECITON 1-3 TO 1-4
SCALE 1:250 @ A3



PROPOSED STORMWATER LONGSECITON CONN TO 1-3A
SCALE 1:250 @ A3

Notes
1. All works to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum 1949 Zone 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractors responsibility to locate all services that may be affected by their operations.
5. Pipe bedding: 0 - 10% granular bedding, 10 - 25% weak concrete bedding, greater than 25% weak concrete bedding (Pipe plus all concrete blocks, all in m).
6. Each connection shall be marked by a 75mm x 50mm treated pine stake extending 600mm above ground level with 'S' top painted. This marker post shall be placed alongside a trench marker outside of the line of pipe laying and extending from the connection to 150mm below finished ground level. Connections shall be accurately indicated on "as built" plans.
7. Approved backfill is to be used in backfilling of all road crossings and vehicle crossings to council standards.
8. Heavy duty manhole lids and frames to be used in trafficked areas.
9. All manholes are to be 1050mm Ø precast concrete unless shown otherwise.
10. All cesspits shall be GTC or CDK 510 unless noted otherwise.
11. All cesspit levels shall have a sump of 1.0m.
12. All lines to be underground shall be sealed at each end and coordinated with council staff.
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in berm and 0/S.
15. Drainage to be confirmed at existing invert and extra to they match design to Engineer before starting work.
16. Private Drainage shall comply to all with E1/AS1 backing over trenches under

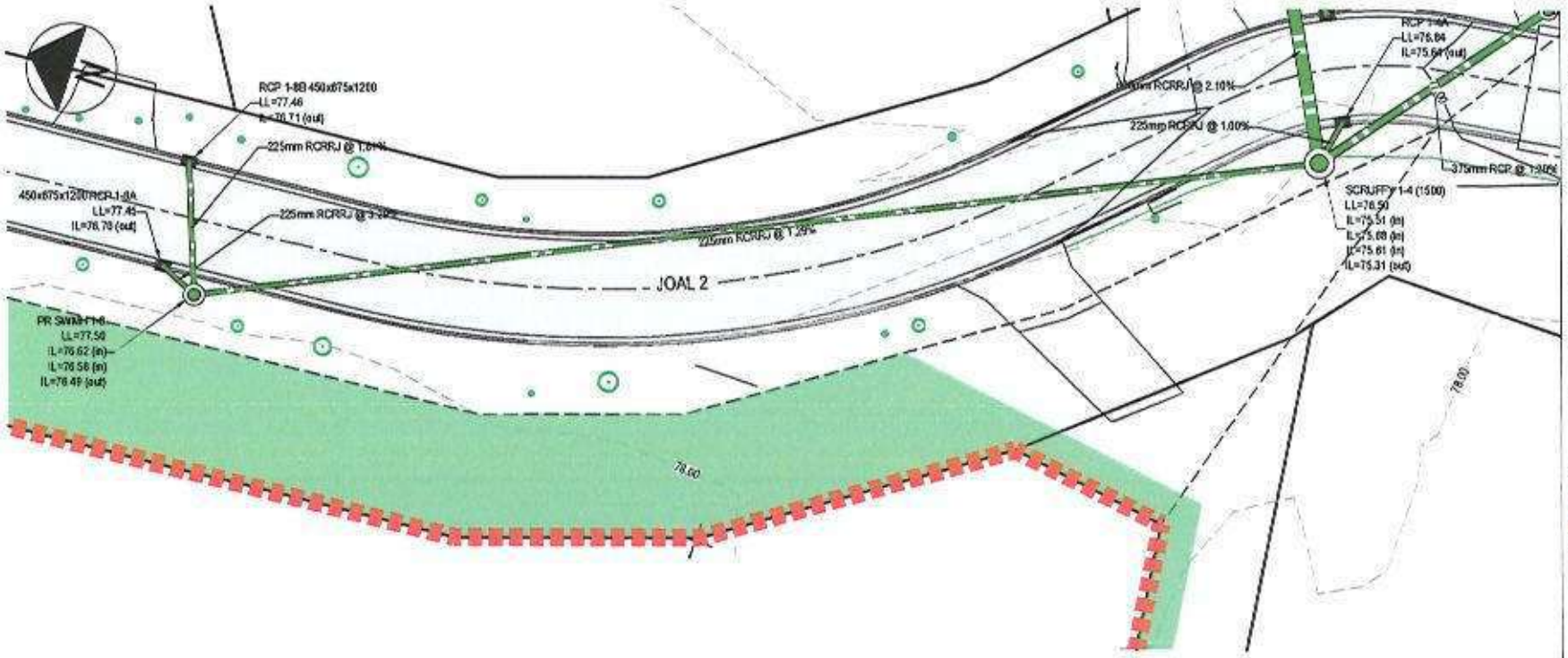
LEGEND
EXIST
PROP RET
PR SW PUBLIC
PR SW PRIVATE
PR SW SUBSOIL
PR SW SWALE
PR RAINGARDEN
PR HARDFILL BACKFILL
EXPROP CMH
PROP CMCP SINGLE
PROP CMCP DOUBLE
PR SW LOT CON
PR WW LOT CON

conquel CONSULTING
Contact: admin@conquel.co.nz
Phone: 09 4050 650

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater Drainage Plan
Sheet 2 of 6

No.	Revision / Description	Drawn	Date
A	Resource Consent	GD	12/25
Surveyed		KM	09/25
Designed		GD	09/25
Drawn		GD	09/25
Checked		FS	12/25
Project no.	10401		
Scale	1:250 @ A3		
Datum	[illegible]		
Drawing no.	C4002	Rev	A

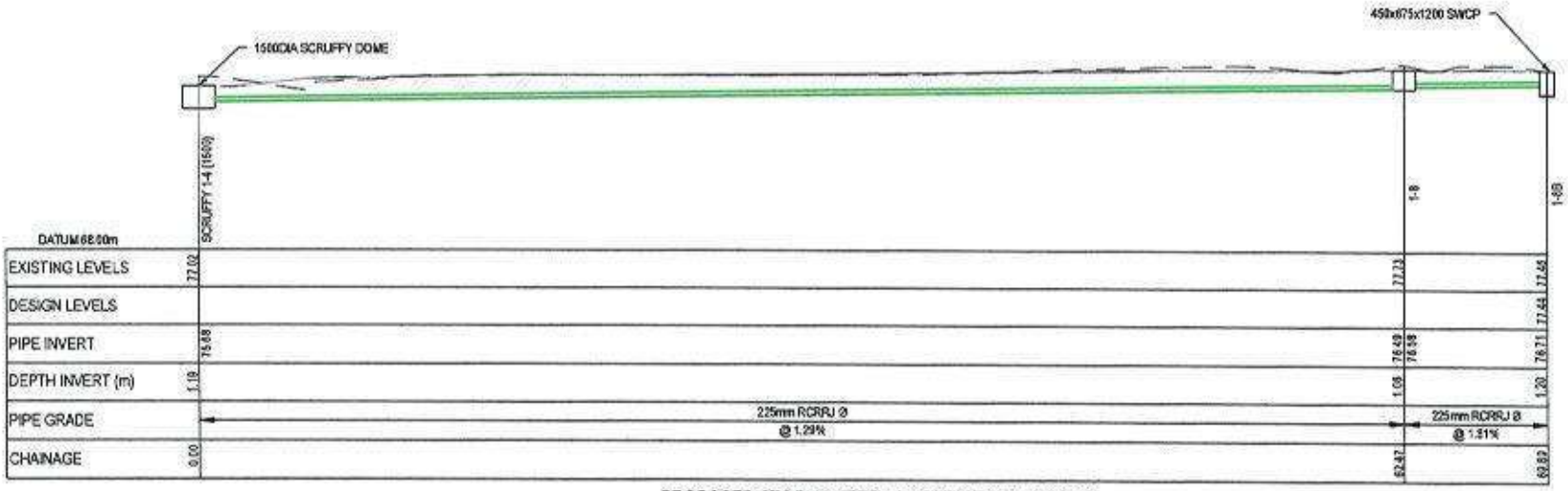


Notes

1. All work to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000
3. Levels in terms of the Auckland Vertical Datum (cyds)
4. It is the contractors responsibility to locate all services that may be affected by their operations.
5. Pipe bedding G - 10% granular bedding, 90 - 20% sand, concrete bedding greater than 20% weak concrete bedding (Wrapped in approved fabric all round).
6. Each connection shall be marked by a 50mm x 50mm timber peg painted blue, extending 600mm above ground level with the top painted blue. The marker peg shall be placed alongside the limiter marker installed at the time of pipe laying and extended from the connection by 600mm below finished ground level. Connections shall be accurately indicated on 'as built' plans.
7. Approved backfill is to be used in backfilling of all road crossings and where necessary to meet council standards.
8. Heavy duty manhole lids and frames to be used in all road areas.
9. All hardware are to be 304 stainless steel unless noted otherwise.
10. All couplings shall be G.S.+G.N.+E.S.S. unless noted otherwise.
11. All pipe lengths shall have an even 1.0m.
12. All lines to be constructed shall be tested for each section and coordinated with overall plan.
13. All uPVC pipes shall be SN16 unless noted otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in berms and lots.
15. Contractor shall maintain all existing rivers and overland flowpaths design to Engineer before starting work.
16. Private Drainage shall comply to all with E1/AS1 building code handbook.

