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I hereby give notice that a hearing by commissioners will be held on:

**Date:** **Wednesday 21 & Thursday 22 August 2024**  
**(with Friday 23 August if required)**

**Time:** **9:30am**

**Meeting room:** **Masonic Hall**

**Venue:** **3 Baxter Street, Warkworth**

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**APPLICATION MATERIAL - VOLUME TWO**

**PRIVATE PLAN CHANGE 92 WELLSFORD**

**NORTH**

**WELLSFORD WELDING CLUB LIMITED**

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**COMMISSIONERS**

**Chairperson** **Greg Hill**  
**Commissioners** **Lisa Mein**  
**Trevor Mackie**

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**Note:** The reports contained within this document are for consideration and should not be construed as a decision of Council. Should commissioners require further information relating to any reports, please contact the hearings advisor.

**PRIVATE PLAN CHANGE 92 - WELLSFORD NORTH  
APPLICATION MATERIAL - VOLUME 1**

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**Private Plan Change 92 – Wellsford North**  
**Date: 21 & 22 August 2024 + 23 August 2024 (if required)**

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# **ATTACHMENT 12**

## **APPENDIX 9 ECOLOGICAL IMPACT ASSESSMENT**



**Wellsford North: Ecological Impact  
Assessment  
March 2022**






# Wellsford North: Ecological Impact Assessment

March 2022

## DOCUMENT APPROVAL

<b>Document title:</b>	Wellsford North: Ecological Impact Assessment
<b>Prepared for:</b>	Wellsford Welding Club Limited)
<b>Version:</b>	Version 1
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## REVISION HISTORY

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1	4 March 2022	Version 1	AN & NK	MD

**Reference:** Bioresearches (2022). Wellsford North: Ecological Impact Assessment. 64449. Report for Wellsford Welding Club Limited).

**Cover Illustration:** Southern view of the site at Monowai Road, Wellsford.

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## 1. INTRODUCTION

Bioresearches was engaged by Barker & Associates Limited, on behalf of their client Wellsford Welding Club, to undertake an ecological impact assessment (EclA) for an approximate 72 ha area located in the Auckland suburb of Wellsford, at Rodney Street and Monowai Street ('the site') (Figure 1). This assessment has been prepared to support the proposed Wellsford North Structure Plan ("the Structure Plan").

The Structure Plan area is primarily currently zoned Future Urban (≈53 ha) with the remaining area zoned as Rural - Countryside Living (≈14 ha), Rural – Production (≈4 ha) and Residential Single House (≈1 ha). The Structure Plan seeks to provide a variety of land use types including countryside living (≈6 ha), lower density residential (≈32 ha), medium density residential (≈4 ha), a village centre (≈0.8 ha) and ecological/open areas (≈13.8 ha), as well as the supporting infrastructure and landscape buffers.

This report details the ecological assessments that were undertaken by Bioresearches to determine the ecological features within the site and the significance of those features. Within this report, Bioresearches considers the ecological value of existing terrestrial and freshwater features on site and evaluates how the Structure Plan may impact the value of these features.



**Figure 1. The Structure Plan area at Rodney Street and Monowai Street, Wellsford. Approximate extent is shown in yellow, with predicted overland flow paths shown in blue, as per the Auckland Council Geomaps.**



## 2. METHODS

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Site assessments were undertaken by experienced ecologists during October 2018, May, 2019, July 2019, December 2021 and February 2022 to assess the ecological values within the site. Prior to the field surveys, a map of the site was created from Auckland Council Geomaps, which defined overland flow paths of watercourses, contours of the property and any ecological overlays. Assessments of freshwater habitats, vegetation and potential fauna habitats were noted during the site visit and photographs of the site were taken. These notes and photographs were used to assess the ecological values of the terrestrial, freshwater, and estuarine ecosystems. A desktop analysis of relevant databases was also undertaken.

### 2.1 Terrestrial Ecology

The vegetation and terrestrial fauna values within the property were assessed during the initial site visit. The botanical value of both exotic and native vegetation was recorded, and the quality and extent of vegetation present on site was considered. Additionally, a desktop review of terrestrial characteristics was undertaken.

Fauna habitats were assessed qualitatively, in conjunction with database reviews (e.g. Department of Conservation's ARDs, Bioweb, eBird, iNaturalist) and considered indigenous lizards, birds, and bats. Opportunistic fauna observations (birds seen or heard) were also recorded during the site visit. A desktop analysis considered local records of bats and herpetofauna from specific databases.

### 2.2 Freshwater Ecology

During the site assessment, the presence and extent of streams and wetlands within the site were noted and the quality of any freshwater habitat was visually assessed.

Watercourses were classified under the Auckland Unitary Plan – Operative in Part (AUP-OP) to determine, in accordance with the definitions in this plan, the ephemeral, intermittent or permanent status of these watercourses. Stream habitat was assessed, noting ecological aspects such as channel modification, hydrological heterogeneity, riparian vegetation extent, substrate type and any fish or macroinvertebrate habitat observed. Riparian and catchment information was also reviewed and the NIWA New Zealand Freshwater Fish Database (NZFFD) was examined for fish species potentially present within the site.

The Ministry for the Environment's (MfE) latest guidance (MfE, 2021) and wetland delineation protocols (MfE, 2020) were utilised to classify areas as a '*natural wetland*' under the National Policy Statement for Freshwater Management 2020 (NPS-FM). Wetland value assessments included identifying native and exotic vegetation species, examining the structural tiers within wetland areas, and assessing the quality and abundance of aquatic habitats. Signs of wetland degradation such as pugging and grazing from stock access, structures such as culverts impeding hydrological function, and weed infestation were also noted.

### Stream Ecological Valuation

A detailed assessment of a representative reach within the site was undertaken using the Stream Ecological Valuation (SEV) methodology (Auckland Council Technical Report 2011/009). The SEV methodology (Storey *et al.*, 2011) enables the overall function of the stream to be assessed and compared to the quality of other streams in the Auckland Region. The SEV assessment involves the collection of habitat data (e.g. stream depth, substrate type, riparian cover), and sampling of fish communities and macroinvertebrates (e.g. insect larvae, snails), the latter being recognised indicators of habitat quality. The SEV method gives a score between 0 (low quality) and 1 (high quality) for each of a number of attributes which are weighted in terms of their contribution to overall stream value. These attributes are then combined to give an overall SEV score, also on a scale of 0 to 1.

### Macroinvertebrates

Macroinvertebrates were sampled from instream habitats within the representative reach to obtain semi-quantitative data in accordance with the Ministry for the Environment's current "Protocols for Sampling Macroinvertebrates in Wadeable Streams" (Stark *et al.*, 2001). Sampling was undertaken along the SEV reaches, using protocol 'C2: soft-bottomed, semi-quantitative' as the streams were dominated by silt substrate. The macroinvertebrate sample was preserved in 70% ethyl alcohol (ethanol), returned to the laboratory and sorted (using protocol 'P3: full count with sub-sampling option' (Stark *et al.*, 2001)). Macroinvertebrates were then identified to the lowest practicable level and counted to enable biotic indices to be calculated.

Several biotic indices were calculated, namely the number of taxa, the number and percentage of Ephemeroptera (mayflies); Plecoptera (stoneflies) and Trichoptera (caddisflies) recorded in a sample (%EPT), the Macroinvertebrate Community Index (MCI) and the Semi-Quantitative Macroinvertebrate Community Index (SQMCI) (Stark & Maxted, 2007a). EPT are three orders of insects that are generally sensitive to organic or nutrient enrichment, but exclude Oxyethira and Paroxyethira as these taxa are not sensitive and can proliferate in degraded habitats. The MCI and SQMCI are based on the average sensitivity score for individual taxa recorded within a sample, although the SQMCI is calculated using coded abundances instead of actual scores (raw macroinvertebrate data are presented in Appendix I). For the MCI and SQMCI, respectively, scores of:

- $\geq 120$  and  $\geq 6.0$  are indicative of excellent habitat quality,
- 100 – 119 and 5.0 – 5.9 are indicative of good habitat quality,
- 80 – 99 and 4.0 – 4.9 are indicative of fair habitat quality and
- $< 80$  and  $< 4.0$  are indicative of poor habitat quality (Stark & Maxted, 2007b).

### Fish Surveys

To sample fish communities, single-pass electric fishing was undertaken within the representative reach, using an EFM300 backpack electric fishing machine in accordance with methodology in Joy *et al.* 2013. The electric fishing machine temporarily stuns the fish, allowing them to be caught. The size of each individual was estimated and the number of fish caught and fish condition (taking into account anomalies such as parasites, lesions and wounds) was recorded before fish were returned to their habitats. All fish handling was carried out by suitably qualified and experienced ecologists.

The Fish Index of Biotic Integrity (IBI) for the Auckland Region was calculated for each site based on fish species present, altitude and distance inland (Joy & Henderson, 2004).

### Water Quality

*In situ* spot measurements of basic water quality parameters (temperature, dissolved oxygen and conductivity) were undertaken a within the representative reach. Measurements were undertaken using a Yellow Springs Instruments (YSI) Professional Series combined dissolved oxygen/temperature/conductivity meter.

## **2.3 Ecological Impact Assessment**

The overarching approach of this analysis and reporting is to ascertain the existing ecological values on the site and determine the impact of the proposed Structure Plan and resulting residential development on those values.

The ecological value of the site, relating to species, communities and systems, were determined as per the EIANZ Ecological Impact Assessment guidelines (EciAG) for use in New Zealand (Roper-Lindsay, Fuller, Hooson, Sanders, & Ussher, 2018). This report also identifies statutory guidelines and regulation with respect to ecology (such as watercourses, wetlands, high value vegetation and habitats) where relevant to the proposed development. Using this framework, the EciAG describes a simple ranking system to assign value to matters of ecological importance such as species assemblages and levels of organisation (Table 1). The overall ecological value is then determined on a scale from 'Negligible' to 'Very High' (Table 2).

Criteria for describing the magnitude of effects are given in Chapter 6 of the EciAG (Table 3). The level of effect can then be determined through combining the value of the ecological feature/attribute with the score or rating for magnitude of effect to create a criterion for describing level of effects (Table 4). The cells in italics in Table 5 represent a 'significant' effect under the EciAG. Cells with low or very low levels of effect represent low risk to ecological values rather than low ecological values per se. A moderate level of effect requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures need to be introduced to avoid through design, or appropriate mitigation needs to be addressed (Roper-Lindsay *et al.* 2018).

**Table 1: Attributes to be considered when assigning ecological value or importance to a site or area of vegetation / habitat / community (as per Table 4 of Roper-Lindsay *et al.* 2018).**

Matters	Attributes to be considered
Representativeness	<p><i>Criteria for representative vegetation and aquatic habitats:</i></p> <ul style="list-style-type: none"> <li>• Typical structure and composition</li> <li>• Indigenous species dominate</li> <li>• Expected species and tiers are present</li> <li>• Thresholds may need to be lowered where all examples of a type are strongly modified.</li> </ul> <p><i>Criteria for representative species and species habitats:</i></p> <ul style="list-style-type: none"> <li>• Species assemblages that are typical of the habitat</li> <li>• Indigenous species that occur in most of the guilds expected for the habitat type</li> </ul>
Rarity/distinctiveness	<p><i>Criteria for rare/distinctive vegetation and habitats:</i></p> <ul style="list-style-type: none"> <li>• Naturally uncommon or induced scarcity</li> <li>• Amount of habitat or vegetation remaining</li> <li>• Distinctive ecological features</li> <li>• National Priority for Protection</li> </ul> <p><i>Criteria for rare/distinctive species or species assemblages:</i></p> <ul style="list-style-type: none"> <li>• Habitat supporting nationally threatened or At-Risk species, or locally uncommon species</li> <li>• Regional or national distribution limits of species or communities</li> <li>• Unusual species or assemblages</li> <li>• Endemism</li> </ul>
Diversity and Pattern	<ul style="list-style-type: none"> <li>• Level of natural diversity, abundance and distribution</li> <li>• Biodiversity reflecting underlying diversity</li> <li>• Biogeographical considerations- pattern, complexity</li> <li>• Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation</li> </ul>
Ecological context	<ul style="list-style-type: none"> <li>• Site history and local environment conditions which have influenced the development of habitats and communities</li> <li>• The essential characteristics that determine an ecosystems integrity, form, functioning and resilience (from 'intrinsic value' as defined in RMA)</li> <li>• Size, shape and buffering</li> <li>• Condition and sensitivity to change</li> <li>• Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material</li> <li>• Species role in ecosystem functioning - high level, key species identification, habitat as proxy</li> </ul>

**Table 2. Assigning value to areas (Roper-Lindsay *et al.* 2018)**

Value	Determining Factors
Very High	Area rates 'High' for at least three of the assessment matters of Representativeness, Rarity/distinctiveness, Diversity and Pattern, and Ecological Context. Likely to be nationally important and recognised as such.
High	Area rates 'High' for two of the assessment matters, and 'Moderate' and 'Low' for the remainder OR area rates 'High' for one of the assessment matters and 'Moderate' for the remainder. Likely to be regionally significant and recognised as such.
Moderate	Area rates 'High' for one of the assessment matters, 'Moderate' or 'Low' for the remainder OR area rates as 'Moderate' for at least two of the assessment matters and 'Low' or 'Very Low' for the remainder. Likely to be important at the level of the Ecological District.
Low	Area rates 'Low' or 'Very Low' for majority of assessment matters, and 'Moderate' for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Area rates 'Very Low' for three assessment matters and 'Moderate', 'Low' or 'Very Low' for the remainder.

**Table 3. Criteria for describing the magnitude of effects (Roper-Lindsay *et al.* 2018)**

Magnitude	Description
Very High	Total loss of, or a very major alteration to, key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss of major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature.
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature.
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances and patterns; AND/OR Having minor effect on the known population or range of the element/feature.
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature.

**Table 4. Criteria for describing the level of effects (Roper-Lindsay *et al.* 2018). Where text is italicised, it indicates 'significant effects' where mitigation is required.**

Magnitude of Effect	Ecological Value				
	Very High	High	Moderate	Low	Negligible
Very High	<i>Very High</i>	<i>Very High</i>	<i>High</i>	<i>Moderate</i>	Low
High	<i>Very High</i>	<i>Very High</i>	<i>Moderate</i>	Low	Very Low
Moderate	<i>High</i>	<i>High</i>	<i>Moderate</i>	Low	Very Low
Low	<i>Moderate</i>	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

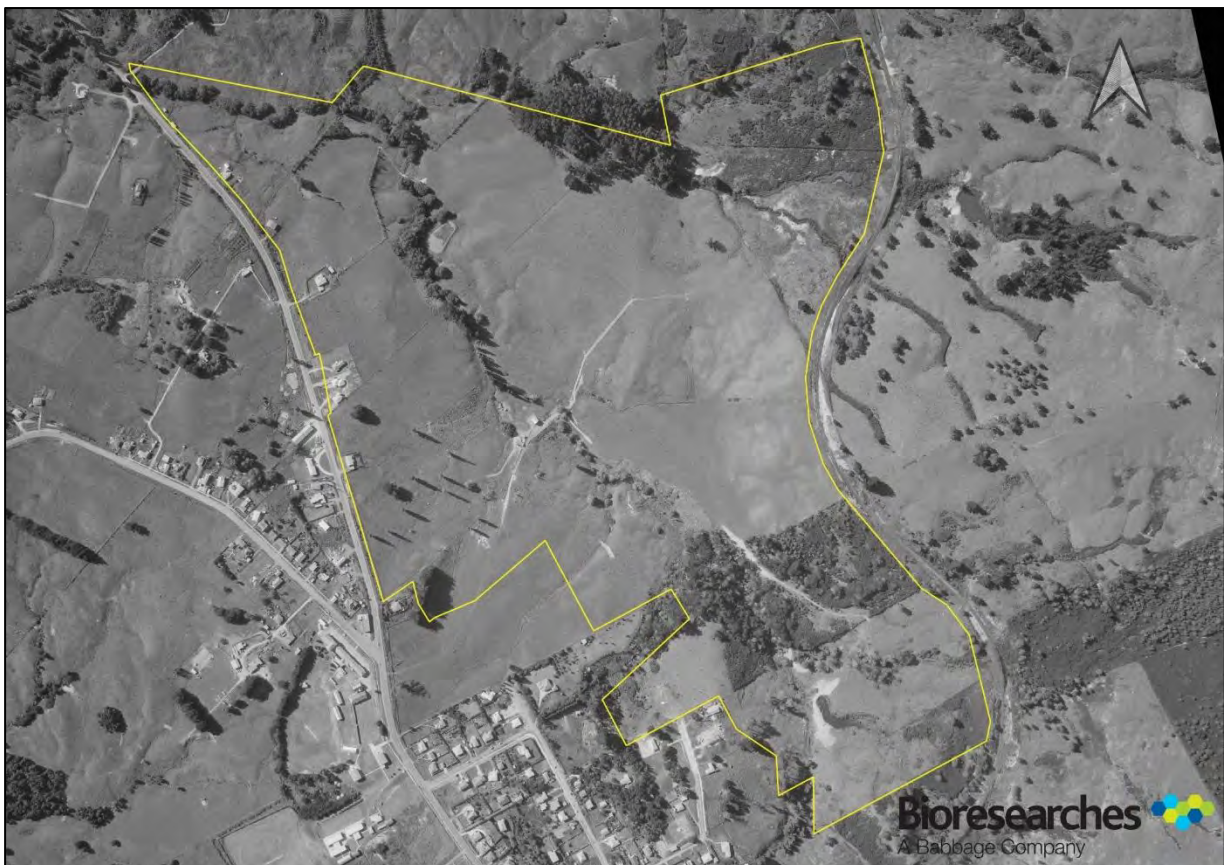


### 3. EXISTING ENVIRONMENT

#### 3.1 Background and Ecosystem Classification

The site is situated within the Otamatea Ecological District of the Auckland Region and is bordered by residential developments and large agricultural properties. Currently, the site consists of managed pasture, some mix exotic/native bush and a few residential buildings (Figure 1). The site does not currently support or border any terrestrial ecosystem types as classified under the AUP-OP: Biodiversity current extent. The site itself is not subject to any Significant Ecological Area (SEA) overlay.

Historically (pre-human era), the site would likely have been comprised of the ecosystem types; pūriri, taraire forest (WF7-2) and kauri, podocarp, broadleaved forest (WF11) (Singers *et al.*, 2017). Flora characteristic of the pūriri forest ecosystem includes mixed broadleaved species, such as pūriri, karaka, kohekohe and, locally, taraire and kohekohe. The northern and western areas of the site would have previously contained a mixture of kauri, podocarp and broadleaved trees. Both these ecosystem types would have supported a diverse range of invertebrates, amphibians, reptiles, birds, and bats. However, historical images indicate that the site, and much of the surrounding landscape, has been cleared for at least 60 years and has been managed for agricultural and horticultural purposes (Figure 2).



**Figure 2. Historical aerial image of the site, dated 1961. The approximate site boundary is shown in yellow. Base image sourced from Retrolens.**

## 3.2 Terrestrial Ecology

The site predominately consists of managed pastoral grasses. The main terrestrial ecology values of the site are associated with the mixed exotic and native riparian vegetation situated along streams intersecting the site. A significant ecological feature of the site is an area of regenerating native podocarp forest in the southern portion of the site. The ecological values of these features are linked to the terrestrial fauna that are expected to utilise these features.

### 3.2.1 Vegetation

Utilising site visit observations and aerial images, Bioresearches classified and mapped the site's vegetation cover (Figure 3). The main terrestrial vegetation types are discussed below.

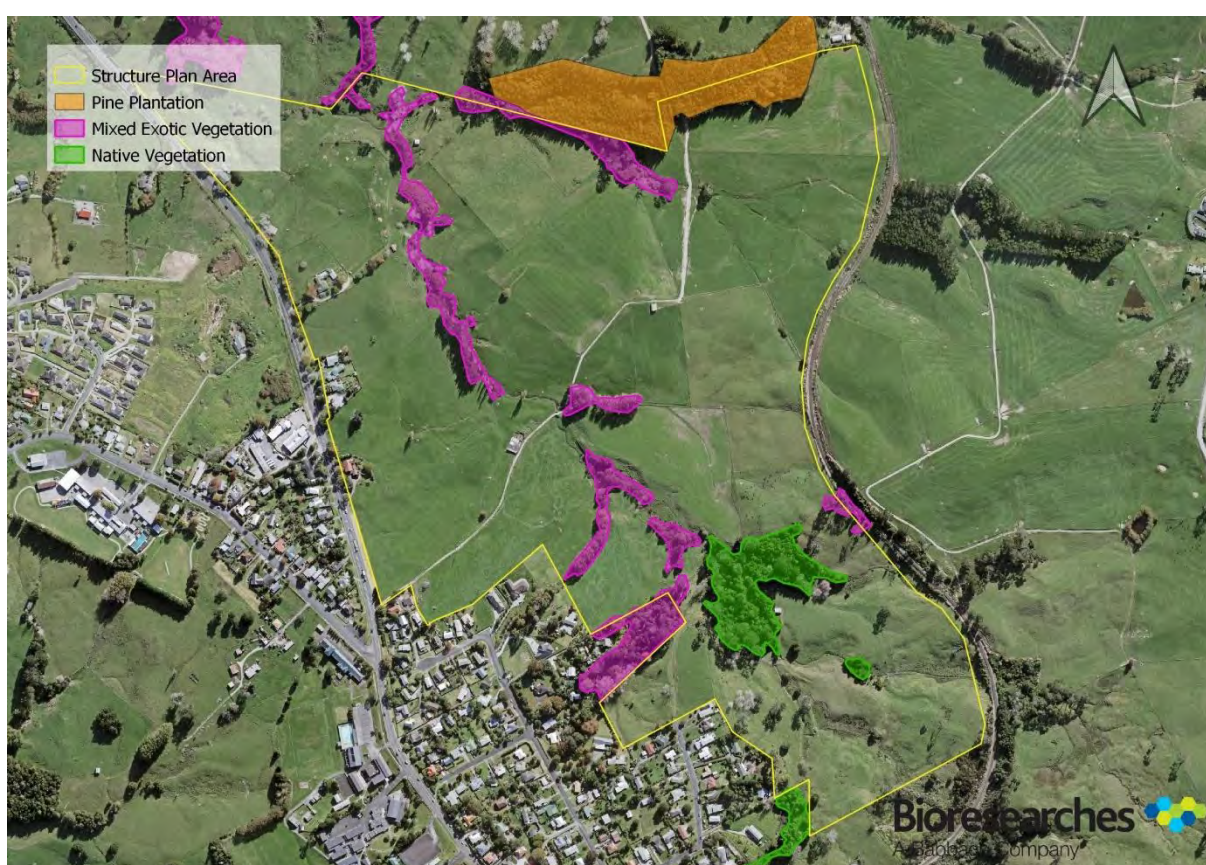


Figure 3. Main vegetation types within the site.

#### 3.2.1.1 Pine Plantation

A relatively small pine plantation is located along the northern border of the site. The canopy is a monoculture of maturing pine (*Pinus radiata*). The understorey consists predominately of exotic species with a few common native species establishing. Exotic species present included high infestations of pest plant species such as arum lily (*Zantedeschia aethiopica*), tree privet (*Ligustrum lucidum*), Chinese privet (*Ligustrum sinense*), blackberry (*Rubus fruticosus* agg.), woolly nightshade (*Solanum mauritianum*) and wild ginger (*Hedychium gardnerianum*). Native species included māhoe (*Melicetyus ramiflorus*), kawakawa (*Piper excelsum*) and tī kōuka (*Cordyline australis*).



Due to the monoculture exotic canopy, the high abundance of exotic species including pest plant species with the understorey and the low diversity of native species, the pine plantation was considered to be of negligible terrestrial and botanical value.



**Figure 4. Pine plantation along the northern boundary**



**Figure 5. Understorey within the pine plantation.**

### 3.2.1.2 [Mixed Exotic Vegetation](#)

Narrow pockets of mixed exotic vegetation are scattered throughout the site. The majority of these patches of exotic vegetation are associated with the riparian margins of streams. The exotic species within these areas predominately include, pine, macrocarpa (*Cupressus macrocarpa*), poplars (*Populus* sp.), willows (*Salix* sp.), elms (*Ulmus* sp.), European oak (*Quercus robur*) and brush wattle (*Paraserianthes lophantha*).

