

BEFORE THE WHANGĀREI DISTRICT COUNCIL INDEPENDENT HEARING PANEL

UNDER the Resource Management Act 1991
("RMA")

IN THE MATTER OF an application by Hurupaki Holdings
Limited for resource consent to create and
operate a 73 residential allotment and
café at 131 and 189 Three Mile Bush
Road, Kamo

STATEMENT OF EVIDENCE OF AARON HOLLAND ON BEHALF OF THE APPLICANT

GEOTECHNICAL AND THREE WATERS

27 APRIL 2022

1. SUMMARY OF EVIDENCE

1.1 My full name is Aaron Holland.

1.2 I am a CPEng engineer, working for Land Development & Engineering Ltd, a medium sized engineering company. My role is Civil Manager for all Land Development & Engineering Ltd offices. Land Development & Engineering Ltd have undertaken the geotechnical investigation and reporting, designed the three stormwater ponds, and provided professional design advice for the wastewater and water system for the proposal at 131 and 189 Three Mile Bush Road, Kamo.

1.3 In respect of Civil and Geotechnical Engineering, the Proposal achieves the following:

- (a) Stormwater effects will be mitigated by the three stormwater ponds, this includes mitigating downstream effects and improving water quality for the discharge into the stream that runs through the Site.
- (b) Wastewater will be managed via gravity for most of the development, with some of the rear lot having individual on site private pump stations which will pump up into the gravity system in the cul-de-sac head.
- (c) The Council's reticulated water supply will service the development for water and for firefighting. Some upgrades to the Council reticulation system (in the form of a new reservoir) are planned to increase the water pressure for the development and surrounding residential areas. As an interim measure, we have recommended the most elevated houses in the development have a 5000lt water tank to allow a private water supply pump to be fitted to houses which will have lower than desirable pressure (expected to be about 200kPa, versus the minimum desirable 300kPa). Once the Council water reservoir is installed they would no longer be required as the new reservoir will boost the Council mains pressure.
- (d) The geotechnical investigation and testing undertaken shows the Site is suitable for residential development. Some setbacks from the slopes surrounding the stream will be required, unless there is specific investigation and design undertake by a geotechnical engineer. Otherwise the Site is suitable for residential development.

1.4 A review of the Council's 42A hearing report indicates that the reporting planner agrees with the submitted reports and findings with regard to the effects of the three waters and

geotechnical aspects of the proposed subdivision being less than minor with the mitigation measures proposed.¹

1.5 In my opinion the Site is suitable for the proposed subdivision.

2. INTRODUCTION

2.1 My full name is Aaron Holland.

2.2 I am a Civil Engineering Manager at Land Development & Engineering Ltd and have been with the company since 2014. A statement of my qualifications and experience are included in **Attachment 1**.

2.3 This evidence is in respect of an application by Hurupaki Holdings Limited ("**the Applicant**") for subdivision and land use resource consent at 131 and 189 Three Mile Bush Road, Kamo ("**the Site**"), to:

- (a) create 73 residential allotments, drainage and recreational reserves to vest and other associated works; and
- (b) establish a food and beverage activity within proposed Lot 22, for setback from boundary and coverage infringements (future residential units within Rural Production Zone) and to relocate dry stone walls.

(together "**the Proposal**")

2.4 My evidence will focus on the three waters and geotechnical aspects of the Proposal. My evidence should be read in conjunction with Geotechnical Investigation Report dated November 2021 (updated from the June report submitted with original Application),² and Three Waters Report, dated September 2021 (updated from the August report submitted with original application).³ Specifically, my evidence will address:

- (a) my involvement with the Proposal;
- (b) an overview of the Proposal;
- (c) summary of the Three Waters Design Report;

¹ Section 42A Report, at [53] and [60].

² Refer to the Resource Consent Application for the Proposal, Appendix 9: Geotechnical Report.

³ Refer to the Resource Consent Application for the Proposal, Appendix 8: Three Waters Design Report.