LEGEND

- EXIST SW
- RECP SW
- PR SW PUBLIC
- PR SW PRIVATE
- PR SW SUBSOIL
- PR SW SWALE
- PR RAIN GARDEN
- PR HARDFILL BACKFILL
- EXIST OP SWMH
- PROP SWOP SINGLE
- PROP SWOP DOUBLE
- PR SW LOT CON
- PR WW LOT CON



PROPOSED STORMWATER LONGSECITON 1-4 TO 1-8B
SCALE 1:250 @ A3

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Taraire Tahi Limited
Riddell Road
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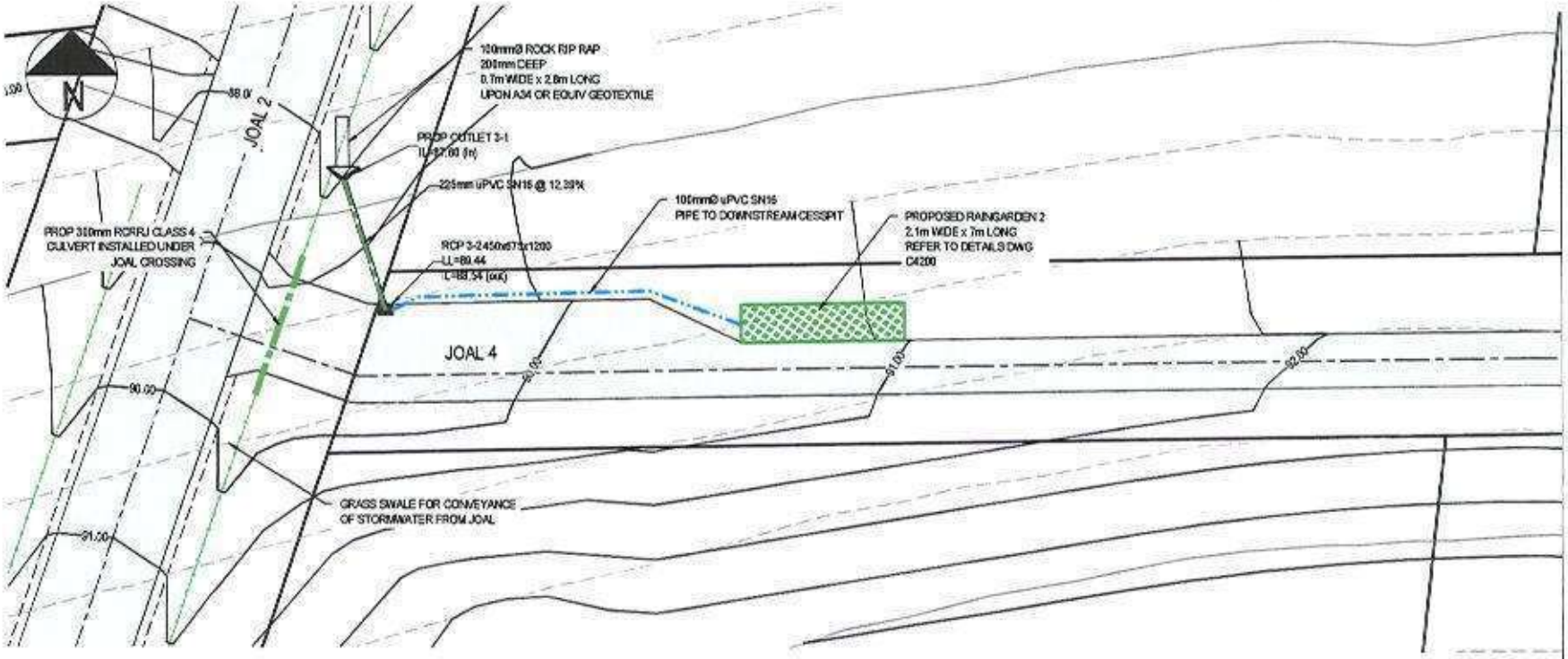
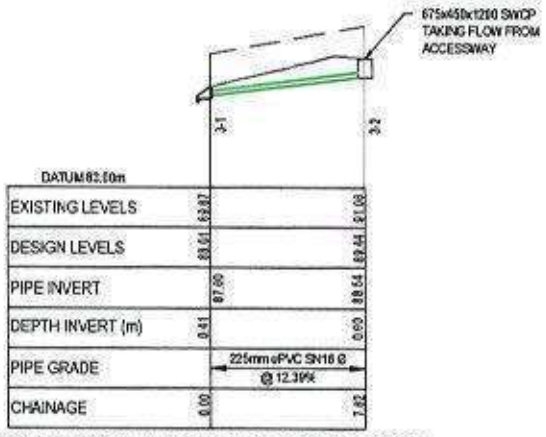
Proposed Stormwater Drainage Plan
Sheet 3 of 6

No.	Revision Description	Name	Date
A	Revision Consent	GB	03/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TS	12/25
Project no	10401		
Scale	1:250 @ A3		
Cad file	[illegible]		
Drawing no	C4003	Rev	A





PROPOSED STORMWATER LONGSECITON 3-1 TO 3-2
SCALE 1:250 @ A3

Notes

1. All works to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractors responsibility to locate all services that may be affected by their construction.
5. Pipe bedding: G - 90% granular bedding | I - 20% weak concrete bedding, greater than 20% weak concrete bedding | P pipe plus soil cohesive bonds as the case.
6. Each connection shall be marked by a 100mm dia timber treated post stake extending 300mm above ground level with the top painted. The marker post shall be placed alongside a timber marker indicating the size of pipe laid and extending from the connection to 150mm below finished ground level. connections shall be continuously exposed on "as built" plans.
7. Approved backfills to be used in backfilling of all road crossings and within carriageways, kerbs, channels.
8. Heavy duty manhole lids and frames to be used in all public areas.
9. All manholes are to be 1050 dia pf precast concrete pipes shown otherwise.
10. All concrete shall be GP, with a f'c of 20 MPa, cured all surfaces
11. All manhole levels to be flush with ground level.
12. All areas to be disturbed shall be grassed all earth and sand contractor with council approval.
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be 65mm thick under pavement areas, 50mm thick in berm and lots.
15. Drawings shall not be scaled, all working levels and dimensions to be checked on site prior to the commencement of any work.
16. Private Drainage shall comply with the NZBC F1 Part 3 building code for the purpose.

LEGEND

EXISTING
PROPOSED
PROPOSED PIPELINE
PROPOSED PRIVATE
PROPOSED WASTEWATER
PROPOSED SWALE
PROPOSED RAINGARDEN
PROPOSED TRENCH BACKFILL
EXISTING MANHOLE
PROPOSED MANHOLE
PROPOSED DOUBLE
PROPOSED LOT CONNECTION
PROPOSED LOT CONNECTION