The understorey of these areas typically included either pasture or pest plant species such as gorse (*Ulex europaeus*), tradescantia (*Tradescantia fluminensis*), pampas (*Cortaderia selloana*), privet, arum lily and wild ginger. Also, within the mixed exotic vegetation, a few common native species were present which predominately included tōtara (*Podocarpus totara*), harakeke (*Phormium tenax*), tī kōuka and māhoe.

Due to the high abundance of exotic species including pest plant species with the understorey, the high edge effects and the low diversity of native species, the mixed exotic vegetation was considered to be of negligible terrestrial and botanical value.



**Figure 6. Mixed exotic vegetation along the central stream**



**Figure 7. Understory within the exotic vegetation.**

### 3.2.1.3 Native Vegetation

Within the southern portion of the site an approximate 1.8 ha patch of regenerating native podocarp forest is present. The vegetation within this area forms the riparian margin of two streams and consists of a canopy of predominately tōtara. Although native species were dominant, there was a high abundance of exotic vegetation within the canopy, including pines, brush wattle and Chinese privet. The understorey appears damaged from grazing/browsing by stock and pests (evidence of goats and cattle access was observed) and was made up of māpou (*Myrsine australis*), Carex species, hangehange (*Geniostoma ligustrifolium*) and multiple ground fern species including hard shield fern (*Polystichum* sp.), crown fern (*Lomaria discolor*), kiokio (*Parablechnum procerum*) and hounds' tongue (*Microsorium pustulatum*). Exotic species were also abundant, including pest plant species such as, arum lily, tradescantia, woolly nightshade and blackberry.

This area was considered of moderate terrestrial and botanical value due to the diverse native vegetation, however the exotic species, many of which are considered pest plants, along with the damaged understorey, decreased the value.



**Figure 8. Native vegetation within the site**



**Figure 9. Understory within the native vegetation.**



### 3.2.1.4 Other Vegetation

The remainder of the site consisted of predominately pasture with a few isolated exotic trees and tōtara as well as amenity plantings that surrounded the residential dwellings. Due to the lack of diversity and generally low stature and structural complexity of the remaining vegetation within the site, these areas were considered to be of negligible terrestrial and botanical value.

### 3.2.2 **Connectivity and Ecological Function**

Connectivity between areas of vegetation is important to facilitate ecological function. Edge communities are heavily influenced by increased exposure to light, drying winds and competitive weeds. This 'edge effect' restricts some native flora and fauna to forest interiors. Patch fragmentation increases the edge effect and decreases the availability of habitat for interior species. Loss of ecological connectivity can also impair reproductive function for both flora and fauna.

The main area of terrestrial significance within the site is the patch native vegetation. Currently, this vegetation provides low connectivity or ecological function to the surrounding environment. It is surrounded by pasture, suburban development, and a small amount of exotic vegetation, which is of very low botanic quality. The site is not in close proximity to any large areas of native vegetation, however one relatively small SEA is located approximately 900m to the west (Figure 10). The grazed pasture and sparse exotic trees likely do not act as connectivity between areas of vegetation.

The remaining areas of vegetation (shelter belts, exotic plantations, amenity plantings and pasture) were considered to have a negligible amount of ecological connectivity and function.



**Figure 10. A terrestrial SEA (green crosses) was located approximately 900m west of the native vegetation within the site (yellow polygon). Larger SEAs or areas of native vegetation were not in close proximity to the site.**

### 3.2.3 Pest Animals

No formal pest animal surveys were undertaken and no evidence of pest control was observed within the site. It is reasonable to assume due to the surrounding urban and agricultural land use that the typical density of rats, mice, feral cats, mustelids and hedgehogs are present within the site.

### 3.2.4 Native Fauna

#### 3.2.4.1 Herpetofauna

Herpetofauna (reptiles and amphibians) comprise a significant component of New Zealand's terrestrial fauna. There is currently 104 endemic herpetofauna taxa recognised in New Zealand (Hitchmough, et al., 2016), 80% of which are considered 'Threatened' or 'At Risk'. All indigenous reptiles and amphibians are legally protected under the Wildlife Act 1953, and vegetation and landscape features that provide significant habitat for native herpetofauna are protected by the Resource Management Act 1991. Statutory obligations require management of resident reptile and amphibian populations if they are threatened by a disturbance i.e., land development.

No formal herpetofauna surveys were undertaken. However, a review of historic lizard records from within 5 km of the project area shows that there are only two records; a single elegant gecko (*Naultinus elegans*) from 1965 and the exotic plague skink (*Lampropholis delicata*) from 1994 which is an introduced species classified as an invasive pest. Due to the date (~60 years ago) of the elegant gecko sighting and the fact that no other sightings have occurred, it is unlikely that this species still inhabits the area. One plague skink was found during an informal habitat search of the leaf litter debris on site (May 2019 site visit). No other species were observed, indicating that if native skinks are present, they are likely to occur only in very low numbers.

Forest gecko (*Mokopirirakau granulatus*), elegant gecko and pacific gecko (*Dactylocnemis pacificus*) are typically arboreal (tree dwelling) and normally associated with regenerating scrubland and forests. Pacific and forest geckos will also inhabit clay banks and rock walls within and around such forests or scrubland. For populations of these species to persist, vegetated areas with good connectivity need to be relatively stable over time. Additionally, geckos prefer dense foliage typical of early seral vegetation communities. The native vegetation located on site was found to be isolated and contained a damaged understorey but expected to provide a moderate valued habitat in the form of mature native trees. As such, this vegetation was only considered of moderate habitat quality.

Copper skink (*Oligosoma aeneum*) and ornate skink (*Oligosoma ornatum*) are generally found in dense ground cover or under logs or other debris around forest edge habitats. Copper skink are widespread within the Auckland region, however ornate skinks tend to be patchily distributed. Moko skink (*Oligosoma moco*) are relatively common on offshore islands, however populations that are not on inshore / offshore islands are rare. Within the native vegetation, edge habitat was common, but the damaged understorey generally provided little groundcover and debris. As such the native vegetation was considered of low habitat quality.

Due to the lack of suitable habitat for native lizards outside of the regenerating native, the herpetofauna habitat value within the rest of the site was considered negligible.

#### 3.2.4.2 Avifauna

During the site visit, indigenous avifauna heard or observed consisted of pūkeko (*Porphyrio melanotus*) were observed. Within the wider site, paradise shelduck (*Tadorna variegata*), fantail (*Rhipidura fuliginosa placabilis*) and kingfisher (*Todiramphus sanctus*) were seen. Other non-threatened native species that were not recorded, but may visit the property intermittently include ruru (*Ninox novaeseelandiae*), grey warbler (*Gerygone igata*), harrier (*Circus approximans*), tūi (*Prothemadera novaeseelandiae*), white-faced heron (*Egretta novaehollandiae*) and silvereye (*Zosterops lateralis*). No 'At Risk' or 'Threatened' species were recorded, or are likely to utilise the property, even on an intermittent basis.

Although the native vegetation is isolated and has a damaged understorey, due to the mature and diverse native species present, the native vegetation was considered to be of moderate avifauna habitat value.

Due to the isolated nature and high edge effects the avifauna habitat value within the rest of the site was considered negligible.

#### 3.2.4.3 Bats

Long-tailed bats (LTBs; *Chalinolobus tuberculatus*) are classified as 'Nationally Vulnerable' in the North Island (O'Donnell et al., 2013). This classification is given the qualifier "Data Poor" which indicates that there is low confidence in the rating due to poor data available on the species populations and distribution (Townsend et al., 2008). LTBs have large home ranges of up to 5,629 ha (O'Donnell 2001).

No formal surveys were undertaken for LTBs. While LTBs are known to occur at several sites across the Auckland Region with scattered records through the Rodney and Otamatea Districts, there are no records of bats within close proximity of the site. However, this lack of records may be an artifact of poor or no survey effort.

Some of the larger pines tree within the site, may support roosting or nesting habitat (cavities, large sections of flaking bark) for LTBs, however, due to the isolation of these trees it is unlikely that these trees are utilised by LTBs. The remaining vegetation provided no suitable habitat for bats and as such the site was considered of low bat habitat value.



### 3.3 Freshwater Ecology

Aerial images obtained for the site indicated the presence of multiple watercourses on the property. These were ground-truthed and classified during the site visits as permanent or intermittent streams, ephemeral flow paths, natural wetlands, or constructed features (Figure 11).



Figure 11. Freshwater features identified on site, including the permanent, intermittent or ephemeral status of streams, and wetland areas.

#### 3.3.1 Streams

Numerous streams (S-A to S-P, Figure 11) were identified within the site. One main permanent stream (S-A & S-D) flows from the south of the site to the north and generally bisects the site in half. All other streams identified with the site were tributaries of this main stream. The catchments within the site feed the Whakapirau Creek, which eventually drains to the Kaipara Harbour via the Oruawharo River.

All the streams within the site have been highly modified and impacted through historic and current agricultural practices. Stock have access to the majority of the streams and many streams have been straightened, deepened and maintained to optimise the drainage of the surrounding land.

Riparian vegetation associated with the streams generally consisted of manged pasture, which provided no effective shading and low levels of filtration and organic matter input. However, the riparian vegetation of some streams and reaches consisted of shelter belts (S-H & S-J), pine plantations (S-B), exotic vegetation (lower reach of S-E) and native vegetation (mid/upper reach of S-E) which formed a canopy over the streams. Where a canopy formed over the streams the riparian vegetation provided a high degree of shading, filtration, organic input and bank stability.

Where shading was low, macrophytes were often abundant within the stream channel. Macrophytes observed included water pepper (*Persecaria hydropiper*), watercress (*Nasturtium officinale*), starwort (*Callitriche stagnalis*), parrot's feather (*Myriophyllum aquaticum*) and water celery (*Helosciadium nodiflorum*).

Stream substrate predominately consisted of soft sediment with a high loading of fines silt in places. Patches of gravel and small cobble were observed where stream S-E flowed through the native vegetation.

The majority of the streams had low hydrologic variation and low amount of habitat diversity, generally consisting of runs with a few relatively small pools. However, where stream S-E flowed through the native vegetation, a higher amount of hydrologic variation and habitat diversity was observed including riffles, large pools and undercut banks.

A number of culverts and farm crossings are located throughout the site. Some of these culverts are perched, such as the culvert within stream S-E upstream of the native vegetation, and form a significant fish passage barrier. A weir is also present within stream S-E, just downstream of the confluence with S-I, and forms another significant fish passage barrier.

With the exception of the S-E and S-L stream reaches (reaches within the native vegetation) and the stream within the pine plantation (S-B), the streams within the site were considered to be overall of low ecological value due to the general lack of riparian vegetation and the low abundance of habitat diversity and hydrologic heterogeneity. The stream reaches within the native vegetation and the stream S-B were considered of moderate-high ecological value due to the relatively extensive riparian vegetation and habitat diversity.



Figure 12. Stream S-A.



Figure 13. Stream S-B.





**Figure 14. True left branch of Stream S-C.**



**Figure 15. Middle branch of Stream S-C.**



**Figure 16. True right branch of Stream S-C.**



**Figure 17. Stream S-D.**



**Figure 18. Lower reach of Stream S-E.**



**Figure 19. Mid reach of Stream S-E.**





**Figure 20. Reach of Stream S-E within native bush.**



**Figure 21. Upper SEV reach of Stream S-E.**



**Figure 22. Stream S-F.**



**Figure 23. Ephemeral reaches within area S-G.**



**Figure 24. Highly modified stream S-H.**



**Figure 25. Artificial watercourse S-I.**





**Figure 26. Stream S-J.**



**Figure 27. Stream S-K.**



**Figure 28. Upper reach of stream S-L.**



**Figure 29. True right ephemeral trib of stream S-L.**



**Figure 30. Upper reach of stream S-M.**



**Figure 31. Ephemeral tributary of stream S-M.**





**Figure 32. Stream S-O.**



**Figure 33. Ephemeral reaches within area S-P.**

### 3.3.1.1 [Stream Ecological Valuation](#)

A Stream Ecological Valuation (SEV) was undertaken (May 2019) on a reach within stream S-E directly upstream of the native vegetation (Figure 21). While not a complete true reflection of all the differing streams ecological values within the site, the SEV reach was considered a fair general representation of the degraded stream environments throughout the site.

The SEV reach had an average width of 1.09m and ranged between 0.87m and 1.61m. Depth varied throughout the reach and was between 0.02m and 0.64m with an average of 0.12m deep.

The instream aquatic habitat was of low quality. Substrate was made up entirely of silt and was often more than 0.1m deep. The abundance of surface reaching macrophytes was high in places and included parrot's feather, watercress (*Nastrutium officianale*), water pepper and water celery. There was no effective shading for the majority of the reach.

A perched culvert was located within the downstream end of the SEV reach, which was determined to be a significant barrier to native fish passage.

The *in situ* water quality results showed parameters such as dissolved oxygen and temperature were at levels that would not cause stress to aquatic organisms (Biggs *et al.* 2002). Conductivity was elevated, indicating moderate nutrient enrichment from the surrounding landscape and was reflective of the pastoral catchment.

The macroinvertebrate community sample was dominated by dragonfly larvae (*Xanthocnemis zealandica*), a pollutant tolerant taxa, which made up 31% of the sample. The reach contained a reasonably low diversity of macroinvertebrates, with 23 taxa recorded including 11% EPT taxa. The EPT taxa, identified as caddisflies, suggests more sensitive species are able to survive in the reach, however the MCI score of 76.26 and SQMCI of 3.78 both represent 'Poor' habitat quality. Raw macroinvertebrate data is presented in Appendix I.

No native fish were caught in the reach during single-pass electric fishing and no evidence of native fish, such as macrophyte movement or sudden substrate suspension were observed. The perched culvert downstream of the reach likely presents a total barrier to fish passage. Potential native fish

habitat within the reach was poor, and limited to macrophytes. Downstream of the perched culvert, within the native vegetated area, spot electric fishing was carried out. Three juvenile shortfin eels (*Anguilla australis*), one juvenile longfin eel (*Anguilla dieffenbachii*) and five kōura (*Paranephrops* sp.) were caught. Native fish habitat within this stream reach was much more abundant, with deep pools, woody debris, riffles, cobbles and undercut banks all common.

The reach had an SEV score of 0.27, which is indicative of a stream highly impacted by land use change and in poor ecological condition. It reflects the low fish and macroinvertebrate diversity and the lack of riparian vegetation. The SEV function scores are presented in Appendix II. The reach was determined to be of very-low ecological value in its current state.

**Table 5. Physical characteristics of the representative reach within stream S-E.**

Average width (m)	1.09
Average depth (m)	0.12
Dominant substrate	Silt
Macrophyte abundance	Common
Macrophyte species	Watercress, parrots feather, water pepper, water celery
Shading	No effective shading to low shading
Riparian vegetation	Pasture grass A few <i>Juncus</i> spp. 1x tōtara and 1x macrocarpa
<b>Water Quality</b>	
Date and Time	1100; 30 <sup>th</sup> May 2019
Temperature (°C)	13.7
Dissolved Oxygen (mg/L)	9.50
Dissolved Oxygen (%)	91.6
Conductivity (µS/cm)	273.9
<b>Macroinvertebrates</b>	
Sampling protocol	SB
Number of taxa	23
Dominant taxon	Dragonfly larvae ( <i>Xanthocnemis zealandica</i> )
Number of EPT	3
%EPT*	8.7
MCI	76.26
MCI Ranking	Poor
SQMCI	3.78
SQMCI Ranking	Poor
<b>Fish</b>	
Sampling protocol	EFM
Species recorded	0
Fish size	-
Fish IBI	0
Fish IBI Ranking	'No Native Species'
<b>SEV score</b>	<b>0.27</b>

### 3.3.2 Ephemeral Streams

A number of ephemeral streams or overland flow paths were identified within the site, namely the reaches within areas S-G and S-P of **Figure 11** (Figure 23 & Figure 33). These overland flow paths had ill-defined channels, no flowing water 48 hrs after a rain event, no natural pools, rooted terrestrial vegetation (pasture grasses) across their widths and no evidence of substrate sorting. As such, these overland flow paths were classified as ephemeral reaches and due to the complete lack of freshwater habitat these reaches were considered of negligible ecological value.

### 3.3.3 Artificial Watercourse

One artificial watercourse was identified within the site (S-I, Figure 11). The watercourse is uniform and has clearly been constructed and maintained to improve the drainage of the surrounding land (Figure 25). Early aerials from 1961 show no evidence of this watercourse (Figure 2), as such it was considered that this watercourse contained no natural portions from its confluence with the connecting stream to its headwaters.

### 3.3.4 Freshwater Fauna

Aquatic fauna data from surrounding stream catchments was extracted from the NIWA New Zealand Freshwater Fish Database (NZFFDB), to determine the likely presence of aquatic fauna (fish, crustaceans and bivalves) within the site. Within the local catchments, of similar elevation and distance to sea, only shortfin eels, gambusia (*Gambusia affinis*, an introduced pest fish), freshwater mussels (*Echyridella menziesii*, kākahi), freshwater shrimp (*Paratya curvirostris*) and kōura have been recorded (Figure 34). No previous records have been recorded within the site itself or in the adjacent catchments.

A fish survey within the stream S-E reach, located within the native vegetation, was undertaken in 2019 as a part of the SEV assessment. Three juvenile shortfin eels, one juvenile longfin eel and five kōura were caught. This diversity of fauna gives an IBI score of 28 which has a 'fair' rating.

A number of fish barriers were observed, most notable was the perched culvert within S-E upstream of the native vegetation, and the weir within stream S-E, just downstream of the confluence with S-J.



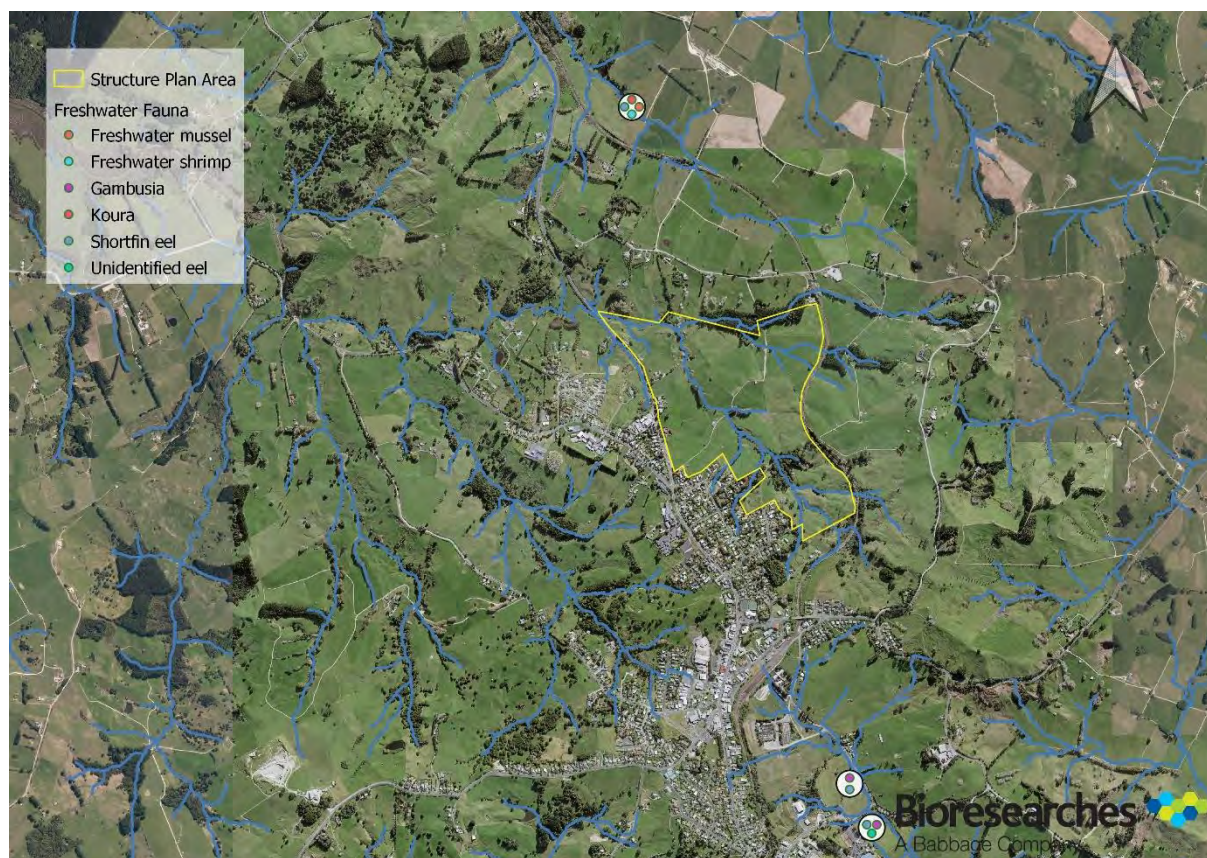


Figure 34. Aquatic fauna data from the NIWA New Zealand Freshwater Fish Database (NZFFDB) for the surrounding catchments.

### 3.3.5 Wetlands

Four wetlands were identified within the site (W-A to W-D, Figure 11). Wetlands were identified and classified using the latest MfE wetland protocols and guidance.

#### 3.3.5.1 Wetland W-A

Wetland W-A, is a series of small wetland sequences/patches associated with the floodplain and riparian margins of streams S-A and S-F. A distinct stream channel ran through the wetland and outside of the channel no aquatic habitat was present, (i.e. no standing or flowing water just damp or boggy ground), indicating the wetland is intermittent or ephemeral. The area is actively grazed as pasture.

The wetland vegetation consisted of common pasture species and pasture weeds such as mercer grass (*Paspalum distichum*, FACW), creeping bent (*Agrostis stolonifera*, FACW), soft rush (*Juncus effusus*, FACW) and water pepper (FACW). These areas passed the vegetation rapid test and as such were considered wetlands under the NPS-FM.

Not all of the floodplain and riparian margins of streams S-A and S-F were considered wetlands, as relatively large areas were comprised of upland pasture species such as kikuyu (*Cenchrus clandestinus*, FACU), paspalum (*Paspalum dilatatum*, FACU) and perennial rye grass (*Lolium perenne*, FACU). The distinction between the wetland and non-wetland areas was clearly defined by the vegetation, hydrology and contours present.

The wetland was considered of low ecological value due to the lack of aquatic habitat, the low diversity and structural complexity of plant species and lack of native species. This wetland represents degraded pasture rather than an ecologically functioning wetland.

### 3.3.5.2 [Wetland W-B](#)

Wetland W-B is a relatively large wetland (≈0.5 ha) located approximately midway along stream S-E. An instream weir is present (Figure 36) which has at least partially induced the wetland. Permanent wetland hydrology was evident consisting of standing water, flowing water and boggy ground.

The area was dominated by obligate and facultative wetland plants and as such met the vegetation tool rapid test. Vegetation present within the wetland included water celery (OBL), parrot's feather (OBL), mercer grass (FACW), water pepper (FACW) and carex spp. (FACW or OBL).

Due to the hydrology, contours and distinct change in vegetation composition, a clear demarcation was apparent between wetland and non-wetland areas.

W-B was considered of moderate ecological value, due to its relatively large size and high hydrological variation. However, its low native diversity and low structural complexity reduced the overall value.

### 3.3.5.3 [Wetland W-C](#)

At the confluence of the S-G ephemeral reaches and adjacent to the permanent stream S-E, a small wetland (approximately 40m<sup>2</sup>) has formed where the land flattens out. The area contained watercress, an exotic obligate wetland plant species, and the ground was saturated even during the December site visit. Due to the presence of the obligate wetland plant and the permanent wetland hydrology present, the small area was classified as a natural wetland under the NPS-FM. The wetland was considered of low ecological value due its small size, lack of aquatic habitat, low diversity and structural complexity of plant species and lack of native plant species.

### 3.3.5.4 [Wetland W-D](#)

Wetland W-D is a constructed wetland within stream S-N. A dam was created prior to 1961 (Figure 2) to purposefully create open water/water storage. This dam has induced wetland features, namely hydrophytic vegetation and wetland hydrology along its margins and further upstream. Due to the wetland being purposefully constructed, it is excluded as a 'natural wetland' under the NPS-FM. However, the area would still be considered a wetland under the RMA definition.