- (d) summary of the Geotechnical Report;
- (e) revisions made to the Proposal;
- (f) matters raised by submitters;
- (g) the Council's s 42A Report; and
- (h) proposed conditions.

2.5 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. I have complied with the Code of Conduct in preparing this statement of evidence. Unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

3. INVOLVEMENT WITH THE PROPOSAL

3.1 I have been involved with the Proposal since October 2020. I was engaged by the Applicant to consider the civil/geotechnical matters raised by the Proposal at the Site.

3.2 Since my appointment, I have visited the Site and surrounding area at least a dozen times, for the purpose of investigations and gathering site information. Prior to working on the Proposal, I was involved in developing the neighbouring site ('The James' subdivision) into residential sections, so I am very familiar with the Site and surrounding area.

3.3 In producing this statement of evidence, I have reviewed the following evidence and materials:

- (a) The original Whangārei District Council ("**WDC**" or "**the Council**") application documents, including the Assessment of Environmental Effects ("**AEE**"), associated technical reports, s 92 requests for further information and responses and WDC's s 95 notification decision.
- (b) The application to the Northland Regional Council and associated technical reports, s 92 request for further information and responses and the decision.
- (c) The s 42A hearing report ("**s42A Report**") prepared by Alister Hartstone, planning consultant on behalf of WDC.

- (d) The expert evidence provided by the Applicant to support its case, including statements of evidence from:
- (i) Mark Holland (Applicant).
 - (ii) Charlotte Nijssen (Legal Survey and Subdivision Design).
 - (iii) Michael Farrow (Landscape).
 - (iv) Madara Vilde (Ecology).
 - (v) Dean Scanlen (Transport).
 - (vi) Jonathan Carpenter (Archaeology).
 - (vii) Melissa McGrath (Planning).

4. OVERVIEW OF PROPOSAL

4.1 The description of the Proposal is accurately outlined in the s42A Report, and the evidence of the Applicant's planner Melissa McGrath.

4.2 Features of the Proposal that are most relevant to my evidence include:

- (a) Three Waters:
- (i) Water.
 - (ii) Wastewater.
 - (iii) Firefighting water supply.
 - (iv) Stormwater ponds.
- (b) Geotechnical:
- (i) Site features and topography.
 - (ii) Ground condition.
 - (iii) Natural hazards and ground deformation potential.

4.3 I address each of these matters in the sections below.

5. SUMMARY OF THE THREE WATERS REPORT

5.1 The servicing strategy for the Proposal is set out in the Three Waters Design Report⁴ and is summarised below.

Water

5.2 Water supplied to the development will be from an extension of the public water mains. This will provide both water supply and firefighting water supply for the new dwellings.

5.3 A new reservoir is required so that each lot receives sufficient water pressure. The Council upgrade to the reservoir is currently expected to be at least two years away. If necessary, to boost water pressure on some of the more elevated lots until such time as the reservoir is built, the Applicant can either:

- (a) install a small 5,000 litre water tank for each dwelling which is trickle fed off the public water main. Water supply for those affected dwellings would then use this in conjunction with a water pump providing sufficient pressure; or
- (b) install rain water tanks with a pump and suitable filtration system.

Wastewater

5.4 The development's wastewater servicing will also be an extension of the existing public reticulation. Council has confirmed that the wastewater network has sufficient capacity for this level of development.

5.5 The network will connect through the adjacent development which has installed a 150 gravity pipeline across the boundary into the Proposal. Lots 65-78 will require individual pump stations on Site as they are isolated from the gravity pipe network.