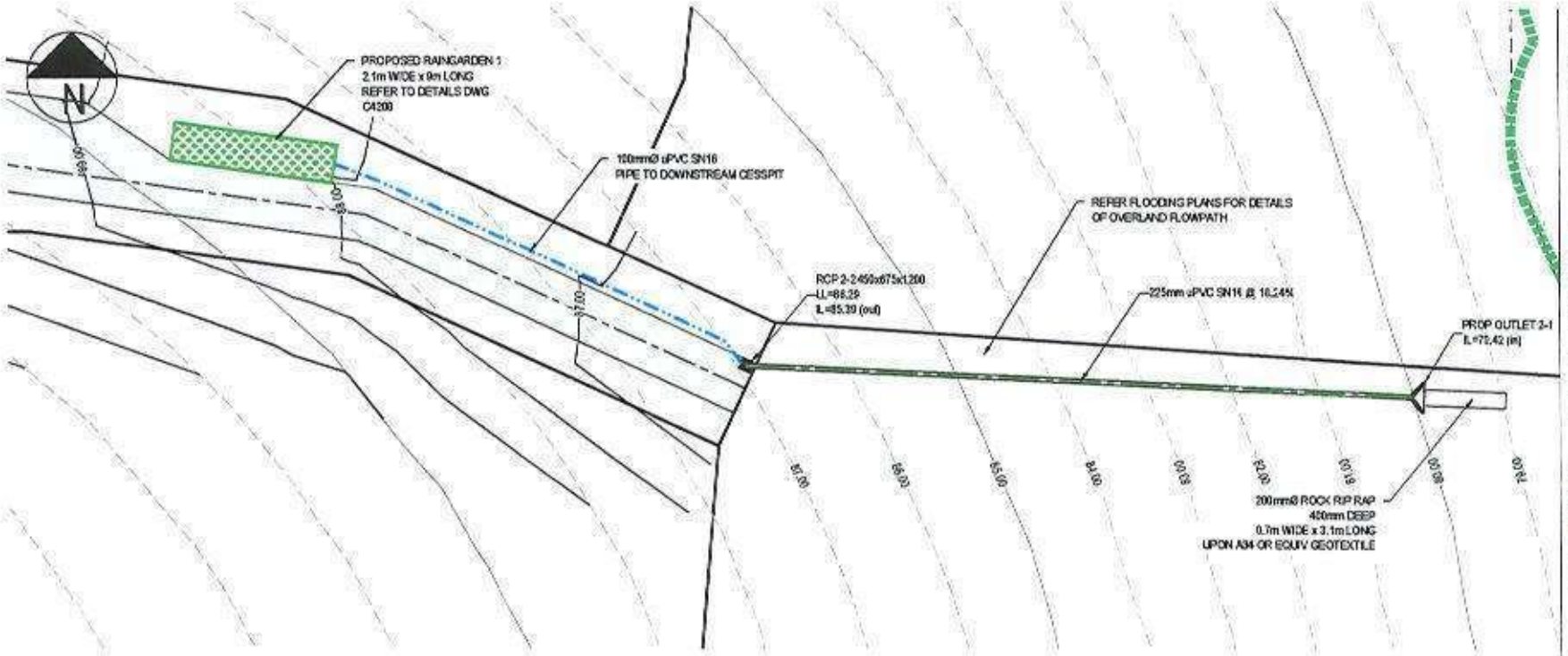
conquel CONSULTING
Contact: info@conquel.co.nz
Phone: +64 9 439 4222

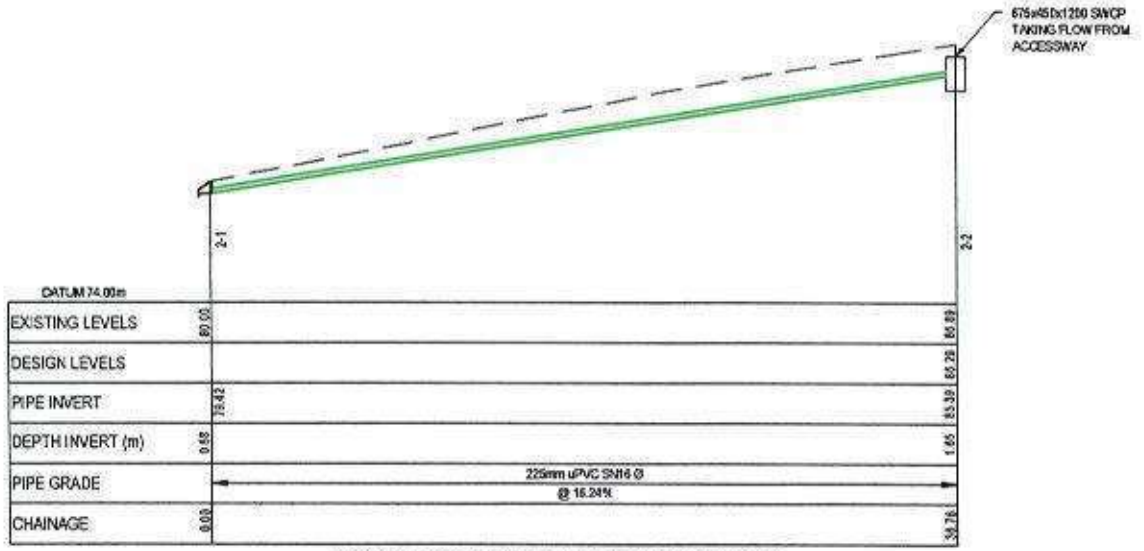
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater Drainage Plan

Sheet 4 of 6

No.	Revision / Description	Name	Date
A	Resource Consent	GB	12/05
Surveyed		KM	05/05
Designed		GB	05/05
Drawn		GB	05/05
Checked		TS	12/05
Project no	10401		
Scale	1:250 @ A3		
Coordinate	Mount Eden Circuit 2000		
Drawing no	C4004	Rev	A





PROPOSED STORMWATER LONGSECITON 2-1 TO 2-2
SCALE 1:250 @ A3

Notes

1. All work to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractors responsibility to locate all services that may be affected by their operations.
5. Pipe bedding: 0 - 10% granular bedding, 10 - 20% weak concrete bedding greater than 20% weak concrete bedding (Rhino plus and concrete blocks all thrust).
6. Each connection shall be available by a Stormwater Connection pipe stub extending 600mm above ground level with the top part of the socket pipe shall be placed perpendicular to the invert and shall be placed at the time of positioning and extending lines to be laid and to follow the finished ground level. Connections shall be accurately indicated on "as built" plans.
7. Approved sand shall be used in bedding of all pipe crossings and where trenches pass through retaining structures.
8. Heavy duty manhole lids and frames to be used in trafficked areas.
9. All manholes are to be 1200mm Ø precast concrete unless shown otherwise.
10. All catchpits shall be 675x450x1200 unless noted otherwise.
11. All catchpit inlets shall have an invert of 10%.
12. All lines to be determined shall be sealed at each end and overbraked with concrete.
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in berm and lots.
15. Drainlayer shall confirm all existing inverts and notify if they match design to Engineer before starting works.
16. Private Drainage shall comply with the NZBC E1 building over & near water.

LEGEND

EXISTING
PROPOSED
PROPOSED PUBLIC
PROPOSED PRIVATE
PROPOSED SUBSOIL
PROPOSED SWALE
RAINGARDEN
PROPOSED BACKFILL
EXISTING MANHOLE
PROPOSED SWCP SINGLE
PROPOSED SWCP DOUBLE
PROPOSED CON
PROPOSED CON

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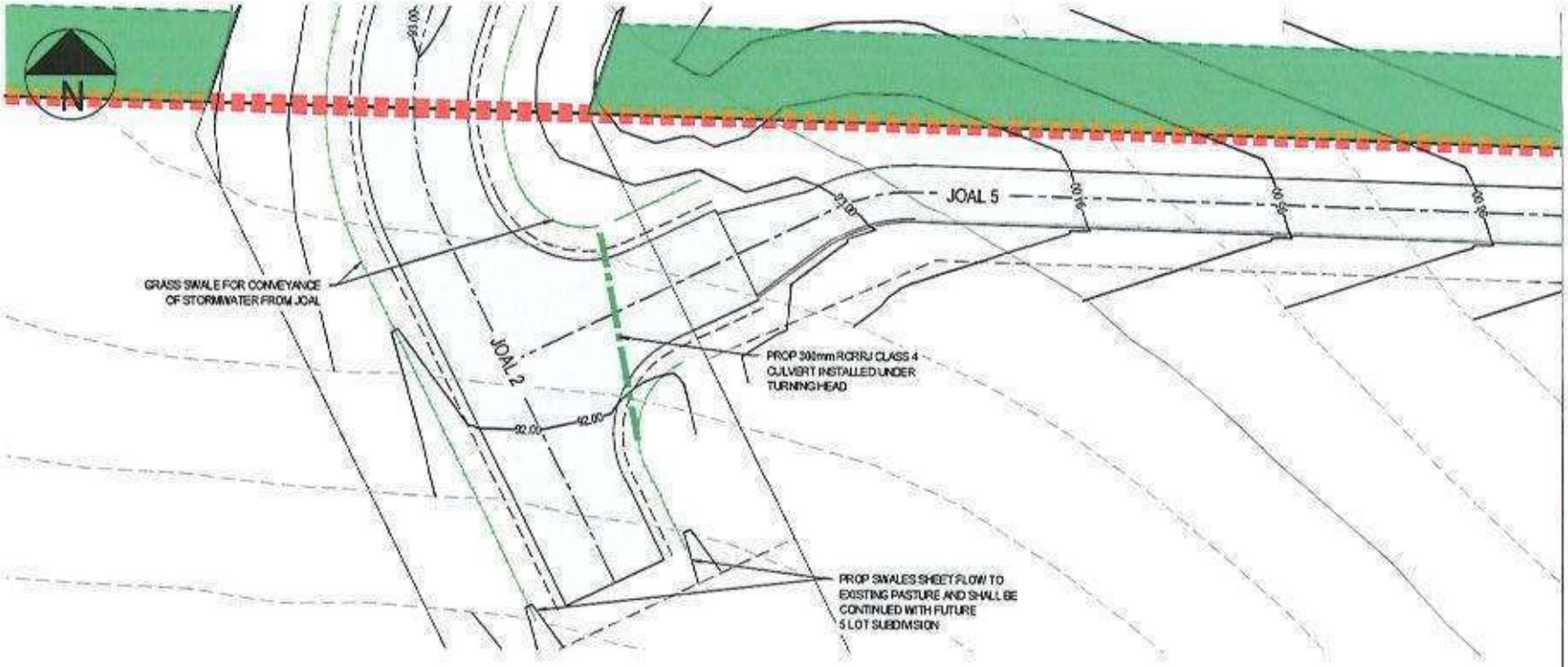
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater
Drainage Plan
Sheet 5 of 6