Stock have direct access to the wetland. Wetland vegetation identified included parrot's feather, soft rush, mercer grass, carex spp. and water pepper. The wetland was considered of low ecological value due to its degraded and artificial nature, the low diversity and structural complexity of plant species and lack of native species. This wetland represents a constructed pond with degraded pasture rather than a natural wetland.





**Figure 35. Wetland sequence within W-A.**



**Figure 36. Weir within wetland W-B.**



**Figure 37. Wetland W-B.**



**Figure 38. Wetland W-C.**



**Figure 39. Wetland W-D lower extent.**



**Figure 40. Wetland W-D upper extent (centre of photo).**

### 3.3.5.5 Additional Features

Throughout the rest of the site, and namely within overland flow paths, a few soft rushes were scattered amongst the pasture grasses. Additionally, creeping buttercup (*Ranunculus repens*), an exotic facultative species, is also present. Both of these species are considered common pasture weeds and were present in low abundance ( $\leq 10\%$  coverage). No standing water was present outside of the identified wetlands and streams, and the soils were not saturated, indicating that wetland hydrology is not present. Due to the absence of evident wetland hydrology and the dominance ( $\geq 90\%$ ) of facultative upland and upland plant species (e.g. perennial ryegrass, kikuyu grass, dallis



grass/paspalum and clover) these areas were not considered natural wetlands under the NPS-FM. It should also be noted that these areas are currently, and have historically, been used and managed as pasture.

### 3.3.6 Receiving Environment

The catchments within the site are tributaries of the Whakapirau Creek, which eventually drains to the Kaipara Harbour via the Oruawharo River.

The Whakapirau Creek and the Oruawharo River are significant high-order streams within the Auckland region. These streams are home to many native freshwater fauna including shortfin eels, longfin eels (At Risk – Declining), banded kōkopu (*Galaxias fasciatus*), īnanga (*Galaxias maculatus*, At Risk – Declining), freshwater mussels and kōura. Through agricultural practices and urban development, the ecological value of these streams has declined.

The Kaipara Harbour is recognised and valued as a significant cultural, ecological, social and economic taonga. However, it has been negatively impacted by high levels of nutrients and sediment entering into the harbour through water ways.

### 3.4 Summary of Ecological Values

The terrestrial ecological value of the site is predominately linked to the presence of the 1.8 ha regenerating native podocarp ecosystem. The remainder of the site itself is largely comprised of low-ecological value pasture. The freshwater values of the site are linked to the presence of a main central stream and its tributaries, and multiple wetland habitats. The values of the site are summarised in Table 6.

**Table 6. Summary of the terrestrial and freshwater ecological values on site.**

Ecological Feature	Assigned Ecological Value
Native Vegetation	Moderate
Pine Planation	Negligible
Mixed Exotic Vegetation	Negligible
Other Vegetation (pasture, shelterbelts, amenity plants etc..)	Negligible
Stream S-B	Moderate
S-E and S-L stream reaches within the native vegetation	Moderate-High
All Other Streams	Low
Wetland W-A, W-C and W-D	Low
Wetland W-B	Moderate

## 4. ASSESSMENT OF ECOLOGICAL EFFECTS

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The Structure Plan area is primarily currently zoned Future Urban. The Structure Plan seeks to provide a variety of land use types including countryside living, lower density residential, medium density residential, a village centre and ecological/open areas, as well as the supporting infrastructure and landscape buffers.

No additional provisions are proposed as part of this Structure Plan. All Auckland-wide and the relevant zone provisions of the AUP will apply to the Structure Plan area and will enable Auckland Council to regulate and manage future subdivision development.

The main threats to the long-term viability of ecosystems in Auckland include; habitat destruction, fragmentation, edge effects and invasion by pest plants and animals. These threats are often augmented through an increase in human population density.

This section assesses the potential effects of the proposed Structure Plan on the current and potential ecological values within the Site and the associated wider landscape.

### 4.1 Terrestrial Ecology

#### 4.1.1 Vegetation

The main area that holds significant ecological value on site is the 1.8 ha regenerating native podocarp forest. This area is not subject to a SEA overlay, however it is currently a restricted discretionary activity to remove vegetation within 20 m of rural streams, within 10 m of an urban stream and greater than 250 m<sup>2</sup> of contiguous indigenous vegetation outside of the rural urban boundary.

The Structure Plan seeks to incorporate approximately 75% of the native vegetation within public ecological areas. The remainder of the native vegetation would be within private land and subject to the AUP's objectives, policies and rules.

The remaining vegetation, outside of the native vegetation, is of negligible-low ecological value and has been degraded by historical and current agricultural land use. The Structure Plan seeks to include an additional approximately 12 ha of land as public ecological areas and open spaces.

The assigning of 13.8 ha of land as ecological areas or open spaces will retain the existing ecological values, protect this land from further degradation and provides the opportunity to further significantly enhance the terrestrial ecological values through the enhancement of the existing native vegetation and the planting and protection of the 10 m and 20 riparian margins. These potential plantings will greatly increase the quantity and diversity of native vegetation as well as result a large increase in ecological connectivity and terrestrial habitat.

As such, it is considered that the Structure Plan will likely result in an overall large ecological gain in regard to terrestrial ecology.

#### 4.1.2 Pest Animals

The Structure Plan is expected to lead to an increase in the human population density within the area. An increase in human population density often brings an increase in rat, mice and domestic cat abundance. However, the current site does not have pest control measures, and most pests are likely at carrying capacity. Pest control is likely to be implemented on site once the number of residential properties increase. Additionally, any potential native vegetation protection and enhancement, as a result of future development, will likely require pest control. Overall, it is considered that there may be a low increase in rat and mice abundance.

Due to the surrounding residential and commercial properties to the west and south, roaming domestic cats would currently likely be present within the Site, as such an increase in density is not expected to have a significant impact on the current ecological values.

It is not expected that possum, mustelid, hedgehog and rabbit abundance would increase as a result of the Structure Plan, in fact there will likely be a decrease due to the reduction in agricultural land.

Overall, it is considered that the rezoning of the Site will result in a negligible increase of pest animal effects.

#### 4.1.3 Terrestrial Fauna

Bat and lizard habitat within the site was considered to be generally of negligible-low quality. The native vegetation was considered to represent moderate valued avifauna habitat, while the remaining areas were considered of negligible value. The Structure Plan provides the opportunity to further enhance the terrestrial fauna habitat through the enhancement of the existing native vegetation and the planting and protection of the 10 m and 20 riparian margins.

Any potential direct adverse effects on native terrestrial fauna as a result of subsequent development works (e.g. earthworks or vegetation removal) would be assessed at the resource consenting phase and can be appropriately mitigated through the implementation of fauna management plans. It should be noted that, any site works resulting from any rezoning of the Future Urban Zone will result in the same or similar potential adverse effects on native fauna.

### 4.2 Freshwater Ecology

With the exception of the S-E and S-L stream reaches (reaches within the native vegetation) and the stream within the pine plantation (S-B), all streams within the site were considered to be of low ecological value. The stream reaches within the native vegetation and the stream within the pine plantation were considered of moderate-high ecological value.

The Structure Plan seeks to incorporate approximately 90% of all intermittent and permanent streams into the public ecological and open space areas. The remainder of the streams will be within private land and subject to the AUP's objectives, policies and rules. In addition, the Structure Plan avoids any direct impacts on natural wetlands and seeks to incorporate them into the public ecological and open space areas.

Multiple stream crossing would likely be required for the Structure Plan to provide the required infrastructure for appropriate development. The Structure Plan provides the opportunity to upgrade existing culverts to the current NES-FW standards and also provides the opportunity to remove redundant farm crossings and rectify fish passage barriers.

The Structure Plan also provides the opportunity to significantly enhance and protect the freshwater systems through the planting and protection of the 10 m and 20 riparian margins.

### Stormwater

The main threats to the freshwater ecology, as a result of a potential increase in residential density, are in relation to stormwater. Any potential residential development will likely result in an increase in impervious surfaces. This increase can amplify the adverse stormwater effects on the receiving environment by resulting in increased scouring, erosion or high levels of contaminant input.

Through the implementation of stormwater management on site, any adverse stormwater effects can be appropriately managed to prevent impacting ecological values on site.

The downstream receiving environment include the Whakapirau Creek, the Oruawharo River and the Kaipara Harbour. These receiving environments have already been highly impacted through nutrient and sediment inputs and therefore warrants protection from further degradation through appropriate controls based on the objectives and policies of Sections B7.3 and B7.4 of the AUP.

## **4.3 Policy Documents**

### **4.3.1 National Policy Statement for Freshwater Management 2020**

The main objective of the NPS-FM is to ensure health and well-being of water bodies and freshwater ecosystems are prioritised. The Structure Plan is in accordance with the NPS-FM as all freshwater ecosystems have been identified within the site, no reclamation is proposed and any potential significant adverse effect can be appropriately avoided, minimised, remedied or offset. Furthermore, the Structure Plan provides opportunities to protect and enhance the freshwater ecosystems.

### **4.3.2 Auckland Unitary Plan**

The AUP sets out a number of policies and objectives that gives effect to the RMA to promote the sustainable management of natural and physical resources. This section addresses the objectives and policies set out in the AUP pertaining to ecology.

#### **4.3.2.1 B2 – Urban Growth and Form**

Consistent with B2, through t vegetation protection and enhancement, the Structure Plan will provide ample opportunity to maintain and enhance the quality of the natural environment, including those scheduled in the AUP, while promoting quality compact urban form.

Additionally, it has been demonstrated above that the adverse environmental effects of the Structure Plan, including significant adverse effects from urban development on receiving waters, can be appropriately avoided, remedied or mitigated.

#### 4.3.2.2 B7 – Natural Resources

Consistent with B7, areas of significant indigenous biodiversity value and freshwater environments have been identified within the site. All freshwater habitat would be protected from inappropriate adverse effects of subdivision use and development.

Additionally, the Structure Plan will provide further opportunities to maintain indigenous biodiversity through the protection, restoration and enhancement of areas where ecological values are degraded and where development is occurring, namely through planting and protection of riparian margins.

#### 4.3.2.3 E1 – Water Quality and Integrated Management

Consistent with E1, the Structure Plan can appropriately manage discharges, subdivision and development that affect freshwater systems to maintain or enhance water quality, flows, stream channels and their margins.

#### 4.3.2.4 Lakes, Rivers, Streams and Wetlands

Consistent with E3, all potential streams, rivers and wetland have been identified within the Site. Additionally, reclamation and significant adverse effects can be avoided and the Structure Plan provides opportunities to protect and enhance the freshwater systems.

#### 4.3.2.5 E15 – Vegetation Management and Biodiversity

Consistent with E15, the vegetation and biodiversity values of the site have been identified. The Structure Plan provides opportunities to maintain and enhance ecosystem services and indigenous biodiversity values, particularly in sensitive environments, and areas of contiguous indigenous vegetation cover, while providing for appropriate subdivision, use and development.

#### 4.3.2.6 Appendix 1 – Structure Plan Guidelines

Consistent with the Structure Plan Guidelines, it has been demonstrated that the Structure Plan provides opportunities and mechanisms to protect, maintain or enhance natural resources, particularly those that have been scheduled in the AUP and integrate green networks, namely through the protection and enhancement of the native riparian vegetation.

### **4.3.3 Auckland Plan 2050**

The Auckland Plan 2050, states that Auckland's natural environment is inextricably connected to Aucklanders' sense of identity and place. Auckland's natural environment not only supports its people, but it is home to many special local ecosystems and is essential for the survival of both indigenous wildlife and species from across the world. However, many of Auckland's treasured natural environments, ecosystems, and indigenous species are already under significant pressure from human activity, and some are in decline. To reverse this decline, Auckland must ensure that development is sustainable and has minimal negative impacts on the natural environment.



Consistent with the Auckland Plan 2050, the Structure Plan provides opportunity to restore degraded ecosystems where appropriate, while providing for appropriate development.

#### **4.3.4 Auckland's Urban Ngahere (Forest) Strategy**

This Strategy was formed to protect what Auckland's urban ngahere in the face of a growing and urbanising population through supporting principles such as; preference for natives, ensure urban forest diversity, protect mature, healthy trees, create ecological corridors and connections and access for all residents.

The Structure Plan is consistent with the Urban Ngahere Strategy, as the Structure Plan has identified the ngahere of the site and provides opportunities for enhancement of ecological corridors, connections and diversity through the planting of native riparian vegetation and maintaining existing vegetation where practicable, while also providing for public access.

## 5. SUMMARY AND RECOMMENDATIONS

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Bioresearches have assessed the proposed Wellsford North Structure Plan. The impact of the Structure Plan has been considered in relation to the terrestrial and freshwater values present on site. It is considered that the Structure Plan is appropriate for the site, and any future subdivision and development can result in the protection and enhancement of indigenous terrestrial and freshwater ecological values of the site. It is recognised that the AUP-OP and the NES-FW provides a framework that manage any proposed future development at the resource consenting phase to ensure development aligns with the appropriate polices and regulations.

The significant ecological values on site are the linked to the regenerating native forest and the freshwater systems. The adverse effects of the Structure Plan on these natural features can be appropriately and effectively managed through existing planning provisions and policy framework within the AUP. Additionally, the Structure Plan provides opportunities to protect and significantly enhance the terrestrial and freshwater values of the site. Appropriate stormwater management, pest-control, maintenance programmes and biodiversity enhancement are expected to be implemented during development of the site.

Bioresearches supports the proposed Wellsford North Structure Plan, given that the existing ecological values will be appropriately protected, enhanced, or managed.

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## 7. APPENDICES

### Appendix I. Raw Macroinvertebrate Data

PHYLUM	CLASS: Order	Family	Taxa	Taxa MCI hb	Taxa MCI sb	Site S-D	
ANNELIDA	OLIGOCHAETA		Oligochaeta	1	3.8	8	
	HIRUDINEA		<i>Glossiphonia</i> sp.	3	1.2	3	
PLATYHELMINTHES			Platyhelminthes	3	0.9	1	
MOLLUSCA	GASTROPODA	Hydrobiidae	<i>Potamopyrgus antipodarum</i>	4	2.1	2	
		Physidae	<i>Physella fontinalis</i>	3	0.1		
ARTHROPODA	BIVALVIA	Sphaeriidae	<i>Pisidium hodgkini</i>	3	2.9		
	ARACHNIDA: Acari (mites)		Acari	5	5.2	1	
	ARACHNIDA: Araneae		<i>Dolomedes</i> sp.	5	6.2	1	
	CRUSTACEA: Copepoda		Copepoda	5	2.4	1	
	Ostracoda		Ostracoda		3	1.9	14
				<i>Paraleptamphopus subterraneus</i>	5	5.5	
	INSECTA: Odonata	Zygoptera	<i>Xanthocnemis zealandica</i>	5	1.2	59	
			<i>Austrolestes colensonis</i>	6	0.7	2	
	Trichoptera	Hydroptilidae	<i>Oxyethira albiceps</i>	2	1.2	3	
		Hydrobiosidae	<i>Costachorema</i> sp.	7	7.2	1	
		Polycentropodidae	<i>Polypectropus puerilis</i>	8	8.1	20	
	Coleoptera	Hydrophilidae	<i>Enochrus tritus</i>	5	2.6	31	
	Diptera	Tipulidae	<i>Zelandotipula</i> sp.	6	3.6	2	
Hexatomini		<i>Paralimnophila skusei</i>	6	7.4	2		
Simuliidae		<i>Austrosimulium australense</i> gp	3	3.9	1		
Chironomidae		<i>Chironomus</i>	1	3.4	16		
		Orthcladiinae	2	3.2	11		
		Tanypodinae	5	6.5	1		
Muscidae		Muscidae	3	1.6			
Culicidae	<i>Culex</i> sp.	3	1.2	1			
Dixidae	<i>Paradixa</i> sp.	4	8.5	3			
Collembola	Collembola	Collembola	6	5.3	4		
<b>TOTALS:</b>			<b>NO. TAXA</b>			23	
			<b>NO. EPT TAXA</b>			3	
			<b>NO. INDIVIDUALS</b>			188	

**Appendix II. SEV Function Summary Table**

Ecological Function	Variable	SEV Values
<b>Hydraulic</b>		
Natural Flow Regime	Vchann	0.37
	Vlining	0.72
	Vpipe	1.00
	=	<b>0.49</b>
Floodplain Effectiveness	Vbank	0.58
	Vrough	0.22
	=	<b>0.13</b>
Connectivity for Natural Species Migration	Vbarr	0.00
	=	<b>0.00</b>
Natural Connectivity to Groundwater	Vchanshape	0.90
	Vlining	0.72
	=	<b>0.78</b>
Hydraulic function mean score		<b>0.35</b>
<b>Biogeochemical</b>		
Water Temperature Control	Vshade	0.28
	=	<b>0.28</b>
Dissolved Oxygen Levels	Vdod	0.40
	=	<b>0.40</b>
Organic Matter Input	Vripar	0.05
	Vdecid	1.00
	=	<b>0.05</b>
In-Stream Particle Retention	Vmacro	0.26
	Vretain	0.20
	=	<b>0.20</b>
Decontamination of Pollutants	Vsurf	0.59
	Vripfilt	0.34
	=	<b>0.47</b>
Biogeochemical function mean score		<b>0.28</b>
<b>Habitat Provision</b>		
Fish Spawning Habitat	Vgalspwn	1.00
	Vgalqual	0.00
	Vgobspwn	0.10
	=	<b>0.05</b>
Habitat for Aquatic Fauna	Vphyshab	0.32
	Vwatqual	0.10
	Vimperv	0.70
	=	<b>0.36</b>
Habitat provision function mean score		<b>0.20</b>
<b>Biodiversity</b>		
Fish Fauna Intactness	Vfish	0.00
	=	<b>0.00</b>
Invertebrate Fauna Intactness	Vmci	0.46
	Vept	0.50
	Vinvert	0.47
	=	<b>0.47</b>
Riparian Vegetation Intactness	Vripcond	0.16
	Vripconn	0.40
	=	<b>0.06</b>
Biodiversity function mean score		<b>0.18</b>
Overall mean SEV score		<b>0.267</b>



# **ATTACHMENT 13**

## **APPENDIX 10 ENGINEERING ASSESSMENT REPORT**





**338 RODNEY STREET,**  
**WELLSFORD**

**PROPOSED PLAN CHANGE**  
**ENGINEERING ASSESSMENT**

Prepared for Wellsford Welding Club

May 2023

Ref L23343



**Hutchinson**  
CONSULTING ENGINEERS

# Wellsford Welding Club

## Engineering Assessment

At  
338 Rodney Street  
Wellsford

Prepared by Matthew Hughes  
**ENGINEER**

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Approved by Ian Hutchinson  
**MANAGING DIRECTOR**

**Date** 29 May 2023  
**Status** Version 1



**Contents**

1.0 Introduction ..... 1  
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3.0 Proposal ..... 4  
4.0 Stormwater ..... 4  
5.0 Wastewater ..... 5  
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**Appendix**

- Appendix A: Proposed Plan Change Area
- Appendix B: Engineering Plans
- Appendix C: Watercare Correspondence
- Appendix D: Chorus Correspondence
- Appendix E: Vector Correspondence

## **1.0 Introduction**

Hutchinson Consulting Engineers have been engaged by Wellsford Welding Club Limited to complete an engineering assessment for a proposed structure plan and plan change in Wellsford. The proposed plan change assessment encompasses an area of around 56 Ha of currently future urban zoned land and includes the following property titles:

- 338 Rodney Street
- PT 117, State Highway One
- PT Lot 4, Monowai Street
- PT Lot 2, Monowai Street
- PT Sec 25, Monowai Street
- 26 Batten Street
- 11 Wi Apo Place

This engineering assessment provides civil engineering input for the infrastructure capacity, availability and requirements to service the proposed plan change development. This report has been based on providing 650 - 800 dwellings and a small neighbourhood centre as advised by Barker and Associates Limited.

The future urban zoned land located to the north of the subject development will also be included within the proposed plan change application. This land has not been included within the engineering assessment as the properties are not owned by the client. However, the engineering requirements are likely to be similar to the requirements detailed within the engineering assessment below. This additional land encompasses an area of around 15 Ha and includes the following property titles:

- 358 – 364 Rodney Street
- 374 Rodney Street
- 56 Boshier Road
- 10 State Highway 1

We have provided comment on the following engineering items that need to be addressed to assist with future resource consent applications for the proposed plan change:

- Stormwater management requirements
- Wastewater
- Water supply
- Power
- Telecommunications
- Earthworks
- Erosion and sediment control

This report should be read in conjunction with the appendices of this report and the drawings prepared by this office and attached to Appendix B.

## 2.0 Site Description

The properties which make up the plan change subject to this assessment are outlined within Table 1. Refer to Appendix A for the overall proposed plan change area.

Address	Site Area (Ha)
338 Rodney Street	24.75
PT 117, SO 22925, State Highway One	11.87
PT Lot 4, DP 9919	6.72
PT Lot 2, DP 26722	5.75
PT Sec 25, DP 9682 Monowai Street	2.09
26 Batten Street	0.92
11 Wi Apo Place	3.40
<b>Total</b>	<b>55.5</b>

Table 1: Property Details

The proposed development covers an area of around 56 Ha (as depicted in Table 1) and is located on the eastern side of the Rodney Street (State Highway One) carriageway and bound by a railway track along the southern boundaries, refer to Figure 1 for development extent. Existing dwellings are contained within 338 Rodney Street, 26 Batten Street and 11 Wi Apo Place. Existing metalled access tracks reticulate the properties and are utilised for farming activities.

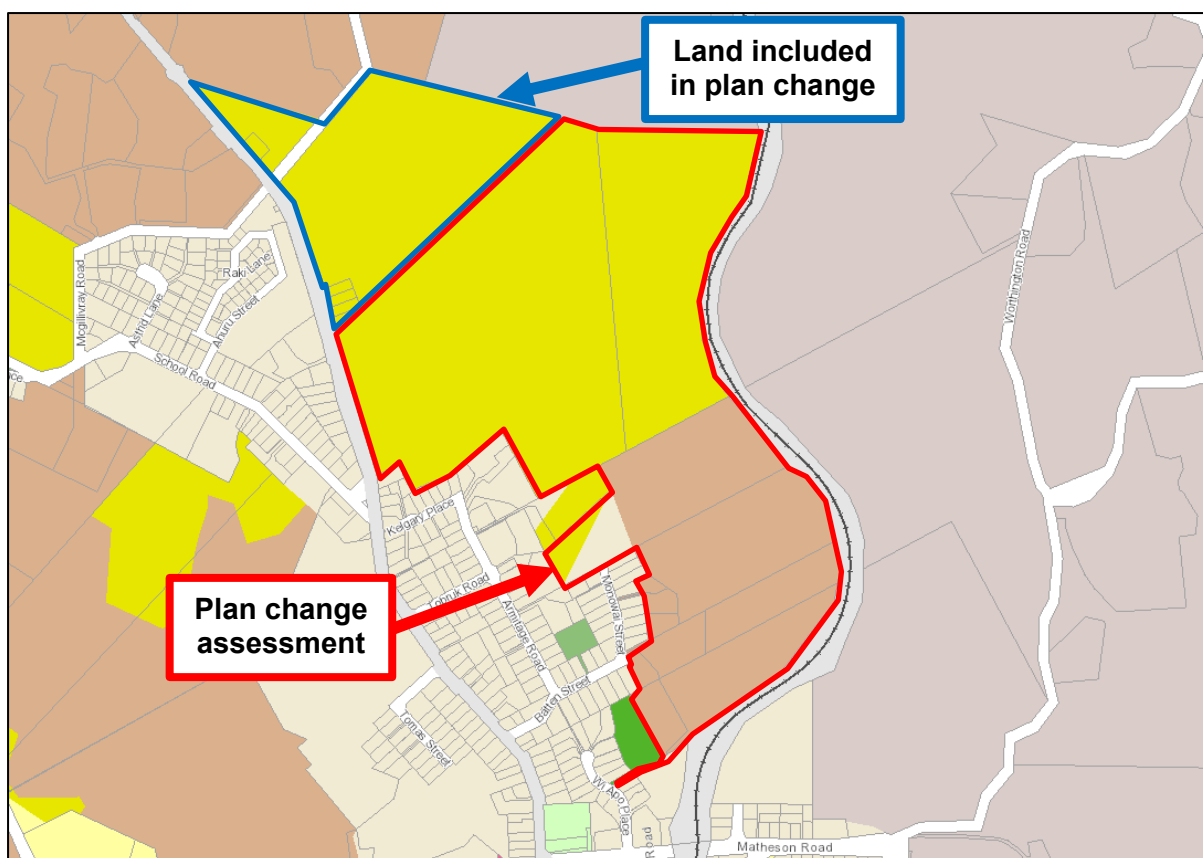


Figure 1: Auckland Unitary Plan Viewer - Site Layout

The properties comprise of undulating pastoral land of moderate to steep slopes that fall towards existing gullies that extend through the properties. The gullies typically flow in a south east to north west direction into the downstream receiving environment, refer to Figure 3 for Auckland Council GeoMap aerial view of development.