Stormwater

5.6 Due to the constraints of the Site, to mitigate the stormwater effects of the development, the following is proposed:

- (a) Three stormwater ponds will be constructed. These have been designed to collect the stormwater runoff from impervious and pervious areas of each lot and the road reserve. The ponds have been designed with the necessary outlet configuration

⁴ Refer to the Resource Consent Application for the Proposal, Appendix 9: Three Waters Design Report.

to mitigate the 2yr, 10yr and 100yr storm events to equal or less than pre-development rates, which ensures that it does not affect downstream areas with any increases in flow rates. The water will discharge from these ponds into the Waitaua stream catchment into the headwaters of the catchment.

- (b) Additional to the 2yr, 10yr and 100yr storm event mitigation an extended detention volume has been allowed for in the pond with a 24hr drain down period designed in accordance with Auckland Council's GD01. The extended detention reduces the stream erosion and increases water quality in the pond for the runoff from all the individual lots and road reserve areas and will help improve the overall quality of the stream that the pond discharges to.
- (c) Approximately 4 ha of hillside planting is proposed as part of the development on the steeper slopes. This will improve water quality and reduce runoff from the steeper hillside area. This also provides a slight improvement for the overall flows from the Site.
- (d) The full water quality treatment volume for all areas of the development is provided within each of the ponds. A forebay is included in the pond designs aid maintenance of each pond. The ponds are also likely to drain completely through soakage during the drier periods, as the stream only flows during heavier rainfall events, remaining dry for a lot of the drier summer period.

Stream road crossing

- 5.7 As the subdivision's proposed road crosses the stream at the upper end of the development, a new box culvert will be installed to accommodate the 100yr flows including 20% increase for climate change.
- 5.8 The box culvert will be partially buried beneath the stream bed to allow the base of the culvert to mimic natural stream bed conditions and allow the passage of fish etc. As an additional community amenity feature within the development, it is planned to construct a 4m long pedestrian timber bridge located downstream, within the reserve area between the box culvert and the Site's waterfall to forming a pedestrian access across the stream.
- 5.9 In summary:
 - (a) The Site can be serviced by Council's reticulation for water and wastewater and is therefore suitable for development.

- (b) The relevant stormwater treatment and mitigation requirements have been incorporated into the developments preliminary design and are therefore suitable for the proposed development. This includes mitigation of downstream effects during a 100yr storm, addressing existing downstream flooding issues.

6. SUMMARY OF THE GEOTECHNICAL INVESTIGATION

- 6.1 The assessment of the geotechnical suitability of the Site for development, and the geotechnical hazards posed to the development and the engineering recommendations for subdivision design and future residential construction are set out in the Geotechnical Report.
- 6.2 The Site can broadly be divided into four topographic areas as shown in Figure 2 of the Geotechnical Report:

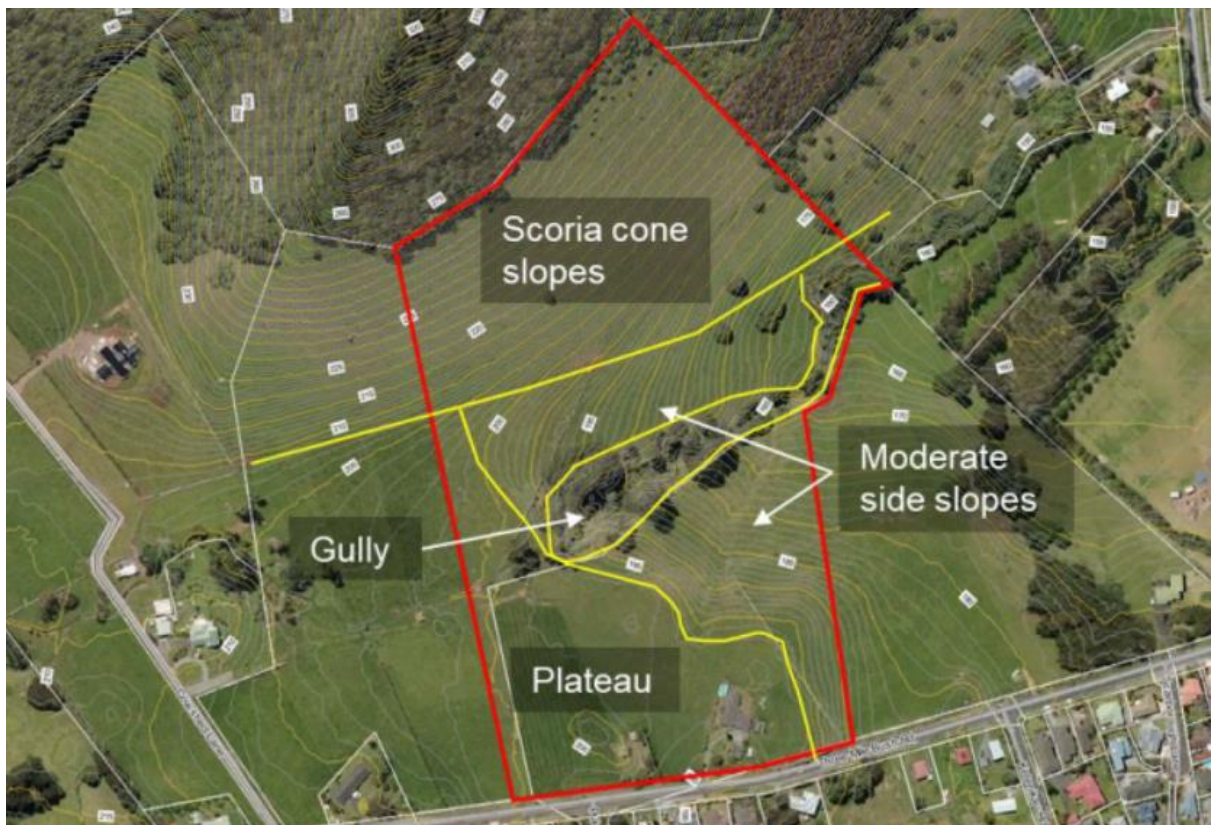


Figure 2: Plan of the site, showing general topographic areas. Site boundary shown in red.

- (a) A nearly level plateau of approximately 3.2 ha in the south-west.
- (b) Moderate side slopes in the central-east of the Site.
- (c) Scoria cone slopes above the moderate side slopes in the northern third of the Site.

(d) A well-defined gully crossing the Site from east to west.

6.3 The assessment of natural hazards and ground deformation and the potential risk these present to the proposed building can be summarised as follows:

(a) Slope instability:

(i) The plateau and moderate side slopes present no evidence of past instability and are considered to have a low instability hazard.

(ii) The gully has very steep and tall side slopes which appear generally stable but show evidence of soil creep at their crest and therefore have an existing factor of safety of below acceptable criteria for residential development. A building setback has therefore been plotted which should be accounted for in development plans.

(iii) The nature of scoria cone deposition makes them fundamentally stable features when undisturbed and therefore they have a factor of safety well above acceptable criteria. Deep cuts into the toe of the slope may result in an increased risk of shallow instability, therefore it is recommended all cuts into steep cone slopes be retained or subject to geotechnical assessment.

(b) Compressible ground and consolidation settlement: soils encountered are expected to be practicably incompressible. Under expected loads from the development, the risk presented by consolidation settlement is expected to be negligible.

(c) Ground shrinkage and swelling potential: the findings of the investigation and laboratory testing generally indicate moderate clay fraction and high clay activity. Final expansive soil site classes should be specified as part of earthworks completion reporting for the subdivision, based on finished cut-fill depths and any further testing carried out.

6.4 From our assessment of the natural hazards and ground deformation risks presented to the proposed development, we consider that the land is adequately safe from natural hazards and suitable for the proposed development, provided the recommendations contained in our Geotechnical Report are followed.