No	Revisions (Description)	Name	Date
A	Revisions Comment	GB	10/25
Surveyed		KM	09/25
Designed		GB	09/25
Drawn		GB	09/25
Checked		TB	10/25

Project no	10401
Scale	1:250 @ A3
Cad file	10401 STORMWATER.dwg
Drawing no	C4005 Rev A



Note:

1. All works to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractors responsibility to locate all services that may be affected by the operations.
5. Pipe bedding (i) - 0% granular bedding, 10 - 20% weak concrete bedding greater than 20% weak concrete bedding (Engineer to advise suitable bedding)
6. Each connection shall be marked by a 75mm x 75mm timber peg extending 600mm above ground level with the top painted. This marker peg shall be placed alongside a timber marker located at the base of the swale and extending from the connection to 150mm below finished ground level. Connections shall be accurately indicated on "as built" plans.
7. Approved manhole to be used where piping of all road crossings and vehicle crossings is required. Standard.
8. Heavy duty manhole lids and frames to be used in trafficked areas.
9. All manholes and tanks 1050mm Ø precast concrete unless shown otherwise.
10. All concrete shall be GP 25 MPa 20 mm unless noted otherwise.
11. All catchpit work shall have rear entry lids.
12. All lines to be abandoned shall be removed or backfilled and consolidated to council standard.
13. All uPVC pipes shall be SN8 unless shown otherwise.
14. All concrete pipes shall be Class 4 under trafficked areas, Class 2 elsewhere etc.
15. Developer shall confirm all existing services and confirm they meet design to Engineer before starting works.
16. Private Drainage shall comply as follows: E1/AS1 Building code for storm water.

LEGEND

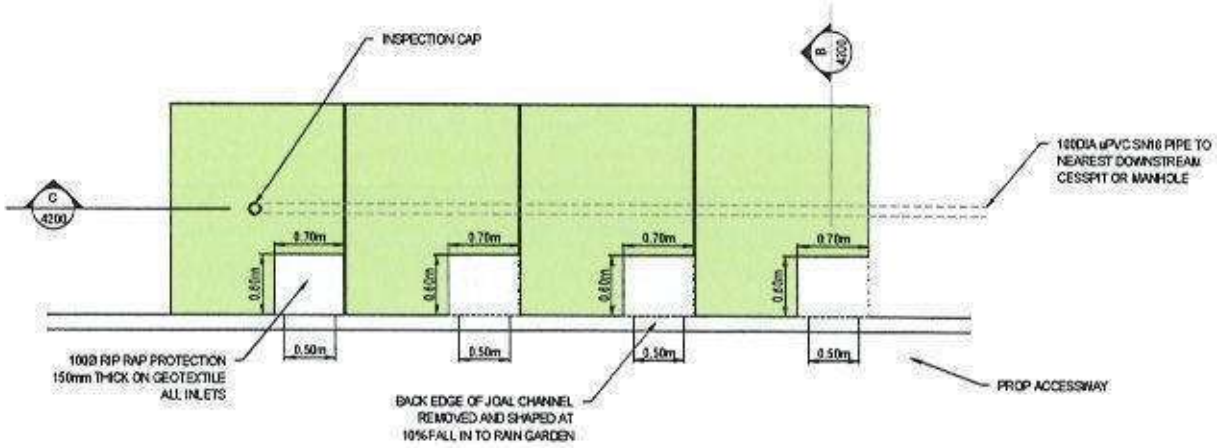
- EX BDY
- PROP LOT
- PR SW PUBLIC
- PR SW PRIVATE
- PR SW SUBSOIL
- PR SW SMALL
- PR RAINGARDEN
- PR HANDFILL BACKFILL
- EXPROP LIMIT
- PROP SNGP SINGLE
- PROP SNGP DOUBLE
- PR SW LOT CON
- PR WW LOT CON

conquel
CONSULTING
Email: admin@conquel.co.nz
Phone: +64 (09) 407 4223

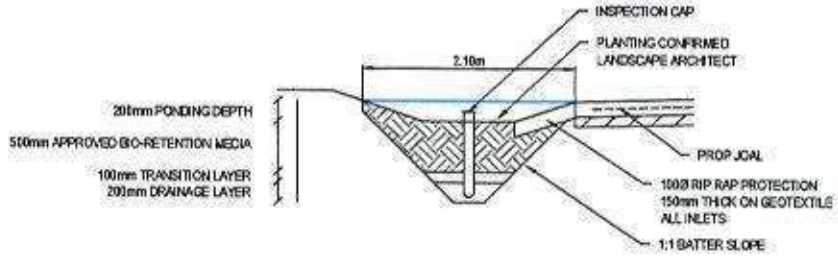
Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater Drainage Plan
Sheet 6 of 6

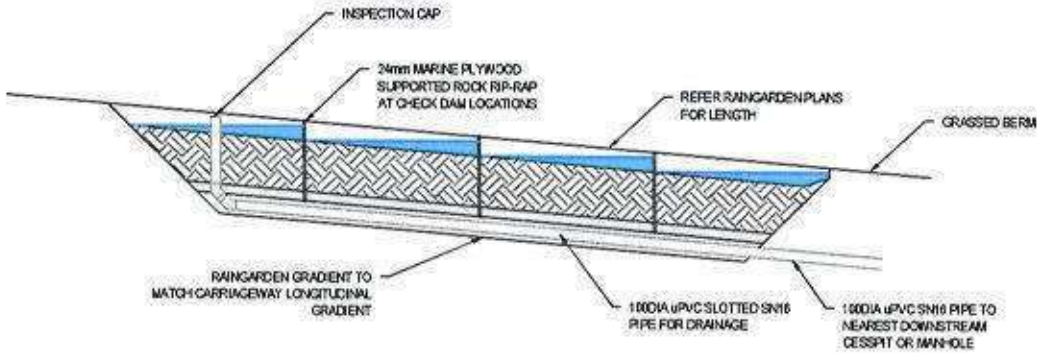
No.	Revision Description	Name	Date
A	Resource Consent	GD	03/25
Surveyed		KM	09/25
Designed		GD	09/25
Drawn		GB	09/25
Checked		GD	12/25
Project no	10401		
Scale	1:250 @ A3		
CAD file	10401 SCHEMATIC.dwg		
Drawing no	C4006	Rev	A



TYPICAL RAINGARDEN PLAN VIEW
SCALE 1:50 @ A3



RAINGARDEN CROSS SECTION B
SCALE 1:50 @ A3



RAINGARDEN CROSS SECTION C
SCALE 1:50 @ A3

Notes:

1. Bio-retention areas to be a minimum of 1m away from property boundaries.
2. Inlet design to ensure no concentrated flows into Bio-retention areas
3. Bio-retention devices to have 200mm ponding depth above the bed
4. The planting soil mix used shall be 0.5m deep, and have long term hydraulic conductivity (Ks) of 100mm/hr
5. Transition layer is to consist of washed sand over washed fine gravel
6. A minimum if 50mm bedding later to be provided for the perforated drain pipe and media shall be sized as "d85 > 1 x size of perforation"
7. The Bio-rentention area are designed for the Water Quality Volume (WQV) only and larger flows are to be bypassed to the kerb channel and primary stormwater network.
8. Weir spacing to be adjusted to suit road grade mix 200mm ponding depth must be achieved between each weir.

