Land Information Memorandum

Application

No.	L250256
Application date	6/05/2025
Issue date	13/05/2025
Phone	
Fax	

Please Note: This LIM report contains information for the entire legal description below.

Property

Valuation No.	0122008878
Location	53 Robert Hastie Drive, Mangawhai
Legal Description	LOT 81 DP 556753 - HAVING 1/826SH IN LOTS 100-103 106 200 202 DP 404128 LOT 1 DP 430128 LOT 1 DP 482523 BEING 96.8877HA
Owner	ACDL Trustee Limited
Area (hectares)	0.5903

Rates

Government Valuation	
Land	$595,000
Capital Value	$2,130,000
Improvements	$1,535,000
Current Rates Year 2024 to 2025	
Annual Rates	$2,989.46
Current Instalment	$ 747.36
Current Year - Outstanding Rates	$ 747.36
Arrears for Previous Years	$ 0.00
Next Instalment Due	20/05/2025.

Note: Rates are charged in four instalments for the period commencing 1 July and ending 30 June each year.

Please refer to the Kaipara District Council Long Term Plan 2024/2027 and to the Kaipara District Council Development Contribution Policy 2024 which can be found at the Council website www.kaipara.govt.nz.

Planning/Resource Management

Zoning: **Kaipara District Plan 2013:** Rural – Mangawhai Harbour Overlay. See attached information regarding the District Plan.

Full details of the zone requirements are found in the current District Plan. Relevant zone ordinance can be found at the Council website.

22/07/20 **RESOURCE CONSENT 190258**: Subdivision - Proposed 3 Stage Subdivision to create 14 Lots, Landuse in breach of 12.10.1a Earthworks, 12.15.2 Accessway, Change of Consent Notice and Amalgamation Lot 2 DP 430128 71 Robert Hastie Drive. **Stage 1 & 2 Created DP 556753**. Stage 3 Created DP 558166. Section 224 Issued 3/06/21: GRANTED BY LOCAL AUTHORITY OFFICER 1/07/20 (Found on parent property: X0122008800).

RM190258 Consent Notices in respect of Lots **81**-84 and Lots 91-94part one (i) Earthworks, the location of buildings, building foundations and stormwater and wastewater disposal shall be subject to specific engineering design by a suitably qualified Chartered Professional Engineer having regard to any soil instability/saturation issues that may exist or arise as a result of the development. Design shall take into account the recommendations identified in the Engineering Suitability Report prepared by Hawthorn Geddes dated 12 July 2019 and submitted to Council with subdivision consent RM190258. At the time of lodging a building consent for a habitable building on the lots and before issuing a Code of Compliance for that building, a vehicle crossing and driveway must be constructed which meets the requirements of the Kaipara District Council Engineering Standards 2011. (iii) At the time of lodging a building consent, a site specific landscape plan prepared by a suitably qualified and experienced Landscape Architect shall be submitted to the Council for approval and be approved. The landscape plan shall refer to Appendix 10 - Building Site Landscape Planting Plan examples within the Assessment of Landscape and Visual Effects prepared by Hawthorn Landscape Architects dated 20 August 2019 and integrate any future buildings within each lot with the landscape, using planting that reflects the character of the surrounding landscape and should include but not be limited to the following: A description of the purpose and objectives of the planting. A plan of the planted areas detailing proposed plant species, plant sourcing, plant sizes at time of planting, plant locations, density of planting and timing of planting, height and density upon maturity. see part 2. **Copy of Engineering Suitability Report and Assessment of Landscape and Visual Effects attached.**

RM190258 Consent Notices in respect of Lots **81**-84 and Lots 91-94 part two A programme of establishment and post establishment protection and maintenance (e.g. planting method, fertilising, weed removal / spraying, replacement of dead or poorly performing plants, watering, length of maintenance programme). Management of the vegetation within the lot shall be the responsibility of the Lot owner. Details of weed management. Details of certification process once established All works described in the approved site specific landscape plan (above) shall be implemented to the satisfaction of the Council or their delegated representative within the next available planting season following approval of the plan. Evidence shall be prepared by a qualified and experienced landscape architect that the planting required has been implemented to the satisfaction of Council or their delegated representative. (v) The planting undertaken in accordance with the approved Landscape Plan under Conditions 4(d) and 5(d) and the approved site specific landscape plan for this lot created by resource consent RM190258 shall be maintained in perpetuity to the satisfaction of Council or their delegated authority. Should the vegetation be removed or die off, equivalent landscape planting is to be undertaken immediately for the purposes of softening the overall effect of the development and protecting rural character and amenity values in the area. Note: No plants listed in Section 6 of the Northland Regional Pest and Marine Pathway Management Plan 2017- 2027 are permitted. All planting on site shall be maintained in accordance with the approved Ecological Enhancement Plan. Evidence of compliance with this requirement shall be provided to Council in writing by a suitably qualified ecologist five years from the date of issue of titles for RM190258. See part three.

RM190258 Consent Notices in respect of Lots **81**-84 and Lots 91-94 part three Maintenance of planting will be monitored by Council for a period of five years from the date of issue of titles for RM190258. There will be a Council charge for this monitoring payable by the lot owner. (vii) Ongoing weed and pest control shall be undertaken in accordance with the approved Ecological Enhancement Plan in perpetuity. Evidence of compliance with this requirement shall be provided to Council in writing by a suitably qualified ecologist five years from the date of issue of titles for RM190258. Weed and pest plant control will be monitored by Council for a period of five years from the date of issue of titles for RM190258. There will be a Council charge for this monitoring The keeping of stock is prohibited within the lots. (ix) The

	keeping of cats, mustelids and rodents on the lots is prohibited. (x) Within the lots, dogs shall not be kept on the lot unless the following conditions are complied with: 1. Prior to the keeping of a dog on the lot, the owner shall provide details of the dog, including registration number, to the Council`s Team Leader Monitoring and Compliance for ongoing monitoring purposes; and 2. Any dog kept on the lot shall be secured/contained at all times to ensure that they cannot roam into the covenant area on the lot or beyond the boundaries of the lot. Containment shall be demonstrated to the satisfaction of the Council`s Team Leader Monitoring and Compliance and may be in the form of an "electronic pet containment fence", secure fenced area or dog run. For the purposes of this condition, "electronic pet containment fence" means a system installed or attached to the perimeter of a defined area (or wireless equivalent) which is designed to prevent dogs escaping by transmitting a digital or electronic signal to a receiver collar worn by the dog. see part four **RM190258** Consent Notices in respect of Lots **81**-84 and Lots 91-94 part four 3. Ongoing compliance with this condition will be monitored by Council. There will be a Council charge for this monitoring payable by the lot owner. (xi) All buildings must be located within the identified building areas shown on the survey plan. (xii) No buildings shall be constructed within the identified areas to be retained as open space within the lots. Sufficient firefighting water supply shall be provided for any single residential dwelling on the lot(s) with a minimum volume of 10,000 litres and shall remain accessible and available all year round. Sufficient firefighting water supply shall be provided for any commercial or industrial land use on the lot(s). Sufficient firefighting water supply is deemed to mean meeting full criteria of the Code of Practice for firefighting water supplies (SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice. (xiv) All buildings shall be sited and constructed, and landscaping provided in accordance with the Sanctuary Building and Landscaping Guidelines. The site specific landscaping plan required above shall be accompanied by evidence of compliance with the Sanctuary Building and Landscaping Guidelines and associated consultation with the Sanctuary Residents Association who administer the guidelines. At the time of building consent suitable engineering evidence/design shall be provided to demonstrate that on site stormwater attenuation will be provided to limit peak flows from impervious areas to less than 1.2l/sec/100m2 impervious area during a 20% Annual Event Probability (AEP) storm event and 1.2l/sec/100m2 impervious area during a 1% AEP storm event. see part five. **Copy of Sanctuary Building and Landscaping Guidelines attached.** **RM190258** Consent Notices in respect of Lots 81-84 and Lots 91-94. The evidence/design shall take into account the findings and recommendations of the Stormwater Management Staging Letter prepared by Hawthorn Geddes dated 25 June 2020 and submitted to Council with subdivision consent RM190258. **Copy of Stormwater Management Staging letter attached.**
11/09/14	**RESOURCE CONSENT 140124:** Subdivide the cell site and access from LOT 105 DP 404128. **Created DP 482523** Section 224 Issued 20/04/15 : GRANTED UNDER DELEGATED AUTHORITY 21/08/14 (Found on parent property: 0122008819)
9/03/10	**RESOURCE CONSENT 090128A:** to add amalgamtion conditions to relocate boundaries between Lot 104 and Lot 34. **Created DP 430128**. Section 224 Issued 1/07/10 (Found on related property: X0122008800)
10/05/06	**RESOURCE CONSENT 040281:** Subdivide Pt Lot 1 DP 171740 Lot 1 DP 196760 Allot 230 423 Waipu Psh Blik II Mangawhai SD Blk XI Waipu SD-Subj to & int in eases-TNA into 69 lots, and removal of 1ha of native vegetation. **Created DP 404128.** : Bond Released 4/03/13. (Found on related property: X0122008800) **Copy of Consent Notice and Conservation Covenants attached.** RM040281: Consent notice for Lots 1, 4-6 (inclusive), 8, 9, 12, 13, 27A, 28, 28A, 29-33 (inclusive), 35, 35A, 36-38 (inclusive)DP 404128: the owner of each lot is required to be a shareholder or member of The Sanctuary Residents Association Inc formed to operate, maintain & administer those components of the of the commonly owned land

& administer monitoring of individual treatment systems connected to the communal system. (Found on related property: X0122008800)

RM040281: Consent notice for Lots 1, 4-6 (inclusive), 8, 9, 12, 13, 27A, 28, 28A, 29-33 (inclusive), 35, 35A, 36-38 (inclusive)DP 404128: the owner of each lot is required to enter into an ongoing contract for the maintenance of the individual treatment systems with an organisation approved by The Sanctuary Residents Association Inc. (Found on related property: X0122008800)

RM040281: Consent notice for Lots 1, 4-6 (inclusive), 8, 9, 12, 13, 27A, 28, 28A, 29-33 (inclusive), 35, 35A, 36-38 (inclusive)DP 404128: in the event that The Sanctuary Residents Association Inc is wound up or liquidated, or ceases or fails to carry out its prescribed purposes, the Owners are deemed to be an unincorporated society for the purposes set out in Paragraphs 1 & 2 of this consent notice. (Found on related property: X0122008800)

RM040281: consent notice for lots 10,17, 19-23(inclusive), 69 & 70 DP 404128: the owner acknowledges that the construction & use of on site waste disposal systems for each lot may require discharge permits from NRC & that advice be sought from NRC accordingly. (Found on related property: X0122008800)

RM040281: consent notice for lots 10,17, 19-23(inclusive), 69 & 70 DP 404128: the owner shall ensure that the wastewater treatment and disposal systems on each lot shall be designed by and installed under the supervision of a competent engineer with appropriate experience in wastewater systems or other suitable qualified person to the approval of the Council. (Found on related property: X0122008800)

RM040281: consent notice for lots 10,17, 19-23(inclusive), 69 & 70 DP 404128: the owner of each lot shall enter into an ongoing contract for the maintenance of the wastewater treatment & disposal systems on each lot & provide details to the entity formed to administer all matters associated with the maintenance of all on-site effluent disposal systems. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP 404128: the owner shall have regard to the Engineering & Geotechnical Report (Job No.4819) prepared by Hawthorne Geddes Engineers & Architects Ltd dated Sept 2004 (the Hawthorne Geddes Report). the owner of each lot shall ensure that it complies with the recommendations of that report with respect to foundations & drainage at the time of development of the lot. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP 404128: the owner of each lot shall not erect of permit the erection of any building otherwise than within the identified building sites and additional building sites referred to in the Hawthorne Geddes Report, such sites being identified in respect of each lot on the table annexed to the consent notice as schedule One. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP 404128: the owner shall comply with the building & landscaping guidelines for the subdivision which have been approved by Council & shall ensure that any buildings on the lot be sited & constructed & the lots landscaped in accordance with those building & landscaping guidelines. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP 404128: the owner shall maintain any landscaping on the lot in accordance with the Landscape Amenity Enhancement Plan approved under Condition 2(bb) of Resource consent. The areas of the landscaping on the lots to

which this condition 9 apply are set out in the table annexed to the consent notice as Schedule two. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP 404128: the owner acknowledges that condition 10 in the consent notice will be monitored by the Council for a period of five years from the date of the completion of planting to the reasonably satisfaction of Council, & that there will be a Council charge for this monitoring payable by the owner. (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP404128: the owner shall not allow the planting of exotic vegetation that could pose a threat to the ecological values of the lots. The includes the introduction of invasive plant species, including those currently listed on the nationally banned for sale list (see NRC Regional Pest Management Strategy). (Found on related property: X0122008800)

RM040281: Consent notice for lot 1, 4-6(inclusive), 8-10 (inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a, 36-60(inclusive) 69 & 70 DP404128: the owner of each lot acknowledges that it is required to be a member of The Sanctuary Residents Association Inc for so long as it is the owner of the lot. The Owner of each lot acknowledges that it shall not take steps to wind up or liquidate The Sanctuary Residents Association Inc without the Council`s prior written consent. (Found on related property: X0122008800)

RM040281: Consent notice for lots 52 & 70 DP 404128: the owner acknowledges the presence of recorded archaeological sites in the Time Depth Heritage Consultants Archaeological Assessment (Found on related property: X0122008800) Report & the protection given to these sites under the Historic Places Act 1993.

RM040281: Consent notices for lots 1, 4-6(inclusive), 8-10(inclusive), 12, 13, 15-17(inclusive), 19-27(inclusive), 27a, 28, 28a, 29-35(inclusive), 35a 36-60(inclusive), 69 & 70 DP 404128: the owner of each lot acknowledges that no further subdivision of the lot shall be permitted for a period on 10 years form the date of registration of the consent notice. (Found on related property: X0122008800)

RM040281: Consent notice for lots 1, 10, 13, 15-17(inclusive) DP 404128: the owner of each lot must not use and must not permit the use of direct vehicular access from the lot onto Cove Road. (Found on related property: X0122008800)

RM040281: Consent notice for lots 100 & 101 DP 404128: the owner must take all practicable steps to protect & enhance the amenity, ecological & water quality values of the lakes on the lots and must not use or permit the use of motorised craft on the lakes except by the owner for dam maintenance or emergency purposes. (Found on related property: X0122008800)

RM040281: Consent notice for lot 103 DP 404128; the owner must not use & must not permit the use of the lot for any purpose other than recreation & recreation facilities & must not use or permit the use of the lot for residential development or commercial accommodation. (Found on related property: X0122008800)

RM040281: Consent notice for **Lot 1 DP 430128,** the owner must not use or permit the use of the lot for any purpose other than maintaining & enhancing its argricultural use and for effluent disposal and must not use or permit the use of the lot for residential development or commercial accommodation.

Access is private and not maintained by Council.

No other information located.

Building

30/08/21	BUILDING CONSENT 210441: New Single Storey 4 Bedroom Dwelling with Attached Double Garage and Swimming Pool: Code Compliance Certificate Issued 5/08/22.

No other information located.

Sewer and Water

Sewer	Not available.
Stormwater	No information located.
Water	Not available.

Any on-site wastewater system for the property may need to comply with Council inspection and maintenance regime under the Councils Wastewater Drainage Bylaw 2016. This bylaw is located on KDC website.

Copy of drainage plan attached.

No other information located.

Land and Building Classifications

There are a number of recorded archaeological sites on the shared lots for this property. For information contact Heritage New Zealand.

Outstanding Natural Landscape ONL14 on shared lot – Bream Tail/Brynderwyn Ranges. **Copy attached**.

Refer to copy of map from District Plan for other classifications in the immediate vicinity.

No other information located.

Compliance with Swimming Pool Bylaw

5/08/22 Swimming Pool SW0571: Pool barriers comply 5/08/22: Expires 5/08/2025.

No other information located.

Land Transport Requirements

No information located.

Special Land Features

Erosion prone land within shared Lots – **See map attached.**

Coastal Flood Hazard Zone **– See map attached.**

This identification may affect any proposed building work on the property in relation to both resource consent and building consent. For further information you may want to visit the Natural Hazards website.

You may also wish to contact the Northland Regional

No other information located.

Licences/Environmental Health

No information located.

Network Utility Operators

Information related to the availability of supply, authorisations etc (eg, electricity or gas) can be obtained from the relevant Network Utility Operator.

Other Information

No title search has been done on this property.

Notes

1. Final inspections on buildings were not mandatory prior to 1 January 1993. Should an evaluation of the building be required an independent qualified person should be consulted. In the interests of safety, an inspection of any fireplace within the dwelling may be requested of Council at any time, after paying the appropriate fee.
2. Every care has been taken to ensure that the information supplied by the Council on this form is accurate. The Council relies on information available to it and will not be held responsible for incomplete or inaccurate information provided, or for any errors or omissions made in good faith.
3. Please note that the property was neither inspected nor visited during the preparation of this Land Information Memorandum. Information is based on a search of Council records only and no inspection of the land or any building on it will be undertaken for the purpose of preparing the Report.
4. Other information may be held by other authorities, for example the Northland Regional Council or Heritage New Zealand.
5. This Land Information Memorandum is a disclosure of information (which may be historical) held by the Council at the time of application and is subject to change.
6. Any enquiry not accompanied by a fee will be invoiced separately. (All prices are GST inclusive).
7. Any Resource or Building consents run with the land; if the project is incomplete, there may be existing/additional charges to pay for which the new owner will be liable.
8. A Development Contribution and or Financial Contribution may be payable if development is carried out, the effect of which is to require new or additional assets or assets of increased capacity and as a consequence Council incurs capital expenditure to provide appropriately for those assets and that capital expenditure is not otherwise funded or provided for. Future rating policies are outlined in Council's Long Term Plan 2024-2027.

Name: _____ Date: 13/05/2025.

Performance Standards of the Kaipara District Plan 2013

To view the performance standards (rules) for each zone please refer to the relevant chapter of the Kaipara District Plan 2013:

Rural - Chapter 12

Residential - Chapter 13

Business: Commercial and Industrial - Chapter 14

Māori Purposes: Māori Land – Chapter 15A

Māori Purposes: Treaty Settlement Land – Chapter 15B

Estuary Estates – Chapter 16

Estuary Estates - Chapter 16A – Trifecta Development Area

All Zones - Chapter 10 Network Utilities and Chapter 11 Transport Network

How can I view the Kaipara District Plan 2013?

If you have access to the internet and want access to the most up to date information, visit the website **www.kaipara.govt.nz**

If you do not have access to a computer, you can visit one of the following locations to view a hard copy of the Plan:

Venue	Opening Hours	
Kaipara District Council Office – Dargaville 32 Hokianga Road Dargaville Telephone 0800 727 059	Monday – Tuesday Wednesday Thursday - Friday	8.00am to 4.30pm 9.00am to 4.30pm 8.00am to 4.30pm
Kaipara District Council Office – Mangawhai Unit 5, The Hub 6 Molesworth Drive Telephone 0800 727 059	Monday – Friday	9.30am to 3.00pm
Dargaville Library Corner Poto and Normanby Streets Dargaville Telephone 0800 534 542	Monday – Wednesday Thursday Friday Saturday	9.30am to 5.00pm 9.30am to 6.00pm 9.30am to 5.00pm 9.30am to 12.30pm
Mangawhai Library 45 Moir Street Mangawhai Telephone 0800 532 542	Tuesday - Wednesday Thursday Friday Saturday	10.00am to 5.00pm 10.00am to 6.00pm 10.00am to 5.00pm 10.00am to 1.00pm
Kaiwaka Library Corner State Highway 1 and Kaiwaka Mangawhai Road Kaiwaka Telephone (09) 431 2539	Monday Tuesday Wednesday - Saturday	4.00pm to 6.00pm Closed 10.00am to 2.00pm
Maungaturoto Library Centennial Building Hurndall Street Maungaturoto Telephone (09) 431 8811	Monday – Tuesday Wednesday Thursday – Saturday Friday Terms 1 & 4 also	10.30am to 1.00pm 10.30am to 4.00pm 10.30am to 1.00pm 4.00pm to 6.00pm
Paparoa Library Brook House 1980 Paparoa Valley Road State Highway 12 Paparoa Telephone (09) 431 7555	Monday Tuesday Wednesday Thursday Friday Saturday	2.00pm to 4.30pm 10.00am to 1.00pm 2.00pm to 4.30pm 10.00am to 4.00pm 11.00am to 1.30pm 10.00am to 12.00pm

All Maps

- State Highway
- Railway
- Bridge or Causeway
- Unformed Road
- Sea, Lakes and Rivers
- Parcel Boundary

Map Series One - Land Use

- Estuary Estates
- Rural
- 8m Height Restriction
- Business: Commercial
- Business: Industrial
- Residential
- Maori Land
- Treaty Settlement
- Estuary Estates
- East Coast Overlay
- Harbour Overlay
- Kai Iwi Lakes Overlay
- West Coast Overlay

Map Series Two - Sites, Features and Units

- Heritage Resource
- Notable Tree
- Maungaturoto Dairy Factory Wastewater Pipeline
- 110-220 kV Electricity Transmission Line
- 50 kV Electricity Transmission Line
- Designation Areas
- Outstanding Natural Landscape
- Reserve Management Units
- Areas of Significance to Maori
- Maungaturoto Dairy Factory Noise Contour Boundary (45dBA leq)

KAIPARA DISTRICT

KAIPARA DISTRICT PLAN - OPERATIVE NOVEMBER 2013

Map Legend

Date Updated:4/08/2021

Whangarei District

Bream Bay

Pacific Ocean

Mangawhai Heads

Mangawhai Village

Tara

Pukepohatu/Bald Rock

Refer to map 53 for further detail

Refer to map 54 for further detail

Refer to maps 56A and 56 for further detail

Refer to map 55 for further detail

Refer to map 57 for further detail

53

54

56A / 56

55

57

COVE ROAD

KAPAWIU ROAD

KING ROAD

LONG ROAD

TARA ROAD

ATKIN ROAD

CUMBERLAND ROAD

HILLTOP ROAD

BALDROCK ROAD

BROWN ROAD

RAYMOND BULL ROAD

Mangawhai River

Mangawhai Harbour

Hakaru River

Cook Creek

Smith Creek

KAIPARA DISTRICT

Kaipara ki Oraanui • Two Oceans Two Harbours

Scale: 1:50,000 @ A3

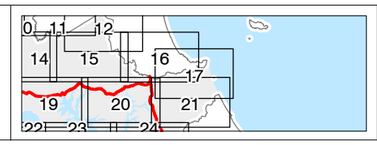
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KAIPARA DISTRICT PLAN - OPERATIVE VERSION - JULY 2013

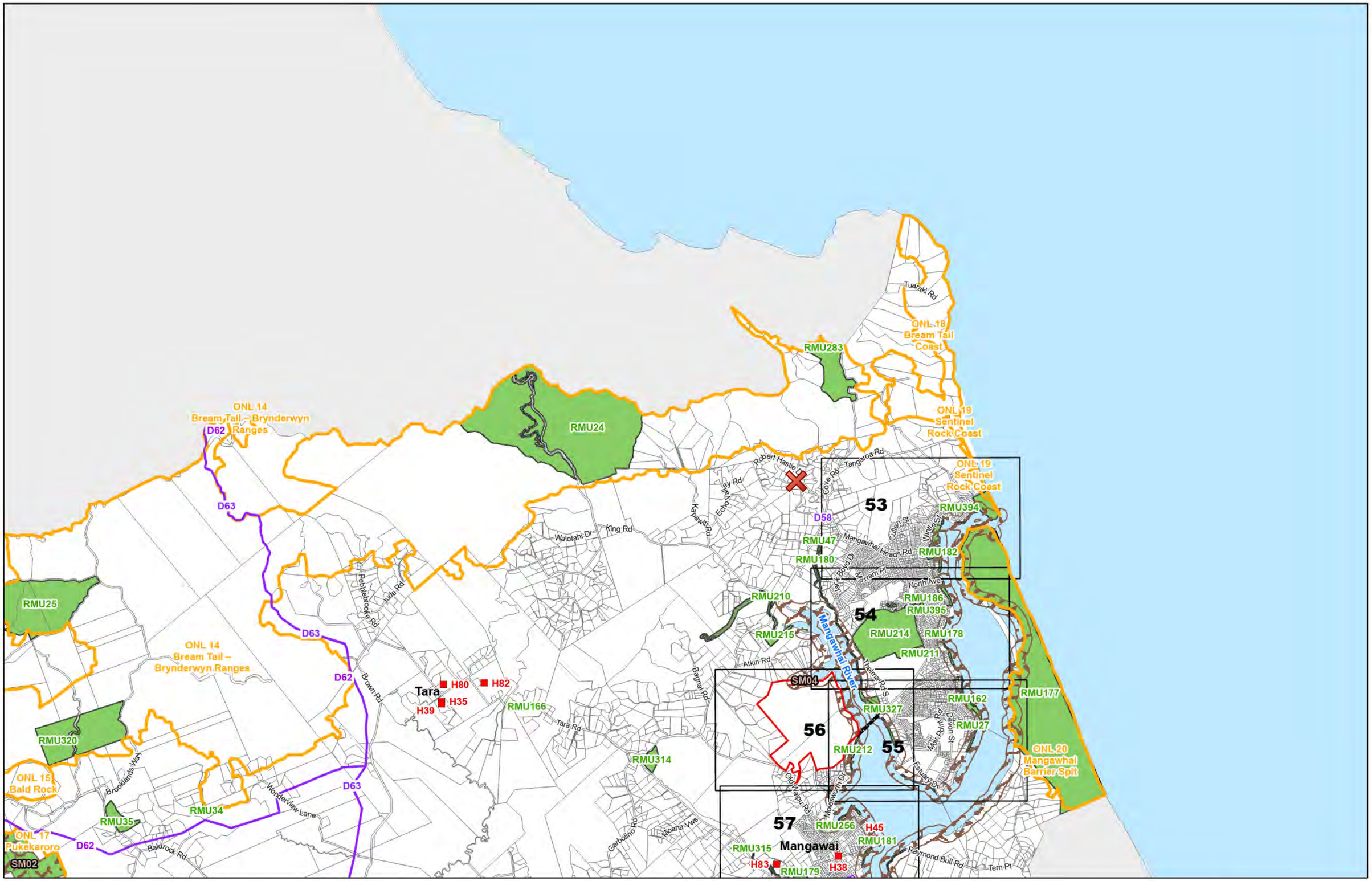
Map Series One

Land Use

Map 17 of 60



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Cadastre from 19 March 2021.

KAIPARA DISTRICT
Kaipara te Oranganui - Two Oceans Two Harbours

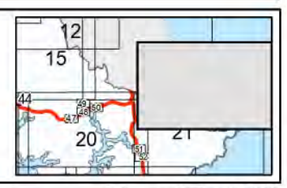
KAIPARA DISTRICT PLAN - OPERATIVE NOVEMBER 2013

Map Series Two
Sites, Features and Units

N

0 10 20 Km

A3 Scale: 1:50,000



Date Updated:4/08/2021

18 Landscapes and Natural Features

18.1 Introduction

Section 6(b) of the Resource Management Act identifies as a matter of importance *"The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development".*

Kaipara includes outstanding landscapes and natural features.

Outstanding Natural Landscapes

Kaipara District includes a diverse range of landscapes ranging from exposed coasts, sheltered estuaries, rivers, steep bush clad hills, riverside flats and rolling farmland. Collectively these varied landscapes contribute to the character and identity of the Kaipara District and some of these landscapes have been assessed and identified as being 'Outstanding Natural Landscapes' (ONLs).

One of the distinguishing characteristics of these landscapes is their degree of 'naturalness'. However, this does not preclude farming activities and structures such as fences, barns, farm houses or other forms of development from being within them. It is the scale and intensity of the built structures and development that determines when an outstanding natural landscape is no longer 'outstanding'.

The criteria used for identifying Outstanding Natural Landscapes are1:-

Significant landscapes were assessed and classified to identify Outstanding Natural Landscapes Outstanding Natural Landscapes.

a) The natural science factors: - the geological, topographical, ecological and dynamic components of landscape;

b) Its aesthetic values including memorability and naturalness;

c) Its expressiveness (legibility): how obviously the landscape demonstrates the formative processes leading to it;

d) Transient values: occasional presence of wildlife, or its values at certain times of the day or of the year;

e) Whether values are shared and recognised;

f) Its value to tangata whenua; and

g) Its historical associations.

Appendix 18A sets out the 23 Outstanding Natural Landscapes identified in the Kaipara District and provides a description of each of them. These descriptions are derived from the Kaipara District Landscape Technical Report (2010). That Report contains worksheets detailing the elements and values associated with each Outstanding Natural Landscape and helps understand what aspects of the landscape are of value in order to provide for appropriate land use management.

You can check if your property has an Outstanding Natural Landscape by looking on Map Series 1 of the District Plan Maps.

Outstanding Natural Landscapes are deemed to be those landscape areas which strongly display the physical characteristics and character associated with a particular landscape type. They are prominent, lend a measure of spectacle or sense of place, and have an uninhabited or sparse level of built development or modification, with a relatively low capacity to absorb change. While these landscapes make a significant contribution to the public realm, land ownership is a mix of public and private ownership. In some cases these include working landscapes.

Issues, Objectives, Policies, Methods, Outcomes and Rules are set out to appropriately manage and/or protect the Outstanding Natural Landscapes.



West Coast Ocean Beach



Mangawhai Barrier Spit

Natural Features

Kaipara District includes a number of natural features, some of which may be considered to be 'Outstanding Natural Features' (ONFs).

At the time of preparing the District Plan, specific mapping or identification of ONFs had not been undertaken. The District Plan identifies Issues, Objectives and Policies for these features and identifies the process for how ONFs will be identified and protected in the Kaipara District.

Regional Context

At a regional level, the Northland Regional Council may also consider the significance of the feature or landscape. Given the scale / grain of these assessments a landscape that is considered "outstanding" within the Kaipara District may not be considered "outstanding" within the Northland Region as a whole.

At the time of preparing the District Plan, the Council was aware that the Northland Regional Council is undertaking work to map outstanding landscapes, natural character and natural features of the coastal environment, as part of its work for the Regional Policy Statement review. It is anticipated that as more current or accurate mapping information becomes available (for example, through the Regional Council's review work) Council will review the defined landscapes. The work by the Regional Council may also provide further information for Council to define and consider management options for outstanding natural features.

18.2 Resource Management Act Requirements

Under the Resource Management Act 1991 the Council has a responsibility to manage landscapes and natural features and the contribution of landscapes to environmental quality as defined below:

Section 6 of the Resource Management Act provides for "Matters of National Importance" which outlines that all persons exercising functions and powers under the Resource Management Act shall recognise and provide for matters of national importance. Of relevance to this Chapter are:

a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes, and rivers and their margins, and the protection of them from inappropriate subdivision, use and development.

b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development.

c) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

d) The protection of historic heritage from inappropriate subdivision, use, and development.

Section 7 of the Resource Management Act sets out 'Other Matters' that those exercising functions and powers under the Resource Management Act shall have particular regard to. Of relevance to this Chapter, are:

a) The maintenance and enhancement of amenity values.

b) Maintenance and enhancement of the quality of the environment.

c) The benefits to be derived from the use and development of renewable energy.

Some of the above section 6 and 7 matters of the Resource Management Act (as well as other matters identified in these sections) are addressed more specifically in the objectives, policies and methods of other Chapters of this District Plan. In particular the following Chapters are relevant: Chapter 2 (District Wide Resource Management Issues), Chapter 4 (Overlays), Chapter 5 (Tangata Whenua Strategy), Chapter 6 (Ecology), Chapter 10 (Network Utilities) and Chapter 17 (Heritage).

To recognise and provide for the section 6 matters listed above, it is appropriate for Council to identify Outstanding Natural Landscapes (which may include outstanding natural features and areas of high natural character). These Outstanding Natural Landscapes have been mapped in the District Plan.

The identification of landscapes and the inclusion of specific Issues, Objectives, Policies and Rules is also necessary to give effect to the relevant Policies, 6 and 15 of the New Zealand Coastal Policy Statement 2010 and Objectives 19.3.1-3 and Policies 19.4.1-19.4.6 of the Regional Policy Statement for Northland 2002.

Other section 6(b) matters and section 7(c) and 7(f) matters (relating to Outstanding Natural Features, amenity and other landscape values contributing to the quality of the environment) are also recognised in this Chapter of the District Plan through the Issues, Objectives and Policies. These are not mapped on the Planning Maps.

[1] These criteria are derived from case law developed in 'Pigeon Bay Aquaculture Ltd and Ors v Canterbury Regional Council' C32/999

18.3 How to Use This Chapter of the District Plan

This Chapter contains specific Issues, Objectives and Policies to recognise landscape values and protect outstanding landscapes.

While this Chapter does contain Methods, it does not contain 'Rules'. The Outcomes sought by this Chapter (how the objectives and policies are implemented) are to be achieved through land use and subdivision rules including assessment criteria for resource consent and performance standards in the Chapters in Part B.

As long as a proposed activity meets the performance standards of the relevant Zone Chapter, landowners do not need to consider this Chapter. However, if a proposed development, new land use or subdivision requires resource consent under the relevant Part B Chapter of the District Plan, you may need to give consideration to this Chapter, particularly on how your proposal contributes to achieving the objectives and policies of this Chapter.

Before you use this Chapter of the Plan, please check:

- ☑ Whether you have an Outstanding Natural Landscape on your property – as this will set different performance standards for your property (identified in Part B of the Plan);
- ☑ That the proposed activity meets the performance standards for the relevant zone (if it does you don't need to refer to this Chapter);
- ☑ If you do require a resource consent, review the assessment criteria to confirm if they include consideration of impacts on landscape/natural feature values (if they don't and your activity is a 'restricted discretionary activity, you don't need to refer to this Chapter);

Otherwise you do need to consider this Chapter and how your proposal meets the relevant objectives and policies.

Issues, Objectives and Policies within each Chapter of the Plan are presented in no particular order of importance.

It is also important to remember that you may want to use this Chapter if you are proposing to seek one of the following types of subdivision as it will assist you in determining whether areas on your land have landscape value for an 'environmental benefit':

- 'Preservation of natural or cultural heritage';
- 'Environmental benefit'; or
- 'Integrated development'.

The provisions in this chapter prevail over the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 on relation to plantation forestry activities and transfers into the rules over landscapes as it appears in all the District Plan zones.

This Chapter contains specific issues, objectives and policies to recognise and protect values of landscapes and natural features

You can check if your property has an Outstanding Natural Landscape mapped on it. Look on Map Series 2 of the District Plan Maps.

If your proposal is for an activity (development) that meets the Performance Standards for the relevant Zone Chapter, you don't need to consider this Chapter

18.4 Landscapes and Natural Features Issues

18.4.1 Inappropriate subdivision, use and development has the potential to threaten the values of Outstanding Natural Landscapes.

The spiritual, cultural, amenity, ecological, geological and scientific values that make individual features and landscapes outstanding, have the potential to be adversely affected or in some cases permanently lost or degraded by inappropriate subdivision, use and development. Generally, Outstanding Natural Landscapes have lower capacity to absorb change.

Subdivision, use and development can be inappropriate due to the level of modification of the landscape and associated reduction in naturalness. Buildings and other structures have the potential to change Outstanding Natural Landscapes through inappropriate siting, character design, scale and form; or by the location and extent of earthworks and vegetation clearance, and inappropriate planting. Conversely good design, the appropriate location of built structures and elements together with good land management practices may allow the character and values of such landscapes to be protected.

The cumulative effects of all types of subdivision, use and development can progressively change Outstanding Natural Landscapes. These changes include positive cumulative effects such as those associated with environmental restoration activities while other land use changes can have adverse cumulative effects associated with the loss of natural character as built structures and elements become more prevalent.

18.4.2 The need to identify and protect Outstanding Natural Landscapes from inappropriate subdivision, use and development while also providing for the social and economic well-being of the District's people and communities.

Some people have a perception that the identification of an Outstanding Natural Landscape on a property detracts from the value and development potential of the property. Such landscapes have the potential to make a significant contribution to the value of land and contribute to economic development, e.g. through increased opportunities for recreation and tourism activities or encouraging people to live and work within or near distinctive or iconic landscapes.

Much of the District's landscape is a working landscape that changes over time and includes pastoral land where structures such as fences, farmhouses, barns, pump-houses, utilities and land management practices form part of the working landscape.

Other industries that may also value resources in or near these areas include extractive industries (due to the presence of a mineral resource) and new significant infrastructure such as renewable energy developments. As an example of the former, Bald Rock is a resource that has had a long history of quarrying. The underpinning volcanic dacite geology of Bald Rock gives the feature its striking geomorphic character but is also a potential source of valuable building and construction material for the district and the wider region (due to its very slow weathering characteristics). There is an acknowledged shortage of aggregate and mineral resources for building and construction in the wider region and the Plan recognises the importance of managed mineral extraction to the social and economic wellbeing of the District (see outcome 2.7.12 and associated provisions).

There needs to be a careful balance between the protection of Outstanding Natural Landscapes and use of these resources (to provide for social and economic wellbeing) in achieving sustainable management.

18.4.3 Inappropriate subdivision, use and development on land outside Outstanding Natural Landscapes may adversely affect the values and characteristics of the Outstanding Natural Landscape.

Council is required to manage Outstanding Natural Landscapes in a way that identifies and protects their values from the adverse effects of inappropriate subdivision, use and development. Some activities outside an Outstanding Natural Landscape may generate effects on, an Outstanding Natural Landscape.

18.4.4 There are natural features in the District that are likely to be of outstanding value. However their values and extent and the risks to these features are currently not well understood.

The spiritual, cultural, ecological, geological and scientific values that contribute to outstanding natural features have the potential to be adversely affected or in some cases permanently lost or degraded by inappropriate subdivision, use and development. Some of these features are identified and included in the mapped Outstanding Natural Landscapes. However, other natural features have been identified (for example through the Geopreservation Society's inventory). Currently, there is limited information on the extent of these features and the extent to which current resource use is threatening their values.

18.4.5 The need to recognise and maintain a diversity of landscape types.

The Kaipara District contains a number of distinctive, 'iconic' and cultural landscapes contributing to amenity and the quality of the environment. Retaining the District's distinctive landscape character relies on managing landscape values (including those outside Outstanding Natural Landscapes) and maintaining strong representation of landscape types. It also involves maintaining and enhancing the key characteristics that define and contribute more broadly to the District's identity. However, it is important to recognise that these landscapes are often working environments undergoing change and used for a variety of purposes.

The District Plan needs to manage the effects of activities in a way that recognises and maintains the range and variety of distinctive landscapes (including cultural landscapes) that distinguish Kaipara recognising that some types are less well-represented than others.

The District's landscapes are also protected through the voluntary efforts of landowners and the Council wishes to foster this type of support.

Some elements of the physical environment that contribute to landscape values overlap with other resource values and are more specifically addressed in other Chapters of the District Plan (particularly Chapters 4, 5, 6, and 17).

18.4.6 Adjoining District Councils are at different stages of identifying outstanding natural landscape, natural features and other landscape values, and have different approaches to protecting and managing those areas. Those differences have the potential to diminish the coherence and value of the broader landscape entity.

Adjoining Councils have not identified Outstanding Natural Landscapes and features n a consistent way. This may result in the degradation or destruction of such features and landscapes over time and cross boundary management issues i.e. the recognition and management of landscape values of the Brynderwyns differs between the districts that this feature spans.

18.5 Landscapes and Natural Features Objectives

18.5.1 **To protect Outstanding Natural Landscapes from inappropriate subdivision, use and development, including in terms of the type, scale, design, intensity and location of any subdivision, use and development.** Issues 18.4.1, 18.4.2 and 18.4.3

18.5.2 **To identify outstanding natural features in the District and determine the most appropriate methods to protect such features from inappropriate subdivision, use and development.** Issue 18.4.4

18.5.3 **To encourage the active management, enhancement, and voluntary protection of landscapes by private land owners by utilising regulatory incentives and non-regulatory methods.** Issues 18.4.1, 18.4.4 and 18.4.5

18.5.4 **To maintain the distinctiveness, diversity and complexity and sense of place of landscapes across the District.** Issue 18.4.5 Issue 18.4.6

18.6 Landscapes and Natural Features Policies

18.6.1 **To recognise and protect Outstanding Natural Landscapes from inappropriate subdivision, use and development by:** Objective 18.5.1 Objective 18.5.3 Objective 18.5.4

a) Identifying and confirming the extent, values and characteristics of Outstanding Natural Landscapes;

b) Protecting natural and physical features and natural systems (such as landforms, indigenous vegetation and watercourses) that contribute to the character and values of Outstanding Natural Landscapes;

c) Managing the potential adverse effects of activities including earthworks, vegetation clearance and the location, scale, design and external appearance of buildings structures and accessways;

d) Protecting the character and values of features and landscapes by managing the potential significant adverse effects of locating inappropriate significant built elements outside Outstanding Natural Landscapes;

e) Recognising the importance of views of Outstanding Natural Landscapes;

f) Avoiding significant adverse effects that would compromise the values and characteristics of Outstanding Natural Landscapes, particularly when viewed from public places including public roads;

g) Recognising the on-going contribution to the social and economic wellbeing of the District derived from activities and maintaining appropriate opportunities for these within Outstanding Natural Landscapes. These activities include farming, forestry operations and renewable energy activities and associated electricity transmission activities; and

h) Encouraging and recognising the wider benefits of sensitive development that protects Outstanding Natural Landscapes.

The Council has recognised and protected Outstanding Natural Landscapes in the District and has mapped them.

Subdivision, use and development within Outstanding Natural Landscapes will be managed so that the key physical characteristics and values that make up each individual landscape will be protected (as identified in Appendix 18A and the worksheets of the Kaipara District Landscape Technical Report 2010) from inappropriate subdivision, use and development. The impact of different activities on Outstanding Natural Landscapes will vary depending on the sensitivity of the landscape to a proposed activity. While generally, Outstanding Natural Landscapes have lower capacity to absorb change, this does not preclude built structures and elements or other land use activities where appropriate. The key focus is protecting the identified values of the Outstanding Natural Landscapes. However, it is recognised that there are other 'competing' policy directions such as the National Policy Statement on Renewable Energy that also need to be taken into account. When considering the effects of activities on these landscapes reference also needs to be had to Appendix 18B which contains assessment criteria.

Subdivision boundaries and the alignment and location of network utilities (including roading networks) should recognise natural topography, important natural features, views and patterns of the landscape to appropriately avoid adverse effects on landscape values.

Enhancing existing environmental systems will be encouraged. For example, this may include extending areas of existing indigenous vegetation to provide ecological linkages and strengthen landscape patterns, and integrating elements such as waterways with subdivision, use and development. Activities which have the potential for adverse effects on these Outstanding Natural Landscapes will be subject to management through the Plan.

In assessing applications for resource consent for subdivision, use and development consideration will be given to the benefits of the proposal in terms of the protection and enhancement of scientific, geological and landscape values being offered. This could be by way of voluntary protection measures, covenant, consent notices or financial contributions. For example the use of covenants to control the volume and extent of land disturbance activities, protection of indigenous vegetation, design and external appearance and location of, accessways, buildings and structures including signage, lighting and fencing.

18.6.2 **To consider, at the time of resource consent applications, the potential adverse effects of subdivision, use and development on landscape values and the diversity of landscape types.** Objective 18.5.4

Recognising that much of the District's amenity, character and sense of place is derived from working landscapes and environments it is important to expect that there will be on-going change, use and development in these areas. The Council will consider the visual and landscape effects of those activities requiring resource consent, in particular to recognise and maintain the range and variety of distinctive landscapes (including cultural landscapes), amenity, character and sense of place.

In assessing applications for resource consent for subdivision, use and development consideration will be given to the impact that the development may have on the diversity of landscape types within the District.

18.6.3 **Working with neighbouring local authorities to provide a consistent approach to the identification, protection and management of Outstanding Natural Landscapes and Outstanding Natural Features.** Objective 18.5.1 Objective 18.5.2 Objective 18.5.4

Several of Kaipara District's Outstanding Natural Landscapes traverse boundaries with Far North, Whangarei and Auckland Council's boundaries. In order to address cross boundary issues an integrated management approach is necessary to facilitate the identification, protection and management of Outstanding Natural Landscapes through District Plan Methods and Other Methods. Inconsistent identification of Outstanding Natural Landscapes will result in inconsistent management of inappropriate development and adverse environmental effects.

Collaborative investigation and assessment of Outstanding Natural Features, with other local Northland local authorities and the Auckland Council will enable Council to identify and as appropriate map and protect these features in a consistent manner to adjoining Districts, providing improved certainty for the environmental outcomes of their management and ensuring consistency in approach for users of the Plan.

18.6.4 **To encourage the voluntary protection and enhancement of Outstanding Natural Landscapes recognising the benefits afforded to the wider community by these actions.** Objective 18.5.3

Outstanding Natural Landscapes are often located within or include private property. The support of land owners and their appreciation of the values and sensitivities of Outstanding Natural Landscapes is therefore an important facet of sustainable management of the District's landscape resource.

Kaipara District Council will encourage opportunities for private landowner benefits in recognition of the wider public benefit of scheduling Outstanding Natural Landscapes in private property. For example, Council will provide financial incentives through the Biodiversity Fund and through provisions of environmental benefit subdivision for protection of Outstanding Natural Landscapes.

18.7 Methods

18.7.1 District Plan Methods

- **Outstanding Natural Landscapes are identified in Map Series 2 and a description of their individual values and characteristics is provided in Appendix 18A. Subdivision, use and development rules, performance standards and specific assessment criteria are included in the Plan to provide for the protection of these Outstanding Natural Landscapes.**

- **Investigation to determine the geographic location of natural features in the District and an assessment and evaluation of their significance to determine the extent to which they need to be recognised and provided for.**

- **Investigating additional development rights if areas of Outstanding Natural Landscapes on private property are permanently protected.**

- **Investigating the development of Transferrable Development Rights to provide additional development rights where the subject land is not capable of absorbing further development.**

- **Additional assessment criteria (in the Zone Chapters) for subdivision in Outstanding Natural Landscapes, for example, by managing the shape of lots and building locations within new lots to encourage land use patterns that avoid or minimise impacts on Outstanding Natural Landscapes.**

- **If a resource consent is required, inclusion of assessment criteria (in the Zone Chapters) for selected activities (subdivision, excavation and fill, indigenous vegetation clearance), to consider the potential adverse effects activities on the diversity of landscape types, amenity and character.**

- **Consideration of Outstanding Natural Landscapes in the definition of Growth Areas and structure planning for those areas.**

18.7.2 Other Methods

The Council will provide the following methods to assist land owners:-

- **Financial support - Council will investigate opportunities for discounts for resource consent fees and specific detailed assessment of landscape areas associated with the protection of landscapes;**
- **Landscape Assistance Fund – Council will establish a fund to assist in the costs of protective fencing, pest control and costs associated with establishing covenants; and**
- **Design guidelines – Council will investigate providing guidelines on how to protect landscapes and their values (e.g. information on preferred building locations, revegetation, cultural values);**
- **Maintain a register of professional consultants to provide advice on landscapes and their values;**
- **Establish and monitor a database of "significant cultural values of landscapes" - Council will record information obtained through the processing of consents and the progressive mapping of this information and work with tangata whenua on opportunities for specific cultural assessment for the District. Through the monitoring of the District Plan (see Chapter 23), Council will investigate inclusion of the outcomes of this mapping and assessment into the District Plan (e.g. if the resource management issues associated with the protection of these values are considered sufficient to warrant management intervention);**
- **The Council will provide the following methods to assist the community:-**
  - **Community liaison – Council will assist in the establishment of community care groups and will provide technical advice and will assist them in gaining funding for community projects;**
  - **Education – Council will investigate further opportunities to work with communities (both landowners and other residents) on what makes a landscape 'valued' and how they should be managed, protected and used;**
  - **Council will provide support for Landcare and Coastcare Programmes; and**
  - **Weed and Pest Management – Council will investigate further opportunities to progress weed and pest management programmes in Outstanding Natural Landscapes and significant natural areas.**
- **Active involvement with the Northland Regional Council, Far North District Council, Auckland Council, Whangarei District Council and Department of Conservation to develop a consistent approach to the protection and management of Outstanding Natural Landscapes, and outstanding natural features and landscape values – within the Northland Region – in particular to give effect to the New Zealand Coastal Policy Statement 2010 and in the development of the Northland Regional Policy Statement Review.**
- **Develop monitoring indicators for Outstanding Natural Landscapes.**

18.8 Outcomes

18.8.1 Outstanding Natural Landscapes are mapped and protected from inappropriate subdivision, use and development.

18.8.2 The characteristics and values that contribute to the diversity of landscape, amenity and character are appropriately maintained and enhanced.

18.8.3 Greater community awareness and support for the protection of Outstanding Natural Landscapes.

Appendix 18A: Schedule of Outstanding Natural Landscapes (ONLs) within the Kaipara District

ONL Name	Description
ONL1: Waipoua Forest	Waipoua Forest is an extensive area of pristine forest. It is moderately elevated and broadly rolling with a very simple horizon and a generally undramatic landform. The edge of upland is, however dissected with deep gullies. This area is part of a wider area of Outstanding Landscape Area which extends northwards into the adjoining District, including the Waima Forest. The vegetation types range from areas of regenerating indigenous vegetation to groves of mature kauri. This forest is highly visible due to elevation, scale and its 'bisection' by SH12. This road access is promoted as a visitor experience in itself.
ONL2: West Coast Ocean Beach	This area extends along the majority of the Tasman coastline, and the western edge of the District. It is approximately 78km in length starting about 13km above the apex of North Head and running up to the District's northern boundary at the Waipoua River. Maunganui Bluff (which is defined as a separate area) forms the only short break in this area. The character of this area is very exposed and remote, with limited opportunities for access and few isolated settlements. The beach stretches in a simple virtually straight line and has a consistent cross section with the intertidal expanse of the beach running in to the elevated bank of the historic dune. Erosion of the exposed rocky headlands, and deposition of sand in the embayment's, has resulted in this relatively straight shoreline on this coast. Vegetation cover is sparse. Dunefield grasses are found on the least mobile areas of sand and either pasture or a mixed coastal scrub of exotic and indigenous species cover most of the backshore bank. More established vegetation including flax and pohutukawa is found in the gullies which occasionally open out onto the beach. Built development occurs in isolated pockets at Glinks Gully, Baylys Beach, Omamari and Aranga. These tend to be restricted in area and have a limited impact on the character of the beach.
ONL3: Tutamoe / Kaihu / Marlborough Forest	This forest contains extensive areas of elevated pristine native forest, with broadly rolling upland. Some portions, such as the Kaihu Forest /Tutamoe are notable for the precipitous vegetated slopes and largely flat and extensive summit. Whilst the upper portion of the elevated areas retain their vegetation cover, the lower slopes have been cleared for pasture or are planted in forestry.
ONL4: Maunganui Bluff	Maunganui Bluff is a prominent and highly visible feature rising above the surrounding landscape. To the seaward side the land falls precipitously from a narrow ridge to the sea. On the landward side the landform shelves more slowly. Indigenous vegetation, sculpted by the wind clings to the slopes. The gently curved valley of the Waitapu Stream hangs between the northern and main 'summits'. Two small settlements cluster, one at the northern end and the other at the southern end of the bluff.
ONL5: Trounson Kauri Park	This park covers an area of 450ha and is just under 300m at its highest point. It forms a discrete area of native bush set within rural landscape, and the scale of the vegetation, most notably the kauri, accentuates this feature. The area includes the catchments of several first order streams of a tributary of the Waima Stream. The bush comprises significant stands of large kauri and provides as a notable mainland island with good kiwi population.
ONL6: Kai-Iwi Lakes	The Kai-Iwi lakes are a series of 3 extensive dune lakes (Waikere, Taharoa and Kai iwi) set within rural landscape. The lakes are notable for the clarity of water and are popular for recreation, including boating and swimming. A campground is located to the south of Lake Taharoa.
ONL7: Mangatipa	Mangatipa is located 12km to the north west of Tangiteroria. It covers an area of approximately 660ha and is a broad dissected peak, with deep valleys and prominent spurs. It rises to almost 500m and is a locally prominent landform. The vegetation comprises a mix of young podocarp-hardwood forest and shrubland and covers most of the feature although on the north western face an area of pasture detracts from its 'naturalness'

ONL Name	Description
ONL8: Maungaru Range	This feature comprises a long narrow range of hills located to the north east of Dargaville. The range rises steeply from the surrounding rolling farmland. The range is aligned on a north west – south east axis, and is partially vegetated with native forest and shrubland, with its northern end the Houto Forest. The high point, Maungaru, is located at the southern end of the range and rises to 418m.
ONL9: Tangihua Range	The Tangihua Range straddles both the Whangarei and Kaipara District and combines with the Maungaru Range to form a 'gateway' landform feature. The high point of the range (at 627m) is located at the western end and gives the range its name. The landform is steep and rugged, with a jagged ridge forming the skyline. The height of the feature in conjunction with the contrasting relatively low lying land around means that the range forms a prominent backdrop to much of the surrounding area. Second growth regenerating native vegetation clothes the upper slopes of the feature.
ONL10: Maungaraho	Maungaraho is a very prominent and recognisable feature in the landscape, jutting from the riverine plain with an immediately recognizable form. The feature is a symmetrical cone, clad with indigenous vegetation and capped with a projection of exposed rock.
ONL11: Tokatoka	Tokatoka is a distinctive and powerful feature in the landscape, jutting from the riverine plain with an immediately recognisable form. Viewed from the majority of angles the feature is a symmetrical cone, viewed from the south-east and north-east the rock displays a strikingly narrow form.
ONL12: Pukekohe Hill	Located 8km north of Paparoa, this landscape area includes the Pukekohe Hill feature which has a height of 201m and includes the headwaters of the Waiotira Stream. The landscape area comprises an extensive area of indigenous native forest and is (in part) protected as a scenic reserve.
ONL13: Marereţu Forest	This area straddles the District boundary and is located 9km north of Maungatoroto. The Mareretu State forest extends along a steep ridge which rises to a maximum height of 361m. It is bound on its southern side by Finlayson Brook Road. The portion within Kaipara District comprises the western end of the ridge, 500m to the east of Golden Stairs Road and rises sharply from the valley floor. The area is visually prominent because of its elevation and continuity of indigenous vegetation.
ONL14: Bream Tail / Brynderwyn Ranges	This area includes the Brynderwyn Ranges where it is covered with a contiguous swathe of indigenous vegetation between State Highway 1 and the east coast. The ranges rise sharply from the surrounding rolling landform and the contrast in topography and vegetation serves to accentuate the visual prominence and influence of the area. The ranges also form a perceptual barrier between the Kaipara and Whangarei Districts. The vegetation within the area is largely unmodified, however there is some evidence of clearance and the cutting of tracks is visible. Where development has occurred on the elevated land it is sometimes very visible due to the use of inappropriate colouring and materials.
ONL15: Bald Rock	Prominent volcanic feature located to the north of Kaiwaka at the western end of the Brynderwyn ranges. The rock comprises a localised high point rising to 238m with exposed rock faces protruding from the surrounding bush. Despite quarrying on its southern face and the encroachment of production activities, the area remains linked by indigenous vegetation with the adjoining areas. Bald Rock is a landmark feature on the journey north along State Highway 1.
ONL16: Pukearenga	Pukearenga comprises a localised highpoint, rising to a maximum height of 274m. It is located 4 to 5km to the south east of Maungaturoto and is encircled on its west and south sides by the Wairau and Kaiwaka Rivers respectively. The edge of the feature is defined by the edge of the indigenous vegetation which extends to the foot of its steep slopes.

ONL17: Pukekaroro	The Pukekaroro Dome is noted in the New Zealand Geopreservational Inventory as a feature of importance. It is located 2km to the north of Kaiwaka and is a prominent feature visible to vehicles on the State Highway. The area includes the vegetated portion of the dome which extends from the foot of the steep slope at its margins. The dome rises to a height of 301m. The feature has a dense covering of native forest, mainly kauri which is relatively young and growing in dense thickets. The area is a Scenic Reserve.
ONL Name	**Description**
ONL18: Bream Tail Coast	This area lies at the north eastern apex of the District and extends about 3km south along the coastal edge towards the Mangawhai harbour. The area also includes an area of contiguous indigenous vegetation which, although largely separated from the coast, does link to the coast at its south eastern corner. The coastal portion of the area includes a steep coastal escarpment of some 100-150m in height. In places the escarpment is more precipitous. The shore is lined by a narrow sandy beach and this is echoed by rocky reef platforms extending out into the sea. The northern parts of the area are largely clad with indigenous coastal shrubland/forest. The coastal walkway traces the coast margin of this area and this forms a link in Te Araroa – 'The long Pathway'. Recent subdivision of Bream Tail Farms will result in a reduction in the 'remote character' of the area.
ONL19: Sentinel Rock Coast	This area extends from the south of the Bream Tail OLA for 2km to Sentinel Rock at the mouth of the Mangawhai Harbour. The area is confined to a narrow coastal belt typically extending to the upper edge of the coastal ridge. Within this area the beach tends to be wider with dunes banking up along the coastal flank whilst the rocky reefs are absent. The steep coastal flanks that feature around the Tail are present here, although lower and more undulating. Pohutukawa remains the prevalent coastal tree and dominates with large groves at the southern end of the area. Recent subdivision of the elevated land at the mouth of the harbour detracts significantly from this vegetated feature.
ONL20: Mangawhai Barrier Spit	This area comprises a 4km long spit of sand dunes, ocean beach and estuarine shore which separates the Mangawhai Harbour from the open sea. It ranges from 200m in width at its narrowest, to over 1km wide at its base. While predominantly natural and unmodified, small areas of exotic tree species, such as pines and wattle detract from the naturalness of this area.
ONL21: Te Kopua Point headland & harbour edge	Also known as Pakaurangi Forest, this area comprises a vegetated headland which extends out into the Kaipara harbour at the mouth of the Arapaoa River and a length of coast 2 to 3km in length. The area is understood to be the most extensive area of indigenous forest and shrubland within the Otamatea Ecological District.
ONL22: North Head Dune Lakes	This area is located near the apex of North Head and 2.5km from Pouto. The area comprises a number of waterbodies that includes Lake Humuhumu, Rotootuaru, Rotokawau, Waingata, Kanono and Kahuparere. The western edge of the area is defined by the pine plantations associated with North Head.
ONL23: North Head Coast & western dune lakes	This area contains the coastal duneland landscape at the apex of North Head. Near the harbour mouth the area is between half a kilometre and two kilometres in width whilst on the western edge of the area it widens to an average of some three kilometres including lakes Whakanene, Mokeno and Karaka. The area is remote and, on its western edge is very exposed with a spacious character. This spaciousness is due to most of the area lacking the coastal bank of the beach to the north. Instead, the predominant character is formed by the extensive duneland and low shrubland vegetation. Behind this dunefield lies the largest three dune lakes and a number of smaller freshwater lakes. Surrounding these features is an extensive area of wetland supporting indigenous wetland vegetation.

Note: Worksheets developed as part of the Kaipara District Landscape Technical Report (2010) provide more detail on the values identified for each of these features and will be considered in addition to the summaries of the physical characteristics and values identified in this Appendix.

Appendix 18B: Additional Assessment Criteria when considering the effects of activities in Outstanding Natural Landscapes

The matters set out in s104 and in Part 2 of the Act apply to the consideration of all resource consents for land use, development and subdivision, use and development activities.

In addition to these matters and the general assessment criteria provided within the relevant chapter of the Plan, the following criteria shall also be considered. These are cross-referenced in the Zone Chapters and will be triggered where a resource consent is required.

a) The extent to which the activity is consistent with the relevant objectives and policies and outcomes contained in Part A and Part C of the Plan, including Chapters 2, 3, 4, 5, 6, 7, 17 and in particular, Chapter 18 Landscapes;

b) The extent to which the activity will affect the values and characteristics that make that landscape outstanding as described in Appendix 18A and the technical worksheets in the Kaipara District Landscape Technical Report 2010;

c) The extent to which the activity is visible in the landscape from public places and public roads;

d) The type and effectiveness of any methods proposed to avoid, remedy or mitigate the effects of the activity on the feature or landscape;

Note: For example, for earthworks, the types of methods might include the profile of cut and fill batters, provisions for revegetation and the likely long term stability of the works proposed.

e) The functional, technical or operational need for the activity to locate within the feature or landscape. In the case of electricity transmission activities, technical and operational requirements include route selection;

f) Without limiting clause 1(b) of Schedule 4 of the Resource Management Act, where it is likely that an activity will result in any significant adverse effect on the feature or landscape, the extent to which alternative locations or methods for undertaking the activity have been considered;

g) Where excavation and / or fill is proposed, the extent to which the location, scale and alignment of the works affect the underlying landform including ridgelines and headlands and any existing indigenous vegetation.

Rates Information - 2024/25

Valuation ID	0122008878	Old Valuation ID	C:0122008800

Property Description

Location (GIS)	53 Robert Hastie Drive, Mangawhai
	View in Google Maps
Legal Description	LOT 81 DP 556753 - HAVING 1/826SH IN LOT S 100-103 106 200 202 DP 404128 LOT 1 DP 430128 LOT 1 DP 482523 BEING 96.8877HA
Certificate of Title	973221

Use	21 Lifestyle: Single Unit	Category	LI202
TORAS	121000	Category Group	Lifestyle Improved with Residential Accommodation
Tenure	Property is not leased. Owner is also occupier.	Ward	4
Ownership	Private: Company - not Crown owned	Region	1
Rateability	Rateable	Zone	1A
Apportionment	Std property - Not Applicable, Not apportionment		

Valuations

Area (Hectares)	0.5903	Land Value	595,000
Improvements	1,535,000	Capital Value	2,130,000
Nature of Improvements	DBLEGGE DECK DWG OI POOL		
Valuation Date	1/09/23		

Rates for Current Year - 2024/25

Type	Description (Basis)	Factor	Amount $
002	Uniform Annual General Charge - Rating Unit	1.00	725.00
081	Mangawhai Harbour Restoration (MHR) - Rating Unit	1.00	80.00
233	General Rate Residential & Small Sized Lifestyle - (L)	595,000.00	1,133.53
238	Parks and Libraries Targeted Rate - (U)	1.00	372.77
	** Kaipara District Council Sub-Total		2,311.30
250	NRC Targeted Council Services Rate - (U)	1.00	242.60
253	NRC Pest Management Rate - (U)	1.00	117.87
254	NRC Targeted Flood Infrastructure Rate - (U)	1.00	40.67
255	NRC Targeted Emergency and Hazard Management Rate - (U)	1.00	66.69
256	NRC Targeted Regional Rescue Services Rate - (U)	1.00	11.30
257	NRC Targeted Regional Sporting Facilities Rate - (U)	1.00	16.18
259	NRC Targeted Land and Freshwater Management Rate - (L)	595,000.00	168.33
260	NRC Targeted Regional Economic Development Rate - (L)	595,000.00	14.52
	** Regional Council Sub-Total		678.16
	Total Rates Levied 2024/25		2,989.46
	(GST on Rates Levied)		389.93
	Rates Last Year 2023/24		2,656.86
	Last Year's Final Instalment		664.21

Rates Last Year 2,656.86 Instalments YTD 2,989.46 Current Instalment 747.36

History

Year	Land Value	Capital Value	Annual Rates
2023/24	425,000	1,440,000	2,656.86
2022/23	425,000	450,000	2,554.69
2021/22	425,000	450,000	2,453.55
2020/21	680,000	710,000	

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Title Plan - LT 556753

Survey Number	LT 556753
Surveyor Reference	93003 - Sanctuary Lot 2
Surveyor	Stephen Thomas Dobbie
Survey Firm	Terra Group NZ Limited trading as Terra Consultants
Surveyor Declaration	

Survey Details

Dataset Description	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128		
Status	Initiated		
Land District	North Auckland	**Survey Class**	Class B
Submitted Date		**Survey Approval Date**	
		Deposit Date	

Territorial Authorities

Kaipara District

Comprised In

RT 781590

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Lot 81 Deposited Plan 556753	Fee Simple Title	0.5903 Ha	973221
Lot 82 Deposited Plan 556753	Fee Simple Title	1.0016 Ha	973222
Lot 83 Deposited Plan 556753	Fee Simple Title	1.4167 Ha	973223
Lot 84 Deposited Plan 556753	Fee Simple Title	0.7397 Ha	973224
Lot 91 Deposited Plan 556753	Fee Simple Title	0.8337 Ha	973225
Lot 92 Deposited Plan 556753	Fee Simple Title	1.2065 Ha	973226
Lot 93 Deposited Plan 556753	Fee Simple Title	1.1723 Ha	973227
Lot 94 Deposited Plan 556753	Fee Simple Title	1.0104 Ha	973228
Area A Deposited Plan 556753	Covenant - Land		
Area B Deposited Plan 556753	Covenant - Land		
Area C Deposited Plan 556753	Covenant - Land		
Area D Deposited Plan 556753	Covenant - Land		
Area E Deposited Plan 556753	Covenant - Land		
Area F Deposited Plan 556753	Covenant - Land		
Area G Deposited Plan 556753	Covenant - Land		
Area H Deposited Plan 556753	Covenant - Land		
Area I Deposited Plan 556753	Covenant - Land		
Area J Deposited Plan 556753	Covenant - Land		
Area K Deposited Plan 556753	Covenant - Land		
Area L Deposited Plan 556753	Covenant - Land		
Area M Deposited Plan 556753	Covenant - Land		
Lot 101 Deposited Plan 556753	Fee Simple Title	5.5952 Ha	973229
Area N Deposited Plan 556753	Covenant - Land		
Area O Deposited Plan 556753	Covenant - Land		

Title Plan - LT 556753

Created Parcels

Parcels	Parcel Intent	Area	RT Reference
Area P Deposited Plan 556753	Covenant - Land		
Area Q Deposited Plan 556753	Covenant - Land		
Area R Deposited Plan 556753	Covenant - Land		
Area S Deposited Plan 556753	Covenant - Land		
Area T Deposited Plan 556753	Covenant - Land		
Area U Deposited Plan 556753	Covenant - Land		
Total Area		13.5664 Ha	

Schedule / Memorandum

Land Registration District	Plan Number
North Auckland	DP 556753

Territorial Authority (the Council)

Kaipara District Council

Amalgamation Conditions
(Pursuant to s220 Resource Management Act 1991)

That Lots 100-103, 106, 200 & 202 DP 404128 and Lot 1 DP 430128 and Lot 1 DP 482523 be held as to eight (8) undivided one, eight hundred and twenty sixth (1/826) shares by the owners of lots 81-84 & 91-94 hereon and as to six (6) undivided one, eight hundred and twenty sixth (1/826) shares by the owners of lot 101 hereon as tenants in common in the said shares and that individual Records of Title be issued in accordance therewith.

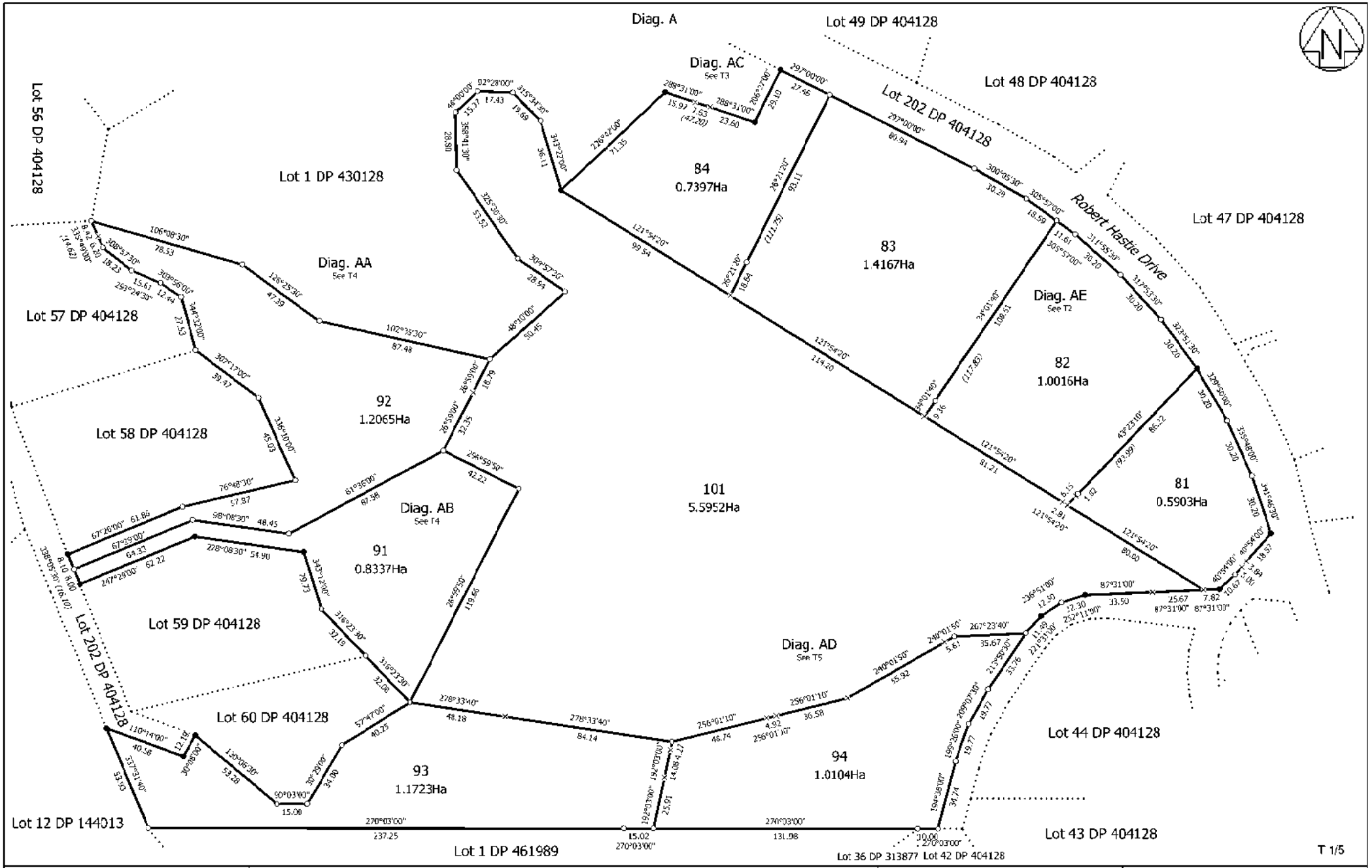
Amalgamation Conditions to be Cancelled
(Pursuant to s241 Resource Management Act 1991)

That the Kaipara District Council shall cancelled the amalgamation conditions requiring Lots 100-103, 106, 200 & 202 DP 404128 and Lot 1 DP 430128 and Lot 1 DP 482523 and Lot 2 DP 430128 to be held in the same Record of Title.

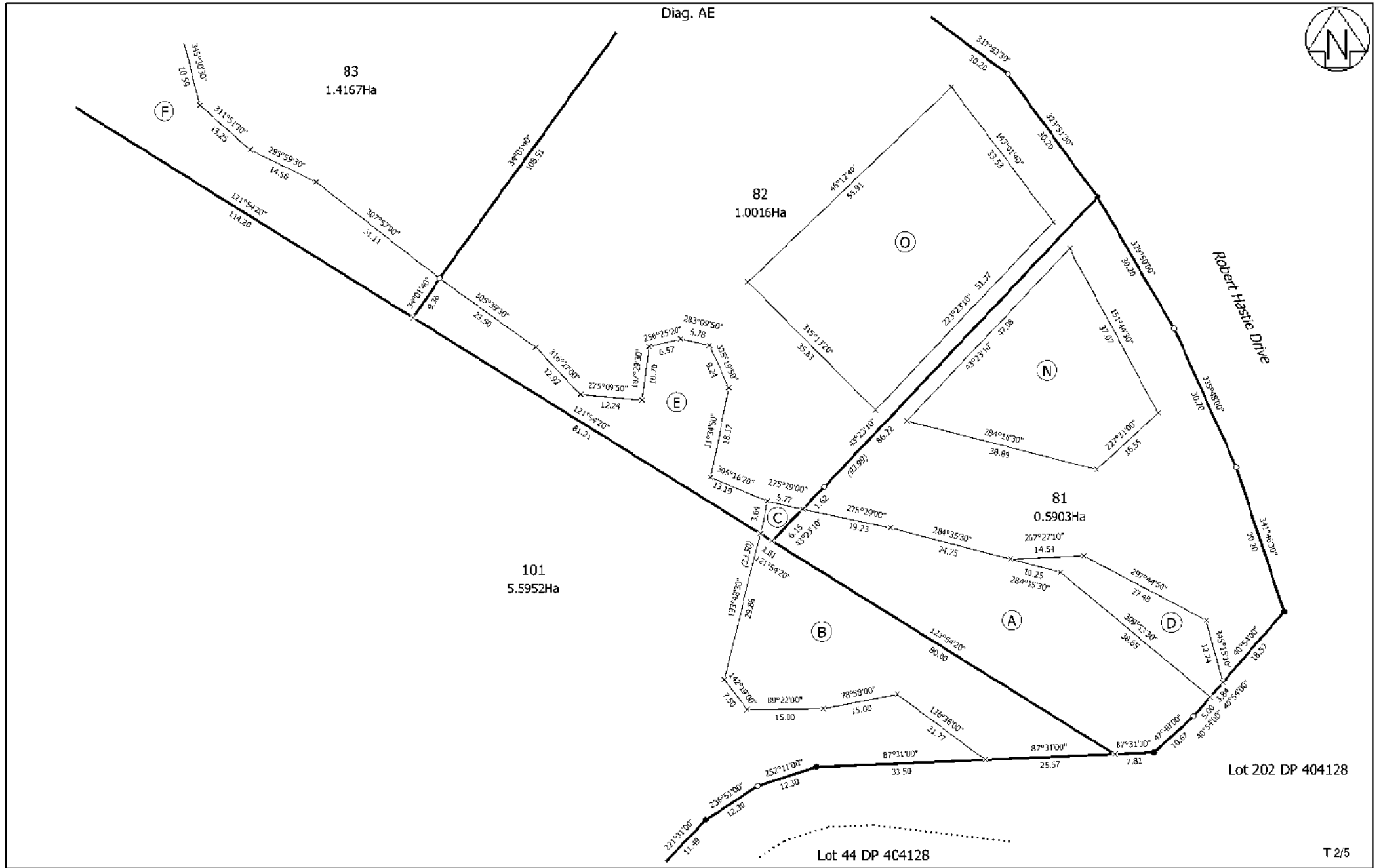
Areas marked A, B & C are subject to existing conservation covenants (Vegetation protection).
Creating document 8138731.7

Areas marked D - M are to be subject to a conservation covenants (Vegetation protection).

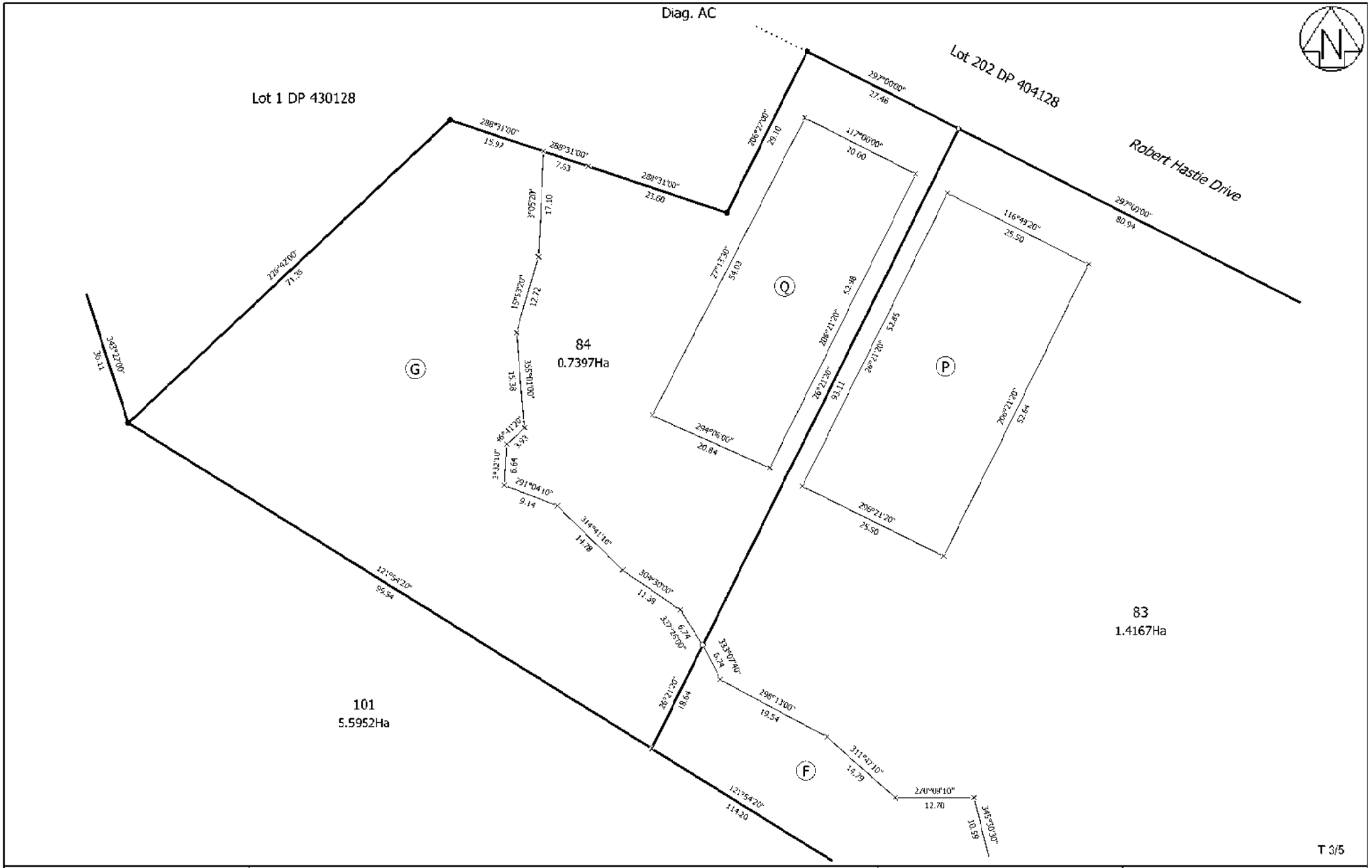
Areas marked N - U are to be subject to a land covenants (Building sites).