6.5 These recommendations include:

- (a) Careful construction of building platforms will be required to ensure their long-term stability and to ensure good founding soil is available for the future dwellings at each site.
- (b) Structural fills supporting dwellings should be kept behind the defined setback line, and no landscaping fill should be placed within the setback area (subject to site specific assessment to ensure the instability hazard is adequately mitigated).
- (c) Foundations should be designed to accommodate the expansive soils at the Site. Site specific classification will be required to account for final cut and fill depths and to incorporate any further testing to be carried out during earthworks.
- (d) Earthworks for the road should be carried out in general accordance with the recommendations for building platforms.

7. REVISIONS MADE TO THE PROPOSAL

- 7.1 In response to concerns raised by Fire and Emergency New Zealand, the Applicant has included in the Proposal the addition of temporary water tanks should firefighting water supply not meet the required standards. Further detail is outlined below.

8. COMMENTS ON SUBMISSIONS

- 8.1 I have reviewed the submissions received and the summary of submissions prepared by the Council. The following submitters have raised concern with respect to servicing the Proposal:

- (a) Fire and Emergency New Zealand (“**FENZ**”); and
- (b) WDC Parks and Recreation and Waste and Drainage Departments.

- 8.2 In particular, the submitters were interested in water supply and the stormwater systems, (including the three proposed ponds).

Fire and Emergency New Zealand

- 8.3 FENZ raised concerns that the resource consent application had not taken into account the operational requirements of FENZ to adequately provide for firefighting activities in a safe and effective and efficient manner as required by the Fire and Emergency New Zealand Act 2017.

- 8.4 In particular FENZ was concerned that flow rates to parts of the subdivision would fall short of the NZFS Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008 (Code of Practice) minimum FW2 flow rates of 12.5l/s (750 l/m) for residential dwellings. The resource consent application suggests alternative water sources that could be used but does not include a confirmed solution. The fire hydrants noted in the application do not extend beyond Lot 54. FENZ request additional fire hydrants be provided, particularly around Lot 57 and Lot 67 to ensure coverage of the Site.
- 8.5 Although the Council currently has plans to upgrade its water system in the next two years by installing an additional water supply reservoir further uphill along Three Mile Bush Road, there could be a transition period between houses having been built on the proposed lots and this upgrade occurring. The Applicant has therefore come to an agreement with the FENZ that, should the proposed subdivision's firefighting supply hydrants not achieve the minimum flow and pressure requirements required by SNZ PAS 4509:2008 firefighting water supply standards, a storage facility of at least 50,000m³ will be installed on one of the rear lots until such a time as the hydrants do have the required capacity. The tanks are to be buried so that no more than 1.5m extends out of the ground, and are to trickle feed off the council water main. They do not require couplings installed as access will be provided from the tank lids. Access to the tanks by fire appliances is to be installed in accordance with SNZ PAS 4509 standard.

WDC Parks and Recreation and Waste and Drainage Departments

- 8.6 WDC Parks and Recreation and Waste and Drainage Departments are interested in confirming the appropriate provision, operation and maintenance of infrastructure to service the Proposal and to ensure that the requirements of built infrastructure and green infrastructure are designed and implemented to be compatible with each other. In particular, WDC considered that attention should be paid to the construction and operational requirements of proposed Lot 205 for its intended use as a recreation reserve, and the stormwater assets within it and adjacent to it.
- 8.7 With regards to the three ponds, access for maintenance will be provided to all three of the ponds and this access for maintenance will be integrated into the proposed walking tracks through the reserve areas, with landscaping design undertaken to integrate the two enabling them to serve dual purposes. The ponds will also form features within the reserve areas, providing amenity value to the areas and the landscaping plans are being developed to support this.