Notes:

1. All works to be in accordance with Tamaki Council Standard.
2. Coordinates in terms of NZ Geodetic Datum NA from 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractors responsibility to locate all services that may be affected by the operations.
5. Pipe bedding G - 80% granular bedding M - 20% lean concrete bedding greater than 20% lean concrete bedding (F type shall be used for slopes at 6% or >).
6. Each manhole shall be marked by a 50mm x 50mm x treated pine stake extending 600mm above ground level with the top painted. The marker post shall be placed alongside a timber marker installed at the time of positioning and extending from the manhole to 100mm below finished ground level. Corresponding shall be accurately indicated on the as built plans.
7. Approved hard fill is to be used in backfilling of all road crossings and vehicle crossings to council standards.
8. Heavy duty manhole lids and frames to be used in trafficked areas.
9. All manholes are to be 1050mm Ø precast concrete unless shown otherwise.
10. All catchpits shall be 675x450x1200 unless noted otherwise.
11. All catchpit lintels shall have an apex of 1:2.
12. All lines to be abandoned shall be sealed at each end and constructed wall complete, shall.
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in berm and lots.
15. Contractor shall confirm all existing inverts and confirm they match design to Engineer before starting work.
16. Private Drainage shall comply with Building Code Clause G13 Foul water and Clause G14 Industrial liquid waste.

LEGEND

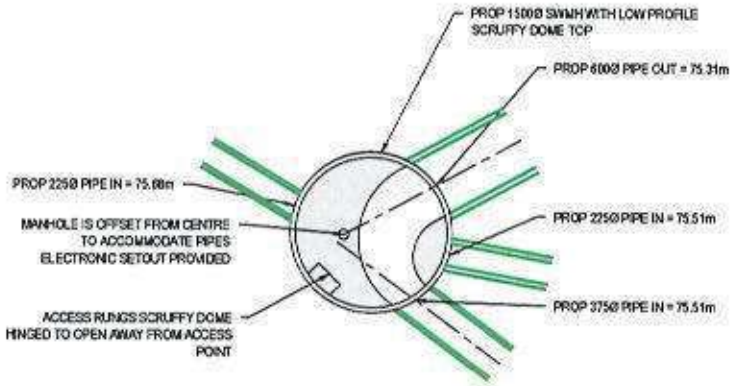
EXBDY
PROP BDY
PROW PUBLIC
PROW PRIVATE
PROW ARRIVAL
PROW WALE
PROW NORTH
PROW SOUTH
PROW EAST
PROW WEST

conquel
CONSULTING
Contact: admin@conquel.co.nz
Phone: +64 (0)9 815 4200

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater
Rain Gardens
Details Sheet 1 of 2

No	Revision Description	Name	Date
A	Resource Consent	GB	10/05
Surveyed		KM	09/05
Designed		GB	09/05
Drawn		GB	09/05
Checked		TS	10/05
Project no	10401		
Scale	Refer to Drawing		
Datum			
Drawing no	C4200	Rev	A



SCRUFFY DOME 1-4 DETAIL A
SCALE 1:50 @ A3

Note:

1. All works to be in accordance with Far North Council Standards.
2. Coordinates in terms of NZ Geodetic Datum Mt Eden 2000.
3. Levels in terms of the Auckland Vertical Datum 2016.
4. It is the contractor's responsibility to locate all services that may be affected by their operations.
5. Pipe bedding: G - 10% granular bedding, M - 20% mass concrete bedding, greater than 20% weak concrete bedding. (Trapezoidal and concrete blocks all round).
6. Each connection shall be made only to 30mm Class 4 medium pipe class extending 600mm above ground level with the top part cut. The marker post shall be placed alongside a finished manhole location at the time of pipelaying and extended from the connection to 150mm below finished ground level connections shall be accurately indicated on "as built" plans.
7. Approved hardfill is to be used in backfilling of all road crossings and vehicle crossings in council standard.
8. Heavy duty manhole rib and frames to be used in trafficked areas.
9. All manholes are to be 1200mm Ø precast concrete unless shown otherwise.
10. All couplings shall be GTex420x250 unless noted otherwise.
11. All cast iron shall have a minimum of 1 bar.
12. All liners to be stainless steel shall be sealed at each end and overlapped with a minimum of
13. All uPVC pipes shall be SN16 unless shown otherwise.
14. All concrete pipes shall be Class 4 under pavement areas, Class 2 in berm and bins.
15. Contractor shall confirm all existing invert and cover levels prior to construction. Engineer before starting works.
4. Private Drainage shall comply with the E1/AS1 building code for the entire

LEGEND

EXISTING
PROPOSED
PROPOSED PUBLIC
PROPOSED PRIVATE
PROPOSED SUBSOIL
PROPOSED SWALE
PROPOSED SWALE
PROPOSED HARDFILL BACKFILL
EXISTING SWMH
PROPOSED MANHOLE
PROPOSED DOMELE
PROPOSED LOT CON
PROPOSED LOT CONN

conquel
CONSULTING
Contact: admin@conquel.co.nz
Phone: +6420801

Taraire Tahi Limited
Riddell Road
Kerikeri

Proposed Stormwater Details
Sheet 2 of 2

No.	Revision Description	Name	Date
A	Resource Consent	CG	03/25
Surveyed		KM	03/25
Designed		GB	04/25
Drawn		GB	03/25
Checked		TS	12/25
Project no	10401		
Scale	Refer to Drawing		
Datum	[illegible]		
Drawing no	C4201	Rev	A

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

HAWTHORN

8/12/2025

Overall Landscape Plan

Tararo Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
1.0	5

N
LOT 12
LOT 11
JOAL 203
LOT 13
POND
LOT 4
LOT 15
LOT 14
JOAL 202
LOT 25
LOT 26
LOT 18
LOT 27
LOT 28
LOT 16
LOT 17
LOT 19
JOAL 204
LOT 29
LOT 30
LOT 24
LOT 23
LOT 22
JOAL 205
Rural boundary planting refer to Drawing 4.0
Trees along main access Drive (JOAL 202) refer to drawing 3.1 & 3.2
KEY
Hedges
Specimen tree
Rural boundary planting
Access to Lot
Existing trees to retain
Existing natural wetland
Proposed riparian planting (refer to Ecologists Plans)
Scale@ A3:1:1000
0
25
50 m
HAWTHORN
8/12/2025
Enlarged Landscape Plan
Farsee Tahi
39 Riddell Road, Kelliwi
Scale
as shown
Drawn By
Card Design
Drawing
3.1
Rev.
B

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1000

0 25 50 m

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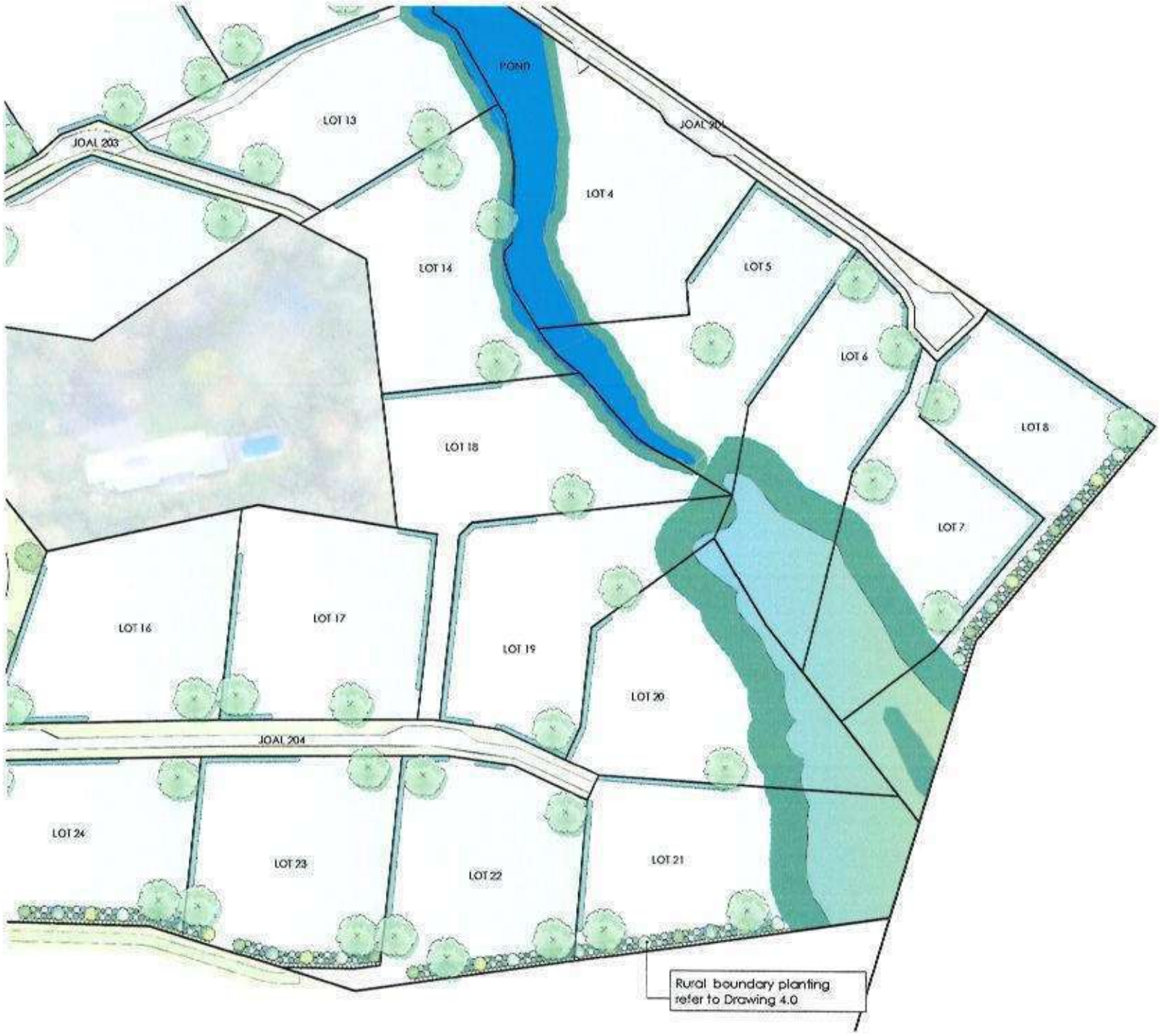
8/12/2025