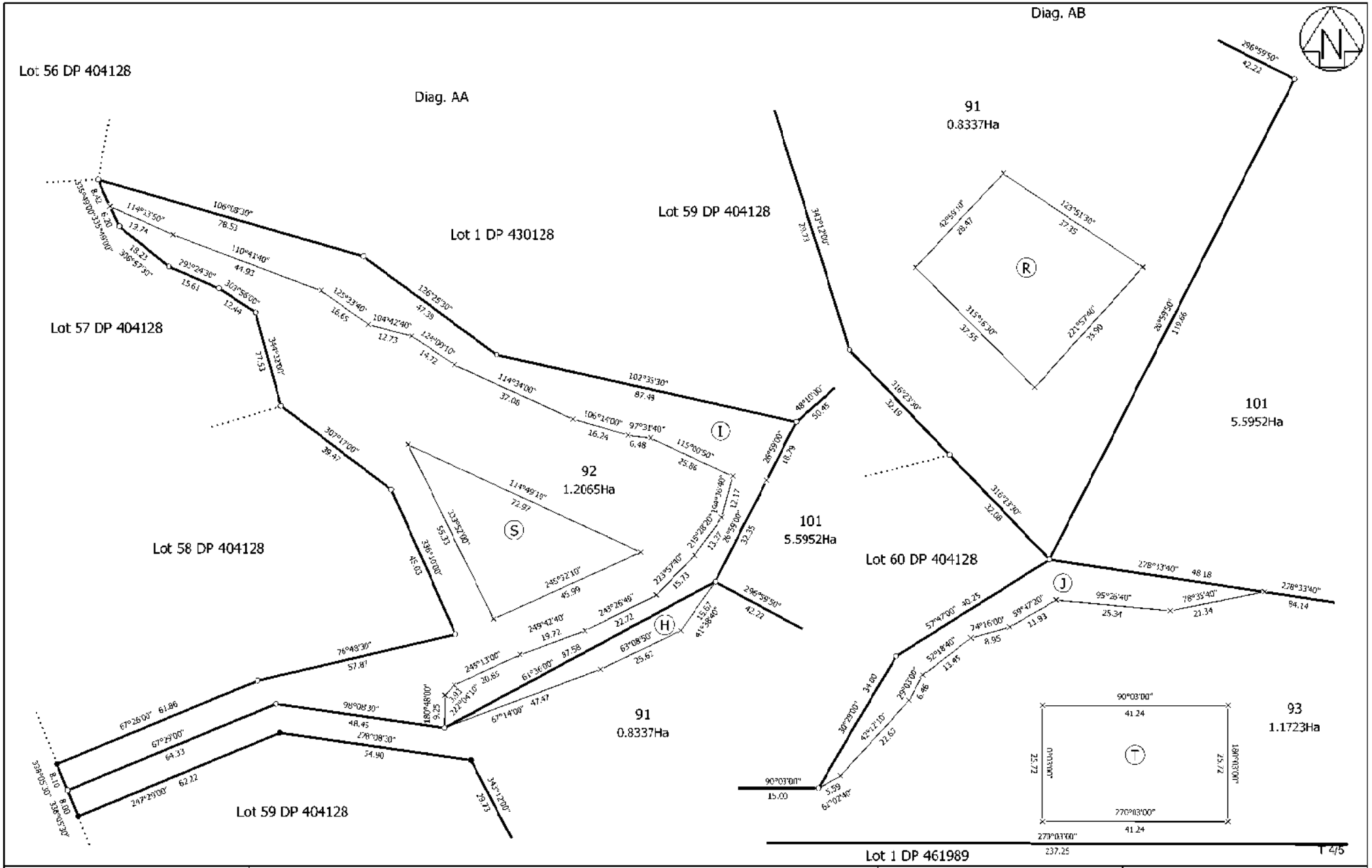
Land District: North Auckland Digitally Generated Plan Generated on, 02/12/2020 12:45pm Page 1 of 8	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128	Surveyor: Stephen Thomas Dobbie Firm: Terra Group NZ Limited trading as Te	Title Plan LT 556753 DRAFT



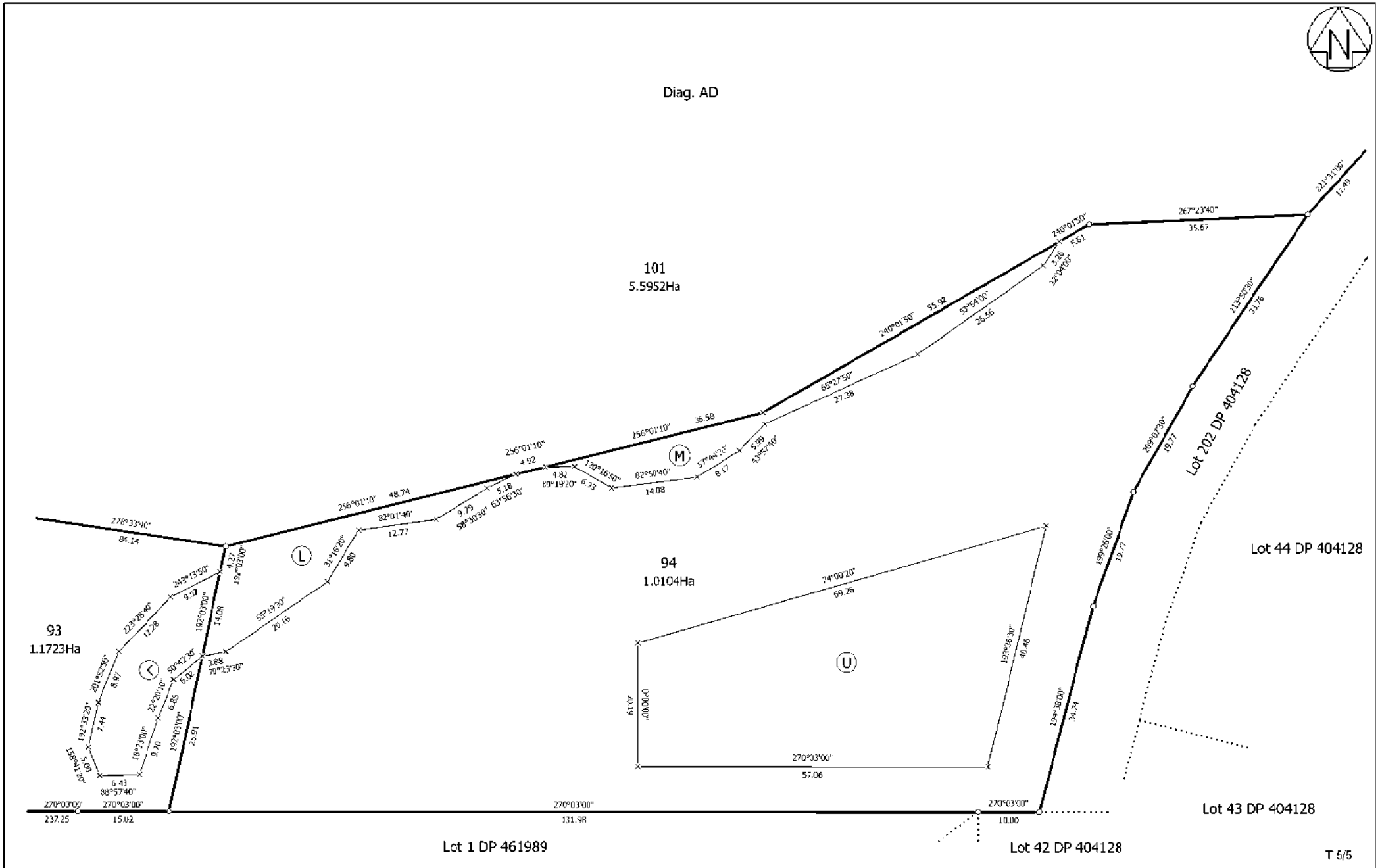
Land District: North Auckland Digitally Generated Plan Generated on, 02/12/2020 12:45pm Page 5 of 8	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128	Surveyor: Stephen Thomas Dobbie Firm: Terra Group NZ Limited trading as Te	Title Plan LT 556753 DRAFT



Land District: North Auckland Digitally Generated Plan Generated on, 02/12/2020 12:45pm Page 5 of 8	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128	Surveyor: Stephen Thomas Dobbie Firm: Terra Group NZ Limited trading as Te	Title Plan LT 556753 DRAFT



Land District: North Auckland Digitally Generated Plan Generated on, 02/12/2020 12.45pm Page 7 of 8	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128	Surveyor: Stephen Thomas Dobbie Firm: Terra Group NZ Limited trading as Te	Title Plan LT 556753 DRAFT



Land District: North Auckland Digitally Generated Plan Generated on, 02/12/2020 12.45pm Page 8 of 8	Lots 81-84, 91-94 & 101 being Subdivision of Lot 2 DP 430128	Surveyor: Stephen Thomas Dobbie Firm: Terra Group NZ Limited trading as Te	Title Plan LT 556753 DRAFT

IN THE MATTER of the Resource Management Act 1991 ("**Act**")

A N D

IN THE MATTER of the subdivision of land shown in Deposited Plan 556753 (North Auckland Land Registration District) ("**Plan**")

CONSENT NOTICE
(Section 221 of the Act)

KAIPARA DISTRICT COUNCIL ("**Council**") being the territorial authority of the district within which the land described in the First Schedule below ("**Land**") is located has consented to the subdivision of the Land as shown in the Plan, subject to the conditions of the Second Schedule below to be complied with on a continuing basis by the Owner (as defined in the Act).

FIRST SCHEDULE
(Land)

Lot 2 on Deposited Plan 430128 and 1/59 share Lot 100-103, 106, 200, 202 Deposited Plan 404128 and Lot 1 Deposited Plan 430128 and Lot 1 Deposited Plan 482523

SECOND SCHEDULE
(Conditions)

The Owner (as defined in the Act) must, on a continuing basis, to the satisfaction of the Council, comply with the following conditions of the Council's Subdivision Consent RM190258, namely:

1. In respect of Lots 81-84 and Lots 91 to 94 on the Plan (each a "Lot").

   (i) Earthworks, the location of buildings, building foundations and stormwater and wastewater disposal shall be subject to specific engineering design by a suitably qualified Chartered Professional Engineer having regard to any soil instability/saturation issues that may exist or arise as a result of the development. Design shall take into account the recommendations identified in the Engineering Suitability Report prepared by Hawthorn Geddes dated 12 July 2019 and submitted to Council with subdivision consent RM190258.

   (ii) At the time of lodging a building consent for a habitable building on the lots and before issuing a Code of Compliance for that building, a vehicle crossing and driveway must be

constructed which meets the requirements of the Kaipara District Council Engineering Standards 2011.

(iii) At the time of lodging a building consent, a site specific landscape plan prepared by a suitably qualified and experienced Landscape Architect shall be submitted to the Council for approval and be approved. The landscape plan shall refer to Appendix 10 - Building Site Landscape Planting Plan examples within the Assessment of Landscape and Visual Effects prepared by Hawthorn Landscape Architects dated 20 August 2019 and integrate any future buildings within each lot with the landscape, using planting that reflects the character of the surrounding landscape and should include but not be limited to the following:

- A description of the purpose and objectives of the planting.
- A plan of the planted areas detailing proposed plant species, plant sourcing, plant sizes at time of planting, plant locations, density of planting and timing of planting, height and density upon maturity.
- A programme of establishment and post establishment protection and maintenance (e.g. planting method, fertilising, weed removal / spraying, replacement of dead or poorly performing plants, watering, length of maintenance programme). Management of the vegetation within the lot shall be the responsibility of the Lot owner.
- Details of weed management.
- Details of certification process once established

(iv) All works described in the approved site specific landscape plan (above) shall be implemented to the satisfaction of the Council or their delegated representative within the next available planting season following approval of the plan. Evidence shall be prepared by a qualified and experienced landscape architect that the planting required has been implemented to the satisfaction of Council or their delegated representative.

(v) The planting undertaken in accordance with the approved Landscape Plan and the approved site specific landscape plan for this lot created by resource consent RM190258 shall be maintained in perpetuity to the satisfaction of Council or their delegated authority. Should the vegetation be removed or die off, equivalent landscape planting is to be undertaken immediately for the purposes of softening the overall effect of the development and protecting rural character and amenity values in the area.
Note: No plants listed in Section 8 of the Northland Regional Pest and Marine Pathway Management Plan 2017- 2027 are permitted.

(vi) All planting on site shall be maintained in accordance with the approved Ecological Enhancement Plan. Evidence of compliance with this requirement shall be provided to Council in writing by a suitably qualified ecologist five years from the date of issue of titles for RM190258. Maintenance of planting will be monitored by Council for a period of five years from the date of issuing of 224 certificate for RM190258. There will be a Council charge for this monitoring peyable by the lot owner.

(vii) Ongoing weed and pest control shall be undertaken in accordance with the approved Ecological Enhancement Plan in perpetuity. Evidence of compliance with this requirement shall be provided to Council in writing by a suitably qualified ecologist five years from the date of issuing of 224 certificate for RM190258.

Weed and pest plant control will be monitored by Council for a period of five years from the date of issuing of 224 certificate for RM190258. There will be a Council charge for this monitoring payable by the lot owner.

(viii) The keeping of mustelids and rodents on the lots is prohibited. Cats shall be limited to no more than two cats for each lot and they shall be required to wear a bell when outside.

No cats or dogs shall be permitted within the conservation covenanted areas and appropriate signs/symbols to this effect shall be erected and maintained at any access points to the conservation covenanted areas.

(ix) Within the lots, dogs shall not be kept on the lot unless the following conditions are complied with:

1. Any dog kept on the lot shall be secured/contained at all times to ensure that they cannot roam into the covenant area on the lot or beyond the boundaries of the lot. Containment shall be demonstrated to the satisfaction of the Council's Team Leader Monitoring and Compliance and may be in the form of an "electronic pet containment fence", secure fenced area or dog run. For the purposes of thie condition, "electronic pet containment fence" means a system installed or attached to the perimeter of a defined area (or wireless equivalent) which is designed to prevent dogs escaping by transmitting a digital or electronic signal to a receiver collar worn by the dog.

2. Ongoing compliance with this condition will be monitored by Council. There will be a Council charge for this monitoring payable by the lot owner.

(x) All buildings must be located within the identified building areas shown on the Plan.

Lot	DP	Record of Title	Building Site
81	556753	973221	N
82	556753	973222	O
83	556753	973223	P
84	556753	973224	Q
91	556753	973225	R
92	556753	973226	S
93	556753	973227	T
94	556753	973228	U

(xi) No buildings shall be constructed within the identified areas to be retained as open spece within the lots.

(xii) Sufficient firefighting water supply shall be provided for any single residential dwelling on the lot(s) with a minimum volume of 10,000 litres and shall remain accessible and available all year round.

Sufficient firefighting water supply shall be provided for any commercial or industrial land use on the lot(s). Sufficient firefighting water supply is deemed to mean meeting full criteria of the Code of Practice for firefighting water supplies (SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice.

(xiii) All buildings shall be sited and constructed, and landscaping provided in accordance with the Sanctuary Building and Landscaping Guidelines.

(xiv) The site specific landscaping plan required above shall be accompanied by evidence of compliance with the Sanctuary Building and Landscaping Guidelines and associated consultation with the Sanctuary Residents Association who administer the guidelines.

(xv) At the time of building consent suitable engineering evidence/design shall be provided to demonstrate that on site stormwater attenuation will be provided to limit peak flows from impervious areas to less than 1.2l/sec/100m^2 impervious area during a 20% Annual Event Probability (AEP) storm event and 1.2l/sec/100m^2 impervious area during a 1% AEP storm event. The evidence/design shall take into account the findings and recommendations of the Stormwater Management Staging Letter prepared by Hawthorn Geddes dated 25 June 2020 and submitted to Council with subdivision consent RM190258.

(xvi) Future lot owners are advised that no physical telecommunication connections are provided and the Kaipara District Council will not be responsible for ensuring nor providing telecommunication connections to the lots.

DATED the 16th day of February 2021

SIGNED by)
KAIPARA DISTRICT COUNCIL)
by its authorised signatory)

Dina Tetzner

Hawthorn Geddes
engineers & architects ltd

ENGINEERING SUITABILITY REPORT

Prepared For

SANCTUARY NORTH LTD

71 & 97 ROBERT HASTIE DRIVE

LOT 2 DP 430128



7 Selwyn Avenue
Whangarei 0110
09 438 7139

hg@hgcs.co.nz

21A The Grange
Warkworth 0910
09 283 3428

hawthorngeddes.co.nz

ENGINEERING SUITABILITY REPORT FOR SANCTUARY NORTH LTD

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Appendix B – Borehole Logs

Appendix C – Stormwater Calculations

Report Prepared by:



Dean Botica
Stacey Gibson

Report Reviewed by:



Dean Botica

DOCUMENT TRANSMITTAL			
Prepared for: Sanctuary North Ltd			Job No.: 10737
Revision	**Issued To**	**Copies Issued**	**Date**
0	Client – David Nathan 4Sight – Max Dunn Terra Consultants – Stephen Dobbie	email	20.09.17
R1	Client – David Nathan 4Sight – Max Dunn Terra Consultants – Stephen Dobbie	Emailed by Dean Botica	
R2	Client – David Nathan 4Sight – Max Dunn Terra Consultants – Stephen Dobbie	email	13.12.18
R3	Client – David Nathan 4Sight – Max Dunn Terra Consultants – Stephen Dobbie	email	08.04.19
R4	Client – David Nathan 4Sight – Max Dunn		12.04.19
R5	Client – David Nathan 4Sight – Max Dunn	email	12.07.19

1. Purpose

The purpose of this report is to provide a summary of the geotechnical investigation and advice on soil conditions for foundations, on-site effluent disposal, stability, stormwater management and traffic for the proposed 17-lot subdivision.

This report supersedes our previous reports and updates advice in relation to the culvert.

This report is suitable for a resource consent application.

2. Proposal

It is proposed to subdivide Lot 2 DP 430128 Robert Hastie Drive into 14 new residential Lots ranging in size from 5600m² to 1.42 ha, as shown by the Terra Consultants Scheme Plan – Option 9 dated 28 October 2018.

The subdivision will be undertaken in three stages. Stage 1 will create Lots 81 – 84 adjacent to Robert Hastie Dr. Stage 2 will create Lots 91 – 94 with access from existing ROW. Stage 3 will create Lots 85 to 90, which will require widening and sealing an existing ROW and constructing a new gravel ROW.

Access to the property from Cove Road is via Robert Hastie Drive, a privately owned Right of Way (ROW). Access to the individual Lots will be either directly from Robert Hastie Drive (Lots 81 – 84), existing Rights of Way (ROW) (Lots 91 – 94) or from the new Jointly Owned Access Lot (JOAL), which extends from an existing ROW from Lake View Drive. The existing ROW from Lake View Drive will be upgraded to comply with Kaipara District Council (KDC) engineering standards.

Earthworks for private access to the proposed house sites will be relatively minor with excavations of less than 1m. Earthworks to form level building platforms is unlikely to exceed 2m of excavation or 1m of fill.

Stormwater attenuation is proposed to be provided for the Lots and JOAL by utilising a low-lying area adjacent to the stream and the existing twin 900 dia culvert outlets under Lake View Drive. Additional attenuation storage is also to be constructed within an existing watercourse directly upstream of the proposed JOAL. These attenuation storage zones are shown on the attached Figure 1.

Stormwater treatment is to be provided via a grass filter strip within the base of the collection swale along the length of the JOAL.

The site is not connected to a reticulated water or wastewater network. Therefore, water supply will be from roof water collected in on-site tanks.

On-site effluent disposal will be required for each of the 14 new residential Lots.

3. Site Description

Lot 2 DP 404128 is an irregular shaped property with an area of some 13.7ha. The site is currently grassed and planted with olive trees. Access to the property is from Robert Hastie Drive and the existing ROW from Lake View Drive.

The property has a prominent north-west to south-east trending ridge through the centre of the property. Either side of the central ridge are two small streams that converge near the eastern property boundary with Lake View Drive.

The area downstream of the confluence has been flooded by creation of a lake during the previous subdivision and is surrounded by relatively flat, low-lying land. The stream discharges to the lake via twin 900 dia culverts under Lake View Drive.

Slopes on the property vary from near flat to steeper than 3H:1V.

4. Geotechnical Investigation

4.1. Geological Setting

The geological map of the Mangawhai area, viewed online from the Institute of Geological and Nuclear sciences indicates the property is underlain by Pakiri formation of the Waitemata Group, consisting of *alternating thick-bedded, volcanic-rich, graded sandstone and siltstone.'*

This description is consistent with soils encountered in hand augered boreholes.

4.2. Soil Investigation

A total of 22 boreholes were augered to depths of between 0.9-2.7m with shear strength testing at nominal 0.5m intervals and Scala penetrometer testing in non-cohesive materials.

Boreholes HA1 - HA7 and HA11 - HA14 were drilled on the central ridge area. These boreholes encountered a similar soil profile consisting of topsoil to a depth of up to 200mm underlain by stiff-to-very-stiff high plasticity silty clays to the bottom of each borehole. Shear vane results were greater than 70kPa and typically greater than 90kPa.in these boreholes.

Groundwater was encountered in HA6 at 1.4m. Groundwater was not encountered in the other boreholes.

HA8 - HA10 were drilled on the slope along the southern property boundary. These boreholes encountered topsoil to 100mm to 200m depth. This was underlain by stiff-to-very-stiff sandy and silty clay to the base of each borehole. Shear vane results were variable in and between the boreholes. In HA8 shear vane results were more than 100kPa to a depth of 1.5m and varied from 30kPa to 80kPa below this depth.

In HA9 shear vane results were more than 90kPa to a depth of 1m and varied from 65kPa to 78kPa below this depth. In HA11 shear vane results were 36kPa to 48kPa to a depth of 1.4m and below this the ground was too hard for the vane to penetrate.

Groundwater was encountered in HA8 at 1.7m and HA9 at 0.7m.

HA15 – HA22 were drilled on the slope along the northern property boundary adjacent to Robert Hastie Dr. Topsoil in this area was variable and generally less than 150mm thick. Topsoil was underlain by silt and clay with variable sand content.

The materials were typically highly plastic and very stiff. Shear vane strengths were typically above 100kPa apart from at less than 0.4m in HA16 and HA21. HA18 refused on hard material at 0.4m and the Scala penetrometer refused at this depth.

Logs of the boreholes and a site plan indicating the borehole locations are attached to this report.

5. Stability

We did not observe any widespread or deep seated instability on Lot 2. We did not observe terracettes on the property indicating creep movement.

Figure 1 attached to this report identifies areas assessed as suitable for building with adequate stability. These areas are all significantly more than the required 15m x 15m area required under the KDC District Plan. It is noted that other areas may be suitable for building but these areas will require specific engineering assessment.

Earthworks to form level building platforms may require excavations of up to 1.5m and fill of up to 1m. Cut batters shall be formed no steeper than 3H:1V to a maximum height of 2m or shall be retained. Fill may be placed on slopes of less than 5H:1V and shall have batters no steeper than 4H:1V to a maximum height of 1m or shall be retained.

Earthworks for the new access will be relatively minor other than the fill embankment for the steam crossing which will be up to 4.5m high. The cross sections attached indicate fill batters of up to 2H:1V. These batters are considered adequate for the proposed ROW.

Subject to the above recommendations it is our opinion in terms of Section 106 of the Resource Management Act that:

(a) the land in respect of which a consent is sought, or any structure on the land, is not and is not likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source; and

(b) any subsequent use that is likely to be made of the land is not likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage or inundation from any source; and

(c) sufficient provision has been made for legal and physical access to each allotment to be created by the subdivision.

6. Foundations

6.1. Lots 81-92

Soils encountered in hand augered boreholes on these Lots were consistent with good ground as described in NZS 3604 except that it is expansive. We consider the property to be suitable for conventional slab on grade foundations.

Shallow foundations may be designed in accordance with NZS 3604 but shall have perimeter footings embedded a minimum of 600mm below cleared ground to allow for any potential shrink/swell movement due to seasonal soil moisture variations.

6.2. Lots 93, 94

Soils encountered in hand augered boreholes were not consistent with good ground as described in NZS 3604 due to low bearing capacity. These Lots will be suitable for shallow foundations subject to specific engineering design of foundations.

Due to variability of ground conditions we recommend further investigation for the building location at the time of building consent.

7. On-Site Effluent Disposal

Soils on the property have been assessed for on-site effluent disposal in terms of AS/NZS 1547:2012 and the Regional Water and Soil Plan (RWSP) for Northland.

There is a potential for increased nutrient levels and pollution of downstream waterways with faecal bacteria and viruses associated with effluent discharge. These potential effects can be mitigated by installation of an appropriate treatment system and which provides a suitable level of treatment and avoiding disposal areas close to water courses or surface water.

We have identified the soils on the proposed lots as very poorly drained clays, or Category 5 in terms of AS/NZS 1547:2000. All of the Lots adjoin one of the two streams. Furthermore, we have identified two areas with surface water due to poor surface drainage and/or groundwater seepage.

Based on these site constraints we consider the proposed Lots are not suitable for conventional septic tanks discharging to trenches. We recommend wastewater be treated to secondary treatment standard and discharge to pressure compensated drip irrigation (PCDI).

A design irrigation rate of 2.8mm/day is recommended for this soil type.

The sizing of the effluent disposal fields for our assessment is based on a maximum design occupancy of ten people to allow for short-term holiday periods without overly restricting future development. It is possible that actual disposal field requirements will be smaller.

Table 1 below shows sizing for a potential dwelling on one of the new Lots:

Table 1: Summary of Effluent Field

Tank water (extra wastewater producing facilities)	200 litres/person/day
Maximum theoretical volume of effluent (10 people)	10 x 200 = 2,000 litres/day
Design irrigation rate (Cat 5 soil)	2.8 mm/day
Application area	2,000 ÷ 2.8 = 715 m^2
Reserve area required (30%)	215 m^2
Total area required	930 m^2

We estimate the discharge fields for each Lot are unlikely to exceed 1,000m^2 including a reserve area of 215m^2 (30%).

The attached Figure 2 shows areas unsuitable for disposal of secondary treated effluent. These areas have at least 15m separation from surface water identified by survey on site.

All of the proposed Lots have at least 1,500m^2 available for on-site effluent disposal with adequate clearance to surface water.

Table 2 below sets out the requirements of the RWSP permitted activity rules and shows how these rules can be complied with.

Table 2: RWSP Permitted Activity Rules

RWSP Permitted Activity Requirement	Means of Compliance
Separation between the lowest point of the disposal system and groundwater.	Groundwater was encountered more than 0.6m deep on all lots.
Minimum treatment levels for secondary treated effluent.	Recommended treatment levels less than rules.
Separation between the disposal and reserve area and groundwater bores.	No groundwater bores nearby.
Separation between the disposal and reserve and any surface water.	Separation distances at least 15m.
Distribution of the effluent	Recommend PCDI.
Design of the system in accordance with principles and procedures outlined in AS/NZS 1547:2000 'On-Site Domestic Wastewater Management'.	Soil categorised from AS/NZS 1547:2000 with appropriate DIR.

No surface runoff of any contaminants from the disposal area.	Mitigation measures referred to above to reduce contaminant loading and increase soil treatment/plant uptake.
No more than minor contamination of ground or surface water beyond the disposal system or boundary.	
The average volume of effluent discharged < $3m^3$/day.	Expected to be single houses only, estimated as 2 m^3/day (10 persons).
The maximum volume of effluent discharge < $6m^3$/day.	
A reserve area is allowed for and set aside.	Areas suitable for disposal sufficient for 30% reserve area shown on site plan.
Maintenance of the treatment and disposal system.	Building Consent should include a maintenance agreement for secondary treatment.

8. Stormwater Management

It is proposed to provide the required stormwater attenuation storage for the proposed Lots and JOAL of the development by utilising the existing low-lying area adjacent to the stream near the eastern site boundary and an additional storage area to be constructed on the watercourse upstream of the proposed JOAL.

All stormwater runoff from the proposed development including the upstream catchments will be collected within the ponds and controlled discharges will be to the lake downstream.

The stormwater design for the proposed development is based on attenuation of the post-development peak flow to pre-development rates. The design utilises attenuation storage to limit the additional runoff generated by the proposed development. The storage elements have been designed to address the runoff generated by a 20% AEP (5-year ARI) and a 1% AEP (100-year ARI) storm events for the entire catchment.

The site was modelled in HydroCAD adopting modified rational method and using rainfall data from table 6.7 of the KDC ES, for pre- and post-development.

8.1. Pre-Development

The catchment to the twin 900 dia culverts, in which the proposed development lies, is approximately 27ha. The catchment is currently grassed, planted with olive plants and there are a few stands of trees. The pre-development form has therefore been defined as 27ha of pervious area with a storage volume provided by the low-lying area adjacent to the stream. The soil on the site has been assessed as hydrologic soil group D and as a result the runoff coefficient of 0.67 has been used.

The pre-development runoff rates for the outlet point of the existing catchment were defined by applying a 20% AEP and a 1% AEP storm event with critical durations associated with the twin culvert outlets. The resulting pre-development peak flows are calculated as 2.56m³/s for the 20% AEP storm event with a critical duration of 29min and as 6.38m³/s for the 1% AEP storm event with a critical duration of 37min. These are used as the upper limits for controlled runoff post-development peak flows.

It should be noted that for a 1% AEP storm event for the pre-development condition, the model indicates that the twin culverts head up and flows discharge across Lake View Drive with a depth of approximately 170mm. The twin culverts have a capacity of 4.28m³/s. The culverts currently provide some attenuation to the flows from the catchment.

8.2. Post-Development

The proposed development is within an area where the permitted pervious coverage is 10%. However, due to a number of the proposed lots being of significant size, and to reduce the attenuation volume requirement for the proposed development, the attenuation calculations allow for the catchment outside of the proposed subdivision to be developed to the maximum pervious coverage permitted, while the lots of the subdivision are to be limited to a maximum of 800m².

The re-use of stormwater provides a significant contribution to stormwater attenuation and therefore a percentage reduction of the required attenuation volume attributable to a house roof can be applied. It is considered that with a roof area of 300m² with a 25,000 litre roof tank, a 25% reduction of required attenuation volume is applicable. Therefore an impervious area reduction of 75m² has been applied for each proposed lot of the subdivision.

For the post-development form the catchment has been split into two sub-catchments (9.6ha to the upper sub-catchment and 17.4ha to the lower sub-catchment). The upper sub-catchment is the area upstream of the JOAL, mainly from the south. Attenuation storage for this sub-catchment is to be provided within the existing watercourse and discharge control via the proposed culvert outlet under the JOAL. The lower sub-catchment is the balance of the catchment, from the north, and will also receive attenuated flows from the upper sub-catchment. Discharge control will be provided via the existing twin culvert outlet.

The post-development form for the upper sub-catchment has been modelled as 1200m² of impervious area for the JOAL, 5280m² of impervious area for the development of the sub-catchment, which allows for 10% impervious coverage, lots limited to 800m², and a 75m² area reduction for water reuse for the 7 Lots (5 proposed as part of this subdivision) within the sub-catchment, and 8.90ha of pervious area. The post-development form for the lower sub-catchment has been modelled as 1.61ha of impervious area for the development of the sub-catchment, which allows for 10% impervious coverage, lots limited to 800m², and the 75m² area reduction for water reuse for the 15 Lots (9 proposed as part of this subdivision) within the sub-catchment, and 15.67ha of pervious area.

From topographical survey data provided for the subdivision it has been calculated that the low-lying area has an available attenuation storage volume of approximately 4700m³. Constructing the storage area upstream of the proposed JOAL is calculated to provide an additional 700m³ of attenuation storage. The proposal is to attenuate flows from the upper sub-catchment via a 600 dia culvert. Attenuation on the lower catchment will remain unchanged, utilising the existing twin culvert outlets.

The post-development peak flow from the catchment outlet is calculated as 2.43m³/s with a 32min critical duration for a 20% AEP storm event and as 6.29m³/s with a 39min critical duration for a 1% AEP storm event. As per the pre-development condition the 1% AEP storm event results in an overflow across Lake View Drive, however no increase in flow depth from the pre-development condition is expected. Flow across the JOAL is also expected for the 1% AEP storm event, not exceeding approximately 100mm. Refer to the attached HydroCAD report summary.

8.3. Treatment

The primary source of contaminants from the development is associated with the JOAL. Treatment to the runoff is proposed by utilising the base of a grassed collection swale along the length of the JOAL. The required length has been calculated in accordance with ARC TP10. Based on the existing ground slope of 8.6% and a base width of 1.0m, a 118.9m length is required to treat the associated runoff. Due to the slope of the swale, check dams will be required. There is more than adequate length in the swale to provide the required treatment and further treatment will be provided via the check dams and the attenuation area and lake downstream. Refer to the attached calculations.

9. Traffic and Access

9.1. Access from Cove Road

Access to the site from Cove Road has previously been assessed in some detail for the commercial development proposal immediately to the south of the main site entrance. The road junction created for the original subdivision has been constructed to the Austroads Figure 4.9(b) with a limiting capacity (movements) in the order of 80 vehicles per hour for a peak traffic of 400 vehicles per hour on Cove Road.

The present development, including recent further subdivision and the consented commercial development has the ultimate potential to generate in the order of 650 one way movements per day (maximum), with associated peak movements unlikely to exceed 65 vehicles per hour. The addition of 14 Lots will add an estimated 56 movements per day which remains well within the capacity of the primary junction design.

Robert Hastie Drive itself has been constructed to a carriageway width of 6m plus flush edging (total width of 6.5m) which is adequate to serve up to 50 Lots. The current number served (beyond the ROW on the north side immediately after the entrance gates) is 43 and the proposal would take this number to 57, potentially more depending on the ultimate development.

Noting that the KDC standards require the edge restraint to not be considered as part of the carriageway width, despite it being flush and available, the access width proposed for the 57 Lots total is considered adequate on the basis that access remains controlled and not open to public use. Users are therefore familiar with the "constrained" carriageway width and the roads are likely to be subject to lower movements generally, which offsets the need to provide an increased carriageway width. Furthermore, Lot size is such that on-road parking is unlikely to have significant demand.

9.2. Lake View Drive and Junction with Robert Hastie Drive

Lake View Drive has an existing carriageway width of 5m plus edge restraint, and currently serves 12 Lots (including the one proposed for subdivision). The existing road width is 0.5m narrower than is required to serve that number of Lots (using the KDC definition outlined in note 2 of table 5.1). On the basis that the 5.0m width was previously accepted by KDC for the current number of Lots, and this places the access in the 7-30 Lot access range, extending the Lot numbers to less than this limit for this classification is considered to be acceptable. This being a maximum of 9 additional Lots onto the access at the existing carriageway width.

The existing junction radius of 10m complies with the requirements of the KDC engineering standards, and no amendment to the junction is required.

9.3. Lake View Drive to ROW

This is presently formed in metal and serves 5 Lots. The proposed subdivision requires that it serve 18 Lots and would require a 5.5m sealed width under the current KDC standards. However, noting the previously accepted width provision of 5m, and the access being from a network of roads constructed at 5.0m width (plus edge restraint), extending the provision of access at the 5m width is considered appropriate.

It is therefore recommended that a 5m sealed width plus edge restraint, as previously provided elsewhere on the development, is suitable to serve the proposed Lots.

The junction radius should be formed to the 10m radius of the KDC standards.

9.4. ROW

The existing ROW beyond Lakeview Dr is gravel surfaced and less than 5m wide. This ROW presently serves 5 Lots. The subdivision will result in the ROW serving a further 6 Lots or a total of 11 Lots. The KDC standards require a minimum carriageway width of 5.5m.

This access will be sealed with concrete edge restraints.

9.5. Proposed JOAL

This JOAL is proposed to serve 6 Lots. The KDC standards require this to be constructed to a width of 3m. It is proposed to form the JOAL with a total width of 4.5m plus shoulders, which exceeds the engineering standards.

10. Earthworks

Earthworks for stages 1 and 2 will be minor requiring little more than stripping topsoil to create vehicle crossings. The total earthworks for each of these stages is unlikely to exceed 200m^3.

Earthworks for stage 3 will require widening an existing ROW by up to 1.5m over a length of some 60m and constructing a new ROW some 260m long. We have undertaken a preliminary design of the new access, attached as figures 3 - 7. Earthworks for this access will involve stripping topsoil and cut and fill of less than 0.4m over most of the ROW. Over a length of approximately 40m, up to 2.5m fill is proposed for a stream crossing.

Widening the existing ROW will involve less tan 50m^3 over an area of some 100m^2.

The total area of earthworks for the new access is estimated at less than 1,700m^2. The total volume of fill including pavements is estimated at 1,200m^3 for the JOAL. Most of the fill is associated with the embankment required for the stream crossing which will be some 950m^3. The remaining fill will be associated with construction of the ROW pavement.

The total volume of cut to fill on site will be less than 200m^3. In addition to this topsoil stripping is estimated at 275m^3, which will be used to construct bunds around the earthworks area or stockpiled and be respread on completion. The remaining earthfill for the stream crossing will be imported from off site.

The plant required to complete this work will involve trucks to import the fill, excavators and/or bulldozers to strip topsoil, muck out any unsuitable soils and spread the material and a padfoot roller for compaction.

The Riparian Management Zone (RMZ) for both the current and proposed Regional Water and Soil Plan (RWSP) will extend 10m from the stream. The volume of earthworks within the RMZ will be approximately 400m^3 with an area of 300m^2. Therefore resource consent is required from NRC for this earthworks.

This work will be undertaken over the summer earthworks season when the stream will not be flowing. It will be necessary to construct the culvert first during a period of fine weather when the stream is not flowing, to create a clean water diversion for the stream through the site.

We estimate the culvert will take no more than 1 week to construct. Bulk filling of the stream crossing is unlikely to take around 2 to 4 weeks. On completion of the bulk earthworks the fill batters will top soiled, grassed and planted. Sediment and erosion controls will remain until grass has adequately established.

Erosion and sediment controls during the earthworks will be undertaken in accordance with Auckland Council GD05. It is likely that this will require decanting earth bunds both above the earthworks to divert water and downstream to control sediment laden run-off.

11. Culvert

A new culvert is proposed, which is approximately 20m long. The culvert will be laid entirely within the bed of the existing stream and there will be no stream diversion. Under the operative Regional Water and Soil Plan the proposed culvert is a permitted activity. However, under the proposed Regional Plan the JOAL is not considered a road. In terms of the proposed Regional Plan permitted activity rules:

a) The contributing catchment is less than 300 hectares, and
b) the culvert length under the crossing parallel to river flow exceeds 10 metres, and
c) the culvert is not designed such that flow velocity will not impede fish passage during normal flow conditions, and
d) culvert approaches and fill placed on the river or lake bed must be free of organic matter, and
e) the total height of the crossing crest is:

   i. no more than 3.5 metres above the invert level of the culvert inlet, and

   ii. within the manufacturer's maximum height specifications for the culvert, and

   iii. below the river bank level unless it is necessary for a road, and

f) the culvert must be either open bottomed or installed so that the base is set a minimum of 25 percent and a maximum of 50 percent of the culvert diameter below the stream bed, and
g) records of structure design and flow calculations are attached to this report, and
h) the culvert is not in a significant wetland , an outstanding freshwater body or mapped Outstanding Natural Character Area, or Outstanding Natural Feature, or Site or Area of Significance to tangata whenua.

Therefore a resource consent is required as Items b) and c) do not comply with the PA rules and a resource consent is required. It is proposed to install baffles within the pipe to promote fish passage.

12. Recommendations and Conclusions

12.1. Suitability of Building Sites

We have identified areas on all lots suitable for building residential dwellings. These areas are all larger than 150m2 as required in the KDC district Plan. All the identified building areas are more than 10m from boundaries with ROW and at least 3m from side boundaries. Apart from Lot 89 the building areas are at least 30m from any stream or water course.

These areas are assessed to have adequate stability but will require some earthworks to create level building platforms. Earthworks to form level building platforms may require excavations of up to 1.5m and fill of up to 1m. Cut batters shall be formed no steeper than 3H:1V to a maximum height of 2m or shall be retained. Fill may be placed on slopes of less than 5H:1V and shall have batters no steeper than 4H:1V to a maximum height of 1m or shall be retained.

Ground conditions within most of these areas are assessed to be good ground in accordance with NZS 3604 except they are expansive. Soil conditions in Lots 93 and 94 are variable. We recommend specific investigation for building consent on these lots to confirm foundations requirements for building consent.

12.2. On-Site Effluent Disposal

The following is a summary of the design requirements for building consent for on-site effluent disposal.

- The treatment system on each Lot shall consist of secondary treatment plant to surface covered pressure compensated dripper irrigation on slopes of less than 4H:1V or buried 100mm in topsoil if on slopes between 4H:1V and 2H:1V.

- Secondary treatment plants must be capable of maintaining a standard of treatment such that:
    a) the five day biochemical oxygen demand (BOD_5) of any sample taken is less than or equal to 20 grams per cubic metre; and

    b) the total suspended solids (TSS) concentration of any sample taken is less than or equal to 30 grams per cubic metre

- Specific design of the application area will be required for building consent.

- Disposal areas shall be based on a DIR of 3mm/day for secondary treated effluent to PCDI.

- It is a permitted activity rule in the RWSP (Regional Water and Soil Plan) that a maintenance contract is entered into for the treatment and disposal system.

- No disposal within 15m of surface water including the areas identified as unsuitable on the attached plan.

- Disposal fields on slopes steeper than 4H:1V shall have an additional 10m buffer zone between the lower extent of the field and any surface water.

- The existing culvert discharging onto proposed Lot 83 will require piping to at least 15m downslope of the proposed disposal field.

Subject to these recommendations the proposed Lots will be suitable for on-site effluent disposal.

We confirm that all proposed lots have 1,500m^2 suitable for on-site effluent disposal subject to the above recommendations as required by the KDC District Plan.

12.3. Stormwater Management

The stormwater management design for the proposed development, as outlined above, meets the requirements of the KDC ES 2011 and AC TP10 in relation to treatment and attenuation of post-development flows.

12.4. Traffic and Access

The existing sealed access widths and junctions are considered appropriate for the proposed development. No adaptations are necessary in providing for the proposed lots.

A 5.0m sealed width plus shoulders is considered suitable for the upgraded length of ROW.

The proposed JOAL will be formed to a width of 4.5m plus 0.25 shoulders which meets the requirements of the KDC engineering standards.

13. Limitation

Recommendations and opinions in this report are based on data from the investigation described herein. The nature and continuity of subsoil conditions away from the boreholes is inferred and it is possible that actual conditions could vary from those assumed. Should subsoil conditions vary from those described in this report, it is essential that Hawthorn Geddes engineers and architects ltd be contacted to confirm the applicability of the recommendations.

This report has been prepared solely for the benefit of our client Sanctuary North Ltd and the Kaipara District Council in relation to the resource consent application for which this report has been prepared.

The comments in it are limited to the purpose stated in this report. No liability is accepted by Hawthorn Geddes engineers & architects ltd in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk.

Appendix A – Figures

NOTE:
SITE INFORMATION ADAPTED FROM SURVEY DRAWING PROVIDED BY TERRA COBNSULTANTS REFERENCE SC106.
ALL INFORMATION MUST BE CONFIRMED ON SITE.
TO BE READ IN CONJUNCTION WITH HAWTHORN GEDDES ENGINEERS & ARCHITECTS LTD REPORT REFERENCE 10737

Key

- HA — Hand augered borehole locations
- Attenuation storage zone
- Existing stream
- Area suitable for building (*Identified building sites subject to consent notice*)
- Areas where building and wastewater suitability overlap

LOT 50 DP 430128
LOT 53 DP 430128
LOT 54 DP 430128
LOT 55 DP 430128
LOT 56 DP 430128
LOT 1 DP 430128
LOT 49 DP 430128
LOT 48 DP 430128
LOT 47 DP 430128
LOT 57 DP 404128
LOT 58 DP 404128
LOT 59 DP 404128
LOT 60 DP 404128

LOT 84
LOT 85
LOT 86
LOT 87
LOT 83
LOT 82
LOT 81
LOT 80
LOT 88
LOT 89
LOT 90
LOT 91
LOT 92
LOT 93
LOT 94

HA1 1270m² LOT 92
HA2
HA3 1170m² LOT 91
HA4
HA5 LOT 90
HA6 1380m²
HA7 1010m² LOT 89
HA8 1790m² LOT 94
HA9 1060m² LOT 93
HA10
HA11 1380m²
HA12 1550m²
HA13 1430m²
HA14 900m² LOT 88
HA15 1080m² LOT 84
HA16 1340m²
HA17
HA18
HA19
HA20 1890m² LOT 82
HA21 1070m² LOT 81
HA22
HA23

SW collection & treatment swale along length of JOAL - sealed access

Attenuation storage zone

2 x existing 900Ø culverts

Attenuation storage zone to southern sub-catchment

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SITE PLAN
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Hawthorn Geddes
engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgcs.co.nz

Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT **DUCK TRUST**
PROJECT **SUBDIVISION SUITABILITY**
97 & 71 ROBERT HASTIE DRIVE, MANGAWHAI
DRAWING **SUITABLE BUILDING AREAS PLAN**

PROJECT No. **10737**
SHEET **Figure 1**

24/05/2019 11:27:02 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 170731 EG from TOPO.dwg

NOTE:
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Key

- Area not suitable for effluent disposal
- Existing stream
- Effluent Disposal Areas (1500m²)
- Indicative 15x15m building platform

LOT 50 DP 430128
LOT 53 DP 430128
LOT 54 DP 430128
LOT 55 DP 430128
LOT 49 DP 430128
LOT 48 DP 430128
LOT 56 DP 430128
LOT 1 DP 430128
LOT 47 DP 430128
LOT 57 DP 404128
LOT 58 DP 404128
LOT 59 DP 404128
LOT 60 DP 404128

LOT 84
LOT 85
LOT 83
LOT 86
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LOT 92
LOT 87
LOT 81
LOT 88
LOT 80
LOT 91
LOT 90
LOT 89
LOT 94
LOT 93

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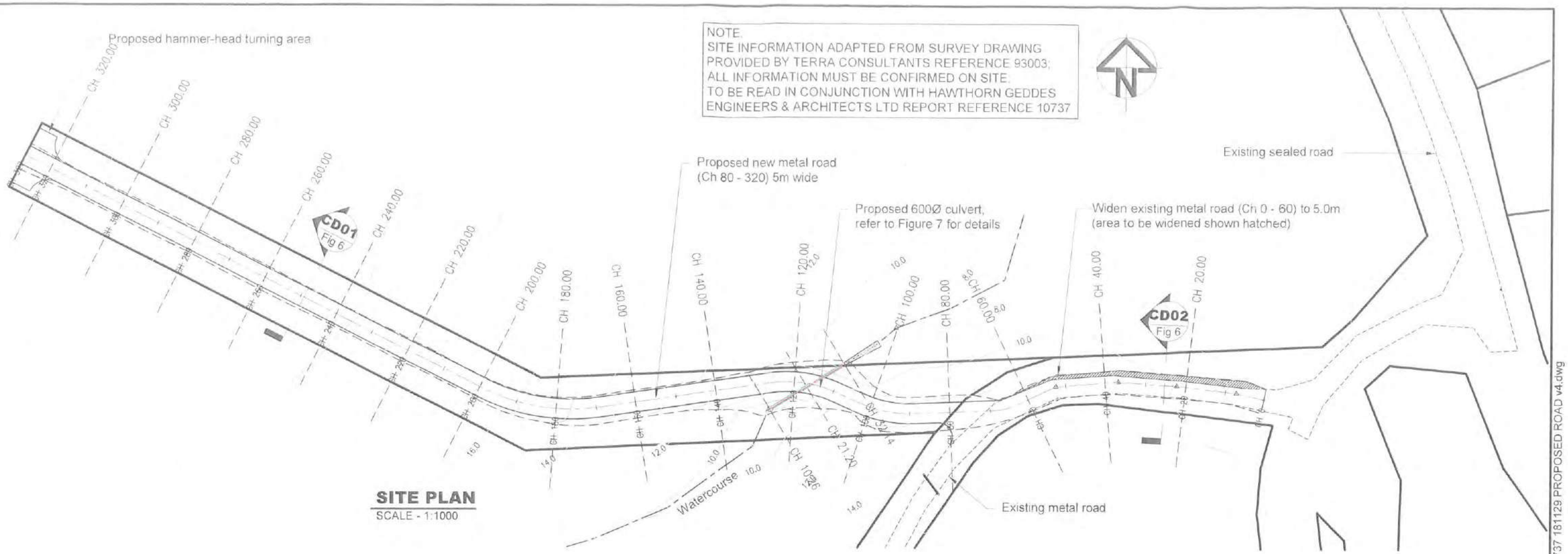
Hawthorn Geddes
engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgcs.co.nz
Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT: **DUCK TRUST**
PROJECT: **SUBDIVISION SUITABILITY**
97 & 71 ROBERT HASTIE DRIVE, MANGAWHAI
DRAWING: **WASTEWATER DISPOSAL PLAN**

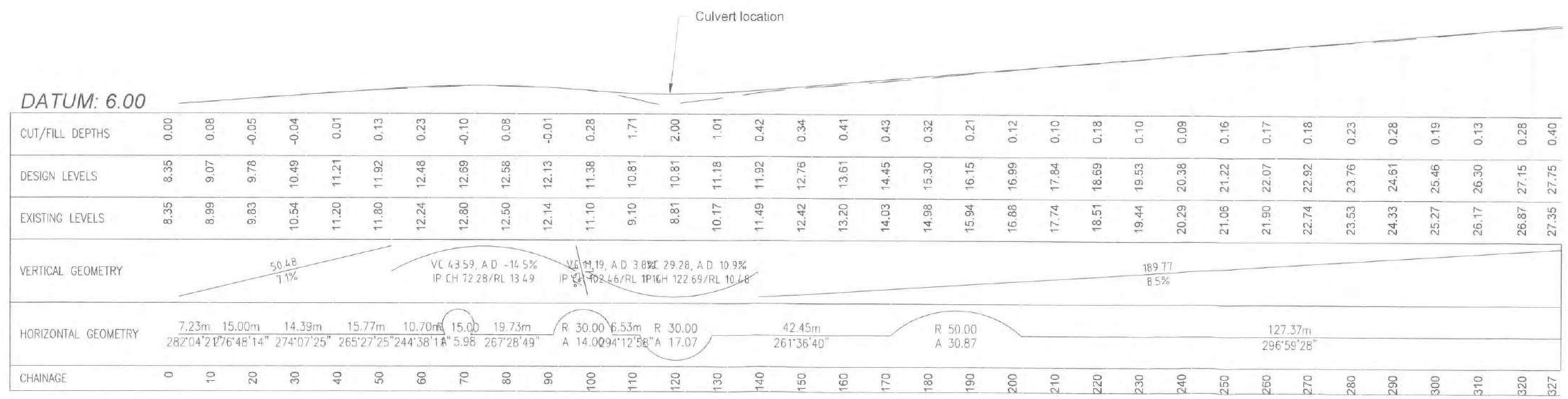
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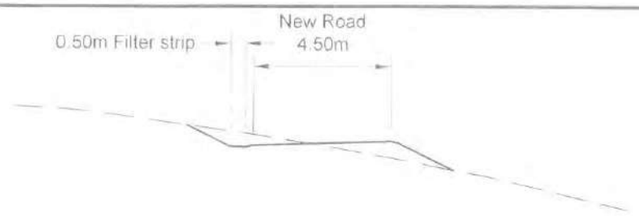
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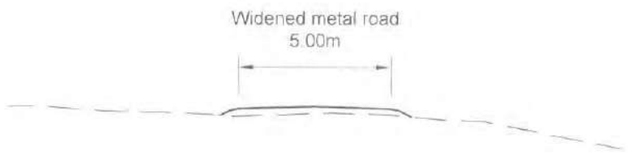
SITE PLAN
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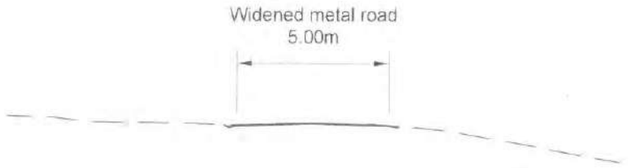
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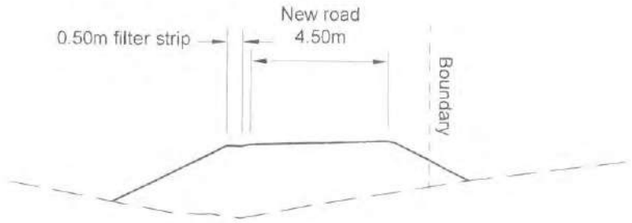
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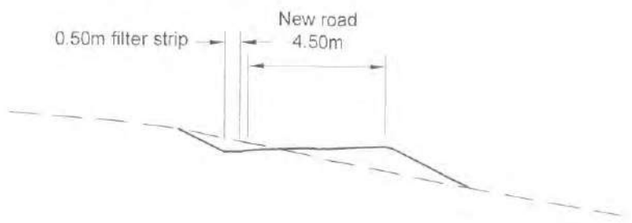
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Hawthorn Geddes
engineers & architects ltd

7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgcs.co.nz

Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT **SANCTUARY NORTH**
PROJECT **PROPOSED SUBDIVISION**
LOT 2 DP 430128
DRAWING **CROSS SECTIONS: CH 20 - 160**

PROJECT No. **10737**
SHEET **Figure 4**

24/05/2019 11:29:29 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg



CH: 240.00



CH: 320.00



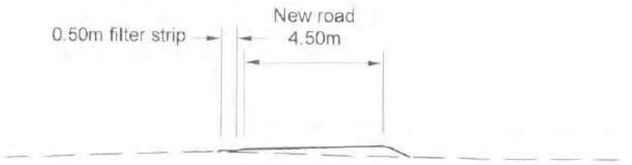
CH: 220.00



CH: 300.00



CH: 200.00



CH: 280.00



CH: 180.00



CH: 260.00

USE WRITTEN DIMENSIONS. DO NOT SCALE FROM DRAWING.

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Hawthorn Geddes
engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hges.co.nz

Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

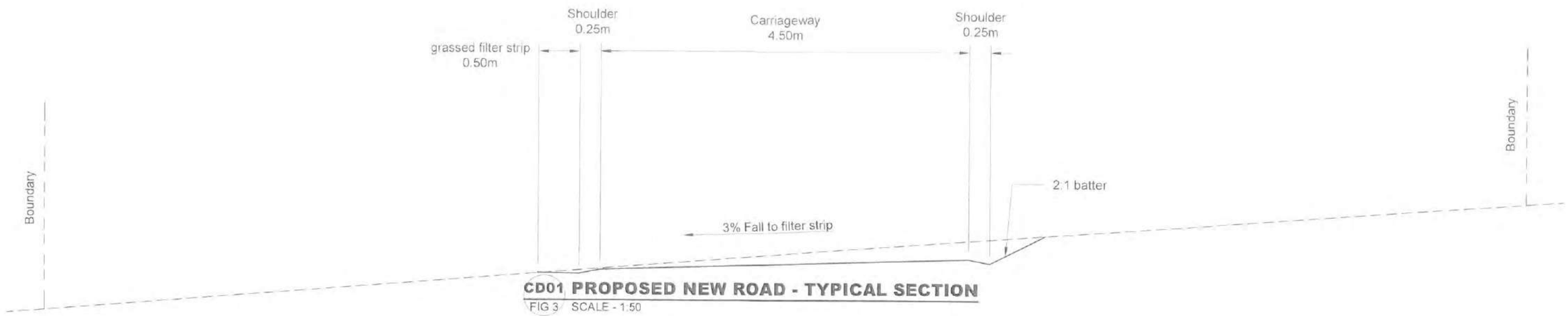
CLIENT **SANCTUARY NORTH**
PROJECT **PROPOSED SUBDIVISION**
LOT 2 DP 430128
DRAWING **CROSS SECTIONS: CH 180 - 320**

SCALE @A3 1:200

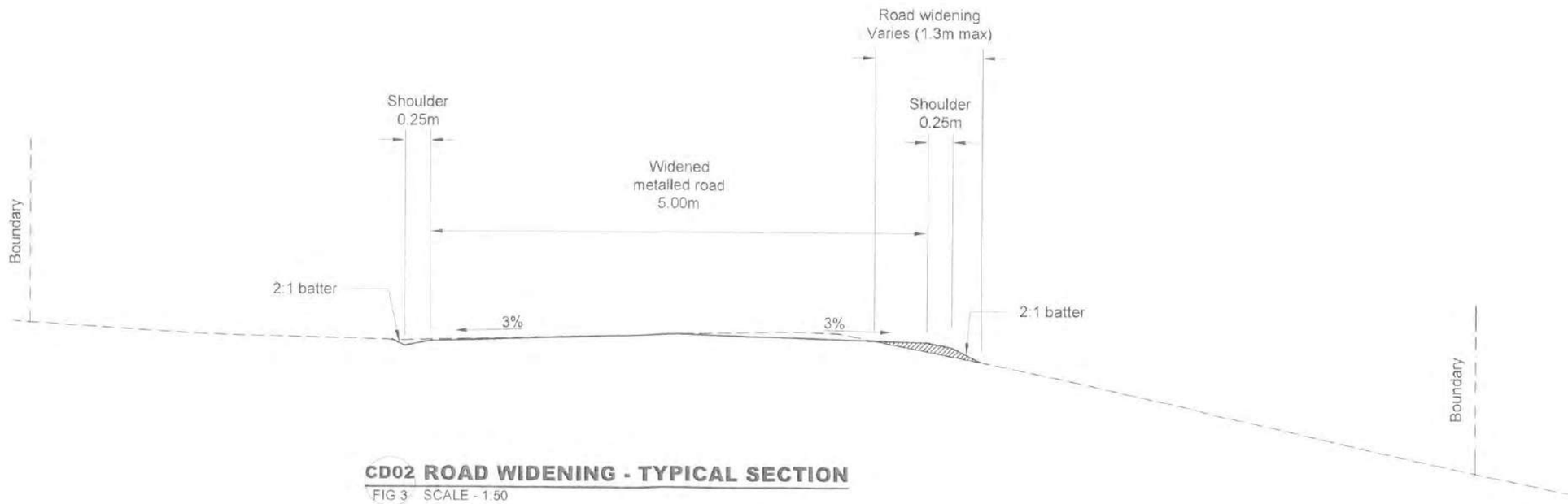
PROJECT No. **10737**

SHEET **Figure 5**

24/05/2019 11:30:51 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg



CD01 PROPOSED NEW ROAD - TYPICAL SECTION
FIG 3 SCALE - 1:50



CD02 ROAD WIDENING - TYPICAL SECTION
FIG 3 SCALE - 1:50

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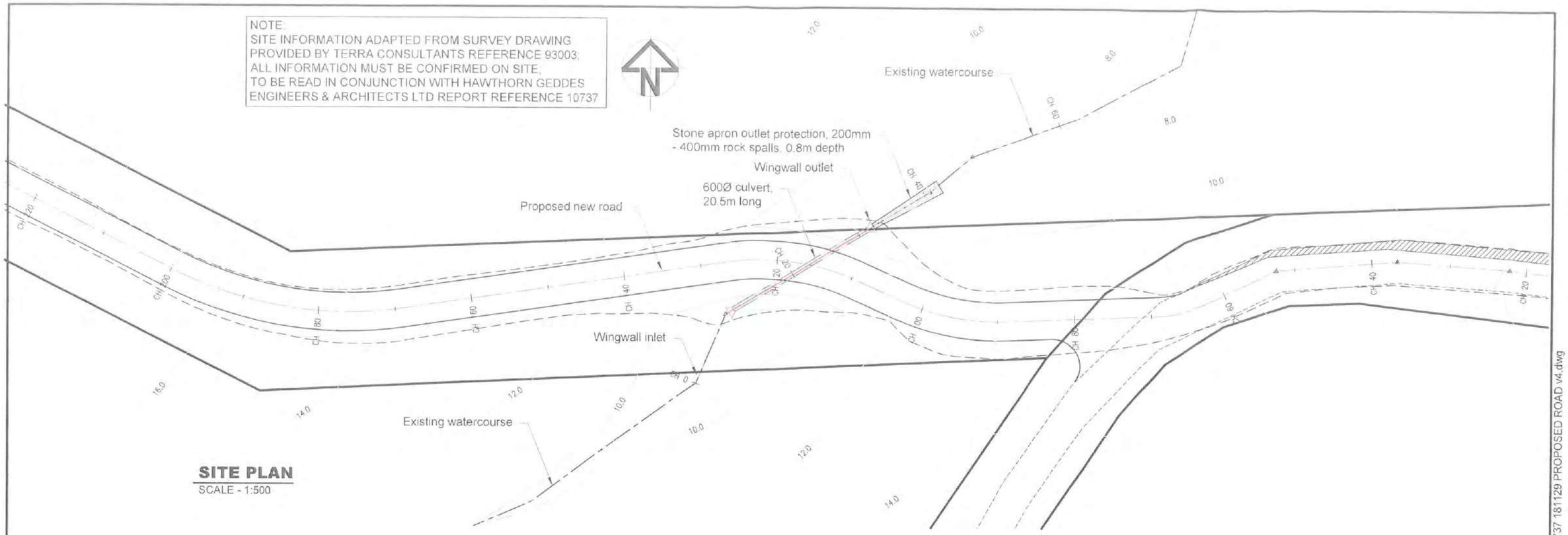
Hawthorn Geddes
engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgcs.co.nz
Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT **SANCTUARY NORTH**
PROJECT **PROPOSED SUBDIVISION**
LOT 2 DP 430128
DRAWING **TYPICAL ROAD DETAILS**

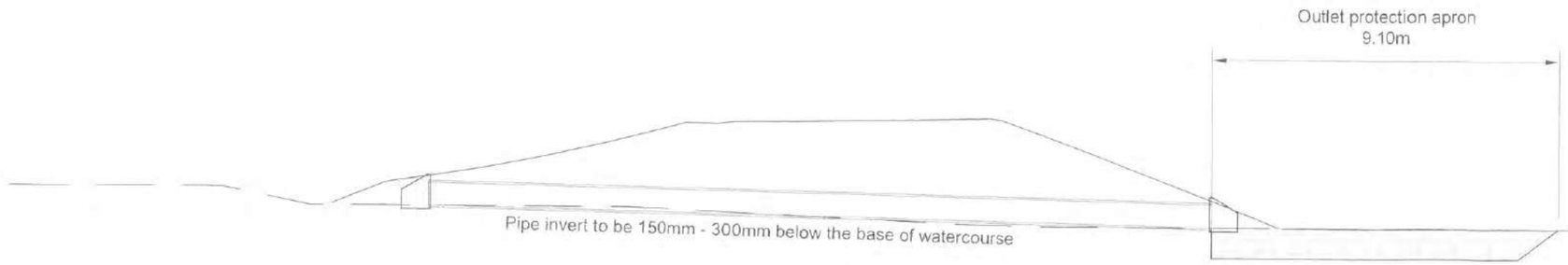
PROJECT No. **10737**
SHEET **Figure 6**

24/05/2019 11:30:27 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg

NOTE:
SITE INFORMATION ADAPTED FROM SURVEY DRAWING PROVIDED BY TERRA CONSULTANTS REFERENCE 93003;
ALL INFORMATION MUST BE CONFIRMED ON SITE;
TO BE READ IN CONJUNCTION WITH HAWTHORN GEDDES ENGINEERS & ARCHITECTS LTD REPORT REFERENCE 10737



SITE PLAN
SCALE - 1:500



DATUM: 4.00

PIPE SIZE & GRADIENT			20.38m of 600mm ø Reinforced Concrete @ 2.41%								
INVERT LEVEL			8.49				8.00				
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50

LONG SECTION
SCALE - 1:250

USE WRITTEN DIMENSIONS. DO NOT SCALE FROM DRAWING.

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Hawthorn Geddes
engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hges.co.nz
Unit 21a, The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT **SANCTUARY NORTH**
PROJECT **PROPOSED SUBDIVISION**
LOT 2 DP 430128
DRAWING **PROPOSED CULVERT**

PROJECT No. **10737**
SHEET **Figure 7**

4/05/2019 11:31:13 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg

Appendix B – Borehole Logs

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LOG OF HAND AUGER

HA1
PAGE 1 OF 1

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	12/07/17	**COMPLETED DATE**	12/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	WNM		
HOLE LOCATION	On building platform on proposed Lot 98		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets, dark brown, moist.	Groundwater Not Encountered	0
				Silty CLAY, light brown, moist, high plasticity, stiff, moderately hard to auger.		
		SV = 143 / 70 kPa (GEO287)				
1		SV = 139 / 63 kPa (GEO287)				1
		SV = 119 / 57 kPa (GEO287)		1.7m: Becoming mottled grey.		
		SV = 109 / 55 kPa (GEO287)		1.80 EOH: 1.80m		
2						2
3						3

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached.

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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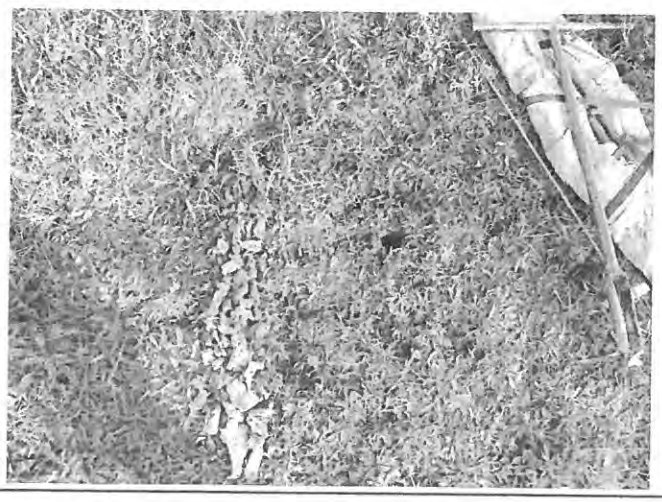
LOG OF HAND AUGER

HA2

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	12/07/17	**COMPLETED DATE**	12/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	CP		
HOLE LOCATION	On effluent disposal field on proposed Lot 98		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	Clayey silt TOPSOIL, blackish brown, wet, rootlets, easy to auger.	Groundwater Not Encountered	
			TS	0.20		
		SV = 140 / 50 kPa (GEO952)		Silty CLAY (CH) grey speckled orange and white, moist, highly plastic, moderately hard to auger, very stiff.		
		SV = 96 / 47 kPa (GEO952)		0.90 EOH: 0.90m		
1						
2						
3						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Hawthorn Geddes
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LOG OF HAND AUGER

HA3
PAGE 1 OF 1

CLIENT David Nathan
PROJECT NUMBER 10737
START DATE 12/07/17 COMPLETED DATE 12/07/17
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On effluent disposal field on proposed Lot 97

PROJECT Duck Trust
PROJECT LOCATION Robert Hastie Drive, Mangawhai
COORDINATES LEVEL 0.00

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Silty clay TOPSOIL with rootlets, dark brown, saturated.	Groundwater Not Encountered	
			TS	0.20 Silty CLAY, light brownish grey, wet, high plasticity, stiff, moderately easy to auger.		
		SV = 98 / 51 kPa (GEO287)				
		SV = 103 / 55 kPa (GEO287)		0.90 EOH: 0.90m 0.9m: Becopming mottled orange.		
1						
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached.

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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LOG OF HAND AUGER

HA4

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 **COMPLETED DATE** 12/07/17
COORDINATES **LEVEL** 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On boundary between proposed building platforms Lots 97 & 96

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, rootlets, easy to auger.	Groundwater Not Encountered	
			TS	0.20		
		SV = 93 / 12 kPa (GEO952)		Silty CLAY (CH), dark greyish orange, moist, highly plastic, stiff moderately hard to auger.		
				0.3m: - becoming saturated		
				0.4m: - becoming more orange and moist		
		SV = 78 / 37 kPa (GEO952)		0.8m: - becoming wet		
1				0.9m: - becoming greyish white with orange streaks		
				1.20		
		SV = 113 / 31 kPa (GEO952)		Clayey SILT (MH), greyish white with orange streaks, moist to wet, highly plastic, very stiff, moderately hard to auger.		
				1.80 EOH: 1.80m		
		SV = 109 / 25 kPa (GEO952)				
2						
3						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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LOG OF HAND AUGER

HA5
PAGE 1 OF 1

CLIENT David Nathan
PROJECT NUMBER 10737
START DATE 12/07/17 COMPLETED DATE 12/07/17
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field, proposed Lot 96

PROJECT Duck Trust
PROJECT LOCATION Robert Hastie Drive, Mangawhai
COORDINATES LEVEL 0.00

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, dark brown, moist, moderately easy to auger.	Groundwater Not Encountered	
				0.20 Silty CLAY, dark brown mottled orange, moist, high plasticity, stiff, moderately hard to auger.		
		SV = 130 / 49 kPa (GEO287)		0.5m: Becoming light brown mottled grey.		
				0.90 EOH: 0.90m		
		SV = 95 / 48 kPa (GEO287)				
1						
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached.

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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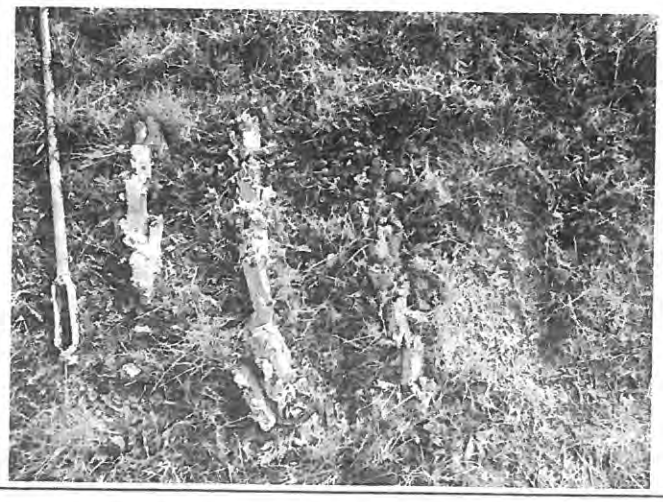
LOG OF HAND AUGER

HA6

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	12/07/17	**COMPLETED DATE**	12/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	CP		
HOLE LOCATION	On building platform on proposed Lot 95		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, rootlets, easy to auger.		
				0.20		
		SV = 158 / 65 kPa (GEO952)		Silty CLAY (CH) greyish orange, moist, highly plastic, very stiff, moderately hard to auger.		
		SV = 70 / 34 kPa (GEO952)				
1		SV = 74 / 26 kPa (GEO952)			12/07/2017	
				1.5m: - hole squeezing		
		SV = 104 / 23 kPa (GEO952)				
2				2.20		
		SV = UTP (GEO952)		Clayey SILT (MH) brownish grey, moist, highly plastic, very stiff, hard to auger (MUDSTONE)		
				2.50 EOH: 2.50m		
		SV = UTP (GEO952)				
3						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 12:00:00 a.m.	1.40	Static Water Level	

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA7

PAGE 1 OF 1

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On effluent disposal field, proposed Lot 91

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, dark brownish grey, saturated, easy to auger.	Groundwater Not Encountered	
				0.15 Silty CLAY, yellow brown speckled grey, moist, high plasticity, stiff, moderately hard to auger.		
		SV = 155 / 79 kPa (GEO287)		0.5m: Becoming grey mottled orange.		
		SV = 95 / 44 kPa (GEO287)		0.90 EOH: 0.90m		
1						
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA8

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On proposed effluent disposal field, proposed Lot 92

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey silt TOPSOIL with rootlets, dark brownish black, saturated, easy to auger.		
		SV = 132 / 63 kPa (GEO287)		Sandy clayey SILT, dark grey mottled orange, wet high plasticity, stiff, moderately easy to auger.		
				0.40 Silty sandy CLAY, orange brown, moist, high plasticity, stiff, moderately hard to auger.		
1		SV = 114 / 49 kPa (GEO287)				
		SV = 111 / 52 kPa (GEO287)				
				1.70 Clayey SILT, orange brown mottled grey, saturated, dialative, low plasticity, firm, very easy to auger.	12/07/2017	
2		SV = 29 / 13 kPa (GEO287)				
		SV = 79 / 35 kPa (GEO287)				
		SV = 81 / 32 kPa (GEO287)		2.70 EOH: 2.70m		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 12:00:00 a.m.	1.70	Static Water Level	

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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LOG OF HAND AUGER

HA9

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 **COMPLETED DATE** 12/07/17
COORDINATES **LEVEL** 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field, proposed Lot 93

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, easy to auger, rootlets.		
			TS	0.20		
		SV = 121 / 39 kPa (GEO952)		Sandy silty CLAY (CH) greyish yellow, moist, highly plastic, very stiff, moderately hard to auger.	12/07/2017	
		SV = 93 / 37 kPa (GEO952)				
1		SV = 78 / 25 kPa (GEO952)		1.3m: - becoming easy to auger		
		SV = 65 / 16 kPa (GEO952)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 2:00:00 p.m.	0.70	Static Water Level	

REMARKS

Hole abandoned at 1.8 due to very heavy rain

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Hawthorn Geddes
engineers & architects ltd

LOG OF HAND AUGER

HA10

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	19/07/17	**COMPLETED DATE**	19/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	WNM		
HOLE LOCATION	On proposed effluent disposal field on proposed lot 94		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey silt TOPSOIL, dark brown, moist, easy to auger.		
		SV = 98 / 40 kPa (GEO287)		Silty CLAY (CH) with minor fine sand, brownish grey, moist, high plasticity, stiff, easy to auger.		
				0.6m: Becoming light yellowish grey.		
		SV = 36 / 24 kPa (GEO287)				
1				1.0m: Wet.		
		SV = 48 / 19 kPa (GEO287)				
				1.60 Clayey SILT (ML), greyish brown, moist, low plasticity, friable, hard, hard to auger.		
		SV = UTP (GEO287)				
2				2.10 Sandy SILT (ML) with trace clay, grey, dry, low plasticity, friable, hard, very hard to auger.		
		SV = UTP (GEO287)		2.40 EOH: 2.40m		
		SV = UTP (GEO287)		2.4m: Auger spinning, very poor recovery.		
3						

Groundwater Not Encountered

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Auger refusal at 2.4m

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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LOG OF HAND AUGER

HA11

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	19/07/17	**COMPLETED DATE**	19/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	CP		
HOLE LOCATION	Southern corner of proposed effluent disposal field on proposed lot 86		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0				0.10 Clayey silt TOPSOIL with rootlets, black, moist, easy to auger.	Groundwater Not Encountered	
				Silty CLAY (CH), light brownish orange, moist, high plasticity, very stiff, moderately hard to auger.		
		SV = 141 / 44 kPa (DR4604)		0.3m: Becoming hard to auger.		
		SV = 150 / 67 kPa (DR4604)		0.8m: Becoming greyish orange.		
1		SV = 141 / 53 kPa (DR4604)				
				1.6m: Becoming wet, and grey mottled orange.		
		SV = 153 / 65 kPa (DR4604)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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LOG OF HAND AUGER

HA12

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On boundary between proposed building platforms and effluent fields Lots 87 & 88

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets, brownish black, moist, easy to auger.	Groundwater Not Encountered	
				Silty CLAY (CH), light brownish grey, moist, high plasticity, very stiff, easy to auger.		
		SV = 164 / 56 kPa (DR4604)		0.3m: Becoming hard to auger.		
1		SV = 123 / 62 kPa (DR4604)		0.8m: Becoming greyish orange.		
		SV = 114 / 50 kPa (DR4604)				
2		SV = 120 / 56 kPa (DR4604)		1.80 EOH: 1.80m		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Hawthorn Geddes
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LOG OF HAND AUGER

HA 13
PAGE 1 OF 1

CLIENT David Nathan
PROJECT NUMBER 10737
START DATE 19/07/17 COMPLETED DATE 19/07/17
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION Bteween proposed building platform and effluent disposal field Lot 89

PROJECT Duck Trust
PROJECT LOCATION Robert Hastie Drive, Mangawhai
COORDINATES LEVEL 0.00

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey silt TOPSOIL, dark brown, moist, easy to auger.		
		SV = 155 / 65 kPa (GEO287)		Silty sandy CLAY (CH), greyish brown mottled orange brown, moist, high plasticity, very stiff, moderately hard to auger.	Groundwater Not Encountered	
1		SV = 111 / 59 kPa (GEO287)				
		SV = 95 / 48 kPa (GEO287)		1.5m: Becoming bluish grey.		
		SV = 111 / 52 kPa (GEO287)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached.