9. COMMENTS ON THE COUNCIL'S SECTION 42A REPORT

- 9.1 Council's s42A Report was prepared by consultant planner, Mr Alister Hartstone, with input from Council's Development Engineer.
- 9.2 Their findings agree that the subdivision effects can be mitigated to less than minor effects with regards to three waters⁵ (referred to as 'servicing' in the s42A Report) and geotechnical aspects of the development.⁶

10. PROPOSED CONSENT CONDITIONS

10.1 Overall, I consider that any related effects of the Proposal will be satisfactorily mitigated through the imposition of the proposed conditions.⁷ In particular:⁸

- (a) Where reticulated water supply cannot achieve compliance with firefighting water pressure/flow requirements of SNZ/PAS4509:2008. The consent holder shall install an additional firefighting supply consisting of water tanks containing at least 50,000 litres located within Lot 58 with suitable hydrant connections to an additional water supply to the hydrants that will be installed. Water tanks shall:
- (i) Be in part buried with a maximum exposed being 1500mm.
 - (ii) Be marked with signage to denote 'firefighting water supply only'.
 - (iii) Have lid padlocks to be able to be opened with a 133 or similar fire alarm key.
 - (iv) Be installed so that lids are as close to roadway as possible.
- (b) The consent holder shall provide an easement in gross over Lot 58 to the fire service provide on-going rights to access the water.

11. CONCLUSION

11.1 In conclusion both submitters have agreed with the proposed solutions, and support the Proposal. A specific consent condition has been proposed to ensure the agreement

⁵ Section 42A Report at [52]-[53].

⁶ Section 42A Report at [59]-[60].

⁷ Refer to the evidence of M McGrath, Attachment 3 (*Proposed Consent Conditions*).

⁸ Proposed Consent Conditions, Condition 35 and 36.

reached between FENZ and the Applicant is implemented, to which both parties have agreed.

11.2 The s42A Report also concurs with my finding that in respect of three water/servicing⁹ and geotechnical¹⁰ effects, any effects are expected to be less than minor.

Aaron Holland

Date: 27 April 2022

⁹ Section 42A Report at [52]-[53].

¹⁰ Section 42A Report at [59]-[60].

Personal Details

Name Aaron Holland

Address 136a Monarch Downs Way, Warkworth

Telephone 021 1855247

Interests Fishing, Sailing, Scuba diving

Memberships MEngNZ, CPEng, SESOC, NZ Geotechnical society, NZ River Group, NZ Transportation Group, NZ Coastal Society, GP Engineers committee, CPEng assessor, occasional undertake dispute assessments and investigations for EngNZ.

Educational Background

1993 New Zealand Navy 4 year apprenticeship in fitting, turning and machining, Advance trade certificate

1999 Padi Scuba Diving Instructor

2004 NZCE Mechanical

2010 Chartered Professional Engineer, MENG NZ

2012 BENG(tech) Civil

Relevant Skills

- Chartered professional engineer specialising in infrastructure development (water, wastewater, and stormwater, earthworks and roads, structures), coastal infrastructure and environmental engineering.
- Personnel management, supervision, teaching and mentoring
- Design of retaining walls, piles, gravity walls, wharfs, coastal structures, commercial and residential structures mainly for infrastructure
- Geometric road design/urban design
- Designing wastewater systems
- Designing coastal structures
- Environmental engineering including climate change and coastal inundation, wastewater treatment and disposal, hydrological modelling, dam design, flood level analysis, erosion and sediment control planning.
- Geotechnical investigation, analysis and repair of landslides including remediation using walls, soil improvements, shear keys, soil nails, horizontal drainage, counterfort drains, geogrids
- Good problem solver providing analysis and solutions
- Manage personnel and project costs effectively
- Computer proficiency with word, excel, autocad, civil 3d, stormwater modelling using Hec-Hms, Hec-Ras Spacegas, Slide.
- RMA experience with reports, consent and compliance
- Surveying, robotic and manual.
- Scuba diving instructor experienced in risk management and teaching
- Contract management, project management, budget management and dispute management