The Auckland Council GeoMaps System indicates two predominant watercourses that convey through the properties existing gullies and have been referred to as Watercourse A and Watercourse B, refer to Figure 2 and plan referenced FP-01 depicting the watercourses through the properties.

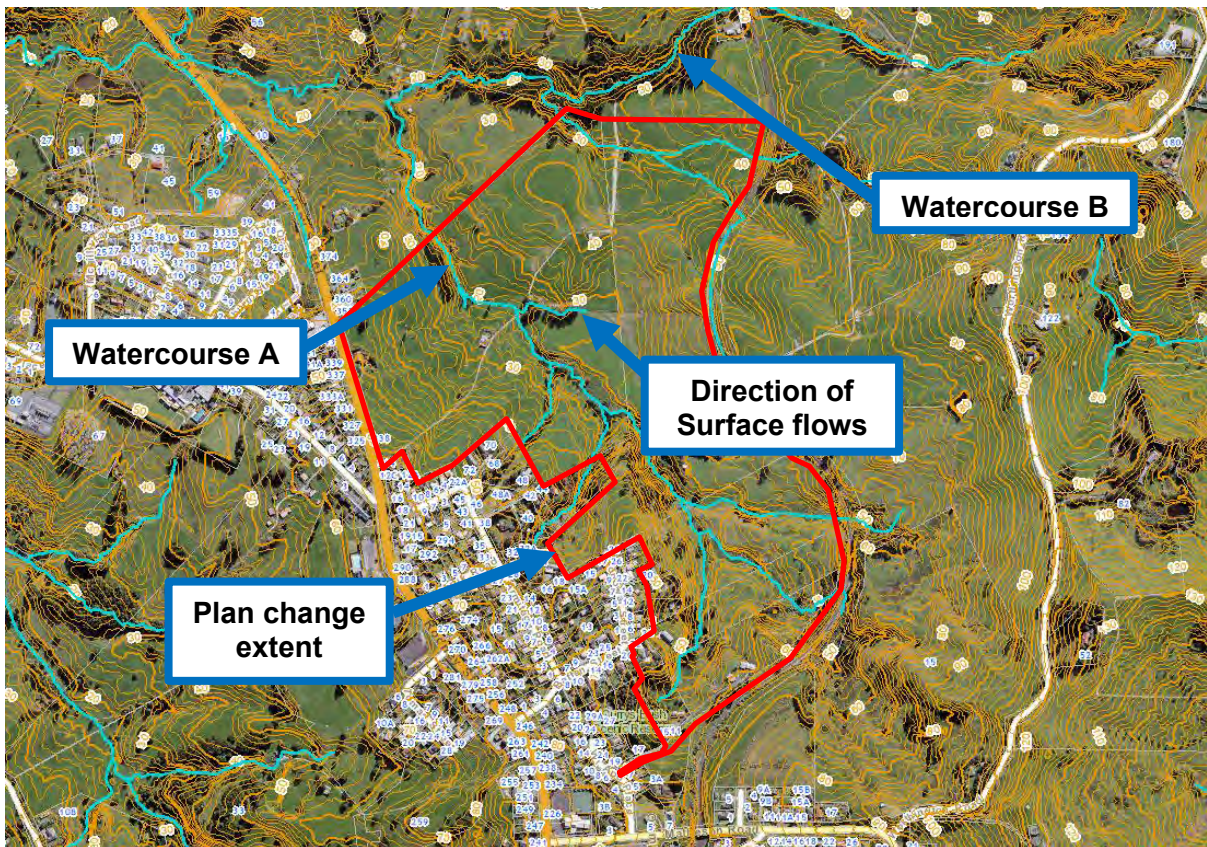


Figure 2: Auckland Council GeoMap Aerial View Depicting Existing Streams

Watercourse A contains numerous tributaries that traverse through 338 Rodney Street, PT Lot 4 Monowai Street, PT Lot 2 Monowai Street, PT Sec 25 Monowai Street, 26 Batten Street and 11 Wai Apo Place. Watercourse B extends through PT 117 State Highway One and 338 Rodney Street and contains one tributary. Both watercourses are part of the same stormwater catchment, forming just upstream of the plan change extent.

The properties have several access points that are located on Rodney Street, Armitage Road, Batten Street, Wai Apo Place and Monowai Street. The existing sites comprise of pasture with bush covered areas surrounding the gullies.



### 3.0 Proposal

The properties encompass an area of around 56 Ha and are currently zoned as future urban in accordance with the Auckland Unitary Plan. It is proposed to investigate the infrastructure serviceability of providing a residential subdivision at the subject sites and determine if there are any potential civil engineering design issues that could affect the development.

This engineering assessment has been based on providing 650 - 800 residential dwellings and one small neighbourhood centre as advised by Barkers and Associates.

We have been in contact with the following organisations to provide comment about capacity, serviceability and design requirements of the plan change proposal:

- Chorus
- Vector
- Watercare

This report outlines the civil engineering aspects for the residential subdivision that would need to be addressed at resource consent stage. We have reviewed the relevant standards and guidelines to assist us with this engineering assessment.

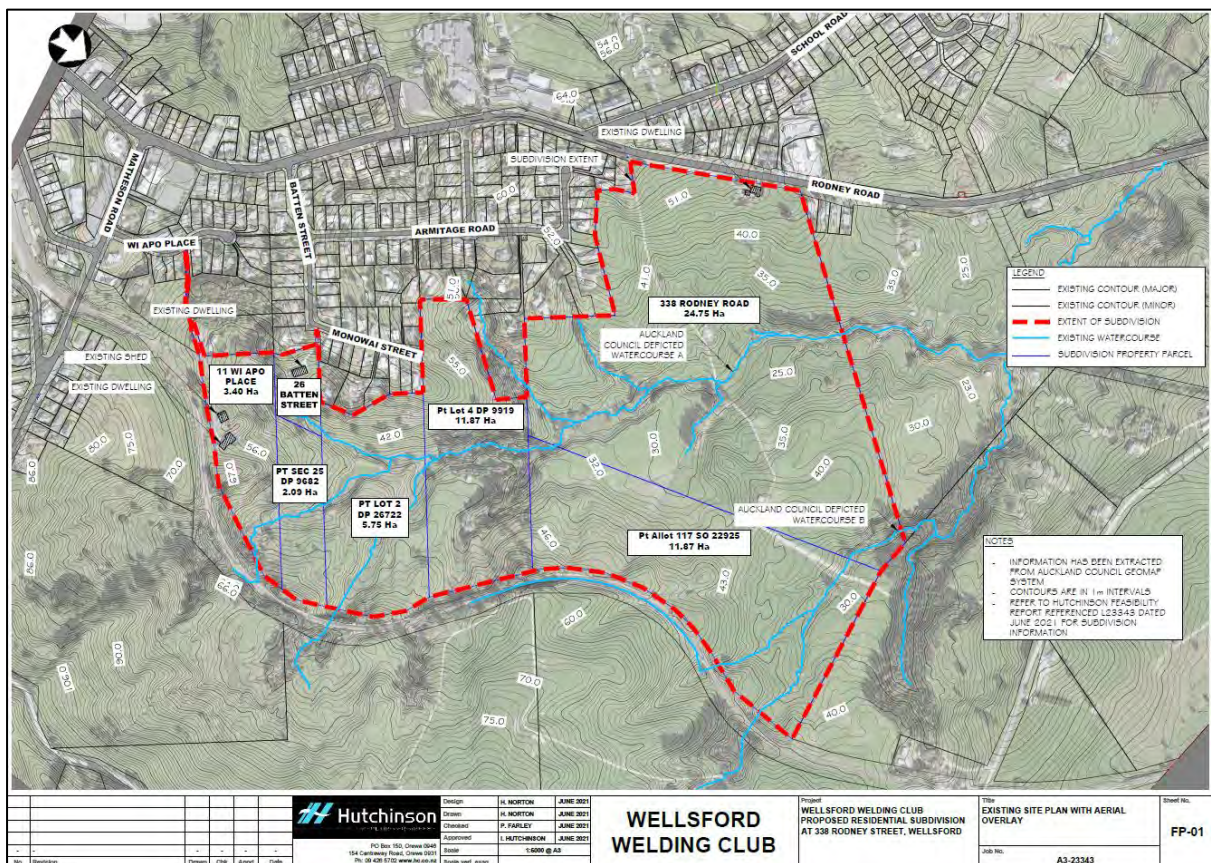


Figure 3: Existing Site Plan

### 4.0 Stormwater

The site stormwater requirements will be addressed by Woods Civil Engineers.



## 5.0 Wastewater

The Auckland Council GeoMap System indicates an existing public wastewater network bisecting through the south western corner of 338 Rodney Street, refer to Figure 4 for locality details.



Figure 4: Auckland Council GeoMap Depicting Existing Wastewater Network

The ideal connection point for any future residential subdivision into the public wastewater network would be at 338 Rodney Street as it is readily available. As part of future subdivision civil works, the existing wastewater pipe that bisects through the south western corner of 338 Rodney Street should be redirected, so it does not traverse through a future residential site.

The internal wastewater network will be reticulated through the subdivision road reserve in preparation for the connection into the public network. The subdivisions internal wastewater network will most likely be a mixture of a low pressurised system and gravity fed networks.

A preliminary wastewater layout plan will be completed at resource consent stage to assist with the application at which time the development wastewater flows will be confirmed.

Watercare has been approached by this office to discuss the existing capacity within the public wastewater network as there are known capacity issues within Wellsford. It has been confirmed by Watercare that the current wastewater network does not provide sufficient capacity for the entire proposed development.

A new Wellsford wastewater treatment plant upgrade which construction timeframe is still to be confirmed should provide enough capacity to cater for the proposed plan change development. However, we are awaiting Watercares confirmation of this following internal meetings, refer to the Watercare correspondence attached to Appendix C of this report.

## 5.1 Stage 1

The first stage of the development will comprise of subdividing 338 Rodney Street and Lot 4 Monowai Street to form a total of 84 residential lots (to be known as 'Stage 1'). Lot 4 Monowai Street is to be subdivided into 19 residential sized lots and is to be located within the southwestern portion of the property title, at the end of Monowai Street, refer to the scheme plan prepared by Buckton Consulting Surveyors.

Watercare have confirmed that there is sufficient capacity within the existing wastewater network to service the 19-lot residential subdivision proposed under Stage 1.

## 6.0 Water Supply

The Auckland Council GeoMaps System indicates existing public water supply available within the road reserves of Rodney Street, Kelgary Place, Armitage Place, Batten Street and Monowai Street, refer to Figure 5.

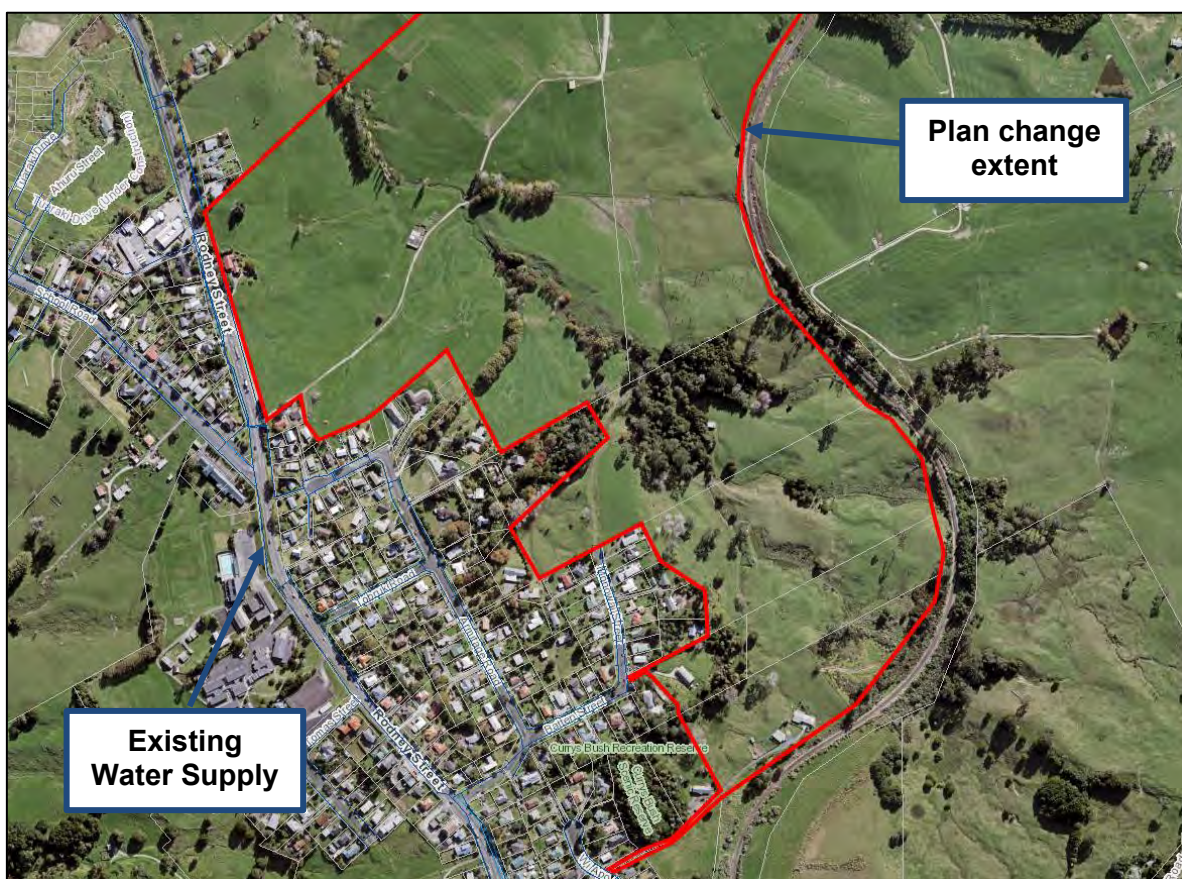


Figure 5: Auckland Council GeoMap of Existing Water Supply Layout

There are several connection points into the public network that is readily available for the proposed plan change development.

Watercare has been approached by this office and Barker & Associates to discuss the capacity within the public water supply network. It has been confirmed by Watercare that water supply network can cater for the proposed subdivisional development.

The water supply pipework is to be installed within the subdivisions combined services trench that will be shared with the pressurised wastewater, power, and telecommunications. Water supply connections will be supplied to each residential lot where a single water meter will be installed at the connection end.



For residential lots serviced from a right of way, Watercare does not allow a public water supply network in private land. As a result, meter banks would need to be installed within the road reserve and individual private connections extended from the meter bank to each residential lot. The meter banks can service a maximum of 6 residential properties at a time. The individual meter valves would be installed directly in the meter bank at the time of building consent for the individual lot, refer to for Watercares meter bank construction detail Figure 6.

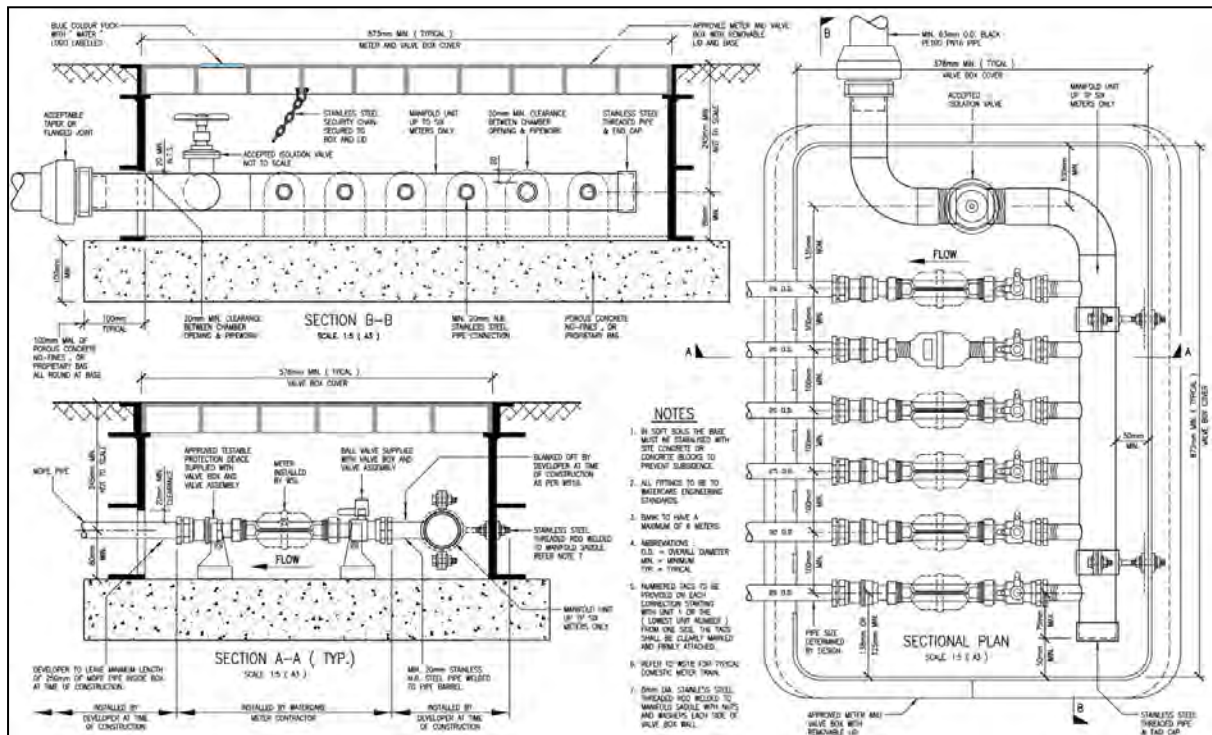


Figure 6: Watercare Meter Bank Detail

The civil contractor that is nominated for the subdivision construction works will install the proposed water supply network and meter bank manifolds but are unable to complete the live connection into Watercares water supply network. The live connection into the public water supply network is completed by Watercare’s nominated contractor.

A preliminary water supply design is to be completed at resource consent stage for review by Auckland Council and Watercare.

### 6.1 Firefighting Provisions

The plan change development will need to provide firefighting provisions in accordance with SNZ PAS 4509:2008 (NZ Fire Service Fighting Water Supplies Code of Practice).

The development water supply classification for firefighting is FW2 and the requirements are outlined in Table 2 below:

Fire Classification	Water Flow Required Within A Distance of 135m	Water Flow Within A Distance of 270m	Maximum Number Of Fire Hydrants To Provide Flow
FW2	750 L/min (12.5 L/s)	750 L/min (12.5 L/s)	2

Table 2: FW2 Requirements to Determine Firefighting Water Supply



Hydrant(s) will need to be constructed within the development's road reserve to meet the FW2 requirements. The location of the proposed hydrants is to be confirmed at resource consent stage once a scheme plan has been prepared.

## **7.0 Telecommunications**

This office has been in discussion with Chorus to confirm if their telecommunications network has sufficient capacity to service the potential residential subdivision development. The telecommunications network will provide both a phone and broadband connection for the development.

We have received email correspondence from Chorus that confirms there is sufficient capacity within their network to service the proposed plan change area. The cost to provide the Chorus network to the subdivision would be a minimum of the standard fee of \$1,200.00 per lot. Based on 650 lots and 1 neighbourhood centre, this amounts to around \$780,000.00. To confirm these costs, a finalised scheme plan can be provided to Chorus once the subdivision is ready to proceed.

Refer to Appendix D for Chorus correspondence.

The chorus ducting is to be installed within the subdivisions combined services trench that will be shared with the pressurised wastewater, power, and water supply. The proposed combined services trench alignment will be excavated both sides of the developments carriageway to allow individual connections to be provided to each residential lot.

Fibre broadband is not available yet for the Wellsford area. However, the chorus website indicates that fibre should be available to the Wellsford area by 2022.

## **8.0 Power**

This office has been in discussions with Vector to confirm if their network has sufficient capacity to service the potential residential subdivision.

Vector have responded to say that there is enough capacity to service the development without significant upgrades to their network. However, the current capacity may not be available for the future if another customer formally requests it. To secure the capacity a HV Network connection would need to be applied for.

The indicative costs for Vector to provide power for the subdivision would be confirmed once the capacity has been applied for and the scheme plan is finalised.

The nominated contractor for the subdivision's construction works will install the ducting for the power on behalf of Vector. The ducting will be installed within the combined services trench that will be shared with the pressurised wastewater, power, and water supply. The proposed combined services trench alignment will be excavated both sides of the developments carriageway to allow individual connections to be provided to each subdivisional lot.

The cabling will be carried out by a Vector that will live the connection at the boundary. At the time of dwelling construction, the lot owners registered electrician can make the connection into the Vector supply located at each residential front boundary.

Refer to Appendix E for Vector correspondence.

## 9.0 Earthworks

An earthworks operation will be required to form the subdivisional development to subgrade levels and minimise the earthworks where possible.

The earthworks will ideally comprise of a cut to fill operation and include the following construction methodology:

- Installation of erosion and sediment control devices
- Excavation and stockpiling topsoil
- Excavation of cut material
- Placement of cut material to raise low lying areas
- Stabilising and forming subdivision roads
- Top soiling landscape areas

A combination of retaining walls and engineered batters is likely required to form near level building platforms and maximise building development potential or alternatively through integrated building design. An earthworks model should be completed at resource consent stage to design finished levels and calculate earthworks areas and volumes to assist with the subdivisions resource consent.

## 10.0 Erosion and Sediment Control

Erosion and sediment control devices will be designed and constructed to treat sediment laden water generated from the earthworks operation in accordance with *Auckland Councils Guideline Document 2016/05 - Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05)*.

The exposed earthworks areas would need to be divided into sub-stage catchments so that the earthworks treatment areas do not exceed 5 Ha. The sub staged earthwork catchments can be operated simultaneously.

Proposed sediment retention ponds will be installed within each sub-stage catchment to treat sediment laden water for a maximum earthworks catchment area of 5 Ha. Chemical treatment will be utilised to increase the treatment performance of the sediment retention ponds.

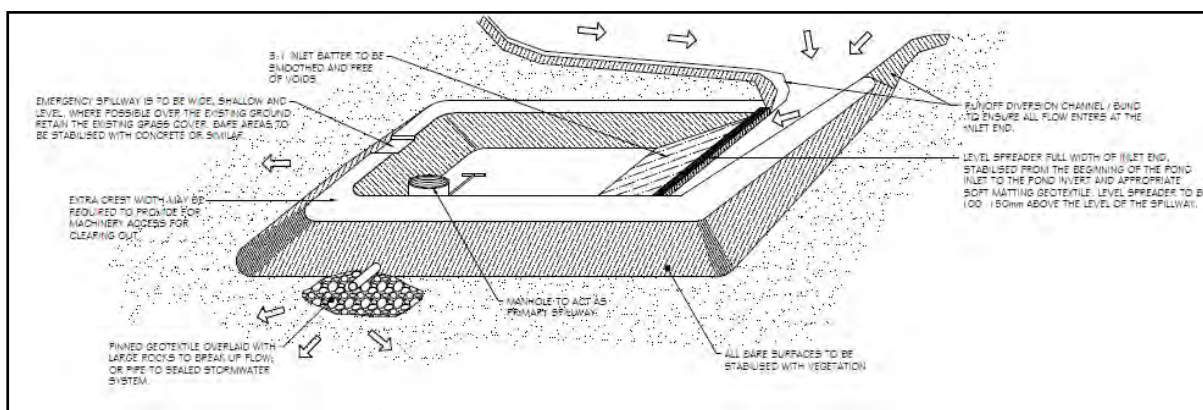


Figure 7: Typical Sediment Retention Pond Detail

A combination of diversion bunds and contour drains will be installed along the boundaries of each sub staged catchment to contain and convey the dirty flows downstream to a sediment retention pond for treatment purposes.