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA14

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION Bteween proposed building platform and effluent disposal field Lot 90

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, blackish brown, wet, very easy to auger.	Groundwater Not Encountered	
				0.15 Silty CLAY (CH), light greyish brown, moist, high plasticity, very stiff, easy to auger.		
		SV = 117 / 41 kPa (DR4604)		0.3m: Becoming moderately hard to auger.		
		SV = 98 / 109 kPa (DR4604)		0.8m: Becoming wet.		
1				1.0m: Becoming light grey mottled orange.		
		SV = 67 / 26 kPa (DR4604)		1.3m: Becoming stiff.		
		SV = 82 / 44 kPa (DR4604)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA15
PAGE 1 OF 1

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	21/07/17	**COMPLETED DATE**	21/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	WNM		
HOLE LOCATION	On proposed effluent disposal field Lot 85		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, dark brown, moist, easy to auger.		
			TS	0.20		
		SV = 182 / 75 kPa (GEO287)		Silty CLAY (CH), orange brown mottled dark brown, moist, high plasticity, very stiff, moderately hard to auger.		
				0.5m: Becoming orange brown with minor fine sand.		
		SV = 166 / 68 kPa (GEO287)				
1						
		SV = 130 / 60 kPa (GEO287)				
				1.5m: Becoming light greyish brown.		
				1.80		
		SV = 122 / 52 kPa (GEO287)		Clayey sandy SILT (ML), light greyish brown mottled orange brown, moist, stiff, low plasticity, easy to auger.	21/07/2017	
2				2.0m: Squeezing and poor progression.		
				2.30 EOH: 2.30m		
		SV = 95 / 52 kPa (GEO287)		2.3m: Hole abandoned due to squeezing.		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
21/07/2017 12:00:00 p.m.	1.90	Inflow	

REMARKS

Abandoned due to squeezing

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA16
PAGE 1 OF 1

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	19/07/17	**COMPLETED DATE**	19/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	CP		
HOLE LOCATION	On proposed building platform Lot 84		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey silt TOPSOIL with rootlets, brown, saturated, very easy to auger.		
		SV = 38 / 4 kPa (DR4604)		Sandy clayey SILT (MH), brown, wet, high plasticity, very easy to auger.	Groundwater Not Encountered	
				0.70 Sandy clayey SILT (ML), grey mottled orange, wet, low plasticity, very stiff, moderately hard to auger.		
1		SV = 161 / 73 kPa (DR4604)		1.0m: Becoming more orange and less sandy.		
		SV = 117 / 67 kPa (DR4604)				
	2	SV = 128 / 62 kPa (DR4604)		1.80 EOH: 1.80m		
2	2					
	3					
	3					
	4					
	6					
	7					
	9					
	9					
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA17

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 84

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey sandy silt TOPSOIL with rootlets, brown, saturated, very easy to auger.	Groundwater Not Encountered	
		SV = 139 / 8 kPa (GEO287)		Clayey sandy SILT (ML), dark grey mottled orange brown, saturated, very stiff, low plasticity, easy to auger. 0.30		
		SV = 127 / 55 kPa (GEO287)		0.40 Sandy clayey SILT (ML), whitish grey mottled light brown, moist, low plasticity, very stiff, friable, fine sand, moderately hard to auger.		
		SV = 174 / 76 kPa (GEO287)		Silty CLAY (CH) with trace fine sand, orange brown mottled grey, moist, high plasticity, very stiff, moderately hard to auger. 0.4m: High sand content. 0.6m: Becoming light grey mottled light brown.		
1		SV = 143 / 63 kPa (GEO287)		1.2m: Becoming saturated.		
	20	SV = UTP (GEO287)		1.30 Silty SAND (SP), orange brown, moist, fine sand, very dense.		
	15 5 5 6			1.50 EOH: 1.50m 1.3m: Auger spinning, very poor recovery. 1.4m: Auger refusal.		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA18

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 83

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS TS	Clayey silt TOPSOIL with rootlets, dark greyish brown, saturated, very easy to auger.	Groundwater Not Encountered	
				0.25		
	20			Sandy SILT (ML) with minor clay, dark grey mottled orange, saturated, low plasticity, hard, hard to auger. 0.35		
				Silty SAND (SP), dark orange, dry, hard, very dense. 0.45		
1				EOH: 0.45m		
				0.4m: Auger spinning, no recovery.		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA19

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed building platform Lot 82

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Silty sandy TOPSOIL with rootlets, dark brown, moist, easy to auger.		
		SV = 174 / 55 kPa (GEO287)		Sandy SILT with some clay, dark brown, moist, low plasticity, very stiff, easy to auger.		
				0.50 Sandy silty CLAY, orange brown, moist, high plasticity, very stiff, moderately hard to auger.		
		SV = 174 / 79 kPa (GEO287)		0.8m: Trace sand.		
1		SV = 174 / 79 kPa (GEO287)		1.1m: Becoming mottled grey.		
		SV = 159 / 63 kPa (GEO287)				
		SV = 119 / 55 kPa (GEO287)				
2		SV = 111 / 48 kPa (GEO287)				
		SV = 82 / 38 kPa (GEO287)		2.70 EOH: 2.70m		
3						

Groundwater Not Encountered

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA20

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	21/07/17	**COMPLETED DATE**	21/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	WNM		
HOLE LOCATION	On proposed effluent disposal field Lot 82		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Silty sandy clay TOPSOIL with rootlets, dark brown, wet, easy to auger.		
				0.15 Clayey SILT (MH) with minor fine sand, orange brown, moist, high plasticity, very stiff, moderately hard to auger.		
		SV = 190 / 60 kPa (GEO287)				
				0.50 Silty CLAY (CH) with trace fine sand, orange brown mottled light grey, moist, high plasticity, very stiff, moderately hard to auger.	Groundwater Not Encountered	
		SV = 147 / 75 kPa (GEO287)				
1						
		SV = 79 / 33 kPa (GEO287)		1.3m: Becoming light grey.		
				1.80 EOH: 1.80m		
		SV = 114 / 29 kPa (GEO287)				
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA21
PAGE 1 OF 1

CLIENT	David Nathan	**PROJECT**	Duck Trust
PROJECT NUMBER	10737	**PROJECT LOCATION**	Robert Hastie Drive, Mangawhai
START DATE	19/07/17	**COMPLETED DATE**	19/07/17
COORDINATES		**LEVEL**	0.00
DRILLING CONTRACTOR	HGEA		
DRILLING METHOD	50mm handauger		
LOGGED BY	CP		
HOLE LOCATION	On proposed effluent disposal field Lot 81		

DEPTH (m)	TESTS	MATERIAL DESCRIPTION
		0.05 Clayey silt TOPSOIL with rootlets, brown, wet, easy to auger.
		Silty sandy CLAY (FILL) with trace gravels, yellowish orange mottled grey, moist, high plasticity, bluish grey gravels MPS 6mm.
	SV = 70 / 35 kPa (DR4604)	
		0.40 Clayey sandy SILT (MH), greyish yellow, moist, high plasticity, stiff, moderately hard to auger.
	SV = 147 / 70 kPa (DR4604)	
		0.7m: Becoming wet.
1	SV = 136 / 56 kPa (DR4604)	
		1.2m: Light whitish yellow.
	SV = 123 / 53 kPa (DR4604)	
2	SV = 138 / 53 kPa (DR4604)	
	SV = 123 / 44 kPa (DR4604)	
	SV = 114 / 32 kPa (DR4604)	2.70 EOH: 2.70m
3		

Groundwater Not Encountered

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA22
PAGE 1 OF 1

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 81

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Silty clay TOPSOIL with rootlets, dark brown, wet, easy to auger.	Groundwater Not Encountered	
				0.20 Sandy SILT (ML), whitish grey, moist, friable, low plasticity, hard, very hard to auger.		
				0.35 Clayey sandy SILT (ML), dark greyish brown, saturated, fine sand, low plasticity, very easy to auger.		
		SV = UTP (GEO287)		0.50 Silty SAND (SP), orange, moist, very dense, very hard to auger.		
				Silty sandy CLAY (CH), whitish grey mottled orange, moist, very stiff, high plasticity, moderately hard to auger.		
		SV = 106 / 52 kPa (GEO287)		0.90 EOH: 0.90m		
				0.9m: Abandoned at 0.90m due to heavy rain.		
1						
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

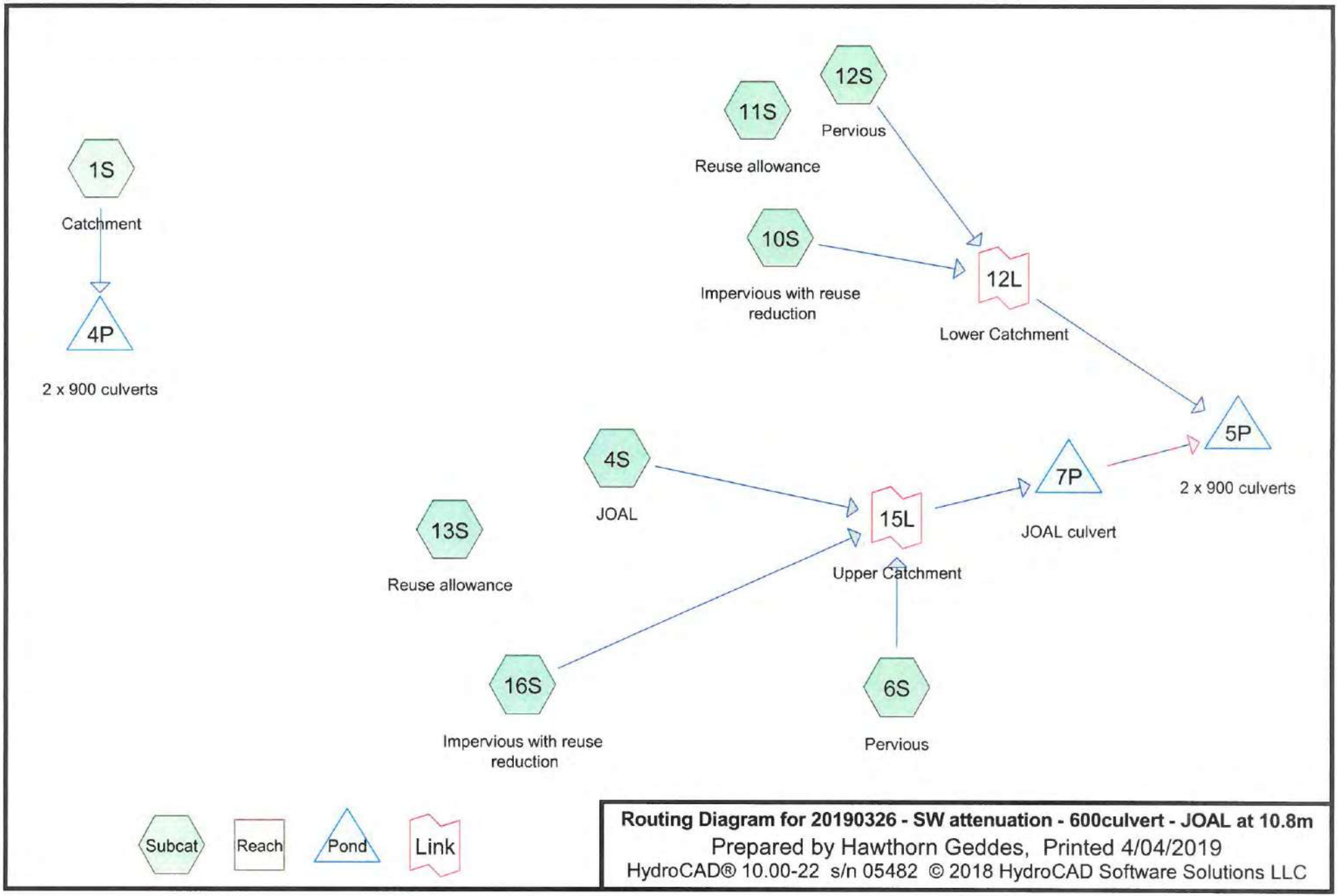
REMARKS

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

Appendix C – Stormwater Calculations


1S
Catchment
4P
2 x 900 culverts
11S
Reuse allowance
12S
Pervious
10S
Impervious with reuse reduction
12L
Lower Catchment
5P
2 x 900 culverts
4S
JOAL
7P
JOAL culvert
13S
Reuse allowance
15L
Upper Catchment
16S
Impervious with reuse reduction
6S
Pervious
Subcat
Reach
Pond
Link
Routing Diagram for 20190326 - SW attenuation - 600culvert - JOAL at 10.8m
Prepared by Hawthorn Geddes, Printed 4/04/2019
HydroCAD® 10.00-22 s/n 05482 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
270,000.0	0.67	75% Grass cover, Fair, HSG D (1S)
1,200.0	0.96	Impervious - JOAL (4S)
156,735.0	0.67	Pervious - Northern catchment (12S)
88,995.0	0.67	Pervious - Southern catchment (6S)
23,070.0	0.96	impervious (10S, 11S, 13S, 16S)

Summary for Pond 4P: 2 x 900 culverts

Inflow Area = 270,000.0 m², 0.00% Impervious, Inflow Depth = 20 mm for 5-year event
Inflow = 3.1801 m³/s @ 0.42 hrs, Volume= 5,532.8 m³
Outflow = 2.5579 m³/s @ 0.56 hrs, Volume= 5,532.7 m³, Atten= 20%, Lag= 8.7 min
Primary = 2.5579 m³/s @ 0.56 hrs, Volume= 5,532.7 m³
Secondary = 0.0000 m³/s @ 0.00 hrs, Volume= 0.0 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-10.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 7.392 m @ 0.56 hrs Surf.Area= 0.0 m² Storage= 1,147.6 m³ (1,119.5 m³ above start)

Plug-Flow detention time= 6.2 min calculated for 5,499.1 m³ (99% of inflow)
Center-of-Mass det. time= 6.0 min (33.0 - 27.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

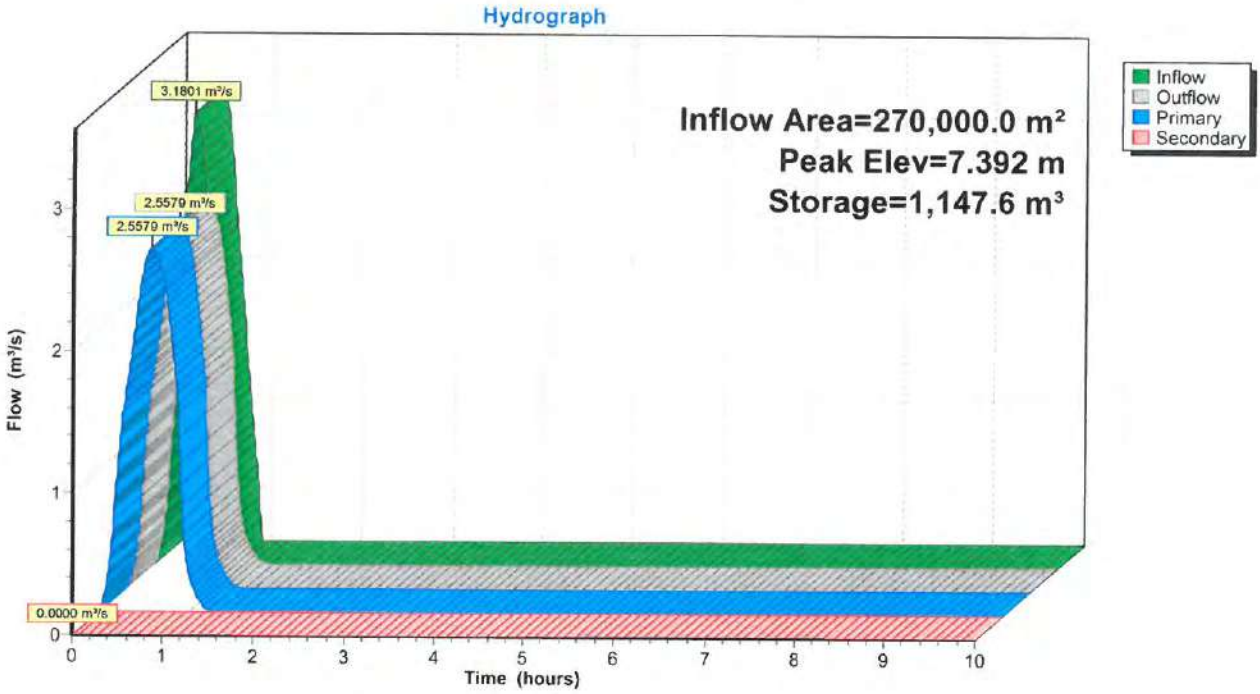
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.50 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=2.5575 m³/s @ 0.56 hrs HW=7.392 m (Free Discharge)
↑—**1=Culvert** (Inlet Controls 2.5575 m³/s @ 2.01 m/s)

Secondary OutFlow Max=0.0000 m³/s @ 0.00 hrs HW=6.370 m (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.0000 m³/s)

Pond 4P: 2 x 900 culverts



Summary for Pond 4P: 2 x 900 culverts

Inflow Area = 270,000.0 m², 0.00% Impervious, Inflow Depth = 57 mm for 100-Year event
Inflow = 6.9778 m³/s @ 0.42 hrs, Volume= 15,490.0 m³
Outflow = 6.3790 m³/s @ 0.65 hrs, Volume= 15,489.9 m³, Atten= 9%, Lag= 14.0 min
Primary = 4.2781 m³/s @ 0.65 hrs, Volume= 14,007.3 m³
Secondary = 2.1009 m³/s @ 0.65 hrs, Volume= 1,482.7 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-10.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 8.421 m @ 0.65 hrs Surf.Area= 0.0 m² Storage= 4,409.1 m³ (4,381.0 m³ above start)

Plug-Flow detention time= 11.7 min calculated for 15,461.8 m³ (100% of inflow)
Center-of-Mass det. time= 11.3 min (42.3 - 31.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

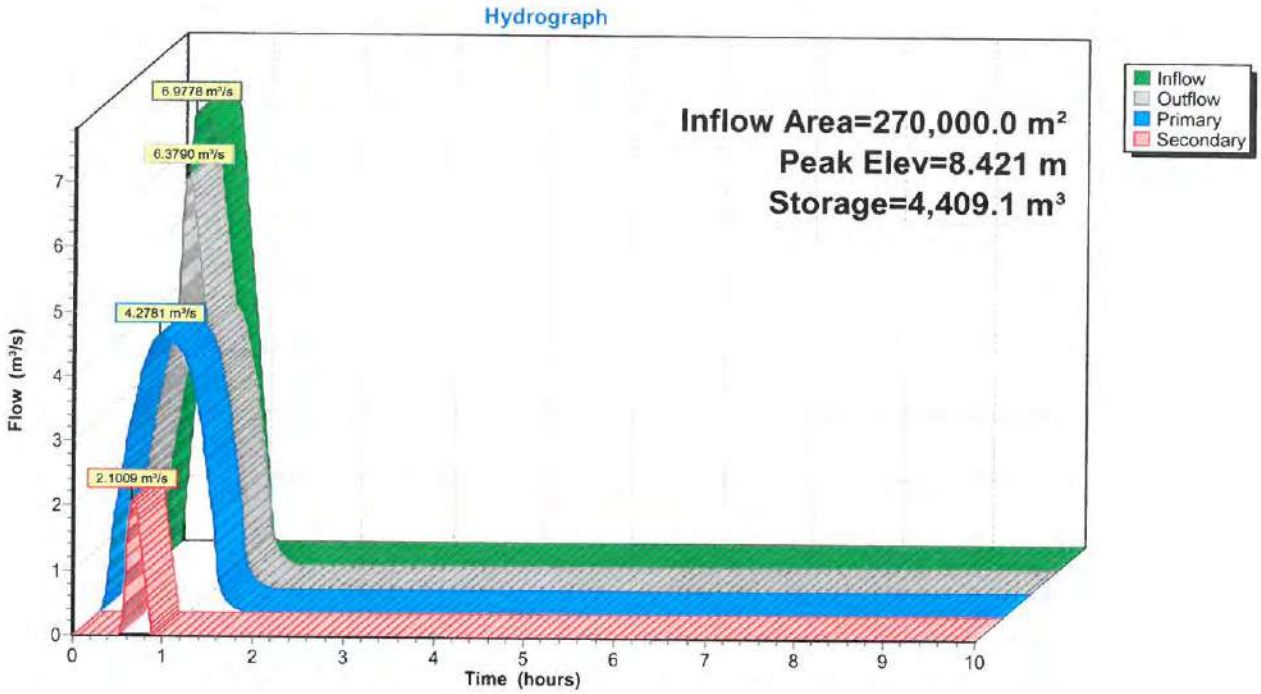
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.50 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=4.2779 m³/s @ 0.65 hrs HW=8.420 m (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.2779 m³/s @ 3.36 m/s)

Secondary OutFlow Max=2.0978 m³/s @ 0.65 hrs HW=8.420 m (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0978 m³/s @ 0.62 m/s)

Pond 4P: 2 x 900 culverts



Summary for Pond 5P: 2 x 900 culverts

Inflow Area = 268,350.0 m², 8.43% Impervious, Inflow Depth = 23 mm for 5-year event
Inflow = 2.8231 m³/s @ 0.53 hrs, Volume= 6,126.7 m³
Outflow = 2.4276 m³/s @ 0.61 hrs, Volume= 6,126.6 m³, Atten= 14%, Lag= 4.8 min
Primary = 2.4276 m³/s @ 0.61 hrs, Volume= 6,126.6 m³
Secondary = 0.0000 m³/s @ 0.00 hrs, Volume= 0.0 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 7.335 m @ 0.61 hrs Surf.Area= 0.0 m² Storage= 1,034.2 m³ (1,006.0 m³ above start)

Plug-Flow detention time= 6.3 min calculated for 6,088.4 m³ (99% of inflow)
Center-of-Mass det. time= 5.7 min (34.7 - 29.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

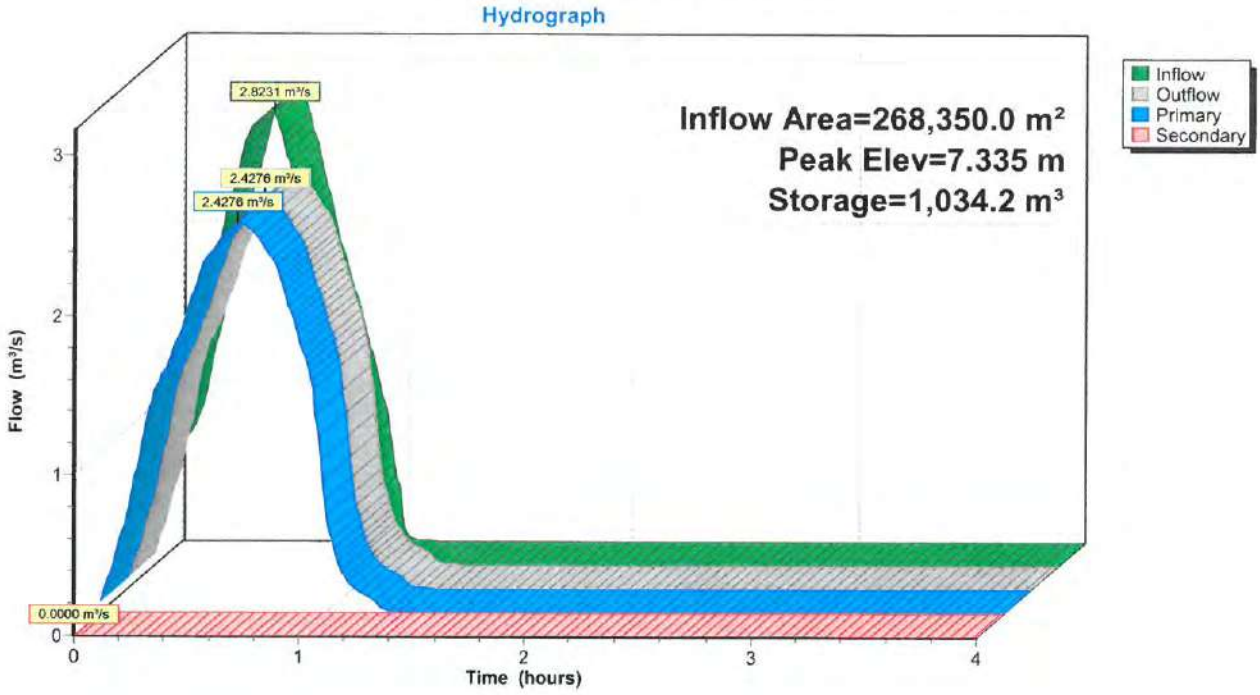
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.58 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=2.4273 m³/s @ 0.61 hrs HW=7.335 m (Free Discharge)
↑—**1=Culvert** (Inlet Controls 2.4273 m³/s @ 1.91 m/s)

Secondary OutFlow Max=0.0000 m³/s @ 0.00 hrs HW=6.500 m (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.0000 m³/s)

Pond 5P: 2 x 900 culverts



Summary for Pond 5P: 2 x 900 culverts

Inflow Area = 268,350.0 m², 8.43% Impervious, Inflow Depth = 60 mm for 100-Year event
Inflow = 6.8747 m³/s @ 0.65 hrs, Volume= 16,223.3 m³
Outflow = 6.2858 m³/s @ 0.68 hrs, Volume= 16,223.2 m³, Atten= 9%, Lag= 2.1 min
Primary = 4.2718 m³/s @ 0.68 hrs, Volume= 14,894.7 m³
Secondary = 2.0140 m³/s @ 0.68 hrs, Volume= 1,328.5 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 8.416 m @ 0.68 hrs Surf.Area= 0.0 m² Storage= 4,390.8 m³ (4,362.7 m³ above start)

Plug-Flow detention time= 11.6 min calculated for 16,185.0 m³ (100% of inflow)
Center-of-Mass det. time= 11.2 min (44.5 - 33.3)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

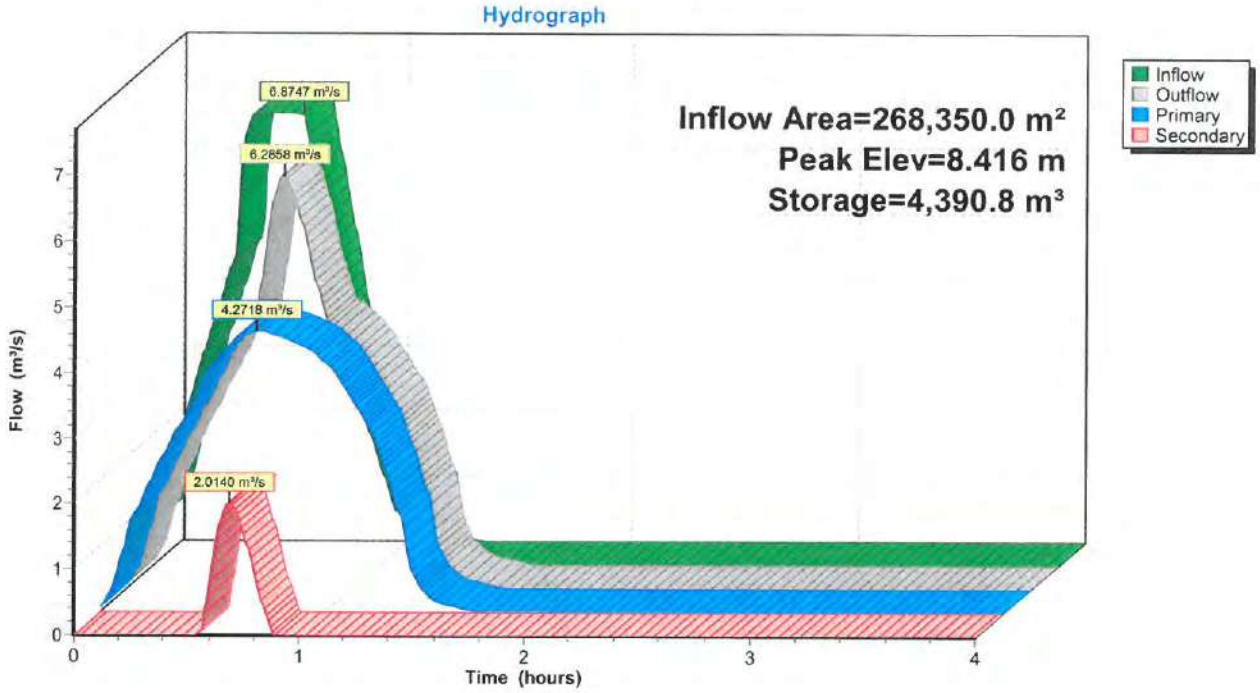
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.58 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=4.2715 m³/s @ 0.68 hrs HW=8.416 m (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.2715 m³/s @ 3.36 m/s)

Secondary OutFlow Max=2.0098 m³/s @ 0.68 hrs HW=8.416 m (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0098 m³/s @ 0.61 m/s)

Pond 5P: 2 x 900 culverts



Summary for Pond 7P: JOAL culvert

Inflow Area = 95,475.0 m², 6.79% Impervious, Inflow Depth = 48 mm for 100-Year event
Inflow = 3.0068 m³/s @ 0.42 hrs, Volume= 4,543.4 m³
Outflow = 2.9786 m³/s @ 0.42 hrs, Volume= 4,679.9 m³, Atten= 1%, Lag= 0.4 min
Primary = 0.9579 m³/s @ 0.42 hrs, Volume= 3,018.1 m³
Secondary = 2.0207 m³/s @ 0.42 hrs, Volume= 1,661.7 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 10.000 m Surf.Area= 0.0 m² Storage= 125.0 m³
Peak Elev= 10.905 m @ 0.42 hrs Surf.Area= 0.0 m² Storage= 785.0 m³ (660.0 m³ above start)

Plug-Flow detention time= 6.4 min calculated for 4,532.2 m³ (100% of inflow)
Center-of-Mass det. time= 5.7 min (30.1 - 24.4)

Volume	Invert	Avail.Storage	Storage Description
#1	9.000 m	870.0 m³	**Custom Stage Data** Listed below

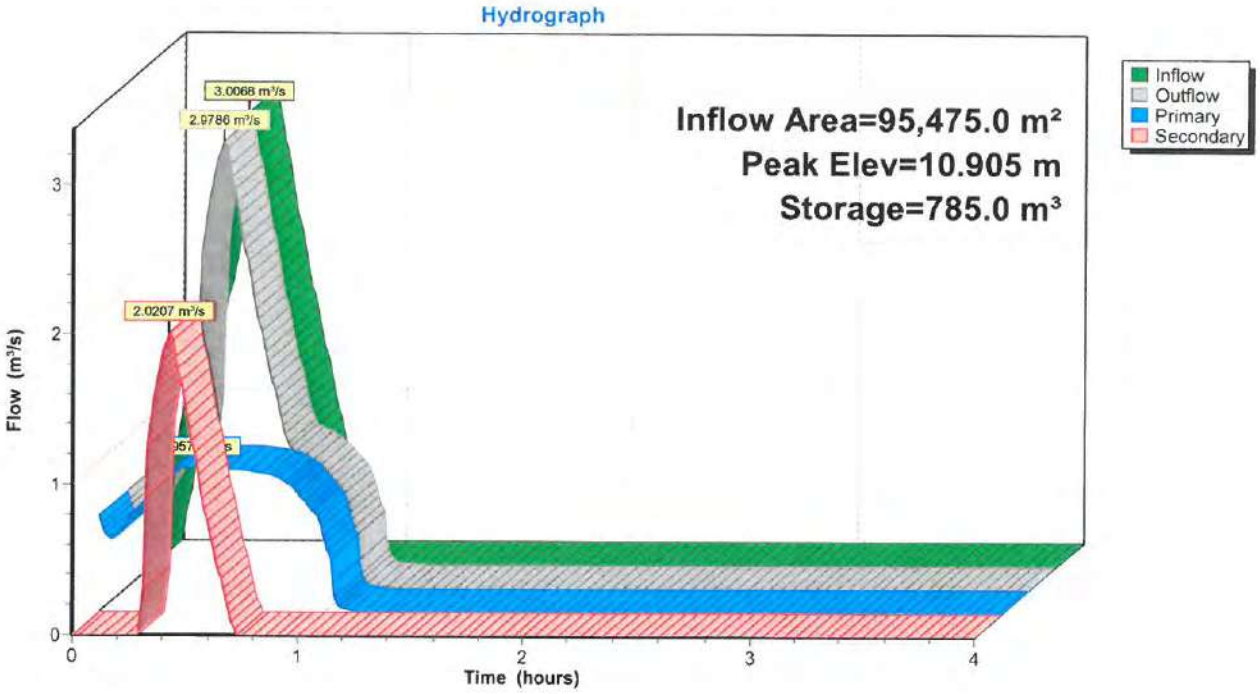
Elevation (meters)	Cum.Store (cubic-meters)
9.000	0.0
9.500	26.0
10.000	125.0
10.500	423.0
11.000	870.0

Device	Routing	Invert	Outlet Devices
#1	Primary	8.980 m	**600 mm Round Culvert** L= 25.00 m Ke= 0.500 Inlet / Outlet Invert= 8.980 m / 8.000 m S= 0.0392 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.283 m²
#2	Secondary	10.800 m	**40.00 m long x 5.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=0.9578 m³/s @ 0.42 hrs HW=10.905 m TW=8.107 m (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.9578 m³/s @ 3.39 m/s)

Secondary OutFlow Max=2.0144 m³/s @ 0.42 hrs HW=10.905 m TW=8.106 m (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0144 m³/s @ 0.48 m/s)

Pond 7P: JOAL culvert



TP108 peak flow calculations for filter strips assuming a small catchment

Table 3.3 - Curve numbers for typical Auckland conditions			
Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (mudstone/sandstone)
Bush, humid-climate, not-grazed	30	55	70
Pasture, lightly grazed good grass cover	39	61	74
Urban lawns	39	61	74
Crops, straight rows, minimal vegetative cover	72	81	88
Sealed roads, roofs	98	98	98

Project:	Duck Trust
Address:	
Consultant:	Hawthorn Geddes
Date:	30.11.18

Data Entry Cells	
Result cells	
Drop Down Menu	

Impervious area	ha	**0.12**
Pervious area	ha	**0**
Total area	ha	**0.12**
Impervious SCS curve number		**98**
Hydrological soil group		Group_C
Pervious SCS curve number		**98**
2 yr 24-hour rainfall depth from TP108 Apdx A	mm	**114.7**
Reticulation design rainfall depth (e.g. 5yr, 10yr) from TP108 Apdx A	mm	**0**
Water Quality Storm (WQS) rainfall depth (2yr/3)	mm	**38.23**
WQS peak rainfall rate from TP108 (10-minute duration)	mm/hr	25.8
Reticulation design rainfall depth (e.g. 5yr, 10yr)		0.0

Impervious surfaces

Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.95
Peak runoff rate (WQS)	m^3/s	0.0082

Pervious surfaces

Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.93
Peak runoff rate (WQS)	m^3/s	0.0000

Combined flow for Water Quality Storm

Peak runoff from surfaces	m^3/s	0.0082
Peak outflow from catchment (allowing for lag)	m^3/s	**0.0073**

TP10 Filter strip (50mm grass)

Data entry cells
Result cells

Project:	Duck Trust	
Address:	0	
Consultant:	Hawthorn Geddes	
Date:	30.11.18	

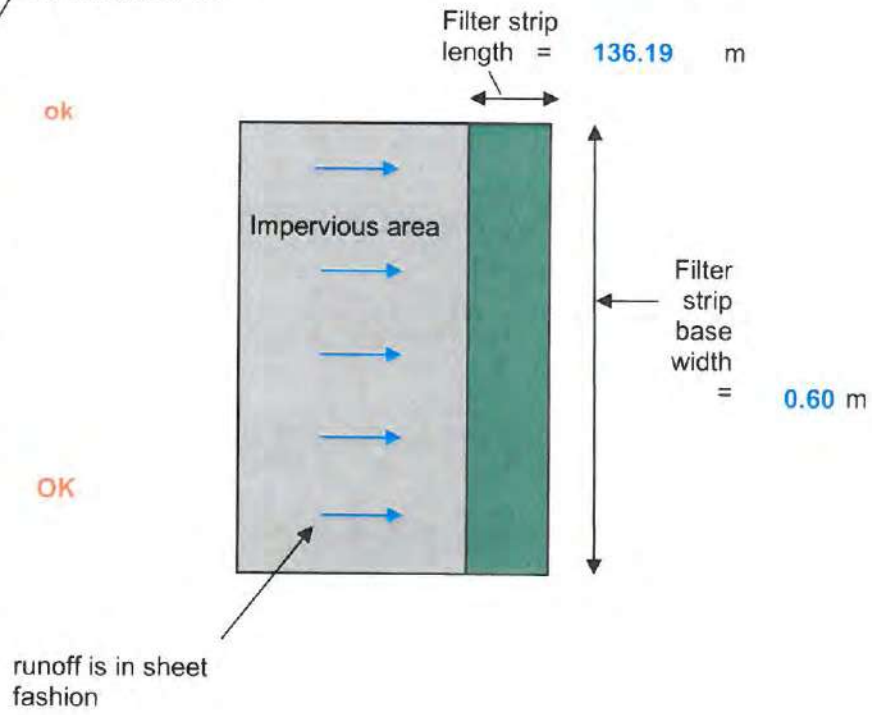
Vary depth until "ok"

Flow rate Q	m^3/s	**0.00731**
Channel slope S		**8.6%**
Depth of flow d	m	**0.05**
Manning's n for 50mm grass		0.142
Hydraulic radius R	m	0.043
Base width	m	0.60
Cross-sectional area A=bd	m^2	0.030
V=R^.667*S^.5/n	m/s	0.252
Hydraulic radius R=A/(b+2*d)	m	0.043
Is velocity V < 0.4m/s ?		**OK**

ok

To meet TP10 stormwater treatment specification:		
Required filter strip length	m	136.19
Filter strip length provided	m	**150.00**
Travel time t (should be >9 mins)	minutes	**9.91**

OK



HAWTHORN
Landscape Architects

Sanctuary North Ltd.
Cove Road – Mangawhai

Proposed Subdivision of Lot 2 DP 430128

Assessment of Landscape and Visual Effects

20th August 2019



27 Hobson Ave, Kerikeri 0230 P. 09 407 6448 M. 021 40764 info@hawthornlandscapes.co.nz

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APPENDICES:

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Appendix 2 – Development Plans
Appendix 3 – Off Site Photographs within the Sanctuary Subdivision (OSPSS)
Appendix 4 – Off Site Viewpoints
Appendix 5 – Ecological and Landscape Enhancement Area Photographs (ELEAP)
Appendix 6 – Visual Cone Map
Appendix 7 – JOAL Landscape Enhancement Plan (JOALEP)
Appendix 8 – Subdivision Landscape Enhancement Plan (SLEP)
Appendix 9 – Proposed Subdivision Landscape Implementation and Maintenance Schedule
Appendix 10 – Building Site Landscape Planting Plan Examples (BSLPP)
Appendix 11 – Open Space Areas Plan (OSAP)

27 Hobson Ave, Kerikeri 0230 P. 09 407 6448 M. 021 40764 info@hawthornlandscapes.co.nz

ATTACHEMENTS:

Attachment A – NZILA Landscape and Visual Effects Table
Attachment B – Sanctuary Building & Landscaping Guidelines

1.0 INTRODUCTION

Hawthorn Landscape Architects Ltd. have been engaged by the applicant Sanctuary North Ltd. to undertake an assessment of landscape and visual effects for the proposed subdivision of Lot 2 DP 430128, being a 13.7ha site located within the Sanctuary subdivision at Cove Road, Mangawhai.

The subdivision proposal seeks consent for the creation of 14 lots ranging in size from approximately 5,600m^2 to 1.31ha, and will include a jointly owned access lot (JOAL).

The application will also involve the amendment of a consent notice and associated building, conservation and landscape enhancement area covenants.

1.1 Purpose of the Report

This report will provide a landscape and visual effects assessment of the proposed subdivision. It contains and analysis of the landscape character and visual amenity values of the site and surrounding landscape and 'environment'. The report will determine the potential impact of the subdivision and future development of dwellings and accessways upon the visual and landscape values of the site and surrounding area.

In assessing this 'environment' I have included the future state of the environment, which may be modified from what is currently visible by the utilisation of rights to carry out a permitted activity under a district plan, or the implementation of approved resource consents. The assessment is therefore not limited to the existing landscape character, but will take into account how it may be modified in the future.

1.2 Methodology

The existing landscape and its visual context contributes to the existing baseline for the landscape and visual effects assessment. As just described the existing landscape or 'environment' to use as the baseline for assessment also includes the future state of the landscape or environment.

The visual components of the proposal and the potential landscape and visual effects generated as a result of the development have the potential to result in both landscape and visual effects.

The difference between these types of effects is that landscape effects arise from the change in the physical landscape, which can result in changes to its character and how this landscape is experienced and the perceived value given to the landscape.

Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity.

The following methodology was used in the preparation of this landscape and visual effects assessment.

- Desktop review of the relevant statutory documents (Regional and District Plan text and mapping);
- Site visits, and filed survey of the local area;
- Identification of the visual catchment and viewing audiences;

- Description of the site and existing landscape character, visual/aesthetic quality and amenity values of the surrounding environment;
- Identification and description of the nature of the proposed development;
- Assessment of anticipated rural character, landscape and visual effects;
- Ranking of landscape and visual effects;
- Review of the relevant planning documentation and reports;
- Identification of the proposed landscape and visual mitigation approach, options considered and recommendations.

This assessment has been prepared by a qualified Landscape Architect and in accordance with the NZILA (New Zealand Institute of Landscape Architects) Code of Conduct and with reference to the Quality Planning Guidelines Note[1]. Attachment A contains the NZILA table of effects rankings and definitions used in this report.

To determine the overall nature and significance of the landscape and visual effects, an understanding of the sensitivity of the landscape and viewing audience has been combined with an assessment of the magnitude of the change resulting from the proposal in order to determine the overall significance of effects.

The site visits and field survey of the local area were conducted on 22nd September 2017, 9th March 2018, 12th January 2019 and the latest visit was on 4th June 2019.

2.0 THE SITE AND ITS LANDSCAPE CONTEXT

2.1 Location

The application site is accessible from Cove Road through the southern gate of the Sanctuary subdivision on the northwestern edge of the Mangawhai Heads settlement. It is approximately 1km northwest of the main hub of Mangawhai Heads.

The site, Lot 2 is a 13.7ha piece of land located between Robert Hastie Drive (to the north and west) and the southern boundary adjoining the rural residential subdivision off Barrier View Drive.

The site is made up of grassed paddocks with olive trees scattered over them that were planted at the time of the Sanctuary subdivision, and two small streams and areas of native bush and riparian vegetation.

The location of the site is shown on the Viewpoint Location Map contained in Appendix 1.

2.2 Neighbourhood Character and Context

The application site is set within the Sanctuary subdivision. The Sanctuary is a rural-residential subdivision that has 63 lots that are individually owned, and range in size from approximately 2100m^2 to over 13.7ha.

The common areas of the Sanctuary subdivision include the 77ha Brynderwyn Hills bush area, two man made lakes, wastewater field area, internal roads and several commonly owned access lots. The Sanctuary subdivision is accessed from Robert

[1] http://qualityplanning.org.nz/index.php/planning-tools/land/landscape

Hastie Drive, Lakeview Lane and Woodleigh Lane. Refer to Appendix 1 – Location Map and Appendix 3 – Off Site Photographs within the Sanctuary Subdivision.

The Mangawhai Heads and the Mangawhai area to the southeast are made up of rural and coastal residential settlement that is focused around the Mangawhai Harbour and the backdrop of rural setting of rolling farmland and bush clad ranges.

The landscape surrounding the application site is characterised by undulating farmland that is interspersed with areas of indigenous vegetation extending down from the Brynderwyn Ranges onto the foothills often following the valleys, riparian corridors and wetlands. Remnant clusters of mature indigenous trees and regenerating scrub dominated by Manuka are scattered within the grassed paddocks.

Areas of exotic forestry are often found adjacent to the indigenous bush on the steeper hill slopes, while other exotic shelterbelts are associated with the areas of horticultural land use, this is more concentrated around the Tara Road ridge.

To the north of the property there are areas that have high conservation values, with the ridgeline that extends from Pukekaroro to Bream Tail being part of the regionally significant Brynderwyn Range. This ridgeline forms a continuous vegetated landscape feature and provides a very characteristic backdrop viewed to the north of the site and this area of Mangawhai Heads.

The Bream Tail Ridge has high landscape and ecological values, and is identified as an Outstanding Natural Landscape within the Kaipara District plan (ONL 14 'Bream Tail-Brynderwyn Ranges') and the 'Brynderwyn Hill and Bush Fringes' ONL in the Northland Regional Policy Statement (NRPS).

The application site is separated from these features by other rural land and the rest of the rural residential lots within The Sanctuary subdivision. The site is located at least 100-150m away from the closest boundary of the ONL.

Built form in this area includes a mix of rural residential housing and dense areas of residential development extending out from the main nodes of settlement in Mangawhai Heads and Mangawhai. Buildings located on the larger farm and bush blocks are more scattered, set within the pastoral and forested landscape.

The immediate context of the application site is characterised by the surrounding rural residential land use within The Sanctuary subdivision, Barrier View Drive and The Rise (under construction) subdivisions. Development of houses within these subdivision has not reached capacity, with many lots being vacant (yet have been consented to be built upon). Once these lots have been built upon the landscape setting will look a lot more rural residential than it currently does.

The residential development within Gum Diggers Lane and Jack Boyd Drive to the south east of the application site is visible in the distance as a sea of roof structures. This area of housing seamlessly extends into the Mangawhai Heads residential area.

The development of the subdivision infrastructure and houses within this once rural pastoral hinterland of Mangawhai Heads has over recent years altered the character of this landscape and created the current 'environment' within which the application site is located adjacent to.

The Sanctuary subdivision contains approximately 30 completed dwellings, with another three dwellings, an early childcare centre and café currently under construction.

It is noted that the current pastoral hill slope that is located between The Rise subdivision, Mangawhai Heads Road and Cullen Street is also zoned Rural Residential and Residential. These areas are visible from the application site and will eventually be developed so that they will be visually similar to the current settlement pattern found locally.

Over time the character of this neighbourhood will change further from one that has clusters of rural residential and residential development set within or adjacent to pastoral landscapes, to one that has a built form that is more residential in nature than rural residential. The larger pockets of pastoral farmland that are currently visible will disappear and will be replaced by housing and infrastructure. Only smaller pockets of bush remnants and smaller open space areas (what were once the open farmed paddocks) will be left.

The land adjacent to Cove Road, and Mangawhai Heads Road to the south of The Rise, and the land to the north of The Rise and northeast of The Sanctuary contains the lifestyle block development of the Bream Tail Farm subdivision. This also forms the current 'environment' within which the application site is set. This land will eventually contain another 40 or so houses located within the visual catchment that extends from the application site.

The Barrier View Drive subdivision is located to the south of the application site. This is a rural residential zoned subdivision that contains a number of established residences, which overlook parts of the Sanctuary subdivision (predominantly towards the southern lake) the residential areas of Mangawhai Heads to the east.

Built development within Barrier View Drive is set within maturing landscaped plantings with only small parts of the houses located within this subdivision being visible from the Sanctuary subdivision. This has assisted with retaining the rural amenity values along Barrier View Drive and provides a sense of naturalness. The application site is not readily visible from the Barrier View Drive environs as it is visually screened from view by intervening shelterbelts, landscaping vegetation and the orientation of the topography of the site.

Looking to the northeast from the site the backdrop view is of the Bream Tail Farm subdivision. It is set within a landscape that is characterised by its setting adjacent to the coast and its steep to undulating bush clad hill slopes and pastoral paddocks. This large lot rural subdivision contains a number of rural lots that generally range in size from 4ha to 20ha.

To the east of the site and The Sanctuary subdivision is Cove Road, the main road that provides access to the Mangawhai Heads settlement. Cove Road carries on to the north leading to Waipu Cove, and the southwest where it links into State Highway 1 at Kaiwaka.

The Rise subdivision is located on the eastern side of Cove Road just to the northeast of the southern entrance to The Sanctuary. This recently subdivided block of land is a 19ha site and is currently under construction with the first stage of the 14 lots being developed. The lots range in size from 4025m^2 to 5.34ha. The rural residential lots will be set within 24252m^2 of covenanted landscape structure planting that will visually integrate future built development into the landscape.

The 'environment' that the application site is set within is constantly and rapidly evolving from its previous pastoral character to a rural residential and residential character. In the last couple of years this has become more noticeable as the subdivided lots within the surrounding landscape have been built upon.

More subdivision development within the surrounding landscape will continue this pattern of expansion and create a distinctive rural residential and residential character to the area surrounding the application site and visible from the site.

2.3 Character of Application Site

The application site and current nature of Lot 2 is shown on the photographs contained in Appendix 3 – Off Site Photographs within the Sanctuary Subdivision (OSPSS) and Appendix 5 – Ecological and Landscape Enhancement Area Photographs (ELEAP).

The 13.7ha site is covered in grass and scattered olive trees that were planted at the time of the Sanctuary subdivision. The two small streamlined gullies contain a mix of predominantly Kanuka and Totara trees, with other native wetland species and some weed species.

The site is gently undulating with the land falling away from the upper contours near the western boundary (adjoining the house sites accessed off Robert Hastie Drive) towards the eastern boundary and the two small riparian gullies (adjoining other lots within The Sanctuary subdivision).

The central part of the site is an easterly sloping plateau that is located between the two small stream lined gullies. Two narrow strips of land form the southern and northern part of the site. The northern strip adjoining Robert Hastie Drive to the north, and is bound by the bush gully to the south. The southern strip is bound by private land to the south (the boundary is identifiable by the row of gum trees along the boundary), and the small riparian gully to the north.

When viewed from outside of the Sanctuary subdivision the application site is viewed as the central middle ground portion of the subdivision. It is located away from the most elevated and visible hill slopes within the subdivision, and away from the ONL, it is also located away from the Cove Road corridor and lake edge. It is moderately concealed from close up external viewpoints by its central location within The Sanctuary and the intervening landform, vegetation patterns and presence of foreground surrounding built development.

The main elements that contribute to the character of the application site are:

- Scattered olive tree set within mown grassed paddocks creating a horticultural theme in areas,
- Indigenous bush lined riparian gullies, indicating the original forest cover, and remnant pattern of vegetation,
- The small gullies divide the site into three separate areas physically,
- The enclosing nature of the surrounding topography creating a small amphitheatre like character to the landscape,
- The limited visibility of the site to close up public viewing position to the south, west and north, with more elevated long generally to the east allowing views towards the site.

- The location of the site within a rural residential subdivision and within a locality and environment that is characterised by this form of subdivision development, and
- The backdrop provided by the bush clad Brynderwyn Ranges to the north.

2.4 The Rise Subdivision Landscape Assessment

The Rise Subdivision is located on the eastern side of Cove Road opposite The Sanctuary subdivision. The Rise site can be viewed from within The Sanctuary and from Lot 2 as depicted in Appendix 3 - OSPSS, and Appendix 4 Off Site Viewpoints. The Rise subdivision forms part of the existing rural residential 'environment' within which The Sanctuary subdivision and Lot 2 are part of.

To accompany the Resource Consent application for The Rise subdivision an Assessment of Landscape and Visual Effects was prepared by Simon Cocker Landscape Architecture (dated 9th June 2016). This assessment considered a 37- lot proposal on the 19ha site. The Environment Court subsequently approved a 14 lot subdivision on The Rise site.

As The Rise subdivision site is directly adjacent to Sanctuary, which Lot 2 is part of I have reviewed Mr Cockers assessment of the potential visual effects and rural character effects of the 37 lot proposal.

In Sections 2 and 3 Mr Cocker describes the context of the site and its setting within the broader landscape and its location adjacent to Cove Road to the west, Bream Tail subdivision to the north and a Residential zone that bounds the south eastern corner of the site. The site is described as being part of the wider pastoral landscape located on a low ridge.

The subdivision proposal included vegetative structure planting to facilitate the successful integration of built development into the landscape. Large areas of revegetation were also proposed, as were development controls including height controls and colour restrictions.

The effects of the development upon the site and its setting were assessed to determine how the proposal would impact upon the experience of people viewing the development from outside the site and to comment upon the level of landscape, rural character and visual effects.

In relation to the potential effects upon rural character Mr Cocker states on page 7 that "*The proposal will result in a change in the character of the site and its immediate area - shifting from rural to rural residential - the resulting character will be consistent with the character provided for in the surrounding area. Furthermore, the proposed revegetation and measures that will ensure the establishment of a vegetated structure and context for the future built development within the site will result in a vegetative character that will soften the appearance of those future buildings, and reduce their potential dominance. As such, it is the opinion of the author at the potential adverse landscape effects and effects on rural character and rural amenity will be no more than minor*".

In section 6.2 on page 10 Mr Cocker states "*effects on landscape values are primarily dependent on the landscape sensitivity of a site and surrounds. The site currently displays a strong rural character, and comprises a grassed ridge with no existing built development". "The landscape setting of the site includes a strongly rural context to*

the north, north east, east, south east and south, the site has the potential to be sensitive to modification".

Mr Cocker then describes how the surrounding land to the west and southwest displays a rural residential character and that when development provided for within The Sanctuary subdivision and on land zoned Residential to the southern side of Mangawhai Heads Road occurs there will be a shift towards a more residential character.

Consequently Mr Cocker is of the opinion that the *"landscape sensitivity of the site is moderated as a result of the developing rural residential character of the landscape, and the anticipated future residential development provided for by the Residential zoning. These likely or potential future changes in the character of the landscape form part of the 'environment'*".

On page 11 Mr Cocker assesses the potential effects of The Rise subdivision on landscape values and rural amenity values. He states that "*the character of the landscape cannot be considered without also considering the 'environment' - that is to say the likely or potential future changes to the character of the landscape. Thus, the existing character of the undulating rural hinterland is likely to change as development provided for through subdivision, or as subdivision and development enabled by Residential zoning in the District Plan take place. The 'environment' therefore provides for landscape change to take place within the landscape context of the site and, as a consequence, the sensitivity of the site to change is diminished. This is not to say that development within the site does not have the potential diminish landscape and amenity values particularly when experience from more proximate locations……. The proposal seeks to address this issue by establishing, and providing for the establishment of a vegetative framework within which development will be constructed*".

"*In addition, the proposed building and landscape design guidelines, contained in Appendix 1 will ensure that the prominence of built development is reduced through height, design and colour controls*". Mr Cocker concludes that "*the potential adverse affect on the landscape and rural character of the site will be no more than minor*".

Within Section 6.3 of the assessment the potential visual effects of the Rise subdivision are determined by Mr Cocker.

Of interest is the viewer group 'occupants of dwellings and users of roads to the south west, west and north west of the site'. This viewer group includes the residents and future residents within the Sanctuary subdivision.

Mr Cockers assessment finds that the existing pattern within the landscape to the south west and west (of which the Sanctuary and Lot 2 are part of), has provided for a change in the character of the wider landscape.

On page 16 Mr Cocker states that "*the subdivided lots of the Sanctuary form part of the 'environment' and anticipate a change in the landscape character from the existing rural character, to a rural residential character, and which built development will have a greater dominance*". "*Within such a context, with the dominance of built development is more apparent, the landscape resulting from development of the site will be perceived as being of a similar character to its foreground context and it is the opinion of the author that the resulting visual and visual amenity affect experience by these individuals will be low*".

The contour of The Rise a ridge and ridge flank with the lack of any remnant bush or natural features on the site. This resulted in Mr Cocker assessing the landscape sensitivity of the site as being moderate. This moderate rating was also a result of the developing rural residential character of the landscape, and the anticipated future residential development provided for by the near by Residential zoning, which Mr Cocker concludes would diminish the sensitivity of the landscape to change.

The assessment for The Rise subdivision prepared in June 2016 was for 37 lots on an elevated ridge that was predominantly in pasture with no existing built development on the site.

Mr Cockers assessment conclusions were that the resulting visual and visual amenity affects (for the viewing audience within The Sanctuary) will be low and the potential adverse landscape effects and effects on rural character and rural amenity will be no more than minor.

The proposed Lot 2 subdivision is for 14 lots on a less visible area of land that is located well away from any public roads and is located within an existing rural residential subdivision. The site is not a highly visible ridge like The Rise; it has an undulating contour with many existing natural features and remnant areas of bush. These will be enhanced and protected and greatly assist with visually absorbing and integrating the proposed development into the landscape setting and rural residential character of the surrounding landscape.

Lot 2 is located within an existing subdivision, which already contains built development. The proposed layout of the subdivision will result in clustering of built development so that there are areas of open space retained to maintain a more rural looking rural residential subdivision. The Lot 2 development will blend seamlessly with the Sanctuary subdivision and will be in context with the existing and evolving rural residential settlement pattern of this area.

3.0 THE APPLICATION

3.1 Proposed Subdivision

The applicant proposes to subdivide their 13.7-hectare property legally described as Lot 2 DP 430128 to create fourteen lots (Lots 81-94) in total and a jointly owned access lot (Lot 80). Refer to Appendix 2 – Development Plans.

The subdivision proposal will result in lots ranging in size from 5,900m^2 to 1.4ha, with an average lot size of 9,100m^2. The proposed subdivision development is described in detail within the AEE prepared by 4Sight Consulting.

The key aspects of the subdivision development and associated landscape and ecological enhancement and protection measures include:

- The two streams will be used generally as boundaries between lots so to avoid any further vehicle crossings and enabling riparian plantings to be effectively protected and managed by future lot owners,
- Enhancement of the existing stream lined gullies to strengthen this landscape pattern, and visually and physically divide the future development of dwellings into three main clusters. A cluster of two lots to the south (Lots 93 and 94), a

cluster of eight lots centrally (Lots 85-92), and a cluster of four lots (Lots 81-84) to the north adjacent to Robert Hastie Drive,

- The proposed enhancement plantings will follow a similar approach to the existing bush, landscape and wetland covenanted areas that underpin the Sanctuary subdivision,
- The average lot size will be approximately 9,100m^2 which is consistent with the current subdivision pattern,
- Formal protection under a conservation covenant of approximately 2.19ha of remnant native vegetation and proposed native enhancement areas along the two riparian corridors,
- Indigenous landscape enhancement plantings within the up and down stream areas adjacent to the conservation covenant areas, covering approximately 1.1ha to be protected by a landscape protection covenant,
- Specimen Tree Plantings on the jointly owned access lot (JOAL) to enhance the amenity of the streetscape and assist with visually separating and integrating future built development upon the lots,
- Subdivision Landscape Enhancement Planting on the individual lots to compliment the protected ecological areas, enhance the overall amenity values of the site and visually separate future built development,
- Building Site Landscape Planting Plans that are specific to future building locations and designs that shall integrate the buildings with the landscape, these shall be submitted to the Council prior to the issue of building consent for any building within the subdivision, and
- Existing Building and Landscaping Guidelines that shall be applied to each lot to ensure future development on each lot happens in the same manner as development within the Sanctuary subdivision.

3.2 Ecological Protection and Enhancement Proposals

A detailed Ecological Assessment of the site has been prepared by 4Sight Consulting to determine the ecological values of the streams and associated native vegetation on the site.

The report finds that there are two small discrete Totara forest remnants, regenerating riparian Kanuka scrub along the watercourses and a modified mixed exotic/native wetland where the streams on site have been dammed at Lakeview Drive.

The areas on the site that have been identified in the Ecological Assessment as being of higher ecological value (the Totara remnants, riparian Kanuka scrub and lower wetland) will all be retained and protected, and extensive ecological enhancement undertaken. These areas will be formally protected through a conservation covenant. Refer to Appendix 3 – Off Site Photographs within the Sanctuary Subdivision and Appendix 5 – Ecological and Landscape Enhancement Area Photographs.

The proposed ecological protection and enhancement will involve:

- Protection of the existing bush shrubland remnants of approximately 1.106ha,
- Enhancement planting of the areas immediately adjacent to the two streams and bush, and wetland areas. The proposed planting of mixed indigenous species will cover an area of approximately 1.615ha, which constitutes approximately 66% of the total proposed 2.43ha conservation covenant area,
- Planting maintenance and pest management programmes will be implemented for the on-going management of the plantings and bush to ensure its continued enhancement and protection and enhancement.

The protection of the existing indigenous vegetation and ecological enhancement through revegetation plantings and pest plant control will greatly enhance the landscape and visual amenity values of the site.

This planting will also assist with providing the framework planting within the subdivision that the proposed JOAL planting, subdivision enhancement planting and building site landscaping can then link into.

4.0 STATUTORY MATTERS

4.1 Introduction

The 4Sight AEE contains an assessment of the relevant statutory planning provisions applicable to the site and proposal. The following is a summary and analysis of the relevant landscape criteria found in:

i. Resource Management Act
ii. Kaipara District Plan
iii. Sanctuary Subdivision Consent Notice Building and Landscaping Guidelines

4.2 Resource Management Act 1991

Within Part II, Purpose and Principles of the Resource Management Act (RMA) landscape principals are generally addressed.

The most relevant provision in relation to assessing the landscape and visual effects of this proposal are:

Section 5 of the RMA sets out the purpose and principals, which is to promote the sustainable management of natural and physical resources. This is, managing the use, development, and protection of natural and physical resources in a way which enables people and communities to provide for their social, economic, and cultural well being and for their health and safety while -

(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
(c) avoiding, remedying,

Section 6; 'Matters of national importance of the RMA', must be recognised and provided for, including;

(b) the protection of outstanding natural features and landscapes from inappropriate
subdivision, use, and development:

Section 7; 'Other Matters of the RMA', sets out matters to which particular regard shall be given including:

(c) the maintenance and enhancement of amenity values:
(f) maintenance and enhancement of the quality of the environment:

4.3 Kaipara District Plan (KDP)

Zoning and Overlay

The application site is situated within the Rural zone as shown on Map 17, and is also subject to the Harbour (Mangawhai) overlay. There are no site features located on the property, although the adjacent bush area within The Sanctuary is contained within an Outstanding Natural Landscape, this is however not part of the application site.

Plan Objectives and Policies

The relevant chapters of the District Plan are:

- Chapter 2 – District Wide Resource Management Issues;
- Chapter 4 – Overlays;
- Chapter 12 – Rural; and
- Chapter 18 – Landscapes and Natural Features.

Chapter 2 – District Wide Resource Management Issues

District Wide Objectives

2.4.5 To recognise and enahnce the amenity and character of the District, while providing for sustainable resource use.

District Wide Policies

2.5.2 By providing incentives for land use and subdivison where these include environmental benefits over and above those required to avoid, remedy or mitigate adversse effects.

Comment:

The proposal is in accordance with the above provisions. The ecological values of the site will be enhanced by the proposed buffer, wetland enrichment, ephemeral stream plantings and the formal protection of this vegetation.

Some of the existing olive plantings are likelky to be retained, and the proposed landscape structure planting and building site landscaping on each lot will assist with maintaining amenity and character of the site and surrounding area.

Objectives and Policies that apply to the Harbour overlay of relevance to this assessment focus on the enabling of subdivison, whilst seeking the protection of natural character, the maintenace and enhancement of amenity values and the managing of potential adverse effects including visual amenity effects.

Chapter 4 – Overlays

Overlay Objectives

4.4.2 To enbale subdivison, land use and development in the Overlays, where it recognises and provides for:

- *The protection of natural character; and*
- *Maintenance or enhancment of the water quality of receiving environments; and*

- *Maintenance or enhancment of amenity values; and*
- *Any other specific values identified in an Overlay.*

4.4.11 To recognise and provide for the protection of habitats and ecological values.

4.4.12 To recognise and where appropriate protect cultural, heritage and amenity values, including the special sense of place of land within the Mangawhai Harbour Overlay.

4.4.13 To enable growth in the Mangawhai Harbour Overlay in a manner that protects and enhances the identified valued natural environments which includes:

...

- *Terrestrial wetland ecosystems and associated riparian corridors;*
- *The Brynderwyn Range*

Overlay Policies

4.5.2 By managing the location, scale and design of subdivison, use and development to minimise the potential adverse effects on the natural character of the coastal environment.

4.5.16 By requiring careful management of subdivision, land use activities including their location, design and operational arrangements (including wastewater and stormwater systems) so as to avoid, remedy or mitigate adverse effects (including discharges) arising from these activities on sensitive receiving environments.

4.5.17 By managing the scale, location and design of activities in the Mangawhai Harbour Overlay.

While activities have the potential to create adverse visual amenity impacts, the Plan seeks to manage such activities, e.g. through the establishment of buffers and screening or landscaping to provide effective mechanisms to reduce potential adverse effects, while not placing undue restrictions on the ability for such activities to be undertaken in the Mangawhai Overlay.

Comment:

The proposal is in accordance with the above provisions. No ecological values or habitats will be adversely affected by this proposal. The conservation covenants will protect the existing and proposed native vegetation and riparian corridors on the site. This will enhance the ecological values on site and the surrounding landscape. The Brynderwyn Ranges and ONL are located approximatly 150-200m away to the north and will not be affected by the subdivsion proposal.

The proposed subdivision is located within an existing rural residential subdivison where there is existing infrastructure to accommodate such a development. The development has been designed and will be managed in such a way that there will be no adverse effects upon any sensitive receiving environments.

The Rural zone objectives and policies are contained in Chapter 12. The following ones are of relevance:

Chapter 12 – Rural

12.5 Rural Objectives

12.5.2 To maintain rural character and amenity, including the:
- *Sense of openness;*
- *low dominance of built form;*
- *pasture and commercial forest areas;*
- *areas of indigenous vegetation and;*
- *unmodified natural landforms.*

12.5.4 To ensure that the servicing of new subdivision and development does not adversely affect the environment, in particular sensitive receiving environments.

12.5.9 To maintain sites and buildings during development to avoid adverse visual amenity effects.

12.6 Rural Policies

12.6.3a By allowing greater intensity of subdivision, or development in the Rural Zone where this is offset by protection, restoration, enhancement or establishment of natural features, vegetation and open space, where they significantly contribute to the natural environment values, natural character of the coastal environment, and rural character and amenity.

12.6.3b By allowing Small Lot subdivision within an Overlay only where it is consistent with the Overlay Objectives.

12.6.3c By providing for more intensive and innovative site-specfic subdivison and development where this results in better environemental outcomes.

12.6.4 By requiring all subdivision to contribute to the retention of rural character and amenity.

12.6.5 By avoiding, remedying or mitigating the adverse effects of subdivision and development (including ribbon development) on the natural environment values of the rural area.

12.6.6 By promoting the integration of subdivison, use or development with the protection, enhancement or establishment of natural features, vegetation and open space.

12.6.7 By avoiding, remedying or mitigating the adverse effects of activities which pose the greatest threat to remaining areas of significant indigenous vegetation and significant habitats of indigenous fauna), and rural amenity (e.g. vegetation clearance, excavation and fill, the bulk and location of buildings and structures).

12.6.15 By requiring site and building development to demonstrate how adverse visual amenity effects will be addressed over the duration of the development.

Comment:

The proposed development includes methods to avoid, remedy and mitigate potential adverse effects upon the more sensitive parts of the site. The proposal also includes the enhancement and protection of the natural features on the site. The existing bush lined gullies will be protected by a conservation covenant and enhanced through native revegetation plantings.

The amenity plantings that will be established and maintained by the future lot owners adjacent to the identified building sites will serve to retain and enhance the amenity values of the proposed subdivision and rural character of the surrounding area. The possible retention of some of the olive trees on the lots, by at least some of the future owners, along with other plantings around driveways and the like, it is also expected to help retain and enhance the amenity values and the productive rural character of the site.

Chapter 18 Landscape and Natural Features . The following ones are of relevance:

Chapter 18 – Landscapes and Natural Features

18.5 Landscapes and Natural Features Objectives

18.5.3 To encourage the active management, enhancement, and voluntary protection of landscapes by private land owners by utilising regulatory incentives and non-regulatory methods.

18.5.4 To maintain the distinctiveness, diversity and complexity and sense of place of landscapes across the District.

18.6 Landscapes and Natural Features Policies

12.6.1 To recognise and protect Outstanding Natural Landscapes from inappropriate subdivision, use and development by:

...

d) Protecting the character and values of features and landscapes by managing the potential significant adverse effects of locating inappropriate significant built elements outside Outstanding Natural Landscapes

The proposed ecological and landscape amenity enhancement plantings will maintain the distinctiveness and diversity of this landscape while still enabling rural residential development within it.

Although the site is located close to the Brynderwyn Ranges ONL it will not adversely affect this sensitive landscape. The site is not located on an elevated ridgeline or viewed as an inappropriate element next to the ONL. The proposal is an extension of the existing rural residential development currently found in this environment within the Sanctuary subdivision. The subdivision proposal will have no adverse effects upon any ONL.

Plan Rules

The development standards (rules) for Rule zone and associated Harbour Overlay will control the design and location of all future buildings in the proposed subdivision. The various rules are identified in the 4Sight AEE. From a landscape perspective the following rules are considered important:

- Only one dwelling is a permitted activity;
- The development standards limit building to 8m (two storeys);
- Buildings are required to be set back at least 10m from roads and at least 30m from streams and wetlands;

- Buildings and other and impermeable services are limited to no more than one 10% of the site.

The AEE also documents the rules that restrict earthworks on the identified building sites and other parts of the lots. These rules also have an important landscape effects component.

4.4 Sanctuary Subdivision Building and Landscaping Guidelines (Building and Landscaping Guidelines)

The Building and Landscaping Guidelines are an additional control mechanism that serve to retain and enhance the rural character and visual amenities of the existing subdivision and surrounding area.

As set out in the 4Sight AEE the guidelines are tied to the land covenants affecting all of the saleable lots. Under the land covenants all buildings are required to be designed in accordance with the guidelines and approved by the Design Committee.

The building and landscape design guidelines have been developed so that future built development on each lot can achieve a high level of integration and meet District Plan development standards on building height, yards and other matters.

This shall be achieved through sensitive building design and location and through the use of vegetation to provide a vegetated context for the built development. This will effectively control the siting and design of dwellings and accessory buildings in the proposed subdivision.

The guidelines recognise that it is not necessary to fully screen buildings with vegetation, however the use of strategically placed trees and areas of planting shall assist in reducing a buildings prominence by breaking up its linearity and fragmenting views of its roof and façade.

Attachment B contains a copy of the guidelines. From a landscape and visual effects assessment perspective aspects such as building height, roofs, colours, reflectivity, design style and form and scale are important when considering the proposed subdivision.

The landscaping design guidelines will control aspects such as driveways, fences, hedges, landscaping, and specimen tree planting.

For a detailed description of the content of the guidelines refer to Section 6.4 of this assessment.

5.0 ASSESSEMNT OF LANDSCAPE, NATURAL CHARACTER AND VISUAL EFFECTS

5.1 Introduction

In assessing effects on landscape there is a distinction made between landscape effects (effects on the character and amenity of a landscape, this may not be visible to the general public), and visual effects (the response of a viewing audience,

principally from public viewing positions, but also surrounding privately owned properties).

These effects are assessed in terms of the degree of change brought about by a development. The degree of landscape and visual effects resulting from a development may be negative (adverse), or positive (beneficial), contributing to the visual character and quality of the environment.

Visual effects are generated through visual changes to the landscape as a result of a development, with the significance of the effects measured by the response of a particular viewing audience and is influenced by the degree of visibility, whether the proposal is the focal point or part of a wider view, whether the view is transient or permanent and the degree of contrast with the surrounding environment.

Landscapes effects can either be a result of landform or land-cover modification, or be more subtle such as influencing the overall pattern of landscape. The significance of the effect is determined by the extent of the change, the significance and sensitivity of the landscape in question and the resilience or capacity of the landscape to absorb the change.

This assessment of visual effects examines the perceptual (visual) response that any of the identified changes to the landscape may induce. The visual sensitivity of the site is influenced by a number of factors including its visibility, the nature and extent of the viewing audience, the visual qualities of the proposal, and the ability to integrate any change within this landscape setting.

The degree of adverse landscape and visual effects generated by this proposal will depend upon the character of the surrounding landscape (the context), existing levels of development surrounding the application site, the contour of the land. It will also be dependent upon the presence or absence of screening and/or backdrop vegetation, and the characteristics of the future activities associated with the development on the application site.

5.2 Visual Catchment & Viewing Audience

To evaluate the extent of visibility and assess the potential landscape and visual impact of the proposed subdivision on the surrounding area a number of viewpoints were chosen that are representative of a range of publicly accessible viewing positions that afford views of the site. Refer to Appendix 4 for the Off Site Viewpoints, Appendix 1 for their locations.

The application site is visible within a visual cone that extends generally to the east of the site and fans out to the northeast and southeast.

The Visual Cone Map in Appendix 6 illustrates the areas and divides them into five visual catchment areas.

The viewer groups within these areas are identified as follows:

- Visual Catchment A – Residents within the Sanctuary subdivision.
  (Refer to Appendix 3 - Off Site Photographs Within the Sanctuary Subdivision, Photos 1 – 13)
  The most immediate views of the site are obtained by the residents within the Sanctuary subdivision on the lots that are located directly adjacent to the site and

parts of Robert Hastie Drive. Views range from directly adjacent to the site to over 400m away adjacent to Cove Road and around the lake margins. This visual catchment also encompasses parts of The Sanctuary subdivision that do not obtain any views of the site, such as some areas around Woodleigh Lane and Sanctuary Lane (which are obscured by landform and existing vegetation).

- Visual Catchment B – Cover Road Users, The Rise Subdivision
  (Refer to Appendix 4 – Off Site Viewpoints, Viewpoints 1- 3 and 5 – 8)
  Middle ground views of the site are obtained by passing motorists along a small section of Cove Road, and by future residents within parts of The Rise subdivision, and the lifestyle blocks adjacent to Mangawhai Heads Road, and a small number of lots within the Bream Tail Subdivision next to Cove Road. The viewing audience within these areas are located approximately 400 – 750m away from the site, and their views are either intermittent or partially obscured by existing vegetation, future growth of landscaping within the Sanctuary, landform and the Structure Planting within The Rise subdivision.
- Visual Catchment C – Residents around the start of Mangawhai Heads Road and Gum Diggers Lane, and Bream Tail Subdivision
  This area encompasses part of Mangawhai Heads Road close to the intersection with Cove Road, the area around the intersection with Gumdiggers Lane (lifestyle blocks in this area), and some of the lots within The Bream Tail Farm subdivision. Viewing distances from the site range from 750 – 1250m away.
  The view towards the site from the Cove Road, Mangawhai Heads Road and its side roads are generally screened by the presence of roadside vegetation and intervening houses. As such no clear vantage points were available to take photographs from that would depict a view that would result in future development being clearly viewed on the site. This is also the case from the surrounding privatively owned lifestyle blocks (many which have yet to be built upon, and the exact house site locations are still unknown. The views towards the site from these areas are distant and in time the intermediate landscape between the site and the viewer will also include a great deal of other built development, (when the lifestyle blocks are all fully developed).
- Visual Catchment D – Residents around the upper part of Mangawhai Heads Road, and Cullen Street, and Bream Tail subdivision
  (Refer to Appendix 4 – Off Site Viewpoints, Viewpoint 4)
  This viewer group is located approximately 1250 -1750m away from the site. It includes the residential area surrounding Cullen Road, the upper portion of Mangawhai Heads Road, and Jack Boyd Drive. It also includes an area of farmland located between the Rise subdivision and Cullen Road (which has a residential zoning). It also includes the lifestyle blocks contained within the Bream Tail subdivision and other lifestyle blocks located off Cullen Road.
  Again, the focal viewing lengths are very distant, with the application site forming such a small portion of the overall view on offer. The future development upon the lifestyle blocks and yet to be developed land that has residential zoning forms part of the existing environment, and when this land is fully developed the view of the application site (if at all visible) will be an inconsequential.
- Visual Catchment E – Residents of the western side of Molesworth Drive and houses on the ridgeline accessed off Peal Street
  This area encompasses the residential areas off the western side of Molesworth Drive and the ridgeline residential development beyond Cullen Street that is accessed off Peal Street, and some of the coastal lots within the Bream Tail subdivision. The views towards the site are very distant and range from around 1750m to 2250m away. The view towards the site from the public roads is mostly screened by roadside vegetation and intervening houses. As such no photographs have been taken to depict this view, or the partial views that may be obtained from the surrounding private properties (due to the fact that the

views are distant, partial, mostly obscured and the lack of public access to these properties). The site when viewed from these distances and these areas forms an insignificant part of the overall landscape scene.

5.3 Visual Absorption Capabilities

The degree of adverse effects upon amenity values and landscape character generated by this proposal will depend upon the character of the surrounding landscape (the context), existing levels of development surrounding the application site, the contour of the land, the presence or absence of screening and/or backdrop vegetation, and the characteristics of the future activities associated with the development on the application site.

The perceived impact of this development is dependant to a degree upon the subjective response of an individual to the future landscape scene. Certain methods are used to apply tested criteria to aid in determining the potential visual effects of a development. This is where the Visual Absorption Capability or VAC of a landscape is assessed.

VAC is defined as the capacity of a landscape unit to visually absorb change without significant modification of its character. Factors such as land use, vegetation cover and topographic type and diversity are considered to determine the VAC of a property. I have looked at these factors and will outline the elements that contribute to the VAC of the application site.

Land use:
The application site is currently vacant and located within the rural residential Sanctuary subdivision. This subdivision is located on the fringe of the Mangawhai Heads settlement. The application site is visually and physically linked to the surrounding rural residential landscape that is currently under development, and will in time depict a strong rural-residential character. The pattern of future built development upon the application site will be complimentary to this existing rural-residential development surrounding the site.

Development on the site will be viewed as an extension of the surrounding land use and landscape patterns and will be visually absorbed without generating any long-term adverse effects upon the present character of the area.

Vegetation Cover:
The property is currently vegetated with a mix of exotic and native species. The areas where the identified building sites are located are within the grassed areas with scattered olive plantings, which were planted approximately 10 years ago, as such there will be no indigenous vegetation removal.

The native vegetation on the property is predominantly located in the stream-lined gullies and protects the more sensitive parts of the site. This existing vegetation provides a vegetated context for development to be set within and an existing vegetative framework for the proposed ecological and landscape amenity enhancement and mitigation plantings to link into.

The existing native vegetation on site and the proposed ecological enhancement plantings will be protected by bush covenants to continue to visually integrate future built development. The proposed landscape amenity plantings will provide a buffer

between building sites and also soften the built form when viewed from off site viewing positions.

The existing and proposed vegetation on the site will assist with integrating the proposed subdivision development into the landscape and minimise visual amenity and rural character effects.

Topographic Type and Diversity:
The application site is undulating, with two side flanks and a central plateau creating and amphitheatre like landform.

The orientation of the site and surrounding hills means that the site has a visual cone that extends towards the northern unpopulated Brynderwyn Ranges and towards the east and southeast towards the Mangawhai Heads settlement. This area already contains rural residential and residential development.

Future buildings within the proposed subdivision will be located well below the most elevated parts of the landscape it is located within. As there are other areas of the Sanctuary subdivision that are more elevated and already contain built development these houses will be more noticeable than future buildings placed on the application site.

The lower elevation of the site compared to the surrounding landscape and its undulating and accommodating topography result in the site having a high capacity to visually absorb the proposed development without significantly changing the current character of the surrounding environment.

Overall the application site has a high capacity to visually absorb the proposed subdivision development without significant modification of the surrounding landscape character.

5.4 Landscape and Visual Impact Analysis

Viewpoints From Within The Sanctuary Subdivision

The viewing audience within Visual Catchment Area A is located within the gated Sanctuary subdivision; this area is not accessible by the general public and is part of a rural-residential subdivision.

Some of the residents within the Sanctuary and their visitors may have the potential to view the proposed subdivision on Lot 2 to varying degrees depending upon their viewing position and proximity to the site.

The landscape character of the Sanctuary and the land surrounding Lot 2 is changing from one that was strongly rural in character (it was farm land and with a lack of built development) to a landscape setting that will be more and more dominated by houses set on rural-residential lots.

A number of viewing positions were chosen along Robert Hastie Drive and off Lake View Drive to depict the representative views of Lot 2 for the residents located close to the site boundaries. The lot owners and visitors to this area of The Sanctuary have the potential to be adversely affected by the proposed Lot 2 subdivision due to their closer proximity to the site. All of the other residents within the sanctuary are located further away, and many of them will not view Lot 2 at all. If the resident or viewer is

located more than 100m away from the site they will not be affected by the proposed development upon Lot 2, as their view will be impeded by the intervening residential development upon other lots within the Sanctuary.

Refer to Appendix 3 for the Off Site Photographs Within The Sanctuary Subdivision (OSPSS) and Appendix 1 for their locations.

The viewing positions are located as follows:

- Along Robert Hastie Drive to the east of the site, approaching the site (Photographs 1 and 2),
- Along Robert Hastie Drive adjacent to the northern boundaries of proposed Lots 81 – 84 (Photographs 5 - 9),
- The driveway that extends off Lakeview Lane, to the southeast of the site (Photographs 3 and 4),
- Along the western boundary of the site adjacent to Lots 53 – 60 of the Sanctuary subdivision, visible from Robert Hastie Drive where there are no houses present on these lots (Photographs 10 – 13).

The following is a description of what is visible from each of the viewing locations and an assessment of what the potential visual and landscape effects associated with development upon the proposed lots.

Photographs 1 and 2

View from Robert Hastie Drive looking northwest towards the site. This is one of the first views of Lot 2 when approaching the site. The central plateau of the site is just visible and will accommodate proposed lots 85-89 and the northern flank that will accommodate proposed Lots 81 – 84.

A number of houses have been built or are under construction on the lots surrounding the site, on Lots 50-60 DP430128, accessed off Robert Hastie Drive.

The Lot 2 landform is at a lower contour than the surrounding Lots 50-60 DP430128 contained within the Sanctuary, which accommodate varying stages of residential housing.

Future development on Lot 2 will not be as visible as the development that exists and is occurring on the higher contours behind the site. It will be set within some existing vegetation that includes a mix of Olive trees, regenerating bush and remnant Totara trees.

In terms of the visual absorption capability of the site; when viewed from this area of the Sanctuary Lot 2 has a high capacity to visually absorb the proposed development without generating a high level of adverse visual or landscape effects. The accommodating topography of the site, the presence of existing vegetation and the location of the site within a rural residential setting all assist with this.

In addition to the existing environment assisting with the visual integration of the development, the proposed subdivision landscape enhancement amenity plantings and landscaping around the future houses will visually screen and soften the future development within the subdivision.

It is my opinion that from this area of the Sanctuary, whether it is on Robert Hastie Drive or on the lots surrounding this area and the lakes the potential adverse visual, landscape and character effects for these viewers will be less than minor.

Photographs 3 and 4
View from the edge of Lot 94 and near the entrance to the JOAL looking northwest across the proposed subdivision. This area of the Sanctuary is not visited by many residents, as there are only three lots beyond this point (Lots 42-44). Visitors to this part of the Sanctuary will view future development on the site set within the amphitheatre like contours, small gully's and wetland areas that will be enhanced with ecological plantings.

Future built development within Lot 2 will be visible on proposed Lots 82 – 84, and Lots 85 -94 to varying degrees, more so initially before landscape plantings mature, and this will result in short term minor adverse visual effects. The development of houses on these lots will be viewed layered one behind the other, with the foreground development screening the development behind.

Future built development will be visible to varying degrees however it will be viewed in the context of the rural residential landscape character of the Sanctuary subdivision. The existing houses above Lot 2 and houses currently under construction within the Sanctuary are located on Lots 53-60 and are accessed from the top of Robert Hastie Drive.

The undulating landform, lower topography of the site compared to the backdrop landscape, and the presence of the existing vegetation on site will assist with integrating future development upon Lot 2 into the evolving rural residential character of this landscape.

The proposed subdivision landscape enhancement amenity plantings, ecological enhancement plantings, JOAL landscape plantings and the landscaping around future houses and driveways in the long term will visually screen and soften the future development upon Lot 2.

In light of this it is my opinion the potential adverse visual, landscape and character effects for these viewers in the short term will be minor, reducing to less than minor in the long term once the landscape mitigation plantings have become established.

Photographs 5 and 6
View from Robert Hastie Drive adjacent to the northern flank of Lot 2, which will accommodate Lots 81- 84. The area beyond the bush remnants will accommodate Lots 85 – 94.

Visitors and residents within the Sanctuary that travel along this part of Robert Hastie Drive and residents adjoining the northern side of Robert Hastie Drive (near Lots 81-84) have the potential to view future development located upon Lot 2.

They will view future development located upon the site as it is developed. Initially the view of the development will be unimpeded by landscaping or other dwellings and will result in short term minor adverse visual effects resulting from the construction phase.

The development upon Lot 2 will be viewed within the context of the Sanctuary rural residential subdivision and when located further up Robert Hastie Drive the wider visual catchment towards Mangawhai becomes visible. The view of housing development within the surrounding area consolidates the rural residential character of this setting.

The proposed subdivision landscape enhancement amenity plantings, ecological enhancement plantings, JOAL landscape plantings and the landscaping around future houses will in the long term visually integrate the future development upon Lot 2. It will visually soften and partially screen future houses and activities on each lot, so that the visual and landscape amenity values of the Sanctuary subdivision are maintained for its residents and visitors.

In my opinion the development upon Lot 2 is in context with the surrounding settlement patterns, and with the implementation of the proposed landscape amenity and mitigation plantings the potential adverse visual, landscape and character effects for these viewers will be less than minor in the long term.

Photographs 7, 8 and 9

Located on the upper parts of Robert Hastie Drive near Lot 1, which contains the waster water treatment area and some existing olive trees. This view is obtainable by passing motorists and pedestrians along this upper part of Robert Hastie Drive, and partially from the lots to the north of Robert Hastie Drive.

From this location the viewer will obtain mid range focal length views towards the southeast looking across the site and beyond to Mangawhai. The development upon proposed lots 81-84, and on Lots 85-94 will be visible to varying degrees set into the landscape as the viewer passes by.

The existing houses and those currently under construction on Lots 54 – 58 are located within the Sanctuary above the site and are accessed off the upper most parts of Robert Hastie Drive. Most of these dwellings have yet to implement any landscape amenity and integration plantings around their houses.

The view of future development upon Lot 2 will be seen in the context of the rural residential landscape it is located within, with the dwellings recently and currently under construction being clearly visible from these locations. The residential development in the background also forms a dominant part of this view.

Once the subdivision landscape enhancement amenity plantings, JOAL landscape plantings and the landscaping around the future development upon Lot 2 will be well integrated into the existing landscape setting. It will assist with visually softening and partially screening future houses and activities on each lot, so that the visual and landscape amenity values of the Sanctuary are maintained and adverse landscape and visual effects are kept at a less than minor level in the long term.

Photographs 10 - 13

View from the top of Robert Hastie Drive adjacent to Lots 57-60. These lots are located on one of the most elevated parts of the Sanctuary subdivision on an area of land that is located between Robert Hastie Drive, Lot 2 and Lot 1 (waste water treatment area).

Lots 53 - 56 adjoin Lot 1, while Lots 57 and 58 will adjoin the western boundary of proposed Lot 92. Lot 59 bounds proposed Lot 91, and Lot 60 bounds onto Lots 91 and 93.

The building sites on Lots 58 – 60 (within the Sanctuary) are located close to Robert Hastie Drive and look out towards Lot 2 in the foreground and beyond towards Mangawhai Heads and The Rise and Bream tail subdivisions.

Future development on proposed Lot 2 will be visible from these lots to varying degrees. The views will be foreground to mid distance, with built development being viewed in a rural residential setting, with the Sanctuary, The Rise and other subdivision development within Mangawhai being part of the backdrop view.

The photographs depict the recently constructed dwellings on Lots 54 – 57 with another under construction on Lot 58. The landscape integration planting that is required as part of the consent notice conditions for the Sanctuary has yet to be implemented. When this is done the buildings will be nestled into the landscape.

The possible building sites on the closest lots within the Lot 2 subdivision (Lots 91 – 93) are approximately 100m away. This separation distance allows room for mitigative landscape plantings on the lots within the Sanctuary and on proposed Lots 91 – 93. Initially however during the construction phase development upon Lot 2 will be more noticeable. This will diminish with time, as the mitigative landscape plantings become established.

The proposed subdivision landscape amenity enhancement plantings and the JOAL landscape enhancement plantings in addition to the ecological enhancement planting and building site landscaping around each new dwelling will in the long term minimise the potential minor short term adverse landscape and visual effects of development on Lot 2.

In my opinion the development upon Lot 2 is in context with the surrounding settlement patterns within the sanctuary and wider landscape. With the implementation of the proposed landscape amenity and mitigation plantings the potential adverse visual, landscape and character effects for the viewers located in this part of the Sanctuary will be less than minor.

Viewpoints From Beyond The Sanctuary Subdivision

The following is an assessment of each of the eight Off Site Viewpoints contained in Appendix 4 that were chosen to represent a selection of the public viewing areas that gain views towards the application site. The locations of the viewpoints are shown on the Location Map contained in Appendix 1.

Every possible view of the site has not been depicted, as there are so many due to the residential intensity around the greater Mangawhai Heads area and its fringes, which are located approximately 1km to 1.5 kilometres away.

Many of the views towards the site are from private properties, with a large proportion being distant with only a small area of the site being visible, often momentarily as the viewer passes by. The viewing positions I have selected are the ones that allow the greatest visibility of the site.