Enlarged Landscape Plan

Tanner Tahi
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
2.0	1



N

KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain
- Existing natural wetland
- Proposed riparian planting (refer to Ecologists Plans)

Scale@ A3:1:1000

0 25 50 m

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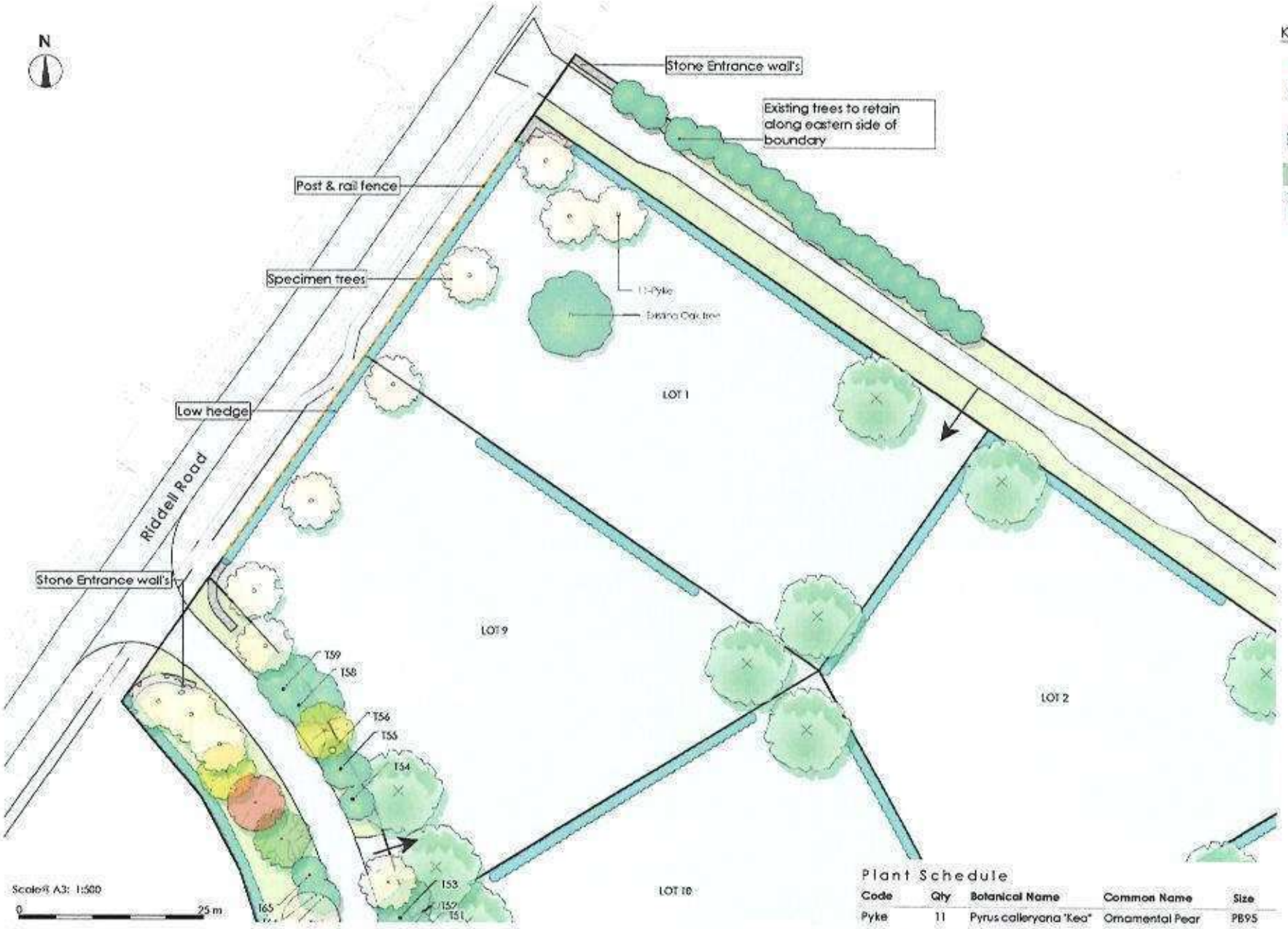
8/12/2025

Enlarged Landscape Plan

Tarare Lane
39 Riddell Road, Kelliwi

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
2.2	B



KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Pyke	11	Pyrus calleryana 'Kea'	Ornamental Pear	PB95

Reference Imagery:

Gateway

Post & Rail Fence

Ornamental Pear Trees

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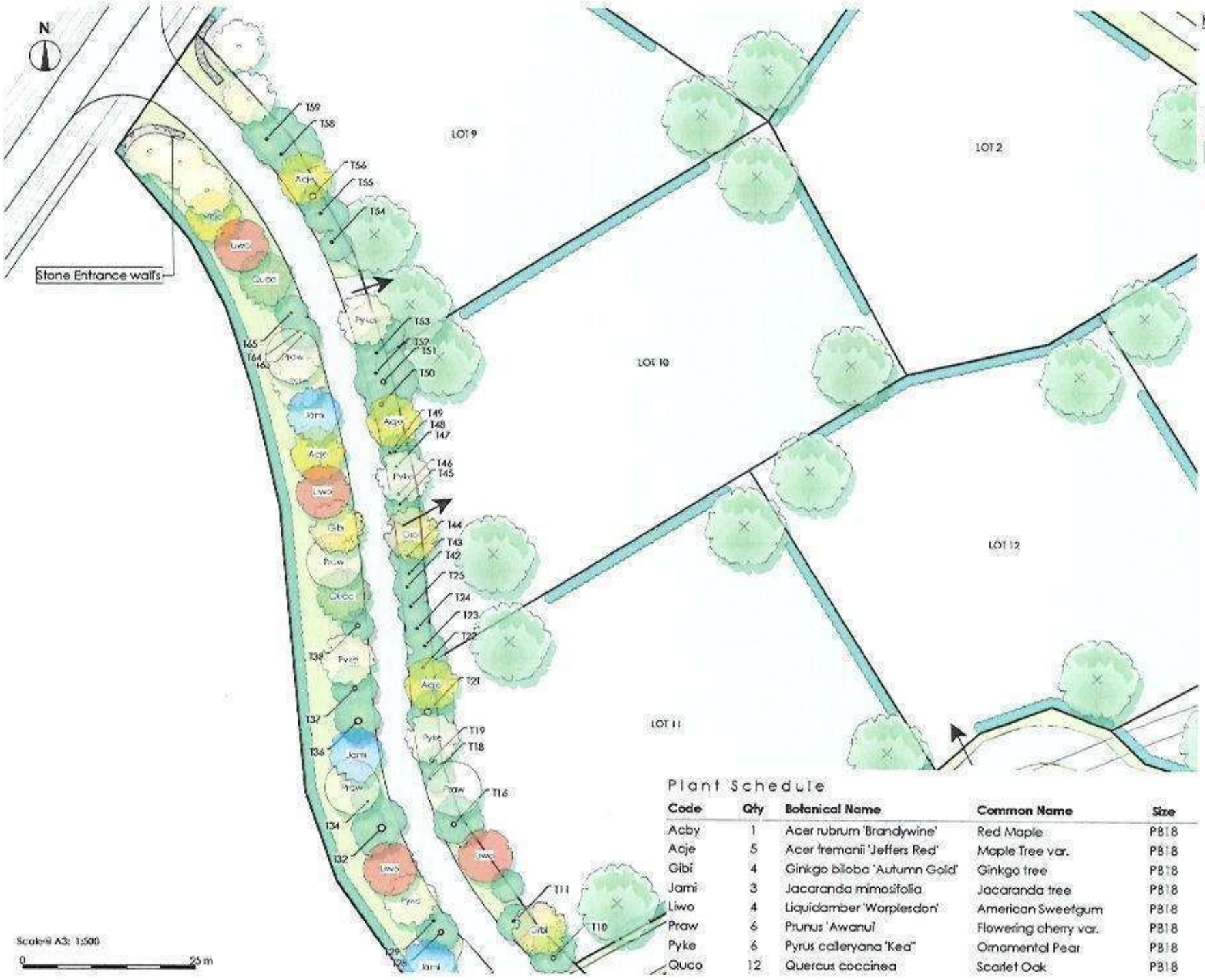
8/12/2015