Clean water diversion bunds will be installed along the upper end of the sub staged catchments to divert clean water flows away from the earthworks areas to avoid sediment contamination within the downstream environment.



*Figure 8: Photograph of Clean Water Diversion Bund*

An erosion and sediment control design will be completed at resource consent stage to assist with the subdivision consent. Following approval of the resource consent, the sediment and erosion control plans will be finalised with input from the Contractor and sent to Auckland Council's Resource Consent Monitoring Team for approval, prior to establishment onsite.

### **11.0 Roding**

The proposed plan change requires internal public roads to be provided within the development to enable vehicular access to each residential lot.

The public roads would be situated within a road reserve which would also contain the public infrastructure services (i.e stormwater, power etc.), pedestrian footpaths and vehicle crossings to each residential lot. The road reserve widths are typically 20m and contain two 3.5m lanes with 1.8m footpaths on each side of the road.

There are existing public road linkages available at Batten Street, Monowai Street and Armitage Road which can be extended into the subdivision, refer to plan FP-02 for locality details. Further input from a Traffic engineer would be required to provide comment on the roading network.

The public roads and vehicle crossings are to be designed in accordance with the Auckland Transport Code of Practice (ATCOP).

## **12.0 Summary**

Hutchinson Consulting Engineers have been engaged by Wellsford Welding Club Limited to complete an engineering assessment for a proposed plan change comprising a potential 650 – 800 lot residential subdivision development in Wellsford.

The proposed plan change is considered feasible from a civil engineering perspective but will require further civil engineering design input at resource consent stage to provide a suitable compliant solution. Further input from geotechnical, traffic, ecology and other specialists will be required.

A summary of the engineering assessment is outlined below:


- The site stormwater requirements will be addressed by Woods Civil Engineers.
- The existing wastewater network in Wellsford is currently under capacity and cannot cater for the entire plan change area however discussions are underway with Watercare who have confirmed that a new wastewater treatment plant is going to be constructed in Wellsford that should provide additional capacity to cater for the future subdivision. Watercare are still discussing this aspect internally and awaiting confirmation.
- Water have confirmed that the existing water supply network can cater for the proposed plan change area.
- Firefighting provisions will need to be provided for the mixed residential development in accordance with SNZ PAS 4509:2008 (NZ Fire Service Fighting Water Supplies Code of Practice).
- Vector have confirmed that there is currently capacity within their network to reticulate the future subdivisional development, but an application would need to be made to secure the capacity for the subdivision.
- Chorus have confirmed that there is capacity within their network to reticulate the future subdivisional development with telecommunications.
- Earthworks and appropriate erosion and sediment control will be required to form the future subdivisional development to proposed design levels. An earthworks model is to be completed at resource consent stage.

Should you wish to discuss any aspects of the above information, please contact this office.


We trust this meets with your approval.

Yours faithfully,

**HUTCHINSON CONSULTING ENGINEERS LTD**

Prepared by   
Matthew Hughes  
**ENGINEER**

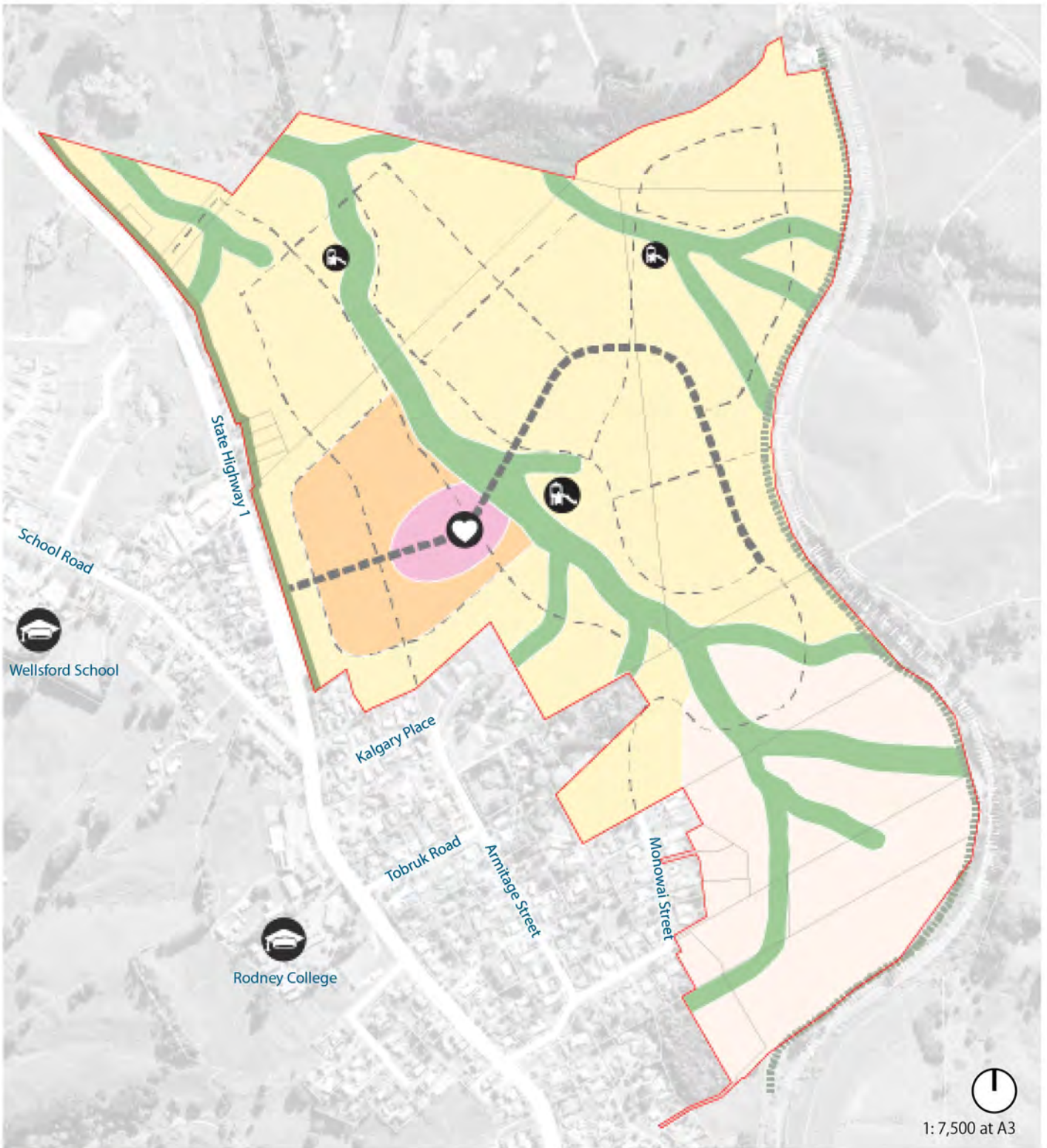
Reviewed by   
Paige Farley  
**CIVIL MANAGER**

Approved by   
Ian Hutchinson  
**MANAGING DIRECTOR**



# **Appendix A**

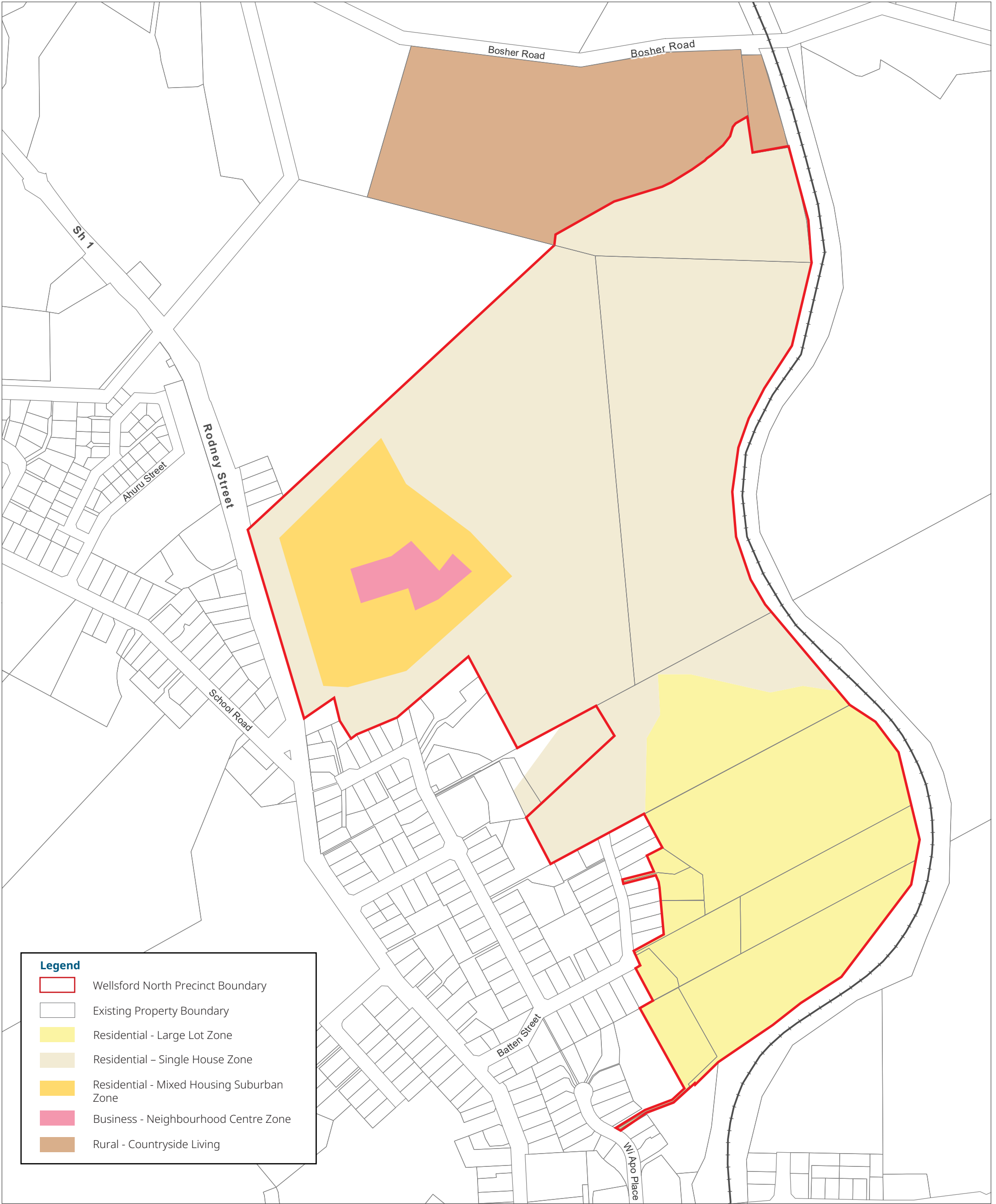
Proposed Plan Change Area



Structure Plan

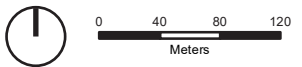
Legend

- Structure plan extent
- Property Boundary
- Indicative Lifestyle Living
- Indicative Lower Density Residential
- Indicative Medium Density Residential
- Indicative Village Centre
- Ecological Areas / Open Spaces
- Main Collector Road
- Local Streets
- Greenway Cycleway
- 10m Landscape Buffer
- P Indicative Playground
- ♥ Indicative Village Centre Public Space
- 🎓 Existing Schools



**Legend**

- Wellsford North Precinct Boundary
- Existing Property Boundary
- Residential - Large Lot Zone
- Residential - Single House Zone
- Residential - Mixed Housing Suburban Zone
- Business - Neighbourhood Centre Zone
- Rural - Countryside Living

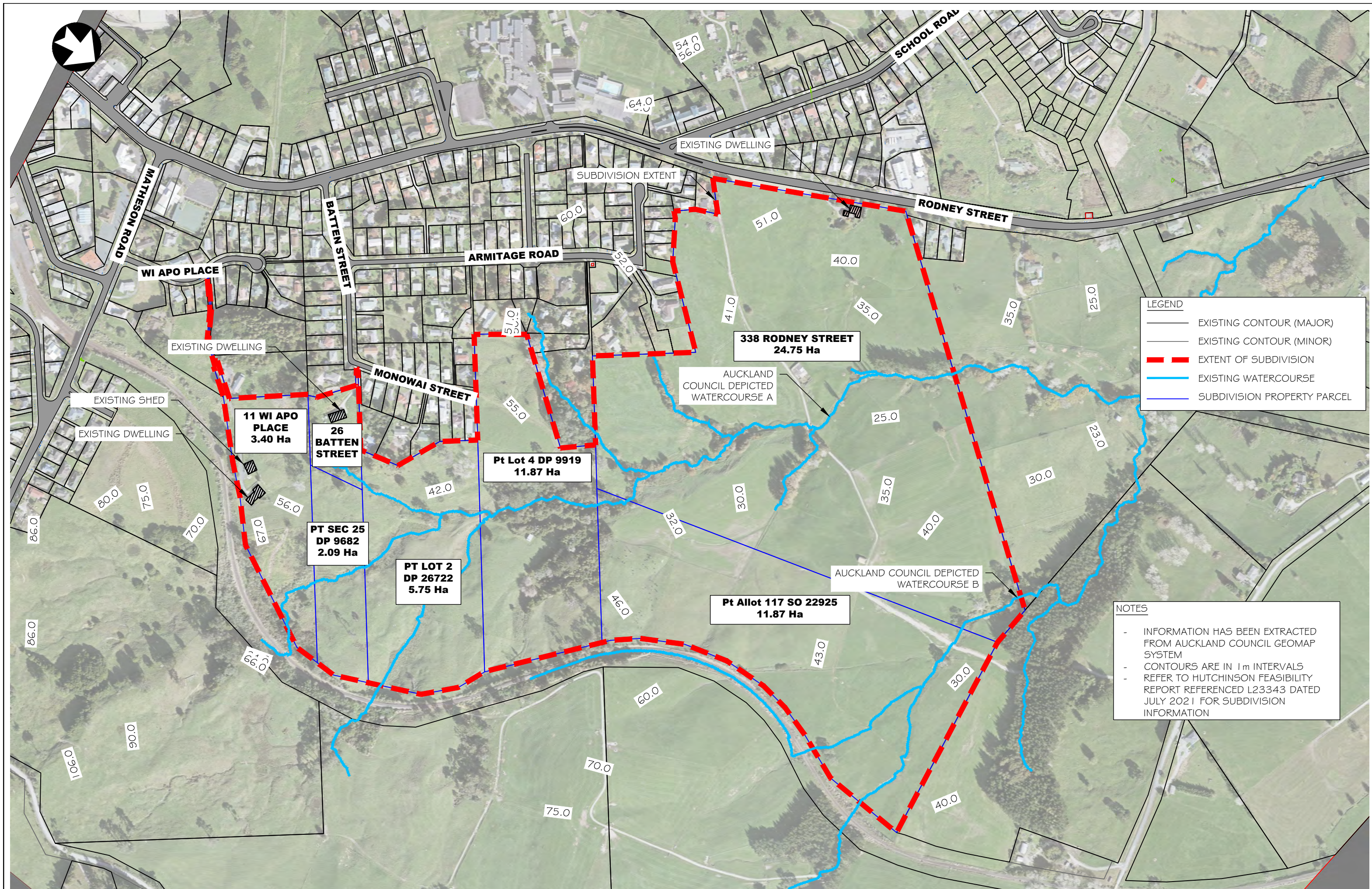


**Scale @ A3**  
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## **Appendix B**

Engineering Plans





**LEGEND**

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXTENT OF SUBDIVISION
- EXISTING WATERCOURSE
- SUBDIVISION PROPERTY PARCEL

**NOTES**

- INFORMATION HAS BEEN EXTRACTED FROM AUCKLAND COUNCIL GEOMAP SYSTEM
- CONTOURS ARE IN 1m INTERVALS
- REFER TO HUTCHINSON FEASIBILITY REPORT REFERENCED L23343 DATED JULY 2021 FOR SUBDIVISION INFORMATION

No.	Revision	Drawn	Chk.	Appd.	Date

PO Box 150, Orewa 0946  
154 Centreway Road, Orewa 0931  
Ph: 09 426 5702 [www.hc.co.nz](http://www.hc.co.nz)

Design	H. NORTON	JUNE 2021
Drawn	H. NORTON	JUNE 2021
Checked	P. FARLEY	JUNE 2021
Approved	I. HUTCHINSON	JUNE 2021
Scale	1:5000 @ A3	
Scale vert. exag.		

# WELLSFORD WELDING CLUB

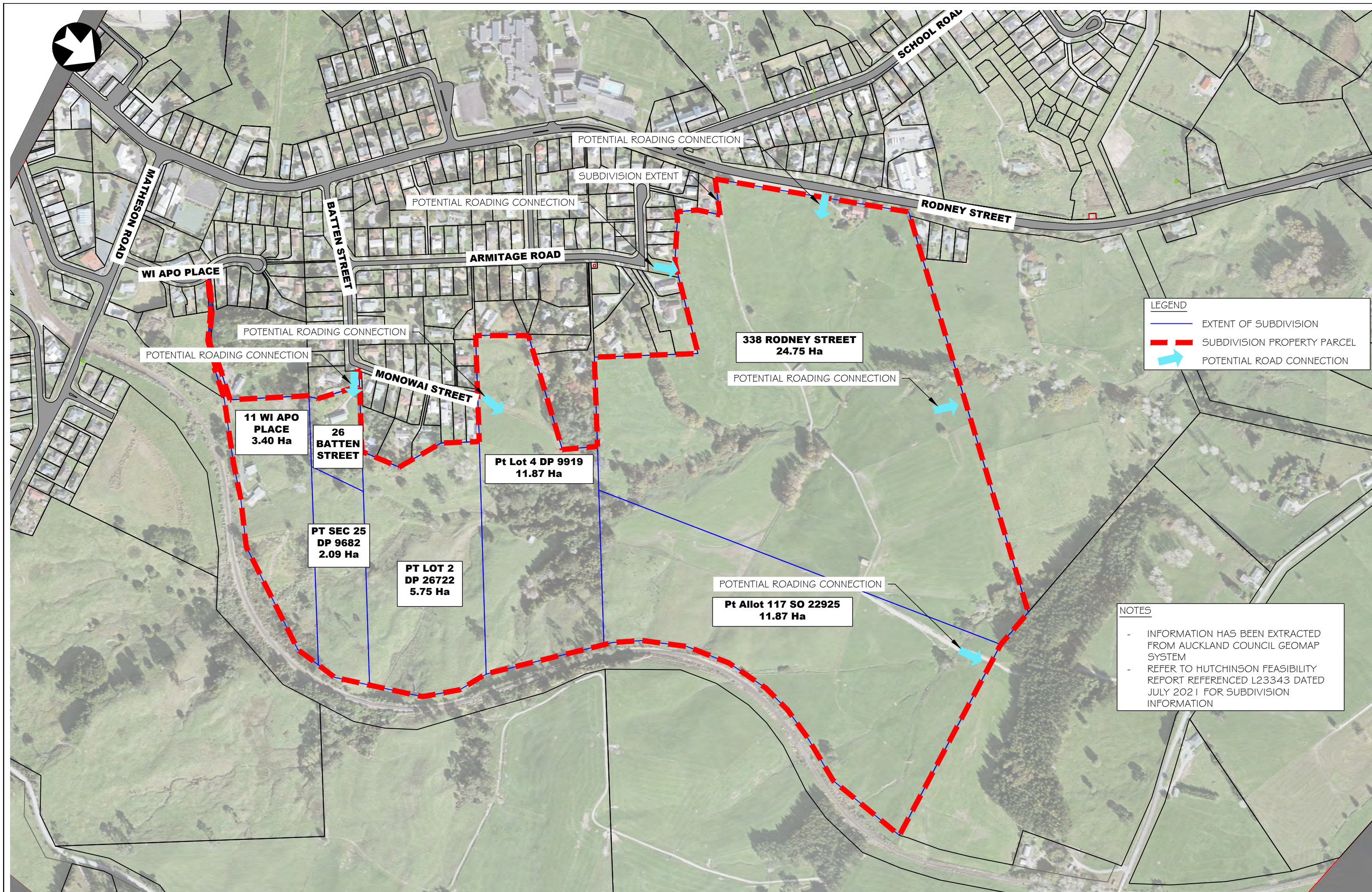
Project  
**WELLSFORD WELDING CLUB  
PROPOSED RESIDENTIAL SUBDIVISION  
AT 338 RODNEY STREET, WELLSFORD**

Title  
**EXISTING SITE PLAN WITH AERIAL  
OVERLAY**

Job No.  
**A3-23343**

Sheet No.  
**FP-01**





**LEGEND**

- EXTENT OF SUBDIVISION
- - - SUBDIVISION PROPERTY PARCEL
- ➔ POTENTIAL ROAD CONNECTION

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Checked	P. FARLEY	JUNE 2021
Approved	I. HUTCHINSON	JUNE 2021
Scale	1:5000 @ A3	
Scale vert. exag.		

**WELLSFORD WELDING CLUB**

Project  
**WELLSFORD WELDING CLUB  
PROPOSED RESIDENTIAL SUBDIVISION  
AT 338 RODNEY STREET, WELLSFORD**

Title  
**POTENTIAL ROADING CONNECTION  
PLAN**

Job No.  
**A3-23343**

Sheet No.  
**FP-02**



## **Appendix C**

Watercare Correspondence

## Harley Norton

---

**From:** IGotelli (Ilze) <ilze.gotelli@water.co.nz>  
**Sent:** Friday, 14 May 2021 8:24 am  
**To:** Harley Norton  
**Cc:** Paige Farley  
**Subject:** RE: 338 Rodney Street, Wellsford

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Harley

The decision on a way forward on the Wellford WWTP is with our executives and new Chief Executive. I believe a meeting is schedule something in the next couple of weeks.

Regards  
Ilze

**Ilze Gotelli** | Head of Major Developments

**Watercare Services Limited**  
DDI: +64 9 539 7806  
Mobile: +64 21 831 470  
Customer service line: +64 9 442 2222  
Postal address: Private Bag 92 521, Wellesley Street, Auckland 1141, New Zealand  
Physical address: 73 Remuera Road, Remuera, Auckland 1050, New Zealand  
Website: [www.watercare.co.nz](http://www.watercare.co.nz)



---

**From:** Harley Norton <Harley@hc.co.nz>  
**Sent:** Friday, 14 May 2021 8:22 am  
**To:** IGotelli (Ilze) <ilze.gotelli@water.co.nz>  
**Cc:** Paige Farley <Paige@hc.co.nz>  
**Subject:** RE: 338 Rodney Street, Wellsford

**CAUTION: External Email!**

Hi Ilze,

Thanks for your response.

Have you had any further discussions with your planning team since your response below? Thanks.

Regards,

**Harley Norton | Engineer** | [www.hc.co.nz](http://www.hc.co.nz)  
Bus 09 426 5702 | Mob 021 191 7092





---

**From:** IGotelli (Ilze) <[ilze.gotelli@water.co.nz](mailto:ilze.gotelli@water.co.nz)>  
**Sent:** Wednesday, 28 April 2021 7:31 pm  
**To:** Harley Norton <[Harley@hc.co.nz](mailto:Harley@hc.co.nz)>  
**Cc:** Paige Farley <[Paige@hc.co.nz](mailto:Paige@hc.co.nz)>  
**Subject:** RE: 338 Rodney Street, Wellsford

Hi Harley

I see this is FUZ land. I am catching up with the planning team on Wellsford and this links to one of my questions. I don't have a time in the calendar yet with them but I will come back to you after I meet with them.

Just to be clear, there is no capacity to cater for the FUZ land now. There is a WWTP planned and I need more information about the capacity that is planned.

Regards  
Ilze

**Ilze Gotelli** | Head of Major Developments

**Watercare Services Limited**  
**DDI:** +64 9 539 7806  
**Mobile:** +64 21 831 470  
**Customer service line:** +64 9 442 2222  
**Postal address:** Private Bag 92 521, Wellesley Street, Auckland 1141, New Zealand  
**Physical address:** 73 Remuera Road, Remuera, Auckland 1050, New Zealand  
**Website:** [www.watercare.co.nz](http://www.watercare.co.nz)



---

**From:** Harley Norton <[Harley@hc.co.nz](mailto:Harley@hc.co.nz)>  
**Sent:** Wednesday, 28 April 2021 12:57 pm  
**To:** IGotelli (Ilze) <[ilze.gotelli@water.co.nz](mailto:ilze.gotelli@water.co.nz)>  
**Cc:** Paige Farley <[Paige@hc.co.nz](mailto:Paige@hc.co.nz)>  
**Subject:** 338 Rodney Street, Wellsford

**CAUTION: External Email!**

Hi Ilize,

We are carrying out a feasibility assessment for a 600-lot residential subdivision that will also include a small neighbourhood centre in Wellsford.