From each of the viewpoints photographs were taken using a camera with a 50mm lens to illustrate the view of the property and the context of its setting.

This assessment will identify the current landscape character and context the site is located within. It will define the potential effects of the proposal and determine the level of landscape and visual amenity effects generated by the proposal.

Viewpoint 1

This viewing position is located within The Rise subdivision adjacent to Lot 2 (of The Rise) on the lower flanks, looking southwest towards the entrance into The Sanctuary subdivision. Lot 2 (the application site) is not visible while looking in this direction from this location.

(This image joins onto the left end of Viewpoint 2, and has been included to depict the current panoramic view and context of the evolving rural residential character of The Sanctuary and surrounding landscape within which the application site is located).

The existing 'environment' visible in this photograph contains a great deal of rural-residential development. This increases the capacity of the site to visually absorb the proposed rural-residential subdivision without any significant modification of the surrounding landscape character.

Viewpoint 2
This viewing position is located within The Rise subdivision adjacent to Lot 2. It is contained within the Visual Catchment area B as depicted on the Visual Cone Map contained in Appendix 6.

Existing environment:
The application site is located within the Sanctuary subdivision. Set in the middle ground view being the grassed area with scattered olive trees and fingers of native vegetation in the gullies.

The foreground view is of the man-made lake, existing houses and houses under construction within the Sanctuary subdivision. There are a number of vacant lots located between this viewing position and the site and these have been indicated by the four larger blue dots on Lots 28 – 31, three medium blue dots on Lots 42 – 44 in the middle ground, and the six smaller dots on Lots 49, 53, and 57 – 60 on the grassed slopes above the site. These thirteen currently undeveloped lots will at some stage in the future accommodate residential dwellings and associated activities and landscaping.

In the short term this view of the site is possible, however as the lots within the Sanctuary are developed, new houses and the landscaping associated with these will screen and obscure the views of Lot 2. In addition, the Structure Planting that is establishing within The Rise subdivision (visible in this photo) and future landscape plantings around the future built development within The Rise will have grown to a height that will completely screen Lot 2 from view from the houses located within this part of The Rise subdivision.

It is also likely that houses within The Rise subdivision will generally be orientated towards the north, and not towards the application site, which is a south-westerly view. The outdoor living areas of houses within The Rise will most likely to be on the sunny or northern side of the house, looking away from the application site and the Sanctuary subdivision.

Potential effects:
As mentioned the long-term visibility of the site will diminish considerably once the Structure Planting within The Rise subdivision is established. The main outdoor living areas are likely to be orientated away from the site, and this will result in the site not being a dominant part of the view from future houses built in The Rise subdivision.

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Future development upon Lot 2 will be located within a landscape that exhibits a strong rural-residential character. The development of 14 houses on Lot 2 will result in a similar character to the existing environment surrounding the site. This increases the landscapes ability to visually absorb the proposed rural-residential subdivision development on Lot 2 without any significant long-term visual effects being generated.

The proposed development on Lot 2 will appear as an extension of the rural residential development surrounding the site. There are currently 13 existing dwellings built within The Sanctuary that are visible from this location. In addition there are 13 vacant lots that will be built upon in the near future. The landscape setting Lot 2 is located within when viewed from this location will contain 26 rural residential style houses and associated activities.

The proposed ecological enhancement plantings, and proposed landscape amenity plantings on Lot 2 will blend in with the existing vegetation patterns and foliage colours present on the site and within the surrounding landscape. Future built development on the lots will be softened by this landscaping and ecological enhancement plantings so that future development is visually absorbed into the context and character of the surrounding landscape.

The Building and Landscaping Guidelines will reduce any potential prominence of future built development. This will also assist with lowering the potential long-term adverse visual and landscape effects of the development to a less than minor level. The proposal constitutes only a minor component of the wider view, and will result in a low level of effect on the character and key attributes of the receiving environment.

Viewpoint 3

This viewing position is located adjacent to Lot 5 within The Rise subdivision and is contained within Visual Catchment Area C as illustrated on the Visual Cone Map in Appendix 6.

Existing environment:

The application site is currently visible in the middle ground view being located within the Sanctuary subdivision and surrounded by rural residential lots. This view of the site is afforded by visitors and future residents within the The Rise subdivision. This view is similar to the view that would be obtained from the farmland surrounding The Rise.

Currently the view of the site is uninterrupted by houses, landscaping and the structure planting within The Rise subdivision. Over time this will change and there will only be partial views towards the site. The viewer will also view the site in the context of the future character of this area, one that will be strongly rural-residential in nature.

Lot 2 is located within an area that has been approved for rural residential development. As the photograph depicts there is currently a lot of rural residential development under construction within the Sanctuary, Barrier View Drive and The Rise subdivisions (only infrastructure to date in The Rise).

The vacant lots that are located within The Sanctuary that are visible from this location have been indicated by the blue dots on the photograph. The four larger blue dots on Lots 28 – 31 indicate the location of building sites in the foreground, and the three medium blue dots on Lots 42 – 44 in the middle ground, and the six smaller dots on Lots 49, 53, and 57 – 60 on the grassed slopes above the site indicate other building sites. Once these thirteen undeveloped lots are built upon this landscape will have a very rural residential character.

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The built development within these subdivisions is becoming more apparent. As there are many more lots that are yet to be built upon, this landscape and the 'environment' that the site is located within will in time display a stronger rural residential character.

Potential effects:
The proposed subdivision of Lot 2 will result in a development pattern that is consistent with the character of the existing environment. The Sanctuary subdivision is currently at just over half of its built capacity, with only 33 or the 63 lots having been built upon.

There are currently 13 existing dwellings built within The Sanctuary that are visible from this location and14 vacant lots yet to be built upon. This will result in the proposed development upon Lot 2 being set within a rural residential setting that contains 27 other houses.

The Lot 2 subdivision design and layout is sensitive to the landscape features of the site and will protect the areas of existing bush, riparian corridors and areas of open space through the design and layout of the subdivision. The ecological and landscape amenity plantings will result in positive landscape effects for the site and wider landscape.

Initially the development upon the site will result in a change through the addition of houses and infrastructure to the overall scene. Initially this is likely to be noticed by the viewing audiences within this area.

The level of adverse visual effects would be comparable to the present development under construction within The Sanctuary, and result in minor short-term adverse visual effects. Once the site earthworks are revegetated and the JOAL Planting, Subdivision Landscape Amenity Plantings and the Building Site Landscaping around the future buildings is established the long-term adverse visual effects will be reduced to a less than minor level. The proposed Building and Landscaping Guidelines will ensure that future built development will not be dominant.

Taking into account the 'existing environment' the site is located within it is my opinion that the potential long term adverse visual and rural amenity effects of the proposal will be less than minor for the viewers within this area. The awareness of the development will not have a marked effect on the overall quality of the scene.

Viewpoint 4
This viewing position is located on Cullen Street looking west towards the application site, and is located within the Visual Catchment Area D as illustrated on the Visual Cone Map in Appendix 6.

Existing environment:
The application site is located approximately 1.6km away and will be visible as a very small part of the overall view. The view from this area comprises the foreground residential development located around Cullen Street, and the pastoral outlook in the middle ground with the Brynderwyn Ranges as the dominant backdrop.

The undulating landscape with its patchwork of paddocks, remnant bush, shelterbelts and riparian strips of vegetation display a moderate level of visual amenity. Built development is obvious within this view, and to the south of the site the development within Barrier View subdivision is apparent. The recent earthworks that are underway within The Rise subdivision are also visible just beyond the row of pine trees.

The foreground view is of the residential dwellings accessed off Cullen Street, and the adjoining farmland, some of which is also zoned residential, and some of which is large lifestyle blocks within the Bream tail subdivision and will in time accommodate residential housing.

Potential effects:
From this location future development upon the site will be visible, although due to the long focal length the exact details of each dwelling will not be readily distinguishable (as is evident by the existing dwellings recently constructed on Lots 54-56 in The Sanctuary located above Lot 2).

The existing built development within The Sanctuary subdivision has been indicated in the photograph and illustrates how unobtrusive appropriately designed and coloured dwellings can be within this landscape. Many of these dwellings have yet to implement landscape integration plantings, which will further integrate them into the landscape.

The blue dots on the photograph indicate the nine other lots within The Sanctuary that have yet to be built upon. Once these lots are developed and the 9 lots within The Rise are developed Lot 2 will have a foreground and backdrop of rural residential development surrounding it.

The longer focal length greatly diminishes the ability of the viewing audience within this area to be potentially affected by the development on Lot 2. The capacity of future development to be absorbed into the landscape is high, and is achieved through the implementation of the Building and Landscaping Guidelines and proposed landscape amenity plantings.

The degree of change that will be apparent when seen from this distant location, and other areas within the Visual Catchment Areas D and E will be low and it will be located within an existing rural residential setting. The proposal will have a less than minor effect on the overall quality of the scene. The resulting visual and visual amenity effect experienced by this viewing audience will be less than minor.

Viewpoint 5
This viewing position is located at the intersection with Cove Road and Mangawhai Heads Road looking northwest towards the application site, and is located within the Visual Catchment Area B as illustrated on the Visual Cone Map in Appendix 6.

Existing environment:
From the intersection with Cove and Mangawhai Heads Road passing motorist and residents (future residents) on the surrounding lifestyle blocks have the potential to view a portion of the site while looking in a north-westerly direction.

The view is momentary as road users pass by and intermittent as the roadside vegetation interrupts and reduces the visibly of the site from this location. The closest part of the site is approximately 600m away and a large part of the site is obscured by intervening landform and vegetation.

The foreground view is of the Cove Road corridor and the man-made lake within the Sanctuary subdivision. The background view is of a portion of the Sanctuary subdivision and Brynderwyn Ranges beyond.

The area of the site that is visible is the hill slope on the southern side of Robert Hastie Drive that will accommodate proposed Lots 81-84.

Existing built development upon the northern and western side of Robert Hastie Drive within the Sanctuary subdivision is currently visible.

The blue dots on the photograph indicate the current vacant lots within The Sanctuary that have yet to be built upon. These lots and future built development upon them make up the existing environment within which the proposed Lot 2 subdivision will be viewed. When these seven lots accommodate dwellings the landscape setting viewed from this location will be very rural residential in character.

Potential effects:
The future development upon Lots 81-84 will be set within the existing scattering of olive plantings and adjacent to the bush remnants in the gully. It will also be set within the proposed JOAL Planting, Subdivision Landscape Amenity Plantings and the Building Site Landscape Plantings. The proposed landscape enhancement planting will integrate the future built development into the landscape and will partially screen it, providing a foreground and backdrop of vegetation.

The future dwellings on Lots 81-84 will also be set within the rural residential landscape setting, with the twelve other houses that are yet to be built within the Sanctuary lots also being partially visible from this location. These future houses will form the dominant character to this landscape once established. The proposed development upon Lot 2 will be viewed as seamlessly blending into this.

The Building and Landscaping Guidelines that control aspects such as building height, colour, form and style among other things will ensure the future development upon Lot 2 is in keeping with the present and future rural-residential character of the area and surrounding Sanctuary subdivision.

Future development upon these lots will be comparable to the present development under construction within the Sanctuary and other nearby subdivisions.

Once site earthworks are revegetated and the landscape amenity plantings around the future dwellings are established the potential adverse landscape and visual effects generated by the development upon this viewer group will be less than minor.

Viewpoint 6
This viewer group includes passing motorist on Cove Road located to the southeast of the site, and is located within the Visual Catchment Area B as illustrated on the Visual Cone Map in Appendix 6.

Existing environment:
Motorist while travelling north along Cove Road have the potential to momentarily view the site if they look towards the northwest.

Once the consented Childcare Centre (currently under construction) and Café is established on Lot 1 and additional dwellings (blue dots) are located on the other foreground lots the view of the site from this location will be obscured by the buildings and landscape plantings (that form part of the consent conditions of that development).

The backdrop view is of the Brynderwyn Ranges and the other built development present within the Sanctuary subdivision on the northern and western sides of Robert Hastie Drive.

Potential effects:
From this location the northern flank of the site that extends along the southern facing side of Robert Hastie Drive is visible (Partially, as it is obscured by the Magnolia tree along the Cove Road boundary). Within this part of the site there will be four proposed lots (Lots 81-84). Once the Childcare and café have been constructed the site will not be visible as it will be completely screened by the landscaping that forms part of the development proposal and consent conditions for the Childcare and café.

The central part of the site that will accommodate Lots 85 -87 is also partially visible in the middle ground view.

As mentioned the foreground landscape is currently being developed and upon completion the built development and landscaping on the site adjacent to Cove Road will screen most of Lot 2 from view. The future development of houses on Lots 4-6 adjacent the Childcare facility and bounding the lake edge will also obscure the view of the site, as these houses and landscaping will form part of the immediate foreground view.

The proposed landscape amenity plantings and the implementation of the Building and Landscaping Guidelines will result in future development upon Lot 2 also being visually screened and softened by the landscape plantings.

The small portion of development that will be visible set amongst the trees on Lot 2 will be viewed in the context of the rural residential setting within which it is located. The potential adverse landscape, rural amenity and visual effects of the development upon this viewer group will be less than minor.

Viewpoint 7 & 8
These viewing positions are located on Cove Road looking northwest towards the application site, and are located within the Visual Catchment Area B as illustrated on the Visual Cone Map in Appendix 6.

Existing environment:
The journey along Cove Road provides some small glimpse views towards the application site, with the closest part of the site being approximately 400m away to the west. The roadside vegetation, presence of existing dwellings within the Sanctuary and presence of bush remnants obscures parts of the site from view. The view for the viewer driving the vehicle will also be fleeting, as the road conditions along this stretch of Cove Road requires the driver to be focused on the road, not the view of the surrounding landscape.

The foreground and background view is of the Sanctuary subdivision; its man-made lakes and recently built dwellings. The backdrop scene is of the bush-clad hillslopes of the Brynderwyn Ranges. The application site is distinguishable by the presence of the grid of olive plantings and is located in the middle ground of the view with rural residential lots located all the way around it.

The blue dots on the photographs represent the existing vacant lots within The Sanctuary subdivision. These in the near future are likely to be developed and accommodate houses and associated landscape plantings.

The gaps in the roadside vegetation currently allow views towards the lots around the lakes, and of Lot 2. These glimpse views will gradually disappear as the roadside vegetation and landscaping around the houses grows and becomes established.

There are currently four lots around the lake in this view that have yet to be built upon and four vacant lots in the middle ground, and six vacant lots in the background view of Lot 2. This makes a total of fourteen lots within The Sanctuary that have yet to be built upon. These consented lots and future development upon them forms part of the existing environment when considering the character of the site and potential effects of the proposed development on Lot 2.

Once these fourteen lots have been developed and accommodate houses and landscape plantings they will partially screen the current view of the site, if not completely screen it (as its likely the owners of the lots that bound Cove Road will plant out the eastern boundary to provide privacy from Cove Road).

Potential effects:
From these locations along Cove Road, and private properties directly adjoining Cove Road future development upon proposed Lots 94 and Lots 81-84 will not be visible as these lots are obscured from view by landform orientation.

Future development upon the lots on the central plateau (Lots 85-92) will be partially visible from these locations. The buildings will be viewed as a cluster of roofs due to the angle of view from these positions along Cove Road.

These views towards the site from Cove Road are only currently possible as a glimpsed view through the gap in the roadside vegetation. The view is very momentary, only a few seconds as the viewer passes by. This will change in time, as landscape plantings around the houses that are located adjacent to Cove Road and around the lake are developed.

As the development upon Lot 2 would likely happen after the lots within The Sanctuary are developed, it is probable that the current view of the site will not be possible when the first development upon Lot 2 occurs. It is more likely that the current view shafts towards the site will no longer be afforded, as the roadside vegetation and landscaping around the future houses on the other fourteen undeveloped lots will screen this view.

The Subdivision JOAL and Landscape Amenity plantings that are proposed for Lot 2 will provide a vegetated framework for future built development to be set within separating each house site and roof structure. This will integrate future development upon Lot 2 into the landscape.

With the implementation of the proposed landscape mitigation plantings and Building and Landscaping Guidelines the development within the subdivision when viewed from within this vicinity along Cove Road will result in less than minor potential adverse visual effects.

5.5 Visual Effects Summary

The following table summaries the short term and long term visual effects of the proposed development upon the receiving environments.

Short-term effects are associated with the initial development upon a lot, where short term adverse visual effects can be generated from earthworks and the construction phase of development before visual mitigation has been achieved.

The long-term visual effects result from a development that is viewed on the site once the development or construction phase is over and the proposed landscape mitigation has been implemented, and given a little time to establish.

Table 2 - Visual Effects Summary (below)

Viewpoint	Visual Catchment	Houses in view	Effects Ranking	
			Short Term	Long Term (RMA)
Photographs 1 & 2 – Off site viewing positions within the Sanctuary subdivision – from Robert Hastie Drive to the southeast	A	Variable	Less than minor	Less than minor
Photographs 3 & 4 – Off site viewing positions within the Sanctuary subdivision – from near entrance to JOAL (view for residents of Lots 42-44 Sanctuary)	A	Variable	Minor	Less than minor
Photographs 5 and 6 – From Robert Hastie Drive (adjacent to proposed Lots 81 – 84)	A	Variable	Minor	Less than minor
Photographs 7 – 9 – from Robert Hastie Drive near Lot 1	A	Variable	Less than minor	Less than minor
Photographs 10 -13 – From the top of Robert Hastie Drive (near Lots 57-60)	A	Variable	Minor	Less than minor
Viewpoint 1 – Adjacent to Lot 2 within the Rise subdivision, looking southwest at the existing development within the Sanctuary. Lot 2 is not visible when the viewer is looking in this direction.	B	Lot 2 not visible	No effect	No effect
Viewpoint 2 - adjacent to Lot 2 within The Rise subdivision, looking west towards the site.	B	13 existing, 13 consented, 14 proposed	Less than minor	Less than minor
Viewpoint 3 - adjacent to Lot 5 within The Rise subdivision, looking west towards the site	B	13 existing, 14 consented, 14 proposed	Less than minor	Less than minor
Viewpoint 4 – the northern end of Cullen Street, looking west towards the site	D	9 existing, 9 consented, 10 proposed	Less than minor	No effect

Viewpoint 5 - intersection with Cove Road and Mangawhai Heads Road, looking north west towards the site	B	6 existing, 7 consented, 4 proposed	Less than minor	Less than minor
Viewpoint 6 – Cove Road, looking west towards the site	B	10 existing, 4 consented, 3 proposed	Less than minor	Less than minor
Viewpoints 7 & 8 – Cove Road, looking west towards the site	B	10 existing, 14 consented, 9 proposed	Less than minor	Less than minor

The key findings of the visual effects of future built development located upon Lot 2 from the visual catchments are as follow:

a) Initially there is the potential for some minor adverse visual and landscape effects generated by the development on Lot 2 for some of the residents and visitors to The Sanctuary subdivision located within the Visual Catchment area A. Minor adverse effects are principally related to the construction phase of the subdivision infrastructure and future development of dwellings upon some of the lots and are only generated for the viewing audience that has very close views of the development on the site, where the development will be located immediately adjacent to their property or in their main view shaft from their dwelling.

   The residents on Lots 43 and 44, and Lots 53-60 within the Sanctuary will have short-term minor adverse visual effects generated by the proposed development of Lot 2. The future dwellings upon Lots 43 and 44 are likely to be orientated away from the site so the proposed subdivision will not be in the main view form their house, however they will have close up views towards Lot 2 while looking west and accessing their property along the right of way.

   The existing houses on Lots 54 – 57 are orientated toward Lot 2 and the elevated position of the building sites results in them looking over Lot 2. Initially development upon Lot 2 will be noticeable, however once the mitigative and enhancement landscape plantings on Lot 2 are established and the Sanctuary subdivision landscaping required on Lots 53 – 60 is implemented the vegetation will provide visual screening of the Lot 2 subdivision so that the potential effects are reduced to a less than minor level.

   Future dwellings placed on Lot 58-60 will also be oriented towards Lot 2 and will overlook future development within the subdivision in a similar manner to the existing houses on Lots 54-57. They will also have short-term adverse visual effects generated by the proposed Lot 2 development.

   These effects will be temporary, and once the landscape enhancement and mitigation plantings have become established the overall adverse visual and landscape effects will be considerably reduced so that the long-term adverse effects are less than minor.

The views for passers by from the sections of roading within the Sanctuary that adjoin proposed Lots 94, and 81 – 84 will also have temporary short term adverse visual effects are they pass by, due to the close proximity to the site and the open unimpeded views across Lot 2. Again these effects will diminish with time and with the implementation of the landscape plantings.

Views towards Lot 2 from Lots 28A, 47 – 50 are currently restricted, even though the building sites on these lots are located on elevated land. The existing vegetation that is located along the Robert Hastie Road corridor currently reduces the visibility of Lot 2. The existing residents obtain some views towards the site, however their main views are towards the east and not towards the site. They are also removed from the site by approximately 75m at the closest point to any proposed building site, with the majority of the building sites being located over 250m away. The roadside vegetation will also continue to grow, and by the time development upon Lot 2 is underway the proportion of the site visible will be even less. The existing dwellings on these lots have also yet to implement the Sanctuary landscaping guidelines requirements, which will also assist with screening the view towards Lot 2. The long-term potential adverse visual effects of the Lot 2 subdivision on these viewers will be less than minor.

b) Within Visual Catchment B the long-term adverse visual and landscape effects of the proposed development on Lot 2 will be less than minor.

For the users of Cove Road the view of the site is fleeting, just a glimpse view towards the site is obtained through roadside vegetation and intervening houses. Motorists that are driving the vehicles are unlikely to view the site due to the set back from Cove Road and the nature of the road carriage way and speed of travel along this part of Cove Road requiring their attention on the road. Passengers or people walking or cycling along Cove Road have the potential to view the site from a distance. Pedestrian numbers are likely to be limited, as this road does not have a footpath that allows safe passage for pedestrian. Once the Sanctuary subdivision has been fully developed the view of Lot 2 will be practically screened by houses and landscape amenity plantings located between the viewer and the site.

The application site is currently visible from the viewing positions within The Rise subdivision. By the time development upon Lot 2 (which will be developed in 3 stages) occurs the recently planted structure planting within The Rise subdivision will have established and will screen the view towards The Sanctuary and Lot 2.

The landscape amenity and mitigation plantings proposed on the 14 lots within Lot 2 will also soften and screen the view of future built development and roading for the future residents of all stages of The Rise subdivision, and other lifestyle blocks to the south and within the Bream Tail subdivision that are located near Cove Road.
The long term adverse visual and landscape effects generated upon the viewing audience within Visual Catchment B will be less than minor.

c) Beyond Visual Catchment A and B, are Catchments C – E, these areas are located from 750m to over 2250m away from the site. Due to the long focal length the site forms a very small portion of the overall scene, and future development upon the site will form only a small part of the background landscape; set within the developing rural residential landscape, a landscape that will eventually accommodate another 50-60 houses in due course (if not more once future subdivision development is applied for and consented on nearby residential land). The potential adverse visual and landscape effects from within these visual catchments will be less than minor.

5.6 Landscape and Natural Character Effects

Landscape effects take into consideration both changes to the physical landscape (physical effects) and the impact upon amenity values. Assessments therefore investigate the likely nature and scale of changes to individual landscape elements and characteristics, the consequential effect on the landscape character, and the perceptual responses that the proposal evokes.

The landscape values of the Sanctuary subdivision were assessed as part of the 2006 subdivision consent application. At this time the landscape was grouped into three distinct units.

The most elevated unit covering the bush-clad ranges is the Brynderwyn Hills, which is formally recognised as an ONL and protected by a conservation covenant. These hills range in height with localised peaks and ridges and associated gully systems. This landscape unit provides the backdrop view from the application site. The site itself is physically separated from this unit by the Sanctuary subdivision located on the northern side of Robert Hastie Drive. The application site is located approximately 150m away from this at its closest point.

The second unit identified was the largest and contains the Robert Hastie Drive and Woodleigh Lane portion of the subdivision. This is located on the flat to gently rolling land that is in grass (and newly built houses), it also contains the man made lakes and wetland areas adjacent to Cove Road. This area comprises a series of low knolls rising towards the west with the highest point being around Lot 52. The land is generally sloping towards Mangawhai Heads. The application site is located within this unit and is located towards the southwestern corner of this unit.

The third unit is the small wedge shaped area that extends of the above unit from the western boundary. It has a westerly aspect similar to the land in the adjacent Kapawhiti Road area.

The application site (Lot 2) is situated within an area that has been modified from its original natural state which would have been a landscape covered in indigenous vegetation similar to the Brynderwyn Ranges. The development upon the site over the years has included the removal of most of the indigenous vegetation, with only remnants found within the two small stream lined gullies. The rest of the site has been in pasture for many years, and of more recent times the grassed areas have been planted up with olives, this being done at the time of the development of the Sanctuary subdivision. This modification of the site has over the years diminished the biophysical elements, patterns and process of this landscape.

The main gully on the northern side of the site has some remnant indigenous bush dominated by Kanuka and Totara, while the other small gully is vegetated in a mix of weed species and Kanuka.

The Ecological Assessment prepared by 4Sight Consulting provides a detailed assessment of the flora and fauna found on site. These bush areas still exhibit a degree of natural character, as there are some natural patterns, processes and elements remaining within these areas.

These riparian gullies will be enhanced with native plantings and protected by conservation covenants. This will result in positive effects upon natural character, protecting and enhancing the natural patterns, processes and elements of this part of

the site. This will also have positive effects upon the landscape and visual amenity values of the site.

Physical effects resulting from the development will include earthworks required for the construction of the jointly owned access lot (JOAL), individual driveways and building platforms. These earthworks will result in minor temporary landscape effects until they are revegetated and no longer visible.

As all of the building sites upon the proposed lots are located within the grassed paddocks that contain scattered olive trees there will be no indigenous vegetation removal for the development of building platforms or driveways. The main access lot is located mainly within the grassed areas with only a small part of it crossing one of the streams.

This will be mitigated by the extensive ecological enhancement plantings that consist of buffer planting around the existing bush remnant's and ephemeral stream plantings. Specimen Kanuka landscape enhancement plantings are also proposed for along the edge of the main access road which will link into the proposed buffer planting. The overall long-term adverse effects of earthworks upon the landscape values of the site will be minimal.

The Sanctuary subdivision was once a dry stock farm with a strong rural character. However, with the Council approved Sanctuary subdivision this has progressively changed over the years with the development of the man-made lakes, roads and other infrastructure within the subdivision, and the development of the houses on the individual lots. As noted earlier there are currently 30 built houses and three under construction within the Sanctuary.

Lot 2 of the Sanctuary subdivision currently contains no built development and although it is more rural in character, due to the lack of development on it compared to the adjoining rural residential lots, it is surrounded by a number of small lots with houses and other buildings on them.

Directly to the north of the site the Brynderwyn Ranges and Bream Tail Ridge are visible and have been identified as an Outstanding Natural Landscape. These areas possess significantly higher landscape values and associated sensitivities than the site does. The site and its rural context are distinctly separate from the vegetated Brynderwyn's and Bream Tail ridgelines.

The landscape to the west, south and east displays an evolving rural residential character. As the vacant lots within the three main subdivisions in this area are built upon the principal character of this landscape will be rural-residential.

The rural residential dwellings surrounding the site are part of this landscape setting. Building within the Sanctuary and Barrier View Drive subdivisions is well underway and The Rise subdivision is currently under construction. The Bream Tail subdivision to the north and east is also being built upon slowly.

Once all of the lots within these subdivisions accommodate dwellings and associated activities the landscape that the site is located within will look quite different from what it does today. In my opinion the Lot 2 subdivision proposal is consistent with this evolving settlement pattern.

The land that is located around Gum Diggers Lane, Jack Boyd Drive, and extending into the farmland down from Cullen Road is zoned Residential. This land is located

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within the visual catchment that extends from the site.

Once these areas are fully developed it will result in a significant shift in the landscape character of the visual catchment that the site is part of. It is these future changes in the character of the landscape that form part of the existing 'environment' within which the site is located.

The application site is not located on the most elevated slopes within the Sanctuary subdivision, or the wider landscape. It forms a small part of the undulating hinterland backing the Mangawhai Heads settlement and is not visually prominent, unlike the surrounding ranges.

The landform consists of a gentle slope rising to the west from the eastern boundary. The Sanctuary subdivision surrounds the site, with new dwellings located around most of the sites boundaries. These dwellings and the future landscaping associated with them will partially obscure views to and from the site. The proposed landscape amenity and ecological enhancement plantings will also assist with obscuring the view of future built development upon Lot 2.

In determining landscape character effects the present 'environment' can greatly influence the degree of adverse effects generated by a development. This includes the likely or potential future changes to the character of the landscape. In the case of this site, the existing character of the surrounding landscape will change considerably as development occurs within the Sanctuary subdivision and nearby Rise and Bream Tail subdivisions.

It will also change when nearby rural residential and residential land is developed as per the allowance within the District Plan. The 'environment' provides for change to take place within the landscape context of the site, this in turn diminishes the sensitivity of the site and surrounding landscape to change.

The subdivision proposal will not significantly change the landscape physically as the earthworks required for the development have the ability to flow with the contours of the site, or be revegetated so that they do no cause any adverse effects.

The development of buildings within the subdivision however have the potential to diminish landscape and visual amenity values if they are not adequately integrated. To minimise the effects of this the design of the subdivision has clustered built development so that there are some larger areas of open space retained to maintain rural amenity values. In addition the landscaping proposals will establish a vegetated framework (JOAL and Subdivision Amenity Plantings) within which development can be constructed so soften and integrate future dwellings into the landscape to assist with retaining as much rural character of the landscape as possible.

The existing indigenous vegetation along the stream-lined gullies also offers areas of existing vegetation that will assist with integrating future built form within the subdivision. These bush areas will be enhanced with Buffer Planting, Wetland Enrichment Planting and Ephemeral Stream Planting, as detailed in the 4Sight Ecological report.

Tree planting is proposed along the JOAL, and will consist of specimen tree plantings of Kanuka (Kunzea robusta) along both side of the roadway. This species will blend in visually with the existing bush that has a high percentage of Kanuka already growing in it. The use of this species will soften the presence of the road alignment. The Kanuka trees will blend in with the proposed subdivision amenity landscape plantings that are

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to be located on the individual lots.

The proposed landscape amenity planting around the building sites will consist of a mix of locally occurring native species that will grow quickly to provide a vegetative buffer between building sites on the lots. When viewed from the east within the main visual cone that extends from the site this planting will provide a softening between buildings, so that the roof lines are not viewed one stacked upon the other. The impression that the planting will give is of buildings set within a bushed dominated landscape.

The key components of the proposed landscape amenity planting are:

- To provide a framework of vegetation for built development to be located within - this will divide the roof structures, breaking up the built form and provide a treed landscape setting when viewed from the main visual catchment to the east,
- Fragment views of the future development upon the lots within the subdivision,
- Utilise native species that are locally occurring on the site – so not to draw attention to the location of the landscape mitigation planting so that it blends in with the existing colours, patterns and textures of the existing bush on site,
- Strengthen the existing vegetation patterns on site and link into the proposed ecological enhancement plantings,
- Partially screen built development from the more proximate viewing locations
- Provide a vegetative screen of planting behind and between buildings to soften and partially screen future built development on site when viewed from near by lots within the Sanctuary subdivision.

In addition to the proposed landscape mitigation and ecological enhancement plantings the Building and Landscaping Guidelines will ensure that future development upon each lot is done in a manner that is sympathetic to the landscape, thus minimising the potential effects upon visual amenity and landscape character values.

As the 'environment' within which the site is located is predominantly rural residential and considering and the large amount of landscape amenity and ecological plantings proposed the development of a subdivision on this site will generate a less than minor change to the landscape and natural character values of the site and surrounding area.

The proposed native ecological revegetation plantings and the conservation covenants that will protect these areas will have positive landscape; amenity and ecological effects and this will enhance the natural character vales of the sensitive areas of the site.

As the Sanctuary subdivision is shown within the District Plan as being within the Mangawhai Harbour Overlay, this results in the site being located within the coastal environment and subject to the provisions on natural character as outlined in Section 6 of the RMA.

Lot 2 is located several kilometers away from the Mangawhai estuary and the East Coast and is separated by a number of intervening hills and residential housing areas. The wider Sanctuary subdivision does contain streams and two man-make lakes that have a degree of natural character.

The proposed subdivision of Lot 2 will have no adverse effects upon the natural character of the nearby lakes and their margins. The two small streams that are

located within Lot 2 will be enhanced through ecological restoration enhancement plantings and through pest weed management. This will enhance this degraded habitat and result in positive effects upon the natural character of these two small streams that feed into the man-made lakes and eventually into the Mangawhai estuary.

Due to physical and visual separation of Lot 2 from the coast the proposed subdivision of Lot 2 will result in no adverse effects upon the natural character of the coast.

In considering all of this the potential long-term adverse effects of the development upon landscape and natural character values are less than than minor.

5.7 District Council Comments

A pre-application meeting was held with Kaipara District Council on 4th June 2019 with Councils consultant planner Kim Nathan and Councils consultant landscape architect Simon Cocker to discuss the application.

Comments provided by Mr Cocker were at a broad level and did not focus on the detail of the landscape assessment, and are summarised as follows:

- Mr Cocker shared Ms Nathans concerns with respect to increasing the density of development within the central portion of the site, mainly due to the potential adverse effect on rural character and rural amenity that will arise,
- There was discussion that the original application for the Sanctuary had retained the balance lot (Lot 2) for the purposes of retaining a sense of spaciousness and separation between the development on the 'flats' near Cove Road, and the ridge on the western boundary, Mr Cocker said that he would review the original application to determine if this was the case,
- The development pattern within the Sanctuary was given scrutiny during the consent process for The Rise subdivision. This recognised that "*there was a spectrum for 'ruralness' and that this spanned a range between a landscape with little or no built form, through to large lot residential with a dominance of buildings and gardens, and very limited evidence of production or natural features*".
- The Sanctuary and its context displays a range of realness which includes large lots residential, and some pockets of productive / pasture land.
- Mr Cocker agreed with the HLA landscape assessment that "*built development is strongly influential of the character of the landscape, that the 'environment' will result in a greater dominance of built form and that the landscape is seen a marked change in character over recent years*".
- Mr Cocker explains that the density of built development in the area is important factor in defining the character of the area. Areas of greater openness / areas of pasture provide a significant contribution to the rural character of the area and offset the density of built form in the surrounding areas. Where these open areas encompass elevated ridge tops, or ridge flanks and are thus more visible from the surrounding area, they provide a greater influence on the character of the area and are therefore of greater significance.
- Mr Cocker is of the opinion that the "*proposed subdivision will have the potential to diminish this sense of openness and spaciousness within and area that is already strongly influenced by built form. As such, at this stage I am inclined not to be supportive of the proposal*".

In response to Mr Cockers comments and concerns about the increase in density of

built development in the central portion of the Sanctuary subdivision I have provided an assessment to determine the amount of open space areas that will be retained on Lot 2 and that has been retained through the development of the Sanctuary subdivision (which also contribute to the sense of openness). This assessment will demonstrate how the application site is very visually accommodating to change and how the design of the subdivision has enable large areas of openness to be retained.

It is my opinion that although the character of the site will change the proposed Lot 2 subdivision will retain large areas of open space and spaciousness, which in turn off sets the clusters of built development on the site so that the rural character of the site and locality will prevail. This is discussed fully in Section 5.8 below.

This will be achieved through the design and layout of the Lot 2 subdivision and the proposed ecological enhancement planting, bush protection covenants, subdivision enhancement landscape planting, as well as the proposed building site landscaping and building design controls and guidelines.

5.8 Open Space Areas and Rural Character Effects

The landscape within the Sanctuary is already characterised by an evolving rural residential character. In addition to the mixed density of housing there are large areas of open space currently provided by the central portion of the Sanctuary (partially made of Lot 2), and the lake water bodies, lake margins, existing landscape covenant areas, Brynderwyn Hills Bush area, Lot 1 wastewater treatment area, and open space areas on the lots that are unlikely to be built upon.

As noted by Mr Cocker areas of greater openness can provide a significant contribution to the rural character of an area and can off set the density of built form in the surrounding areas.

As Lot 2 is located within a subdivision that has retained large areas of openness, it is set within a rural residential subdivision where the rural character is more intact than some of the other subdivisions found locally. This is primarily due to the Sanctuary subdivision development retaining large areas of openness, natural features and areas of vegetation, which has assisted with the retention of rural character values.

To assist with retaining the rural character of the landscape the subdivision layout has been developed so that large areas of the Lot 2 will still contain no built development.

The Open Space Areas Plans A - C contained in Appendix 11 illustrates that the proposed subdivision will retain large areas of open space. This will assist with the retention of the existing natural features and rural character of the site, and subsequently off-sett the density of the proposed clusters of future building development upon the Lot 2 building sites.

The plans contained in Appendix 11 are:

- Plan A – Open Space Layout Plan showing the location of all of the open space areas on Lot 2 and nearby within the Sanctuary subdivision. The open space areas have been dived into areas located on Lot 2 and areas within the Sanctuary. The Legend clearly identifies these areas,
- Plan B – View from Viewpoint 2 within the Rise subdivision. The location of the building sites and JOAL access, and indicative position of the subdivision and JOAL landscape plantings have been indicated on Lot 2. The open space

areas surrounding the clusters on development on Lot 2 have also been indicated. The existing and future house locations within the Sanctuary have been shown and the areas of open space that has been retained within the Sanctuary surrounding Lot 2 has been shown. This plan illustrates the large areas of open space that have been retained within the Sanctuary subdivision and will be retained within the Lot 2 subdivision.

- Plan C – this is a zoomed in version of Plan B to assist with viewing more detail closer up.

Lot 2 currently helps with keeping a sense of spaciousness and separation between the development on the lower contours near the lakes and Cove Road, and the ridge along the western boundary (Lots 53-60 which are accessed off Robert Hastie Drive). Through the design of the subdivision large areas of Lot 2 will remain free of built development, so that they in conjunction with adjoining open space areas within the Sanctuary subdivision can maintain a sense of separation between the clustered of built development on the flats and on the ridge.

Plans A - C illustrates the areas of land that will remain free of any built development and will be viewed as open space areas providing a separation between the clusters of built development and retaining rural character.

The open space areas on Lot 2 illustrated on Plans A – C have been divided into the following areas:

- Proposed bush protection and ecological enhancement areas (approximately 2.7 ha)
- Proposed subdivision amenity planting areas around the building sites (approximately 0.3ha)
- Un-built areas within Lot 2 that will be retained as open space to maintain rural amenity values (8.3ha)

The 14 areas identified as suitable for building upon on Lot 2 (ranging in size from 900-1800m^2) cover approximately 1.8 ha, which is approximately 13% of the total site.

The un-built areas outside of the bush and ecological protection areas and the subdivision amenity planting which will assist with retaining the rural amenity values of the site will cover approximately 60% of Lot 2.

The development of Lot 2 will not diminish the sense of openness and spaciousness within this area. The areas of Lot 2 that will be retained as open space total approximately 11.5ha, which is over 80% of the total area of Lot 2. This is well over 3/4 of the site that will still be visible to the surrounding viewers as open space.

These areas are viewed in conjunction with the Lot 2 site and also contribute to maintaining rural character and open space of the surrounding landscape, and setting within which the proposed subdivision is located.

To illustrate the view of the open space areas of Lot 2 and the surrounding Sanctuary subdivision, refer to Plans B and C contained in Appendix 11. This view of the site is from within The Rise Subdivision (Viewpoint 2) has been used to illustrate the view of the site and its setting within the Sanctuary Subdivision.

The open space areas identified on the Open Space Plan have been indicatively shown on the photograph to illustrate how the open space areas contribute to the rural amenity values of the area and retain the rural character of the landscape.

As detailed on the Open Space Plan the bush and ecological enhancement areas have been indicated and cover approximately 2.7 ha of the site, and will retain the natural features on the site. These areas in addition to the Lot 1 wastewater area and the unbuilt areas on the proposed lots retain a large central area of the site that will remain free of any development. This retains the centrally located open space areas that form part of the middle ground view of the Sanctuary subdivision and contribute to the current rural amenity values.

The cluster of lots (Lot 85 – 92) located either side of the JOAL are positioned so that they are not spread out across the site, but are viewed as being clustered in one area. This enables the proposed JOAL planting, and subdivision amenity planting to provide a vegetated framework for built development to be located within.

This planting will partially screen and soften future built development and the road alignment of the main access to the subdivision. The clustering of these lots results in the surrounding land remaining free of built development so that the open space areas on each lot read as one. This will minimise the presence of buildings and garden areas, and will be viewed as open space areas that will assist with maintaining rural amenity and rural character values.

The location of future dwellings on the periphery lots (Lots 81-84, and Lots 93 and 94) around the edges of Lot 2 visually connects them to the existing built development within The Sanctuary. It visually separates them from the cluster of development centrally on Lot 2. This also assists with allowing for the open space areas between these lots (bush remnants and ecological enhancement areas) to provide a variation of built density and a sense of spaciousness and separation between the building sites.

Plan B (Plan C is a zoomed in version of Plan B) illustrates how the 14 new dwellings located upon Lot 2 will be set within the existing landscape so that over 80% of the site is retained as open space. This will maintain the rural character of large parts of the site and contribute to the overall rural amenity values of the site and sanctuary subdivision.

The Sanctuary Subdivision itself has many large areas that also contribute to the retention of rural character, and these provide large areas of open space, as can be seen in Plan B, particularly the areas of the lakes and its margins, the Brynderwyn Hills and the hill slopes below the building sites on Lots 43 and 44. This has created a landscape that has retained larger areas of openness and natural features than other rural residential subdivisions found locally.

6.0 LANDSCAPE MITIGATION AND ENHANCEMENT PROPOSALS

Landscape mitigation and enhancement plantings are proposed to assist with integrating the subdivision and future built development into the landscape. This will maintain visual amenity values and minimise any potential adverse visual and landscape effects to less than minor.

The proposed mitigation and enhancement plantings are made up of:

1. JOAL Landscape Enhancement Planting,
2. Subdivision Landscape Enhancement Planting,
3. Building Site Landscape Planting.

6.1 JOAL Landscape Enhancement Planting

The grass verge either side of the access road on Lot 80 will be landscaped with specimen Kanuka trees to provide a vegetated streetscape along the jointly owned access lot (JOAL). The landscape planting is illustrated on the plan contained in Appendix 7 – JOAL Landscape Enhancement Plan.

The key aspects of the JOAL Landscape Enhancement planting include:

- Revegetation of any cut and fill batter with grass,
- The planting of 58 Kanuka (*Kunzea robusta*) trees planted in clusters along the 240m long access lot either side of the road carriage way,
- The Kanuka trees will provide a fast growing hardy tree species that will establish quickly on any soil conditions to enhance the visual amenity values of the streetscape,
- The Kanuka trees will provide a vegetated framework of trees that the Subdivision Landscape Enhancement structure planting will link into,
- The Kanuka trees will visually integrate seamlessly with the existing indigenous bush on site,
- This planting will be implemented by the applicant.

6.2 Subdivision Landscape Enhancement Planting

Areas of landscape amenity planting are proposed for each building site within the subdivision. The plantings will be located on individual lots generally along shared boundaries to provide a vegetated screen between the areas that have been identified as suitable for building. Refer to Appendix 8 Subdivision Landscape Enhancement Plan.

This plan illustrates the location of the amenity planting on the lots located around the areas suitable for building. An indicative example of an area of landscape amenity planting has been provided to illustrate how the planting on the individual lots could be expected to be undertaken.

The Subdivision Landscape Enhancement Plan also contains some example photographs of amenity plantings that have been established within the Sanctuary showing how the proposed amenity planting could be expected to look and how successful it is at providing visual amenity planting between houses.

The key aspects of the landscape amenity planting include:

- The use of a mix of predominantly native tree and shrub species to provide dense areas of planting that are generally located between the identified areas suitable for building to provide a vegetated buffer between future built structures.
- The amenity planting will break up the “staked” effect of the roof lines of buildings that are located on Lot 85 – 88 and 89 and 90 when they are viewed from the east and west.
- On Lots 83 and 84 the amenity planting will provide a dividing strip of vegetation between future built structures if they are positioned on the higher contours of the site, which are more visible that the lower contours.
- The amenity planting on Lots 91 and 92 will provide a vegetated backdrop to the building areas so that they are partially screened from view to the west within the Sanctuary subdivision and so that when viewed from the east they have a vegetated context to be set within. This planting will also provide some

framework planting for the building site landscape plantings to link into, which will be implemented around the dwellings on these lots.

- The predominantly native species proposed will tolerate a range of growing conditions so that they survive and provide the desired visual mitigation between building sites,
- The predominantly native species proposed will provide a fast growing framework of vegetation to provide the necessary separation between building sites to provide privacy and visual integration of the future buildings on site,
- The amenity planting will visually integrate with the existing indigenous vegetation on site and the proposed ecological enhancement plantings and JOAL plantings. This will assist with maintain the visual amenity and rural character values of the site and surrounding landscape.
- This planting will be implemented by the future lot owners at the time of building and as part of the building consent process.

The planting is to be undertaken at the time of building because the lots contain relatively large building sites ranging from 900m² to 1890m² and the location, form and size of the house (which could range from 100m² - 350m²) will largely govern the actual landscape effects. This LVIA has been prepared on the basis that the average 225m² house (15m x 15m) is built on each lot (as recorded in Appendix 2 Development Scheme Plan) and the required minimum planting for each lot has been based on this.

Landscape enhancement covenants are proposed for the amenity planting and this will compliment the protected ecological plantings and reinforce the landscape and visual amenity nature of the subdivision.

The areas covered by the landscape amenity planting of each lot is summarised in the Table 2 below. The areas range from 115m² on Lot 85 to 555m² on Lot 91. The total area of amenity planting on the 14 lots is 3400m² and the average planting area per lot is 243m².

Table 2 – Areas covered by the Subdivision Landscape Enhancement Planting

Lot Number	Area of Amenity Planting	Area defined for Building
Lot 81	270m²	1070m²
Lot 82	225m²	1890m²
Lot 83	270m²	1340m²
Lot 84	320m²	1080m²
Lot 85	115m²	1380m²
Lot 86	180m²	1550m²
Lot 87	245m²	1430m²
Lot 88	160m²	900m²
Lot 89	165m²	1010m²
Lot 90	105m²	1380m²
Lot 91	555m²	1440m²
Lot 92	310m²	1270m²
Lot 93	250m²	1060m²
Lot 94	230m²	1790m²

The following lot by lot explanation is provided of the proposed Subdivision Landscape Enhancement Plantings shown on the plan contained in Appendix 8.

This planting forms part of the proposed landscape enchantment and mitigation plantings proposed for the subdivision. This planting will compliment and link into the subdivision JOAL landscape enhancement plantings, ecological enhancement plantings and the building site landscape plantings that will be implemented within the subdivision and around each building site.

Lot 81
The landscape amenity plantings on this lot are positioned along the western and northern side of the indicative building site. The plantings are intended to provide a visual screen of the future built development on this lot from Robert Hastie Drive and from viewpoints to the west within the Sanctuary.
The planting along the western side will also provide a vegetated backdrop to buildings when viewed to the east within the visual catchment areas to the east, particularly from around Cove Road and within The Rise subdivision. It will also break up the location of the two buildings side by side on Lots 81 and 82.

Lot 82
The landscape amenity plantings on this lot are positioned along the northern side of the indicative building site. The plantings are intended to provide a visual screen of the future built development on this lot from Robert Hastie Drive.
The planting along the eastern side on Lot 81 will break up the location of the two buildings side by side on Lots 81 and 82.

Lot 83
The landscape amenity plantings on this lot are positioned along the western and northern side of the indicative building site. The plantings are intended to provide a visual screen of the future built development on this lot from Robert Hastie Drive and from viewpoints to the west within the Sanctuary.
The planting along the western side will also provide a vegetated backdrop to buildings when viewed to the east within the visual catchment areas to the east, particularly from around Cove Road and within The Rise subdivision. It will also break up the location of the two buildings side by side on Lots 83 and 84.

Lot 84
The landscape amenity plantings on this lot are positioned along the western and northern side of the indicative building site. The plantings are intended to provide a visual screen of the future built development on this lot from Robert Hastie Drive and from viewpoints to the west within the Sanctuary.
The planting along the western side will also provide a vegetated backdrop to buildings when viewed to the east within the visual catchment areas to the east, particularly from around Cove Road and within The Rise subdivision. It will also break up the location of the two buildings side by side on Lots 83 and 84.

Lot 85
The landscape amenity plantings on this lot are positioned along the eastern side of the indicative building site and are shared with Lot 86. The plantings are intended to provide a visual buffer and screen between Lots 85 and 86, breaking up the location of two building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 86
The landscape amenity plantings on this lot are positioned along the western and eastern sides of the indicative building site and are shared with Lots 85 and 87. The plantings are intended to provide a visual buffer and screen between Lots 85 and 87, breaking up the location of three building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 87
The landscape amenity plantings on this lot are positioned along the western and eastern sides of the indicative building site and are shared with Lots 86 and 88. The plantings are intended to provide a visual buffer and screen between Lots 86 and 88, breaking up the location of three building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 88
The landscape amenity plantings on this lot are positioned along the western side of the indicative building site and are shared with Lot 87. The plantings are intended to provide a visual buffer and screen between Lots 87 and 88, breaking up the location of two building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 89
The landscape amenity plantings on this lot are positioned along the western side of the indicative building site and are shared with Lot 89. The plantings are intended to provide a visual buffer and screen between Lots 89 and 90, breaking up the location of two building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 90
The landscape amenity plantings on this lot are positioned along the western side of the indicative building site and are shared with Lot 89. The plantings are intended to provide a visual buffer and screen between Lot 90 and 89, breaking up the location of two building sites that are located side by side.
This will break up and partially screen the buildings and their rooflines, particularly when viewed form the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the west on the more elevated parts of the Sanctuary subdivision.

Lot 91
The landscape amenity plantings on this lot are positioned along the western and northern side of the indicative building site. The plantings are intended to provide a

vegetated backdrop for future built development upon this lot when viewed from the east.
The planting will also visually screen the view of future development on this lot form the more elevated Lots 53 – 60 within the Sanctuary to the west of the site. This is particularly so for the Sanctuary Lots 59 and 60 that adjoins the western boundary of proposed Lot 91.

Lot 92
The landscape amenity plantings on this lot are positioned along the western and part way along the northern side of the indicative building site. The plantings are intended to provide a vegetated backdrop for future built development upon this lot when viewed from the east.
The planting will also visually screen the view of future development on this lot form the more elevated Lots 53 – 60 within the Sanctuary to the west and northwest of the site. This is particularly so for the Sanctuary Lots 57 and 58 that adjoins the western boundary of proposed Lot 92.

Lot 93
The landscape amenity plantings on this lot are positioned along the western and part way along the northern side of the indicative building site. The plantings are intended to provide a vegetated backdrop for future built development upon this lot when viewed from the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the north on the more elevated parts of the Sanctuary subdivision.
The planting will also visually screen the view of future development on this lot form the more elevated Lots 53 – 60 within the Sanctuary to the west and northwest of the site. This is particularly so for the Sanctuary Lot 60 that adjoins the north western boundary of proposed Lot 93.

Lot 94
The landscape amenity plantings on this lot are positioned along the western and part way along the northern side of the indicative building site. The plantings are intended to provide a vegetated backdrop for future built development upon this lot when viewed from the visual catchments to the east, around Cove Road, and The Rise, and from the viewing positions to the north on the more elevated parts of the Sanctuary subdivision.

Refer to Appendix 8 – Subdivision Landscape Amenity Enhancement Plan for the illustrative plans, plant schedules and Appendix 9 for the Implementation and Maintenance Schedule for each area of planting.

6.3 Building Site Landscape Planting Plans

Due to the size of the proposed areas suitable for building, and the great flexibility in the potential building locations on each lot it is difficult to provide site specific mitigation planting proposals at this stage; in advance of known building locations and designs.

Therefore mitigation planting for around each building is proposed to be addressed through conditions of consent, requiring personalised planting plans, rather than planting outcomes being nominated on the scheme plan in advance of knowing exact building locations.

Therefore prior to the issue of building consent for any building on each lot within the subdivision a Building Site Landscape Planting Plan shall be prepared by a suitably qualified and experienced Landscape Architect and submitted to Council for approval. The plan shall integrate the building with the landscape, using planting that reflects the character of the surrounding landscape and rural residential setting.

Once the exact building design and location within the area suitable for building (identified building sites subjects to consent notice) identified on the Site Plan prepared by Hawthorn Geddes. Refer to Appendix 2 has been chosen a Building Site Landscape Planting Plan shall be prepared. This will be submitted firstly to the Design Committee for approval and then the Council.

The Building Site Landscape Planting Plan shall generally follow the design guidelines below and provide the following information:

Building Site Landscape Planting Plan Design Guidelines:

- This plan shall provide specific details of the planting around the Identified Building Site
- The type of planting selected will integrate the buildings into the landscape and provide privacy between adjoining lots,
- The landscape planting shall provide a vegetated foreground and backdrop to any buildings on each lot,
- The exact species chosen, location of plants, numbers and grades of plant stock at the time of planting shall be detailed on the plan,
- Implementation and maintenance schedule shall be provide on the plan,
- The goal of the building site landscape planting is to achieve:
    - Visual and landscape mitigation of any site works and built form, so that the proposed structures on each lot are integrated into the landscape and context of the existing settlement pattern,
    - Maintenance of visual and rural amenity values and landscape character by the use of plants and landscape designs that reflect the existing vegetation patterns and rural residential character of the area,
    - Forming a connective green landscape element that will link the existing native bush remnants and ecological plantings with the proposed JOAL and subdivision amenity plantings and the building site landscape plantings,
- All plantings on the approved Building Site Landscape Planting Plan shall be implemented by the individual lot owner within the next available planting season following approval of the plan.
- All new planting shall be maintained in perpetuity in accordance with the Building Site Landscape Planting Plan for the lot.

The 4Sight AEE sets out the consent notice and other requirements that will apply to the plans.

Building Site Landscape Planting Plan Examples

To assist with facilitating future owners to provide the appropriate plan to the Council two example Building Site Landscape Planting Plans have been prepared and are contained within Appendix 10.

Lots 86 and 92 have been selected to use as the examples, and their location with the Lot 2 subdivision development is shown on Plan A – Overall Context Plan.

The Overall Context Plan (Plan A) illustrates how a possible house, driveway and the subdivision amenity planting and building site landscaping could be positioned on these lots. It also illustrates their relationship to the surrounding bush remnants, proposed ecological enhancement plantings and JOAL planting.

Lot 86 is shown on Plan B and is located on the central plateau on more gently sloping ground, and is located within the cluster of houses located on Lots 85- 91.

Lot 92 is shown on Plan C and is located adjacent to the lots within the Sanctuary subdivision that are accessed off the ridgeline of Robert Hastie Drive (Lots 53-60). Lot 92 is located on one of the more elevated and sloping sites.

The Building Site Landscape Planting Plans have been prepared so that they follow the design guidelines above and so they integrate the building into the landscape, softening its built form, and providing privacy between neighbours and screening of future buildings on the lots from surrounding owners within the sanctuary subdivision.

For the purposes of providing these examples and to assist with future owners providing their own individual plans the landscaping on the example plans has been divided into Landscape Areas (with the square meter areas calculated).

Landscape Areas include the following:

Area A
Subdivision Amenity Planting, providing separation between the identified building sites,

Area B
Foreground Planting, providing softening of the front facade of the house blending it into the landscape and to revegetate any cut and fill batters,

Area C
Backdrop Planting, providing softening of the front facade of the house blending it into the landscape and to revegetate any cut and fill batters,

Area D
Specimen tree planting, clusters of native trees on the lawn areas linking into the existing native bush and ecological buffer planting,

Area E
Lawn areas, open space areas away from the house and immediate gardens, that will be left free of built development,

Area F
Native Bush, areas of existing native bush and proposed ecological enhancement plantings,

Area G
House and Driveway, a possible house design that is located with the Identified Building Sites, including possible driveway location an parking and manoeuvring areas, and immediate house gardens that will be utilised by the new owners for living purposes.

6.4 Building & Landscaping Guidelines

The Building and Landscaping Guidelines that were proposed for the Sanctuary subdivision are proposed for use in the Lot 2 subdivision. These guidelines will be utilised to enable future built development to be set into the landscape with the least amount of visual intrusion. Refer to Attachment B for the “Sanctuary Building and Landscaping Guidelines”.

The Building and Landscaping Guidelines cover the following matters:

Site Planning
- Building Areas
- Grouping of Buildings & Landscape Setting
- Neighbours Privacy & Views
- Road & Boundary Setbacks
- Building Coverage
- Driveway & Parking Areas
- Phased Development
- Temporary Buildings & Storage Facilities

Environmental Considerations
- Earthworks
- Drainage
- Water Storage Tanks
- Wastewater Treatment & Disposal Utility Services
- Electricity and Telecommunications Facilities

Building Design & Appearance
- Form and Massing
- Height
- Roofs and Related Structures
- Doors & Windows
- Exterior materials & Colours
- Lighting & Signage

Fencing & Landscaping
- Roadside Treatment
- Internal Fences
- Hedges & Shelterbelts
- Landscaping Within the 'Homestead Site'
- Specimen Tree Planting
- Orcharding and Tree Crops
- Control of Livestock

Design Approval Process
- Design Committee
- Plan Preparation & Approval
- Terms Used

The building and landscaping guidelines and the district plan development standards will effectively control the siting and design of the dwellings and accessory buildings and landscaping on the lots within the proposed subdivision.

7.0 CONCLUSION

The application is for a 14-lot subdivision of the 13.7ha property located within the Sanctuary subdivision accessed off Cove Road on the northwestern fringes of the Mangawhai Heads settlement.

The application site is located within The Sanctuary an existing rural residential subdivision. It is located in the same area as the Barrier View and The Rise and Bream

Tail subdivisions, and is visually connected to the residential area of the western extent of Mangawhai Heads. The proposed subdivision development will be viewed in context with these existing rural residential and residential areas.

The visual context of Lot 2 contributes to the 'environment' within which it is located. This includes the future state of the landscape or environment, and in this instance it includes a landscape that is quickly changing from a rural pastoral landscape to a rural residential landscape.

The landscape amenity and building and landscape design guidelines will ensure sympathetically designed and coloured built forms are developed within a vegetated framework of landscape amenity, ecological enhancement and integration plantings.

The potential adverse landscape and visual effects of the development will be avoided through the proposed design and layout of the subdivision, and mitigated through the proposed Subdivision Landscape Amenity Enhancement plantings, JOAL Landscape Enhancement planting and Building Site Landscape Plantings.

The design of the proposed subdivision and the ecological proposals will protect the more sensitive parts of the site. Ecological enhancement proposals include native revegetation plantings within the gullies and wetland areas and bush protection covenants.

The nearby Brynderwyn Ranges ONL and the riparian bush corridors on the site will not be adversely affected by the subdivision proposal.

When assessed the site has a high capacity to visually absorb the proposed development into this landscape and surrounding rural residential landscape character.

The proposal will maintain the visual amenity values of the site and rural character of the area and is consistent with the policy framework of the Operative District Plan. The landscape and rural character effects have been assessed as being less than minor in the long term.

Overall with the implementation of the proposed mitigation measures and design controls the proposed subdivision development will result in visual amenity and landscape character effects that are less than than minor.

THE SANCTUARY – MANGAWHAI

BUILDING & LANDSCAPING GUIDELINES

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INTRODUCTION

The Sanctuary at Mangawhai will be a special place. Careful consideration has already been given to the design of the subdivision, including the creation of lakes and the protection and enhancement of extensive bush, stream and wetland corridors.

Buildings and other facilities in the Sanctuary are expected to be planned and designed in harmony with the surrounding environment. A Design Committee will review all building and site development plans, including earthworks, fencing and landscaping. These guidelines are intended to help the owners and the Committee with the design and approval process in accordance with a Council consent condition.

Owners and their advisers are encouraged to read these guidelines. It is only through careful site planning and design that the natural features and other attractions of the Sanctuary will be maintained and protected for future generations.

SITE PLANNING

Building Areas

Building areas are defined on all properties in accordance with a Council consent condition. Their sizes vary according to the different nature of the properties, including access, bush setting, ground conditions, and relationship to the lakes.

Many properties contain bush, stream and wetland areas protected by conservation covenants. No buildings or structures are to be placed within covenanted areas.

Areas planted or landscaped as part of the subdivision are protected by consent notices. They are also not to be affected by buildings or structures.

Grouping of Buildings & Landscape Setting

Buildings are to be grouped and located on one discrete part of the building area- known as the 'homestead site'. This is so accessory buildings are not scattered over properties and affect the 'open' rural nature of the estate.

Buildings are best set into the landscape and framed by landform and vegetation. Where possible the homestead site should be related to a bush, hillside or lake setting and any specimen trees on the property.

Some of the properties contain small groups of totara's and other specimen trees and shrubs that are not formally protected. They contribute to the rural character of the estate and are expected to be retained and, if possible, incorporated into the layout of the homestead site.

Neighbours Privacy & Views

Each 'homestead site' is expected to be developed in a manner that protects the privacy and amenities of adjacent properties. Views from, into and past the site from others are to be taken into account. Consideration is to be given to views of the lakes, stands of bush and the adjacent Brynderwyn Hills from adjacent properties.

Road & Boundary Setbacks

Buildings are to be setback at least 10m from Cove Rd as required under the district plan. This same setback is expected on internal roads, except where ground or other conditions limit building options.

For other boundaries buildings are generally to be sited at least 3m away in accordance with the district plan. However setback distances of 5-6m or more may be required in some circumstances to protect the privacy of existing or proposed dwellings.

Buildings containing 'farm' and other equipment are to be well separated from neighbouring dwellings located. The district plan requires any buildings containing livestock be at least 50m from dwellings on other properties.

Building Coverage

There are no district plan controls on building coverage. Large buildings, especially on some of the smaller properties, have the potential to affect the estates rural character.

The building coverage is to relate to the size, shape and intended use of the property. Generally, the building 'footprint' on properties of less than 1ha is not expected to be more than 600m^2. For the larger properties, some of which are over 4ha, building 'footprints' of up to 1000m^2 are likely.

Driveways & Parking Areas

Driveways are to effectively serve the building area and be designed so cut and fill earthworks are minimised. They are expected to be paved, ideally with hot mix (to match the roads) or exposed aggregate concrete to a maximum width of 3m.

Provision is to be made for garaging of at least two vehicles on all properties. Outdoor vehicle parking areas are expected to be kept as small as possible. They should be paved or incorporate 'gobiblock' or 'grass cell' permeable materials.

Phased Development

Building in phases is permitted provided it is in the context of a site development plan approved by the Design Committee. Once construction has started the exterior of the building is expected to be completed within 12 months.

Temporary Buildings & Storage Facilities

Temporary buildings and storage structures are not expected to be established, except during a confined building period. No shipping containers or the like are to be placed on properties, except with the specific approval of the Design Committee.

ENVIRONMENTAL CONSIDERATIONS

Earthworks

Earthworks on hillside and other visually prominent areas are to be minimised. All earthworks are to be designed to ensure cut and fill faces can effectively regrassed or revegetated.

Drainage

Driveway, parking and other paved areas are to be designed to so that all runoff is directed into disposal facilities within the property, unless specific approval is obtained from the Design Committee. Roof water collection and drainage systems are also expected to be designed on the same basis.

Water Storage Tanks

Water storage tanks and pumps are generally to be located within or close to homestead site. Consideration is to be given to underground storage wherever possible. Screening of above ground structures from neighbouring dwellings and roadside viewing points is also encouraged.

Wastewater Treatment & Disposal Utility Services

Wastewater disposal systems on properties not served by the communal scheme are to be sited well away from the lakes, streams and wetlands. Appropriate separation distances are also expected from neighbouring dwellings.

All individual property based wastewater systems are to approved by the Design Committee. They are to be systems nominated by Innoflow Technologies Ltd, suppliers of the communal scheme, unless the Design Committee expressly authorises an alternative system. This arrangement is intended to ensure cost effective effective monitoring and maintenance of waste disposal systems across all properties.

Low flow plumbing fixtures and other water conservation measures are encouraged.

Electricity & Telecommunications Facilities

All electricity and telecommunication facilities are to be placed underground, except approval to do otherwise is obtained form the Design Committee.

BUILDING DESIGN & APPEARANCE

Form & Massing

Buildings are expected to be of New Zealand rural vernacular nature. Exotic or unusual forms such as A frames, domes and towers will not be approved by the Design Committee. Kitset, prefabricated and relocated buildings are also generally not permitted.

The contour of the land and its setting is to be considered when siting and designing buildings. Any large multi storey building is to incorporate significant one storey elements and/or low eavelines to reduce its apparent bulk or scale. Building scale can also be reduced by breaking larger buildings into several smaller 'blocks' or 'wings'.

Buildings designs that link indoor and outdoor spaces through courtyards, decks, loggias and pergolas are encouraged.

Height

The district plan provides for buildings of up to 10m, on the properties. This means three storey buildings may be possible. Any buildings of this nature are expected to be the principal residence and not in visually prominent locations. Sheds and other accessory buildings of this height are unlikely to be approved.

Buildings of more than 8m are expected on the less visually prominent properties, where bush, planted hillside and other features are able to reduce their impact on the landscape.

Low level buildings are preferred on the relatively flat properties around the lakes.

Roofs & Related Structures

Roof forms are expected to relate to each properties landscape setting. Simple hip, shed (monopitch), gable and dormer roof forms are favoured. Roof forms that demand attention and conflict with their setting will not be approved. On flat to gently undulating properties roofs with relatively low pitches (less than 25^{O}) are preferred.

Chimneys and other roof projections are to be related to the roofline and overall form of the building.

Large satellite dishes and antennae are not permitted. Small facilities (less than 1m in circumference) of a recessive nature may be approved in some settings.

Solar energy collectors and other similar rooftop facilities are to be integrated into the roof design and kept as unobtrusive as possible.

Doors & Windows

'Farm' and other utility buildings, including garages, are to be sited and designed to have doors and other openings that do not face nearby roads or neighbouring dwellings.

Heavily reflective or tinted glass is generally not permitted. Large areas of glass are also discouraged. Any significant areas are to be shaded by projecting roof overhangs, balconies and other forms of sun-shade to minimise reflection onto neighbouring properties.

Exterior Materials & Colours

A limited range of exterior materials are expected to be used on buildings on the same property. Board timber, concrete, plaster and dark stone finishes are preferred. Brick, corrugated iron, compressed board, plywood and other exterior products may be appropriate in some settings. Light coloured stone and other materials/finishes that 'stand out' are discouraged.

All exterior walls and roofs are to be generally finished in neutral or dark colours that suit the landscape setting. Generally they should have a reflectivity value of less than 40% as illustrated within the Resene BS5282 colour range. This restriction does not apply to window joinery or doors.

Large areas of primary colour paint finishes will generally not be permitted. Primary colours may be used in discrete areas, especially if not exposed to neighbouring dwellings or roads.

Lighting & Signage

Ground and exterior building lighting is to be of a discrete and subdued nature. All fixtures are to have covers or reflectors to direct light to the ground and avoid glare and light spill.

Signs are generally not permitted.

FENCING & LANDSCAPING

Roadside Treatment

The entire Cove Rd boundaries of the subdivision are landscaped and required to be maintained as such by a consent condition. The internal boundary is fenced and expected to be maintained by the adjacent owners.

The internal road boundaries are generally not fenced or planted. Roadside avenue trees are in place, along with some discrete plantings adjacent to intersections. Fences or planted hedges may be established along road boundaries.

Roadside fences are not expected to exceed 1.8 metres in height. They are able to be constructed out of stone, timber, or plaster, with the latter painted or stained in recessive colours. The design of the roadside fence on a property is to be related in height and form to those already in the immediate area.

All fences along road boundaries are to be 'softened 'by planting'. This planting is expected to extend over at least 50% of the total length of the fence. The following species are recommended:

- *Coprosma 'Yvonne', Coprosma repens, Gordonia species, Griselinia littoralis, Griselinia lucida, Michelia figo, Phormium tenax, Pseudopanax lessonii, Schefflera 'Pitman's Pride'*, all at 1m centres.
- *Corynocarpus laevigatus & Leptospermum 'Coppersheen'* at 1.5m centres

Any roadside hedge is to be planted at least 1.5 metres from the boundary to allow for growth. It should be pruned for shape twice yearly (this does not necessarily mean box like), and not allowed to grow any taller than 2.5 metres.

Internal Fences

Fences along other property boundaries are expected to be of a post and wire or post and rail nature. Corrugated iron, timber panel and other solid type fences are not permitted along or close to internal property boundaries.

Solid panel fences for privacy, screening and wind protection are permitted close to the building area. Material use is to be compatible with the exterior building materials. They are to be integrated into with the landscaping around the building area.

Hedges & Shelter Belts

The planting of long linear hedges and shelter belts along boundaries should be avoided. If significant hedging or other linear planting is required for privacy or shelter then it should be designed to 'fit' the landscape context. This is likely to involve considering 'breaks' or mixes in form and plant types and softening by additional plant clusters.

Landscaping Within the 'Homestead Site '

Formal plantings, which may include exotic species, are expected within the homestead site. They should be of a predominately native or naturalistic nature around the perimeter, especially where they border or come close existing native stands or plantings.

The planting immediately around the buildings should be a mix of groundcover, grasses, shrubs and trees. Species should be selected that are suitable for the predominantly clay soils and in some places exposed nature of the sites. The size of the plantings used should be a mix a small and large grade plants. The specimen trees used should contain at least five large grade trees, pb150 or larger.

The plantings outside of the 'homestead site' should have a predominantly native theme, especially in areas that are adjacent to existing native bush, wetlands or streams. Where possible new plantings should link into existing areas of bush, wetlands, stream corridors or specimen totara trees.

The use of invasive or noxious exotic plants on the lots is not allowed. Thought is to be given to selecting plant species that pose no future threat to the native bush areas.

Accessory buildings, such as garages and sheds are to be located in positions where they can be softened and tied into the landscape through the use of large growing specimen trees, or a cluster of amenity shrubs and trees.

No plantings should unduly shade or impede on views from other homestead sites and commonly owned areas.

All landscaping is expected to be completed within one planting season after commencement of construction of any buildings. Regular maintenance is also expected, including replacement of diseased or dead specimens.

Specimen Tree Planting

The planting of exotic and native specimen trees on properties is encouraged. However consideration of their location, form and growth rate is required. Large trees that attain a height of 6m or more are not to be placed in positions where they detract from the amenities of neighbouring properties, the lakes and roads.

Orcharding & Tree Crops

Orchards can be planted providing their management (such as mowing ,and spraying) does not detract from the amenities of adjoining properties. Significant artificial shelter structures and tall growing shelter belt trees are generally not permitted.

Tree crops such as a coppice for fire wood are able to be established. However they are to be planted only in areas that will not block views or restrict sunlight to neighbouring properties. They also should not be planted in areas directly adjoining native stands of bush.

Control of Livestock

The conservation covenants protecting the various bush, stream and wetland areas require stock be excluded from at all times. This is expected to be achieved through the erection and maintenance of either permanent post and wire or permanent electric fences. Temporary electric fences are only to be used for controlling stock grazing and movements within permanently fenced areas.

DESIGN APPROVAL PROCESS

Design Committee

The Design Committee established under the land covenants have the responsibility to consider all site development, building and landscaping plans in the Sanctuary Estate. It will have three members; one being representative of the developer, one being a registered architect appointed by the developer and one being a representative of the Association.

Plan Preparation & Approval

The design approval process is illustrated in the following diagram. Before commissioning building or other plans the owner and/or designers are urged to arrange a meeting with the Design Committee to discuss initial site planning, building and landscaping ideas for the property.

The most important part of the approval process is determining the location and extent of the homestead site and how the rest of the property is to be developed. The site development plan is to show the homestead site, the general layout of buildings and other facilities within it, along with access, services, fencing and landscaping concepts. Any significant earthwork areas are also to be identified on this plan. It is to show all existing features, including any areas subject to conservation covenants and consent notices, along with the specimen trees. This plan can be submitted and approved prior to the more detailed building and specifications.

The building plans and specifications are expected to be very similar to those submitted to the Council for building consent purposes. Full working drawings, including on site drainage, are required. In addition information on exterior colours is to be provided.

The landscaping plan is to show the proposed driveway, along with all fences and plantings. It is to describe the materials to be used in the driveway and the form and height of the fences. The nature of any hedges, or orchards are to be shown, along with all amenity plantings.

Three sets of the site development, building and landscaping plans along with accompanying specifications ,are to be provided to the Design Committee. The Committee will review the plans and specifications within 15 working days of their receipt and advise of their approval or otherwise. Any design changes requested by the Committee will be reviewed by the Design Committee on the same timely basis.

Building consent is best sought from the Council once the plans and specifications have been reviewed by the Design Committee. However the two processes can be carried out in parallel, as they are completely independent of each other.

Following Council building consent approval and before any building related construction is undertaken a construction method statement is to be submitted to and approved by the Design Committee. This statement is to explain and/or illustrate access to the site, the location and form of any temporary buildings, material storage, parking, rubbish, security and washdown area facilities/arrangements. Information on the expected construction period, hours of work and use of any noisy equipment is also expected. Three copies of the statement are to be provided to the Design Committee.

In the event of any plan, specification or statement not being approved by the Design Committee an arbitrator shall be appointed to resolve matters. Any owner may also may also work on an informal basis with the Design Committee to resolve matters, prior to arbitration.

Terms Used

"Association" means the Sanctuary Residents Association or other body charged with owning and administering communal facilities within the Sanctuary Estate.

"Building Area" means the notional building area shown on the approved survey plan for the property.

"Building Plan" means a plan or set of plans showing proposed building and /or drainage works

"Design Committee" means the Committee from time to time appointed by the Sanctuary Residents Association Incorporated to consider site development and building plans.

"Homestead Site" means the area of each property where buildings and other significant structures are confined to.

"Land Covenant" means the covenant attached to each saleable property in the Sanctuary Estate.

"Landscaping plan" means a plan showing proposed plantings, including any hedges and shelter belts, along with fences, retaining structures and the like.

"Owner" means the owner of the property and his/her designate.

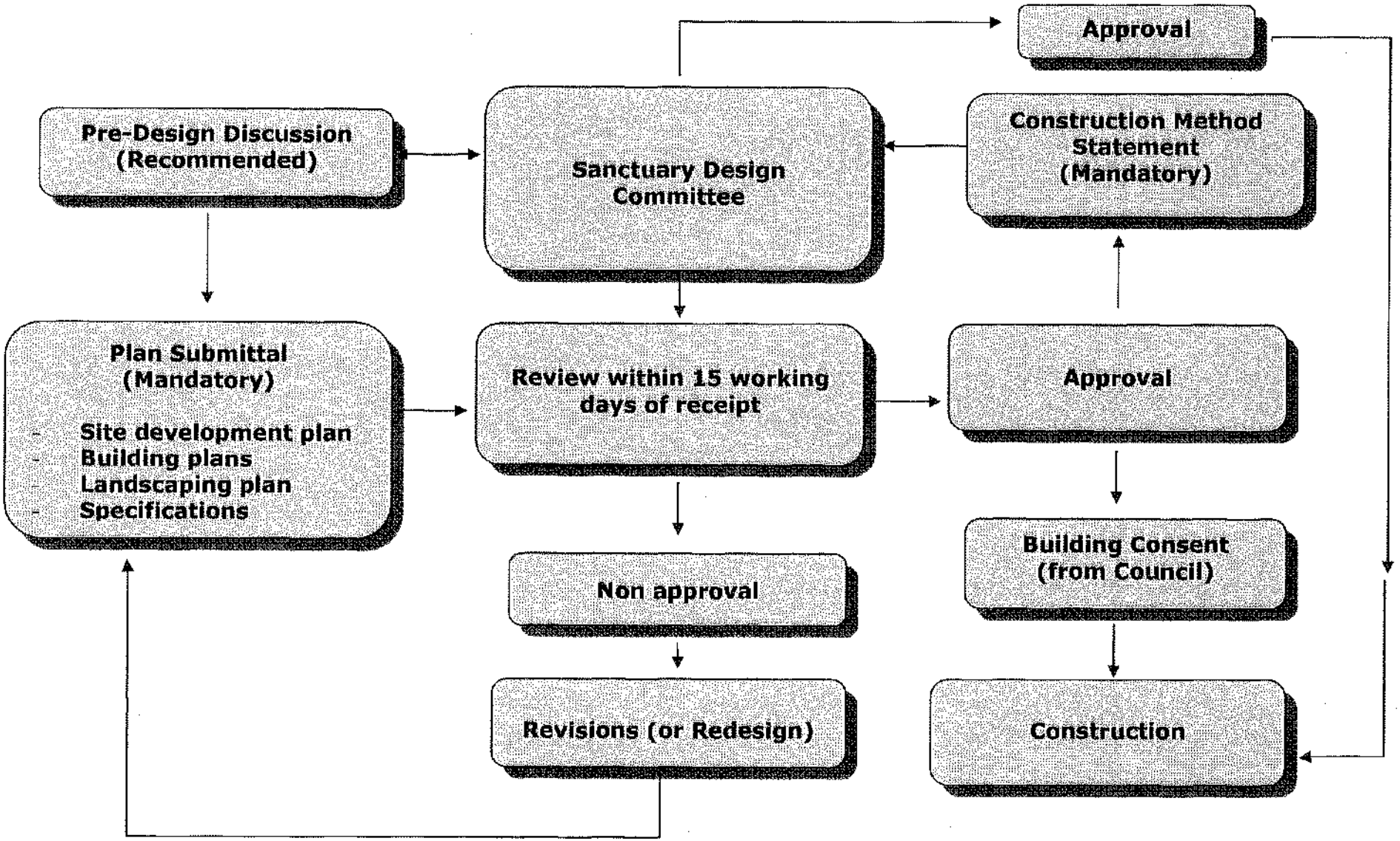
"Property" means the land or lot purchased and held by the owner.

"Reflectance Value" means the amount of light (and heat) materials and colours reflect and are indicative of their likely visibility in the landscape. The reflectance values of painted values are detailed in the Resene Paints British Standard BS 5252 colour range with black having a reflectance value of 0% and white having a reflectance value of 100%. The Resene colour range is based of BS 5252:1976 Framework for Colour Co-ordination for Building Purposes.

"Sanctuary Estate" means the land shown on the approved survey plan (include ref.)

"Site Development Plan" means a plan showing all existing features on a property, including any areas subject to covenants, consent notices or the like, along with a proposed homestead site, building, earthworks, driveway and parking areas, fences, landscaping and significant structures.

Sanctuary Design Approval Process



In reply please quote: 10737

25 June 2020

Hawthorn Geddes
engineers & architects ltd

Sanctuary North Ltd
101 Bream Trail Road
RD2
Waipu 0582

Attention: David Nathan

STORMWATER MANAGEMENT
RE: PROPOSED STAGING OF SANCTUARY NORTH
71 ROBERT HASTIE DRIVE, MANGAWHAI
(LOT 2 DP 430128)

The purpose of this letter is to summarise the revised stormwater management for the proposed staging of the Sanctuary North subdivision at 71 Robert Hastie Drive, Mangawhai (Lot 2 DP 430128), in relation to the associated land use and subdivision consent applications (RM 190528).

The original stormwater management design for the proposed subdivision of 71 Robert Hastie Drive, as outlined in Section 8 of the Hawthorn Geddes – Engineering Suitability Report – R6, dated 20 August 2019, was for attenuation storage to be provided upstream of the proposed JOAL embankment and discharge control via the proposed culvert outlet beneath. Attenuation was not required to be provided on individual lots, and unattenuated discharges from lots downstream of the JOAL were to be compensated by over-attenuation of the JOAL and upstream lots within the attenuation storage area.

The current proposal is to complete the subdivision in three stages, with the JOAL and associated embankment within the third stage. As a result, no attenuation for stages 1 and 2 of the development will be provided until installation of the embankment and control culvert is completed. Therefore, onsite attenuation will be required on individual lots of stages 1 and 2.

Discharges from the development are to be limited to that of the predevelopment peak runoff rates for the critical duration of the catchment, being 27 mins for the 20% AEP storm event and 39 mins for the 1% AEP storm event. The resulting peak discharge rates for the development are 1.2ℓ/sec/100m² of impervious area for a 20% AEP storm event, and 2.6ℓ/sec/100m² of impervious area during a 1% AEP storm event. Refer to the attached HydroCAD summary report.

To address the changes to the stormwater management design for the development as a result of the proposed staging of the subdivision, it is recommended that a Consent Notice be added to titles for stages 1 and 2 for stormwater attenuation, as follows:

At the time of building consent, provide suitable evidence/design to illustrate that on-site stormwater attenuation will be provided to limit peak flows from impervious areas to 1.2L/sec/100m² of impervious area during a 20% AEP storm event, and 2.6L/sec/100m² of impervious area during a 1% AEP storm event to the satisfaction of the Development Engineering Officer

The stormwater management design for the proposed staging of the development, as outlined above, meets the requirements of the KDC ES 2011 in relation to attenuation of post-development flows.

Limitation

This letter has been prepared solely for the benefit of our client Sanctuary North Ltd and the Kaipara District Council in relation to the subdivision consent application for which this report has been prepared. The comments in it are limited to the purpose stated in this letter. No liability is accepted by Hawthorn Geddes engineers & architects ltd in respect of its use by any other person, and any other person who relies upon any matter contained in this letter does so entirely at their own risk.