Enhances and Riddell Road Boundary

Tongue Ton
39 Riddell Road, Geelong

Scale	Drawn By
as shown	iCad Design
Drawing	Rev
3.0	B



KEY

- Hedges
- Specimen tree
- Rural boundary planting
- Access to Lot
- Existing trees to retain

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Acby	1	Acer rubrum 'Brandywine'	Red Maple	PB18
Acje	5	Acer tremanii 'Jeffers Red'	Maple Tree var.	PB18
Gibi	4	Ginkgo biloba 'Autumn Gold'	Ginkgo tree	PB18
Jami	3	Jacaranda mimosifolia	Jacaranda tree	PB18
Liwo	4	Liquidamber 'Worplesdon'	American Sweetgum	PB18
Praw	6	Prunus 'Awanui'	Flowering cherry var.	PB18
Pyke	6	Pyrus calleryana 'Kea"	Ornamental Pear	PB18
Quco	12	Quercus coccinea	Scarlet Oak	PB18

Scale@ A3: 1:500

0 25 m

Notes:
Along JOAL 202 remove trees not being retained, including grinding stumps to below the ground level.

Remove the existing Agapanthus from under the trees. Smooth off the ground levels with additional weed free top soil to enable lawn cacca under remaining trees along roadside.

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Trees along Main Access Drive (JOAL 202)
(To retain or remove)

Tarsley Tahr
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
01	P

Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Acby	1	Acer rubrum 'Brandywine'	Red Maple	PB18
Acje	5	Acer fremanii 'Jeffers Red'	Maple Tree var.	PB18
Gibi	4	Ginkgo biloba 'Autumn Gold'	Ginkgo tree	PB18
Jami	3	Jacaranda mimosifolia	Jacaranda tree	PB18
Liwo	4	Liquidamber 'Worplesdon'	American Sweetgum	PB18
Praw	6	Prunus 'Awanui'	Flowering cherry var.	PB18
Pyke	6	Pyrus calleryana 'Kea'	Ornamental Pear	PB18
Quco	12	Quercus coccinea	Scarlet Oak	PB18

Notes:
Remove trees not being retained, including grinding stumps to below the ground level.

Remove the existing Agapanthus from under the trees. Smooth off the ground levels with additional weed free top soil to enable lawn area under remaining trees along roadside.

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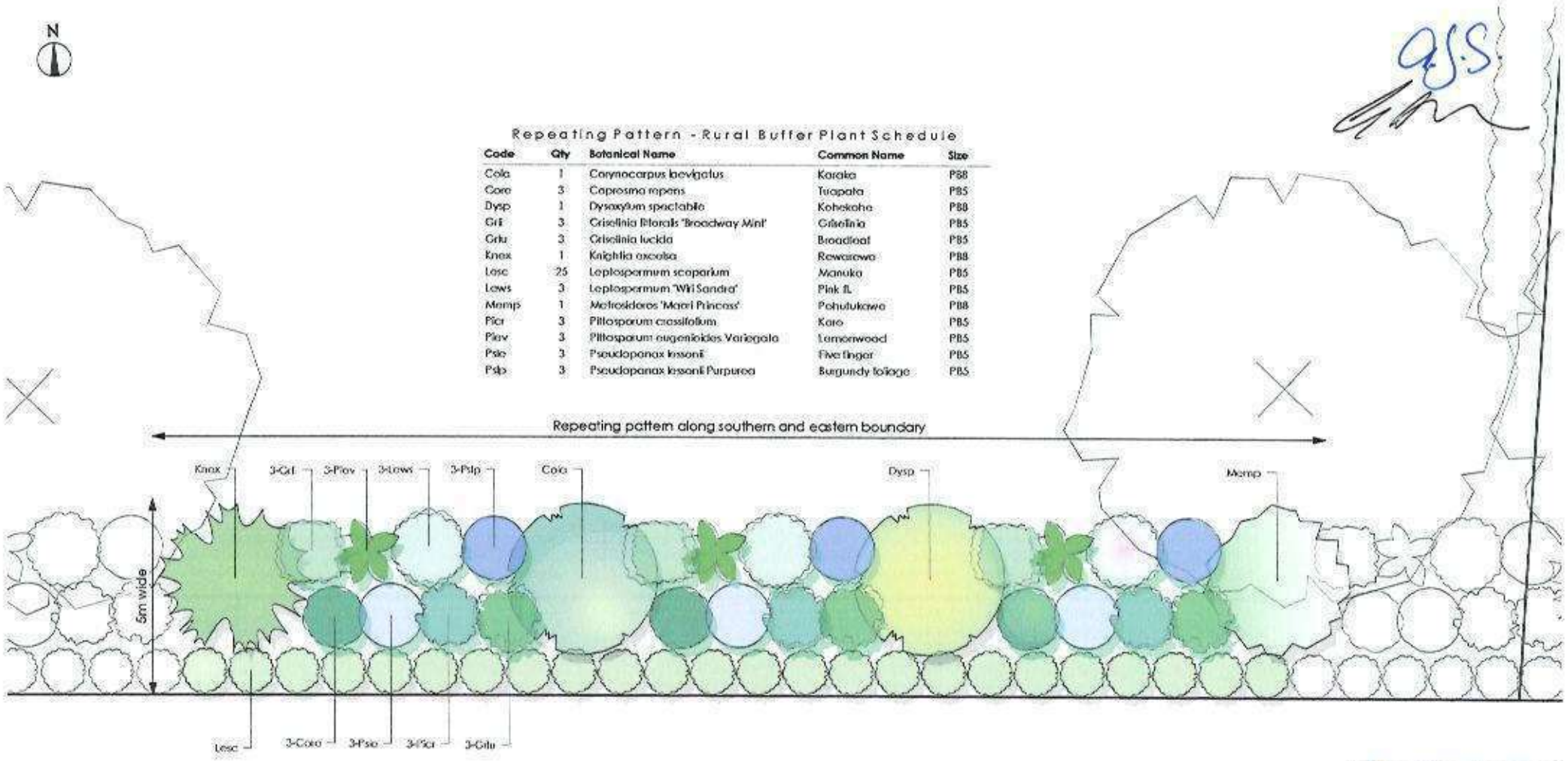
Trees along Male Access Drive (JOAL 202)
(to retain or remove)

Farore Tahi
39 Riddell Road, Kelliell

Scale	Drawn By
as shown	Cad Design
Drawing	Rev
3.2	h

Repeating Pattern - Rural Buffer Plant Schedule

Code	Qty	Botanical Name	Common Name	Size
Cola	1	Corynocarpus laevigatus	Karaka	PB8
Core	3	Coprosma repens	Taupata	PB5
Dysp	1	Dysoxylum spectabile	Kohekohe	PB8
Gril	3	Griselinia littoralis 'Broadway Mint'	Griselinia	PB5
Grlu	3	Griselinia lucida	Broadleaf	PB5
Knex	1	Knightia excelsa	Rewarewa	PB8
Lesc	25	Leptospermum scoparium	Manuka	PB5
Lews	3	Leptospermum 'Wil Sandra'	Pink fl.	PB5
Memp	1	Metrosideros 'Maori Princess'	Pohutukawa	PB8
Plcr	3	Pittosporum crassifolium	Karo	PB5
Plev	3	Pittosporum eugenioides Variegata	Lemonwood	PB5
Psle	3	Pseudopanax lessonii	Five finger	PB5
Pslp	3	Pseudopanax lessonii Purpurea	Burgundy foliage	PB5