The subdivision is located across several property titles, refer to attached plan which depicts the subdivision extent.

Are you able to confirm if there will be capacity within the Water Supply and Wastewater networks (now or in the future) to service this residential subdivision? Thanks

Regards,

**Harley Norton | Engineer** | [www.hc.co.nz](http://www.hc.co.nz)  
Bus 09 426 5702 | Mob 021 191 7092



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## **Appendix D**

Chorus Correspondence

## Harley Norton

---

**From:** Chorus Property Developments <develop@chorus.co.nz>  
**Sent:** Thursday, 27 May 2021 8:46 am  
**To:** Harley Norton  
**Subject:** Chorus Simple Estimate | WFD64759 | WFD: 338 Rodney Street, Wellsford, Auckland. 600 Lots. High Level Estimate

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hello Harley,

Thank you for providing an indication of your development plans in this area. I can confirm that we have infrastructure in the general land area that you are proposing to develop. Chorus will be able to extend our network to provide connection availability. However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The cost involved would be a minimum of our current standard fee of \$1200 per lot excluding GST. This cost can only be finalised at the time that you are ready to proceed.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and home owners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan when you are ready to proceed.

Thanks,  
**Maia Luxford Sullivan**  
Property Development Coordinator

**T** 0800 782 386 (opt. 1)  
**E** [Develop@chorus.co.nz](mailto:Develop@chorus.co.nz)

PO Box 9405  
Hamilton  
[www.chorus.co.nz](http://www.chorus.co.nz)

**C H ● R U S**

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## **Appendix E**

Vector Correspondence

## Harley Norton

---

**From:** Maria Ah Colt <Maria.AhColt@vector.co.nz>  
**Sent:** Thursday, 20 May 2021 11:57 am  
**To:** Harley Norton  
**Subject:** 1-4607434812 ASSET RODNEY ROAD

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Good morning Harley

Thank you for contacting Vector with regard to your feasibility assessment you are undertaking for a subdivision in Wellsford.

Our planning team have provided the following feedback for you:

- A residential subdivision of 600 lots will require about 1.5 MVA.
- The Wellsford K07 – Te Hana feeder runs along State Highway one that can be used to provide the required 1.5 MVA.
- There is also Wellsford K08 feeder with enough capacity about 200m North of the subdivision.
- There is capacity on the network right now without need for significant upgrades, however this can change if a customer formally requests the capacity.
- It is important for you to know that while there is spare capacity available at present, it might not still be available in the future.
- To secure capacity you would need to go through the process and request a HV Network Connection Approval form.
- You will need to cover the cost of providing the supply to the dwelling from the HV.

Please let me know if you require any further information.

Kind regards

**Maria Ah Colt** | Senior Customer Resolutions Specialist  
Vector Limited | PO Box 99882, Newmarket 1149 | Auckland 1023  
DDI: 09 213 5177 |  
[Maria.AhColt@vector.co.nz](mailto:Maria.AhColt@vector.co.nz) | [www.vector.co.nz](http://www.vector.co.nz)



# **ATTACHMENT 14**

## **APPENDIX 11 GEOTECHNICAL ASSESSMENT REPORT**







**Wellsford Residential  
Development - Structure  
Plan & Plan Change**

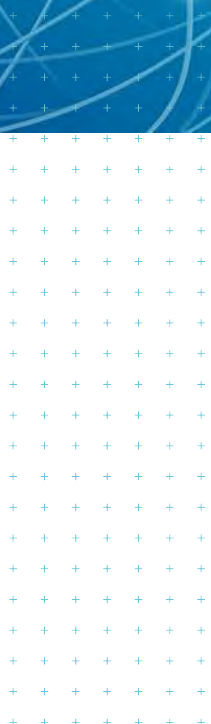
**Geotechnical Assessment Report**

**Prepared for**  
Wellsford Welding Club Ltd

**Prepared by**  
Tonkin & Taylor Ltd

**Date**  
June 2023

**Job Number**  
1018519.v4



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[www.tonkintaylor.co.nz](http://www.tonkintaylor.co.nz)

## Document Control

Title: Wellsford Residential Development - Structure Plan & Plan Change					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
02/12/21	1	Geotechnical Assessment Report	J Lawrie / M Child	M Child / B Hegan	M Thomas
16/12/21	2	Minor updates	J Lawrie / M Child	M Child / B Hegan	M Thomas
13/04/22	3	Update to include proposed structure plan area	J Lawrie	M Child / B Hegan	M Thomas
1/06/23	4	Update to include revised land use zoning	M Child	M Child / B Hegan	M. Thomas

### Distribution:

Wellsford Welding Club Ltd

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Tonkin & Taylor Ltd (FILE)

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## 1 Introduction

Tonkin + Taylor Ltd (T+T) has been engaged by Wellsford Welding Club Ltd to provide specialist geotechnical services to assess a proposed structure plan (PSP) and proposed plan change (PPC) for a residential development in Wellsford (the site). As shown on Figure 1 in Appendix A, the site for the PSP encompasses approximately 77.5 ha of land, currently zoned as future urban and rural countryside living under the Auckland Unitary Plan (AUP). The PPC area is located within the wider structure plan area and encompasses approximately 56 ha of land.

This report outlines the findings from a geotechnical desktop study and the results of site investigations undertaken in October 2021 by T+T. This information has been used to review the suitability of the ground and groundwater conditions for the proposed new land uses, and provide comment on the likely implications for building foundations, excavations and other geotechnical factors that may affect the development.

This report has been prepared to assist Auckland Council and decision makers in assessing this PSP and PPC in accordance with section 32 and Schedule 1 of the Resource Management Act 1991 (RMA).

We understand that investigations and reporting for contaminated land and other aspects of this development are being prepared by others.

### 1.1 Scope of work

The work has been undertaken based on our Letter of Engagement dated 23 July 2021<sup>1</sup> and Variation Order dated 31 March 2022<sup>2</sup>. The work carried out is limited to geotechnical aspects and is summarised below:

- Undertake a desktop assessment to review the historic land use and geomorphology of the PSP area.
- Preliminary geotechnical investigations to assess the subsurface site conditions for the PPC
- Site walkover carried out by a T+T Engineering Geologist to carry out geomorphological mapping of the PPC.
- Preparation of this report to summarise the outcomes of the work undertaken and geotechnical recommendations for the proposed plan change.

### 1.2 Site description

The site, shown in Figure 1-1 and Figure 1-2 below, comprises 20 land parcels with an area of approximately 77.5 ha. The properties are located approximately 0.5 km north of Wellsford town centre, 3 km south-east of Te Hana, and 15 km south-east of Kaiwaka. They are bordered by Rodney Street (State Highway 1) to the west, Worthington Road to the east, and Boshier Road to the north. The eastern border of the site is also adjacent to KiwiRail's existing North Auckland Line (NAL). The site is accessed from Monowai Road, Rodney Street, and Boshier Road.

The site generally comprises undulating pastoral land with moderate slopes that steepen where they fall towards existing gullies. Two prominent watercourses form the existing gullies and flow from the south-east to north-west. A number of existing dwellings are located within the site including along

<sup>1</sup> Tonkin & Taylor Letter of Engagement dated 23 July 2021. *Offer of Geotechnical Services to Support Resource Consent Application. Proposed Subdivision at 28 and 48 Old Waipu Road, Mangawhai.*

<sup>2</sup> Tonkin & Taylor Variation Order dated 29 March 2022. Child, M. *RE: Wellsford North Structure Plan and Plan Change – Updates* [email].

the western boundary and south-western corner. Several existing farm structures including sheds and barns are located across the site.

Figure 1-2 indicates the extent of the PPC and PSP areas. The PPC covers the central and eastern area of the site as indicated by the black outline (approximately 52.3 ha). The PSP includes the area in the PPC and several additional properties to the north-west as indicated by the red outline (approximately 77.5 ha).

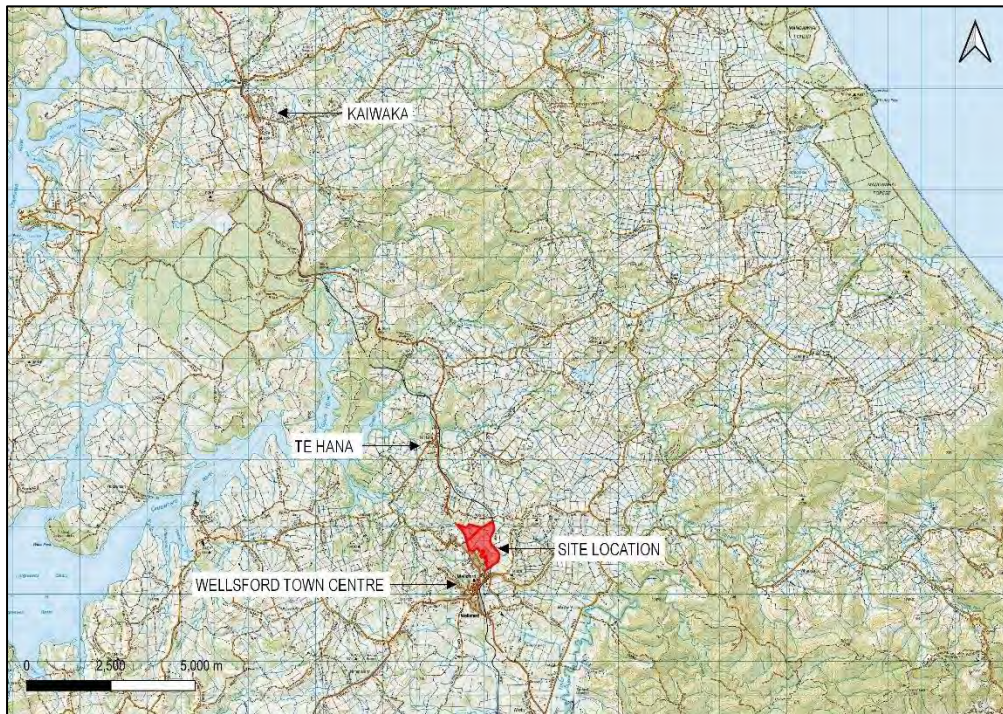


Figure 1-1: Location plan (scale 1 in 100,000)



Figure 1-2: Location plan (scale 1 in 7,500)



### 1.3 Proposed development

Concept site plans for the PSP and PPC<sup>3</sup> change were provided to T+T by the project planners Barker & Associates (B&A) and are shown as Figure 1-3 below.

The planned development currently proposes medium and low-density residential lots at the northern and central parts of the site. Lifestyle lots are proposed on the southern part of the site between Monowai Street and the NAL. A small neighbourhood/village centre is also shown near the western area of the site. The primary access road for the development is proposed at the western property boundary, along Rodney Street (SH1). Several ecological areas/open park spaces are proposed through the centre of the site, and near the northern end, adjacent to the existing watercourses.

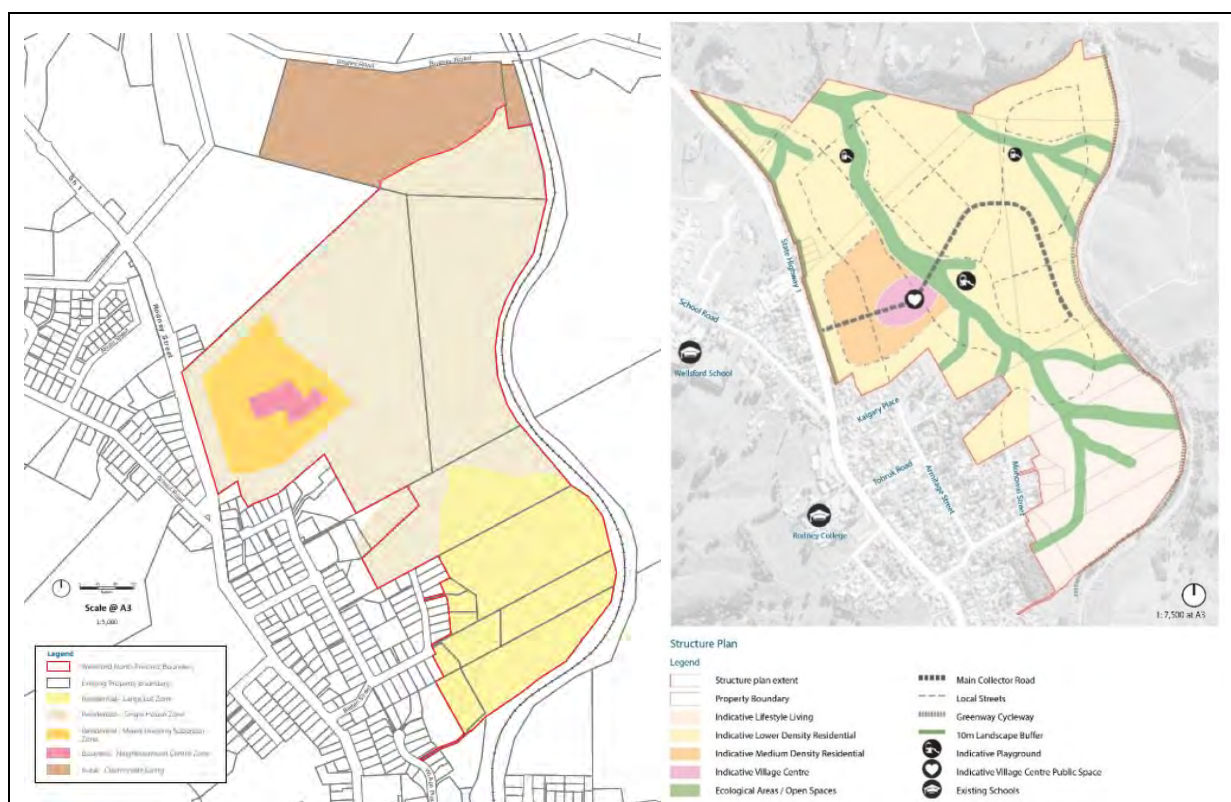


Figure 1-3: Proposed development zoning by B&A. Left figure – plan change area. Right figure – structure plan area

## 2 Review of existing geotechnical information

### 2.1 Published geology

The GNS Science 1:250,000 geological map of the Auckland area<sup>4</sup> shows part of the site underlain by Mahurangi Limestone (Omm) of the Northland Allochthon. This material is described as a series of pale grey to white, laminated muddy limestones, commonly interbedded with graded sandstone beds. Mangakahia Complex (kk) of the Northland Allochthon is mapped to the east and west of the site. This material is described as closely fractured to sheared, light or dark coloured, siliceous, and

<sup>3</sup> Email: R. Sanders (B&A) to M. Thomas (T+T), Subject: Wellsford North Plan Change, dated 29 May 2023 @ 3.18 PM

<sup>4</sup> Edbrooke, S.W (compiler) 2001. Geology of the Auckland area. Institute of Geological & Nuclear Sciences 1:250 000 geological map 3. 1 sheet + 74p. Lower Hutt, New Zealand. Institute of Geological and Nuclear Sciences Limited.

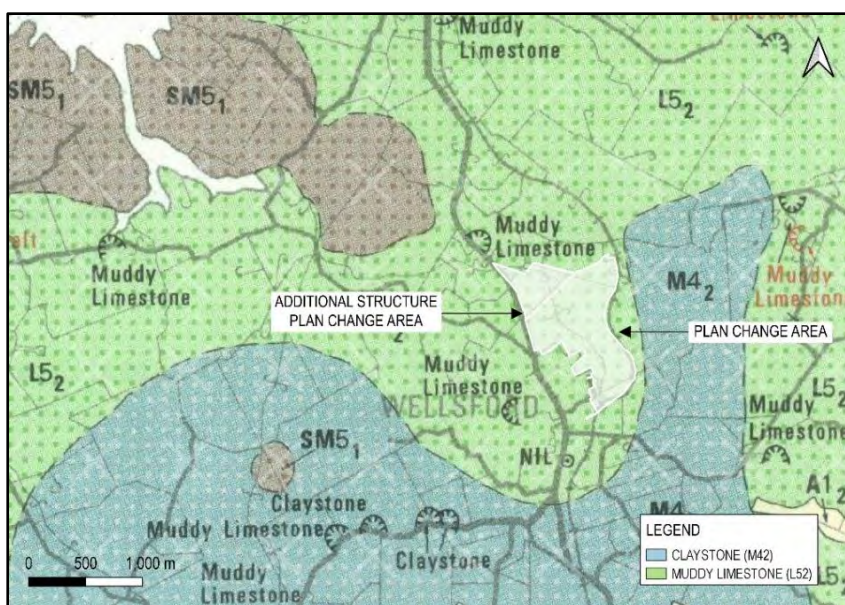
locally calcareous mudstone. It should be noted that the GNS geological map is based on compilation of existing data at a large scale, and cannot be relied on for site specific data.

The 1:100,000 land inventory rock map of the Maungaturoto-Kaipara area<sup>5</sup> maps the site as being underlain by muddy limestone (L5<sub>2</sub>) with mudstone with blocks (M4<sub>2</sub>) mapped to the east and south of the site. Comparison with the 1:250,000 geological map indicates that the muddy limestone (L5<sub>2</sub>) is likely equivalent to the Mahurangi Limestone (Omm) and the mudstone with blocks (M4<sub>2</sub>) to the Mangakahia Complex.

Annotated extracts of the geological maps showing the site location are presented in Figure 2-1 and Figure 2-2.



Figure 2-1: Extract of the 1:250,000 geological map of the Auckland area



<sup>5</sup> Markham, G.S and Crippen, T.F. 1981: "Maungaturoto-Kaipara" NZMS290 Sheet Q08/09, 1:100 000. New Zealand Land Inventory. Rock Types. Department of Lands and Survey, Wellington, New Zealand.

Figure 2-2: Extract of the 1:100,000 rock type map of the Maungaturoto-Kaipara area

## 2.2 Review of aerial photographs

A review of historical and recent aerial photography has been undertaken to understand whether any land-use or obvious topographical changes have occurred within the available record.

Historic aerial photographs have been sourced from Retrolens<sup>6</sup>, Google Earth<sup>7</sup>, and Land Information New Zealand (LINZ)<sup>8</sup> for the purpose of this assessment. A schedule presenting the aerial images described below is included in Appendix B.

In the timeframe available (1961 to 2017) the following notable features and changes to the site were observed:

- 1 Based on the aerial photography from 1961 (sourced from Retrolens), the site appears to be primarily used as farmland. The building at the corner of Batten Street and Monowai Street, and several existing dwellings along the western boundary of the site are constructed. Part of the existing farm tracks is visible near the centre of the site. Numerous slope deformation features can be observed across the site including hummocky ground and small landslides including what we infer to be a recent landslide feature near south-eastern corner of the site.
- 2 From the 1976 and 1982 aerial photography (sourced from Retrolens), the now existing farm track which accesses the site from Rodney Road has been constructed as well as several dwellings on the south-western boundary near Monowai Street. The existing structures on the farm have been demolished with new farm sheds and barns constructed near the centre of the site. Large areas of bush have also been cleared near the north-eastern corner and south-eastern end of the site. An existing pond, visible near the north-western end of the site, appears to have been filled in. A possible landslip feature, near the north-eastern boundary of the site, is visible in the 1976 aerial.
- 3 No notable changes are observed between 1982 and 1992 aerial photography. Construction had begun on the development at Kelgary Place near the south-western corner of the site, and a barn was constructed near the centre of the site.
- 4 From 1992 to 2017, the site appears visually to be largely the same. A new access track was constructed near the northern end of the site from Bosher Road. Changes to SH1 near the western boundary of the site are also observed which we infer to have occurred prior to 2006, based on Google Earth imagery. These changes appear to be associated with earthworks stabilisation of SH1 and may also comprise installation of subsoil drainage and relief wells.

<sup>6</sup> Retrolens 2021, accessed 1 October 2021, <https://retrolens.co.nz>

<sup>7</sup> Google Earth 2021, accessed 15 November 2021, <https://earth.google.com>

<sup>8</sup> Land Information New Zealand 2021, accessed 1 October 2021, <https://data.linz.govt.nz>



### 3 Structure plan change assessment – Northern area

#### 3.1 Overview

This section of the report includes a preliminary assessment of the northern part of the PSP area which is not covered by the PPC, shaded red in Figure 3-1 below. This assessment is based on a geotechnical desktop study and visual observations made from public land and adjoining properties in April 2022. This information has been used to review the likely suitability of the ground and groundwater conditions for the proposed new land use, and comments on the possible geotechnical implications which may affect the development.



Figure 3-1: Proposed Structure Plan area (outlined in red). The shaded area is not covered by the Proposed Plan Change

#### 3.2 Desktop and site walkover assessment

The northern area of the PSP shown in Figure 3-1 generally comprises gently sloping grassed paddocks with undulating terrain. The land becomes moderately to steeply inclined closer to large drainage gullies that run approximately south to north through the centre of the site, and east to west along the northern boundary. Steeper slopes, particularly adjacent to the central drainage gully, show signs of shallow near surface creep. Relic signs of deeper-seated instability were observed within the topography. No obvious signs of recent significant instability were observed.

Exposures of light grey to white limestone were observed on the steeper western slopes leading down to the central drainage gully. Similar exposures were not observed on the eastern portion of the site, indicating a change in the geology between the western and eastern sides of the gully.

### 3.3 Inferred geotechnical conditions in the Northern PSP area

The likely ground conditions within the northern area (which is subject to the PSP only) can be inferred based on the desktop studies and site walkover described above, and information gained from our 2021 site investigation for the PPC to the southeast of the site (refer to Appendix A – Figure 1). The subsoil conditions within this northern PSP area are inferred and it must be appreciated that actual conditions are likely to vary to some degree.

We generally expect the subsoil conditions to comprise residually weathered soils overlying Northland Allochthon rock at depth. East of the central gully, Northland Allochthon derived mudstone (clay shale) is inferred. West of the central gully, Northland Allochthon material comprising siltstone, sandstone and limestone is inferred.

Alluvial soils may also be present within the lower lying topography as a layer of surficial material overlying Northland Allochthon derived soils and rock.

### 3.4 Implications for development of the Northern PSP area

Ground conditions within the western part of the Northern PSP area are generally expected to be similar to “Zone C” of the PPC area, discussed in more detail in section 4.4 of this report. Slopes are expected to generally exhibit shallow surface creep, and movement within slopes steeper than about 14 degrees may be moving on slip surfaces in the order of 3 to 4 m depth below the surface.

Some parts of the site may be stabilised for development using relatively simple measures such as deep drainage.

Stabilisation of steeper parts of the site may require methods such as mass earthworks stabilisation. The economic feasibility of this would need to be weighed against the lot density. If mass earthworks stabilisation to enable density is not economically feasible, then a more suitable approach may be to stabilise building platforms using methods such as piled foundations, localised earthworks, drainage, and in-ground palisade walls. Once building platforms have been stabilised, houses could probably be supported on shallow foundations.

It is likely that similar stabilisation methods could generally be used for the eastern part of the Northern PSP area; however, some work would need to be carried out to investigate the apparent underlying ancient/dormant slope mechanisms which also appear to be present in “Zone D” to the southeast. Our investigations in the PPC area indicate that there may be dormant ancient geological features in this area which have not moved for a very long time and therefore might not be a credible threat to development. In areas where large relic dormant features with deep landslip surfaces are confirmed, it will be important to confirm acceptable stability assessment methods/criteria with Auckland Council for any of these ancient features, as stabilisation of very deep slip surfaces may be uneconomical, and housing would need to be located in areas which can be developed more economically. Conversely, some localised areas within these dormant features and areas that have not been subject to ancient instability may be suitable for residential development with much less onerous design requirements. In these areas conventional raft type foundations may be feasible (possibly coupled with drainage measures) subject to site specific testing and stability assessment.