Yours faithfully,

Stacey Gibson
Hawthorn Geddes
engineers & architects ltd

Summary for Subcatchment 44S: Pervious

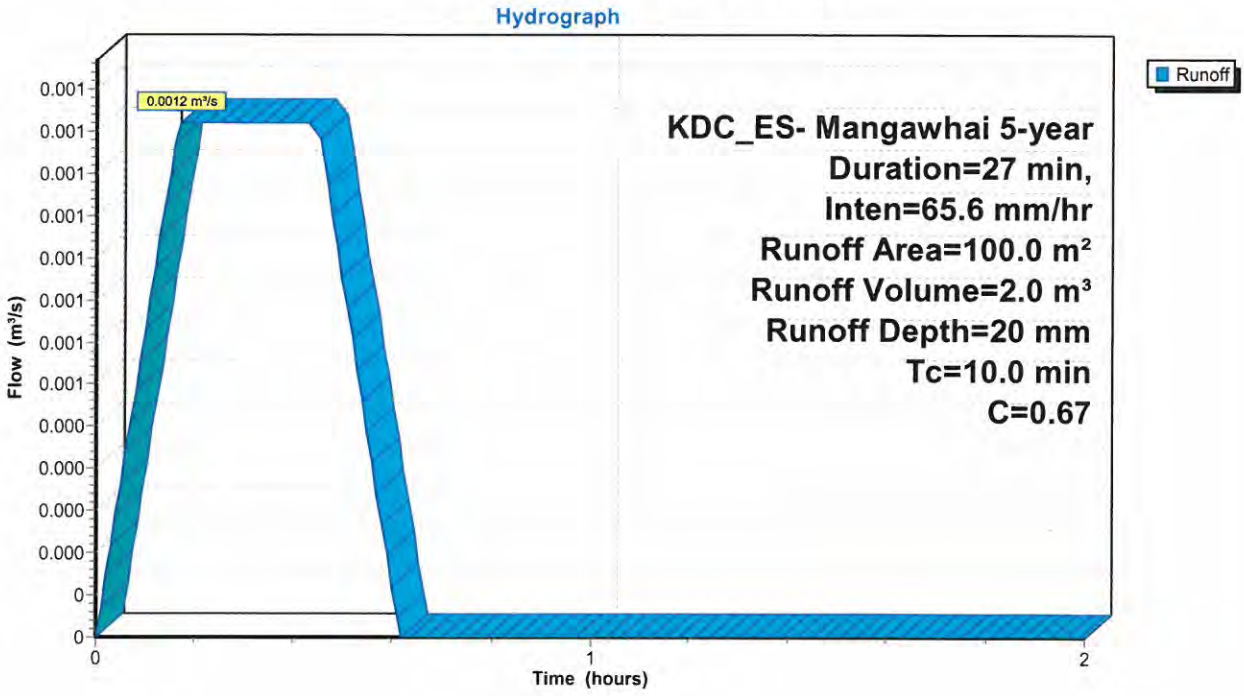
Runoff = 0.0012 m³/s @ 0.17 hrs, Volume= 2.0 m³, Depth= 20 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-2.00 hrs, dt= 0.01 hrs
KDC_ES- Mangawhai 5-year Duration=27 min, Inten=65.6 mm/hr

Area (m²)	C	Description
100.0	0.67	Pervious - Northern catchment
100.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 44S: Pervious



Summary for Subcatchment 44S: Pervious

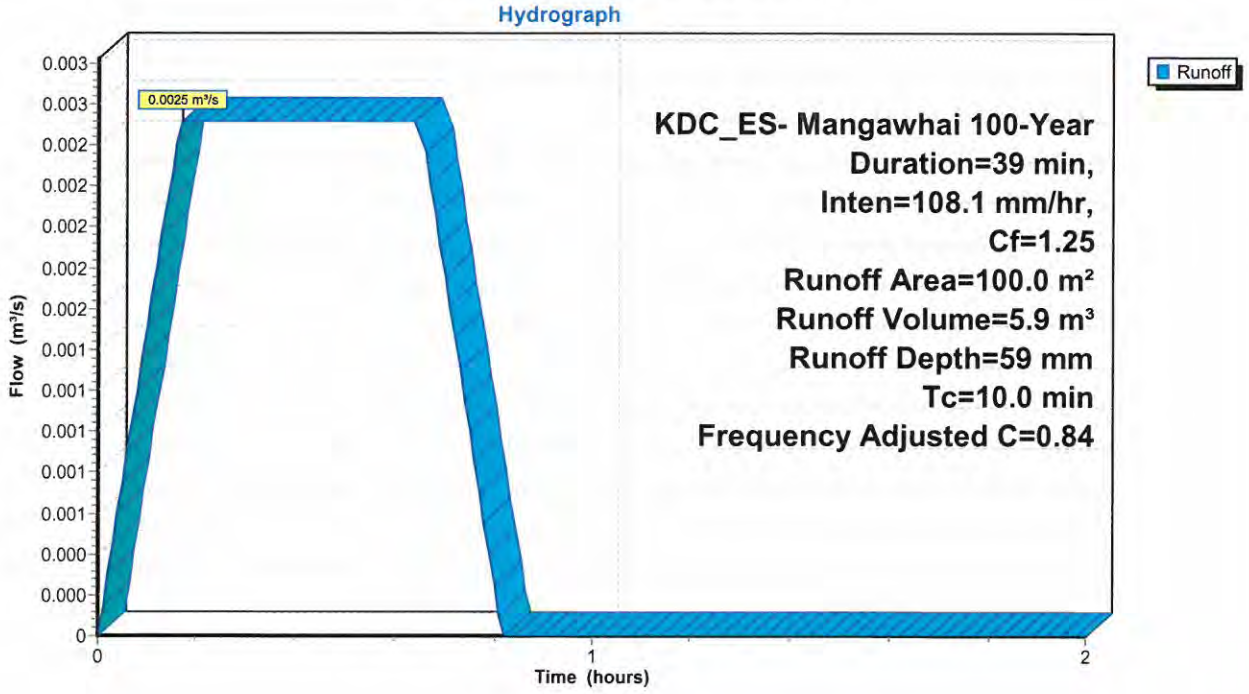
Runoff = 0.0025 m³/s @ 0.17 hrs, Volume= 5.9 m³, Depth= 59 mm

Runoff by Rational method, Rise/Fall=1.0/1.0 xTc, Time Span= 0.00-2.00 hrs, dt= 0.01 hrs
KDC_ES- Mangawhai 100-Year Duration=39 min, Inten=108.1 mm/hr, Cf=1.25

Area (m²)	C	Adj	Description
100.0	0.67		Pervious - Northern catchment
100.0	0.67	0.84	Weighted Average, Frequency Adjusted
100.0			100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
10.0					**Direct Entry,**

Subcatchment 44S: Pervious



VARIATION OF CONSENT NOTICE
PURSUANT TO SECTION 221 (3)
RESOURCE MANAGEMENT ACT 1991

IN THE MATTER of Record of Title No 781590 (North Auckland Land Registration District)

AND

IN THE MATTER of a Consent Notice 8509265.4 (North Auckland Land Registration District)

Pursuant to Section 221(3) of the Resource Management Act 1991 the **KAIPARA DISTRICT COUNCIL** ("the Council") being satisfied that the conditions of subdivision imposed in respect of Lot 2 on Deposited Plan 430128 and 1/59 share Lot 100-103, 106, 200, 202 Deposited Plan 404128 and Lot 1 Deposited Plan 430128 and Lot 1 Deposited Plan 482523 where such conditions of consent were to be complied with on a continuing basis and were secured by way of a consent notice may now be varied by deleting from clause 16 of Consent Notice 8509265.4 referred to Lot 2 on Deposited Plan 430128 and 1/59 share Lot 100-103, 106, 200, 202 Deposited Plan 404128 and Lot 1 Deposited Plan 430128 and Lot 1 Deposited Plan 482523 to the intent that:

Reference to Lot 2 DP 430128 of the Subdivision in clause 16 of Consent Notice 8509265.4 shall be cancelled.

It is hereby agreed between the registered proprietor of the land contained in Record of Title No 781590 and the Council that Consent Notice No. 8509265.4 (North Auckland Lands Registration District) ("the Consent Notice") can be varied and the parties request the District Land Registrar to make an entry in the register and on any relevent instrument of title noting that the Consent Notice has been varied.

In all other respects Consent Notice 8509265.4 remains unaltered

DATED this 4th dey of February 2021

SIGNED by
KAIPARA DISTRICT COUNCIL
by its authorised signatory

Dine Tetzner

KAIPARA DISTRICT COUNCIL

CONSENT NOTICE
PURSUANT TO SECTION 221 OF THE RESOURCE MANAGEMENT ACT 1991

In the matter of a Consent Notice issued pursuant to Section 221 of the Resource Management Act 1991 (*Act*) in respect of Resource Consents RM090281 and RM090281A (*Resource Consent*) for the subdivision (*Subdivision*) on survey plan DP 404128 showing Lots 1, 4-6, 8-10, 12, 13, 15-17, 19-27, 27a, 28, 28a, 29-33, 35, 35a, 36-60, 69, 70, 100-106, 200 and 202 (all inclusive) and on survey plan DP 430128 showing Lots 1 and 2 DP 430128.

I, Alan John McKerchar, the Principal Administrative Officer of the Kaipara District Council (*Council*), hereby certify that pursuant to the consents under RM090281 dated 18 April 2006 and RM090281A dated 18 November 2009, the following shall apply as conditions of such consents to be complied with on a continuing basis by the Owner as defined in the Act:

In relation to Lots 1, 4-6 (inclusive), 8, 9, 12, 13, 27A, 28, 28A, 29-33 (inclusive), 35, 35A, 36-38 (inclusive) on DP 404128 of the Subdivision

1 The Owner of each lot is required to be a shareholder or member of The Sanctuary Residents Association Incorporated formed to operate, maintain and administer those components of the communal wastewater treatment and disposal system for the Subdivision located on commonly owned land and administer monitoring of individual treatment systems connected to the communal system.

2 The Owner of each lot is required to enter into an ongoing contract for the maintenance of the individual treatment systems with an organisation approved by The Sanctuary Residents Association Incorporated .

3 In the event that The Sanctuary Residents Association Incorporated is wound up or liquidated, or ceases or fails to carry out its prescribed purposes, the Owners are deemed to be an unincorporated society for the purposes set out in paragraphs 1 and 2 of this Consent Notice.

In relation to Lots 10, 17, 19-23 (inclusive), 27, 39-60 (inclusive), 69 and 70 on DP 404128 and Lot 2 on DP 430128 of the Subdivision

4 The Owner acknowledges that the construction and use of on site wastewater disposal systems for each lot may require discharge permits from the Northland Regional Council and that advice on specific resource

consent requirements (if any) should be sought from the Northland Regional Council accordingly.

5 The Owner shall ensure that the wastewater treatment and disposal systems on each lot shall be designed by and installed under the supervision of a competent engineer with appropriate experience in wastewater systems or other suitable qualified person to the approval of the Council; and.

6 The Owners of each lot shall enter into an ongoing contract for the maintenance of the wastewater treatment and disposal systems on each lot and provide details to the entity formed to administer all matters associated with the maintenance of all on-site effluent disposal systems.

In relation to lots 1, 4-6 (inclusive), 8-10 (inclusive), 12, 13, 15-17 (inclusive), 19-27 (inclusive), 27a, 28, 28a, 29-33 (inclusive), 35, 35a, 36-60 (inclusive), 69 and 70 on DP 404128 and Lot 2 on DP 430128 of the Subdivision

7 The Owner shall have regard to the Engineering and Geotechnical Report (Job No. 4819) prepared by Hawthorne Geddes Engineers & Architects Ltd dated September 2004 (*the Hawthorne Geddes Report*).

8 The Owner of each Lot shall ensure that it complies with the recommendations of that report with respect to foundations and drainage at the time of development of the Lot.

9 The Owner of each Lot shall not erect or permit the erection of any building otherwise than within the identified building sites and additional building sites referred to in the Hawthorne Geddes Report, such sites being identified in respect of each lot on the table annexed to this consent notice as Schedule One.

10 The Owner shall comply with the building and landscaping guidelines for the Subdivision which have been approved by Council and shall ensure that any buildings on the lot be sited and constructed and the lots landscaped in accordance with those building and landscaping guidelines.

11 The Owner shall maintain any landscaping on the lot in accordance with the Landscape Amenity Enhancement Plan approved under Condition 2(bb) of Resource Consent. The areas of the landscaping on the lots to which this condition 9 apply are as set out in the table annexed to this consent notice as Schedule Two.

12 The Owner acknowledges that condition 10 above will be monitored by the Council for a period of five years from the date of completion of planting to

the reasonably satisfaction of Council, and that there will be a Council charge for this monitoring payable by the Owner.

13 The Owner shall not allow the planting of exotic vegetation that could pose a threat to the ecological values of the lots. This includes the introduction of invasive plant species, including those currently listed on the nationally banned for sale list (see N.R.C Regional Pest Management Strategy).

14 The Owner of each Lot acknowledges that it is required to be a member of The Sanctuary Residents Association Incorporated for so long as it is the owner of a Lot. The Owner of each Lot acknowledges that it shall not take steps to wind up or liquidate The Sanctuary Residents Association Incorporated without the Council's prior written consent.

In relation to lots 52 and 70 on DP 404128 of the Subdivision

15 The Owner acknowledges the presence of recorded archaeological sites in the Time Depth Heritage Consultants Archaeological Assessment Report and the protection given to these sites under the Historic Places Act 1993.

In relation to lots 1, 4-6 (inclusive), 8-10 (inclusive), 12, 13, 15-17 (inclusive), 19-27 (inclusive), 27a, 28, 28a, 29-33 (inclusive), 35, 35a, 36-60 (inclusive), 69 and 70 on DP 404128 and Lot 2 on DP 430128 of the Subdivision

16 The Owner of each Lot acknowledges that no further subdivision of the lot shall be permitted for a period of 10 years from the date of registration of this consent notice.

In relation to lots 1, 10, 13 and 15-17 (inclusive) on DP 404128 of the Subdivision

17 The Owner of each Lot must not use and must not permit the use of direct vehicular access from the Lot onto Cove Road.

In relation to Lots 100 and 101 on DP 404128 of the Subdivision

18 The Owner must take all practicable steps to protect and enhance the amenity, ecological and water quality values of the lakes on the Lots and must not use or permit the use of motorised craft on the lakes except by the Owner for dam maintenance or emergency purposes.

In relation to Lot 103 on DP 404128 of the Subdivision

19 The Owner must not use and must not permit the use of the Lot for any purpose other than recreation and recreation facilities and must not use or

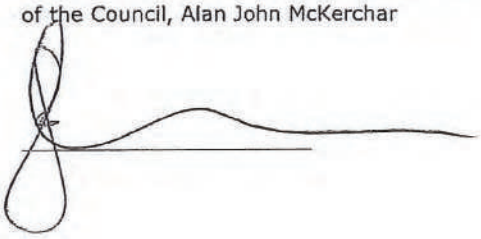
permit the use of the Lot for residential development or commercial accommodation.

In relation to Lot 1 DP 430128 of the Subdivision

20 The Owner must not use or permit the use of the Lot for any purpose other than maintaining and enhancing its agricultural use and for effluent disposal and must not use or permit the use of the Lot for residential development or commercial accommodation.

Dated this day 16th of June 2010

AUTHENTICATED by the Chief Executive of the Council, Alan John McKerchar



SCHEDULE ONE

Building sites and additional building sites

Lot	Building sites as shown on DP 404128	Additional building sites shown on DP 404128
Lot 1 on DP 404128	ZZ	
Lot 4 on DP 404128	ZY	
Lot 5 on DP 404128	ZX	
Lot 6 on DP 404128	ZW	
Lot 8 on DP 404128	ZV	
Lot 9 on DP 404128	ZU	
Lot 10 on DP 404128	ZT	
Lot 12 on DP 404128	ZS	
Lot 13 on DP 404128	ZQ	
Lot 15 on DP 404128	ZP	
Lot 16 on DP 404128	ZO	
Lot 17 on DP 404128	ZN	XP
Lot 19 on DP 404128	ZL	XE and XF
Lot 20 on DP 404128	ZM	XO
Lot 21 on DP 404128	ZK	
Lot 22 on DP 404128	ZJ	
Lot 23 on DP 404128	ZI	
Lot 24 on DP 404128	ZH	
Lot 25 on DP 404128	ZG	
Lot 26 on DP 404128	ZF	
Lot 27 on DP 404128	XR	
Lot 27a on DP 404128	ZD and ZE	
Lot 28 on DP 404128	ZC	
Lot 28a on DP 404128	ZB	
Lot 29 on DP 404128	ZA	
Lot 30 on DP 404128	YZ	
Lot 31 on DP 404128	YY	
Lot 32 on DP 404128	YX	
Lot 33 on DP 404128	YW	
Lot 35 on DP 404128	YV	
Lot 35a on DP 404128	YU	XN
Lot 36 on DP 404128	YT	XM
Lot 37 on DP 404128	YS	XL
Lot 38 on DP 404128	YR	XG and XK
Lot 39 on DP 404128	YQ	
Lot 40 on DP 404128	YP	XJ
Lot 41 on DP 404128	YO	XI
Lot 42 on DP 404128	YN	XH
Lot 43 on DP 404128	YM	
Lot 44 on DP 404128	YL	XD
Lot 45 on DP 404128	YJ	
Lot 46 on DP 404128	YI	
Lot 47 on DP 404128	YH	
Lot 48 on DP 404128	YG	

Lot	Building sites as shown on DP 404128	Additional building sites shown on DP 404128
Lot 49 on DP 404128	YF	
Lot 50 on DP 404128	YE	
Lot 51 on DP 404128	YD	
Lot 52 on DP 404128	YC	
Lot 53 on DP 404128	YB	
Lot 54 on DP 404128	YA	
Lot 55 on DP 404128	XZ	
Lot 56 on DP 404128	XY	
Lot 57 on DP 404128	XX	
Lot 58 on DP 404128	XW	
Lot 59 on DP 404128	XV	
Lot 60 on DP 404128	XU	
Lot 69 on DP 404128	XT	
Lot 70 on DP 404128	XQ and XS	
Lot 2 on DP 404128	YK	ZR

SCHEDULE TWO

Landscape enhancement areas

Lot	Landscape enhancement areas as shown on DP 404128
Lot 1 on DP 404128	C, D, P, CA, CE and CH
Lot 4 on DP 404128	E and CC
Lot 5 on DP 404128	F and CJ
Lot 6 on DP 404128	G
Lot 8 on DP 404128	H
Lot 9 on DP 404128	I
Lot 10 on DP 404128	J
Lot 12 on DP 404128	K
Lot 13 on DP 404128	L, N and O
Lot 17 on DP 404128	CT
Lot 19 on DP 404128	Y, Z, AG and AO
Lot 24 on DP 404128	CW
Lot 25 on DP 404128	AH
Lot 27 on DP 404128	AK
Lot 27a on DP 404128	AM
Lot 29 on DP 404128	AP
Lot 30 on DP 404128	AQ
Lot 31 on DP 404128	AR
Lot 32 on DP 404128	AS
Lot 33 on DP 404128	S and CU
Lot 35a on DP 404128	AU
Lot 36 on DP 404128	AV
Lot 37 on DP 404128	AW
Lot 38 on DP 404128	AX
Lot 102 on DP 404128	BQ
Lot 103 on DP 404128	BD
Lot 106 on DP 404128	BO
Lot 1 on DP 430128	BR
Lot 2 on DP 430128	BK and BL

8138731.7

CHAPMAN TRIPP

Conservation Covenant

Duck Nominees Limited (the Covenantor)

Kaipara District Council (the Council)

CONSERVATION COVENANT

Date: 4th August 2009

PARTIES

Duck Trust Limited (*the Covenantor*)

Kaipara District Council (*the Council*)

BACKGROUND

A The Covenantor has obtained a resource consent from the Council for the subdivision of Lot 1 DP 196760, Lot 1 DP 205260 and Allotments 230 and 423 Parish of Waipu in respect of resource consent number RM040281 (*the Consent*).

B As a condition imposed under the Consent, the Council has required the Covenantor to register a conservation covenant pursuant to Section 77 of the Reserves Act 1977 in respect of certain areas within the above subdivision for the purposes of protecting bush, shrubland, streamside and wetland areas.

NOW BY THIS DEED it is agreed by the parties as follows:

1 The Covenantor covenants with the Council on the terms of this deed and enters into and executes with the Council, pursuant to section 77 of the Reserves Act 1977, a conservation covenant in respect of those areas (*Covenant Areas*) of the land set out in the First Schedule (*the Covenant Land*).

2 The Covenantor covenants as follows:

2.1 that the Covenant Areas shall be fenced to a stock proof standard provided that gates shall be permitted to be part of these protective fence lines where the consented new internal roads/access ways and internal farm tracks existing prior to the application for the Consent required such or alternatively, the Covenant Areas shall have stock proof fences to exclude stock from the Covenant Areas on the lot should any stock be kept on the Covenant Land.

2.2 that no farm animals or stock shall be kept or grazed within the Covenant Areas and all reasonable steps shall be taken to prevent ingress into the Covenant Areas by such animals.

2.3 that the Covenant Areas shall be kept clean of invasive and/or woody weeds.

2.4 that vegetation (except for invasive and/or woody weeds) within the Covenant Areas shall not be cut down or destroyed.

3 The Covenantor further covenants that no cats or dogs shall be permitted within the Covenant Area on Lot 105 on DP 404128 and that appropriate signs/symbols to this effect are to be erected at access points to the Covenant Area on that lot.

4 The Covenantor covenants that it shall comply with the ecological management plan for Lot 105 on DP 404128 which has been approved by Council and which details the areas to control stock access and the animal and plant pest control programmes for Lot 105 on DP 404128.

5 The Covenantor shall permit the Council access at reasonable times to enable Council to review compliance by the Covenantor with the terms of this conservation covenant.

6 This Conservation Covenant has been entered into and executed pursuant to the provisions of section 77 of the Reserves Act 1977 and accordingly, this Conservation Covenant shall run with and bind the Covenant Land, shall be deemed to be an interest in the Covenant Land for the purpose of the Land Transfer Act 1952, and shall bind all subsequent owners of the Covenant Land.

Duck Nominees Limited by:

Director

in the presence of:

Name: C. M. MURPHY

Occupation: CONSULTANT

Address: AUCKLAND

Signed by the **Kaipara District Council** under seal by the Chief Executive Officer:

Alan John McKerchar

THE COMMON SEAL of)
KAIPARA DISTRICT COUNCIL)
was affixed in the)
presence of:)

THE KAIPARA DISTRICT COUNCIL
The Common Seal of

Mayor

Chief Executive Officer

CONSERVATION COVENANT

FIRST SCHEDULE

Covenant Area (all as shown on DP 404128)	Covenant Land - Lot, DP and (Unique Identifier)
A	Lot 1 on DP 404128 (414229)
M, Q, T	Lot 15 on DP 404128 (414238)
U	Lot 16 on DP 404128 (414239)
W	Lot 17 on DP 404128 (414240)
AA, AC, CK	Lot 19 on DP 404128 (414241)
X	Lot 20 on DP 404128 (414242)
AD	Lot 21 on DP 404128 (414243)
AE	Lot 22 on DP 404128 (414244)
AF	Lot 23 on DP 404128 (414245)
CL	Lot 25 on DP 404128 (414247)
AI	Lot 26 on DP 404128 (414248)
AJ	Lot 27 on DP 404128 (414249)
AL, CM	Lot 27a on DP 404128 (414250)
AN	Lot 28 on DP 404128 (414251)
AT	Lot 35 on DP 404128 (414259)

Covenant Area (all as shown on DP 404128)	Covenant Land - Lot, DP and (Unique Identifier)
CS	Lot 35a on DP 404128 (414260)
AY	Lot 38 on DP 404128 (414263)
AZ	Lot 39 on DP 404128 (414264)
BA	Lot 41 on DP 404128 (414266)
BB	Lot 42 on DP 404128 (414267)
BE	Lot 45 on DP 404128 (414270)
CP	Lot 46 on DP 404128 (414271)
CQ	Lot 48 on DP 404128 (414273)
BF, CR	Lot 49 on DP 404128 (414274)
BG	Lot 50 on DP 404128 (414275)
BH and BI	Lot 70 on DP 404128 (414287)
B, BS	Lot 100 on DP 404128 (414229-414287 (inclusive))
BT	Lot 101 on DP 404128 (414229-414287 (inclusive))
BC	Lot 104 on DP 404128 (414229-414287 (inclusive))
BV	Lot 105 on DP 404128 (414229-414287 (inclusive))

8138731.8

DUCK NOMINEES LIMITED
(Covenantor)

KAIPARA DISTRICT COUNCIL
(Council)

CONSERVATION COVENANT - OPEN SPACE

Brookfields
LAWYERS

CONSERVATION COVENANT – OPEN SPACE
PURSUANT TO SECTION 77 OF THE RESERVES ACT 1977

PARTIES

1. DUCK NOMINEES LIMITED ("Covenantor")

2. KAIPARA DISTRICT COUNCIL ("Council")

INTRODUCTION

A. The Covenantor is the registered proprietor of an estate in fee simple in the land described in Schedule 1 ("Land").

B. The Council is authorised by the Reserves Act 1977 ("Act") to obtain conservation covenants in respect of any private land for the purpose of managing that land so as to preserve the natural environment or the landscape amenity or wildlife or fresh water marine life habitat or historical value.

C. The Covenantor has agreed to grant to the Council a conservation covenant for the purposes of protecting and enhancing the amenity, ecological and water quality values of part of the Land and preserving that part of the Land as open space.

D. The areas of the Land in respect of which the covenant applies are Lots 100 and 101 on Deposited Plan 404128 and in this covenant referred to as the "Conservation Areas".

1. THE PARTIES AGREE:

1.1 The Covenantor grants to the Council a conservation covenant which will forever bind the Land into whomever's hands it may come (but not so as to render the Covenantor personally liable in damages for any breach of covenant committed in respect of the Land after the Covenantor is no longer the registered proprietor of that Land).

1.2 The parties covenant at all times to observe and perform their respective duties and obligation imposed in the restrictions, stipulations and agreements contained in this covenant.

2. THE COVENANTOR COVENANTS IN RESPECT OF THE CONSERVATION AREAS THAT:

2.1 The Covenantor shall maintain the Conservation Areas as open space at all time.

2.2 The Covenantor shall not permit the use of motorised craft on the lakes forming part of the Conservation Areas except by the registered proprietor of the Land for the purposes of dam maintenance or for emergency purposes.

2.3 The Covenantor shall not erect any structures within any of the Conservation Areas.

2.4 The Covenantor shall preserve and protect the Conservation Areas. No act or thing shall be done or placed or permitted to be done or remain upon the Land or to escape from the Land which in the opinion of the Council materially alters the actual appearance or condition of the Conservation Areas or is prejudicial to the amenity or ecology of the Conservation Areas or to the water quality of the lakes on the Conservation Areas.

2.5 The Covenantor shall keep the Conservation Areas clean of invasive and/or woody weeds.

2.6 The Covenantor shall not cut down or destroy vegetation within the Conservation Areas except for invasive and/or woody weeds.

2.7 The Covenantor shall not light nor permit to be lit any fire within the Conservation Areas or on any adjacent land owned or occupied by the Covenantor or under the Covenantor's' control when there may be a risk of fire spreading into the Conservation Areas.

2.8 The Covenantor shall undertake plant pest control measures to ensure plant pests do not prevent or significantly impair the growth of native seedlings, and shall seek to ensure that plant pest control measures do not adversely affect native species.

2.9 The Covenantor shall undertake animal pest control measures in accordance with the local operative regional pest management strategy.

2.10 The provisions of Section 77 and Sections 93 to 105 of the Reserves Act 1977 apply to this agreement as far as they are applicable and they shall be read subject to this covenant.

2.11 The Covenantor shall not grant any easement or concession in respect of the Covenant Areas without the prior written consent of the Council.

2.12 The Council, through its officers or agents, is permitted to enter at any reasonable time the Conservation Areas, and any adjacent or nearby land in which the Covenantor has any interest, to determine whether the covenant is complied with or for carrying out any protection or maintenance work on the Conservation Areas consistent with the objects set out in this covenant.

2.13 The Council or Covenantor may at any time during the term of this covenant by mutual agreement, carry out any work or improvements, or take any action either jointly or individually or vary the terms of this covenant to ensure the more appropriate preservation of the Conservation Areas PROVIDED HOWEVER such agreement is not contrary to the purpose and intent of this covenant specified in Clause C in the Introduction to this covenant.

2.14 The costs of the preparation, execution, registration and enforcement of this covenant shall be borne by the Covenantor.

SCHEDULE

CONSERVATION AREA ON DP 404128	IDENTIFIER NO.
Lot 100 and Lot 101	414229 – 414287 (inclusive) (North Auckland Registry)

EXECUTION

SIGNED on behalf of)
DUCK NOMINEES LIMITED)
by its directors:)

Name: CAMILLE PEARCE

Position: CONSULTANT

Address: AUCKLAND

THE COMMON SEAL of)
KAIPARA DISTRICT COUNCIL)
was affixed in the)
presence of:)

KAIPARA DISTRICT COUNCIL The Common Seal of

Mayor

Chief Executive Officer

Form 7
Code compliance certificate

Section 95, Building Act 2004

The building

Street address of building:	53 Robert Hastie Drive, Mangawhai
Legal description of land where building is located:	Lot 81 DP 556753
Building name:	N/A
Location of building within site/block number:	53 Robert Hastie Drive Mangawhai
Level/unit number:	0
Current, lawfully established, use:	2.0 Housing: 2.0.2 Detached Dwelling
Year first constructed:	2021

The owner

Name of owner:	ACDL Trustee Limited
Contact person:	David and Linda Kendall
Mailing address:	17 Pinefield Road, Whenuapai, Auckland
Street address/registered office:	N/A
Phone number:	Landline: N/A Mobile: 02102210567
Daytime:	Landline: N/A Mobile: 02102210567
After hours:	Landline: N/A Mobile: 02102210567
Facsimile number:	No information provided
Email address:	linda.kendall@xtra.co.nz
Website:	No information provided

First point of contact for communications with the council/building consent authority:
Lisa Fletcher ; Mailing Address: 14 Fallow Street
Queenstown 9300; Mobile: 02102210567; Email: lisa@c3bc.co.nz

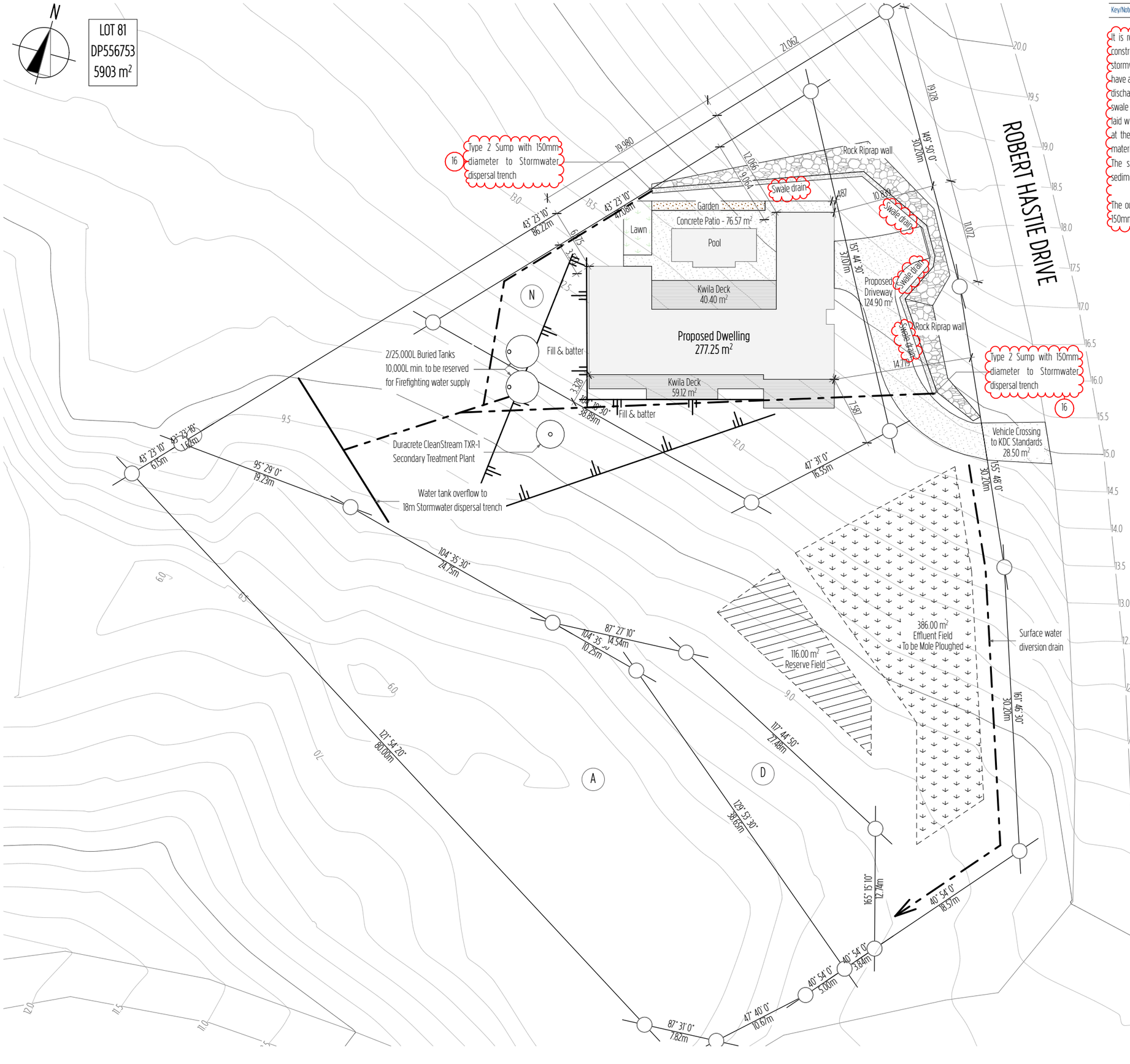
Building work

Building consent number:	BC210441
Description:	New Single Storey 4 Bedroom Dwelling with Attached Double Garage and Swimming Pool
Issued by:	Kaipara District Council

Code compliance

The building consent authority named below is satisfied, on reasonable grounds, that -
the building work complies with the building consent.

Signature: John Edwards
Position: building control officer
On behalf of: Kaipara District Council
Date: 05 August 2022



Key/Notes

It is recommended that a swale drain or simple v-drain is constructed upslope of the proposed house site to help catch stormwater run-off from the upslope areas. The drain should have a minimum width of 500 mm and depth of 300 mm and discharge downslope clear of the proposed dwelling. The swale should be situated towards the base of the cut and be laid with a minimum gradient of 1% towards a sump structure at the lowest point. The sump shall aid in filtering out any material which could block or fill up the stormwater pipes. The sump should be routinely inspected for debris and sediment, and cleaned out if required.

The outflow from the sump should then be conveyed via a 150mm closed pipe to proposed water tank overflow location.

16

Key/Notes

Wind Zone -	High
Earthquake Zone -	1
Exposure Zone -	C
Climate Zone -	1
Territorial Authority -	Kaipara District Council
Environment -	Rural Harbour

Coverage - 35% max.
Actual Coverage - 3.84%

Impermeable Surfaces - 10% max.
Actual Impermeable Surfaces = 9.04%

Levels are in terms of the NZVD2016 Datum

Temporary Site Fences to be constructed around the site as per New Zealand Building Code Clause F5/AS1

Sediment and runoff control shall be designed and installed by the licensed building practitioner prior to or during earthworks for the project. The sediment controls shall be installed in accordance with the requirements of the acceptable guidelines for erosion and sediment control are documented in the ARC publication TP90.

Sediment and erosion control measures shall be the responsibility of the main contractor and shall be regularly checked and maintained as required during construction. Refer to earthworks plan for sediment control locations.

Refer to the On-site 'secondary' wastewater treatment / disposal system design reference WW_21076 by Wiley Geotechnical Ltd. dated 1 June 2021.

Kaipara District Council
Approved Building Consent Document
BC210441 - Pg 4 of 46
30/08/2021 ComplyNZ

COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

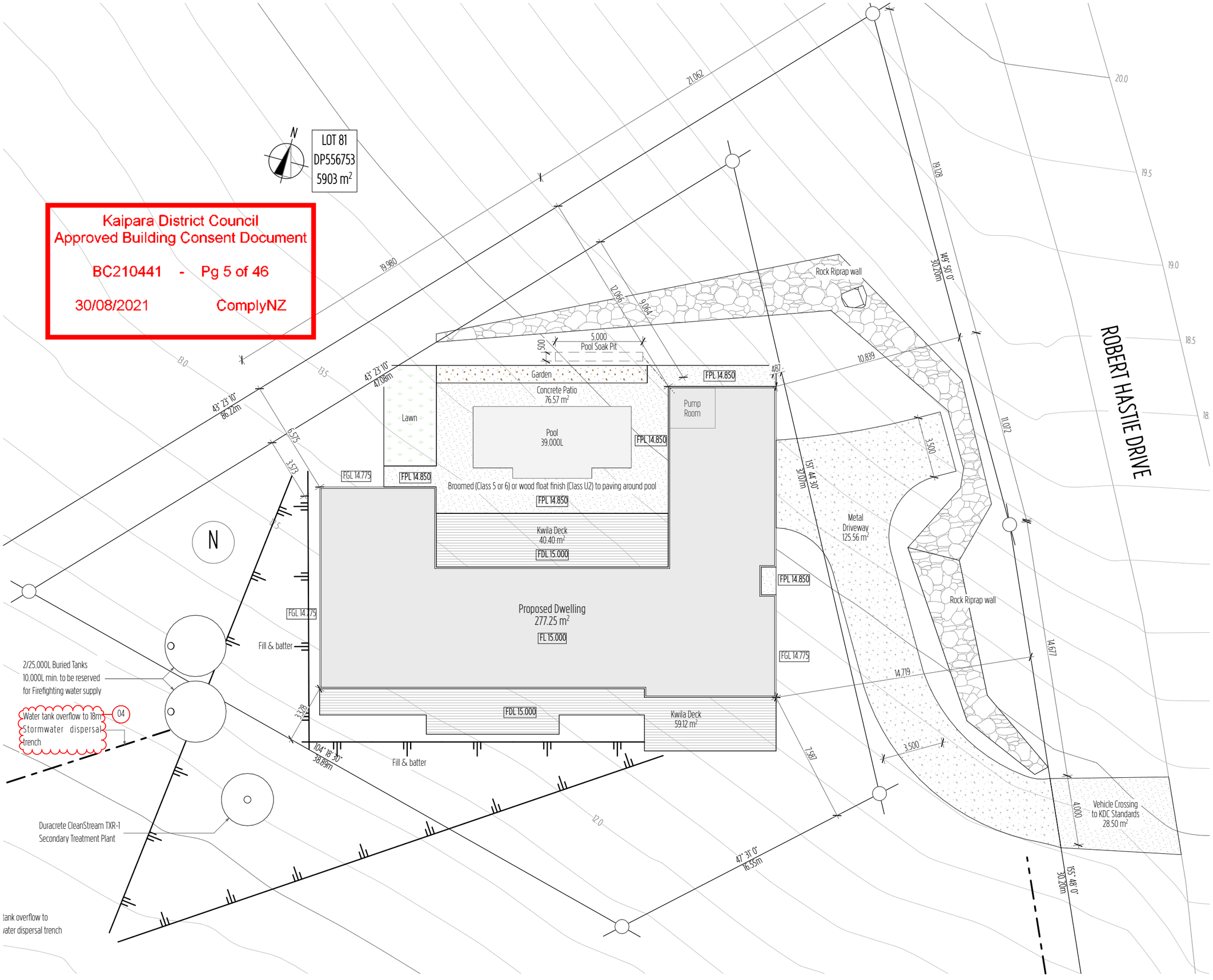
Drawing Issue
Building Consent

Sheet Title
Overall Site Plan

Scale	Drawn
1:400 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
101	06

All dimensions to be verified on site before commencing any work or producing shop drawings. Do not scale.
The copyright of this drawing remains with CH Northland Ltd and CADetailer Ltd.

RevID	ChID	Change Name	Date
03	02	Water tank overflow	30/06/21
04	03	Firefighting water reserve	12/07/21
05	04	Stormwater dispersal	19/07/21
06	16	Site drainage	18/08/21



Key/Notes

Wind Zone -	High
Earthquake Zone -	1
Exposure Zone -	C
Climate Zone -	1
Territorial Authority -	Kaipara District Council
Environment -	Rural Harbour

Levels are in terms of the NZVD2016 Datum

A minimum 200 mm layer of compacted hard fill is recommended to be placed for a waffle slab (i.e Rib-Raft) with the foundation being designed for expansive site class 'M – Moderate', as per AS 2870. All topsoil and fill material must be removed before foundation construction commences.

Refer to the Geotechnical Investigation reference 21076 by Wiley Geotechnical Ltd. dated 27 May 2021 for specific site preparation details, bearing depth and capacity.

Broomed (Class 5 or 6) or wood float finish (Class U2) to all access route paving

Temporary Site Fences to be constructed around the site as per New Zealand Building Code Clause F5/AS1

Sediment and runoff control shall be designed and installed by the licensed building practitioner prior to or during earthworks for the project. The sediment controls shall be installed in accordance with the requirements of the acceptable guidelines for erosion and sediment control are documented in the ARC publication TP90.

Sediment and erosion control measures shall be the responsibility of the main contractor and shall be regularly checked and maintained as required during construction. Refer to earthworks plan for sediment control locations.

COASTAL HOMES

Project Title

ACDL Trustee Ltd. D&L Kendall

Site Address

Lot 81 The Sanctuary, Mangawhai

Drawing Issue

Building Consent

Sheet Title

Site Plan

Scale	Drawn
1:200 @ A3	Marc R. Vale
Date	Checked
19/07/21	CADetailer Ltd.
Drawing no.	Revision
102	05

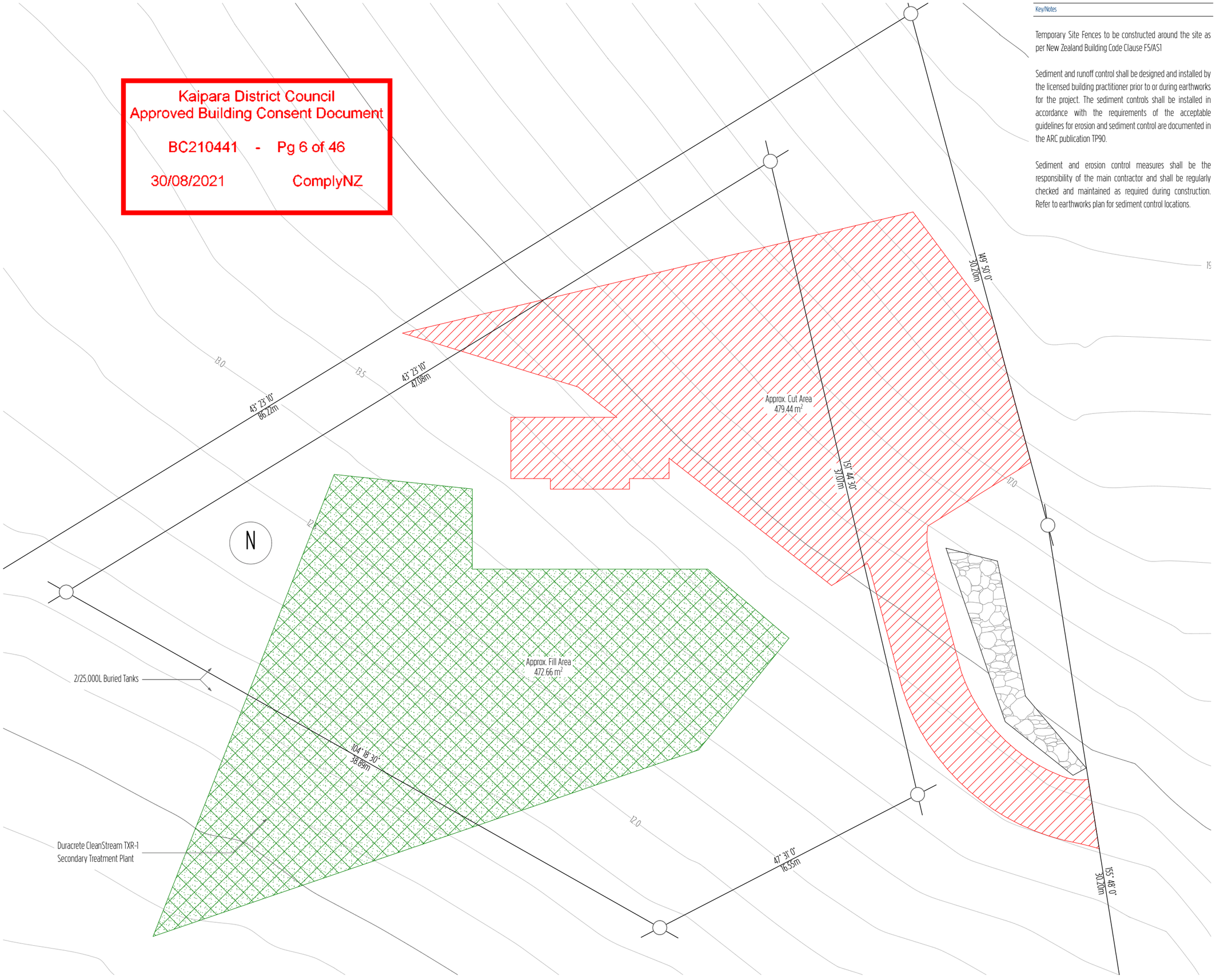
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RevID	ChID	Change Name	Date
02	01	Building Consent	27/06/21
03	02	Water tank overflow	30/06/21
04	03	Firefighting water reserve	12/07/21
05	04	Stormwater dispersal	19/07/21

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30/08/2021 ComplyNZ



Key/Notes

Temporary Site Fences to be constructed around the site as per New Zealand Building Code Clause F5/AS1

Sediment and runoff control shall be designed and installed by the licensed building practitioner prior to or during earthworks for the project. The sediment controls shall be installed in accordance with the requirements of the acceptable guidelines for erosion and sediment control are documented in the ARC publication TP90.

Sediment and erosion control measures shall be the responsibility of the main contractor and shall be regularly checked and maintained as required during construction. Refer to earthworks plan for sediment control locations.

Key/Notes

Refer to the Geotechnical Investigation reference 21076 by Wiley Geotechnical Ltd. dated 27 May 2021 for specific site preparation details, bearing depth and capacity.

Wiley Geotechnical Ltd recommend that the earthworks are undertaken by an experienced contractor familiar with the contents of this report and is experienced in these soils.

It is considered that the vast majority of on-site soil material shall be suitable to be utilised as engineered fill supporting the proposed residential development. This is expected to primarily consist of silty clay soil and highly to completely weathered rock material. We recommend that all overlying topsoil and organic rich material is stripped and removed from the proposed cut areas prior to excavating the in-situ soil material. The excavated in-situ soil should be handled separately to the topsoil material. No topsoil should be used as, mixed with or remain below any engineered fill material. The cut excavation areas should be graded to allow the flow of stormwater away from the area. Suitable erosion and sediment control methodologies should be employed. Any sloping ground that is excavated into should be battered back to a slope of 3:1 (H:V). Once cut excavation are complete planting or regressing of the areas may have to be employed or long-term erosion and sediment control measures implemented. At this point we would envisage a maximum allowable slope of on-site engineered fill material being 3:1 (H:V), while imported engineered hardfill may be placed up to a maximum slope of 2:1 (H:V).

A minimum 200 mm layer of compacted hard fill is recommended to be placed for a waffle slab (i.e Rib-Raft) with the foundation being designed for expansive site class 'M – Moderate', as per AS 2870. All topsoil and fill material must be removed before foundation construction commences.

Approximate Earthworks
Total Fill Area - 472.66 m²
Total Fill Volume - 131.23 m³
Total Cut Area - 479.44 m²
Total Cut Volume - 155.50 m³
Total Earthworks Area - 952.10 m²
Total Earthworks Volume - 286.73 m³

COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

Drawing Issue
Building Consent

Sheet Title
Earthworks Plan

Scale	Drawn
1:200 @ A3	Marc R. Vale
Date	Checked
27/06/21	CADetailer Ltd.
Drawing no.	Revision
103	01

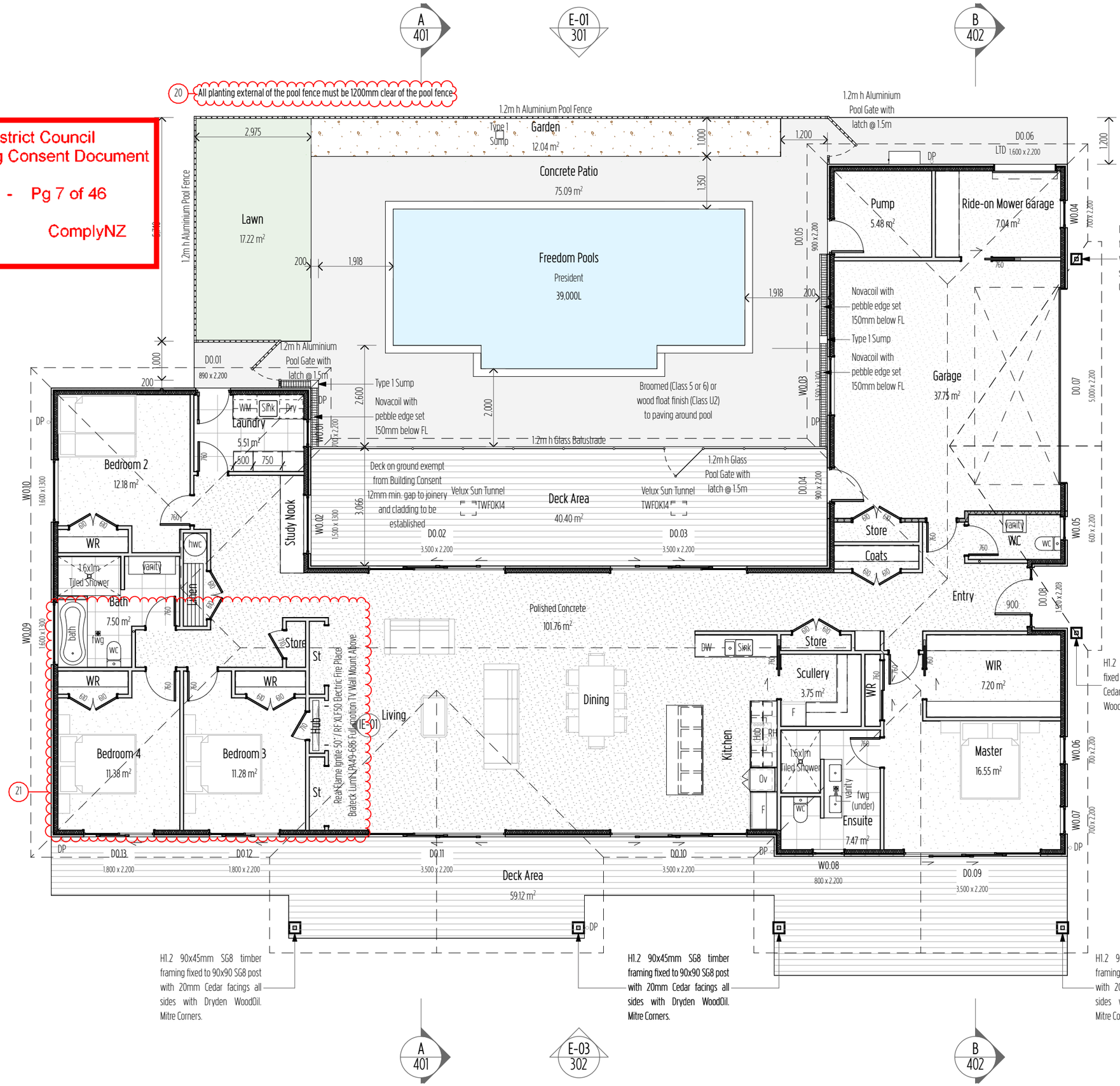
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RevID	ChID	Change Name	Date
01			27/06/21

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Key/Notes

- Insulated H1.2 SG8 wall framing
- Acoustic insulated H1.2 SG8 wall framing
- Un-insulated H1.2 SG8 wall framing

Waterproofing Membrane installed to entire bathroom/ensuite floor area with 2.1m upstand on walls 1.5m from corner of shower

All flooring tiles to a mean coefficient of friction no less than 0.4

Square stop to ceiling/wall junction

Internal shower glass to be safety glass

Main access deck to be in place for the final inspection, any steps to be max. 190mm riser and min. 280mm tread

Ground Floor Area over Framing
269.69 m²

Ground Floor Area over Cladding
277.25 m²

COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

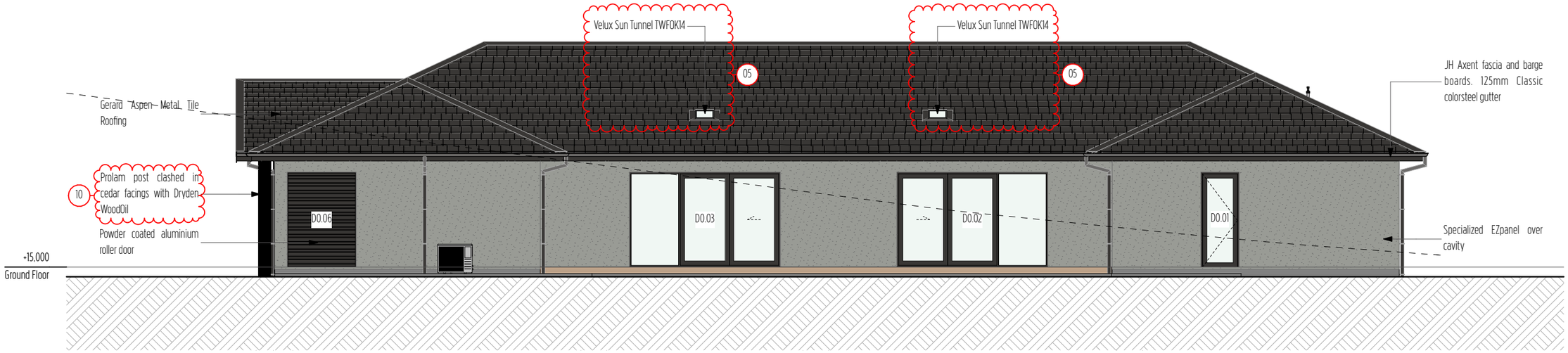
Drawing Issue
Building Consent

Sheet Title
Floor Plan

Scale	Drawn
1:100 @ A3	Marc R. Vale
Date	Checked
25/08/21	CADetailer Ltd.
Drawing no.	Revision
201	04

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RevID	ChID	Change Name	Date
03	10	Cedar coating	18/08/21
	14	Door swings	
04	20	Pool fence landscaping clearance	25/08/21
	21	Lounge wall moved closer	



E-01
201

North Elevation

Scale 1:100



E-02
201

East Elevation

Scale 1:100

Risk Factor	Description	Risk	Score
Wind Zone	High	M	1
Number of Storeys	Single Storey	L	0
Roof/Wall Intersection Design	Fully protected (e.g. hip and gable roof with eaves)	L	0
Eaves Width	450mm - 600mm wide	M	1
Envelope Complexity	Simple L-shape with single cladding type.	L	0
Deck Design	Timber slat deck at ground floor level	L	0
		Total Score: 2	
Selected Cladding:	Stucco over nominal 20mm drained cavity		

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COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

Drawing Issue
Building Consent

Sheet Title
Elevations

Scale	Drawn
1:100 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
301	03

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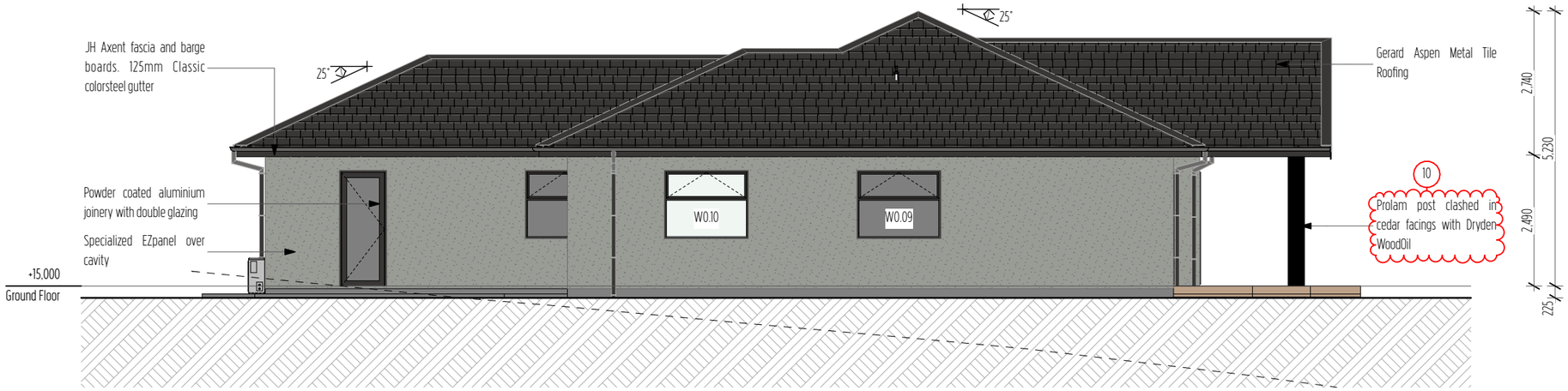
RevID	ChID	Change Name	Date
01			14/05/21
02	01	Building Consent	27/06/21
03	05	Skylights added	18/08/21
	10	Cedar coating	



E-03
201

South Elevation

Scale 1:100



E-04
201

West Elevation

Scale 1:100

Risk Factor	Description	Risk	Score
Wind Zone	High	M	1
Number of Storeys	Single Storey	L	0
Roof/Wall Intersection Design	Fully protected (e.g. hip and gable roof with eaves)	L	0
Eaves Width	450mm - 600mm wide	M	1
Envelope Complexity	Simple L-shape with single cladding type.	L	0
Deck Design	Timber slat deck at ground floor level	L	0
		Total Score: 2	
Selected Cladding:	Stucco over nominal 20mm drained cavity		

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COASTAL HOMES

Project Title

ACDL Trustee Ltd. D&L Kendall

Site Address

Lot 81 The Sanctuary, Mangawhai

Drawing Issue

Building Consent

Sheet Title

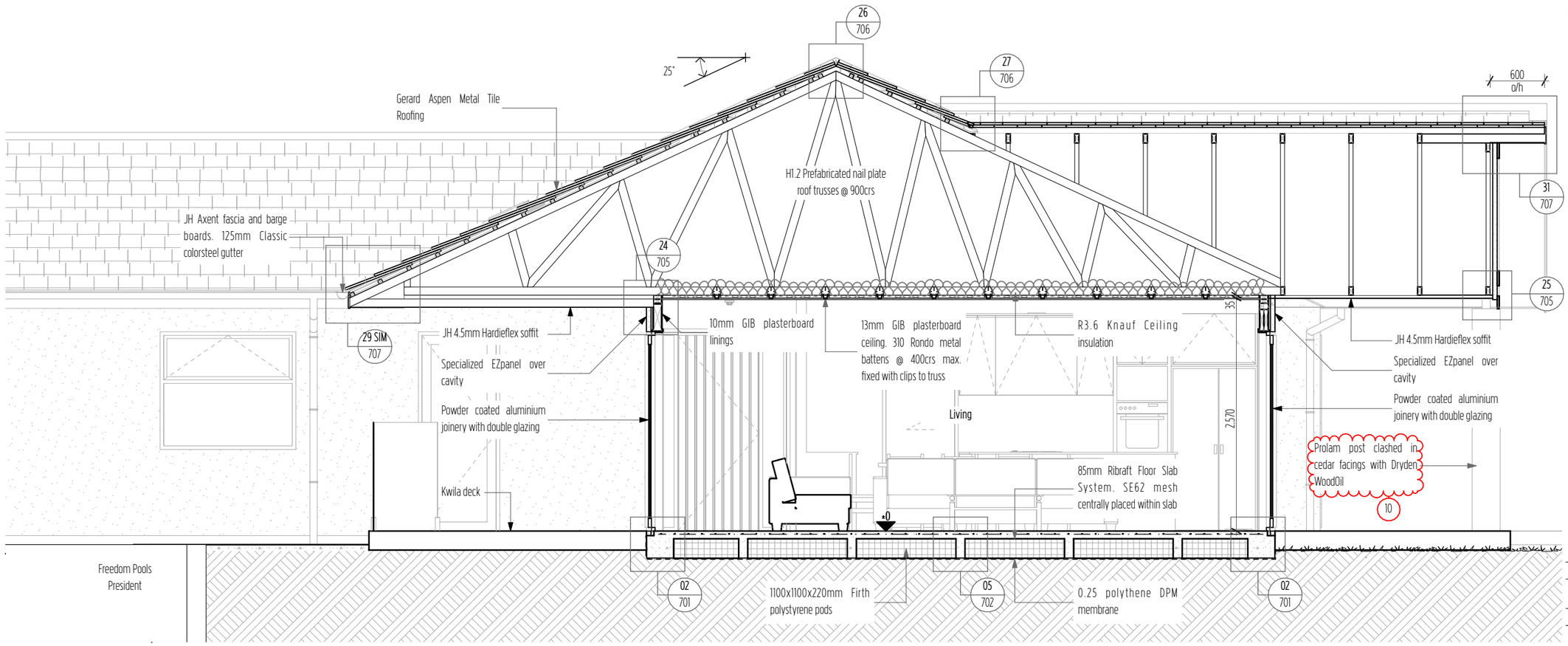
Elevations

Scale	Drawn
1:100 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
302	03

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RevID	ChID	Change Name	Date
01			14/05/21
02	01	Building Consent	27/06/21
03	10	Cedar coating	18/08/21

Stud Framing as per NZS 3604:2011 Section 8 - Walls		High Wind
from Table 8.2 - Load bearing walls		
Stud height	Stud size	Stud Spacing
2.7m	90x45mm	400crs
3.0m	90x45mm	300crs
3.6m	2/90x45mm	300crs
from Table 8.4 - Non-load bearing walls		
Stud height	Stud size	Stud Spacing
2.7m	90x45mm	400crs
3.0m	90x45mm	300crs



A
201, 504
Cross Section A-A
Scale 1:50

Key/Notes

Refer to the Geotechnical Investigation reference 21076 by Wiley Geotechnical Ltd. dated 27 May 2021 for specific site preparation details, bearing depth and capacity.

A minimum 200 mm layer of compacted hard fill is recommended to be placed for a waffle slab (i.e Rib-Raft) with the foundation being designed for expansive site class 'M – Moderate', as per AS 2870. All topsoil and fill material must be removed before foundation construction commences.

Square stop to ceiling/wall junction

All structural fixings sheltered and exposed in Exposure Zone D to be Type 304 stainless steel as per NZS3604:2011

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COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

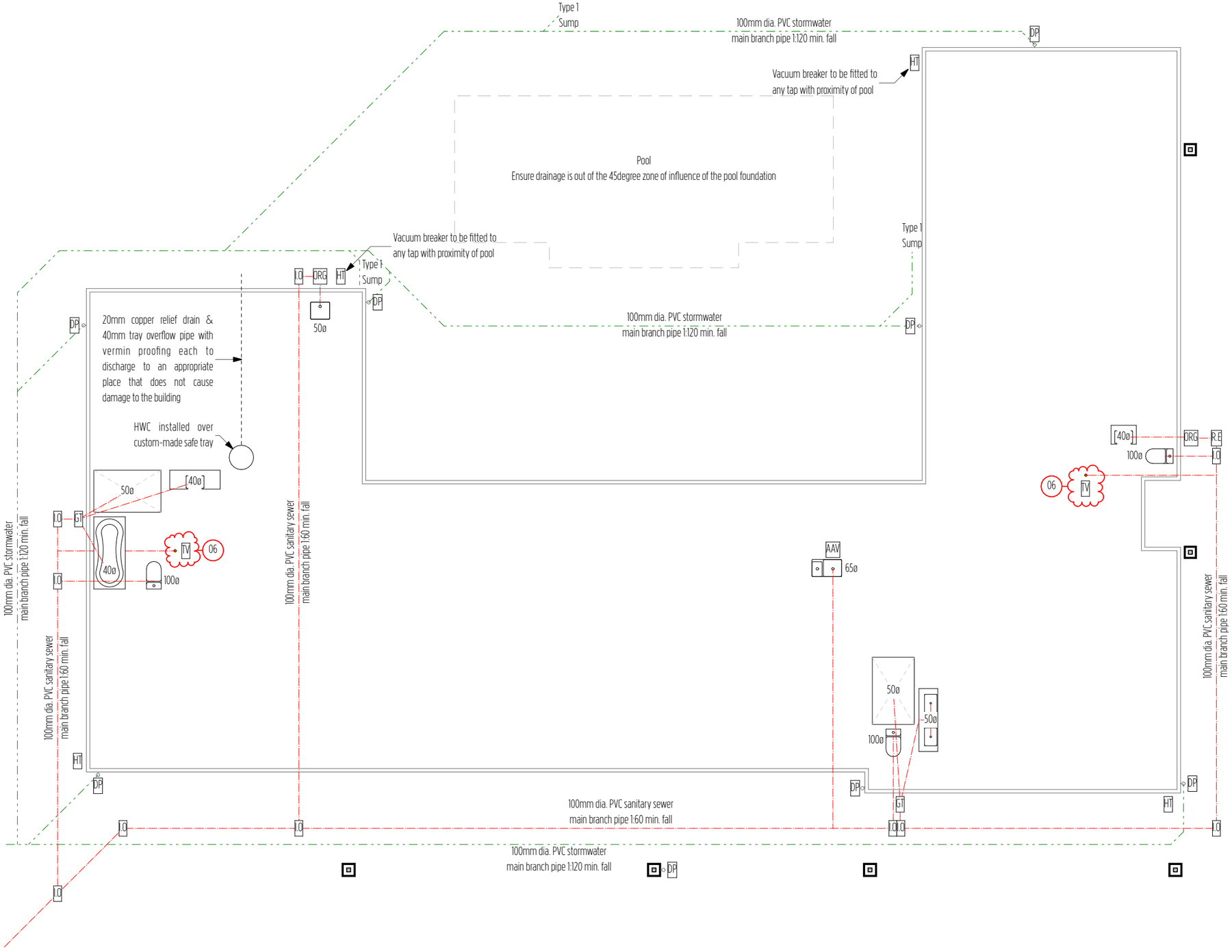
Drawing Issue
Building Consent

Sheet Title
Cross Sections

Scale	Drawn
1:50 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
401	03

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RevID	ChID	Change Name	Date
01			14/05/21
02	01	Building Consent	27/06/21
03	10	Cedar coating	18/08/21



Key/Notes

RE	Rodding Eye
IO	Inspection Point
AAV	Air Admittance Valve
ORG	Overflow Relief Gully
DG	Disconnector Gully
TV	Terminal Vent
FV	Fixture Vent
SV	Stack Vent
– – –	uPVC Sanitary Sewer Pipe
DP	Downpipe
– – –	100mm uPVC Stormwater Pipe
HT	Hosetap

Key/Notes

Carry out all sanitary sewer work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and AS/NZS 3500.2, as modified by NZBC G13/AS3

1:40 for 65mm diameter and under
1:60 for 100mm diameter and under

Carry out all stormwater work and complete all tests to NZBC E1/AS1

1:120 for 100mm diameter and under

Lay uPVC pipe systems to relevant sections of AS/NZS 2032, NZS 2566.1 and AS/NZS 2566.2

All plumbing and drainage to be confirmed by contractor before commencement of works

A registered drainlayer/plumber is to provide an as-built layout to council

Drains installed under buildings shall be:
a) Straight and of even gradient,
b) Separated from the building foundation by at least 25 mm, and
c) When passing through concrete, sleeved or wrapped in a durable and flexible material to allow for expansion and contraction.

Drains passing beneath buildings with a concrete slab on the ground floor shall have in addition to Paragraph 5.8.1:
a) 50 mm clearance from the top of the pipe to the underside of the slab, and
b) Junctions beneath the building joining at an angle of not

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COASTAL HOMES

Project Title
ACDL Trustee Ltd. D&L Kendall

Site Address
Lot 81 The Sanctuary, Mangawhai

Drawing Issue
Building Consent

Sheet Title
Plumbing and Drainage Plan

Scale	Drawn
1:100 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
601	03

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RevID	ChID	Change Name	Date
01			14/05/21
02	01	Building Consent	27/06/21
03	06	Terminal vents	18/08/21

Key/Notes

SD Type 1 Domestic smoke alarm to NZBC F7/AS1

3.0m smoke alarm radius

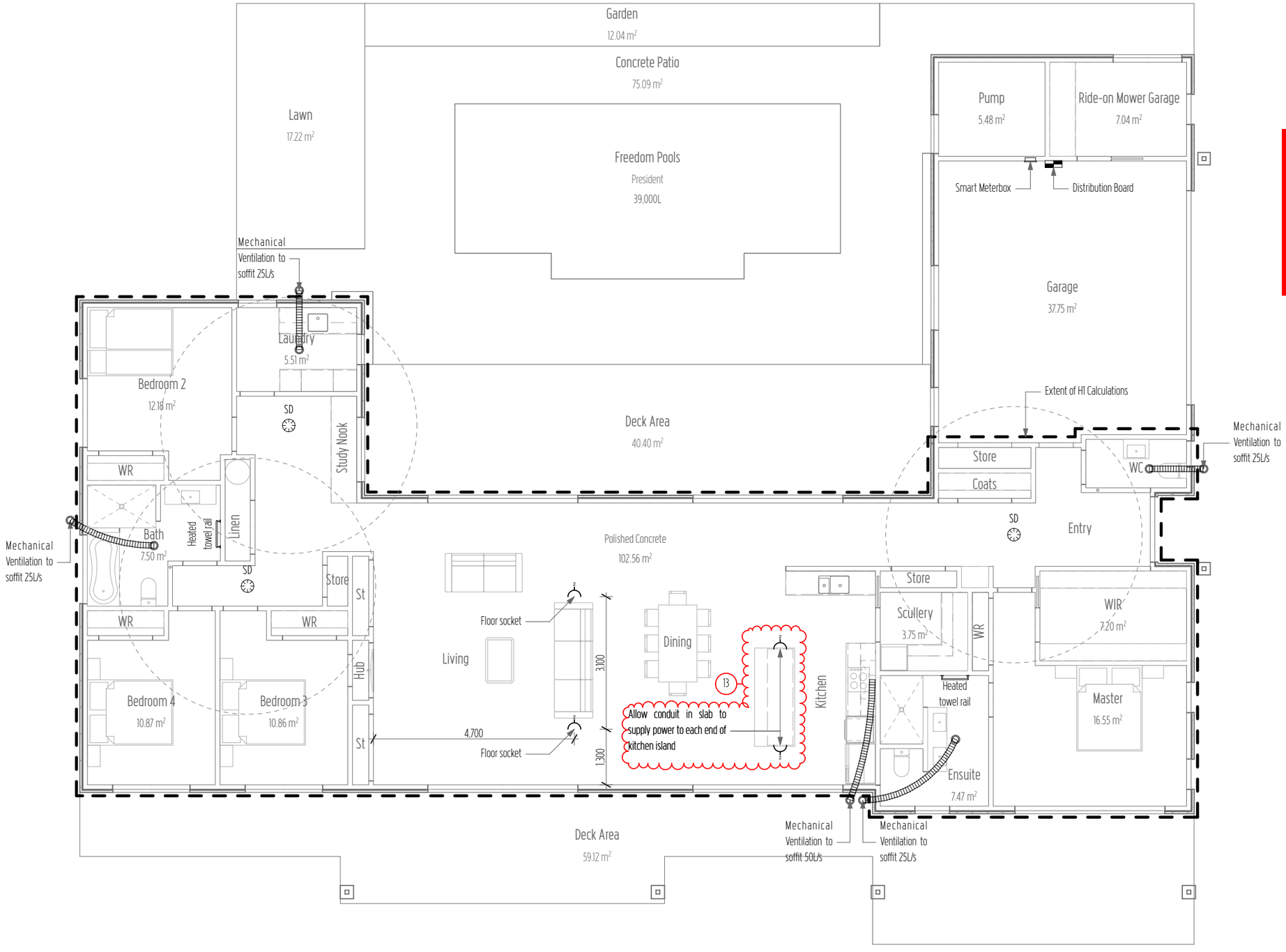
Mechanical Ventilation to NZS 4303:1990

All electrical work to be confirmed by client before commencement of works

Kaipara District Council
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COASTAL HOMES

Project Title

ACDL Trustee Ltd. D&L Kendall

Site Address

Lot 81 The Sanctuary, Mangawhai

Drawing Issue

Building Consent

Sheet Title

Electrical & Ventilation Plan

Scale	Drawn
1:100 @ A3	Marc R. Vale
Date	Checked
18/08/21	CADetailer Ltd.
Drawing no.	Revision
602	03

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RevID	ChID	Change Name	Date
01			14/05/21
02	01	Building Consent	27/06/21
03	13	Island bench powerpoints	18/08/21

17 August 2021

Linda & David Kendall
linda.kendall@xtra.co.nz

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RE: Geotechnical Investigation for Proposed Residence at Lot 81, The Sanctuary, Mangawhai.

Wiley Geotechnical Limited (WGL) was requested by Linda & David Kendall to provide a geotechnical investigation and guidance on foundation design for a proposed new build of a 3-bedroom dwelling and a pool. We have received and reviewed a site plan and a concept house design. We understand the dwelling is proposed to be constructed upon a concrete foundation. We have also received and reviewed the Engineering Suitability report by Hawthorn Geddes dated 12 July 2019.

WGL visited the site on and made the following observations:

- The site is located on a section sloping to the west at 12 degrees, and is currently grassed with an olive grove.
- A stormwater culvert is located at the southern end of the house, at the roadside boundary.
- A cut off drain is required behind the house, on the upper part of the slope.
- The building platform for the dwelling has not been formed.
- No obvious signs of instability were noted.
- Two hand augers and Four Scala Penetrometer (Scala) test were undertaken within potentially suitable building sites to a maximum depth of 3 m below ground level.

Geology

The GNS map for the site indicates that it is underlain by sedimentary rocks of the Pakiri Formation (Waitemata Group) (PF) comprising “alternating thick-bedded, volcanic rich, graded sandstone and siltstone with volcaniclastic grit beds.”

Seismic Hazards

Since there are no known active faults crossing the property, it is our opinion that ground rupture is unlikely at the subject property. Granular soils, such as sand, are susceptible to liquefaction in the event of future earthquakes. This may result in settlement or lateral deformation. Based on the regional earthquake risk (discussed further below) and depth to groundwater, it is our opinion that there is a relatively low risk of liquefaction induced settlement or lateral movement such that specific liquefaction design is not required.

We recommend that the future structures and improvements are designed to account for seismic shaking and ground motions. For seismic design at the site and in line with NZS 1170.5:2004 the corresponding design peak ground accelerations (PGA) for the site have been calculated from NZS 1170.5:2004 using the recommendations of the New Zealand Geotechnical Society as follows:

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a_h = Z R C

In which:

Z = base PGA called “Hazard factor” and is given by Table 3.3 and Figures 3.3 and 3.4 of NZS 1170.5:2004. Z = 0.13 for areas north of Auckland.

R = “Return period factor” and is given by Table 3.5 of NZS 1170.5:2004 (R = 1.0 for 500 year return period and R = 0.25 for a 25 year return period)

C = Site response factor called “Spectral shape factor” in NZS 1170.5:2004 and is based on the seismic site classification. We consider this site to be **Class C**, based on soil depth and therefore C = 1.33.

The design PGA at the site is given as:

ULS: a_h = 0.13 x 1.00 x 1.33 = 0.17 (i.e. PGA = 0.17 g)

SLS: a_h = 0.13 x 0.25 x 1.33 = 0.04 (i.e. PGA = 0.04 g)

Field Exploration and Subsurface Conditions

WGL carried out a shallow subsurface investigation consisting of two hand augers with shear vane testing and four Scala Penetrometer (Scala) tests within the approximate areas shown on the site plan below.



Figure 1: Approximate Subsurface Exploration Locations

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The hand augers were carried out to depths of 2.1 and 3.0 m. The subsurface material encountered in our hand auger investigation generally consisted of topsoil underlain by slightly clayey, slightly sandy silt with orange brown staining. Desiccation cracking was observed up to 0.7 m depth. Alternating layers of light grey slightly sandy silt, and light brown/orange brown moderately clayey silt were encountered from about 1.0 and 1.5 m. The measured undrained shear strengths generally all exceeded 100 kPa. The results of the individual Scala tests are shown below.

Groundwater was not encountered during our testing. The groundwater level may vary from the depth measured at the time of exploration, as a result of seasonal change, recent precipitation and/or irrigation practices.

Based on this, it is our opinion that the material encountered in our subsurface investigation is broadly consistent with published geologic mapping. The bore logs are presented as an appendix to this report and are written in general accordance with the New Zealand Geotechnical Society field classification guidelines (NZGS, 2005).

Scala Results

Scala blows/100mm at Lot 81, The Sanctuary, Mangawhai				
(m)	Scala 1 (SP1)	Scala 2 (SP2)	Scala 3 (SP3)	Scala 4 (SP4)
0.1	0	0	0	1
0.2	1	1	1	1
0.3	2	2	2	7
0.4	2	4	3	6
0.5	4	3	4	2
0.6	3	3	3	1
0.7	3	2	3	1
0.8	3	2	2	2
0.9	3	2	2	1

Expansive Soils

Expansive clay and silt soils are common in the wider Northland region and have the tendency to shrink and swell, particularly with seasonal fluctuations of soil water content. This behavior has implications for foundation design and surface structures and should be incorporated during foundation design.

Based on our visual and field assessment of the soils encountered onsite, and our experience in the area, we consider that the Expansive Site Class for this site is “M - moderate” - in accordance with AS 2870. Accordingly, the minimum footing depth is 600 mm below cleared ground level.

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Conclusions and Recommendations

It is our opinion that the proposed development is feasible from a geotechnical point of view, provided the recommendations presented in this report and standard development practices are incorporated in the design and construction of the project.

The soil underlying the site does **not** reach "good ground" in the upper metre as defined in NZS 3604 (2011) based on the Scala results as the requirement is 5 blows per 100 mm with a Scala Penetrometer; however the shear vane readings indicate a suitable bearing capacity is available for the proposed house, with readings generally greater than 100 kPa.

Earthworks

We recommend that the earthworks are undertaken by an experienced contractor familiar with the contents of this report and is experienced in these soils.

We consider that the vast majority of on-site soil material shall be suitable to be utilised as engineered fill supporting the proposed residential development. This is expected to primarily consist of silty clay soil and highly to completely weathered rock material. We recommend that all overlying topsoil and organic rich material is stripped and removed from the proposed cut areas prior to excavating the in-situ soil material. The excavated in-situ soil should be handled separately to the topsoil material. No topsoil should be used as, mixed with or remain below any engineered fill material. The cut excavation areas should be graded to allow the flow of stormwater away from the area. Suitable erosion and sediment control methodologies should be employed. Any sloping ground that is excavated into should be battered back to a slope of 3:1 (H:V). Once cut excavation are complete planting or regressing of the areas may have to be employed or long-term erosion and sediment control measures implemented. At this point we would envisage a maximum allowable slope of on-site engineered fill material being 3:1 (H:V), while imported engineered hardfill may be placed up to a maximum slope of 2:1 (H:V).

Concrete Foundation

We recommend a minimum 300 mm layer of compacted hard fill is placed for a waffle slab (i.e Firth Rib-Raft) which can be placed on top. The gravel raft should extend a minimum of 1 m beyond the building footprint. The construction of the gravel raft shall act as ground remediation so that the negative effects of expansive soil shall be negated so that a standard Rib-Raft foundation can be constructed upon it. This recommendation of ground remediation, covers specific engineering design input based on engineering principles and written by the Chartered Engineer authoring this report. Specific engineering design of the foundation is not required by a structural engineer, and therefore a PS1 not required. A waffle slab foundation design does not have any embedded structural elements and therefore the 600 mm embedment is not applicable in this instance. All topsoil and fill material must be removed before foundation construction commences.

We recommend the following regarding hard fill and its placement:

- Underslab hard fill comprising GAP40/GAP65, or an equivalent approved product, should be placed across the building platform in 100 mm lifts and compacted using appropriate compaction plant (e.g. a hand held or excavator mounted vibrating compaction plate), and brought up to the finished design levels. We would recommend a high quality gravel without too many fines.

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- For fills greater than 0.6 m. Every third layer of hard fill lift should be observed and tested by WGL to confirm that it has been placed to an appropriate specification. At this stage it is anticipated that compaction should be to achieve 95% of the maximum dry density (MDD) of the material, to be confirmed onsite using either a NDM (nuclear densometer) or Impact Hammer testing (Target 15 CBR).

A geotechnical ultimate bearing capacity of 300 kPa may be used in the design of a reinforced concrete slab or a waffle slab (i.e. Rib Raft). The ultimate bearing capacity should be available provided that the hard fill has been placed and certified according to the construction specification. We recommend WGL, or a qualified geotechnical engineer, inspect any excavations prior to the placing of any fill or foundation elements.