Overall Rural Buffer Plant Numbers

Code	Qty	Botanical Name
Cola	11	Corynocarpus laevigatus
Core	43	Coprosma repens
Dysp	11	Dysoxylum spectabile
Gril	43	Griselinia littoralis 'Broadway Mint'
Grlu	129	Griselinia lucida
Knex	13	Knightia excelsa
Lesc	334	Leptospermum scoparium
Lews	43	Leptospermum 'Wil Sandra'
Memp	11	Metrosideros 'Maori Princess'
Plcr	43	Pittosporum crassifolium
Plev	129	Pittosporum eugenioides Variegata
Psle	129	Pseudopanax lessonii
Pslp	129	Pseudopanax lessonii Purpurea

Scaled A3: 1:100

0 5 10 m

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Rural Boundary Buffer Planting

Tahere Tan
39 Riddell Road, Kerikeri

Scale	Drawn By
as shown	Card Design
Drawing	Rev
4.0	B

Trees To Retain Along The Main Entrance Road (JOAL 202)

Left Hand Side of Main Drive (going in):

T59 — Liquidamber
T58 — Red oak
T56 -Banksia
T55 — English Oak
T54 — Pittosporum
T52 — Gleditsia
T51 Red Oak
T48 Poplar
T45 — Oak
T44 — Melia
T43 — Poplar
T42 — Titoki
T23 Magnolia
T22 — Pin oak
T21 — Acmena
T19 — Robinia
T18 -titoki
T16 — Oak
T11a Magnolia (unlabelled)
T11 — Cedar
T10 — Oak
T6 & 7 — Cedars

Right hand side of drive (going in)

T65 — Oak
T 63 — Oak
T38 — Magnolia
T37 — Poplar
T36 — Linden
T34 — Acmenia
T32 — Linden
T28 — Gum
T15- Macadamia nut
T5 — Cedar
T3 — Pittosporum
T4 — Pohutukawa

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Tree Schedule

Tarore Tahi
39 Riddell Road, Ranfurly

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
50	A

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Plant Palette

Hedges - Suitable for tall hedges (above 1.2m)

Camellia sasanqua Setsugekka

Coprosma repens

Eugenia ventenatii

Feijoa species

Ficus Tuffy

Griselinia littoralis

Leptospermum 'Red Ensign'

Leptospermum 'Wiri Sandra'

Michelia figo

Myrsine australis

Pittosporum Limelight

Pittosporum ralphii Stephens Island

Podocarpus totara 'Matapouri Blue'

Pseudopanax 'Cyril Watson'

Pseudopanax lessonii

Metrosideros 'Fiji Fire'

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Plant Palette

Tandle Tohu
39 Riddell Road, Kerikeri

Scale	Drawn By
nts@a3	Oasis Design
Drawing	Rev
6.0	A

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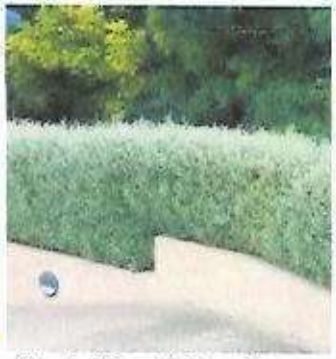
Plant Palette

Hedges - Suitable for lower hedges (below 1.2m)

Camellia sasanqua 'Early Pearly'

Choisya ternata

Corokia 'Geenty's Ghost'



Corokia 'Geenty's Green'

Hebe 'Blue Gem'

Hibiscus rosa sinensis

av-5

Loropetalum 'Plum Gorgeous'

Pittosporum 'Golf Ball'

Tibouchina 'Peace Baby'

Rosmarinus 'Tuscan Blue'

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Plant Palette

Tararo Tahi
39 Riddell Road, Gonville

Scale	Drawn By
no scale	Cad Design
Drawing	Rev.
6.1	A

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Plant Palette

Specimen Trees - Deciduous - Small

Acer palmatum 'Beni Otake'

Acer palmatum 'Bloodgood'

Acer palmatum 'Senkaki'

Cercis 'Forest Pansy'

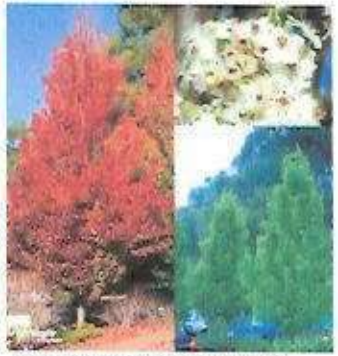
Cercis 'Hearts of Gold'

Diospyros fuyu

Lagerstroemia Kimono

Lagerstroemia 'St Emillion'

Magnolia 'Black Tulip'


Pyrus calleryana Candelabra

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Plant Palette

Tararua Lahi
39 Riddell Road, Fernhill

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
6.2	A

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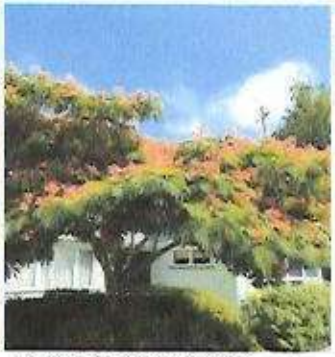
Plant Palette

Specimen Trees - Deciduous - Large

Acer fremanii 'Jeffers Red'

Acer rubrum 'Brandywine'


Albizia julibrissian 'Red Silk'

Ginkgo biloba 'Autumn Gold'

Gleditsia 'Ruby Lace'

Gleditsia 'Sunburst'

Jacaranda mimosifolia

Liquidamber 'Worplesdon'

Magnolia 'Felix Jury'

Magnolia 'Strawberry Fields'

Magnolia Brixton Belle

Nyssa sylvatica

Prunus Awanui

Pyrus calleryana 'Aristocrat'

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6/12/2006

Plant Palette

Tarare Jahi
35 Riddell Road, Kenkeri

Scale	Drawn By
no scale	Cad Design
Drawing	Rev
A3	A

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Plant Palette

Specimen Trees - Evergreen - Native

Alectryon excelsus

Corynocarpus laevigatus

Dysoxylum spectabile

Knightia excelsa

Meryta sinclairii

Metrosideros 'Fiji'

Metrosideros 'Maori Princess'

Metrosideros 'Springfire'

Sophora tetraptera

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Plant Palette

Torcaire Tabs
39 Fleddes Road, Kenbert

Scale	Drawn By
As scale	Cad Design
Drawing	Rev
64	A

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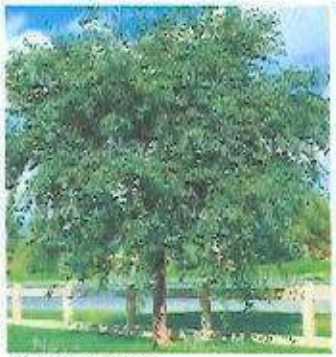
Plant Palette

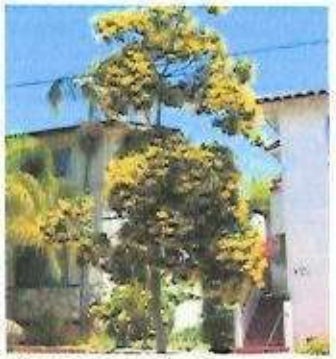
Specimen Trees - Evergreen - Exotic

Acacia baileyana Purpurea


Alnus jorullensis

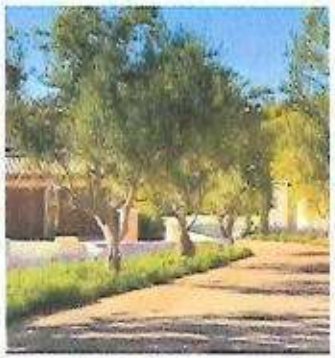
Brachychiton acerifolius

Cunonia capensis


Hymenosporum flavum

Magnolia 'Little Gem'

Michelia 'Fairy Blush'


Olea europaea

Stenocarpus sinuatus

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Plant Palette

Tandara Lane
39 Riddell Road, Kelmet

Scale	Drawn By
Nonscale	Cad Design
Drawing	Rev
65	A

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