### 3.5 Conclusions – Northern PSP area

The northern PSP area is likely to be suitable for residential development, subject to the following preliminary conclusions and recommendations:

- 1 From our review of published geological information, as well as our suite of preliminary investigations on the adjacent PPC site – we infer the site is likely underlain by various lithologies of the Northland Allochthon. Alluvial soils may also be present as a surficial cover deposit on the lower lying topography.
- 2 The geotechnical hazards within the site are likely similar to the adjacent PPC site, and many other parts of northern Auckland. Conventional and/or commonly used design solutions are available to manage and mitigate these hazards.
- 3 Active and relic slope deformation features were observed during a visual walkover of the site. Slope stability and development of cost-effective stabilisation measures is likely to present the biggest geotechnical risk to development.
- 4 Earthquake induced liquefaction lateral spread hazards are highly unlikely but cannot be ruled out completely.
- 5 Site-specific geotechnical investigations should be undertaken to better understand the ground conditions and to inform the specific zoning and actual intensification within the PSP area prior to a future plan change application being lodged.
- 6 Subsequent detailed geotechnical investigation and assessment will be required to support a future subdivision design or Resource Consent application within the PSP area.



## 4 Plan change assessment

### 4.1 Overview

This section of the report includes our assessment of the PPC area as shown in Figure 4-1 below. This assessment based on our geotechnical desktop study and site investigations undertaken in October 2021. This information has been used to review the suitability of the ground and groundwater conditions for the proposed new land use, and comments on the geotechnical implications which may affect the development.

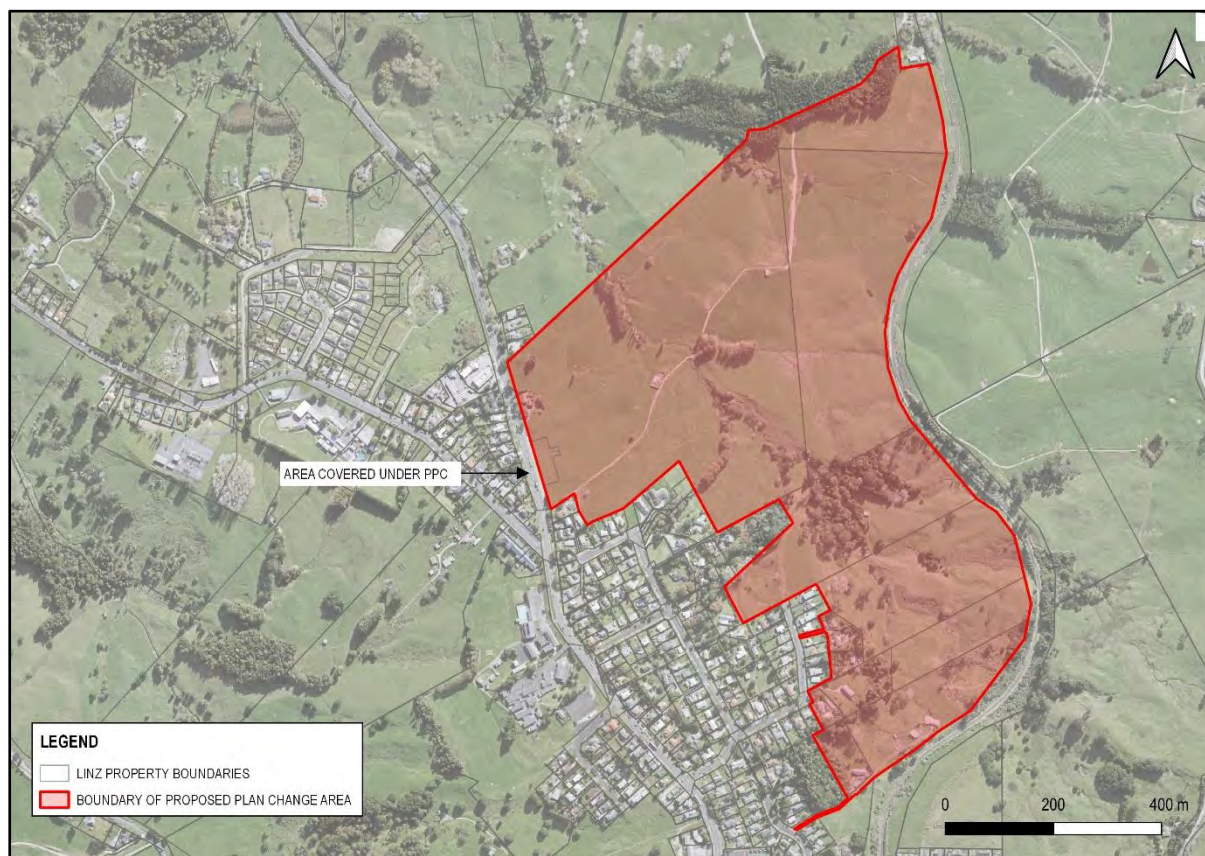


Figure 4-1 Assessment area for PPC

## 4.2 Geotechnical investigations

### 4.2.1 General

The scope of geotechnical investigations undertaken to assess ground conditions and aid the recommendations within this report comprised a walkover by a Senior Engineering Geologist from T+T to undertake geological and geomorphological mapping of the site, and a suite of intrusive investigations to ascertain the geology of the site comprising:

- 1 26 test pits (TP) excavations
- 2 11 hand auger (HA) boreholes

Coordinates for investigation locations are presented in terms of the New Zealand Transverse Mercator 2000 (NZTM 2000) projection. Locations were assessed using a handheld GPS (typical accuracy of  $\pm 2$  m) or inferred on site. Elevations correspond to the New Zealand Vertical Datum 2016

(NZVD2016) and were assessed using a handheld GPS or from LIDAR contours (typical accuracy of  $\pm 1$  m).

Materials recovered during the investigation were logged by a T+T Geotechnical Engineer and Engineering Geologist in general accordance with the Field Description of Soil and Rock guideline (NZGS, 2005)<sup>9</sup>.

The presence of overhead and underground services was considered prior to any intrusive investigations being undertaken. Service plans were requested via the beforeUdig online service and obtained from Council GIS databases. No services were found to be in the vicinity of the works.

Investigation locations are presented on the Site Investigation Plan which is attached as Figure 1 in Appendix A.

#### **4.2.2 Site walkover inspection findings**

The site generally comprises grassed paddocks with small areas of bush and tree lined slopes which are predominantly confined to the steeper slopes of local drainage gullies. To the west and south the site is bordered by SH1 and private properties that form part of Wellsford township. The eastern site boundary is shared with KiwiRail's North Auckland Line (NAL), and the northern boundary borders open farmland.

Based on the topography and geomorphology observed on site we have broadly categorised it into four typical geological zones, as shown in Figure 4-2 and in Appendix A. The four zones are described below:

##### **Geological zone A: Terraces (inferred alluvial deposits)**

Three broad terrace features are located within the site. These features generally comprise gently sloping even ground with no obvious signs of recent instability observed within the terraces. These areas are denoted **Zone A** for discussion of the development and zoning considerations presented in Section 4.4.

##### **Geological zone B: Active slope movement (Northland allochthon)**

In the western corner of the site there is a narrow area of land that slopes gently down from SH1 to toward the main central drainage gully within the site. Above the gully immediately east is a small pocket of land that falls west, back toward the central drainage gully.

The land in this area typically comprises undulating and hummocky topography, and obvious signs of active earth movement upon the insitu bedrock were observed immediately below SH1. Shallow slope creep is also typical of this terrain on slopes exceeding about 8 degrees. This area is denoted **Zone B** for discussion of the development and zoning considerations presented in Section 4.4.

##### **Geological zone C: Steeper terrain (Northland allochthon: Siltstone / Sandstone / Limestone)**

The remaining southwest portion of the site comprises undulating terrain formed of several broad ridge crests with gently to moderately inclined side slopes leading down to a series of local drainage gullies. Many of these gullies are tree lined, indicating land that is less favourable to farming compared to the gently sloping land in the north. The steeper side slopes show signs of shallow near surface creep, and some possible signs of instability. This area is denoted **Zone C** for discussion of the development and zoning considerations presented in Section 4.4.

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<sup>9</sup> New Zealand Geotechnical Society (2005). Field description of soil and rock. Guideline for the field classification and description of soil and rock for engineering purposes. New Zealand Geotechnical Society inc.

### Geological zone D: Gentler terrain (Northland allochthon: Mudstone / Clay Shale)

The northeast half of the site generally comprises gently to moderately inclined undulating terrain with less obvious surface drainage features and incised gullies. The land in this area has what is inferred to be relic dormant features indicating inactive<sup>10</sup> slope movement in the form of scallop shaped arc features below the main ridge crests, above undulating terrain below. This area is denoted **Zone D** for discussion of the development and zoning considerations presented in Section 4.4.

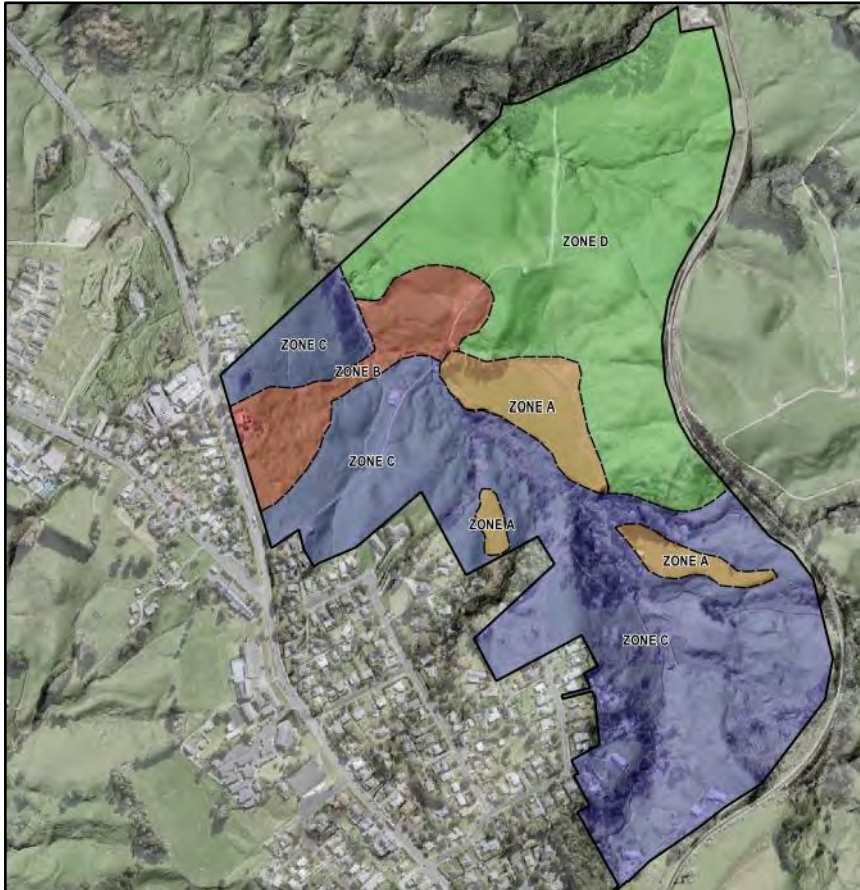


Figure 4-2: Geological zones

### 4.2.3 Test pit excavations

Excavation of 28 test pits was undertaken by Masons Contractors Limited from the 12 October 2021 to 14 October 2021. The test pits were excavated using a 16-tonne excavator, which was able to excavate to a maximum depth of 3 to 5 metres depending on the terrain. Several of the test pits did not reach maximum depth due to “refusal” on hard rock, as noted in Table 4.2 below. Handheld shear vanes were undertaken on selected spoil samples, and in the floor and wall of test pits where possible.

A summary of the completed test pit excavations is presented in Table 4.2, with geotechnical logs and photographs included in Appendix C.

<sup>10</sup> Paper from Utah State University “Preliminary Age Classification of Landslides for Inventory Mapping” J.P. McCalpin 1984



**Table 4.1: Summary of test pit excavations**

Hand auger ID	Location (NZTM 2000)		Ground surface elevation (NZVD2016) [m RL]	Termination depth [m bgl]	Termination reason
	Easting [m]	Northing [m]			
TP01_2021	1736665	5983629	31	1.5	Encountered rock.
TP02_2021	1736581	5983454	47	4.6	Encountered rock.
TP03_2021	1736633	5983316	56	2.6	Encountered rock.
TP04_2021	1736893	5983346	43	4.0	Encountered rock.
TP05_2021	1736771	5983405	41	2.7	Encountered rock.
TP06_2021	1736790	5983507	28	3.7	Encountered rock.
TP07_2021	1736702	5983737	25	4.4	Unable to excavate further
TP08_2021	1736844	5983674	33	4.8	Unable to excavate further
TP09_2021	1736957	5983515	30	4.7	Unable to excavate further
TP10_2021	1737247	5983029	47	3.6	Encountered rock.
TP11_2021	1737134	5983438	47	4.6	Unable to excavate further
TP12_2021	1737220	5983472	53	4.3	Unable to excavate further
TP13_2021	1737164	5983660	50	3.4	Encountered rock.
TP14_2021	1737291	5983963	42	3.0	Unable to excavate further
TP15_2021	1737278	5984071	45	3.8	Unable to excavate further
TP16_2021	1737003	5983981	30	3.8	Unable to excavate further
TP17_2021	1736849	5983852	40	3.7	Unable to excavate further
TP18_2021	1737003	5983821	36	3.7	Unable to excavate further
TP19_2021	1737118	5983752	42	3.0	Encountered rock.
TP20_2021	1737065	5983685	38	3.0	Encountered rock.
TP21_2021	1736952	5983732	41	5.0	Unable to excavate further

Hand auger ID	Location (NZTM 2000)		Ground surface elevation (NZVD2016) [m RL]	Termination depth [m bgl]	Termination reason
	Easting [m]	Northing [m]			
TP22_2021	1737002	5983549	30	4.6	Unable to excavate further
TP23_2021	1737223	5983260	46	4.4	Unable to excavate further
TP24_2021	1737379	5983251	50	4.5	Encountered rock.
TP25_2021	1737269	5983155	47	4.3	Encountered rock.
TP26_2021	1737412	5983111	54	2.9	Unable to excavate further

#### 4.2.4 Hand auger boreholes

A total of 11 hand auger boreholes were completed by T+T between the 13 and 14 of October 2021. Nine of the eleven hand augers did not reach the target depth of 5.0 m bgl as they were unable to be advanced or reached refusal within hard ground. Handheld shear vanes were undertaken downhole in cohesive soil at 0.3 m intervals. Where encountered, groundwater measurements were recording using an electronic dip meter.

A summary of the hand auger boreholes is presented in Table 4.2. The full logs are presented in Appendix C.

**Table 4.2: Summary of hand auger boreholes**

Hand auger ID	Location (NZTM 2000)		Ground surface elevation (NZVD2016) [m RL]	Termination depth [m bgl]	Groundwater level [m bgl]	Termination reason
	Easting [m]	Northing [m]				
HA01_2021	1736784	5983570	24	4.7	2.12	Too difficult to auger
HA02_2021	1736676	5983527	31	3.0	Dry	Too difficult to auger
HA03_2021	1736942	5983445	26	3.1	1.51	Squeezing
HA04_2021	1736577	5983560	40	1.8	Dry	Too difficult to auger
HA05_2021	1736648	5983412	43	2.2	Dry	Too difficult to auger
HA06_2021	1736945	5983142	48	2.4	Dry	Too difficult to auger
HA07_2021	1737085	5983127	58	3.4	1.12	Squeezing
HA08_2021	1737298	5983288	45	3.6	2.95	Too difficult to auger
HA09_2021	1736894	5983676	34	5.0	Dry	Target depth

Hand auger ID	Location (NZTM 2000)		Ground surface elevation (NZVD2016) [m RL]	Termination depth [m bgl]	Groundwater level [m bgl]	Termination reason
	Easting [m]	Northing [m]				
HA10_2021	1736832	5983560	22	3.2	3.40	Too difficult to auger
HA11_2021	1737025	5983460	31	5.0	2.58	Target depth

## 4.3 Geotechnical conditions and ground model

### 4.3.1 Overview

This section summarises the inferred ground conditions at the site based on our interpretation of the geomorphology, the material encountered, and data recovered from discrete investigation locations. The nature and continuity of subsoil away from these locations are inferred but it must be appreciated that actual conditions could vary from the assumed model.

Across the site, the subsurface investigations generally indicate alluvium and residually weathered soils are present overlying Northland Allochthon rock at depth, which is generally consistent with the published geology described in Section 2. Northland Allochthon derived mudstone/siltstone was encountered at the northern portion of the site and in a small area which extends to the south-western boundary. Northland Allochthon material described as siltstone, sandstone and limestone were also encountered across most of the sites southern portion, particularly in the moderately inclined areas of the site.

Northland Allochthon has an inherently variable lithology and changes may occur both laterally and vertically in the geologic profile over very short distances. It is not uncommon to have a range of Northland Allochthon lithologies over tens of meters in open excavations. As such, we expect that the geology on site will vary from that assumed.

A plan showing the approximate extent of the inferred geological units is presented as Figure 2 in Appendix A, an excerpt of this map is presented as Figure 4-3 below.



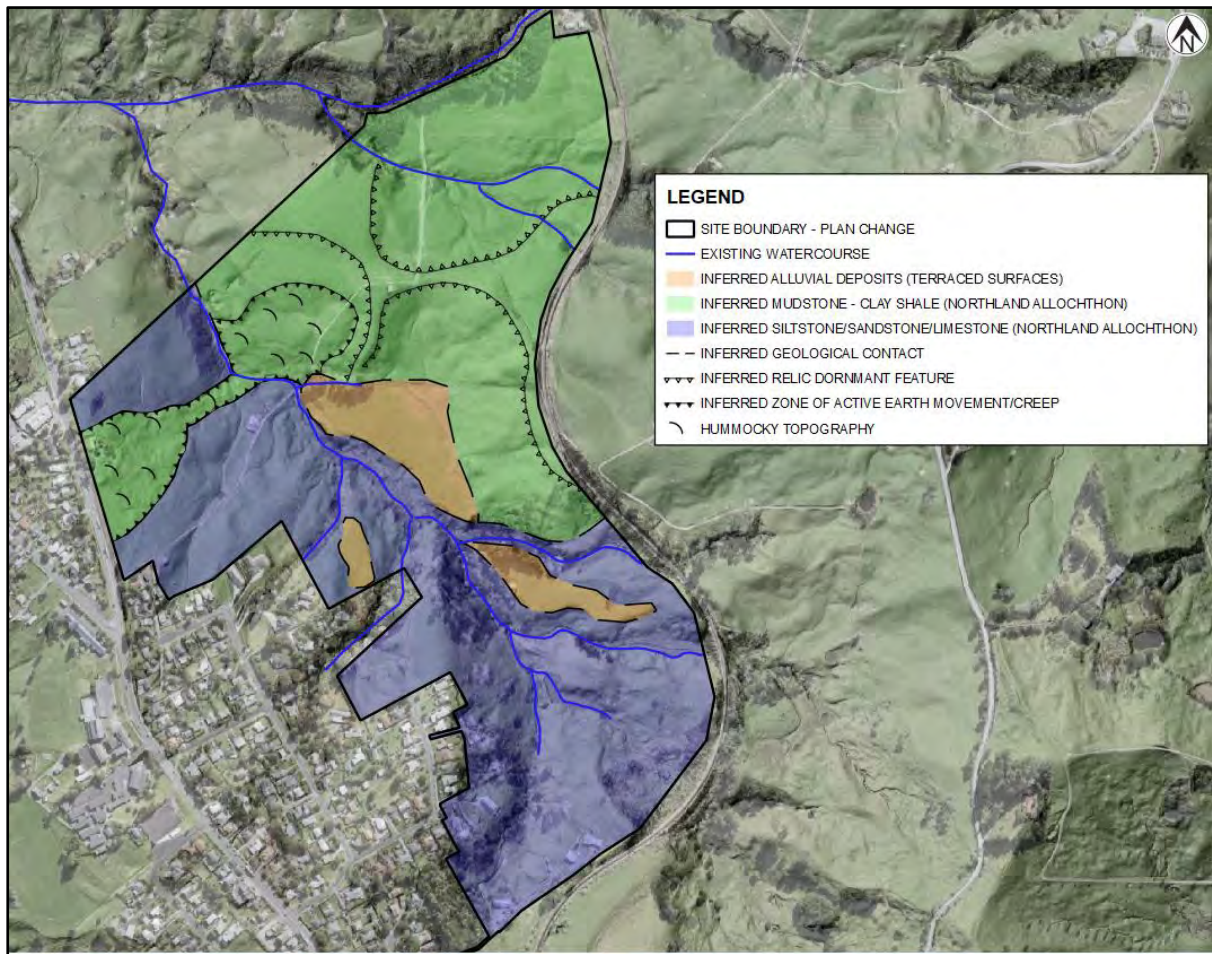


Figure 4-3: Inferred geology of the site

#### 4.3.2 Site ground conditions

The recent site investigations have been used to inform the extent and development implications of each identified Zone (shown in Figure 4-2). A summary of the encountered geology in each zone is included in Table 4.3.

**Table 4.3: Summary of site ground conditions at each development zone**

Zone	Investigations	Encountered geology
A	4 test pit excavations 1 hand auger borehole	Alluvial deposits to depths of 1.3 m bgl to greater than 5 m bgl, overlying residual and weathered Northland Allochthon rock.
B	2 test pit excavations 1 hand auger borehole	Northland Allochthon residual soils and active earth movement to depths of between 1.4 m bgl to greater than 5 m bgl overlying weathered siltstone and mudstone rock.
C	8 test pit excavations 9 hand auger boreholes	Northland Allochthon residual soils and areas of local instability to depths of between 0.5 m bgl to 4.1 m bgl overlying weathered siltstone / sandstone / limestone rock.

Zone	Investigations	Encountered geology
D	12 test pit excavations	Northland Allochthon residual soils to depths of 2.7 m bgl to greater than 5.0 m bgl overlying and inferred to be overlying mudstone and siltstone rock. Inferred relic dormant features, possibly related to higher sea levels are also observed.

**4.3.3 Typical mode of slope deformation within Northland Allochthon materials on low angle slopes**

Northland Allochthon geology comprises a complex assemblage of different geologies that were formed over tens of millions of years from the late Cretaceous to the early Miocene. These materials were transported as sub-marine landslides some 100 km to 200 km, forming highly sheared rock of various lithologies.