Pile Foundation

It is our opinion that wooden piles designed in accordance with NZS3604 (2011) will provide a suitable foundation for the proposed dwelling. We recommend all piles are H5 treated and have a minimum 125 x 125 mm dimensions. We recommend that anchor piles are embedded to a minimum depth of 0.9 m, and all other piles are embedded to a minimum depth of 0.6 m. Pile holes should be bored with a minimum diameter of 400 mm. These recommendations form specific engineering design input and therefore specific design b y a structural engineer is not required based on the propose embedment depths and allowed bearing capacity outlined below.

The piles should meet NZS3640 Class H5, and cut surfaces should be retreated with a protective coating in accordance with the manufacturer's recommendations. The pole length should be sufficient to extend to the design foundation level, and provide the stick-up length necessary for the super-structure and planned floor levels. Piles should not be spliced.

All bored holes should be inspected by WGL, or a qualified geotechnical engineer, prior to continuing with foundation construction

A geotechnical ultimate bearing capacity of 300 kPa should be available.

Stormwater

Section 12.10.8 of the KDC District Plan outlines that a site less than 5 hectares and located within an Overlay may create impermeable surfaces up to 10% of the total Lot area as a permitted activity. Creating impermeable areas exceeding this limit becomes a restricted discretionary activity. The proposed development does not exceed 10% impervious of the total Lot area, and therefore specific attenuation design and associated calculations are not required.

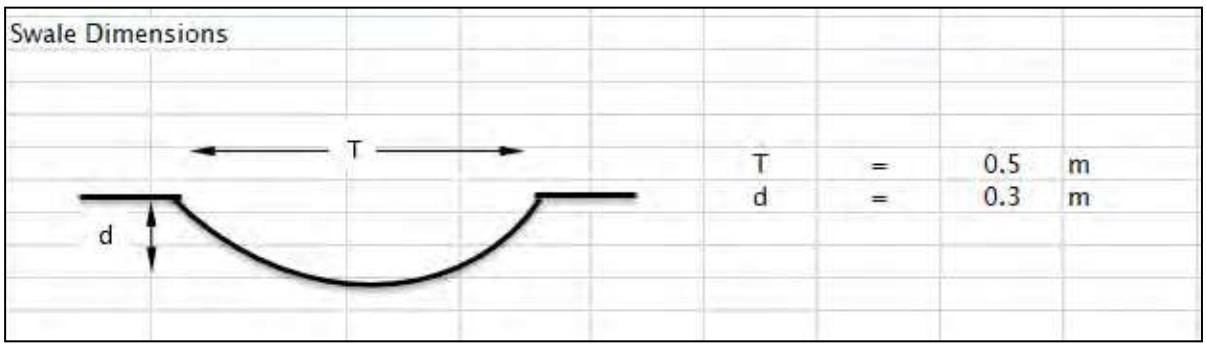
Drainage

We recommend that a swale drain or simple v-drain is constructed upslope of the proposed house site to help catch stormwater run-off from the upslope areas. The drain should have a minimum width of 500 mm and depth of 300 mm and discharge downslope clear of the proposed dwelling. The shape of the cut off drain does not matter, but for the purposes of outlining a solution a cross section a parabolic cross section is illustrated below. This shall have a depth of 300 mm and width of 500 mm. The swale should be situated towards the base of the cut and be laid with a minimum gradient of 1% towards a

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sump structure at the lowest point. The sump shall aid in filtering out any material which could block or fill up the stormwater pipes. The sump structure should be sized at minimum in line with a “Type-Two” sump illustrated in Figure 9 E1/AS1 of the NZBC which is attached as an appendix to this Letter. The sump should be routinely inspected for debris and sediment, and cleaned out if required.

The outflow from the sump should then be conveyed via a 150 mm closed pipe to proposed water tank overflow location. A proposed T-bar dispersal trench is proposed to be constructed which is considered suitable. The proposed driveway should be graded towards the downslope to disperse runoff via sheet flow which is considered the best suitable solution as collected and creating a point source only requires further dispersion.



LIMITATIONS

(i) This report has been prepared for the use of our client, Linda & David Kendall and their professional advisers and the relevant Regional Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

(ii) Assessments made in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Variations in ground conditions may exist between test locations and therefore have not been taken into account in the report. If variations are found during excavation or at foundation preparation stage WGL should be notified immediately so we can amend our recommendations.

(iii) This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 021 0399 385 or matt@wileygeotechnical.co.nz if you require any further information.

John Rowland

M Wiley

John Rowland, BEng, MEngNZ

Associate Geotechnical & Stormwater Engineer

Matt Wiley, CPEng, CMEngNZ

Principal Engineer

Attachments:

- Bore Logs

- E1/AS1 of the NZBC: Type-two Sump (Figure 9)

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WILEY GEOTECHNICAL LTD

BOREHOLE No. 1

SITE: Lot 81 The Sanctuary, Mangawhai

REF: 21076

Sheet 1 of 1

REDUCED LEVEL (RL)	INFERRED GEOLOGY	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL	CORRECTED VANE SHEAR STRENGTH (kPa) ●Peak Field Vane ○Remoulded Field vane 50 100 150	SCALA PENETROMETER BLOWS / 100 mm 5 10 15
TS		TOPSOIL dark brown, some topsoil fill							
		SILT slightly sandy, slight plasticity, slightly clayey, light brown with orange brown mottling, desiccation cracks to 0.7 m		1				200 200 93 ○ 162 ● 78 ○ 147 ●	
		at 1.3 m increase in mositure, plasticity and clay alternating layers of light grey slightly sandy silt, and light brown/orange brown moderately clayey silt		2				69 ○ 147 ● 57 ○ 123 ● 78 ○ 147 ●	
		Hole squeezing encountered - expansive soils						78 ○ 138 ● 87 ○ 141 ●	
		E.O.B: 3.0 m (target depth)		3				81 ○ 138 ●	
				4					
				5					

NOTES Groundwater was not encountered.
Hole squeezing encountered.
TS = Topsoil

LOGGED BY: CS & GW
DATE DRILLED: 17-May-21
DRILL METHOD 50 mm Hand Auger

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WILEY GEOTECHNICAL LTD

BOREHOLE No. 2

SITE: Lot 81 The Sanctuary, Mangawhai

REF: 21076

Sheet 1 of 1

REDUCED LEVEL (RL)	INFERRED GEOLOGY	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL	CORRECTED VANE SHEAR STRENGTH (kPa) ●Peak Field Vane ○Remoulded Field vane 50 100 150	SCALA PENETROMETER BLOWS / 100 mm 5 10 15
		TOPSOIL dark brown							
		SILT slightly clayey, slightly plastic, slightlty sandy, light brown with orange brown staining, desiccation cracks to 0.45 m						200 ●	
								200 ●	
		at 0.9 m increase in clay, increase in plasticity		1				81 ○ 138 ●	
		alternating clayey silts and sandy silts						48 ○ 105 ●	
		at 1.5 m hole squeezing, increase in moisture						63 ○ 105 ●	
				2				42 ○ 93 ●	
		E.O.B: 2.1 m (target depth)						84 ○ 132 ●	
				3					
				4					
				5					

NOTES Groundwater was not encountered.
Hole squeeze ar 1.5 m.

LOGGED BY: CS & GW
DATE DRILLED: 17-May-21
DRILL METHOD 50 mm Hand Auger

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Rahui Formation of the Waitemata Group

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Hawthorn Geddes
engineers & architects ltd

ENGINEERING SUITABILITY REPORT

Prepared For

SANCTUARY NORTH LTD

71 & 97 ROBERT HASTIE DRIVE

LOT 2 DP 430128



7 Selwyn Avenue
Whangarei 0110
09 438 7139

hg@hgcs.co.nz

21A The Grange
Warkworth 0910
09 283 3428

hawthorngeddes.co.nz

Civil, Structural, Environmental and Geotechnical Engineers
Registered Architects and Project Managers

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ENGINEERING SUITABILITY REPORT FOR SANCTUARY NORTH LTD

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Appendix A – Figures

Appendix B – Borehole Logs

Appendix C – Stormwater Calculations

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Report Prepared by:

Dean Botica
Stacey Gibson

Report Reviewed by:

Dean Botica

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1. Purpose

The purpose of this report is to provide a summary of the geotechnical investigation and advice on soil conditions for foundations, on-site effluent disposal, stability, stormwater management and traffic for the proposed 17-lot subdivision.

This report supersedes our previous reports and updates advice in relation to the culvert.

This report is suitable for a resource consent application.

2. Proposal

It is proposed to subdivide Lot 2 DP 430128 Robert Hastie Drive into 14 new residential Lots ranging in size from 5600m² to 1.42 ha, as shown by the Terra Consultants Scheme Plan – Option 9 dated 28 October 2018.

The subdivision will be undertaken in three stages. Stage 1 will create Lots 81 – 84 adjacent to Robert Hastie Dr. Stage 2 will create Lots 91 – 94 with access from existing ROW. Stage 3 will create Lots 85 to 90, which will require widening and sealing an existing ROW and constructing a new gravel ROW.

Access to the property from Cove Road is via Robert Hastie Drive, a privately owned Right of Way (ROW). Access to the individual Lots will be either directly from Robert Hastie Drive (Lots 81 – 84), existing Rights of Way (ROW) (Lots 91 – 94) or from the new Jointly Owned Access Lot (JOAL), which extends from an existing ROW from Lake View Drive. The existing ROW from Lake View Drive will be upgraded to comply with Kaipara District Council (KDC) engineering standards.

Earthworks for private access to the proposed house sites will be relatively minor with excavations of less than 1m. Earthworks to form level building platforms is unlikely to exceed 2m of excavation or 1m of fill.

Stormwater attenuation is proposed to be provided for the Lots and JOAL by utilising a low-lying area adjacent to the stream and the existing twin 900 dia culvert outlets under Lake View Drive. Additional attenuation storage is also to be constructed within an existing watercourse directly upstream of the proposed JOAL. These attenuation storage zones are shown on the attached Figure 1.

Stormwater treatment is to be provided via a grass filter strip within the base of the collection swale along the length of the JOAL.

The site is not connected to a reticulated water or wastewater network. Therefore, water supply will be from roof water collected in on-site tanks.

On-site effluent disposal will be required for each of the 14 new residential Lots.

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3. Site Description

Lot 2 DP 404128 is an irregular shaped property with an area of some 13.7ha. The site is currently grassed and planted with olive trees. Access to the property is from Robert Hastie Drive and the existing ROW from Lake View Drive.

The property has a prominent north-west to south-east trending ridge through the centre of the property. Either side of the central ridge are two small streams that converge near the eastern property boundary with Lake View Drive.

The area downstream of the confluence has been flooded by creation of a lake during the previous subdivision and is surrounded by relatively flat, low-lying land. The stream discharges to the lake via twin 900 dia culverts under Lake View Drive.

Slopes on the property vary from near flat to steeper than 3H:1V.

4. Geotechnical Investigation

4.1. Geological Setting

The geological map of the Mangawhai area, viewed online from the Institute of Geological and Nuclear sciences indicates the property is underlain by Pakiri formation of the Waitemata Group, consisting of *alternating thick-bedded, volcanic-rich, graded sandstone and siltstone.*

This description is consistent with soils encountered in hand augered boreholes.

4.2. Soil Investigation

A total of 22 boreholes were augered to depths of between 0.9-2.7m with shear strength testing at nominal 0.5m intervals and Scala penetrometer testing in non-cohesive materials.

Boreholes HA1 - HA7 and HA11 - HA14 were drilled on the central ridge area. These boreholes encountered a similar soil profile consisting of topsoil to a depth of up to 200mm underlain by stiff-to-very-stiff high plasticity silty clays to the bottom of each borehole. Shear vane results were greater than 70kPa and typically greater than 90kPa in these boreholes.

Groundwater was encountered in HA6 at 1.4m. Groundwater was not encountered in the other boreholes.

HA8 - HA10 were drilled on the slope along the southern property boundary. These boreholes encountered topsoil to 100mm to 200m depth. This was underlain by stiff-to-very-stiff sandy and silty clay to the base of each borehole. Shear vane results were variable in and between the boreholes. In HA8 shear vane results were more than 100kPa to a depth of 1.5m and varied from 30kPa to 80kPa below this depth.

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In HA9 shear vane results were more than 90kPa to a depth of 1m and varied from 65kPa to 78kPa below this depth. In HA11 shear vane results were 36kPa to 48kPa to a depth of 1.4m and below this the ground was too hard for the vane to penetrate.

Groundwater was encountered in HA8 at 1.7m and HA9 at 0.7m.

HA15 – HA22 were drilled on the slope along the northern property boundary adjacent to Robert Hastie Dr. Topsoil in this area was variable and generally less than 150mm thick. Topsoil was underlain by silt and clay with variable sand content.

The materials were typically highly plastic and very stiff. Shear vane strengths were typically above 100kPa apart from at less than 0.4m in HA16 and HA21. HA18 refused on hard material at 0.4m and the Scala penetrometer refused at this depth.

Logs of the boreholes and a site plan indicating the borehole locations are attached to this report.

5. Stability

We did not observe any widespread or deep seated instability on Lot 2. We did not observe terracettes on the property indicating creep movement.

Figure 1 attached to this report identifies areas assessed as suitable for building with adequate stability. These areas are all significantly more than the required 15m x 15m area required under the KDC District Plan. It is noted that other areas may be suitable for building but these areas will require specific engineering assessment.

Earthworks to form level building platforms may require excavations of up to 1.5m and fill of up to 1m. Cut batters shall be formed no steeper than 3H:1V to a maximum height of 2m or shall be retained. Fill may be placed on slopes of less than 5H:1V and shall have batters no steeper than 4H:1V to a maximum height of 1m or shall be retained.

Earthworks for the new access will be relatively minor other than the fill embankment for the steam crossing which will be up to 4.5m high. The cross sections attached indicate fill batters of up to 2H:1V. These batters are considered adequate for the proposed ROW.

Subject to the above recommendations it is our opinion in terms of Section 106 of the Resource Management Act that:

(a) the land in respect of which a consent is sought, or any structure on the land, is not and is not likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source; and

(b) any subsequent use that is likely to be made of the land is not likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage or inundation from any source; and

(c) sufficient provision has been made for legal and physical access to each allotment to be created by the subdivision.

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6. Foundations

6.1. Lots 81-92

Soils encountered in hand augered boreholes on these Lots were consistent with good ground as described in NZS 3604 except that it is expansive. We consider the property to be suitable for conventional slab on grade foundations.

Shallow foundations may be designed in accordance with NZS 3604 but shall have perimeter footings embedded a minimum of 600mm below cleared ground to allow for any potential shrink/swell movement due to seasonal soil moisture variations.

6.2. Lots 93, 94

Soils encountered in hand augered boreholes were not consistent with good ground as described in NZS 3604 due to low bearing capacity. These Lots will be suitable for shallow foundations subject to specific engineering design of foundations.

Due to variability of ground conditions we recommend further investigation for the building location at the time of building consent.

7. On-Site Effluent Disposal

Soils on the property have been assessed for on-site effluent disposal in terms of AS/NZS 1547:2012 and the Regional Water and Soil Plan (RWSP) for Northland.

There is a potential for increased nutrient levels and pollution of downstream waterways with faecal bacteria and viruses associated with effluent discharge. These potential effects can be mitigated by installation of an appropriate treatment system and which provides a suitable level of treatment and avoiding disposal areas close to water courses or surface water.

We have identified the soils on the proposed lots as very poorly drained clays, or Category 5 in terms of AS/NZS 1547:2000. All of the Lots adjoin one of the two streams. Furthermore, we have identified two areas with surface water due to poor surface drainage and/or groundwater seepage.

Based on these site constraints we consider the proposed Lots are not suitable for conventional septic tanks discharging to trenches. We recommend wastewater be treated to secondary treatment standard and discharge to pressure compensated drip irrigation (PCDI).

A design irrigation rate of 2.8mm/day is recommended for this soil type.

The sizing of the effluent disposal fields for our assessment is based on a maximum design occupancy of ten people to allow for short-term holiday periods without overly restricting future development. It is possible that actual disposal field requirements will be smaller.

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Table 1 below shows sizing for a potential dwelling on one of the new Lots:

Table 1: Summary of Effluent Field

Tank water (extra wastewater producing facilities)	200 litres/person/day
Maximum theoretical volume of effluent (10 people)	10 x 200 = 2,000 litres/day
Design irrigation rate (Cat 5 soil)	2.8 mm/day
Application area	2,000 ÷ 2.8 = 715 m^2
Reserve area required (30%)	215 m^2
Total area required	930 m^2

We estimate the discharge fields for each Lot are unlikely to exceed 1,000m^2 including a reserve area of 215m^2 (30%).

The attached Figure 2 shows areas unsuitable for disposal of secondary treated effluent. These areas have at least 15m separation from surface water identified by survey on site.

All of the proposed Lots have at least 1,500m^2 available for on-site effluent disposal with adequate clearance to surface water.

Table 2 below sets out the requirements of the RWSP permitted activity rules and shows how these rules can be complied with.

Table 2: RWSP Permitted Activity Rules

RWSP Permitted Activity Requirement	Means of Compliance
Separation between the lowest point of the disposal system and groundwater.	Groundwater was encountered more than 0.6m deep on all lots.
Minimum treatment levels for secondary treated effluent.	Recommended treatment levels less than rules.
Separation between the disposal and reserve area and groundwater bores.	No groundwater bores nearby.
Separation between the disposal and reserve and any surface water.	Separation distances at least 15m.
Distribution of the effluent	Recommend PCDI.
Design of the system in accordance with principles and procedures outlined in AS/NZS 1547:2000 'On-Site Domestic Wastewater Management'.	Soil categorised from AS/NZS 1547:2000 with appropriate DIR.

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No surface runoff of any contaminants from the disposal area.	Miligation measures referred to above to reduce contaminant loading and increase soil treatment/plant uptake.
No more than minor contamination of ground or surface water beyond the disposal system or boundary.	
The average volume of effluent discharged < 3m^3/day.	Expected to be single houses only, estimated as 2 m^3/day (10 persons).
The maximum volume of effluent discharge < 6m^3/day.	
A reserve area is allowed for and set aside.	Areas suitable for disposal sufficient for 30% reserve area shown on site plan.
Maintenance of the treatment and disposal system.	Building Consent should include a maintenance agreement for secondary treatment.

8. Stormwater Management

It is proposed to provide the required stormwater attenuation storage for the proposed Lots and JOAL of the development by utilising the existing low-lying area adjacent to the stream near the eastern site boundary and an additional storage area to be constructed on the watercourse upstream of the proposed JOAL.

All stormwater runoff from the proposed development including the upstream catchments will be collected within the ponds and controlled discharges will be to the lake downstream.

The stormwater design for the proposed development is based on attenuation of the post-development peak flow to pre-development rates. The design utilises attenuation storage to limit the additional runoff generated by the proposed development. The storage elements have been designed to address the runoff generated by a 20% AEP (5-year ARI) and a 1% AEP (100-year ARI) storm events for the entire catchment.

The site was modelled in HydroCAD adopting modified rational method and using rainfall data from table 6.7 of the KDC ES, for pre- and post-development.

8.1. Pre-Development

The catchment to the twin 900 dia culverts, in which the proposed development lies, is approximately 27ha. The catchment is currently grassed, planted with olive plants and there are a few stands of trees. The pre-development form has therefore been defined as 27ha of pervious area with a storage volume provided by the low-lying area adjacent to the stream. The soil on the site has been assessed as hydrologic soil group D and as a result the runoff coefficient of 0.67 has been used.

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The pre-development runoff rates for the outlet point of the existing catchment were defined by applying a 20% AEP and a 1% AEP storm event with critical durations associated with the twin culvert outlets. The resulting pre-development peak flows are calculated as 2.56m³/s for the 20% AEP storm event with a critical duration of 29min and as 6.38m³/s for the 1% AEP storm event with a critical duration of 37min. These are used as the upper limits for controlled runoff post-development peak flows.

It should be noted that for a 1% AEP storm event for the pre-development condition, the model indicates that the twin culverts head up and flows discharge across Lake View Drive with a depth of approximately 170mm. The twin culverts have a capacity of 4.28m³/s. The culverts currently provide some attenuation to the flows from the catchment.

8.2. Post-Development

The proposed development is within an area where the permitted pervious coverage is 10%. However, due to a number of the proposed lots being of significant size, and to reduce the attenuation volume requirement for the proposed development, the attenuation calculations allow for the catchment outside of the proposed subdivision to be developed to the maximum pervious coverage permitted, while the lots of the subdivision are to be limited to a maximum of 800m².

The re-use of stormwater provides a significant contribution to stormwater attenuation and therefore a percentage reduction of the required attenuation volume attributable to a house roof can be applied. It is considered that with a roof area of 300m² with a 25,000 litre roof tank, a 25% reduction of required attenuation volume is applicable. Therefore an impervious area reduction of 75m² has been applied for each proposed lot of the subdivision.

For the post-development form the catchment has been split into two sub-catchments (9.6ha to the upper sub-catchment and 17.4ha to the lower sub-catchment). The upper sub-catchment is the area upstream of the JOAL, mainly from the south. Attenuation storage for this sub-catchment is to be provided within the existing watercourse and discharge control via the proposed culvert outlet under the JOAL. The lower sub-catchment is the balance of the catchment, from the north, and will also receive attenuated flows from the upper sub-catchment. Discharge control will be provided via the existing twin culvert outlet.

The post-development form for the upper sub-catchment has been modelled as 1200m² of impervious area for the JOAL, 5280m² of impervious area for the development of the sub-catchment, which allows for 10% impervious coverage, lots limited to 800m², and a 75m² area reduction for water reuse for the 7 Lots (5 proposed as part of this subdivision) within the sub-catchment, and 8.90ha of pervious area. The post-development form for the lower sub-catchment has been modelled as 1.61ha of impervious area for the development of the sub-catchment, which allows for 10% impervious coverage, lots limited to 800m², and the 75m² area reduction for water reuse for the 15 Lots (9 proposed as part of this subdivision) within the sub-catchment, and 15.67ha of pervious area.

From topographical survey data provided for the subdivision it has been calculated that the low-lying area has an available attenuation storage volume of approximately 4700m³.

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Constructing the storage area upstream of the proposed JOAL is calculated to provide an additional 700m³ of attenuation storage. The proposal is to attenuate flows from the upper sub-catchment via a 600 dia culvert. Attenuation on the lower catchment will remain unchanged, utilising the existing twin culvert outlets.

The post-development peak flow from the catchment outlet is calculated as 2.43m³/s with a 32min critical duration for a 20% AEP storm event and as 6.29m³/s with a 39min critical duration for a 1% AEP storm event. As per the pre-development condition the 1% AEP storm event results in an overflow across Lake View Drive, however no increase in flow depth from the pre-development condition is expected. Flow across the JOAL is also expected for the 1% AEP storm event, not exceeding approximately 100mm. Refer to the attached HydroCAD report summary.

8.3. Treatment

The primary source of contaminants from the development is associated with the JOAL. Treatment to the runoff is proposed by utilising the base of a grassed collection swale along the length of the JOAL. The required length has been calculated in accordance with ARC TP10. Based on the existing ground slope of 8.6% and a base width of 1.0m, a 118.9m length is required to treat the associated runoff. Due to the slope of the swale, check dams will be required. There is more than adequate length in the swale to provide the required treatment and further treatment will be provided via the check dams and the attenuation area and lake downstream. Refer to the attached calculations.

9. Traffic and Access

9.1. Access from Cove Road

Access to the site from Cove Road has previously been assessed in some detail for the commercial development proposal immediately to the south of the main site entrance. The road junction created for the original subdivision has been constructed to the Austroads Figure 4.9(b) with a limiting capacity (movements) in the order of 80 vehicles per hour for a peak traffic of 400 vehicles per hour on Cove Road.

The present development, including recent further subdivision and the consented commercial development has the ultimate potential to generate in the order of 650 one way movements per day (maximum), with associated peak movements unlikely to exceed 65 vehicles per hour. The addition of 14 Lots will add an estimated 56 movements per day which remains well within the capacity of the primary junction design.

Robert Hastie Drive itself has been constructed to a carriageway width of 6m plus flush edging (total width of 6.5m) which is adequate to serve up to 50 Lots. The current number served (beyond the ROW on the north side immediately after the entrance gates) is 43 and the proposal would take this number to 57, potentially more depending on the ultimate development.

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Noting that the KDC standards require the edge restraint to not be considered as part of the carriageway width, despite it being flush and available, the access width proposed for the 57 Lots total is considered adequate on the basis that access remains controlled and not open to public use. Users are therefore familiar with the "constrained" carriageway width and the roads are likely to be subject to lower movements generally, which offsets the need to provide an increased carriageway width. Furthermore, Lot size is such that on-road parking is unlikely to have significant demand.

9.2. Lake View Drive and Junction with Robert Hastie Drive

Lake View Drive has an existing carriageway width of 5m plus edge restraint, and currently serves 12 Lots (including the one proposed for subdivision). The existing road width is 0.5m narrower than is required to serve that number of Lots (using the KDC definition outlined in note 2 of table 5.1). On the basis that the 5.0m width was previously accepted by KDC for the current number of Lots, and this places the access in the 7-30 Lot access range, extending the Lot numbers to less than this limit for this classification is considered to be acceptable. This being a maximum of 9 additional Lots onto the access at the existing carriageway width.

The existing junction radius of 10m complies with the requirements of the KDC engineering standards, and no amendment to the junction is required.

9.3. Lake View Drive to ROW

This is presently formed in metal and serves 5 Lots. The proposed subdivision requires that it serve 18 Lots and would require a 5.5m sealed width under the current KDC standards. However, noting the previously accepted width provision of 5m, and the access being from a network of roads constructed at 5.0m width (plus edge restraint), extending the provision of access at the 5m width is considered appropriate.

It is therefore recommended that a 5m sealed width plus edge restraint, as previously provided elsewhere on the development, is suitable to serve the proposed Lots.

The junction radius should be formed to the 10m radius of the KDC standards.

9.4. ROW

The existing ROW beyond Lakeview Dr is gravel surfaced and less than 5m wide. This ROW presently serves 5 Lots. The subdivision will result in the ROW serving a further 6 Lots or a total of 11 Lots. The KDC standards require a minimum carriageway width of 5.5m.

This access will be sealed with concrete edge restraints.

9.5. Proposed JOAL

This JOAL is proposed to serve 6 Lots. The KDC standards require this to be constructed to a width of 3m. It is proposed to form the JOAL with a total width of 4.5m plus shoulders, which exceeds the engineering standards.

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10. Earthworks

Earthworks for stages 1 and 2 will be minor requiring little more than stripping topsoil to create vehicle crossings. The total earthworks for each of these stages is unlikely to exceed 200m^3.

Earthworks for stage 3 will require widening an existing ROW by up to 1.5m over a length of some 60m and constructing a new ROW some 260m long. We have undertaken a preliminary design of the new access, attached as figures 3 – 7. Earthworks for this access will involve stripping topsoil and cut and fill of less than 0.4m over most of the ROW. Over a length of approximately 40m, up to 2.5m fill is proposed for a stream crossing.

Widening the existing ROW will involve less tan 50m^3 over an area of some 100m^2.

The total area of earthworks for the new access is estimated at less than 1,700m^2. The total volume of fill including pavements is estimated at 1,200m^3 for the JOAL. Most of the fill is associated with the embankment required for the stream crossing which will be some 950m^3. The remaining fill will be associated with construction of the ROW pavement.

The total volume of cut to fill on site will be less than 200m^3. In addition to this topsoil stripping is estimated at 275m^3, which will be used to construct bunds around the earthworks area or stockpiled and be respread on completion. The remaining earthfill for the stream crossing will be imported from off site.

The plant required to complete this work will involve trucks to import the fill, excavators and/or bulldozers to strip topsoil, muck out any unsuitable soils and spread the material and a padfoot roller for compaction.

The Riparian Management Zone (RMZ) for both the current and proposed Regional Water and Soil Plan (RWSP) will extend 10m from the stream. The volume of earthworks within the RMZ will be approximately 400m^3 with an area of 300m^2. Therefore resource consent is required from NRC for this earthworks.

This work will be undertaken over the summer earthworks season when the stream will not be flowing. It will be necessary to construct the culvert first during a period of fine weather when the stream is not flowing, to create a clean water diversion for the stream through the site.

We estimate the culvert will take no more than 1 week to construct. Bulk filling of the stream crossing is unlikely to take around 2 to 4 weeks. On completion of the bulk earthworks the fill batters will top soiled, grassed and planted. Sediment and erosion controls will remain until grass has adequately established.

Erosion and sediment controls during the earthworks will be undertaken in accordance with Auckland Council GD05. It is likely that this will require decanting earth bunds both above the earthworks to divert water and downstream to control sediment laden run-off.

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11. Culvert

A new culvert is proposed, which is approximately 20m long. The culvert will be laid entirely within the bed of the existing stream and there will be no stream diversion.

Under the operative Regional Water and Soil Plan the proposed culvert is a permitted activity under Rule 29.1.03 as:

a) The length of the culvert crossing does not exceed 25 metres and is of sufficient size to contain the bankfull flow.
b) There are no adverse flooding or erosion effects on any upstream, adjoining or downstream properties.
c) The works include the provision of an overland flowpath on the same property to ensure the safe passage of a 1 in 100 year period flood flow event.
d) During the disturbance of the bed, upstream flow up to a 1 in 5 year return period storm event, will be temporarily diverted around the area of disturbance except where the temporary damming of the water is undertaken in accordance with Rule 28.01.05.
e) The activity does not take place in any dune lake listed in Schedule E; or in an indigenous wetland; or a river, or section of river or lake, deemed to have outstanding values as shown in Appendix 18.
f) It is not regulated by Rule 27.03.02. It is noted that baffles will need to be installed within the culvert so as to not impede the passage of fish.
g) The activity complies with the Environmental Standards in 29.01.11. It is noted that baffles will need to be installed within the culvert so as to not impede the passage of fish.

In terms of the proposed Regional Plan permitted activity rules:

a) The contributing catchment is less than 300 hectares, and
b) the culvert length under the crossing parallel to river flow exceeds 10 metres, and
c) the culvert is designed in such a way with baffles that flow velocity will not impede fish passage during normal flow conditions, and
d) culvert approaches and fill placed on the river or lake bed will be free of organic matter, and
e) the total height of the crossing crest is:

   i. no more than 3.5 metres above the invert level of the culvert inlet, and

   ii. within the manufacturer's maximum height specifications for the culvert, and

   iii. below the river bank level unless it is necessary for a road and

f) the culvert will be installed so that the base is set a minimum of 25 percent and a maximum of 50 percent of the culvert diameter below the stream bed, and
g) records of structure design and flow calculations are attached to this report, and
h) the culvert is not in a significant wetland, an outstanding freshwater body or mapped Outstanding Natural Character Area, or Outstanding Natural Feature, or Site or Area of Significance to tangata whenua.

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It is proposed to install baffles within the pipe to promote fish passage. However, a resource consent is required as item b) does not comply with the PA rules and a resource consent is required.

12. Recommendations and Conclusions

12.1. Suitability of Building Sites

We have identified areas on all lots suitable for building residential dwellings. These areas are all larger than 150m2 as required in the KDC district Plan. All the identified building areas are more than 10m from boundaries with ROW and at least 3m from side boundaries. Apart from Lot 89 the building areas are at least 30m from any stream or water course.

These areas are assessed to have adequate stability but will require some earthworks to create level building platforms. Earthworks to form level building platforms may require excavations of up to 1.5m and fill of up to 1m. Cut batters shall be formed no steeper than 3H:1V to a maximum height of 2m or shall be retained. Fill may be placed on slopes of less than 5H:1V and shall have batters no steeper than 4H:1V to a maximum height of 1m or shall be retained.

Ground conditions within most of these areas are assessed to be good ground in accordance with NZS 3604 except they are expansive. Soil conditions in Lots 93 and 94 are variable. We recommend specific investigation for building consent on these lots to confirm foundations requirements for building consent.

12.2. On-Site Effluent Disposal

The following is a summary of the design requirements for building consent for on-site effluent disposal.

- The treatment system on each Lot shall consist of secondary treatment plant to surface covered pressure compensated dripper irrigation on slopes of less than 4H:1V or buried 100mm in topsoil if on slopes between 4H:1V and 2H:1V.

- Secondary treatment plants must be capable of maintaining a standard of treatment such that:
    a) the five day biochemical oxygen demand (BOD_5) of any sample taken is less than or equal to 20 grams per cubic metre; and

    b) the total suspended solids (TSS) concentration of any sample taken is less than or equal to 30 grams per cubic metre

- Specific design of the application area will be required for building consent.

- Disposal areas shall be based on a DIR of 3mm/day for secondary treated effluent to PCDI.

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- It is a permitted activity rule in the RWSP (Regional Water and Soil Plan) that a maintenance contract is entered into for the treatment and disposal system.
- No disposal within 15m of surface water including the areas identified as unsuitable on the attached plan.
- Disposal fields on slopes steeper than 4H:1V shall have an additional 10m buffer zone between the lower extent of the field and any surface water.
- The existing culvert discharging onto proposed Lot 83 will require piping to at least 15m downslope of the proposed disposal field.

Subject to these recommendations the proposed Lots will be suitable for on-site effluent disposal.

We confirm that all proposed lots have 1,500m^2 suitable for on-site effluent disposal subject to the above recommendations as required by the KDC District Plan.

12.3. Stormwater Management

The stormwater management design for the proposed development, as outlined above, meets the requirements of the KDC ES 2011 and AC TP10 in relation to treatment and attenuation of post-development flows.

12.4. Traffic and Access

The existing sealed access widths and junctions are considered appropriate for the proposed development. No adaptations are necessary in providing for the proposed lots.

A 5.0m sealed width plus shoulders is considered suitable for the upgraded length of ROW.

The proposed JOAL will be formed to a width of 4.5m plus 0.25 shoulders which meets the requirements of the KDC engineering standards.

13. Limitation

Recommendations and opinions in this report are based on data from the investigation described herein. The nature and continuity of subsoil conditions away from the boreholes is inferred and it is possible that actual conditions could vary from those assumed. Should subsoil conditions vary from those described in this report, it is essential that Hawthorn Geddes engineers and architects ltd be contacted to confirm the applicability of the recommendations.

This report has been prepared solely for the benefit of our client Sanctuary North Ltd and the Kaipara District Council in relation to the resource consent application for which this report has been prepared.

The comments in it are limited to the purpose stated in this report. No liability is accepted by Hawthorn Geddes engineers & architects ltd in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk.

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Appendix A – Figures

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NOTE:
SITE INFORMATION ADAPTED FROM SURVEY DRAWING PROVIDED BY TERRA CONSULTANTS REFERENCE SC106
ALL INFORMATION MUST BE CONFIRMED ON SITE
TO BE READ IN CONJUNCTION WITH HAWTHORN GEDDES ENGINEERS & ARCHITECTS LTD REPORT REFERENCE 10737

Key

- HA — Hand augered borehole locations
- Attenuation storage zone
- Existing stream
- Area suitable for building *(Identified building sites subject to consent notice)*
- Areas where building and wastewater suitability overlap

LOT 50 DP 430128
LOT 53 DP 430128
LOT 54 DP 430128
LOT 55 DP 430128
LOT 56 DP 430128
LOT 1 DP 430128
LOT 48 DP 430128
LOT 46 DP 430128
LOT 47 DP 430128
LOT 57 DP 404128
LOT 58 DP 404128
LOT 59 DP 404128
LOT 60 DP 404128

LOT 84
LOT 85
LOT 83
LOT 86
LOT 87
LOT 82
LOT 81
LOT 88
LOT 80
LOT 92
LOT 91
LOT 90
LOT 89
LOT 93
LOT 94

HA1 1270m²
HA2
HA3 1170m²
HA4
HA5
HA6 1380m²
HA7 1010m²
HA8 1790m²
HA9 1050m²
HA10
HA11 1380m²
HA12 1550m²
HA13 1430m²
HA14 900m²
HA15 1080m²
HA16 1340m²
HA17
HA18
HA19
HA20 1890m²
HA21 1070m²
HA22
HA23

SW collection & treatment swale along length of JOAL - sealed access

2 x existing 900Ø culverts

Attenuation storage zone to southern sub-catchment

Attenuation storage zone

USE WRITTEN DIMENSIONS - DO NOT SCALE FROM DRAWING

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SITE PLAN
SCALE - 1:2000

Hawthorn Geddes
engineers & architects ltd
7 Spikyn Avenue, Whangarei 0110, Phone: 09 438 7139, hg@hgea.co.nz
Unit 21a, The Grange, Warkworth 0910, Phone: 09 283 3428, www.hawthorngeddes.co.nz

CLIENT: DUCK TRUST
PROJECT: SUBDIVISION SUITABILITY
97 & 71 ROBERT HASTIE DRIVE, MANGAWHAI
DRAWING: SUITABLE BUILDING AREAS PLAN

PROJECT NO: 10737
SHEET: Figure 1

24/05/2019 11:27:32 AM K:\10737 Duck Trust Subdivision Suitability\Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 FIG from TOPO.dwg

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N

NOTE
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Key

- Area not suitable for effluent disposal
- Existing stream
- Effluent Disposal Areas (1500m²)
- Indicative 15x15m building platform

LOT 50 DP 430128
LOT 53 DP 430128
LOT 54 DP 430128
LOT 55 DP 430128
LOT 56 DP 430128
LOT 57 DP 404128
LOT 58 DP 404128
LOT 59 DP 404128
LOT 60 DP 404128
LOT 49 DP 430128
LOT 48 DP 430128
LOT 47 DP 430128
LOT 1 DP 430128

LOT 84
LOT 85
LOT 83
LOT 86
LOT 82
LOT 87
LOT 81
LOT 92
LOT 88
LOT 80
LOT 91
LOT 90
LOT 89
LOT 93
LOT 94

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SITE PLAN
SCALE - 1:2000

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engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
Unit 21a, The Grange
Warkworth 0910
Phone: 09 293 3428
www.hawthorngeddes.co.nz

CLIENT: DUCK TRUST
PROJECT: SUBDIVISION SUITABILITY
97 & 71 ROBERT HASTIE DRIVE, MANGAWHAI
DRAWING: WASTEWATER DISPOSAL PLAN

PROJECT No: 10737
SHEET: Figure 2

24/05/2019 11:28:28 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 170731 SS from TOPO.dwg

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Proposed hammer-head turning area

NOTE
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ENGINEERS & ARCHITECTS LTD REPORT REFERENCE (073)

N

Proposed new metal road
(Ch 80 - 320) 6m wide

Existing sealed road

Proposed 600Ø culvert,
refer to Figure 7 for details

Widen existing metal road (Ch 0 - 80) to 5.0m
(area to be widened shown hatched)

CD01
Fig 6

CD02
Fig 6

Watercourse

Existing metal road

SITE PLAN
SCALE - 1:1000

Culvert location

DATUM: 6.00

| | | |

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SCALE @A3 1:200

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engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7119
hg@hgea.co.nz
Unit 21b, The Grange
Warkworth 0910
Phone: 09 253 1428
www.hawthorngeddes.co.nz

CLIENT	SANCTUARY NORTH
PROJECT	PROPOSED SUBDIVISION
	LOT 2 DP 430128
DRAWING	CROSS SECTIONS: CH 20 - 160
PROJECT No	10737
SHEET	Figure 4

24/03/2016 11:29:29 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Harris Drive Mangawhai\10737 181129 PROPOSED ROAD.lyt.dwg

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engineers & architects ltd
7 Scilwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgea.co.nz

Unit 21d, The Grange
Warkworth 0910
Phone: 09 283 3438
www.hawthorngeddes.co.nz

SCALE @A3 1:200

JOB: SANCTUARY NORTH
PROJECT: PROPOSED SUBDIVISION
LOT 2 DP 430128
DRAWING: CROSS SECTIONS: CH 180 - 320

JOB No: 10737
SHEET: Figure 5

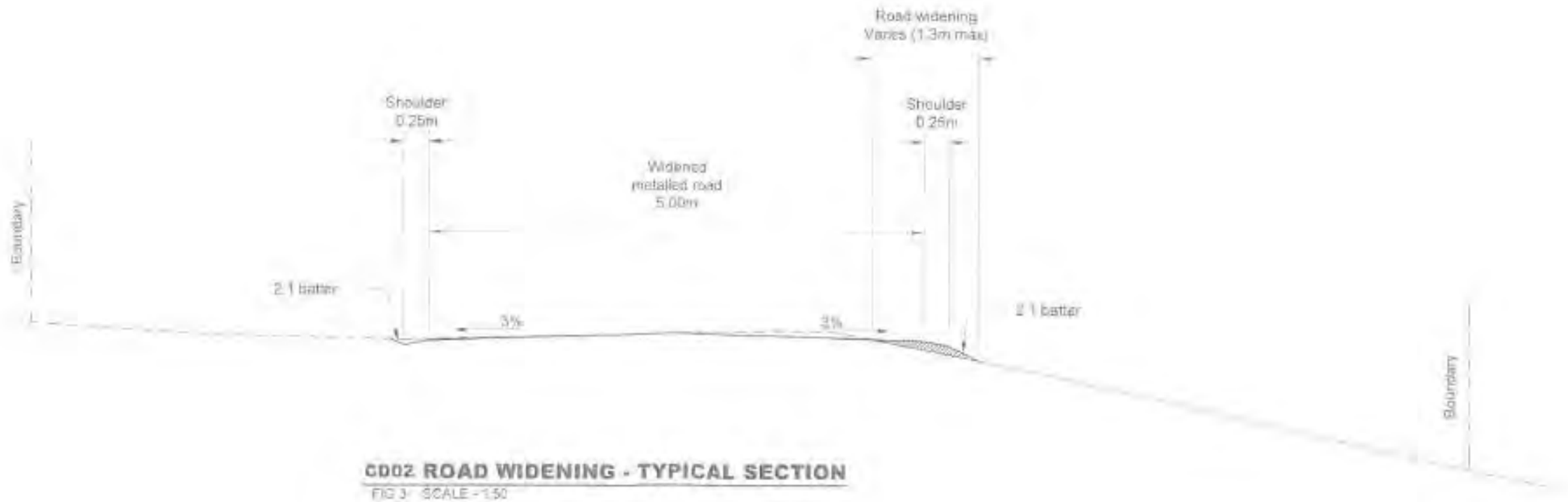
24/05/2019 11:30:51 AM K:\10737 Duck Trust Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD (4.dwg

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CD01 PROPOSED NEW ROAD - TYPICAL SECTION

FIG 2 SCALE - 1:50



CD02 ROAD WIDENING - TYPICAL SECTION

FIG 3 SCALE - 1:50

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Hawthorn Geddes
engineers & architects ltd
7 Sirkeyn Avenue
Whangarei 0110
Phone: 09 438 7138
hg@hgea.co.nz

Unit 21b, The Grange
Waiheke 0810
Phone: 09 265 3408
www.hawthorngeddes.co.nz

JOB:	SANCTUARY NORTH
DESIGN:	PROPOSED SUBDIVISION
	LOT 2 DP 430128
DRAWING:	TYPICAL ROAD DETAILS
PROJECT No:	10737
SHEET:	Figure 6

24/05/2019 11:30:27 AM K:\10737 Dark Trust Subdivision Suitability Lots 1 & 2 Kotare Heights Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg

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NOTE
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ENGINEERS & ARCHITECTS LTD REPORT REFERENCE 10737

N

Existing watercourse

Stone apron outlet protection, 200mm - 400mm rock spalls, 0.6m depth

Wingwall outlet

600Ø culvert
20.5m long

Proposed new road

Wingwall inlet

Existing watercourse

SITE PLAN
SCALE - 1:500

Outlet protection apron
9.10m

Pipe invert to be 150mm - 300mm below the base of watercourse

DATUM: 4.00

PIPE SIZE & GRADIENT	20.5lm of 600mm ø Reinforced Concrete @ 2.41%																			
INVERT LEVEL																				
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95

LONG SECTION
SCALE - 1:250

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engineers & architects ltd
7 Selwyn Avenue
Whangarei 0110
Phone: 09 438 7139
hg@hgea.co.nz

Unit 21a The Grange
Warkworth 0910
Phone: 09 283 3428
www.hawthorngeddes.co.nz

CLIENT: SANCTUARY NORTH
PROJECT: PROPOSED SUBDIVISION
LOT 2 DP 430128
DRAWING: PROPOSED CULVERT

PROJECT No: 10737
SHEET: Figure 7

14/05/2019 11:31:13 AM K:\10737 Duck Thier Subdivision Suitability Lots 1 & 2 Robert Hastie Drive Mangawhai\10737 181129 PROPOSED ROAD v4.dwg

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Appendix B – Borehole Logs

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA1

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On building platform on proposed Lot 98

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets; dark brown; moist	Groundwater Not Encountered	0
				Silty CLAY; light brown; moist; high plasticity; stiff; moderately hard in auger		
		SV = 143 / 70 kPa (GEO287)				
1		SV = 139 / 63 kPa (GEO287)				1
		SV = 119 / 57 kPa (GEO287)				
				1.7m Becoming mottled grey		
		SV = 109 / 55 kPa (GEO287)		1.80 EOH: 1.80m		
2						2
3						3

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
Standing Water Level
Water Out flow
Water In flow

Produced with Core-GS

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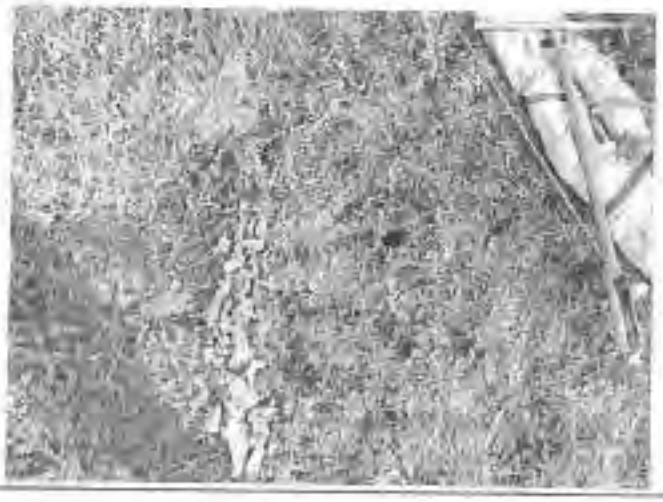
LOG OF HAND AUGER

HA2

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On effluent disposal field on proposed Lot 98

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, rootlets, easy to auger	Groundwater not encountered	
				0.20		
		SV = 149 / 50 kPa (GEO952)		Silty CLAY (CH) grey speckled orange and white, moist, highly plastic, moderately hard to auger, very stiff		
		SV = 98 / 47 kPa (GEO952)		0.90 EOH 0.90m		
1						
2						
3						
4						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
Standing Water Level
Water Out flow
Water In flow

Produced with Core-GS

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA3

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On effluent disposal field on proposed Lot 97

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Silty clay TOPSOIL with rootlets, dark brown, saturated	Groundwater Not Encountered	
				0.20 Silty CLAY, light brownish grey, wet, high plasticity, stiff, moderately easy to auger.		
		SV = 98 / 51 kPa (GEO287)				
1		SV = 103 / 55 kPa (GEO287)		0.90 EOH: 0.90m 0.9m: Becoming mottled orange.		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

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KDC - Approved Building Consent Document - BC210441 - Pg 66 of 336 - 30/08/2021 - ComplyNZ

Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA4

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17
COMPLETED DATE 12/07/17
COORDINATES
LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On boundary between proposed building platforms Lots 97 & 96

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, rooted, easy to auger	Groundwater Not Encountered	0
		SV = 93 / 12 kPa (GEO952)		0.20 Silty CLAY (CH), dark greyish orange, moist, highly plastic, stiff, moderately hard to auger 0.2m becoming saturated 0.4m becoming more orange and moist		
1		SV = 79 / 37 kPa (GEO952)		0.6m becoming wet 0.8m becoming greyish white with orange streaks		1
		SV = 113 / 31 kPa (GEO952)		1.20 Clayey SILT (MH), greyish white with orange streaks, moist to wet, highly plastic, very stiff, moderately hard to auger.		
2		SV = 106 / 25 kPa (GEO952)		1.80 EOH 1.80m		2
3						3

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

Standing Water Level
Water Out Flow
Water In Flow

Produced with Core GS

KDC - Approved Building Consent Document - BC210441 - Pg 67 of 336 - 30/08/2021 - ComplyNZ

Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA5

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field, proposed Lot 96

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0		SV = 130 / 45 kPa (GEO287)	TS	Clayey silt TOPSOIL with rootlets, dark brown, moist, moderately easy to auger	Groundwater Not Encountered	0
				0.20		
				Silty CLAY, dark brown mottled orange, moist, high plasticity, stiff, moderately hard to auger		
				0.5m: Becoming light brown mottled grey		
1		SV = 85 / 45 kPa (GEO287)		EOH @ 0.90m		1
2						2
3						3

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA6

CLIENT David Nathan
PROJECT NUMBER 10737
START DATE 12/07/17 COMPLETED DATE 12/07/17
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On building platform on proposed Lot 95

PROJECT Duck Trust
PROJECT LOCATION Robert Hastie Drive, Mangawhai
COORDINATES
LEVEL 0.00

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL: blackish brown, wet, rootlets, easy to auger		
				0.20		
		SV = 158 / 65 kPa (GEO952)		Silty CLAY (CH) greyish orange, moist, highly plastic, very stiff, moderately hard to auger.		
1		SV = 70 / 34 kPa (GEO952)				
		SV = 74 / 28 kPa (GEO952)		1.6m hole squeezing	12/07/2017	
2		SV = 104 / 23 kPa (GEO952)				
				2.20		
		SV = UTP (GEO952)		Clayey SILT (MH) brownish grey, moist, highly plastic, very stiff, hard to auger (MUDSTONE)		
		SV = UTP (GEO952)		2.50 EOH: 2.50m		
3						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 12:00:00 a.m	1.40	Static Water Level	

REMARKS

Target depth reached

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA7

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On effluent disposal field, proposed Lot 91

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, dark brownish grey, saturated, easy to auger		
				0.15 Silty CLAY, yellow brown speckled grey, moist, high plasticity, stiff, moderately hard to auger	Groundwater Not Encountered	
		SV = 165 / 79 kPa (GEO287)				
				0.5m Becoming grey mottled orange		
		SV = 95 / 44 kPa (GEO287)		0.80 EOH: 0.80m		
1						
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

Produced with HoleBase SE

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA8

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On proposed effluent disposal field, proposed Lot 92

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets; dark brownish black; saturated; easy to auger.		
		SV = 132 / 63 kPa (GEO287)		Sandy clayey SILT; dark grey mottled orange; wet high plasticity; stiff; moderately easy to auger.		
				0.40 Silty sandy CLAY; orange brown; moist; high plasticity; stiff; moderately hard to auger.		
1		SV = 114 / 48 kPa (GEO287)				
		SV = 111 / 52 kPa (GEO287)				
				1.70 Clayey SILT; orange brown mottled grey; saturated; dilatative; low plasticity; firm; very easy to auger.	12/07/2017	
2		SV = 29 / 13 kPa (GEO287)				
		SV = 79 / 35 kPa (GEO287)				
				2.70 EOH 2.70m		
		SV = 81 / 32 kPa (GEO287)				
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 12:00:00 a.m.	1.70	Static Water Level	

REMARKS

Target depth reached

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA9

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 12/07/17 COMPLETED DATE 12/07/17
COORDINATES LEVEL 2.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field, proposed Lot 93

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL, blackish brown, wet, easy to auger, rootlets		
				0.20		
		SV = 121 / 35 kPa (GEO952)		Sandy silty CLAY (CH) greyish yellow, moist, highly plastic, very stiff, moderately hard to auger		
1		SV = 93 / 37 kPa (GEO952)			12/07/2017	
		SV = 78 / 28 kPa (GEO952)		1.3m : becoming easy to auger		
				1.60 EOH @ 1.60m		
2		SV = 85 / 16 kPa (GEO952)				
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
12/07/2017 2:00:00 p.m.	0.70	Static Water Level	

REMARKS

Hole abandoned at 1.6 due to very heavy rain

SYMBOLS

Standing Water Level
Water Out flow
Water In flow

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LOG OF HAND AUGER

HA10

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CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field on proposed lot 94

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Clayey silt TOPSOIL, dark brown, moist, easy to auger		
		SV = 98 / 40 kPa (GEO287)		Silty CLAY (CH) with minor fine sand, brownish grey, moist, high plasticity, stiff, easy to auger		
				0.6m: Becoming light yellowish grey		
1		SV = 36 / 24 kPa (GEO287)		1.0m: Wet		
		SV = 48 / 19 kPa (GEO287)		1.60 Clayey SILT (ML): greyish brown, moist, low plasticity, friable, hard, hard to auger	Groundwater not encountered	
2		SV = UTP (GEO287)		2.10 Sandy SILT (ML) with trace clay, grey, dry, low plasticity, friable, hard, very hard to auger		
		SV = UTP (GEO287) SV = UTP (GEO287)		2.40 EOH: 2.40m 2.4m: Auger spinning, very poor recovery		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Auger refusal at 2.4m

SYMBOLS

- Standing water level
- Water Out Flow
- Water In Flow

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LOG OF HAND AUGER

HA11

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CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hoste Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17 COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION Southern corner of proposed effluent disposal field on proposed lot 86

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0		SV = 141 / 44 kPa (DR4604)		0.10 Clayey silt TOPSOIL with rootlets, black, moist, easy to auger Silty CLAY (CH), light brown/ish orange, moist, high plasticity, very stiff, moderately hard to auger 0.3m Becoming hard to auger	Groundwater Not Encountered	
1		SV = 150 / 67 kPa (DR4604)		0.6m Becoming pinkish orange		
		SV = 141 / 53 kPa (DR4604)		1.0m Becoming wet and grey mottled orange		
2		SV = 153 / 65 kPa (DR4604)		1.50 EOH: 1.50m		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
Standing Water Level
Water Out flow
Water in flow

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LOG OF HAND AUGER

HA12

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On boundary between proposed building platforms and effluent fields Lots 87 & 88

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets, brownish black, moist, easy to auger.		
				Silty CLAY (CH), light brownish grey, moist, high plasticity, very stiff, easy to auger.		
		SV = 164 / 56 kPa (DR4604)		0.3m: Becoming hard to auger.		
		SV = 123 / 62 kPa (DR4604)		0.6m: Becoming greyish orange.		
1		SV = 114 / 50 kPa (DR4604)				
		SV = 120 / 58 kPa (DR4604)		1.60 EOH: 1.60m		
2						
3						

Groundwater Not Encountered

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA 13

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CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION Bteween prooosed building platform and effluent disposal field Lot 89

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL: dark brown, moist, easy to auger.		
				Silty sandy CLAY (CH), greyish brown mottled orange brown, moist, high plasticity, very stiff, moderately hard to auger.		
		SV = 155 / 85 kPa (GEO287)				
1		SV = 111 / 59 kPa (GEO287)				
		SV = 95 / 48 kPa (GEO287)		1.5m: Becoming brown/grey.		
		SV = 111 / 52 kPa (GEO287)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached.

SYMBOLS

- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA14

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CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17 COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION Bteween proposed building platform and effluent disposal field Lot 90

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0				Clayey silt TOPSOIL with rootlets, blackish brown, wet, very easy to auger	Groundwater Not Encountered	
				0.15 Silty CLAY (CH), light greyish brown, moist, high plasticity, very stiff, easy to auger		
		SV = 111 / 81 kPa (DR4604)		0.3m Becoming moderately hard to auger		
		SV = 98 / 109 kPa (DR4604)		0.6m Becoming wet		
1				1.0m Becoming light grey mottled orange		
		SV = 67 / 26 kPa (DR4604)		1.3m Becoming soft		
		SV = 82 / 44 kPa (DR4604)		1.80 EOH 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

Target depth reached

SYMBOLS

Standing Water Level
Water Out flow
Water In flow

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LOG OF HAND AUGER

HA15

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hassil Drive Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 85

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Clayey silt TOPSOIL with rootlets, dark brown, moist, easy to auger		
				0.50 Silty CLAY (CH), orange brown mottled dark brown, moist, high plasticity, very stiff moderately hard to auger		
		SV = 182 / 75 kPa (GEO287)		0.5m: Becoming orange brown with minor fine sand		
1		SV = 166 / 68 kPa (GEO287)				
		SV = 130 / 80 kPa (GEO287)		1.5m: Becoming light greyish brown		
		SV = 122 / 52 kPa (GEO287)		1.80 Clayey sandy SILT (ML), light greyish brown mottled orange brown, moist, stiff, low plasticity, easy to auger	21/07/2017	
2				2.0m: Squeezing and pole progression		
		SV = 65 / 52 kPa (GEO287)		2.30 EOH 2.30m 2.3m: Hole abandoned due to squeezing		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
21/07/2017 12:00:00 p.m	1.90	Inflow	

REMARKS
Abandoned due to squeezing

SYMBOLS
Standing Water Level
Water Outflow
Water Inflow

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LOG OF HAND AUGER

HA16

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On proposed building platform Lot 84

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey silt TOPSOIL with rootlets, brown, saturated, very easy to auger.		
				Sandy clayey SILT (MH), brown, wet, high plasticity, very easy to auger.		
		SV = 36 / 4 kPa (DR4604)		0.70		
		SV = 161 / 73 kPa (DR4604)		Sandy clayey SILT (ML), grey mottled orange, wet, low plasticity, very stiff, moderately hard to auger.		
1				1.0m: Becoming more orange and less sandy.		
		SV = 117 / 67 kPa (DR4604)				
		SV = 128 / 62 kPa (DR4604)		1.80 EOH 1.80m		
2	2					
	2					
	3					
	3					
	4					
	6					
	7					
	9					
	9					
3						

Groundwater Not Encountered

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA17

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 54

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	0.10 Clayey sandy silt TOPSOIL with rootlets, brown, saturated, very easy to auger	Groundwater not encountered	
		SV = 139 / 6 kPa (GEO287)		Clayey sandy SILT (ML), dark grey mottled orange brown, saturated, very stiff, low plasticity, easy to auger		
		SV = 127 / 55 kPa (GEO287)		0.30 0.40 Sandy clayey SILT (ML), whitish grey mottled light brown, moist, low plasticity, very stiff, friable, fine sand, moderately hard to auger		
		SV = 174 / 76 kPa (GEO287)		Silty CLAY (CH) with trace fine sand, orange brown mottled grey, moist, high plasticity, very stiff, moderately hard to auger 0.5m High sand content 0.6m Becoming light grey mottled light brown		
1		SV = 143 / 63 kPa (GEO287)		1.2m Becoming saturated		
	20 15 5 5 6	SV = UTP (GEO287)		1.30 Silty SAND (SP), orange brown, moist, fine sand, very dense 1.60 EOH 1.60m 1.5m Auger spinning, very poor recovery 1.6m Auger refusal		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS
Standing Water Level
Water Out flow
Water In flow

Post-Level with Core 68

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LOG OF HAND AUGER

HA18

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 83

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0	20		TS	Clayey silt TOPSOIL with rootlets, dark greyish brown, saturated, very easy to auger	Groundwater Not Encountered	0
				0.25		
				Sandy SILT (ML) with minor clay, dark grey mottled orange, saturated, low plasticity, hard, hard to auger.		
				0.35		
				Silty SAND (SP), dark orange, dry, hard, very dense		
				0.45		
				EOH: 0.45m		
				0.6m Auger spinning, no recovery		
1						1
2						2
3						3

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

Standing Water Level
Water Out flow
Water In flow

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LOG OF HAND AUGER

HA19

CLIENT David Nathan
PROJECT NUMBER 10737
START DATE 19/07/17 COMPLETED DATE 19/07/17
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed building platform Lot 82

PROJECT Dock Trust
PROJECT LOCATION Robert Hastie Drive, Mangawhai
COORDINATES
LEVEL 0.00

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0		SV = 174 / 55 kPa (GEO287)	TS	0.10 Silty sandy TOPSOIL with rootlets, dark brown, moist, easy to auger.	Groundwater Not Encountered	
				Sandy SILT with some clay, dark brown, moist, low plasticity, very stiff, easy to auger.		
				0.50		
		SV = 174 / 79 kPa (GEO287)		Sandy silty CLAY, orange brown, moist, high plasticity, very stiff, moderately hard to auger.		
				0.60 Trace stone		
1		SV = 174 / 78 kPa (GEO287)		1.1m Becoming mottled grey		
		SV = 169 / 63 kPa (GEO287)				
2		SV = 119 / 55 kPa (GEO287)				
		SV = 111 / 48 kPa (GEO287)				
		SV = 82 / 38 kPa (GEO287)		2.70 EOH: 2.70m		
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
Standing Water Level
Water Out flow
Water In flow

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LOG OF HAND AUGER

HA20

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 82

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0			TS	Silty sandy clay TOPSOIL with rootlets, dark brown, wet, easy to auger	Groundwater Not Encountered	
				0.15 Clayey SILT (MH) with minor fine sand, orange brown, moist, high plasticity, very stiff, moderately hard to auger.		
		SV = 190 / 60 kPa (GEO287)		0.50 Silty CLAY (CH) with trace fine sand, orange brown mottled light grey, moist, high plasticity, very stiff, moderately hard to auger.		
1		SV = 147 / 75 kPa (GEO287)				
		SV = 79 / 33 kPa (GEO287)		1.3m: Becoming light grey		
		SV = 114 / 29 kPa (GEO287)		1.80 EOH: 1.80m		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

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LOG OF HAND AUGER

HA21

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 19/07/17 COMPLETED DATE 19/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY CP
HOLE LOCATION On proposed effluent disposal field Lot 8!

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
0				0.05 Clayey silt TOPSOIL with rootlets, brown, wet, easy to auger		
		SV = 70 / 35 kPa (DR4604)		Silty sandy CLAY (FILL) with trace gravels, yellowish orange mottled grey, moist, high plasticity, bluish grey gravels MPS 6mm		
				0.40 Clayey sandy SILT (MH), greyish yellow, moist, high plasticity, stiff, moderately hard to auger		
		SV = 147 / 70 kPa (DR4604)		0.7m Breaking wet		
1		SV = 138 / 56 kPa (DR4604)		1.2m Light whitish yellow		
		SV = 123 / 53 kPa (DR4604)				
2		SV = 138 / 53 kPa (DR4604)				
		SV = 123 / 44 kPa (DR4604)				
		SV = 114 / 32 kPa (DR4604)		2.70 EOH: 2.70m	Groundwater Not Encountered	
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS
Target depth reached

SYMBOLS
Standing Water Level
Water Out Flow
Water In Flow

Produced with CoreJSB

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Hawthorn Geddes engineers & architects ltd

LOG OF HAND AUGER

HA22

CLIENT David Nathan
PROJECT Duck Trust
PROJECT NUMBER 10737
PROJECT LOCATION Robert Hastie Drive, Mangawhai
START DATE 21/07/17 COMPLETED DATE 21/07/17
COORDINATES LEVEL 0.00
DRILLING CONTRACTOR HGEA
DRILLING METHOD 50mm handauger
LOGGED BY WNM
HOLE LOCATION On proposed effluent disposal field Lot 81

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
			TS	0.10 Silty clay TOPSOIL with rootlets, dark brown, wet, easy to auger.	Groundwater Not Encountered	
				0.20 Sandy SILT (ML), whitish grey, moist, friable, low plasticity, hard, very hard to auger.		
				Clayey sandy SILT (ML), dark grayish brown, saturated, fine sand, low plasticity, 0.35 very easy to auger.		
		SV = UTP (GEO287)		Silty SAND (SP), orange, moist, very dense, very hard to auger. 0.50		
				Silty sandy CLAY (CH), whitish grey mottled orange, moist, very stiff, high plasticity, moderately hard to auger.		
1		SV = 106 / 52 kPa (GEO287)		0.90 EOH: 0.90m		
				0.9m: Abandoned at 0.90m due to heavy rain.		
2						
3						

PHOTO / SKETCH

WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

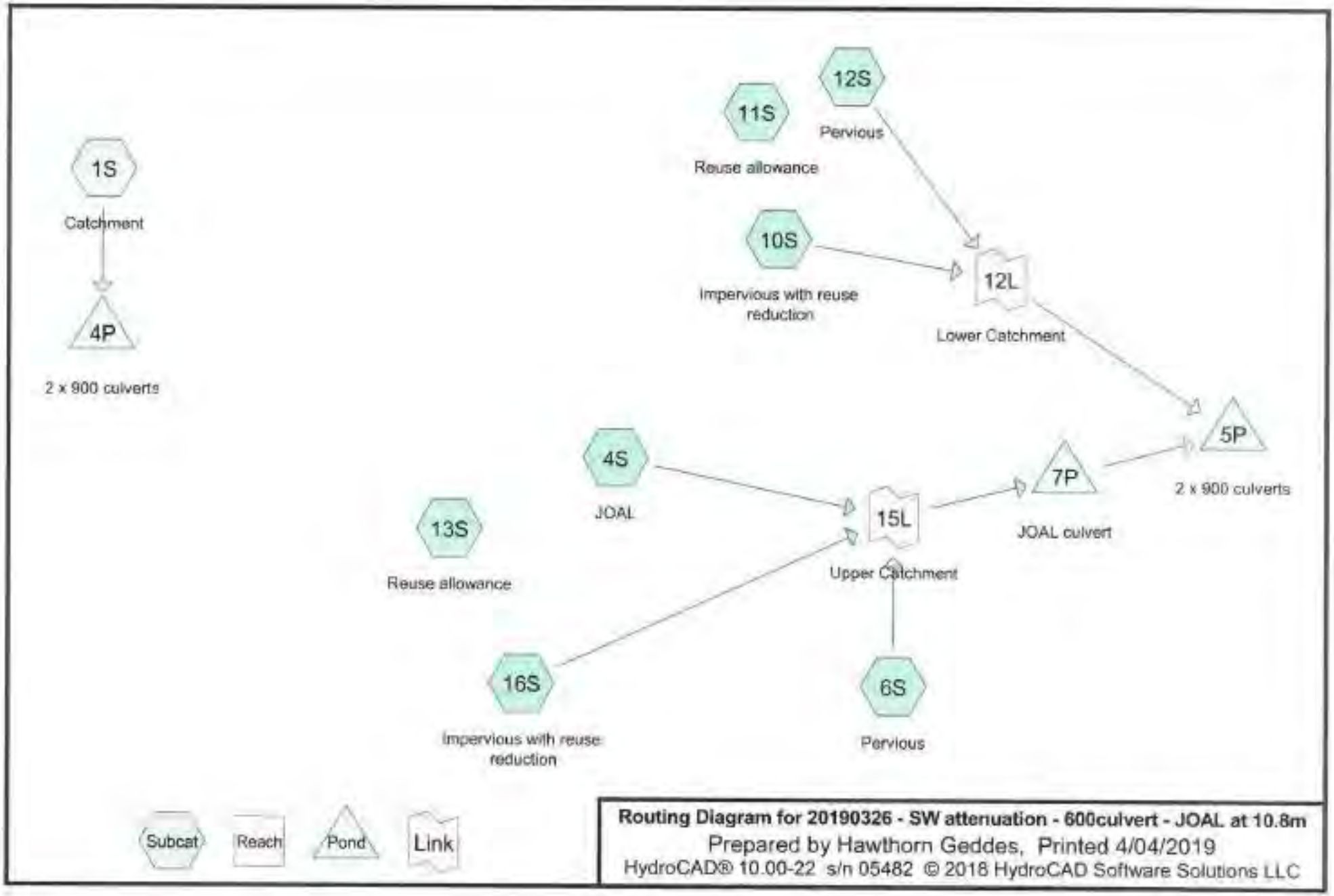
SYMBOLS
- Standing Water Level
- Water Out flow
- Water In flow

Produced with Core-GS

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Appendix C – Stormwater Calculations

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Area Listing (selected nodes)

Area (sq-meters)	C	Description (subcatchment-numbers)
270,000.0	0.67	75% Grass cover, Fair, HSG D (1S)
1,200.0	0.96	Impervious - JOAL (4S)
156,735.0	0.67	Pervious - Northern catchment (12S)
88,995.0	0.67	Pervious - Southern catchment (6S)
23,070.0	0.96	Impervious (10S, 11S, 13S, 16S)

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Summary for Pond 4P: 2 x 900 culverts

Inflow Area =	270,000.0 m²,	0.00% Impervious,	Inflow Depth =	20 mm	for 5-year event
Inflow =	3.1801 m³/s @	0.42 hrs, Volume=	5,532.8 m³		
Outflow =	2.5579 m³/s @	0.56 hrs, Volume=	5,532.7 m³,	Atten= 20%,	Lag= 8.7 min
Primary =	2.5579 m³/s @	0.56 hrs, Volume=	5,532.7 m³		
Secondary =	0.0000 m³/s @	0.00 hrs, Volume=	0.0 m³		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-10.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 7.392 m @ 0.56 hrs Surf.Area= 0.0 m² Storage= 1,147.6 m³ (1,119.5 m³ above start)

Plug-Flow detention time= 6.2 min calculated for 5,499.1 m³ (99% of inflow)
Center-of-Mass det. time= 6.0 min (33.0 - 27.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

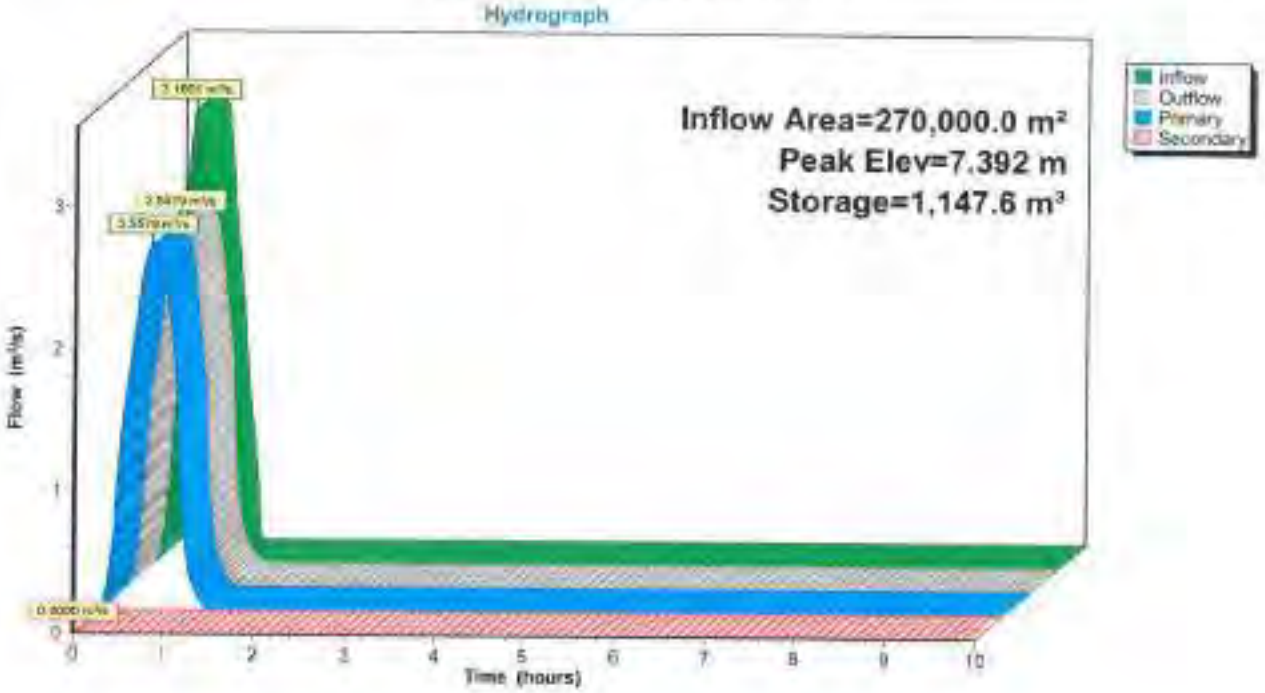
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.50 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=2.5575 m³/s @ 0.56 hrs HW=7.392 m (Free Discharge)
1=Culvert (Inlet Controls 2.5575 m³/s @ 2.01 m/s)

Secondary OutFlow Max=0.0000 m³/s @ 0.00 hrs HW=6.370 m (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.0000 m³/s)

Pond 4P: 2 x 900 culverts



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Summary for Pond 4P: 2 x 900 culverts

Inflow Area =	270,000.0 m²,	0.00% Impervious,	Inflow Depth =	57 mm	for 100-Year event
Inflow =	6.9778 m³/s @	0.42 hrs, Volume=	15,490.0 m³		
Outflow =	6.3790 m³/s @	0.65 hrs, Volume=	15,489.9 m³,	Atten= 9%,	Lag= 14.0 min
Primary =	4.2781 m³/s @	0.65 hrs, Volume=	14,007.3 m³		
Secondary =	2.1009 m³/s @	0.65 hrs, Volume=	1,482.7 m³		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-10.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 8.421 m @ 0.65 hrs Surf.Area= 0.0 m² Storage= 4,409.1 m³ (4,381.0 m³ above start)

Plug-Flow detention time= 11.7 min calculated for 15,461.8 m³ (100% of inflow)
Center-of-Mass det. time= 11.3 min (42.3 - 31.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

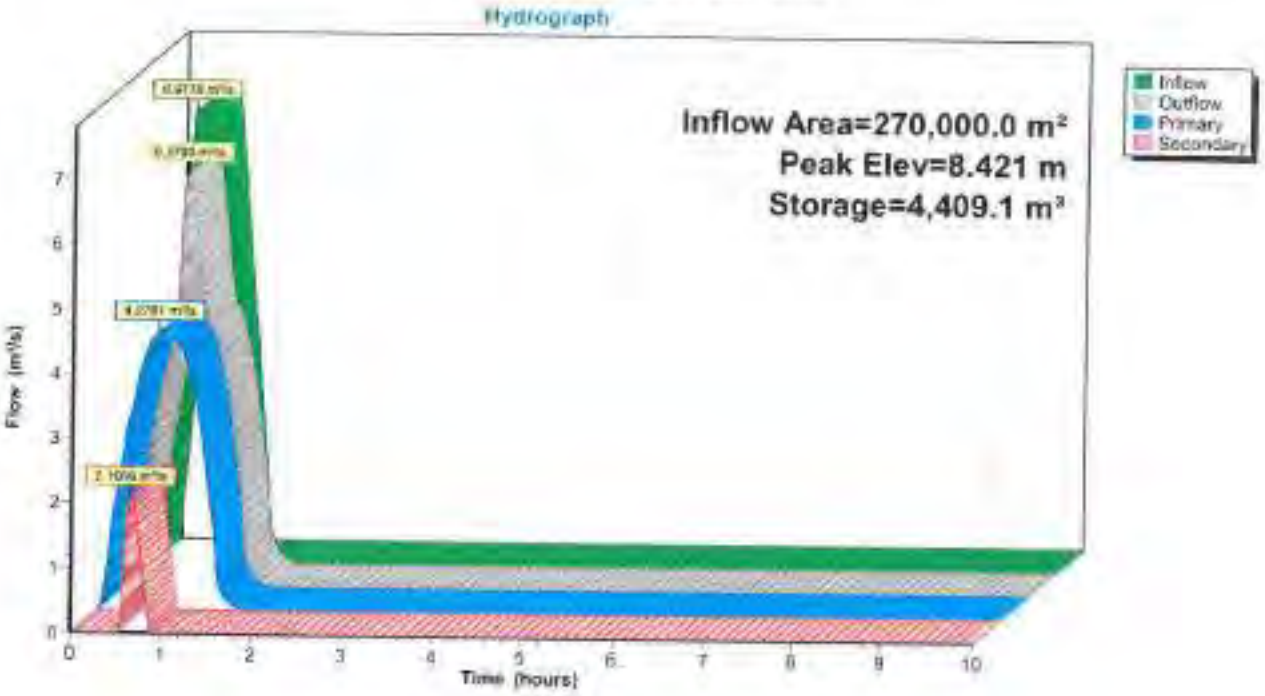
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.50 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=4.2779 m³/s @ 0.65 hrs HW=8.420 m (Free Discharge)
└**1=Culvert** (Inlet Controls 4.2779 m³/s @ 3.36 m/s)

Secondary OutFlow Max=2.0978 m³/s @ 0.65 hrs HW=8.420 m (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0978 m³/s @ 0.62 m/s)

Pond 4P: 2 x 900 culverts



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Summary for Pond 5P: 2 x 900 culverts

Inflow Area = 268,350.0 m², 8.43% Impervious, Inflow Depth = 23 mm for 5-year event
Inflow = 2.8231 m³/s @ 0.53 hrs, Volume= 6,126.7 m³
Outflow = 2.4276 m³/s @ 0.61 hrs, Volume= 6,126.6 m³, Atten= 14%, Lag= 4.8 min
Primary = 2.4276 m³/s @ 0.61 hrs, Volume= 6,126.6 m³
Secondary = 0.0000 m³/s @ 0.00 hrs, Volume= 0.0 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 7.335 m @ 0.61 hrs Surf.Area= 0.0 m² Storage= 1,034.2 m³ (1,006.0 m³ above start)

Plug-Flow detention time= 6.3 min calculated for 6,088.4 m³ (99% of inflow)
Center-of-Mass det. time= 5.7 min (34.7 - 29.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

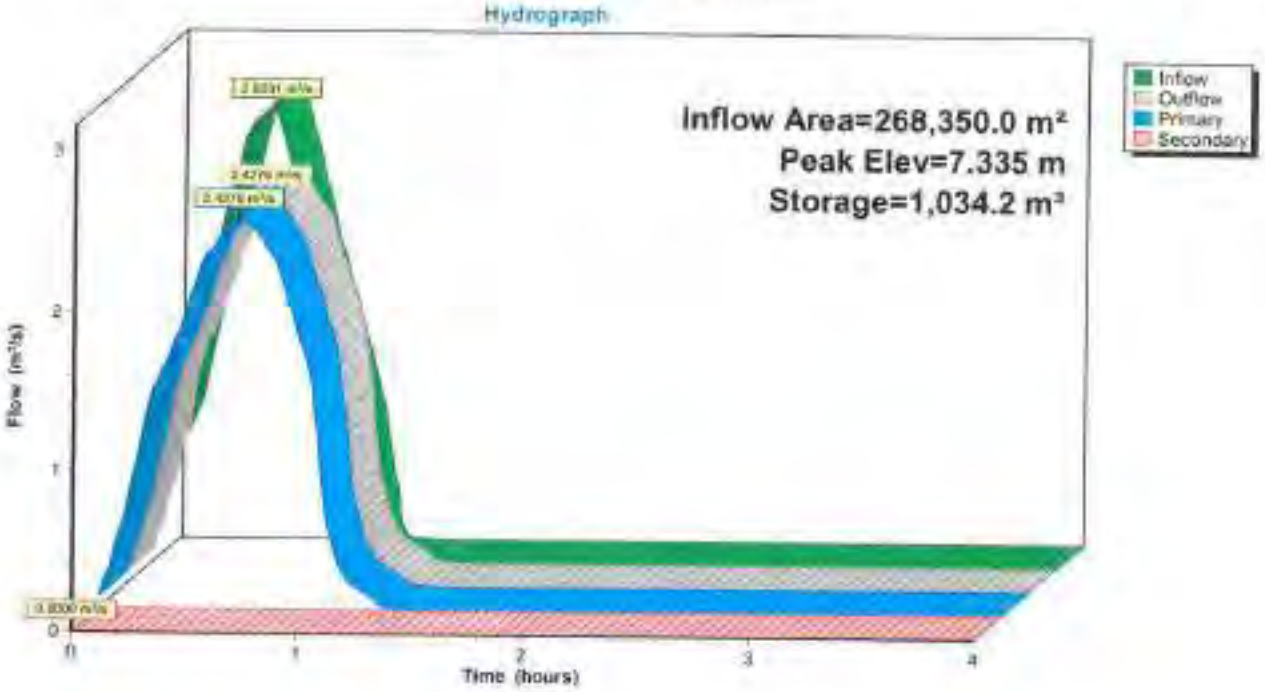
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.58 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=2.4273 m³/s @ 0.61 hrs HW=7.335 m (Free Discharge)
└**1=Culvert** (Inlet Controls 2.4273 m³/s @ 1.91 m/s)

Secondary OutFlow Max=0.0000 m³/s @ 0.00 hrs HW=6.500 m (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.0000 m³/s)

Pond 5P: 2 x 900 culverts



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Summary for Pond 5P: 2 x 900 culverts

Inflow Area = 268,350.0 m², 8.43% Impervious, Inflow Depth = 60 mm for 100-Year event
Inflow = 6.8747 m³/s @ 0.65 hrs, Volume= 16,223.3 m³
Outflow = 6.2858 m³/s @ 0.68 hrs, Volume= 16,223.2 m³, Atten= 9%, Lag= 2.1 min
Primary = 4.2718 m³/s @ 0.68 hrs, Volume= 14,894.7 m³
Secondary = 2.0140 m³/s @ 0.68 hrs, Volume= 1,328.5 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 6.370 m Surf.Area= 0.0 m² Storage= 28.1 m³
Peak Elev= 8.416 m @ 0.68 hrs Surf.Area= 0.0 m² Storage= 4,390.8 m³ (4,362.7 m³ above start)

Plug-Flow detention time= 11.6 min calculated for 16,185.0 m³ (100% of inflow)
Center-of-Mass det. time= 11.2 min (44.5 - 33.3)