Work Experience

2014-Present LDE Ltd National Civil manager

LDE is a medium sized engineering firm that undertakes environmental, civil, geotechnical and structural work, with approximately 120 employees including a team of approx. 30 civil engineers. My duties involve running the Warkworth office, mentoring and training our younger geotechnical, civil and structural engineers. I manage the civil team across the various offices spread out through the north island. My duties involve, supervising and approving others work, managing clients, dealing with the companies complex engineering problems across all the 9 offices, projects of note are managing the FNDC slip projects of which there have been 100s and infrastructure as the main point of contact and team leader often undertaking the initial assessments, investigations and design/design management, managing the Auckland transport coastal projects as the main point of contact and team leader. I also am involved in a number of other developments for commercial entities like the design and construction of two new transfer stations for northland waste in Auckland which are nearing completion. The development of five major subdivisions for a private developer in Whangarei, ranging in size from 450 lots down to about 80 lots. The development of a new town covering about 60 hectares in Papamoa. My role include civil, geotechnical and structural mentoring across the engineers in the company. My most notable project to date is the repair of the Downtown ferry terminal seawall, which came second in the NZ coastal society's engineering project of the year with me as the lead design engineer in the project team.

2008 – 2014 Ashby Consulting Engineering Ltd Engineering Manager, Warkworth, CPEng engineer.

Ashby Consulting Engineering is a medium sized engineering firm based in Warkworth and Christchurch. The firm undertakes civil, geotechnical, coastal, environmental and structural engineering with a staff of 4 engineers in Warkworth and 3 in Christchurch. My duties involve managing the Warkworth office, supervising and approving other engineers work. Design of civil, coastal, environmental and geotechnical projects, with a focus on large scale complex development projects. Liaising with new clients and winning new jobs.

I have been involved in a number of notable projects during my time with Ashby Consulting Engineering with varying roles from designer through to project manager and engineer. Large scale commercial bus servicing depot for Auckland, Kawau island 12 lot coastal subdivision, Kaiwaka 6 lot rural subdivision, Paparoa 7 lot urban subdivision, Warkworth 3 lot rural subdivision, streetscape engineering for urban design in Auckland CBD, 12m farm bridge, various jetty and boat ramps including structural assessments for Auckland transport, Warkworth retirement village.

2004 - 2008 Duffill Watts Consulting Engineers (now CPG) Civil Engineer

Duffill Watts Kerikeri was an engineering consultancy specialising in civil and structural engineering. My duties involved civil design work including; designing all aspects of subdivisions, sewer infrastructure design including pumping stations, rising mains, and reticulated gravity systems, commercial privatised wastewater systems, domestic waste water system design, storm water management and infrastructure design, flood analysis, hydrological modelling and habitable building level recommendations incorporating climate change, and erosion and sediment control design. I was also responsible for contract administration, project management, estimating and scheduling

projects. As well as overseeing, teaching and checking other engineer's designs and reports, carrying out site suitability investigations, feasibility reports, resource consents, geotechnical testing, roading assessment, improvements and upgrades.

I was involved in the following notable projects during my time with Duffill Watts with varying roles from designer through to project manager and engineer's representative, Ngawha power generation (Geothermal power station), Cable Bay (89 lot coastal urban/rural subdivision) Whatawhiwhi (240 lot coastal urban subdivision), Coopers Beach (29 lot coastal urban subdivision), Coopers Beach (2 coastal urban subdivisions), Cable Bay (50 unit coastal condominium complex), Bay of Islands (Coastal Road assessments and upgrades), Large Kerikeri retirement village.

November 2003 – August 2004 Truweld Engineering (Kerikeri)

Estimator, designer and draughtsman

August 2000 – November 2003 Compac Sorting Equipment (Auckland)

Mechanical design engineer and trouble shooter

March 1998 - May 1999 Goldfields Contracting (WA) Heavy Duty Fitter

1996 -1997 Half Moon Bay Marine Engineering (Auckland) Marine engineer

1995-1996 Compac Sorting Equipment (Auckland) Project engineer/fitter, Purchasing Officer

1989-1995 Naval Engineer New Zealand Navy, Marine Fitter