Volume	Invert	Avail.Storage	Storage Description
#1	6.000 m	4,716.0 m³	**Custom Stage Data** Listed below

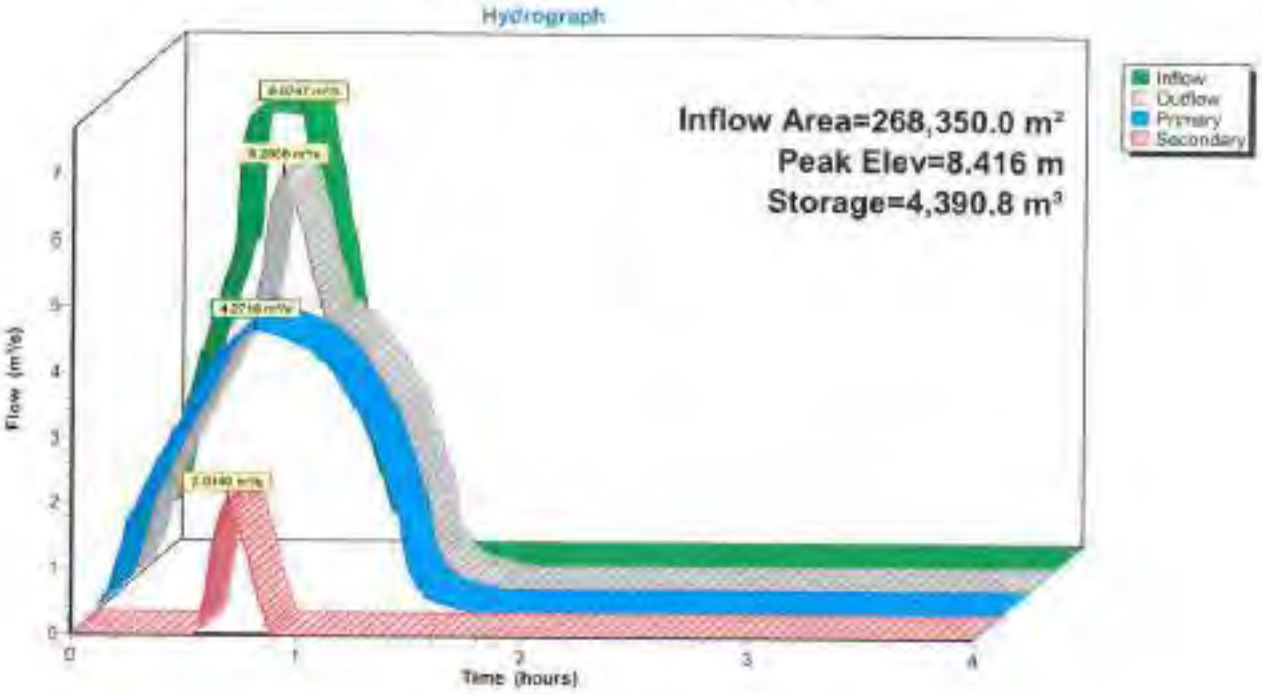
Elevation (meters)	Cum.Store (cubic-meters)
6.000	0.0
6.500	38.0
7.000	364.0
7.500	1,363.0
8.000	2,782.0
8.500	4,716.0

Device	Routing	Invert	Outlet Devices
#1	Primary	6.370 m	**900 mm Round Culvert X 2.00** L= 17.58 m Ke= 0.500 Inlet / Outlet Invert= 6.370 m / 6.140 m S= 0.0131 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.636 m²
#2	Secondary	8.250 m	**20.00 m long x 8.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=4.2715 m³/s @ 0.68 hrs HW=8.416 m (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.2715 m³/s @ 3.36 m/s)

Secondary OutFlow Max=2.0098 m³/s @ 0.68 hrs HW=8.416 m (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0098 m³/s @ 0.61 m/s)

Pond 5P: 2 x 900 culverts



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Summary for Pond 7P: JOAL culvert

Inflow Area = 95,475.0 m², 6.79% Impervious, Inflow Depth = 48 mm for 100-Year event
Inflow = 3.0068 m³/s @ 0.42 hrs, Volume= 4,543.4 m³
Outflow = 2.9786 m³/s @ 0.42 hrs, Volume= 4,679.9 m³, Atten= 1%, Lag= 0.4 min
Primary = 0.9579 m³/s @ 0.42 hrs, Volume= 3,018.1 m³
Secondary = 2.0207 m³/s @ 0.42 hrs, Volume= 1,661.7 m³

Routing by Dyn-Stor-Ind method, Time Span= 0.00-4.00 hrs, dt= 0.01 hrs
Starting Elev= 10.000 m Surf.Area= 0.0 m² Storage= 125.0 m³
Peak Elev= 10.905 m @ 0.42 hrs Surf.Area= 0.0 m² Storage= 785.0 m³ (660.0 m³ above start)

Plug-Flow detention time= 6.4 min calculated for 4,532.2 m³ (100% of inflow)
Center-of-Mass det. time= 5.7 min (30.1 - 24.4)

Volume	Invert	Avail.Storage	Storage Description
#1	9.000 m	870.0 m³	**Custom Stage Data** Listed below

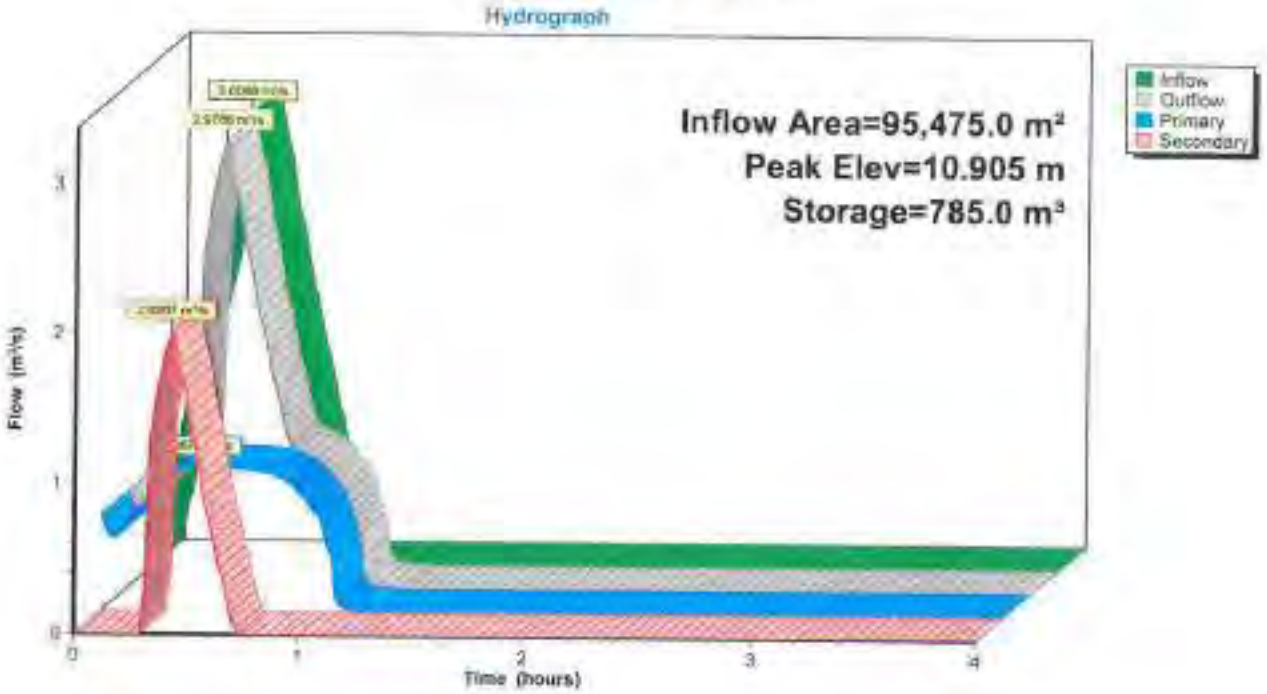
Elevation (meters)	Cum.Store (cubic-meters)
9.000	0.0
9.500	26.0
10.000	125.0
10.500	423.0
11.000	870.0

Device	Routing	Invert	Outlet Devices
#1	Primary	8.980 m	**600 mm Round Culvert** L= 25.00 m Ke= 0.500 Inlet / Outlet Invert= 8.980 m / 8.000 m S= 0.0392 m/m Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.283 m²
#2	Secondary	10.800 m	**40.00 m long x 5.00 m breadth Broad-Crested Rectangular Weir** Head (meters) 0.061 0.122 0.183 0.244 0.305 0.366 0.427 0.488 Coef. (Metric) 1.48 1.49 1.49 1.46 1.45 1.46 1.46 1.45

Primary OutFlow Max=0.9578 m³/s @ 0.42 hrs HW=10.905 m TW=8.107 m (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.9578 m³/s @ 3.39 m/s)

Secondary OutFlow Max=2.0144 m³/s @ 0.42 hrs HW=10.905 m TW=8.106 m (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.0144 m³/s @ 0.48 m/s)

Pond 7P: JOAL culvert



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TP108 peak flow calculations for filter strips assuming a small catchment

Table 5.3 - Curve number for typical Auckland conditions			
Land use	Group A Soil (volcanic granular loam)	Group B Soil (alluvial)	Group C Soil (sandstone/ mudstone)
Bush, mixed climax, not grazed	30	55	70
Pasture, lightly grazed, good grass cover	39	61	74
Urban lawns	39	61	74
Crops, annuals, row, minimal vegetative cover	72	81	88
Sealed roads, roofs	98	98	98

Project:	Duck Trust
Address:	
Consultant:	Hawthorn Geddes
Date:	30.11.18

Data Entry Cells	
Result cells	
Drop Down Menu	

Impervious area	ha	0.12
Pervious area	ha	0
Total area	ha	0.12
Impervious SCS curve number		98
Hydrological soil group		Group C
Pervious SCS curve number		98
2 yr 24-hour rainfall depth from TP108 Apdx A	mm	114.7
Reticulation design rainfall depth (e.g. 5yr, 10yr) from TP108 Apdx A	mm	0
Water Quality Storm (WQS) rainfall depth (2yr/3)	mm	38.23
WQS peak rainfall rate from TP108 (10-minute duration)	mm/hr	25.8
Reticulation design rainfall depth (e.g. 5yr, 10yr)		0.0

Impervious surfaces

Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.95
Peak runoff rate (WQS)	m^3/s	0.0082

Pervious surfaces

Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.93
Peak runoff rate (WQS)	m^3/s	0.0000

Combined flow for Water Quality Storm

Peak runoff from surfaces	m^3/s	0.0082
Peak outflow from catchment (allowing for lag)	m^3/s	0.0073

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TP10 Filter strip (50mm grass)

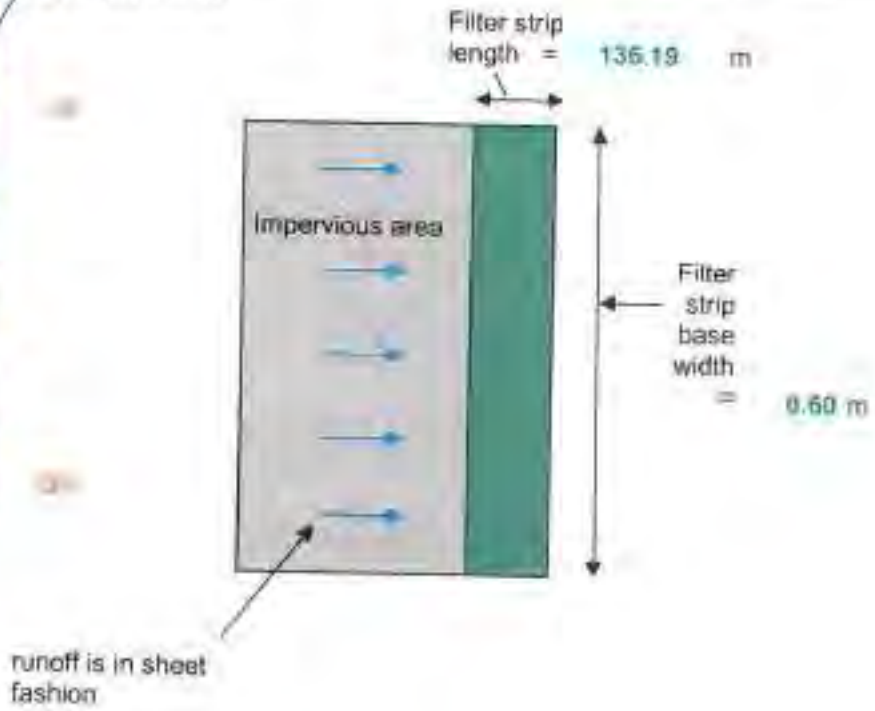
Data entry cells
Result cells

Project:	Duck Trust	
Address:	0	
Consultant:	Hawthorn Geddes	
Date:	30.11.18	

Vary depth until "ok"

Flow rate Q	m^3/s	0.00731
Channel slope S		8.6%
Depth of flow d	m	0.05
Manning's n for 50mm grass		0.142
Hydraulic radius R	m	0.043
Base width	m	0.60
Cross-sectional area A=bd	m^2	0.030
V=R^.667*S^.5/n	m/s	0.252
Hydraulic radius R=A/(b+2*d)	m	0.043
Is velocity V < 0.4m/s ?		OK

To meet TP10 stormwater treatment specification:		
Required filter strip length	m	136.19
Filter strip length provided	m	150.00
Travel time t (should be >9 mins)	minutes	9.91



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BUILDING COMPLIANCE
DELIVERING CONSISTENT COLLABORATIVE COMPLIANCE THROUGHOUT NEW ZEALAND

Date: 21st April 2021

The Building Department Kaipara District Council

Dear Sir/Madam,

Re: Construction of New Dwelling at Lot 81, Robert Hastie Drive, Mangawhai

Please direct all correspondence for the lodgement and management of the Building Consent in relation to the construction of our dwelling, to our agent below:

C3 Building Compliance Lisa@c3bc.co.nz & daniel@c3bc.co.nz

Yours faithfully

Lance Vale
12 William Gilbert Place, Mangawhai

Director / Project Manager

ACDL TRUSTEE LTD
Linda and David Kendal
17 Pinefield Road, Whenuapai

Property Owner

If you are signing this application on behalf of a company/trust/other entity (the applicant), you are declaring that you are duly authorised to sign on behalf of the applicant to make such an application.

PLEASE NOTE: C3 Building Compliance does not meet the definition of Designer Or Building as defined in sections 14d & 14e of the Building Act 2004.

22 November 2021

Linda & David Kendall
C/: Lance Vale (CH Northland Ltd)
linda.kendall@xtra.co.nz
lance@coastalhomesnz.com

RE: PS 4 for compaction of fill beneath proposed dwelling – Lot 81, DP 556753, Robert Hastie Drive, Mangawhai. Building Consent BC 210441.

Wiley Geotechnical Limited (WGL) was requested by Lance Vale (CH Northland), acting on behalf of Linda & David Kendall, to visit the site and perform geotechnical site observations, compaction control and certification of engineered fill for a proposed new concrete slab foundation.

WGL visited the site on the 11th of October 2021. The compacted engineered fill (up to 3.0 m of hardfill) within the proposed building area was inspected. Typical measured CBR values of 24 to 30 were achieved in the area of engineered fill as indicated by the Clegg Hammer and was considered appropriate. All works were as per design. Test locations and their respective CBR values are illustrated in the Site Report attached to this letter.

All works are to be in general accordance with NZS4431 Code of Practice for Earthfill for Residential Development.

Conclusions and Recommendations

We consider the site to be suitable for the construction of the proposed dwelling.

The fill that has been placed appears to be in general accordance with NZS4431 “Code of Practice for Earthworks for Residential Development”.

Based on our testing, it is our opinion that a geotechnical ultimate bearing capacity of 300 kPa is available on the prepared engineered pad.

LIMITATIONS

(i) This report has been prepared for the use of our client, Linda & David Kendall and their professional advisers and the relevant Regional Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

(ii) Assessments made in this report are based on the ground conditions indicated from published sources, site inspections and subsurface investigations described in this report based on accepted normal methods of site investigations. Variations in ground conditions may exist between test locations and therefore have not been taken into account in the report. If variations are found during excavation or at foundation preparation stage WGL should be notified immediately so we can amend our recommendations.

(iii) This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 021 0399 385 or matt@wileygeotechnical.co.nz if you require any further information.



Matt Wiley, CPEng

Principal Engineer

Attachments:

- PS 4 – Construction Review

- Site Notes

Building Code Clause(s) B1/VM4

PRODUCER STATEMENT – PS4 – CONSTRUCTION REVIEW

ISSUED BY: Wiley Geotechnical Ltd
(Construction Review Firm)

TO: Linda & David Kendall
(Owner/Developer)

TO BE SUPPLIED TO: Kaipara District Council
(Building Consent Authority)

IN RESPECT OF: Compaction of Hard Fill beneath proposed dwelling.
(Description of Building Work)

AT: Lot 81 Robert Hastie Drive
(Address)

Town/City: Mangawhai (Address) **LOT** 81 **DP** 556753 **SO**

We Wiley Geotechnical Ltd (Construction Review Firm) have been engaged by Lance at CH Northland Ltd

To provide ☐ CM1 ■ CM2 ☐ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ observation as per agreement with owner/developer Linda & David Kendall

or ☐ other ..... (Extent of Engagement) services

in respect of clause(s) B1 & B2 of the Building Code for the building work described in documents relating to Building Consent No. BC 210441 and those relating to Building Consent Amendment(s) Nos. ..... issued during the course of the works. We have sighted these Building Consents and the conditions of attached to them.

Authorised instructions/variations(s) No. ..... (copies attached) or by the attached Schedule ☐ have been issued during the course of the works.

On the basis of ☐ this review ■ these review(s) and information supplied by the contractor during the course of the works and **on behalf of the firm** undertaking this Construction Review, **I believe on reasonable grounds** that ☐ All or ■ Part only of the building works have been completed in accordance with the relevant requirements of the Building Consent and Building Consent Amendments identified above, with respect to Clause(s) B1/VM4 of the Building Code. I also believe on reasonable grounds that the persons who have undertaken this construction review have the necessary competency to do so.

I, Matthew Lewis Wiley (Name of Construction Review Professional) am: ■ CPEng.# 220767

I am a member of: ■ Engineering New Zealand and hold the following qualifications BSc, MSc (Honours)

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

The Construction Review Firm is a member of ACE New Zealand: ☐

SIGNED BY Matthew Lewis Wiley (Name of Construction Review Professional) (Signature) M Wiley

ON BEHALF OF Wiley Geotechnical Ltd (Construction Review Firm) Date 11 Oct 21

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

This form is to accompany **Forms 6 or 8 of the Building (Form) Regulations 2004** for the issue of a Code Compliance Certificate.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACE NEW ZEALAND AND ENGINEERING NEW ZEALAND

GUIDANCE ON USE OF PRODUCER STATEMENTS

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

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

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

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

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011[2]

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

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

The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Design Professional

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

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

Membership of a professional body, such as Engineering New Zealand (formerly IPENZ), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the ACE New Zealand, this provides additional assurance about the standing of the firm.

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

*Professional Indemnity Insurance

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

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

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers[3]). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

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

Attached Particulars

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

Refer Also:

1 Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013

2 NZIA Standard Conditions of Contract SCC 2011

3 Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/IPENZ 2004)

4 PN Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org

Engineer's / Inspector's Report

WILEY GEOTECHNICAL

Lindy Kendall c/ Lance Coastal Homes

Project Name: Lot 81, Robert Hastie Drive The Sanctuary

Project No.: 21076 Date: 11 - 10 - 21

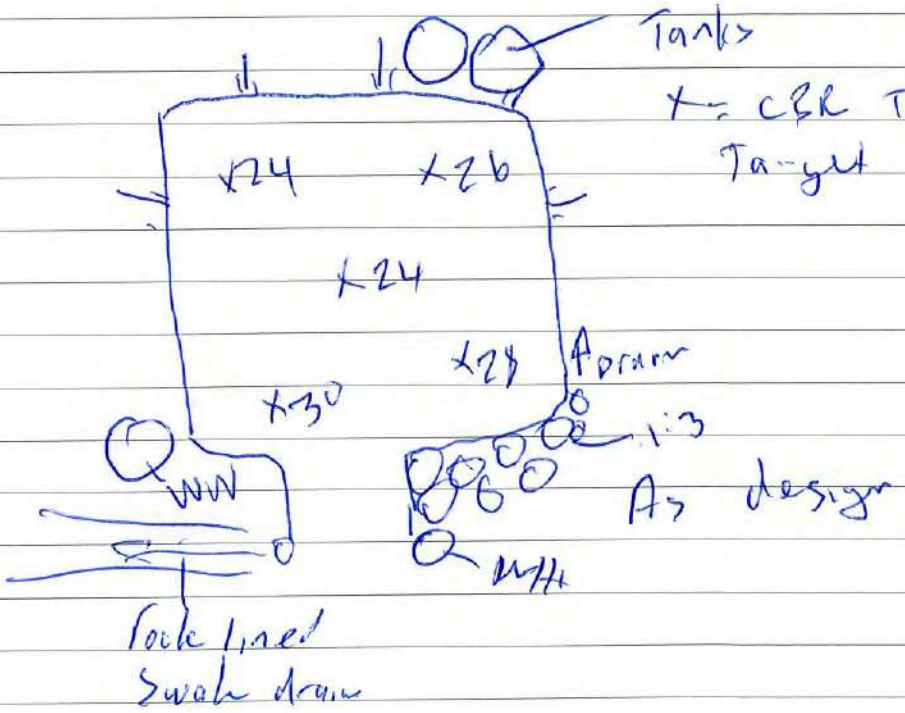
Time arrived on site: Weather: Fine

Time left site: hrs Contractor's Working Hours:

Travel time: hrs

Total time: 3:30

Final inspection of earthworks & fill for new dwelling. Upto 3.0 m of hard fill



X = CBR Test
Target > 15

As design

All tests > 15; OK for 300 kPa ultimate bearing capacity

OK to place foundation elements (Rafts)

Will to issue PS4 for ground bearing

Distribution	Initials

Engineer / Inspector:

Reviewed by:

PRODUCT CERTIFICATE

Kronospan OSB Barrier

CERTIFICATE NO: CM70096
Date of issue: 24 March 2021

KEY INFORMATION

1 CERTIFICATE HOLDER DETAILS

GlobalBuild.NZ
Interior Installations Limited
PO Box 36-150
Northcote, Auckland 0627
New Zealand

Email: interior.install@xtra.co.nz
Ph: +64 2148 7007
www.globalbuild.nz

2 PRODUCT CERTIFICATION BODY

Bureau Veritas Australia Pty Ltd
3/435 Williamstown Road
Port Melbourne VIC 3207
Australia

Ph: 1800 855 190
www.bureauveritas.com.au

Bureau Veritas Australia Pty Ltd

The complaints process for this certificate can be found here:
www.bureauveritas.com.au/your-feedback

3 SUMMARY OF DESCRIPTION OF BUILDING METHOD OR PRODUCT

Kronospan OSB Barrier is a 9 mm oriented strand board (OSB) panel product. Panels are available in sizes: 2400 x 1200mm, 2700 x 1200 mm, 2440 x 1220 mm and 2740 x 1220 mm. It is available untreated or treated to hazard class H3.1 (LOSP). The treated version is identifiable by green edge colour and identifying stamp.

Continuation of description can be found in item 9. Supporting Information about Description of Building Product or Method.
Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and Limitations of Use.

4 SUMMARY OF INTENDED USE OF BUILDING METHOD OR PRODUCT

For use as a protected external wall bracing element and as a rigid air barrier in conjunction with a ventilated cavity.

Continuation of intended use can be found in item 8. Supporting Information about Intended use of Building Product or Method.

5 BUILDING CODE PROVISIONS

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

B1 Structure: B1.3.1, B1.3.2, B 1.3.3 (a, f, h) B1.3.4
B2 Durability: B2.3.1(a)
E2 External moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.7
F2 Hazardous building materials: F2.3.1

How the building method or product complies or contributes can be found in item 12. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.
The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product.
The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website http://www.building.govt.nz.

PRODUCT CERTIFICATE

Kronospan OSB Barrier

6 CONDITIONS AND LIMITATIONS OF USE

1. Kronospan OSB Barrier is certified for use in timber framed buildings:
   a) designed in accordance with accordance with NZS3604:2011, or by specific design in accordance with Verification Method B1/VM1, and
   b) up to 10m in height, and
   c) located in wind zones up to and including EXTRA HIGH (as defined in NZS3604:2011) or up to a ULS wind design pressure of 2.6 kPa for buildings specifically designed in accordance with Verification Method B1/VM1, and
   d) located in all exposure zones (as defined in NZS3604:2011), and
   e) located in all seismic zones, and
   f) located greater than 1 m from a relevant boundary.
2. Kronospan OSB Barrier shall be installed in accordance with the GlobalBuild NZ OSB Barrier Design & Install Guide Version 1.3, February 2021
3. Where Kronospan OSB Barrier is installed on the external face of external wall framing the construction shall incorporate a flexible wall underlay and flashing tapes with a drained and ventilated cavity all complying with the requirements of E2/AS1.
4. The flexible underlay shall be installed within 14 days of the Kronospan OSB Barrier being installed (30 days for H3.1 treated Kronospan OSB Barrier).

NOTE: Together, items 3, 4, 5 and 6 define scope of use.

7 HEALTH AND SAFETY INFORMATION

The compliance with any manufacturer's installation instructions, maintenance, OH & S statements, MSDS's and other Health and Safety declarations will provide the necessary Health and Safety Information pertaining to the product.

8 SIGNATURES

Sam Guindi
Product Certification Manager

For and on behalf of
Bureau Veritas Australia Pty Ltd

Brad Smith
Director

For and on behalf of
GlobalBuild.NZ
Interior Installations Limited

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The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product.
The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

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PRODUCT CERTIFICATE

Kronospan OSB Barrier

SCHEDULE: INFORMATION THAT SUPPORTS KEY INFORMATION

9	SUPPORTING INFORMATION ABOUT DESCRIPTION
Further details regarding the description of the product can be found in GlobalBuild NZ OSB Barrier Design & Install Guide Version 1.3, February 2021.	
10	SUPPORTING INFORMATION ABOUT INTENDED USE
Further details regarding the use of the product can be found in GlobalBuild NZ OSB Barrier Design & Install Guide Version 1.3, February 2021.	
11	SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE
N/A	

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CERTIFICATE V1.3

PRODUCT CERTIFICATE

Kronospan OSB Barrier

12 BASIS FOR CERTIFICATION

B1 Structure - By testing and comparison with Acceptable Solution B1/AS1
B2 Durability - By analysis and comparison with Verification Method B2/VM1
E2 External moisture - By analysis and comparison with Acceptable Solution E2/AS1
F2 Hazardous building materials - By testing and comparison with performance requirements of Building Code clause F2.3.1

13 SUPPORTING DOCUMENTATION FOR CERTIFICATION

1. Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B1 Structure 1st Edition (Amendment 19), 28 November 2019
2. Acceptable Solutions and Verification Methods For New Zealand Building Code Clause B2 Durability (Amendment 12), 28 November 2019
3. Acceptable Solutions and Verification Methods For New Zealand Building Code Clause E2 External moisture 3rd edition (Amendment 9), 27 June 2019
4. BBA Agrément Certificate 13/4998 Product Sheet 3, Kronospan OSB/3 for Sheathing, 26 April 2016
5. BBA Agrément Certificate 18/5480 Product Sheet 3, Kronospan OSB/3 for Sheathing, 26 April 2018
6. EPH Test Certificate CT-20-03-25-01 "Formaldehdye Content of Kronospan OSB/3", 25 March 2020
7. IVS Test Report 50198 "Test for retention of H3.1 LOSP treated OSB", 20 March 2020
8. Scion Test Report "P21:2010 9mm Kronspan OSB 600 Wall with Brackets", 24 October 2019
9. Scion Test Report "P21:2010 9mm Kronspan OSB 1200 Wall with Brackets", 24 October 2019
10. Scion Test Report "P21:2010 9mm Kronspan OSB 400 Wall with Brackets", 28 February 2020
11. Scion Test Report "P21:2010 9mm Kronspan OSB 10mm GIB standard 400 Wall with Brackets", 28 February 2020
12. Scion Test Report "P21:2010 9mm Kronspan OSB 10mm GIB standard 600 Wall with Brackets", 28 February 2020
13. Scion Test Report "P21:2010 9mm Kronspan OSB 10mm GIB standard 1200 Wall with Brackets", 28 February 2020
14. DOP 1393-CPR-0522 Kronospan OSB/3 according to EN300, 28 January 2019
15. GlobalBuild NZ OSB Barrier Design & Install Guide Version 1.3, February 2021

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.
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PRODUCT CERTIFICATE

Kronospan OSB Barrier

14 CONDITIONS RELATING TO NOTIFICATION

(a) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change to any of the following particulars:
- (i) the name, address, or contact details of the certificate holder:
- (ii) any address of a location where a certified product is produced or manufactured:

(b) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change, modification, or alteration to any of the following:
- (i) the certified building method or product:
- (ii) the method of its production or manufacture:
- (iii) the product quality plan prepared in respect of the certified building method or product:
- (iv) the application or installation instructions for the certified building method or product:
- (v) any documentation relating to the use and maintenance of the certified building method or product:

(c) if the certificate holder has any reason to suspect that the certified building method or product does not comply with the Building Code, the certificate holder notifies the product certification body (Bureau Veritas) in writing of the reason for that suspicion:

(d) if the certificate holder or the product certification body (Bureau Veritas) finds that a certified building method or product that has been released on the market does not comply with the Building Code, the certificate holder discloses that fact in disclosure statements published in a form that is acceptable to the product certification body and to the chief executive:

(e) if the certificate is suspended or revoked, the certificate holder—
- (i) notifies all customers to whom the building method or product is regularly supplied; and
- (ii) immediately ceases using the certificate, the mark of conformity, and any reference to the number of the certificate.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.
The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product.
The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

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Kronobuild®



OSB Barrier General Warranty Terms

Oriented Strand Board OSB

WARRANTY TERMS

This warranty applies to GlobalBuild NZ OSB Barrier ('OSB Barrier') supplied by GlobalBuild NZ when used in accordance with all GlobalBuild NZ requirements.

This warranty is to be read in conjunction with all relevant and applicable technical documentation published or referenced by GlobalBuild NZ.

Date warranty valid:

5 years from proven date of purchase or dispatch from GlobalBuild NZ whichever is the earlier.

All enquiries relating to this warranty must (in the first instance) be directed to the place of purchase, the supplier or the installer.

GlobalBuild NZ warrants that:
At the time of delivery to the merchant (or site where applicable) the OSB Barrier will:

- be free from freight-related defects
- be free from defects that may have arisen through defective factory workmanship or materials
- conform to the performance characteristics listed on the current OSB Barrier pass™ ('warranted condition')

In the event a breach of the warranty is proven, the following applies:

- GlobalBuild NZ will, at its discretion, supply replacement OSB Barrier without charge or refund the value of the product.
- Other losses or damage caused by a breach of the warranty or failure of the product for any other reason are not covered.
- GlobalBuild NZ obligations under this warranty are limited to the replacement of defective OSB Barrier or the value of the OSB Barrier. The value of the materials will be reduced pro-rata, based on the remaining life of the product (as set by the relevant durability requirements of the NZ Building Code).
- GlobalBuild NZ reserves the right to supply other comparable materials should the warranted materials no longer be supplied by GlobalBuild NZ.

This warranty is subject to the following:

- Receipt of date of purchase of the product.
- Evidence satisfactory to GlobalBuild NZ of failure of the OSB Barrier.
- Receipt of a written claim from the claimant either within 30 days of when the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
- The claim must include full details of the alleged defect.
- Evidence satisfactory to GlobalBuild NZ that all maintenance requirements have been carried out.
- The warranty does not cover failure or problems caused by defective use; failure relating to improper design of the project structure; structural failure; settlement; movement of materials to which the product is attached or dependent on; acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions; inadequate maintenance; growth of mould, mildew, fungi, bacteria or any organism on any product; or acts or omissions of a third party over whom GlobalBuild NZ has no control.
- The warranty does not cover failure or loss arising from the failure to follow all relevant GlobalBuild NZ advice and requirements.
- Normal wear and tear is excluded from this warranty.

All relevant information is available from GlobalBuild NZ (refer to www.globalbuild.nz).

Note:

All OSB Barrier technical information is uncontrolled in printed format, so in all instances refer only to the documentation on the website.



GLOBALBUILD.NZ

PO BOX 36-150, NORTHCOTE, AUCKLAND 0627
GLOBALBUILD.NZ

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Construction (PS3)

Construction

ISSUED BUILDING CONSENT NUMBER 210441

THIS PS3 IS ISSUED BY: BREAM BAY COATINGS (2015) LTD

TO: **KAIPARA DISTRICT COUNCIL**

IN RESPECT OF: .....

AT (Address): LOT 81 THE SANCTUARY

MANGAWHAI HEADS

LEGAL DESCRIPTION - LOT.....DP .....SO .....

FROM: ..... (Installer),

LICENSED BY.....Reg./License No: 129163

engaged by LINDA KELLOGG (Owner/Builder)

In respect of clause(s) B1 and B2 of the Building Regulations 1992 for the building work described by the drawings and specifications prepared by the design firm titled;

.....

.....

.....

numbered.....

.....

authorised variation(s).....(copies attached)

have been issued during the course of the works.

I have sighted the issued building consent and read the conditions. As the contractor/builder I can confirm that the building works have been carried out in accordance with the requirements of the New Zealand Building Code, the conditions of the building consent, the design drawings and specifications and in accordance with the listed variations (if any).

I understand that if this producer statement is accepted, that it may be used to verify that the building work All / Part only as specified in the attached particulars, the subject of this building consent meets, based on reasonable grounds, the requirements of this building consent and the requirements of the Building Code in respect to clauses B1, B2, ...of the Building Regulations 1992.

☑ I understand and accept that Council may rely on this document, for the purposes of establishing compliance with the above building consent and that the content including the signature, whether electronic or not, is truly representative and authoritative of the information contained.

Name: CLARK SMITH Signature: [signature] Date: 25/02/2022

Address: 7 HOLHEDE DRIVE ONE TREE POINT

Contractor/Applicator: BREAM BAY COATINGS (2015) LTD

Telephone: 021552196 (bus) .....(home) Fax .....

File: 3117.03

PS.C
Version 1
Issued 1 March 2014

Form 6A

Memorandum from licensed building practitioner: Record of building work

Section 88, Building Act 2004

Please fill in the form as fully and correctly as possible.
If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: LOT 81 THE SANCTUARY	
Suburb:	
Town/City: MANGAWHAI HEADS	Postcode:

THE PROJECT

Building consent number: 210441

THE OWNER(S)

Name(s): Mr & Mrs KENDALL	
Mailing address:	
Suburb:	PO Box/Private Bag:
Town/City:	Postcode:
Phone number: 0220 546323	Email address: linda.kendall@xtra.co.nz

EXTERNAL MOISTURE MANAGEMENT SYSTEMS		
Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Damp proofing ☐		○ Carried out ○ Supervised
Roof cladding or roof cladding system ☐		○ Carried out ○ Supervised
Ventilation system (for example, subfloor or cavity) ☐		○ Carried out ○ Supervised
Wall cladding or wall cladding system ☑	To Supply, Fit, Plaster & Joint Specified ESP Panel AAC System to Exterior	○ Carried out ✓ Supervised
Waterproofing ☐		○ Carried out ○ Supervised
Other ☐		○ Carried out ○ Supervised

ISSUED BY

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise restricted building work.

Name: CLARK SMITH	LBP number: 129163
Class(es) licensed in: E 2.	
Plumbers, Gasfitters and Drainlayers registration number (if applicable):	
Mailing address (if different from below):	
Street address/Registered office: 7 HOLMSDALE DRIVE LA POINTE	
Suburb: LA POINTE	Town/City: ONE TREE POINT
PO Box/Private Bag	Postcode:
Phone number:	Mobile: 021 552196
After hours:	Fax:
Email address: plastering@bremaycastings.co.nz	Website:

DECLARATION

I CLARK SMITH carried out or supervised the restricted building work recorded on this form.

Signature: .....

Date: 25/02/2022

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Construction (PS3)

Construction

ISSUED BUILDING CONSENT NUMBER BC210441

THIS PS3 IS ISSUED BY: Freedom Pools and Spa 2006 Limited

TO: **KAIPARA DISTRICT COUNCIL**

IN RESPECT OF: Private Fibreglass Swimming Pool. Also includes necessary plumbing to gulley trap or soak pit.

AT (Address): 53 Robert Hastie Drive, Mangawhai 0573

LEGAL DESCRIPTION - LOT 81 DP 556753 SO ……

FROM: Glenn Handley …… (Installer),

LICENSED BY……Reg./License No: N/A

engaged by Linda & David Kendall (Owner/Builder)

In respect of clause(s) B1 and B2 of the Building Regulations 1992 for the building work described by the drawings and specifications prepared by the design firm titled;

……

……

……

numbered……

……

authorised variation(s)……(copies attached)

have been issued during the course of the works.

I have sighted the issued building consent and read the conditions. As the contractor/builder I can confirm that the building works have been carried out in accordance with the requirements of the New Zealand Building Code, the conditions of the building consent, the design drawings and specifications and in accordance with the listed variations (if any).

I understand that if this producer statement is accepted, that it may be used to verify that the building work All / Part only as specified in the attached particulars, the subject of this building consent meets, based on reasonable grounds, the requirements of this building consent and the requirements of the Building Code in respect to clauses B1, B2, ……..……of the Building Regulations 1992.

☑ I understand and accept that Council may rely on this document, for the purposes of establishing compliance with the above building consent and that the content including the signature, whether electronic or not, is truly representative and authoritative of the information contained.

Name: Glenn Handley ……..Signature: Glenn Handley Digitally signed by Glenn Handley Date: 2022.02.28 12:03:07 +13'00' ……Date: 28/02/2022

Address: 1/14 Agency Lane, Silverdale ……..…

Contractor/Applicator: Freedom Pools and Spa 2006 Limited ……..……..…

Telephone: 0272830141 ……(bus) 094267371 ……..(home) Fax N/A ……

File: 3117.03

Electrical Certificate of Compliance & Electrical Safety Certificate

Reference/Certificate ID No.: 53115

This form has been designed to be used by licensed electrical workers to certify that installations or Part installations under Part 1 or Part 2 of AS/NZS 3000 are safe to be connected to the specified system of electrical supply

Location Details: 53 Robert Hastie Drive

Contact Details: (Name and address) Kendall

Name of Electrical Worker: Jason Brown

Registration/Practising license number: E19481

Organisation/company: Hotwired Electrical

Phone and email: 021 405 019

Name of person(s) supervised:

CoC

Type of work: ☐ Additions ☐ Alterations ☑ New work

The prescribed electrical work is: ☐ Low risk ☐ General ☑ High Risk (Specify): mains

Reference standards: ☐ Part 1 of AS/NZS 3000 ☐ Part 2 of AS/NZS 3000

☐ Additional Standards:

Description of Work (including date/s of work and type of supply system)

Prewire & fit off 3ø house & meterbox.
earth peg located West side of house by pool shed.

I certify that the completed prescribed electrical work to which this Certificate of Compliance applies has been done lawfully and safely, and the information in the certificate is correct in that the installation, or part of the installation:

Select those that apply:

- ☐ Has been installed in accordance with the specified certified design[1]
- ☑ Has an earthing system that is correctly rated (where applicable)
- ☑ Contains fittings that are safe to connect to a power supply
- ☑ Relies on a supplier Declaration of Conformity[1]
- ☑ Relies on a manufacturer's instructions[1]
- ☑ Has been satisfactorily tested in accordance with the Electricity (Safety) Regulations 2010
- ☑ Is safe to connect

Test Results	
Polarity (Independent earth):	
Insulation resistance:	
Earth Continuity:	
Bonding:	
Fault Loop impedance:	
Other (specify):	

Electronic/Other reference: 53115

Certifier's signature:

Date: 11/5/22

1 Attach or reference. If it is impractical to attach a copy of a particular manufacturer's instructions, or of any certified design or supplier declaration of conformity, provide a reference to where the documents can be found, in a readily accessible format, by electronic means.

ESC

I certify that the installation, or part of the installation, to which this Electrical Safety Certificate applies is connected to a power supply and is safe to use.

Certifier's name: Jason Brown

Registration/Practising license number: E19481

Certifier's signature:

Certificate Issue Date: 11/5/22

Connection Date: 11/5/22

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED FOR A MINIMUM OF 7 YEARS

This certificate also confirms that the electrical work complies with the building code for the purposes of Section 19(1) (e) of the Building Act 2004

White - Customer Copy Blue - Inspectors Copy Yellow - Electricians Copy

JOP10566A

Memorandum from Licensed Building Practitioner

Record of Building Work

Section 88, Building Act 2004

GERARD CERTIFIED ROOFER

BC 210441

The Building Bruce and Linda Kendall

Street Address: 81 The Sanctuary		
Suburb:	Town/City: Mangawhai	Postcode: 0573

External Moisture Management System

Work that is restricted building work	Description of restricted building work	Carried out / Supervised?
☑ Roof cladding or roof cladding system	Installation of Gerard Roofs pressed steel tiles and accessories per manufacturer's specification.	☐ Carried out ☑ Supervised

Issued By

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise restricted building work

Name: Lucas Hardwick		LBP Number: BP 131196
Class(es) licensed in: Roofing R2 R3		
Address: Po Box 4282		Phone: 027 478 4459
Suburb: Kamo		Fax:
Town/City: Whangarei	Postcode: 0141	Mobile:
Mailing Address: ☐ Same as above?		After Hours Phone:
Suburb:		
Town/City:	Post Code:	
Email Address: johnduffroofing@gmail.com		
Website:		

Declaration

I carried out or supervised the restricted work recorded on this form.

Name	Signature	Date
Lucas Hardwick	Lucas Hardwick	22/12/2021

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Construction (PS3)

Construction

ISSUED BUILDING CONSENT NUMBER BC 210441

THIS PS3 IS ISSUED BY: John Duff Roofing

TO: **KAIPARA DISTRICT COUNCIL**

IN RESPECT OF: Bruce and Linda Kendall

AT (Address): 81 The Sanctuary Mangawhai

LEGAL DESCRIPTION - LOT.....DP .....SO .....

FROM: Luke Hardwick (Installer),

LICENSED BY John Duff Roofing Reg./License No: BP 131196

engaged by.....(Owner/Builder)

In respect of clause(s) B1 and B2 of the Building Regulations 1992 for the building work described by the drawings and specifications prepared by the design firm titled;

Battens fixed as per consented plans

numbered.....

.....

authorised variation(s).....(copies attached)

have been issued during the course of the works.

I have sighted the issued building consent and read the conditions. As the contractor/builder I can confirm that the building works have been carried out in accordance with the requirements of the New Zealand Building Code, the conditions of the building consent, the design drawings and specifications and in accordance with the listed variations (if any).

I understand that if this producer statement is accepted, that it may be used to verify that the building work All / Part only as specified in the attached particulars, the subject of this building consent meets, based on reasonable grounds, the requirements of this building consent and the requirements of the Building Code in respect to clauses B1, B2, ...of the Building Regulations 1992.

☑ I understand and accept that Council may rely on this document, for the purposes of establishing compliance with the above building consent and that the content including the signature, whether electronic or not, is truly representative and authoritative of the information contained.

Name: Luke Hardwick Signature: Date: 22/12/2021

Address: PO Box 4282 Kamo

Contractor/Applicator: John Duff Roofing

Telephone: .....(bus) 027 478 4459 (home) Fax .....

File: 3117.03

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Construction (PS3) - Drainage

Issued by: Kevin Wood being a Registered Certifying Drainlayer

In respect of installing drainage and the on-site wastewater disposal for:

(Owner) _____

At (Address) 53 Robert Hastie Drive
Mangawhai

Legal Description: Lot 81 DP _____ Valuation _____

I have sighted the issued Building Consent (BC 210441) and have constructed the drainage system including the pipes and fittings in accordance with the approved Building Consent, the New Zealand Building Code, and the manufacturers specifications and requirements.

I have tested the pipework and installed the system as follows:

☑ Installed an on-site effluent disposal system in accordance with AS/NZS 1547:2000 and provide a schedule to the owner for the systems maintenance.

☑ Has been installed in accordance with G13 (Foul Water) and G14 (Industrial Liquid Waste) and B2 (durability 15 years) of the Building Regulations 1992.

I believe on reasonable grounds that the work complies with the Building Consent issued.

I also understand that Kaipara District Council in accepting this Producer Statement Construction (PS3), will be relying on it to establish compliance at the completion of the building work.

☑ I understand and accept that Council may rely on this document, for the purposes of establishing compliance with the above building consent and that the content including the signature, whether electronic or not, is truly representative and authoritative of the information contained.

Signature of Registered Certifying Drainlayer: Kevin Wood

[redacted] Registration Number: 14366 [redacted] Reg Expiry Date: 31-3-23

Date: 15-5-22

File: 3117.0

PS.CD
Version 1
Issued 1 March 2014

KAIPARA DISTRICT
Kaipara Te Oranganui · Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Private Utility Service As-Built Record

(Section 216, Building Act 2004)

Part A Consent Details (to be completed in all cases)

Building Consent Number 210441

Applicants Name .....

Applicants Mailing Address .....

.....

Site Address 53 Robert Hastie Drive Mangawhai.

Part B As Built Services Information (to be completed in relation to service provided, ticking each box as appropriate)

Stormwater

Pipe Diameter	Pipe Material	Connection Type
☐ 80mm	✓ uPVC	☐ Public Utility Service Connection
✓ 100mm	☐ Vitrified Clay	✓ Soak Hole
☐ 150mm	☐ Ductile Iron	☐ Stream
☐ 225mm	☐ Concrete	☐ Drain
☐ Other_____mm	☐ Other_____	☐ Other_____

Water Supply

Pipe Material - Cold

- ☐ uPVC
- ☐ Copper
- ☐ Polybutylene
- ☐ Other _____

Hot Water Cylinder

- ☐ High Pressure _____ Litre
- ☐ Low Pressure _____ Litre

Meter Type

Make _____ Model _____

Pipe Material - Hot

- ☐ uPVC
- ☐ Copper
- ☐ Polybutylene
- ☐ Other _____

Diameter _____

Serial Number _____

Reading ☐☐☐☐☐☐☐ m^3

(Quote all black figures inclusive of zeros only)

☐ **Note Part B As Built Services Information**

Wastewater - Pressure

(Pump Make/Model)_____

Connection Diameter	Pipe Material	Connection Type
☐ 40mm	☐ uPVC	☐ Public Utility Service Connection
☐ 50mm	☐ Vitrified Clay	☐ Septic Tank
☐ 80mm	☐ Concrete	☐ Other _____
☐ Other_____mm	☐ Other _____	

Wastewater - Gravity

Connection Diameter	Pipe Material	Connection Type
☐ 65mm	✓ uPVC	☐ Public Utility Service Connection
☐ 80mm	☐ Vitrified Clay	☐ Soak Hole
✓ 100mm	☐ Concrete	☐ Stream
☐ Other_____mm	☐ Other _____	✓ Other Septic

Wastewater - Disposal System Description

Septic Tank

Size: _____ litres

Type
- ☐ **Septic tank DECOMMISSIONED**
- ☐ Ecotank
- ✓ Biocycle

Effluent Field

Trench _____ m

- ☐ Deep Soakhole
  - Depth _____ m
  - Number of holes _____ m
- ☐ Other _____

Sanitary Facilities

- ☐ Toilet Number _____
- ☐ Bidet Number _____
- ☐ Urinal Number _____

Waste Disposal Unit

- ☐ No
- ☐ Yes Type _____

Certification

I Kevin Wood. being

- ☐ Owner
- ☐ Occupier
- ☐ Craftsman plumber
- ✓ Registered drainlayer

Registration Number _____

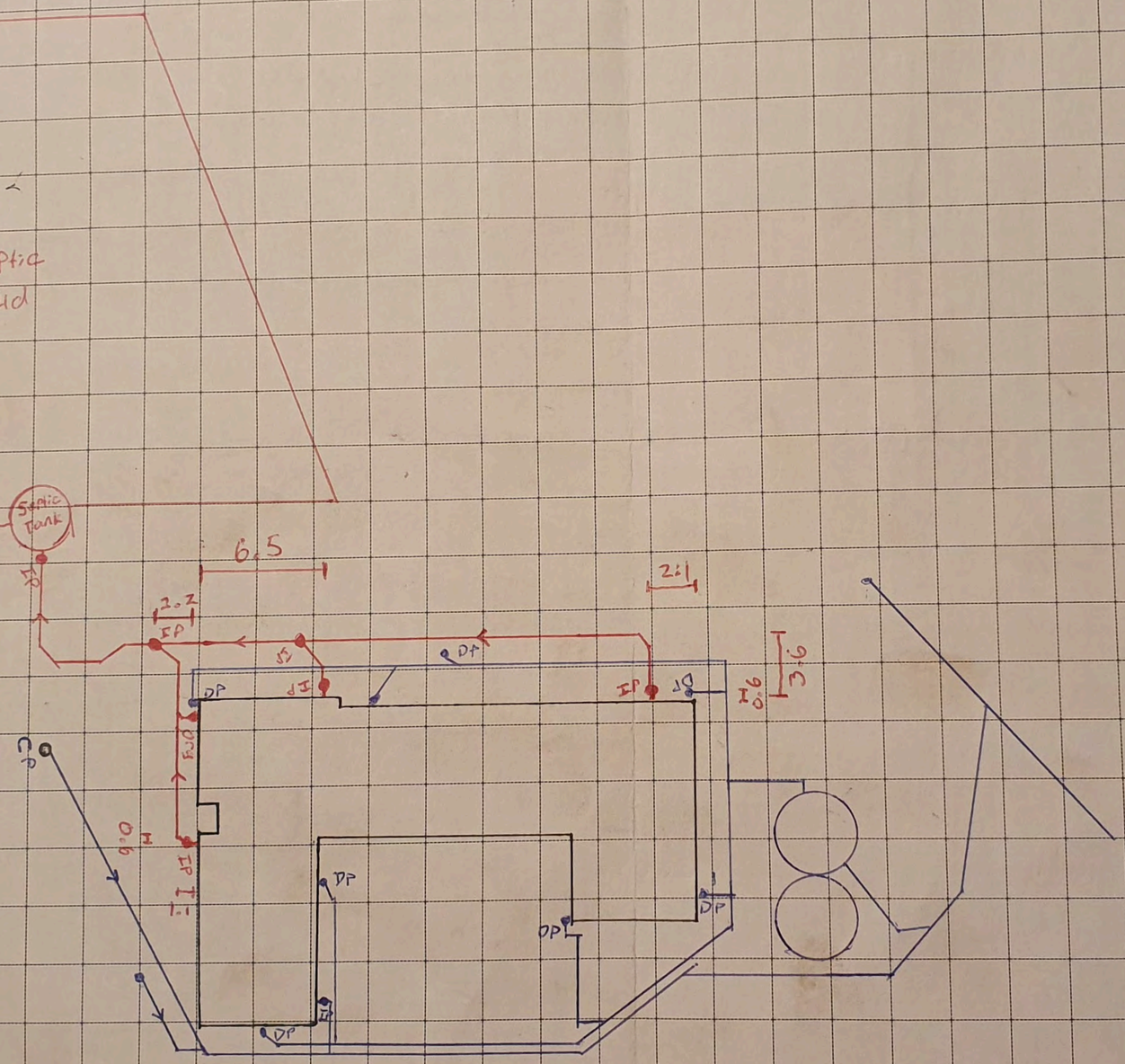
Registration Number 14766

certify that this Private Utility Service As-Built Record is an accurate representation of the work carried out.

Kevin Wood
Signature

15-5-23.
Date

PART C: As Built Services Plan
(To be completed in all cases. If details are already noted on separate drawings then provide copies in duplicate as appropriate and attach to this sheet. Ensure that drawing numbers, etc, are noted below.)



Scale: 1 in 300

Site Address: ~~53~~ 53 Robert Hastie Dr Mangawhai

BC#210441

Please provide at least two measurements for each access point for future location

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Water Proof Construction (PS3B)

Water Proof Construction

ISSUED BUILDING CONSENT NUMBER 210441

THIS PS3b IS ISSUED BY: Mark Maelzer

TO: **KAIPARA DISTRICT COUNCIL**

IN RESPECT OF: Linda and Dave Kendall

AT (Address): 53 Robert Hastie Drive Mangawhai

LEGAL DESCRIPTION - LOT 81 DP 556753 SO .....

FROM: Purecraft tiling Ltd (Water Proof membrane Applicator),

LICENSED BY Mapei Reg./License No: 2267

engaged by Coastal Homes (~~Owner~~/Builder)

In respect of clause(s) E2 and E3 and B2 of the Building Regulations 1992 for the building work described by the drawings and specifications prepared by the design firm titled;

.....

.....

.....

numbered.....

.....

I have sighted the issued building consent and sighted the waterproofing details and have inspected the substrate to which the membrane is to be applied and found it to be satisfactory. As a licensed water proof membrane applicator I can confirm that the application of the membrane has been carried out in accordance with the requirements of the New Zealand Building Code, the manufacturer's specifications and requirements.

I understand that if this producer statement is accepted, that it may be used to verify that the building work All / Part only as specified in the attached particulars, the subject of this building consent meets, the requirements of this building consent and the requirements of the Building Code in respect to clauses E2 and E3 and B2 of the Building Regulations 1992.

☑ I understand and accept that Council may rely on this document, for the purposes of establishing compliance with the above building consent and that the content including the signature, whether electronic or not, is truly representative and authoritative of the information contained.

Name: Mark Maelzer Signature: [signature] Date: 17/5/22

Address: 55 Nukuroa Rd, Topuni

Contractor/Applicator: Mark Maelzer

Phone: — (bus.) 0273104848 (home) Fax —

Please find attached the 15 year product and the 5 year workmanship warranties to the property owners.

File: 3117.03

PRODUCER STATEMENT PS1

WANAKA GLASS POOL FENCING





WARNER.

Fences • Path & driveway gates • Auto-gate openers • Balustrades

IPENZ ENGINEERS NEW ZEALAND | NEW ZEALAND INSTITUTE OF ARCHITECTS INCORPORATED | ACENZ

Building Code Clause(s) B1,B2,F2 ,F9

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

ISSUED BY: P&P CONSULTING ENGINEERS LIMITED
(Design Firm)

TO: WARNER FENCING & GATES LIMITED
(Owner/Developer)

TO BE SUPPLIED TO: RELEVANT COUNCIL
(Building Consent Authority)

IN RESPECT OF: SWIMMING POOL FENCE SUPPORTED BY WANAKA SPIGOTS
(Description of Building Work)

AT: VARIOUS SITES
(Address)

LOT ..... **DP** ..... **SO** .....

We have been engaged by the owner/developer referred to above to provide STRUCTURAL DESIGN services in respect of the requirements of
(Extent of Engagement)

Clause(s) B1, B2, F2 of the Building Code for
All ☐ or Part only ☑ (as specified in the attachment to this statement), of the proposed building work.

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

☑ Compliance Documents issued by the Ministry of Business, Innovation & Employment B1/VM1 & GLASS TESTING or
(verification method / acceptable solution)

☐ Alternative solution as per the attached schedule

The proposed building work covered by this producer statement is described on the drawings titled WARNER FENCING & GATES and numbered REF: 13/243/ds & ENG 01;
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

(i) Site verification of the following design assumptions REFER NOTES AT END OF DESIGN SUMMARY

(ii) All proprietary products meeting their performance specification requirements;

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

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

I, MR. P PRAKASH am: ☑CPEng 251801 #
(Name of Design Professional)

☐Reg Arch ..... #

I am a Member of : ☑ IPENZ ☐NZIA and hold the following qualifications: B.E. (Civil), CPEng

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

The Design Firm is a member of ACENZ: ☐

SIGNED BY MR. P PRAKASH ON BEHALF OF P&P CONSULTING ENGINEERS LTD
(Design Firm)

Date 13/10/2021 (signature)

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

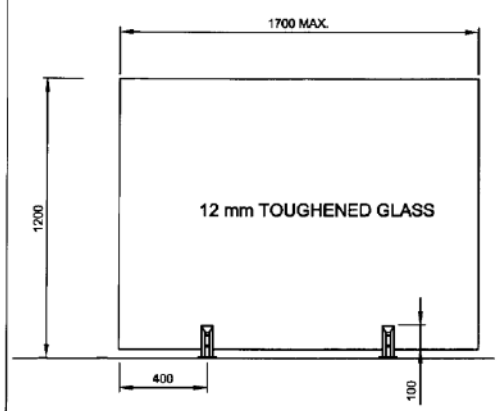
This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA

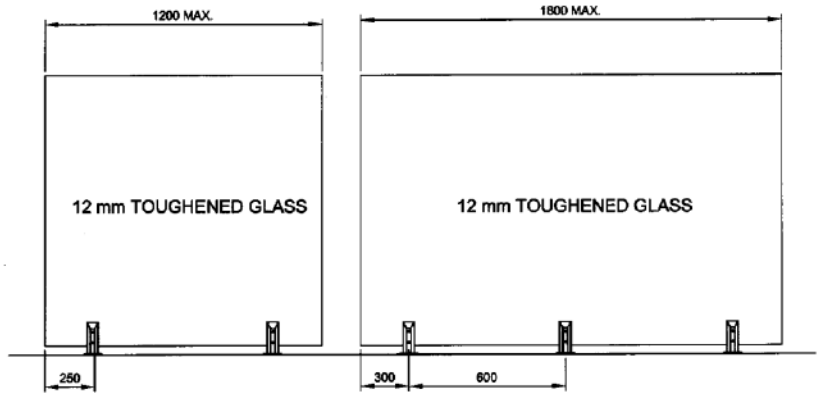
WARNER.

Fences • Path & driveway gates • Auto-gate openers • Balustrades

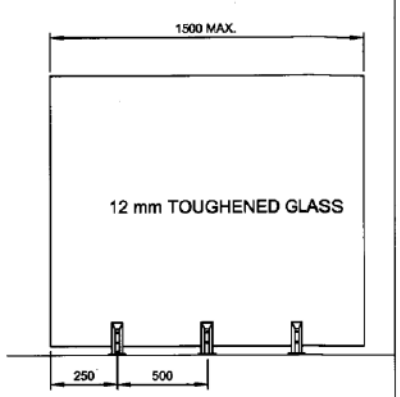
FRAMELESS GLASS SWIMMING POOL FENCE SUPPORTED BY WANAKA SPIGOTS



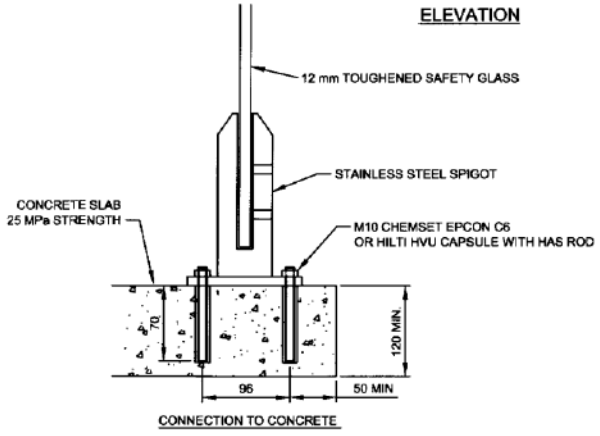
MEDIUM WIND ZONE

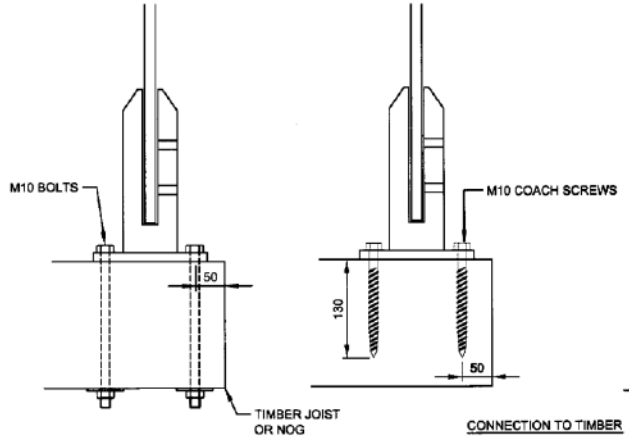


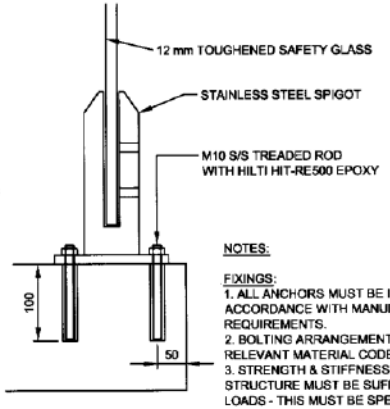
HIGH WIND ZONE



VERY HIGH WIND ZONE







NOTES:

FIXINGS:
1. ALL ANCHORS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.
2. BOLTING ARRANGEMENT MUST COMPLY WITH RELEVANT MATERIAL CODES.
3. STRENGTH & STIFFNESS OF THE SUBSTRATE STRUCTURE MUST BE SUFFICIENT FOR THE LOADS - THIS MUST BE SPECIFICALY CHECKED BY OTHERS FOR EACH SITUATION.
4. ALL FIXINGS TO BE STAINLESS STEEL.

P & P CONSULTING ENGINEERS LTD Civil and Structural Engineering 6A Montel Avenue, Henderson ph: 836-1853	WARNER FENCING & GATES LTD	Scales N.T.S	Project 13/243
	GLASS FENCE SUPPORTED BY STAINLESS STEEL SPIGOTS	Drawn PP / Date 6-3-14	Sheet ENG 01

2A

WARNER.

Fences • Path & driveway gates • Auto-gate openers • Balustrades

Maximun glass spans and spigot requirements for the Wanaka spigot

Glass Height	Glass Width	Windzones		
		Medium 32-37 M/S	High 37-44 M/S	Very High - 44-50 M/S
1160	1000	2 Spigots	2 Spigots	2 Spigots
1160	1050	2 Spigots	2 Spigots	2 Spigots
1160	1100	2 Spigots	2 Spigots	2 Spigots
1160	1150	2 Spigots	2 Spigots	2 Spigots
1160	1200	2 Spigots	2 Spigots	2 Spigots
1160	1250	2 Spigots	2 Spigots	2 Spigots
1160	1300	2 Spigots	2 Spigots	2 Spigots
1160	1350	2 Spigots	2 Spigots	3 Spigots
1160	1400	2 Spigots	2 Spigots	3 Spigots
1160	1450	2 Spigots	2 Spigots	3 Spigots
1160	1500	2 Spigots	2 Spigots	3 Spigots
1160	1550	2 Spigots	2 Spigots	3 Spigots
1160	1600	2 Spigots	2 Spigots	3 Spigots
1160	1650	2 Spigots	2 Spigots	3 Spigots
1160	1700	2 Spigots	2 Spigots	3 Spigots
1160	1750	2 Spigots	3 Spigots	3 Spigots
1160	1800	2 Spigots	3 Spigots	3 Spigots
1160	1850	2 Spigots	3 Spigots	3 Spigots
1160	1950	2 Spigots	3 Spigots	3 Spigots
1160	2000	2 Spigots	3 Spigots	3 Spigots

AZUMA Design

NATA Accredited Laboratory No: 15147

HINGE TEST REPORT

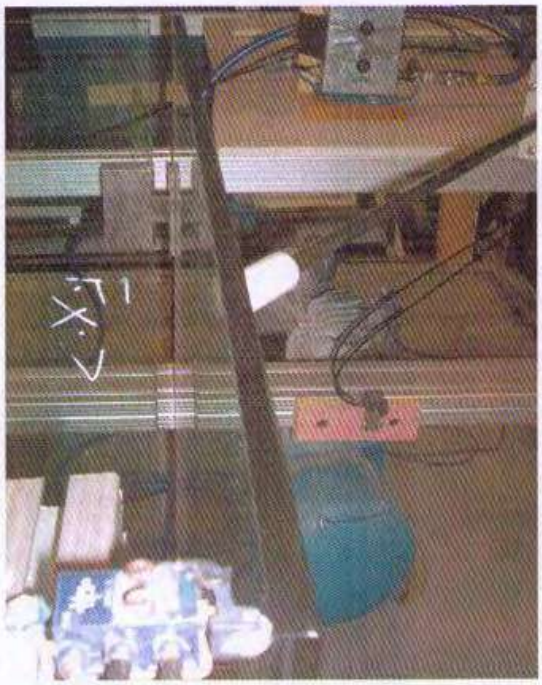
Model No. / Name: Magna Close Safety Hinge

AZT Number: AZT0113.09

Customer: Glass FX Frameless Glass Solutions

Date of Test: 14th July 2009 – 21st July 2009









Latch

Applicable Standard: AS 1926.1 Clause 2.4.2
Test Method: Visual and dimensional and Figure 2.9

COMPLIES

Test requirement	Observation
The following is applicable when the gate is installed to the manufacturer's instructions and requirements.	
2.4.2.1 General Gates shall be fitted with a latch that will automatically operate on the closing of the gate and will prevent the gate from being re-opened without being manually released. The gate shall not be able to be:	The latch prevented the gate from being re-opened without being manually released.
Inadvertently adjusted during operation	Cannot be adjusted
Locked in the "open " position	Cannot be locked open
Adjusted without the use of tools	Not adjustable without use of tools
A latch shall not be able to be released by insertion of any implement in the 10mm opening shown in Figure 2.9	Cannot be opened through insertion of an implement through the opening.
2.4.2.2 Location Where the release point of the latch is located at a height less than 1500mm above the finished ground level, the location of the latch shall:	
Not be on the outside of the barrier	Latch is located on the inside of the barrier when installed in accordance with the manufacturer's installation instructions.
Be in such a position that to release the latch from the outside it will be necessary to reach over or through the barrier at a height of not less than 1200mm above the finished ground level or not less than 1000mm above the highest lower horizontal member.	Height is 1200mm above the finished ground when installed in accordance with the manufacturer's installation instructions.
Be at least 150mm below the top of the barrier if a hand-hole is not provided, or at least 150 mm below the edge of any hand-hole if provided.	No hand hole is provided
2.4.2.3 Shielding of the latch In a gate with vertical openings greater than 10mm, where the latch is located at a height less than 1500 mm above the finished ground level, the latch release shall be shielded so that no opening greater than 10mm occurs within the bounded area as shown in Figure 2.9	The vertical opening is less than 10mm

94 Vickery Street, Te Rapa, Hamilton 3200 | p 07 850 9093 | f 07 850 9026 | m 027 509 8425
waikato@warnerfences.co.nz | www.warnerfences.co.nz

Product Tested

Manufacturer:	Glass Outlet
Brand:	Master Range
Model Nos:	Not provided
Model Name:	Master Range Glass Gate Installation Kit
Description:	Master Range Inline & Hinges with 8mm thick 890mmW x 1200mmH glass gate fitted with D&D side pull latch kit.

Queensland Testing Laboratory Pty Ltd — Test Report: 132647 3248

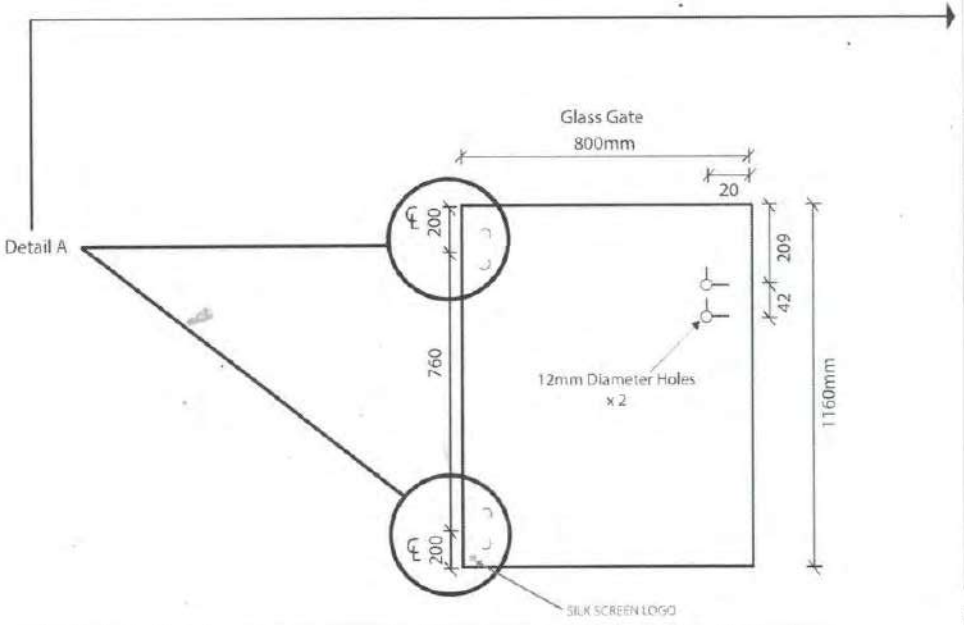
Component Description

Sample Number	Description	Photo / Product / Component
3427	Side pull glass gate latch kit	

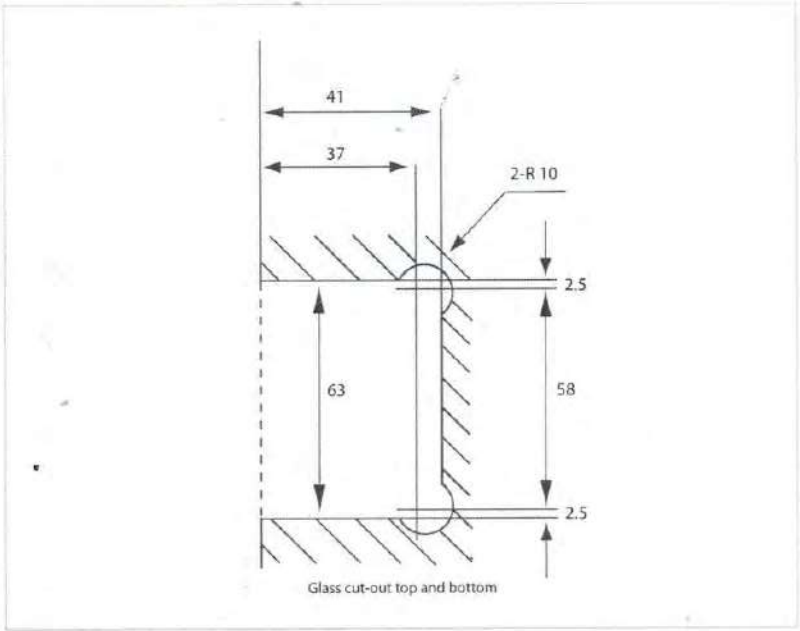
WARNER.

Fences • Path & driveway gates • Auto-gate openers • Balustrades

CODE: 12NPG-0800
DESCRIPTION: 12mm Polaris Glass Gate, 800 x 1160mm



Not To Scale



Detail A

Not To Scale

Glass Gate Specification:

- 12mm Thick Clear Toughened Glass
- 12mm Diameter Holes x 2
- 5mm Radius Corners
- 2 x Cut Outs As Per Detail A
- Flat Polish All Sides
- ℄ - Centre Line

Producer statement construction (PS3)
General construction work

All sections of this form must be completed

TO BE COMPLETED BY THE PERSON WHO HAS UNDERTAKEN THE BUILDING WORK

Author name:	Ryan O'Connor	Building consent No:	
Author company:	Warner Fencing	Author Registration No:	
Description of building work:	Warner Glass Pool Fencing & Clutha Pool Fencing		
Performance standard for maintenance and inspection, if applicable	☐ N/A		
Legal description:	Pool Fencing		
Site address:	53 Robert Hastie Drive, Mangawhai		

NZBC clauses: (select as applicable)

B1 ✔	B2	C1	C2	C3	C4	C5 ✔	C6	D1	D2	E1	E2	E3
F1	F2	F3	F4	F5	F6	F7	F8	G1	G2	G3	G4	G5
G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	H1		

I have sighted the above building consent and read the attached conditions of consent and confirm that I have undertaken the building work described above in accordance with the consented plans and specifications.

I understand that Council will rely upon this producer statement, for the purposes of establishing compliance with the above building consent.

Signature:  Date: 11 Oct 21

Tradesperson's contact details:

Address:	15 Taylors Road, Morningside Postcode: 1025		
Business:	Warner Fencing	Fax:	
Mobile:	0275183930	Email	ryan@warnerfencing.co.nz

COUNCIL USE ONLY

☐ Central ☐ Henderson ☐ Manukau ☐ Orewa ☐ Papakura ☐ Pukekohe ☐ Takapuna

☐ Accepted in support of inspection ☐ Accepted instead of inspection

Register checked: Council ☐ LBP ☐ N/A ☐

Name: Date:

Producer statement accepted as establishing compliance with the consented plans: YES ☐ NO ☐

Producer statements are accepted solely at Auckland Council's discretion; please refer to the Producer Statement Policy which can be found on Councils website for further details

http://www.aucklandcouncil.govt.nz/EN/ratesbuildingproperty/consents/Consent%20documents/ac2301producerstatementpolicy.pdf

P & P CONSULTING ENGINEERS LTD

Civil and Structural Engineering

Mr P. Prakash (Director)
B.E. (Civil), CPEng, MIPENZ
Mr J. Dela Cruz
B.E. (Civil), GIPENZ
Mr M. Ormeno
B.E. (Civil), Ph.D., GIPENZ
Dr. H.D.W. FENDALL (Consultant)
B.E. (Civil) Hons., Ph.D., CPEng, MIPENZ

6A Montel Avenue,
Henderson,
AUCKLAND, 0612
Ph. & Fax 09-836-1853
parmil@pnpltd.co.nz
joel@pnpltd.co.nz
miguel@pnpltd.co.nz

Ref: 12/170/ds2
02/09/2021

WARNER FENCING & GATES LTD

ALUMINIUM SWIMMING POOL FENCE

DESIGN CALCULATIONS SUMMARY

INDEX **PAGE**

1. **Producer Statement - Design** 1

2. **General** 2

3. **Design of Aluminium Fence** 3

3.1 **Vertical Rails** 3

Use 6063-T6 Ø16 mm x 1.2 mm thick Aluminium Vertical Rails @ 90 mm max centres, 1.2 m max span.

3.2 **Top Rails** 5

Use 6063-T6 25 mm deep x 38 mm wide x 1.5 mm thick Aluminium Top Rails with max clear span of 2450 mm.

3.3. **Posts** 6

Use 6063-T6 50 mm deep x 50 mm wide x 2.0 mm thick Aluminium posts at max spacing of 2.5 m.

3.4. **Footing** 6

Use 250 mm Diameter x 900 mm min deep concrete footing.

Min concrete strength to be 20 MPa or 25 MPa if within sea spray zone.

Assumed Undrained Shear Strength is 50 kPa.

3.5 With Base Plate Option 8

Use 6063-T6 135 mm x 100 mm x 10 mm thick Aluminium Base Plate.

Use 4 / M10 Chemset Anchor Studs Grade A4/316 SS with Epcon C6 Series. Drilled hole depth to be 80 mm minimum into concrete. Other requirements are as follows:

Minimum Substrate (Concrete) Thickness = 100 mm
Minimum Concrete Edge Distance = 50 mm.
Minimum Spacing = 60 mm

3.6 With coach screws option 10

Use 4 / M10 coach screws. 150 mm minimum penetration

Refer to Drawing S01 – S04 for reference.

Notes:

1. Any parts of the structure which are not covered by the specific design included with these calculations must comply either with the New Zealand Building Code or specific design as detailed by others. Any exceptions to this should be referred back to this Design Office.

2. The above calculations include structural work for which a Building Consent must be obtained prior to building. It is the Owner's responsibility to obtain all necessary consents.

3. This design assumes that all the specified members are suitably protected from excess moisture in accordance with Section E1, E2 and E3 of the Building Code. All timber, steelwork, bolts and fasteners to be corrosion protected in accordance with the requirements of NZS 3604:2011 Chapter 4, Durability.

4. All aluminium surfaces shall be painted where the structures are to be exposed to extremely corrosive conditions and where the aluminium alloy parts are in contact with, or are fastened to, steel members or other dissimilar materials.

5. Painting procedure must be in accordance with AS/NZS 1664.

6. All welding shall be done in accordance with AS1665.

Building Code Clause(s) B1

PRODUCER STATEMENT – PS1 – DESIGN

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

ISSUED BY: P & P CONSULTING ENGINEERS LTD
(Design Firm)

TO: HARCO (HARKNESS & YOUNG LTD)
(Owner/Developer)

TO BE SUPPLIED TO: VARIOUS COUNCILS
(Building Consent Authority)

IN RESPECT OF: ALUMINIUM SWIMMING POOL FENCE
(Description of Building Work)

AT: VARIOUS SITES
(Address)

Town/City:..... **LOT**..... **DP**..... **SO**.....
(Address)

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

STRUCTURAL DESIGN OF ALUMINIUM SWIMMING POOL FENCES

(Extent of Engagement)

services in respect of the requirements of Clause(s) B1 of the Building Code for:

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

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

■ Compliance Documents issued by the Ministry of Business, Innovation & Employment B1/VM1,VM4 or
(verification method/acceptable solution)

☐ Alternative solution as per the attached schedule

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

HARCO - ALUMINIUM SWIMMING POOL FENCES and numbered 12/170/DS2, S01-S04;
together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:
(i) Site verification of the following design assumptions REFER NOTES AT END OF DESIGN CALCULATIONS
(ii) All proprietary products meeting their performance specification requirements;

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

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

I, PARMIL PRAKASH (Name of Design Professional) am: ■ CPEng 251801 # ☐ Reg Arch ..... #

I am a member of: ■ Engineering New Zealand ☐ NZIA and hold the following qualifications: BE (Civil), CPEng
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY PARMIL PRAKASH (Name of Design Professional) (Signature)

ON BEHALF OF P & P CONSULTING ENGINEERS LTD (Design Firm) Date 02/09/2021

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

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, ENGINEERING NEW ZEALAND AND NZIA

P & P CONSULTING ENGINEERS LTD

Civil and Structural Engineering

Mr P. Prakash (Director)
B.E. (Civil), CPEng, MIPENZ
Mr J. Dela Cruz
B.E. (Civil), GIPENZ
Mr H. Yin
B.E. (Civil), GIPENZ
Dr. H.D.W. FENDALL (Consultant)
B.E. (Civil) Hons., Ph.D., CPEng, MIPENZ

6A Montel Avenue,
Henderson, AUCKLAND,
0612
Ph. & Fax 09-836-1853
parmil@pnpltd.co.nz
joel@pnpltd.co.nz
hansen@pnpltd.co.nz

02/09/2021

Ref: 12/170

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

B2 COMPLIANCE

Producer Statement for Design-PS1 for Clause B2 of the Building Code – Structural Durability.

We are not able to provide this because there is no effective verification method for B2 contained within the Building Code.

However we can confirm that for the structural elements shown on our documentation:

Timber
Timber treatment has been selected in accordance with Table 1A of B2/AS1.

Concrete
Concrete cover have been selected in accordance with NZS3101:2006, Part 1 Section 3.

Mild Steel
Steel protection has been specified in accordance with the "Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings" AS/NZS3212. We Note that this is on a time to first maintenance basis.

We trust this provides the information that you are seeking.

Yours faithfully,

Mr P Prakash
Director
P & P Consulting Engineers Limited

2. GENERAL

The following will be used for the design of proposed pool fence

Use	AS / NZS 1170:2002	Loadings Code
	NZS 8500:2006	Safety Barriers and Fences Around Swimmng Pool
	NZS 3404:1997	Structural Steel
	NZS 3101:2006	Concrete

LOADS

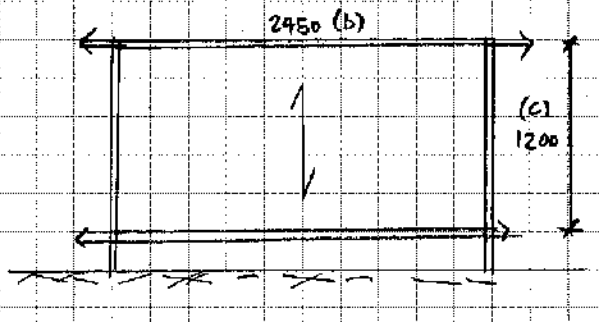
Live Loads — Consider 0.25 kN point load to all structural components

Wind Loads — Consider Very High Wind Zone

Vu = 50 m/s

q = 1.50 kPa (ULS)

3. DESIGN of ALUMINIUM FENCE



c/h = 0.92
b/c = 2 (1 panel)
= 5 (> 1 panel)

Wind Load : Very High
q_a = 1.5 kPa

Consider wind on individual members : Cd = 1.2 for circular & square sections

3.1 VERTICAL RAILS

Spacing = 90mm max. crs

Span = 1200 - 25×2 = 1150mm

LOADING

1.5Q
- 1.5 × 0.5kPa = 0.75kPa
- 1.5 × 0.125kN × 50% = 0.1875kN

Wu 1.5kPa × 1.2 × 0.18 = 0.324 kN/m
(V_{max} = 50 m/s) → Very High Wind

MOMENT, M*

$M^* = (0.75)(0.09)(1.2)^2/8 = 0.012$ kNm

$M^* = (0.1875)(1.2)/8 = 0.027$ kNm ← governs

$M^* = (0.324)(1.15)(1.2)^2/8 = 0.0515$ kNm

Say both ends fixed

Provided Section : ϕ16 × 1.2 mm (6063-T5) Aluminium

Elastic Section Modulus, $Z = \frac{\pi[(16)^4 - (13.6)^4]}{32(16)} = 192.21\ mm^3$

Plastic Section Modulus, $S = \frac{d^3 - d_1^3}{6} = 263.42\ mm^3$



USING 6063 - T5

As per AS/NZS 1664 : 1997 Sect. 3.4.9 (Tension - Round Tubes)

$\phi F_L = 1.17\, \phi_y F_{ty} = (1.17)(0.95)(110) = 122.3$ MPa ← governs

$\phi F_L = 1.24\, \phi_u F_{tu}/k_t = (1.24)(0.85)(152)/1.0 = 160.2$ MPa

Using 6063 - T5 Material

$F_{ty} = 110$ MPa

$F_{tu} = 152$ MPa

$k_t = 1.0$

MOMENT CAPACITY OF THE SECTION PROVIDED

$f_b = \phi M / Z_{nt}$; $\phi M = (\phi F_L)(Z_{nt})$

ϕM_z (elastic) = 0.0235 kNm < M^* NOT ok'

ϕM_s (plastic) = 0.0322 kNm

USING 6063 - T6

$F_{ty} = 172$ MPa

$F_{tu} = 207$ MPa

$k_t = 1.0$

$\phi F_L = (1.17)(0.95)(172) = 191.2$ MPa ← governs

$= (1.24)(0.85)(207)/1 = 218.2$ MPa

MOMENT CAPACITY : $\phi M = (\phi F_L)(Z_{nt})$

ϕM_z (elastic) = 0.0367 kNm > M^*

ϕM_s (plastic) = 0.0504 kNm > M^*

Use 6063 - T6 Φ16mm x 1.2mm thick Aluminium Vertical Rails @ 90mm max crs. (1.2m max. span)

3.2 TOP RAILS

Section = 25 x 38 x 1.5mm

Span = 2.5m

Z = 1473.8 mm^3

S = 1702.5 mm^3

Loads:

Wind Load from Infill = 1.5 kPa x 1.2 x 0.016 x $\frac{1.2}{2}$ = 0.017 kN/rail

kN/m = $\frac{0.017}{0.1}$ = 0.17 kN/m

on rail = 1.5 x 1.2 x 0.025 = 0.045 kN/m

Total = 0.215 kN/m

BM = $\frac{1}{8}$ x 0.215 x 2.5^2 = 0.17 kNm

Live load: Consider 0.25 kN @ mid span

BM = $\frac{0.75 \times 1.5 \times 2.5}{4}$ = 0.23 kNm

Using 6063 - T6

ϕF_L = 0.95 x 172 = 163 mPa

= 0.85 x $\frac{201}{1}$ = 175 mPa

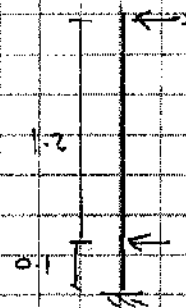
moment capacity = $\phi M = \phi F_L (Z or S)$

ϕM_z = 0.24 kNm ✓ OK

ϕM_s = 0.28 kNm ✓ OK

→ Use 6063-T6 25mm deep x 38mm wide x 1.5mm thick Top Rails

3.3 Posts



Section = 50×50×2 SHS

Spacing = 2.5m

Z = 5393 mm³

S = 6399.8 mm²

F = 0.215 × 2.5 = 0.54 kN (wind)

Φ = 0.25 × 1.5 = 0.38 kN

Bm = (0.54 × 0.1) + (0.54 × 1.3) = 0.76 kN·m

Using 6063-T6

ϕf_L = 163 MPa, ϕM = (φfL)(Z or S)

ϕM_z = 0.881 kN·m ✓ OK

ϕM_3 = 1.05 kN·m ✓ OK

→ Use 6063-T6 50×50×2 SHS Aluminium post at 2.5 m centres.

3.4 Footing

Mo base = 0.76 kN·m

Ve base = 1.1 kN

eff. load ht = M/V = 0.69 m

Refer PSS 7

→ Use 250 mm ϕ × 900 mm deep concrete footing

Assumed S_u = 50 kPa

Concrete strength = 20 MPa (25 MPa within sea spray zone)

LATERALLY LOADED POLES - Ultimate Limit State Design

CLIENT: HARCO

REF: 12/170
DATE: 26-Jun-16

POLE AND FOOTING DETAILS

Pole / Load Height =	**0.70** metres
Lateral Load	**1.1** kN (ULS)
Footing Diameter =	**0.25** metres
Min Pole Spacing =	**2.5** metres
Req'd Footing Depth	0.79 metres
No Resistance Depth (fo)	**0.25** metres

SOIL PROPERTIES:

Undrained Shear Strength (Su)	=	**50 kPa**
Soil Strength Reduction Factor	=	**0.5**

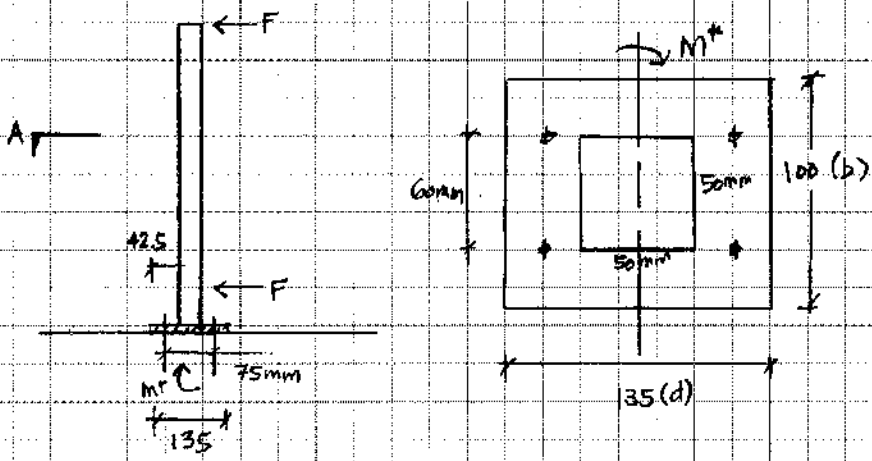
FOOTINGS (Using "Broms and Beyond" by Pender)

Spacing Factor (B1/VM4) = 1.000

Required Footing Depth = Pender + Dia = 0.54 + 0.25

= 0.79 metres

3.5 WITH BASE PLATE OPTION



SIDE ELEVATION PLAN 'A'

⇒ BASE PLATE

Provided Section : 135 x 100mm Base Plate

$M^*_{@\,BASE}$ = 0.76 kNm $\quad N^* = 1.2(0.5kPa)(1.2)(2.5) = 1.8kN$

$V^*_{@\,BASE}$ = 1.1 kN

$f_{BASE} = \frac{P}{A} \pm \frac{6M}{BD^2} = 0.133\ MPa \pm 25 = 26MPa, -25MPa$

17.5MPa

Allo BP (concrete) = $0.85f'c$
support = 15MPa

$M^*_{plate} = (2.6MPa)(100)(42.5)^2/2 = 234812\ N\text{-}mm$

USING 6063 – T6

As per NZS1664 : 1997 Sect 3.45 (Tension – plates)

$\phi F_L = 1.3\,\phi_y F_{ty} = 1.3(0.95)(172) = 212.42\ MPa$ ←

$= 1.42\,\phi_u F_{tu}/k_t = 1.42(0.85)(207)/1 = 250\ MPa$

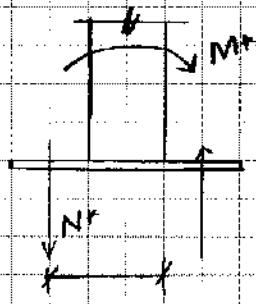
$\phi F_L = \phi M / Z$, $\quad Z\ (elastic) = \frac{bt^2}{6}$

$(212.42\ MPa) = (234812) / \left(\frac{100\,t^2}{6}\right)$

Min. thickness = 8.1 mm ~ say 10mm

Use 6063 – T6 135mm x 100mm x 10mm thick Aluminium Base Plate

⇒ ANCHORS INTO CONCRETE



$M^* = 0.76\ kNm$

$V^* = 1.1\ kN$

$N^* = M^*/x = 12.2\ kN$

$N^*/_{BOLT} = 12.2\ kN/2 = 6.1\ kN$

$V^*/_{BOLT} = 1.10\ kN/4 = 0.3\ kN$

USING M10 Chemset Anchor Stud (EPCON C6 SERIES)

$\phi N_{ur} = (9.3\ kN)(0.87)(1)(1)(1.0)(0.54)$
$= 9.9\ kN/BOLT \quad > N^*$ ok!

Eff depth, h_{ef} = 80mm
F'_c = 20 MPa
Edge Distance = 50mm min
Spacing = 60mm min

$\phi V_{ur} = (5.1\ kN)(0.79)(1)(0.79)(0.82)(0.71)$
$= 1.74\ kN/BOLT \quad > V^*$ ok!

RATIO = 0.9 < 1.2 ok!

Use 4/M10 Chemset Anchor Studs Grade A4/316 SS with Epcon C6 Series. Drilled hole depth to be 80mm min into Concrete. Other requirements are as follows:

Min. Substrate (Concrete) thickness = 100 mm
min. Concrete Edge Distance = 50mm
Min. Spacing = 60mm

NOTE: FIXING of POSTS to BASE PLATES BY OTHERS. IF WELDED THE CAPACITY OF THE POSTS WILL BE REDUCED AND NEEDS TO BE REDESIGNED.

3.6 Alternatively Using Coach Screws

$N_u = 6.3\ kN$, $V_u = 0.3\ kN$

Using M10 coach screws

$$\phi N_n = \phi \times n \times k \times p \times Q_k$$

where $\phi = 0.7$
$n = 1$, number of screws
$k = 0.7$, timber group J5
$= 0.8$, medium duration
$p = 150\ mm$
$Q_K = 10.7\ N/mm$, NZS 3603 / Table 4.16

$\Rightarrow \phi N_n = 6.3\ kN > N_u$, hence OK

Shear Verification

$$\phi V_n = \phi \times n \times k_1 \times k_{12} \times k_{13} \times k \times Q_{sk}$$

where $\phi = 0.7$
$n = 1$
$k = 1$
$k_1 = 0.8$, medium duration
$k_{12} = 0.7$
$k_{13} = 1.0$
$Q_{sk} = 2.26\ kN$

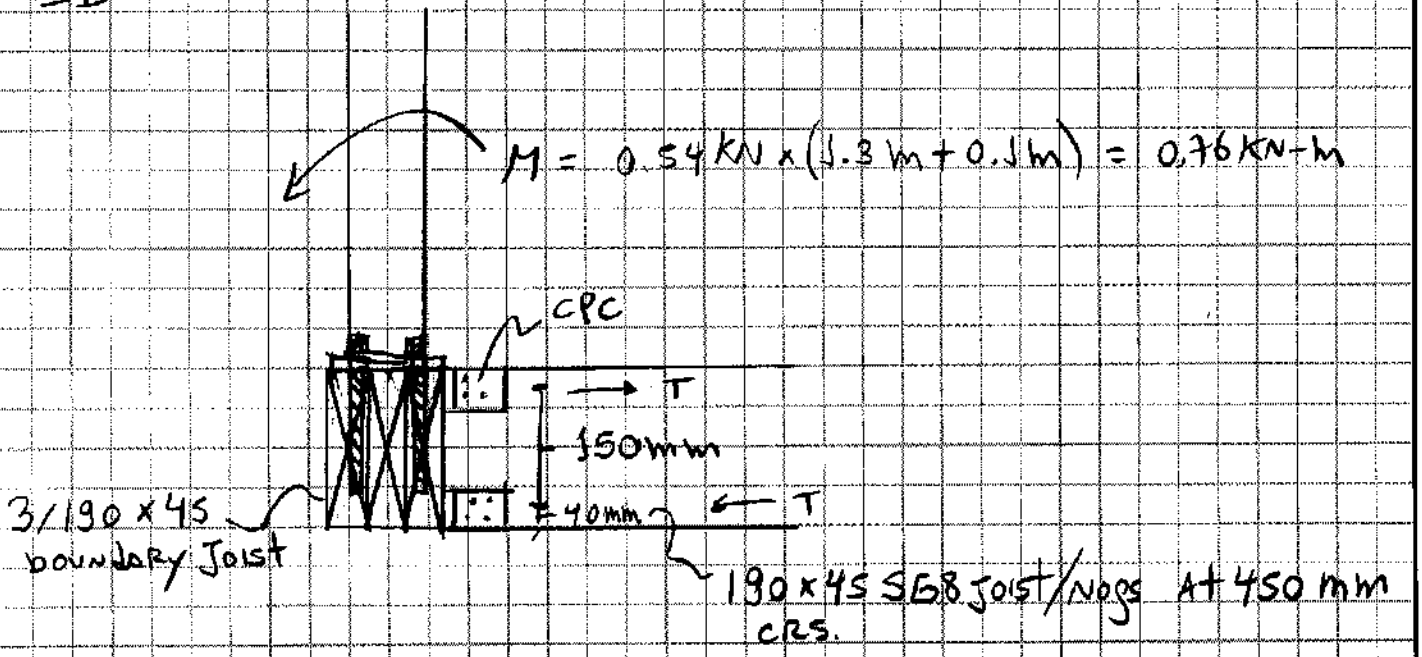
$\Rightarrow \phi V_n = 0.9\ kN > V_u$, hence ok

$\therefore$ Use 4/M10 coach screws . 150 mm minimum penetration

4.- Boundary Joist to Joist/Nog Connection

Using 190 x 45 SG8 joists or nogs at 450 mm crs

→ Δ



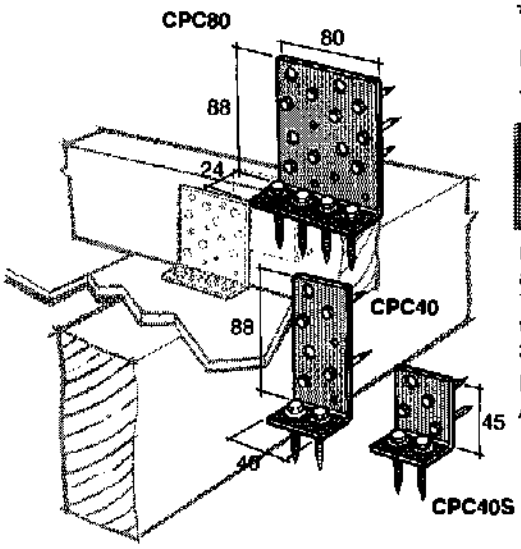
→ $T = \frac{0.76\ kN-m}{0.15\ m} = 5.1\ kN$

Using CPC 40 cleats at the 2 adjacent joist/nogs to post

→ Load per cleat = $\frac{5.1\ kN}{2} = 2.6\ kN$

Cleat Capacity (PAIR) = 5.5kN , hence OK

Refer cleat specification on pages 12 & 13



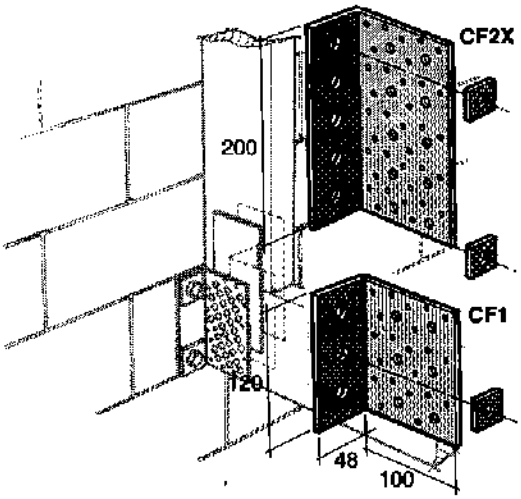
*CONCEALED PURLIN CLEATS CPC40, CPC80, CPC40S

1.55mm G300 Z275 Galvanised Steel

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

CPC cleats provide an excellent purlin/rafter fixing in exposed situations, resisting any wind uplift.
The cleats can also be used for exposed rafter to ridge beam connections. Fixed with Type 17-14g Hex Head Screws and LUMBERLOK Product Nails 30mm x 3.15mm diameter (not supplied with product).

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.

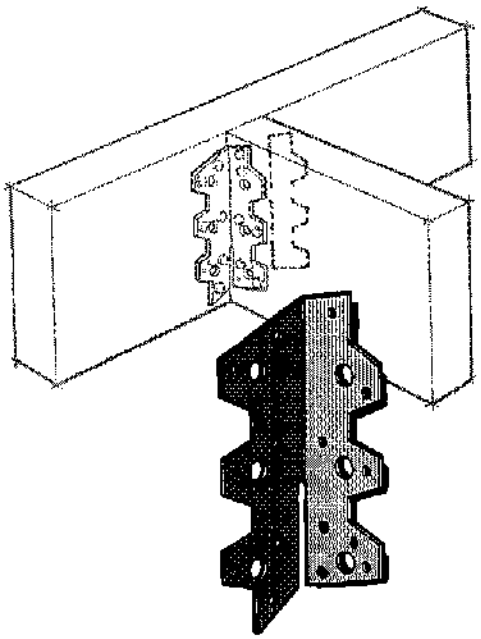


CONCRETE FIXING CLEATS CF1 & CF2X

1.55mm G300 Z275 Galvanised Steel

Both cleats provide a quick and economical method of joining timber trusses, beams, columns to solid concrete or grouted concrete blockwork.
Both cleats can be used on one or two sides of timber members, depending on the loads required. Fixed with LUMBERLOK Product Nails 30mm x 3.15mm diameter and appropriate M12 bolts (not supplied with product). 40x40x5mm washer supplied.

Refer to Characteristic Loadings Brochure for design values.



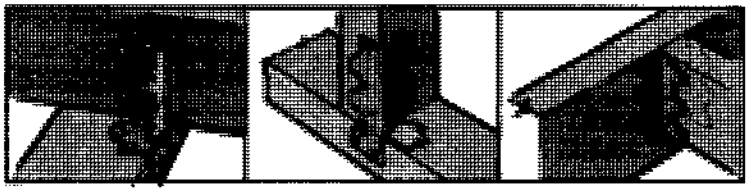
MULTIGRIP

0.91mm G300 Z275 Galvanised Steel

LUMBERLOK Multigrips are a multipurpose product that can be bent into any of five combinations. One product provides for all alternatives with the bending slot enabling easy on-site bending.

Size 125mm high x 38mm flanges. Fix with LUMBERLOK Product Nails 30mm x 3.15mm diameter.
Correct nailing shown below.

Refer to Characteristic Loadings Brochure for design values.
Available in Stainless Steel 304.



* Detailed product sheet available

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LUMBERLOK®

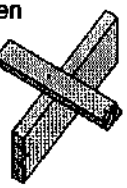
STANDARD FIXING OPTIONS

FIXING TYPE A 0.55kN

1 NAIL

Note: Two nails maybe preferred to prevent batten rolling over with high roof pitches.

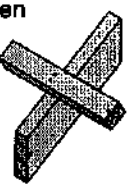
Purlin / Batten



FIXING TYPE B 0.6kN

2 NAILS

Purlin / Batten



FIXING TYPE C 2.4kN

1 BLUE SCREW

Purlin / Batten



FIXING TYPE D 3.45kN

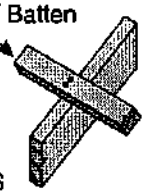
2 BLUE SCREWS

OR

2 SKEW NAILS plus 2 WIRE DOGS

(for purlin on edge)

Purlin / Batten



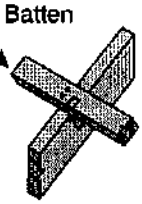
FIXING TYPE E 5.5kN

2 NAILS plus 1 CT200

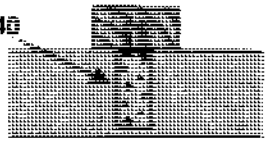
OR

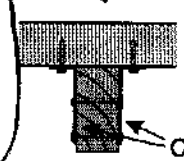
1 PAIR of CPC40

Purlin / Batten



CPC40





CPC40

FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

BLUE SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW

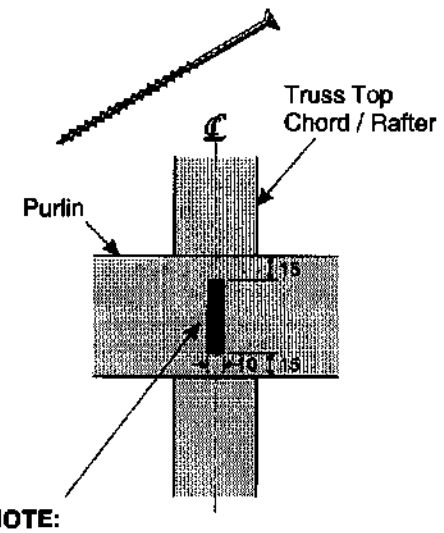
WIRE DOG = LUMBERLOK WIRE DOG either LH or RH

CT200 = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

CPC40 = LUMBERLOK CPC40 with 2 x Type 17-14g x 35mm Hex Head Screws per flange

FIXING TOLERANCES

LUMBERLOK BLUE SCREW



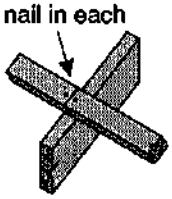
NOTE:

Locate fixings within the shaded area. Care to be taken to avoid over tightening of screws.

PURLIN / BATTEN SPLICE FIXING OPTIONS

FIXING TYPE A & B OVER PURLIN SPLICE

1 nail in each

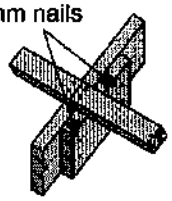


NOTE:

Skew nail when fixing to 35mm rafter or truss

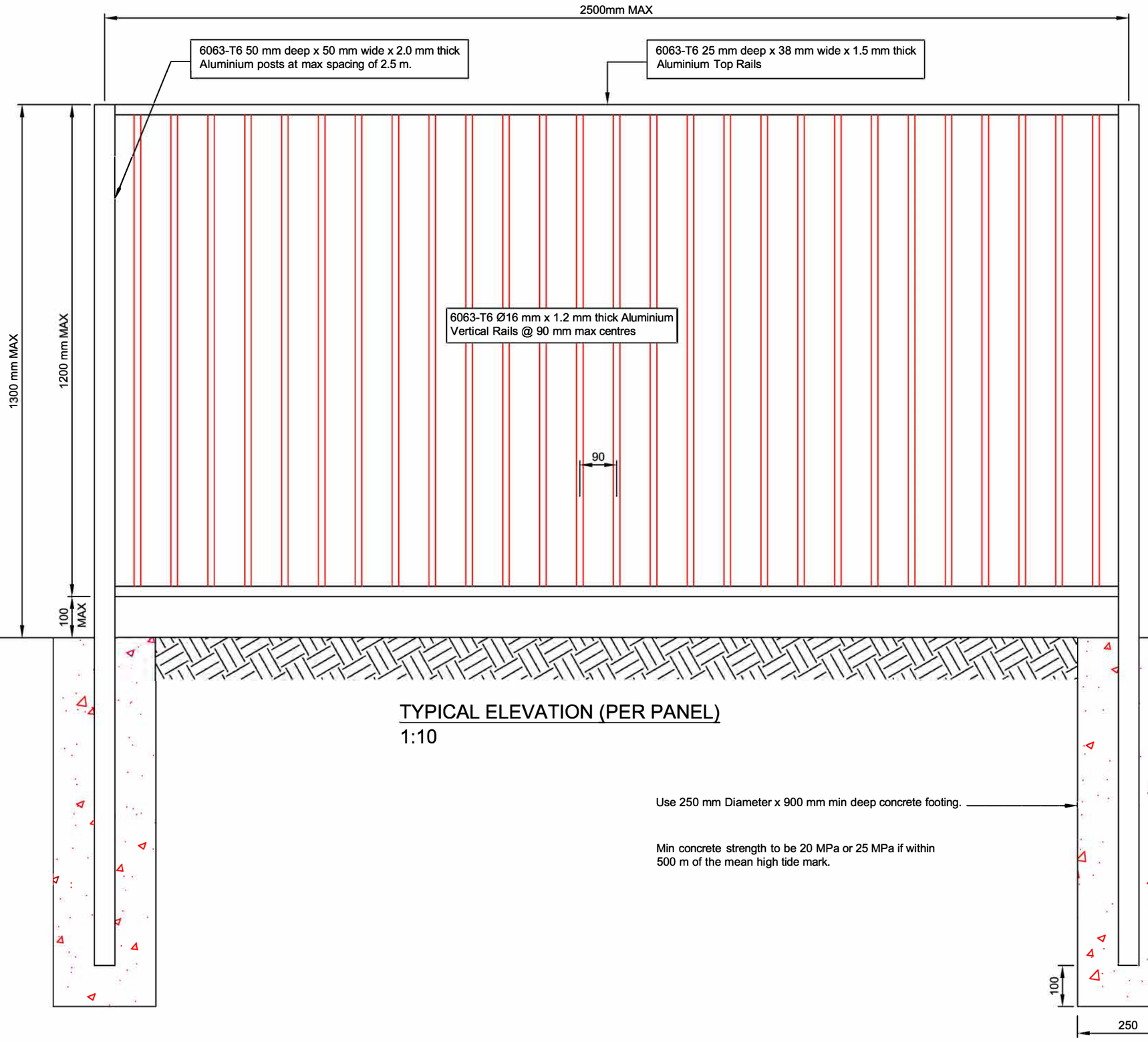
FIXING TYPE C, D or E OVER PURLIN SPLICE

90 x 35mm block fixed to chord or rafter with 4 x 75mm nails



- TYPE C
  1 SCREW
  to each purlin
- TYPE D & E
  1 NAIL plus 1 SCREW to each purlin

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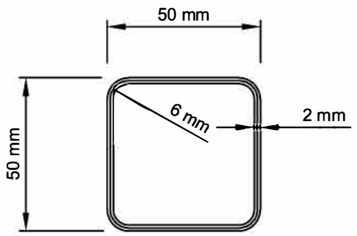
TYPICAL ELEVATION (PER PANEL)
1:10

THIS POOL FENCE IS SUITABLE FOR THE FOLLOWING:

WIND LOAD:	UP TO "VERY HIGH" WIND ZONE
SOIL UNDRAINED SHEAR STRENGTH:	50 kPa

NOTE:

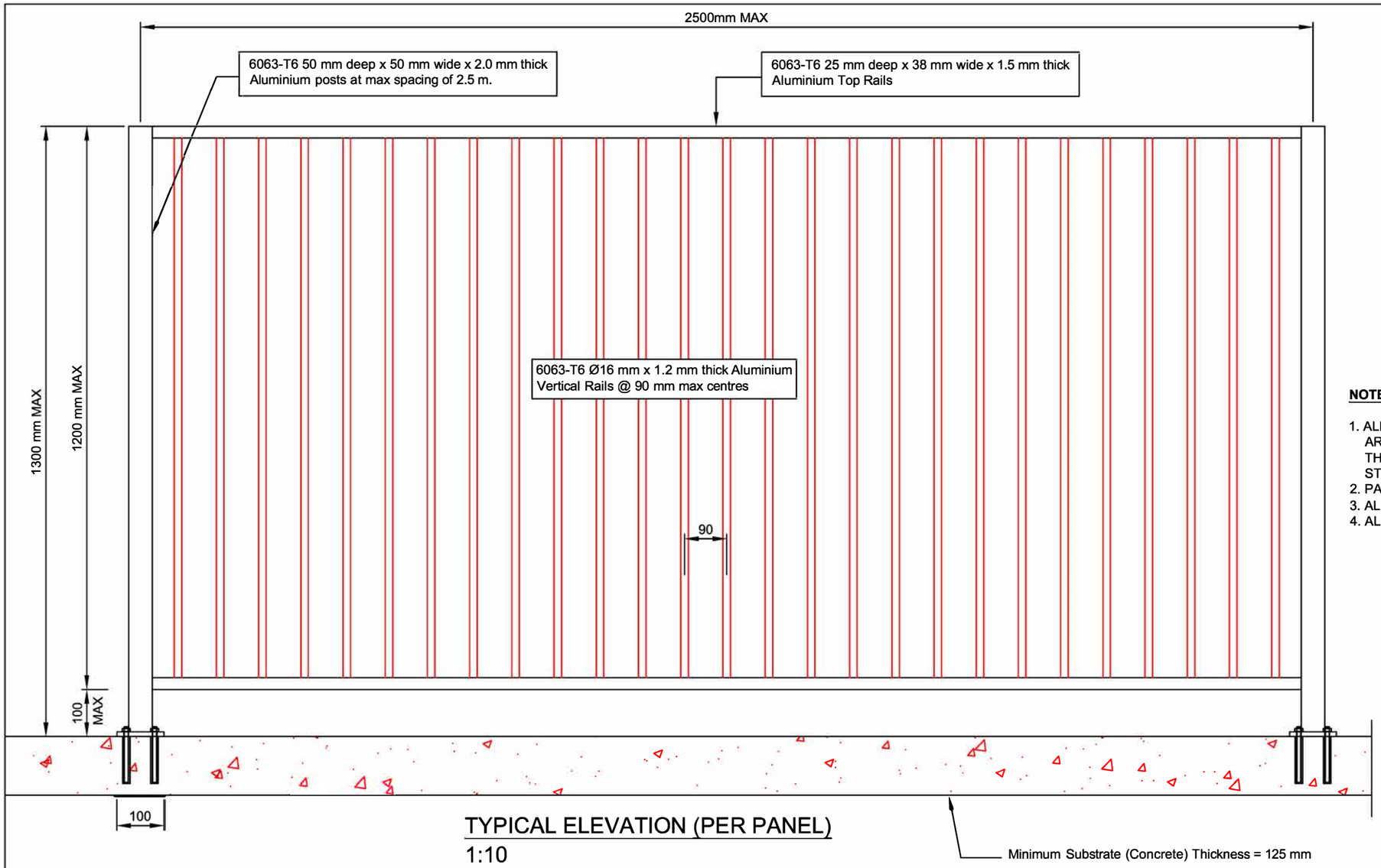
1. ALL ALUMINIUM SURFACES SHALL BE PAINTED WHERE THE STRUCTURES ARE TO BE EXPOSED TO EXTREMELY CORROSIVE CONDITIONS AND WHERE THE ALUMINIUM ALLOY PARTS ARE IN CONTACT WITH, OR ARE FASTENED TO, STEEL MEMBERS OR OTHER DISSIMILAR MATERIALS.
2. PAINTING PROCEDURE MUST BE IN ACCORDANCE WITH AS/NZS 1664.
3. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH AS1665.



PLAN (POST)
1:2

REVA:27-06-16

P & P CONSULTING ENGINEERS LTD Civil and Structural Engineering 6A Montel Avenue, Henderson ph: 836-1853	WARNER FENCING & GATES LTD	Scales 1:10 , 1:2 (A3)	Project 12/170
	ALUMINIUM SWIMMING POOL FENCES	Drawn JD / Date 12-09-12	Sheet S01



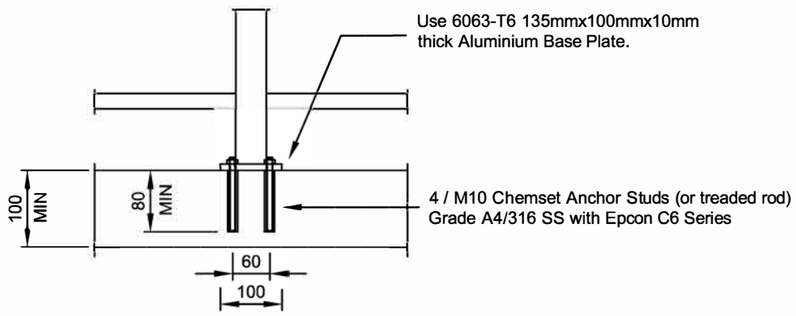
TYPICAL ELEVATION (PER PANEL)
1:10

THIS POOL FENCE IS SUITABLE FOR THE FOLLOWING:

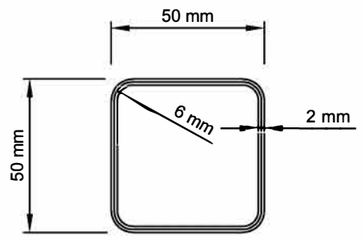
WIND LOAD: UP TO "VERY HIGH" WIND ZONE

NOTE:

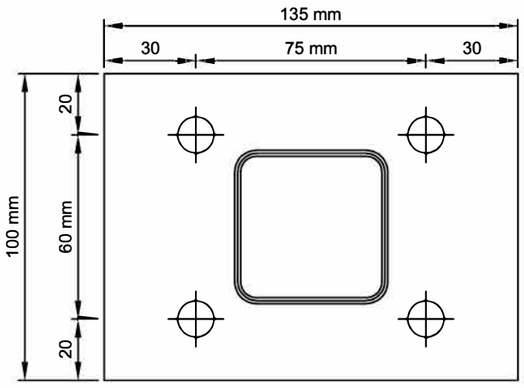
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3. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH AS1665.
4. ALL BOLTS TO BE STAINLESS STEEL.



BASE FIXING
1:10



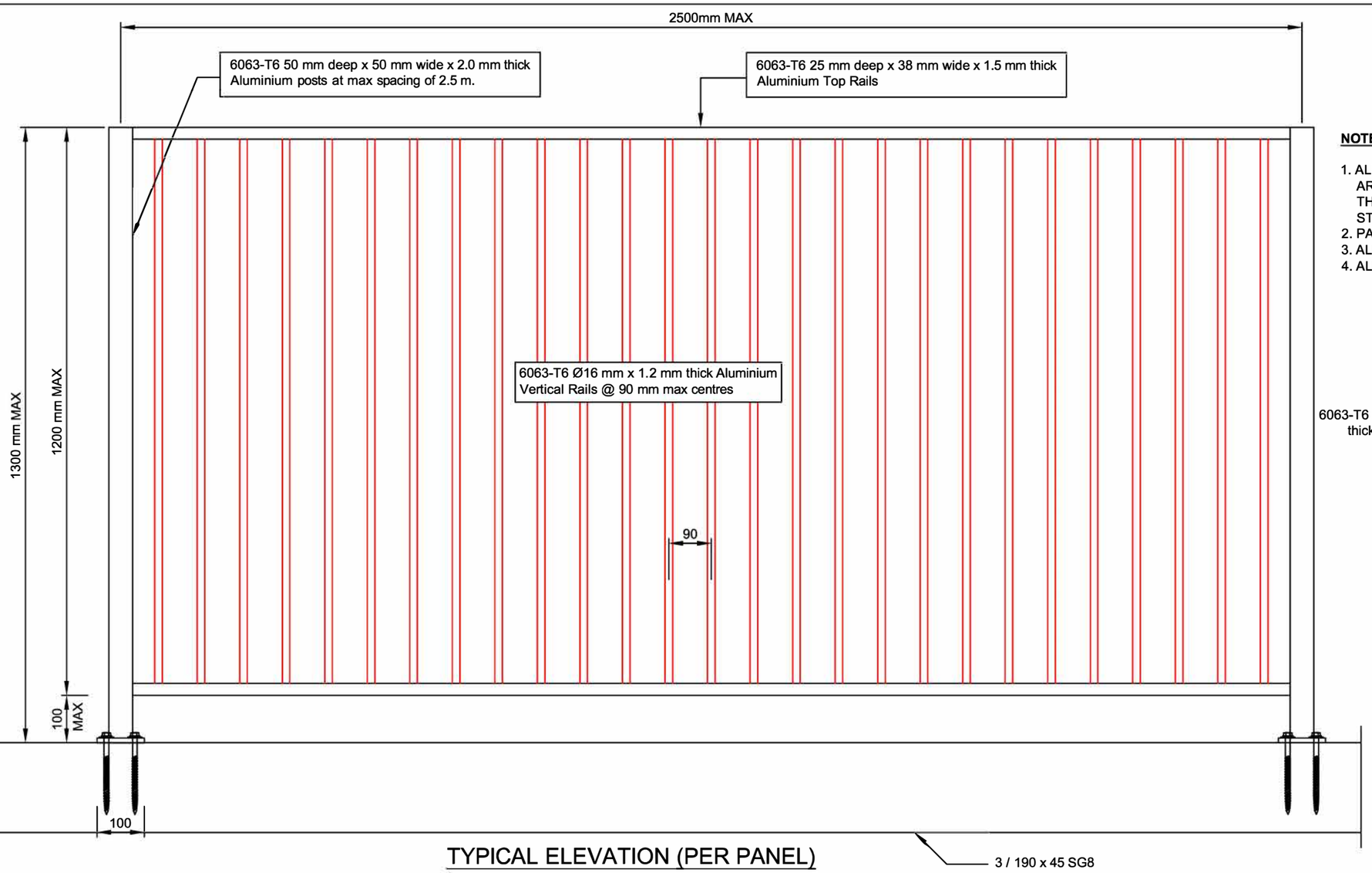
PLAN (POST)
1:2



PLAN (BASE PLATE)
1:2

REVA:27-06-16

P & P CONSULTING ENGINEERS LTD Civil and Structural Engineering 6A Montel Avenue, Henderson ph: 836-1853	WARNER FENCING & GATES LTD	Scales 1:10 , 1:2 (A3)	Project 12/170
	ALUMINIUM SWIMMING POOL FENCES (BASE PLATE OPTION)	Drawn JD / Date 12-09-12	Sheet S02



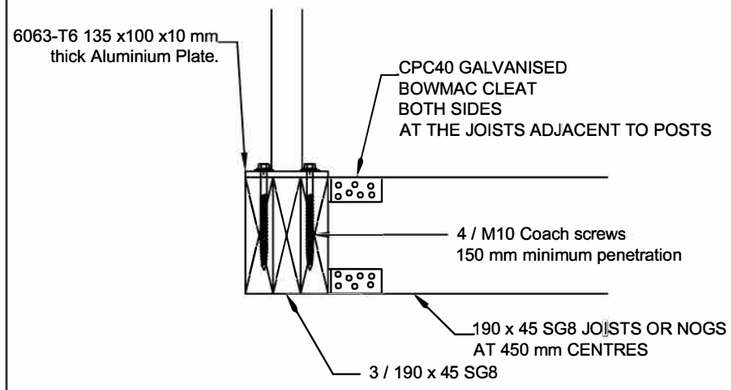
TYPICAL ELEVATION (PER PANEL)
1:10

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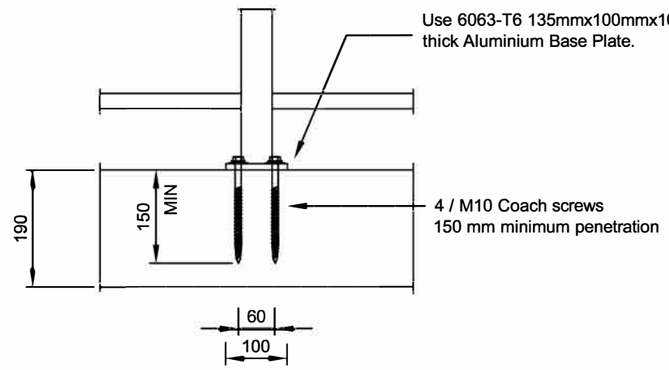
WIND LOAD: UP TO "VERY HIGH" WIND ZONE

NOTE:

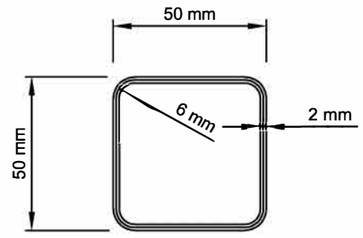
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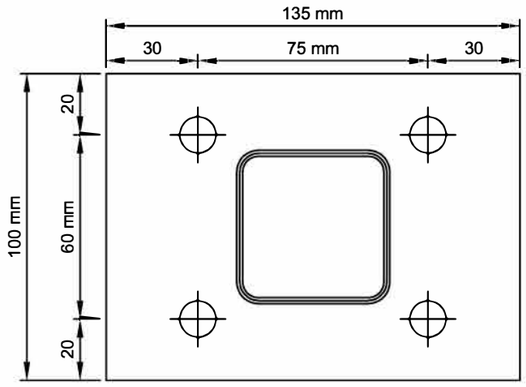
POST TO TIMBER CONNECTION DETAIL
1:10



BASE FIXING
1:10



PLAN (POST)
1:2



PLAN (BASE PLATE)
1:2

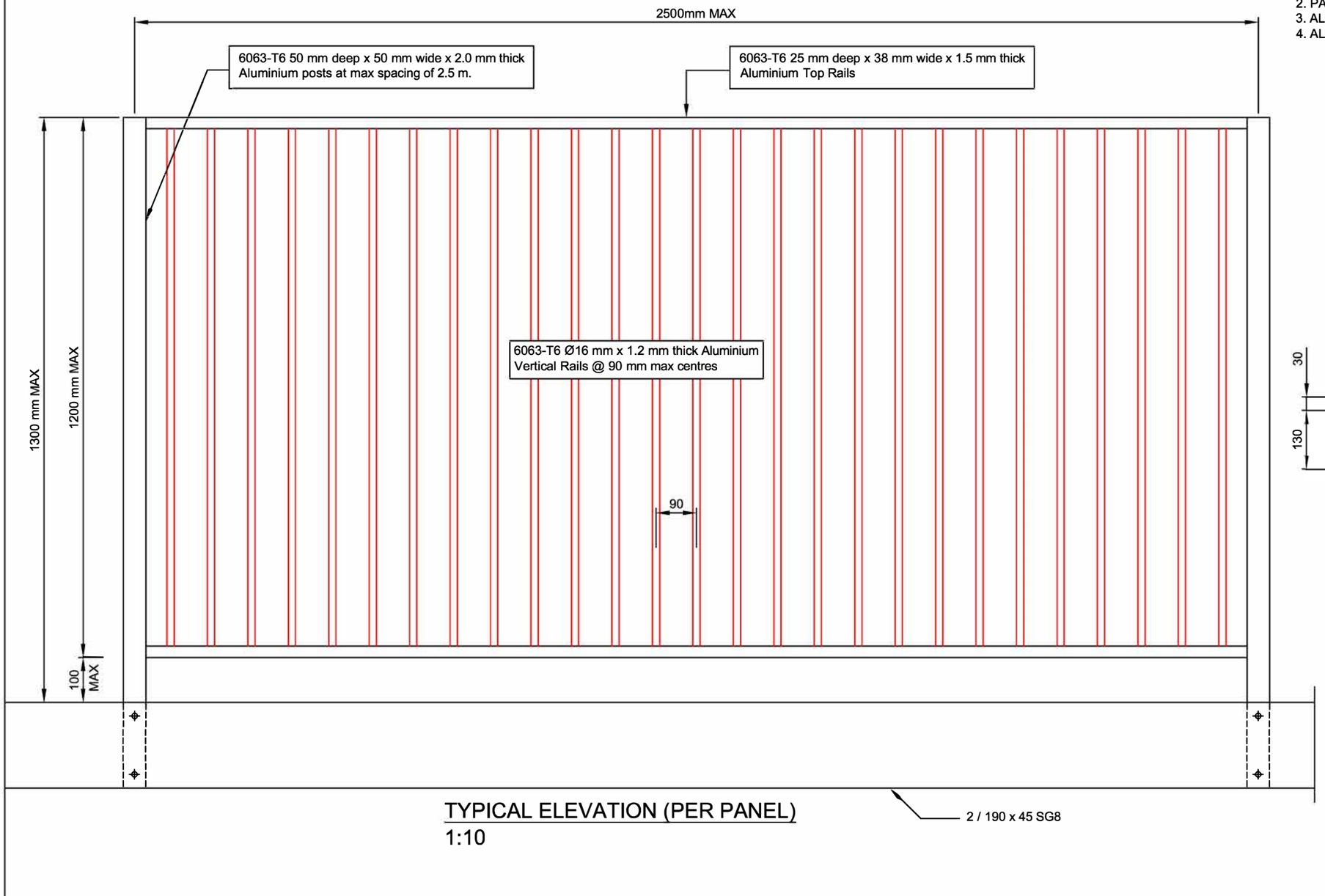
P & P CONSULTING ENGINEERS LTD Civil and Structural Engineering 6A Montel Avenue, Henderson ph: 836-1853	WARNER FENCING & GATES LTD	Scales 1:10 , 1:2 (A3)	Project 12/170
	ALUMINIUM SWIMMING POOL FENCES (BASE PLATE OPTION WITH COACH SCREWS)	Drawn JD/MO | Date 03-08-16	Sheet S03

THIS POOL FENCE IS SUITABLE FOR THE FOLLOWING:

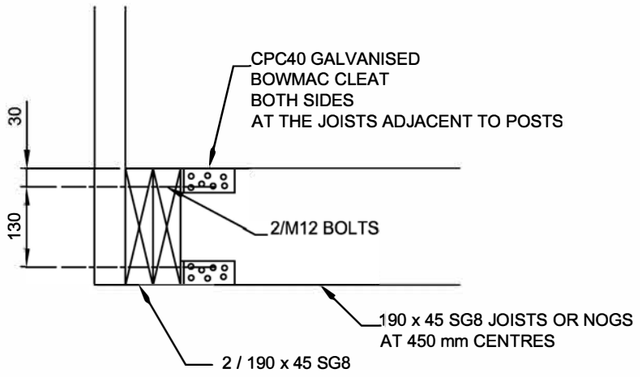
WIND LOAD: UP TO "VERY HIGH" WIND ZONE

NOTE:

1. ALL ALUMINIUM SURFACES SHALL BE PAINTED WHERE THE STRUCTURES ARE TO BE EXPOSED TO EXTREMELY CORROSIVE CONDITIONS AND WHERE THE ALUMINIUM ALLOY PARTS ARE IN CONTACT WITH, OR ARE FASTENED TO, STEEL MEMBERS OR OTHER DISSIMILAR MATERIALS.
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4. ALL BOLTS TO BE STAINLESS STEEL.



TYPICAL ELEVATION (PER PANEL)
1:10



POST TO TIMBER CONNECTION DETAIL
1:10

P & P CONSULTING ENGINEERS LTD Civil and Structural Engineering 6A Montel Avenue, Henderson ph: 836-1853	WARNER FENCING & GATES LTD	Scales 1:10		Project 12/170
	ALUMINIUM SWIMMING POOL FENCES (BOLTED TO TIMBER OPTION)	Drawn JD/MO	Date 03-08-16	Sheet S04

NORTHERN FOUNDATIONS LTD.

Memorandum from licensed building practitioner: Record of building work

Section 88, Building Act 2004

Please fill in the form as fully and correctly as possible.
If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING	
Street address: Lot 81, The Sanctuary	
Suburb:	
Town/City: Mangawhai	Postcode:

THE PROJECT
Building consent number: 210441

THE OWNER(S)	
Name(s): ACDL Trustee Ltd. D&L Kendall	
Mailing address:	
Suburb:	PO Box/Private Bag:
Town/City:	Postcode:
Phone number:	Email address:

RECORD OF WORK THAT IS RESTRICTED BUILDING WORK

PRIMARY STRUCTURE

Work that is restricted building work	Description of restricted building work	Carried out or supervised
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Foundations and subfloor framing ☑	Foundations as per engineers specs.	☑ Carried out ☑ Supervised
Walls ☐		◯ Carried out ◯ Supervised
Roof ☐		◯ Carried out ◯ Supervised
Columns and beams ☐		◯ Carried out ◯ Supervised
Bracing ☐		◯ Carried out ◯ Supervised
Other ☐		◯ Carried out ◯ Supervised

EXTERNAL MOISTURE MANAGEMENT SYSTEMS		
Work that is restricted building work	**Description of restricted building work**	**Carried out or supervised**
Tick ✓	If necessary, describe the restricted building work.	Tick ✓ whether you carried out the restricted building work or supervised someone else carrying out the restricted building work.
Damp proofing ☑	Polythene underneath slab	☑ Carried out ☑ Supervised
Roof cladding or roof cladding system ☐		◯ Carried out ◯ Supervised
Ventilation system (for example, subfloor or cavity) ☐		◯ Carried out ◯ Supervised
Wall cladding or wall cladding system ☐		◯ Carried out ◯ Supervised
Waterproofing ☐		◯ Carried out ◯ Supervised
Other ☐		◯ Carried out ◯ Supervised

ISSUED BY

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise restricted building work.

Name: Jason Wright	LBP number: 126479
Class(es) licensed in:	
Carpentry	
Plumbers, Gasfitters and Drainlayers registration number (if applicable):	
Mailing address (if different from below):	
Street address/Registered office:	
Suburb:	Town/City:
PO Box/Private Bag	Postcode:
Phone number:	Mobile: 021975279
After hours:	Fax:
Email address: sales@northernfoundations.co.nz	Website:

DECLARATION

I Jason Wright carried out or supervised the restricted building work recorded on this form.

Signature: 

Date: 27/10/2021

KAIPARA DISTRICT

Kaipara te Oranganui • Two Oceans Two Harbours

KAIPARA DISTRICT COUNCIL

Producer Statement Construction (PS3) - Plumbing

Issued by: PAUL MASSEY being a Registered Certifying Plumber.

In respect of the testing of water pipework prior to concealment for:

(Owner) MR & MRS D & C RENDALL

At (Address) 53 ROBERT HASTIE DRIVE

MANGAWHAI

Legal Description: Lot 81 DP 556753 Valuation

I have sighted the issued building consent (BC 210441) and have constructed the plumbing pipes and fitting in accordance with the approved building consent, the New Zealand Building Code, and the manufacturers specifications and requirements.

I have tested the water supply system as follows:

(✓) By pressurising the water supply system by subjecting the hot and cold system to a pressure of 1500kPa for a period of not less that 15 minutes and inspecting the system to ensure that there are no leaks, in accordance with NZBC G12/AS1 Clause 7.5.1

(✓) By pressurising the UPVC water piping systems to 1.5 times the working pressure for a period not less than 15 minutes and checking that there are no leaks, as given in section 9 of NZS 7643, in accordance with NZBC G12/AS1 clause 7.5.2

I believe on reasonable grounds that the pipework has passed that test.

I also understand that Kaipara District Council in accepting this producer statement construction (PS3), will be relying on it to establish compliance at the completion of the building work.

Signature of Registered Certifying Plumber: P.J.Massey

Registration Number: 12780 Reg Expiry Date: 31/3/2022

Date: 20/1/2022

A Rated Waste Water Services Ltd
52 Fork Road
RD 1
KUMEU 0891
AUCKLAND
09 412 7588 or 027 273 6967
aratedwws@xtra.co.nz

Accredited Service Agent for

bioCYCLE

"Turn Your Ones and Twos into Trees"

SERVICING & MAINTENANCE CONTRACT

Customer Register/Tank Number **Biocycle Model #**_____

THIS AGREEMENT is between
A RATED WASTE WATER SERVICES LTD (the Company)
Registered office: 52 Fork Road, RD 1, Kumeu 0891, Auckland
and
DAVE & LINDA KENDALL (the Customer) of ***MANGAWHAI*** (area)

is for the maintenance of your waste water treatment system installed at :

Site address: ***53 ROBERT HASTIE DRIVE, MANGAWHAI***

Postal address: ***PO Box 401094, MANGAWHAI HEADS.***

Landline Phone Number: ..... Mobile Number: ***022 054 6323 LINDA***

Email Address: .....

Which shall operate under the following terms and conditions:

1. Once each six (6) months of the term agreed, the Company shall inspect the system and carry out the following work:
   (a) Check and adjust air intake where necessary.
   (b) Clean where necessary the inside of the tank from which the irrigation network runs.
   (c) Check the blower, irrigation pump and electrical system, including the alarm system.
   (d) Monitor and maintain the balance of purifiers.
   (e) Clean the irrigation discharge lines and repair defective drippers at Customer's expense.
   (f) Report to the Customer and local authority of any problems that which have arisen.
   (g) Check and if necessary clean the irrigation filter. If filter needs replacing this would be at Customer's expense. Regular cleaning of the irrigation filter is the responsibility of the homeowner and should be done on a monthly basis.
   (Cleaning of the irrigation filters on a monthly basis can be carried out by A Rated Waste Water Services Ltd at an extra charge of **$60.00 (incl GST)** – this will be additional to the service cost as per paragraph 5 below.)

2. In the event of the alarm system becoming active, the customer will notify the authorised Biocycle agent **A Rated Waste Water Services Ltd,** telephone **Kevin Carr on 09 412 7588 or 027 273 6967** and advise that the system has malfunctioned. **A Rated Waste Water Services Ltd** will undertake to attend the call within 48 hours of receiving the advice that the alarm system has activated, or that there is a malfunction of the system.

..../2

3. If the customer requests the Company to carry out work to the system other than in Clause 1. above, or that covered by the guarantee, then the Customer will have to pay the Company's reasonable additional charges for such work and any necessary materials. Travel kilometres and call out fees will be additional to the above. Also the customer shall pay the Company's reasonable additional charges for work done and materials supplied pursuant to Clause 1. above where the need for such work and materials results from the Customer's failure to ensure compliance with any operating instructions, suggestions or recommendations given by the Company or from negligent or wilfully damaging actions of any person, or from the system being required to bear a workload which is in excess of design loading for the site, or from earthquake, fire, flood, storm, lightening, tempest, landslip, or from persons not authorized by the Company interfacing with the present system in any way, or from the Customer's failure to advise of any alarm warning or failure to comply with this agreement.

4. The Company (A Rated Waste Water Services Ltd) cannot be held responsible for:
any defects arising from the installation of the system and it's irrigation fields, either by the manufacturer, installers, drain layers or engineers, etc. Any such defects and subsequent remedies or repairs required, will be the liability of the aforementioned above, or the home owner.

5. The Company will invoice the Customer for any reasonable additional charges for work done and materials supplied and the Customer shall make payment within seven (7 days) of the said invoice. (Late payment will incur penalties of 5%).

6. The maintenance fee is **$212.75** per visit, (including GST) **payable within 7 days** of the work being performed. This fee is the current maintenance charge and is subject to change if an adjustment is required. An invoice and maintenance form will be provided after each visit.

This contract is effective from ***7th July 2022*** and expires on the sale of the above mentioned property unless notice is given by the Customer to the Company of termination of this agreement.
If this agreement is terminated, A Rated Waste Water Services Ltd will be obliged to inform council that an on-going service agreement no longer stands between the parties.

Dated this ..... 13 .....day of ..... July .....20..22....
Signed by (Mr / Mrs / Ms / Miss)

..... DAVID KENDALL ..... (Customer's Name)

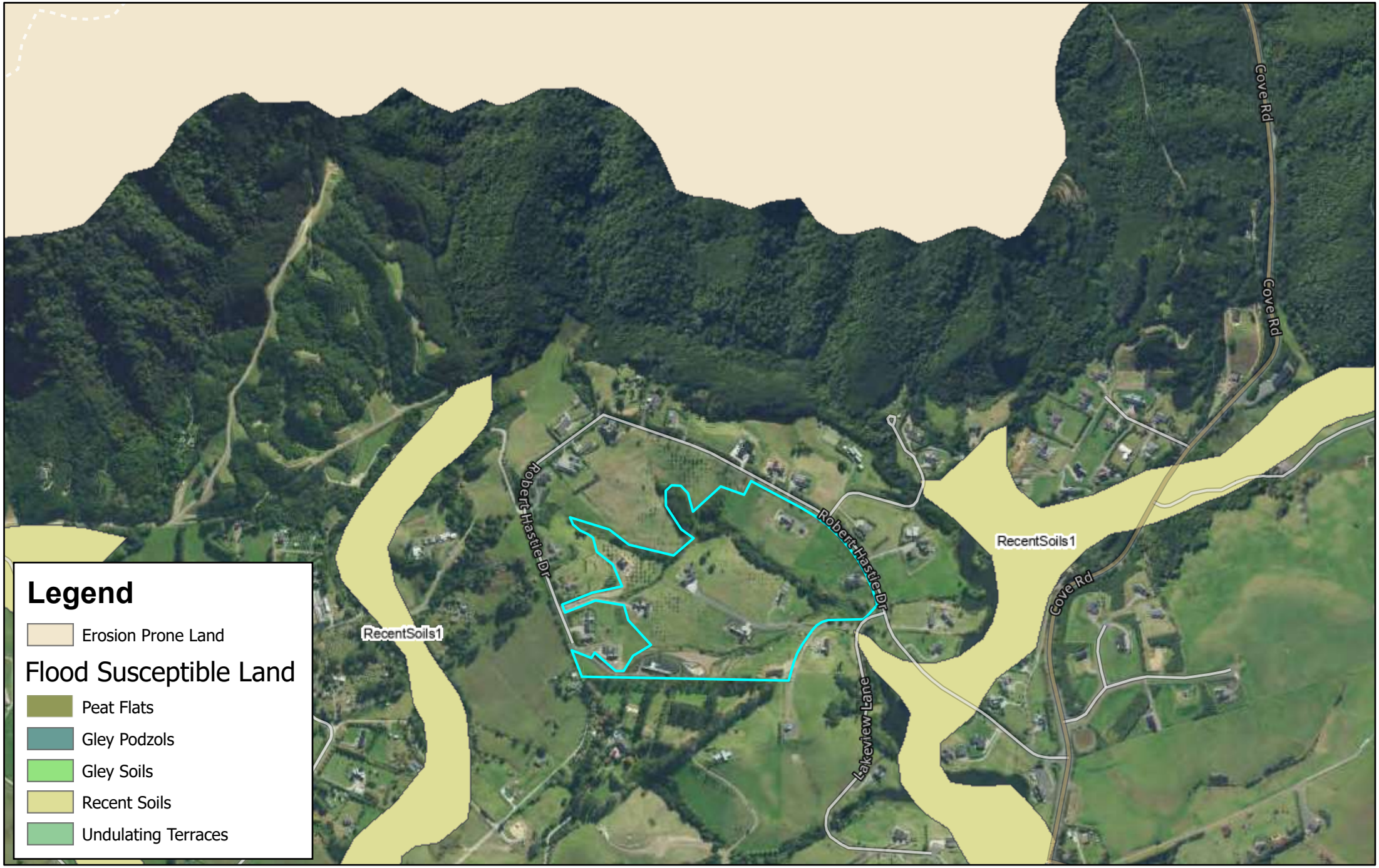
.... (Customer's Signature)

For and on behalf of **A RATED WASTE WATER SERVICES LTD**

A Rated Waste Water Services Ltd

Signed .... Kevin Carr (Director)

PLEASE RETURN ONE COPY TO A RATED WASTE WATER SERVICES LTD
AND RETAIN A COPY FOR YOUR OWN RECORDS.
THE THIRD COPY OF THIS AGREEMENT SHALL BE GIVEN TO THE COUNCIL BY THE INSTALLER or HOME OWNER
This document is not for distribution and is invalid unless signed by ARated Director



Northland Regional Council

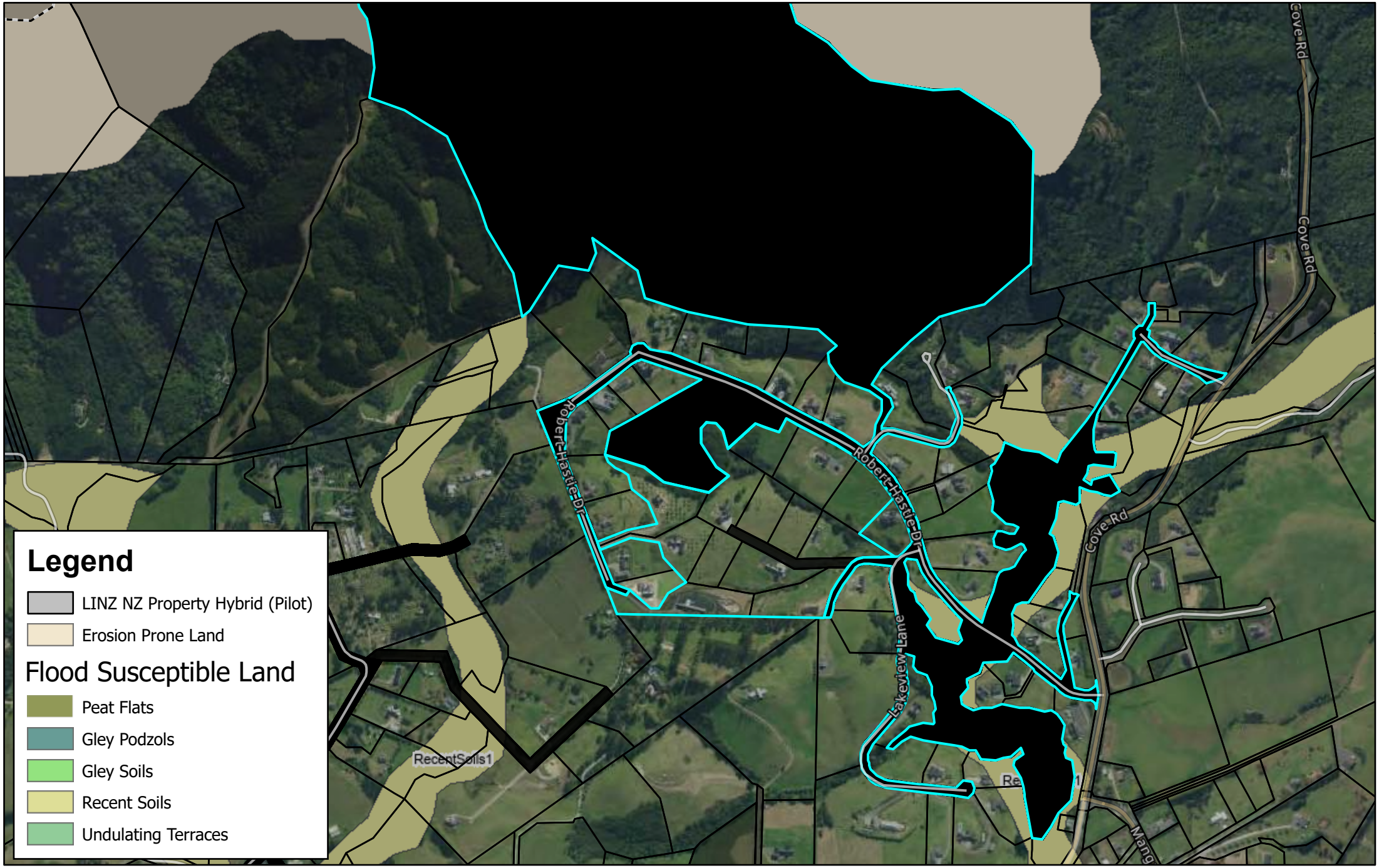
Natural Hazards

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Projection NZTM. Datum NZTM2000.
DISCLAIMER:
The Northland Regional Council cannot guarantee that the information shown is accurate and should not be reused in any manner without proper consultation with its owner.

N

0 0.05 0.1 0.2 0.3 0.4 0.5 km

May 13 2025



Northland Regional Council

Natural Hazards

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N

0 0.05 0.1 0.2 0.3 0.4 0.5 km

May 13 2025

Disclaimer

Flood maps

Northland Regional Council's flood maps have been compiled using an assessment of best available information.

The maps indicate the outer extent of the flooding from analysis of information only and do not necessarily reflect the greatest extent of flooding suffered in the past, or likely to be suffered in the future.

The design storms used to generate flood plain maps are based on HIRDS v3 datasets, provided by NIWA. It should not be assumed without further investigation that land outside of the boundary is not susceptible to flooding.

The flood maps reflect flooding originating from the river, and as such may not represent flooding caused by ponding or runoff of local water or overflow of stormwater networks.

The flood plain mapping within each catchment extends to only those areas covered by LIDAR survey; areas outside of the LIDAR survey may, or may not be, at risk from river flooding. Within the areas of LIDAR coverage, the emphasis has been on capturing the extent and level of flood overflow from the main stream and river channels. Flooding from surface run off, and storm water networks, is not always reflected in the flood maps.

When using these flood maps, users shall clearly identify that the results may be subject to change at the discretion of the Northland Regional Council.

While the maps have been quality controlled, their accuracy can not be guaranteed. Accordingly, these maps should not be relied upon as the sole basis for the making of any decision in relation to potential flood risk. Further, the maps should be interpreted only by an expert duly qualified to interpret these maps and when so interpreted, should not be utilised without reference to other source information and data.

The information contained in these flood maps is provided for general information purposes only. While the authors have done their best to provide accurate information, users are requested to inform Northland Regional Council of any suspected errors in the maps and/or electronic files.

Northland Regional Council makes no representations, warranties or undertakings about any of the information in these maps and/or electronic files including, without limitation, their accuracy, their completeness or their quality or fitness for any particular purpose.

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Northland Regional Council

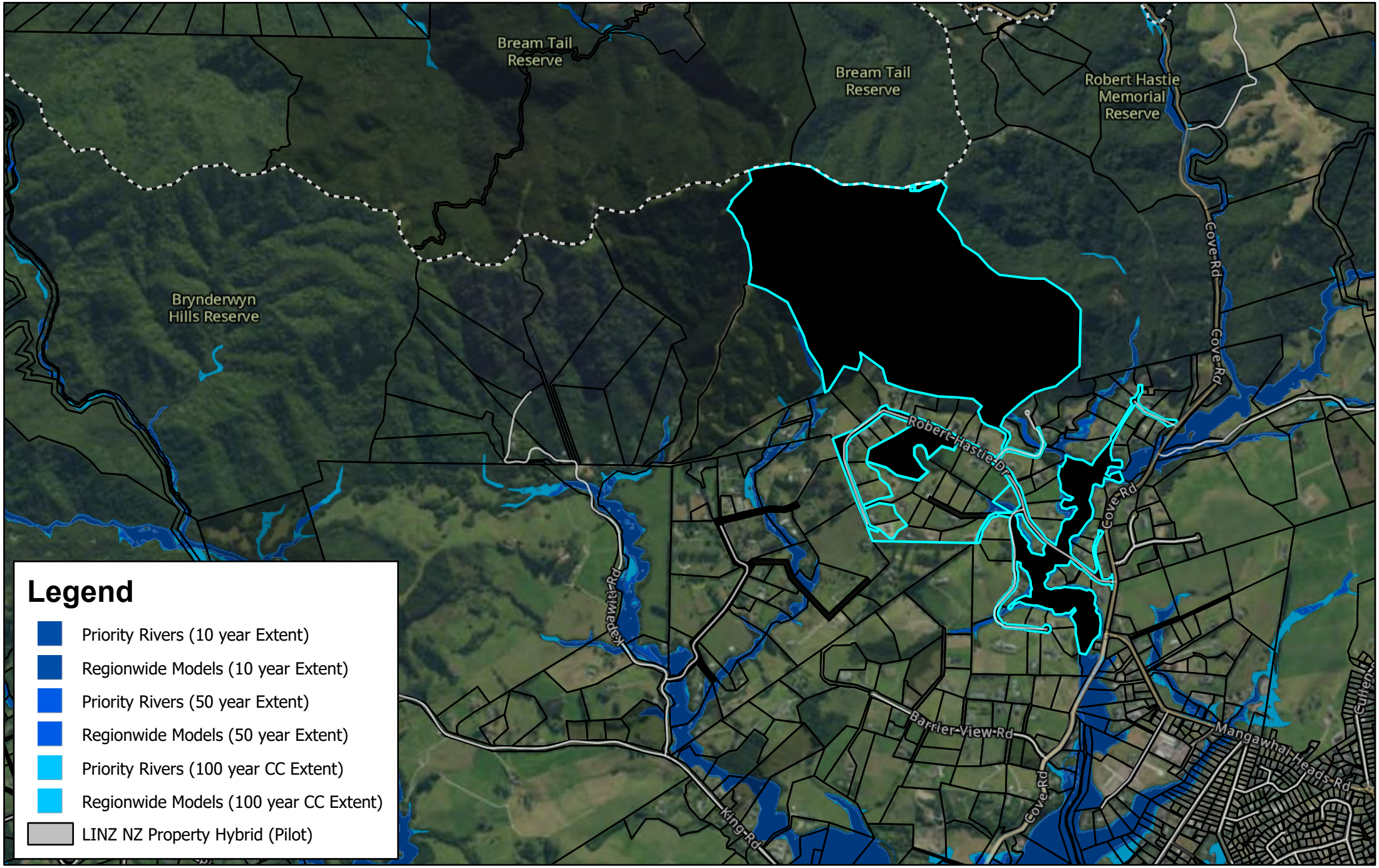
Natural Hazards

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N

0 0.01 0.03 0.05 0.08 0.1 0.13 km

May 13 2025



Northland Regional Council

Natural Hazards

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N

0 0.1 0.2 0.4 0.6 0.8 1 km

May 13 2025

Print Date: 5/6/2025
Print Time: 1:41 PM

Asset Map 0122008878

KAIPARA DISTRICT
Kaipara ki Oraanui • Two Oceans Two Harbours



Scale: 1:2,257
Original Sheet Size: A4

Projection: NZGD 2000 New Zealand Transverse Mercator
Bounds: 1740831.122595E 6006506.670652N
1741475.038569E 6006121.232441N

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Print Date: 5/6/2025
Print Time: 1:40 PM

Asset Map 0122008878

KAIPARA DISTRICT
Kaipara ki Oraanaui • Two Oceans Two Harbours



Scale: 1:2,257
Original Sheet Size: A4

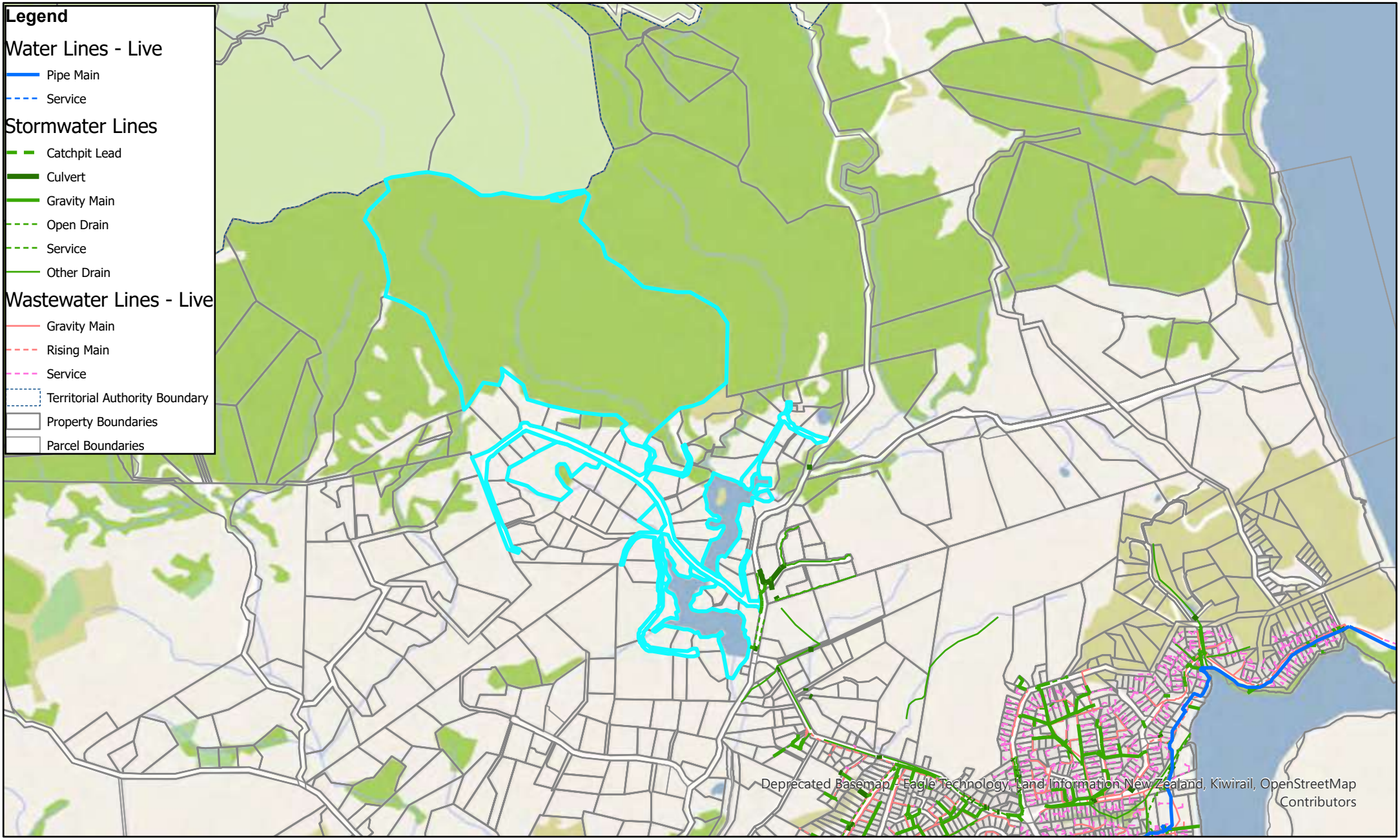
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Bounds: 1740831.122595E 6006506.670652N
1741475.038569E 6006121.232441N

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Print Date: 5/6/2025
Print Time: 1:38 PM

Asset Map 0122008878

KAIPARA DISTRICT
Kaipara ki Oraanui • Two Oceans Two Harbours



Scale: 1:18,056
Original Sheet Size: A4

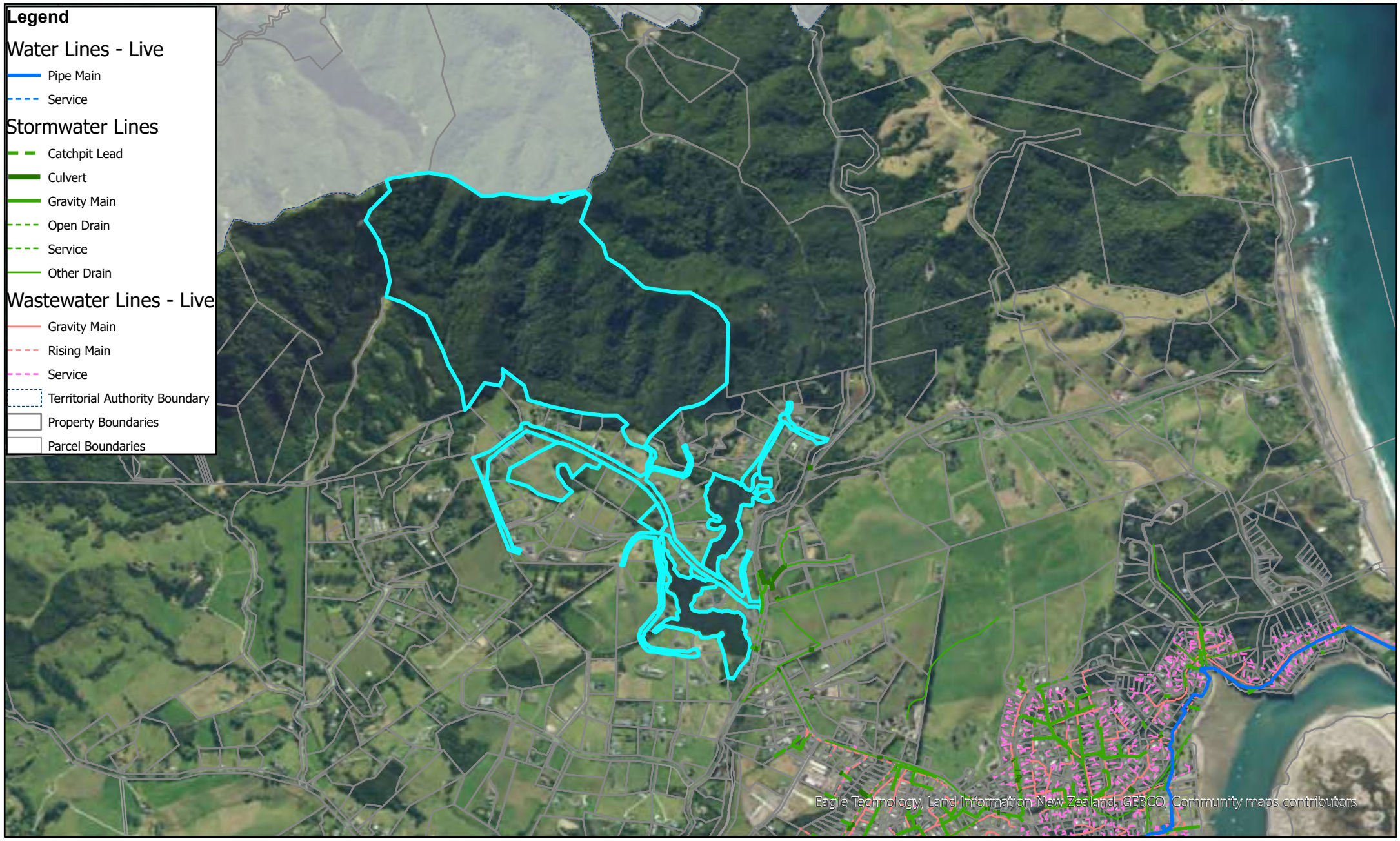
Projection: NZGD 2000 New Zealand Transverse Mercator
Bounds: 1738708.989003E 6008229.421303N
1743860.316802E 6005145.915619N

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Asset Map 0122008878

KAIPARA DISTRICT
Kaipara ki Oruawharo • Two Oceans Two Harbours



Scale: 1:18,056
Original Sheet Size: A4

Projection: NZGD 2000 New Zealand Transverse Mercator
Bounds: 1738708.989003E 6008229.421303N
1743860.316802E 6005145.915619N

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Roads and driveways

District councils are responsible for local roads and Transit New Zealand is responsible for state highways. Private driveways are the responsibility of private landowners.

Check whether the access driveway from the public road is part of the property or crosses other land.

Make sure any right of way is recorded on the title.

Check that any right of way shown on paper matches up with the formed access.

Check the location of any dwelling in relation to other people's or shared driveways – vehicles using driveways can cause dust.

Will my green rural outlook change?

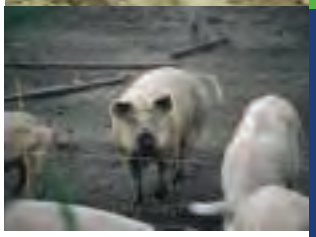
The rural landscape is constantly changing. Change is a necessary and inevitable part of living in the country -

- farming methods change
- new types of rural production will occur
- crops (including trees) will be harvested
- land may be subdivided
- new people and new ideas will come

The council's rules are not intended to preserve things as they are now but to manage the environmental effects of ongoing changes.

Ask the council about its rules for rural subdivision and the location of buildings on adjoining land.





Other things to check:

- Requirements for controlling serious weeds
- Responsibilities to control dogs and livestock
- The use of chemical sprays
- The location of emergency services (doctor, rural fire service)
- Power connection to the property



How can I find out about all of that?

Visit your district council – they will be able to answer many of your questions.

The district council can give you a Land Information Memorandum (a 'LIM') which describes important details about any property. There will usually be a small fee – but it is a small price to pay for accurate information.

You might also like to talk to the regional council.

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Thinking about living in the country?

Some things to check

This brochure answers some of the frequently asked questions about living in the country

REAL ESTATE INSTITUTE OF NEW ZEALAND

NEW ZEALAND PLANNING INSTITUTE



it's paradise – right?

It can be but remember - the rural environment is where people live and work. That means it's both a beautiful landscape and a place of production.

Some production activities create effects that are noticeable on adjoining properties. Many of these effects are a necessary and legitimate part of rural production. Maybe not all day or all year – but sometimes, depending on the season, there might be:

Noise Dogs barking, farm machinery operating, planting or harvesting activities, stock being moved, bird scaring devices, truck movements in the early or late hours, stock noise at weaning time, helicopters

Smell Animal enclosures, silage, effluent disposal

Smoke Stubble burn-off or other fires

Dust Cultivation, planting and harvesting, vehicles on unsealed roads and driveways

Spray Agrichemical spraying of crops and paddocks

Look around the rural neighbourhood and see what's there. Think about how established activities might affect you.

Ask around – find out what day-to-day life is like in that rural area in all seasons.

Spend some time there – check it out in good weather and bad weather days and all wind directions.

Can I do anything I want on my land?

It might pay to check. Usually you can – provided your activities don't cause adverse environmental effects.

Councils are responsible for managing the effects of activities and may have rules and bylaws controlling things like:

- house location and number of houses
- location of farm buildings and stock yards
- disposal of household sewage and stock effluent
- taking water from the ground or rivers
- discharges to ground and water
- burning of open fires
- distance of shelter belts and plantation forestry from boundaries
- noise
- removal of scrub or trees
- earthworks to build access tracks

There may be particular or additional controls in areas that have special landscape or ecological importance.

Ask the council for a copy of the rules applying to your property and rural neighbourhood.

Just as in town, it's important to get on with neighbours. The council can set basic guidelines or standards but, when it comes to managing minor matters, it's up to you and your neighbours.

Make sure you can get hold of your neighbours if anything happens on their property that might affect you.

Why not tell your neighbours about anything you plan to do that might affect them?





Water and sewerage

Most rural properties have to provide for their own water supply and sewage disposal.

This usually means rain water has to be collected in tanks or water has to be pumped from waterways or an underground bore. If water is already piped onto the property from elsewhere, find out where it comes from and check that there is an easement or permission that allows this to continue – even in summer dry periods.

Sewage disposal is often to a septic tank. Septic tanks need to be emptied periodically.

It may be that you will need to install a new water supply or sewage disposal system – especially if the property is bare land.

water supply and sewage disposal systems meet required standards and actually work.

Rural landowners are responsible for the ongoing maintenance of water supply and sewage disposal systems – you'll need to know how to maintain pumps and clear blocked drains.