These sheared rocks are readily weathered into low strength soils and are prone to deformation of slopes as shallow as 7 or 8 degrees when groundwater becomes trapped within a “broken zone” causing sub-artesian ground water pressures. This ground profile, as shown on Figure 4-4, typically comprises:

- Fully softened near surface clayey soils overlying;
- A broken zone of sheared material, overlying;
- A basal sheared zone, overlying; and
- An un-softened rock mass

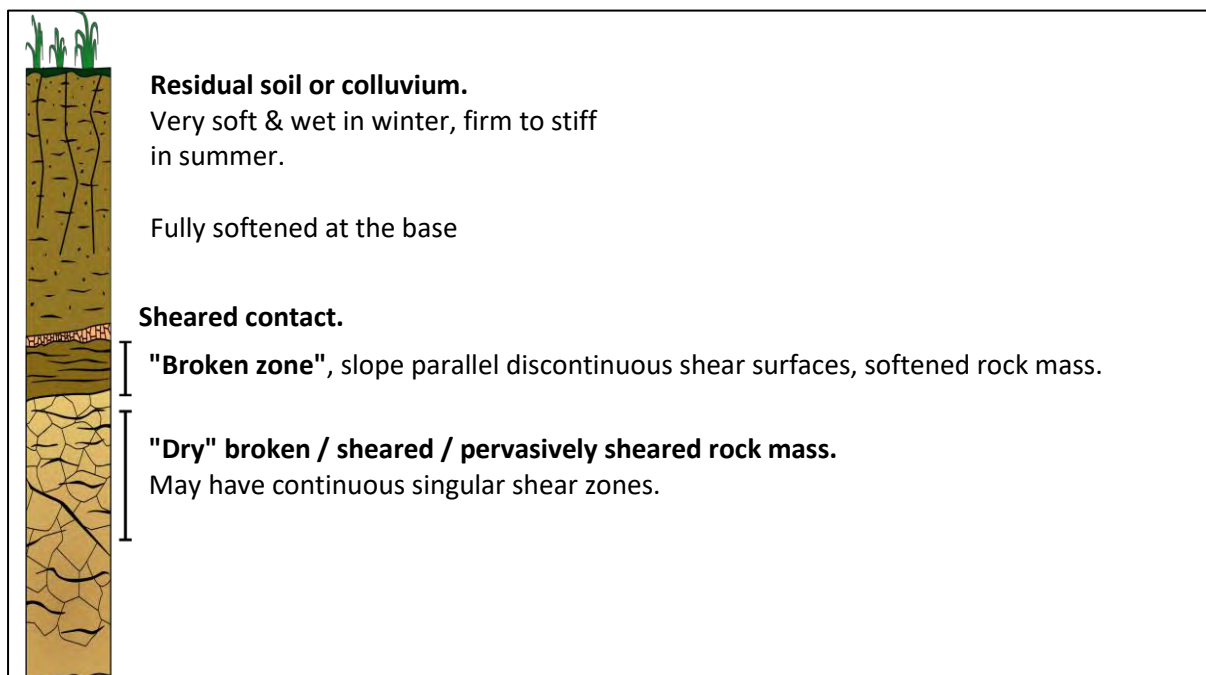


Figure 4-4: Annotated sketch of typical soil and rock profile within Northland Allochthon geology


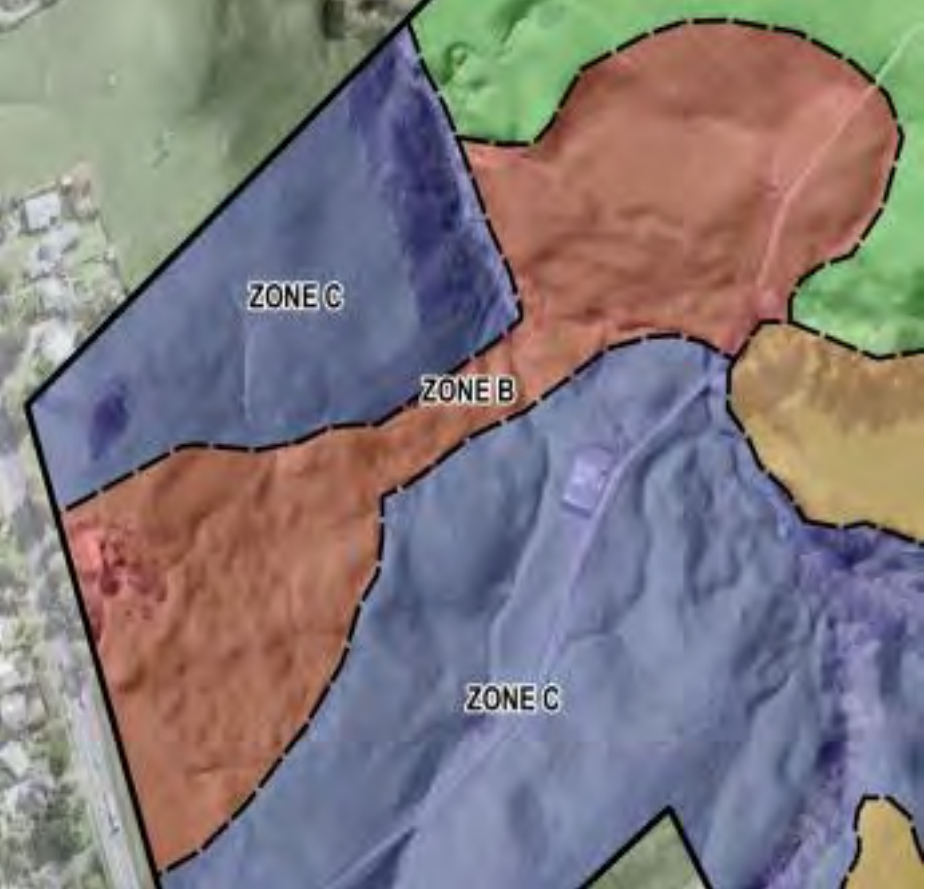
## **4.4 Geotechnical implications of the plan change**

### **4.4.1 Development zones and general geotechnical implications of the plan change**

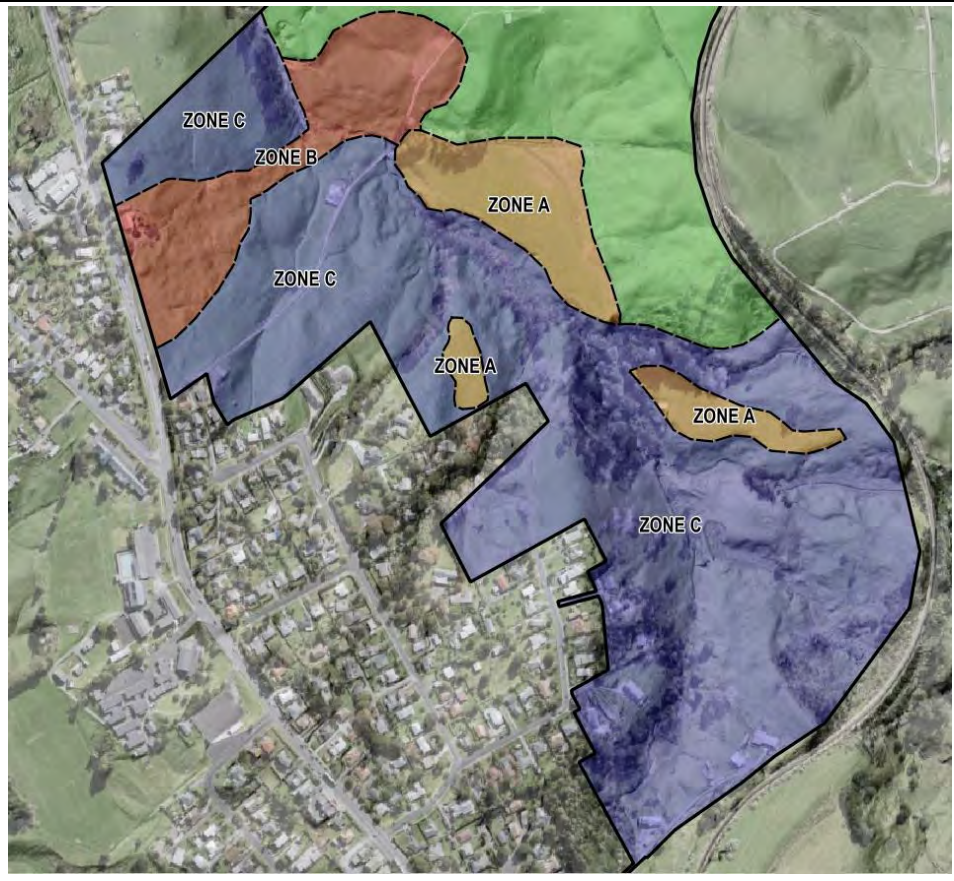
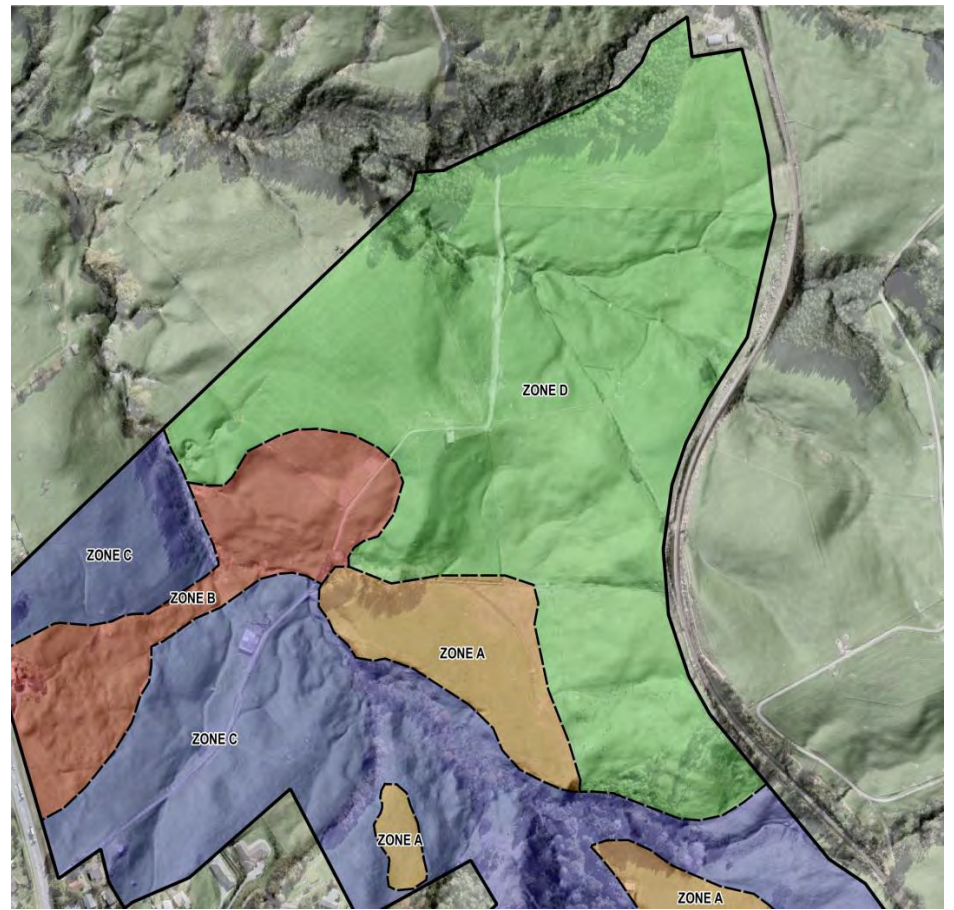
The geotechnical implications of the proposed plan change can be described across four main areas (Zone A to Zone D). The preliminary location of the Zones overlain on a digital elevation model (DEM) is presented as Figure 3, attached in Appendix A. Excerpts of this figure are included in Table 4.4 below.



**Table 4.4: Geotechnical assessment for the plan change**

Geological Zone	Proposed Plan Change	Ground Conditions	Implications for change of Zoning
A		<p><b>Terrain:</b> Zone A typically comprises terrace features which slope at between about 2 and 3 degrees to the northwest.</p> <p><b>Data confidence:</b> Published maps of the area indicate that these areas are underlain by Mahurangi Limestone of the Northland Allochthon. Our site observations indicate that these terraces comprising alluvial soils overlie the Allochthon (as described below). No other historical supporting information is readily available for this zone.</p> <p><b>Inferred ground conditions:</b> Our preliminary investigations indicate that the ground conditions within the areas denoted Zone A are likely to comprise alluvial deposits. Alluvial deposits can be highly variable and may comprise soft compressible, or liquefiable granular materials. We infer that these terrace deposits were deposited during a period of elevated sea level, indicating that they are in the order of 100,000 to 150,000 years old.</p>	<p><b>Geotechnical Implications:</b> The inferred ground conditions within these zones are anticipated to be favourable for light weight residential development on shallow or raft type foundations. Where adverse ground conditions are encountered, local ground improvement measures could be incorporated into the earthworks development of these sites. Development will need to be set back from steeper slopes to satisfy Auckland Councils minimum factor of safety for slope stability.</p> <p><b>Confirmation of Geotechnical Assessment:</b> Development within this Zone is achievable but requires confirmation of ground conditions and may require assessment of liquefaction vulnerability and slope stability where development near steep slopes is proposed.</p>
B		<p><b>Terrain:</b> Zone B typically comprises gently to moderately sloping hummocky and undulating topography leading from SH1 down toward the central drainage gully. Above the gully immediately east is a small pocket of land that falls west, back toward the central drainage gully. The hummocky terrain located centrally within this zone displays obvious signs of active earth movement within the upper soils and broken zone of upper rock. It appears that a series of manholes and relief wells are located on the site below SH1 that may be associated with stabilisation of the road. Moderately sloping ground either side of this is potentially subject to shallow surface creep.</p> <p><b>Data confidence:</b> Published maps of the area indicate that these areas are underlain by Mahurangi Limestone and Mangakahia Complex of the Northland Allochthon. Our site observations also indicate the presence of Mangakahia Complex. No other historic supporting information is readily available for this zone.</p> <p><b>Inferred ground conditions:</b> Our preliminary investigations indicate that near surface soils within this Zone are underlain by fissile mudstone. Clay shale may also be present, and it is likely that this material is present within the zone of active movement. These materials generally correspond to the mapped geology of and Mangakahia Complex mudstone of the Northland Allochthon.</p>	<p><b>Geotechnical Implications:</b> The investigations undertaken for this report generally indicate that the underlying moderately weathered rock is located within about 5 m of the surface over most of Zone B. The relatively shallow rock and active instability lends the site toward a conventional but relatively complex bulk earthworks mass stabilisation comprising a series of stabilised terraces or slopes. Stability improvement can be achieved through deep earthworks shear keys and drainage measures that extend through the broken zone into the top of the intact rock. This type of earthworks and retention solution is typical of the large scale recent development surrounding the Silverdale area. Development will need to maintain or improve the stability of adjacent properties and infrastructure such as State Highway 1 to the west.</p> <p><b>Confirmation of Geotechnical Assessment:</b> Development within this Zone is possible but requires confirmation of ground conditions, slope stability assessment and large scale earthworks design.</p>



<p><b>C</b></p>		<p><b>Terrain:</b> Zone C typically comprises a series of ridge crests and drainage gullies with gently to moderately inclined side slopes up to about 20 degrees (locally steeper), falling toward watercourses at the base of the slopes. This zone is considered susceptible to primarily shallow surface creep and local instability within the upper 3 m to 4 m on slopes steeper than about 14 degrees. Deeper seated instability or instability on slopes as gentle as 7 degrees is less likely, but cannot be ruled out at this stage.</p> <p><b>Data confidence:</b> Published maps of the area indicate that these areas are underlain by Mahurangi Limestone and Mangakahia Complex of the Northland Allochthon. This is supported by our site observations and investigations. No other historic supporting information is readily available for this zone.</p> <p><b>Inferred ground conditions:</b> Our preliminary investigations indicate that near surface soils within this Zone are underlain by variable brittle sandstones, siltstones and limestone. These materials generally correspond to the mapped geology of Mahurangi Limestone of the Northland Allochthon. Due to the high variability of Northland Allochthon materials, fissile mudstone / clay shale (Mangakahia Complex) may also be present locally within this zone.</p>	<p><b>Geotechnical Implications:</b> The investigations undertaken for this report generally indicate that the underlying moderately to highly weathered rock is located within about 3 m to 4 m of the surface over most of Zone C. Some areas within Zone C may be suitable for development with relatively simple stability improvement measures such as deep drainage to lower ground water pressures. The feasibility of mass earthworks stabilisation should be considered against the achievable lot density in Zone C. Some areas within this zone may lend themselves to specific mass earthworks stability enhancement where greater lot densities can be achieved, if economically feasible. This may be the case in the western corner of the site.</p> <p>Where stabilisation of large land areas to enable density is not economically feasible, then stabilisation of selected building platforms within larger lot sizes may be more suitable to this Zone. Building platforms in some areas may not be economically feasible to develop in this zone and may be better suited to green spaces within larger lots.</p> <p>Typically, building or site-specific engineering design in Zone C may comprise solutions such as piled foundations designed to resist soil creep, local earthworks stabilisation, drainage, and in-ground reinforced concrete palisade walls. Shallow foundations may be suitable in some situations or areas that have been enhanced through earthworks and/or deep drainage measures.</p> <p><b>Confirmation of Geotechnical Assessment:</b> Development within this Zone is possible but requires confirmation of ground conditions. Depending on the chosen development density, suitable building platforms will need to be identified. This is likely to entail site specific geotechnical investigation and design.</p>
<p><b>D</b></p>		<p><b>Terrain:</b> Zone D typically comprises gently to moderately inclined undulating terrain with some hummocky areas, and less obvious surface drainage features and incised gullies. The land in this area shows what appear to be relic dormant features associated with inactive slope movement. These features appear in the form of scallop shaped arcs within the landscape below the main ridge crests, above undulating terrain below. Localised areas within the Zone appear free of obvious signs of recent instability, and generally present less onerous development opportunities than Zones B and C.</p> <p><b>Data confidence:</b> Published maps of the area indicate that these areas are underlain by Mahurangi Limestone of the Northland Allochthon. No other historic supporting information is readily available for this zone.</p> <p><b>Inferred ground conditions:</b> Our preliminary investigations indicate that near surface soils within this Zone are typically underlain by fissile mudstone / clay shale of the Mangakahia Complex of the Northland Allochthon. Due to the high variability of Northland Allochthon materials brittle sandstone, siltstone and limestone may also be present locally within this zone.</p> <p>Based on the geomorphology and our understanding of the age of the terrace surfaces, we infer that the relic dormant features are in the order of 50,000 to 200,000 years old.</p>	<p><b>Geotechnical Implications:</b> The investigations undertaken for this report generally indicate that the underlying moderately to highly weathered rock is located greater than 3 m depth below the existing ground surface. It appears that there are relic features of large ancient, dormant landslides in this zone. Assessment of the stability of ancient features with deep landslip surfaces can be complex, as they may have formed under very different conditions (such as high sea level during inter-glacial periods). It will be important to confirm acceptable stability assessment methods/criteria with Auckland Council for any of these ancient features, as stabilisation of very deep slip surfaces may be uneconomical, and housing would need to be located in areas which can developed more economically.</p> <p>Conversely, some localised areas within these dormant features and areas that have not been subject to ancient instability may be suitable for residential development with much less onerous design requirements. In these areas conventional raft type foundations may be feasible (possibly coupled with drainage measures) subject to site specific testing and stability assessment. The land within Zone D may also comprise a “middle ground” where stability enhancement can be achieved through bulk earthworks and drainage or retention to promote local areas of higher density.</p> <p><b>Confirmation of Geotechnical Assessment:</b> Development within this Zone is achievable but requires confirmation of ground conditions and a better understanding of the inferred dormant features to confirm the most suitable method of development. This is likely to entail site specific geotechnical investigation, monitoring and design. Flexibility to reduce the proposed lot densities within some areas of this zone is considered prudent at this stage.</p>

Notes: Zoning taken from B&A Masterplan, Indicative Lot / Landuse Layout, Dated 12/07/2021 – Draft in progress

#### 4.4.2 Slope stability

Gentle to moderately sloping ground forms the majority of the proposed development area. However, the geology in the Wellsford area is inherently unstable due to its Northland Allochthon origin and requires careful consideration and design to support development.

A range of geological features were observed on site that indicate both historic and recent instability may have occurred on site. The modes of instability we infer to include:

- Active surficial near surface creep
- Active earth movement of the soil mantle over shallow rock
- Possible relic dormant features associated with inactive (ancient) earth movement

We believe that the risk of instability can be suitably mitigated through commonly used earth working and retaining systems such as embedded pile walls, mechanically stabilised earth (MSE), mass earthworks comprising shear keys, and deep drainage, along with site specific in-ground walls and foundation solutions where required. All are likely to be suitable options in this geology to provide suitably stable building platforms and have been used successfully elsewhere. However, there are likely to be parts of the site which are not economically viable to stabilise for housing, and these areas could be more suited for use as open / green spaces.

#### 4.4.3 Expansive soils

Expansive soils are clayey soils that undergo appreciable volume change upon changes in moisture content. This 'shrink-swell' effect results in movement of the near-surface soils over the course of seasonal moisture fluctuations and affects the design of shallow building foundations. The soils in the Wellsford area are expected to be typical of clay rich soils associated with the Northern Allochthon geological conditions and high expansivity can be expected. Locally, extremely expansive soils may exist on the site and can be treated accordingly. Commonly used design solutions such as stiffened (waffle / ribraft) slabs, or deep (~1 m) footings or piles are likely to be suitable for buildings in these ground conditions, subject to other geotechnical considerations such as laboratory testing and assessment of the performance of existing building foundations.

#### 4.4.4 Liquefaction

Liquefaction is the partial or complete loss of strength of soil, usually as a result of ground shaking during an earthquake. The loss of strength causes the soil to behave more like a liquid, potentially resulting in effects such as sand boils, settlement of the ground surface, damage to buildings and buried structures, infrastructure and lateral ground movement. To liquefy, the soil must be loose, sandy or silty and below the groundwater table.

Evidence of past liquefaction due to historical/ancient earthquakes can sometimes be seen in the sides of excavations. We did not observe any evidence of liquefaction in the test pits excavated during October 2021. Our qualitative assessment of the soils within Zones A to D is that they are unlikely to liquefy during an earthquake, as they are predominantly residually weathered cohesive soils with relic structure, or alluvial deposits with high clay content. This is a preliminary assessment, and it would be prudent to confirm this conclusion for each area of the site during design development with additional site investigations and lab testing.

The design of infrastructure and buildings of any size will need to consider these hazards. Liquefaction hazard does not preclude the proposed plan changes for building development, as there are many conventional design solutions which can be used to manage and mitigate the risk of liquefaction on buildings of all sizes. Typical measures include stiffened floor (waffle / ribraft) slabs, suspended floors, piled foundations, structural earth fill building platforms, rammed aggregate piers

and many other widely used systems which have been developed for the New Zealand housing market. Buried pipework in land subject to liquefaction or other types of potential ground movement can utilise designs which are tolerant of movement, such as PE pipes and flexible connections. Manholes and other buried structures can be designed for buoyancy and mitigation against liquefaction ejecta, if required.

Lateral spread could potentially occur if liquefaction occurs within a continuous or largely continuous soil layer, on sloping ground or ground adjacent to a free edge such as a streambank. Based on the data presented in this report, the risk of earthquake-induced lateral spread appears to be highly unlikely, though it cannot be ruled out completely.

#### **4.4.5 Existing residential and infrastructure development considerations**

Adjacent residential dwellings and public infrastructure (State Highway 1 and the North Auckland railway line) should be suitably considered when developing the scheme plan and in the ensuing project stages. Conventional geotechnical assessment and design methods can be used to manage geotechnical effects upon these assets.



#### 4.5 Conclusion – Proposed Plan Change

The ground conditions within the PPC area are generally suitable for residential development, subject to the following conclusions and recommendations:

- 1 A suite of preliminary investigations have been undertaken to inform development of a global ground model for the site. The site is underlain by various lithologies of the Northland Allochthon, with some surficial alluvial deposits also present. Both relic dormant features and active slope deformation features were observed on site. Slope stability presents the biggest risk to development, and achieving Councils required factor of safety for residential development presents the main geotechnical challenge in developing the site and confirming the development plan.
- 2 Whilst we have confidence in the global model (in general), additional site-specific geotechnical investigation and design will be required to better understand local ground conditions and confirm our geotechnical assessment and development recommendations for Resource Consent application and subdivision design. The type of investigations and design outcomes that can be anticipated are discussed in Table 4.4 which should be read in conjunction with these conclusions.
- 3 The specific zoning and actual intensification should be confirmed in collaboration with the Geotechnical Engineer as understanding of the ground conditions is developed. Therefore, we recommend that the development is afforded the flexibility to increase or decrease the proposed lot intensity based on the scale and complexity of ground enhancement required to achieve the required levels of slope and geotechnical stability.
- 4 Ground enhancement works to achieve acceptable slope stability, and/or specific foundation design will be required over most of the site and the type and scale of these works will need to be determined on confirmation on item 3 above.
- 5 The soil expansivity and potential liquefaction hazards within the site are similar to many other parts of northern Auckland. Conventional and/or commonly used design solutions are available to manage and mitigate these hazards, such as stiffened floor (waffle / rib-raft) slabs, suspended floors, piled foundations, structural earth fill building platforms, rammed aggregate piers. Earthquake induced liquefaction lateral spread hazards are highly unlikely but cannot be ruled out completely.
- 6 The proposed development and associated ground enhancement works should give due consideration to existing residential development and public infrastructure (e.g. State Highway 1 and the North Auckland rail line).

## 5 Applicability

This report has been prepared for the exclusive use of our client Wellsford Welding Club Ltd, with respect to the particular brief given to us to support the proposed plan change and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Recommendations and opinions in this report are based on data from discrete investigation locations. The nature and continuity of subsoil away from these locations are inferred but it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Report prepared / reviewed by:

Technical review by:

.....  
Mark Child  
Geotechnical Engineer

.....  
Bernard Hegan  
Technical Director

Authorised for Tonkin & Taylor Ltd by:

PP

.....  
Mark Thomas  
Project Director

p:\1018519\issueddocuments\geotechnical assessment report\rev 4 - zoning map update\wellsford development\_geotechnical assessment report\_rev 4 1 june 2023.docx

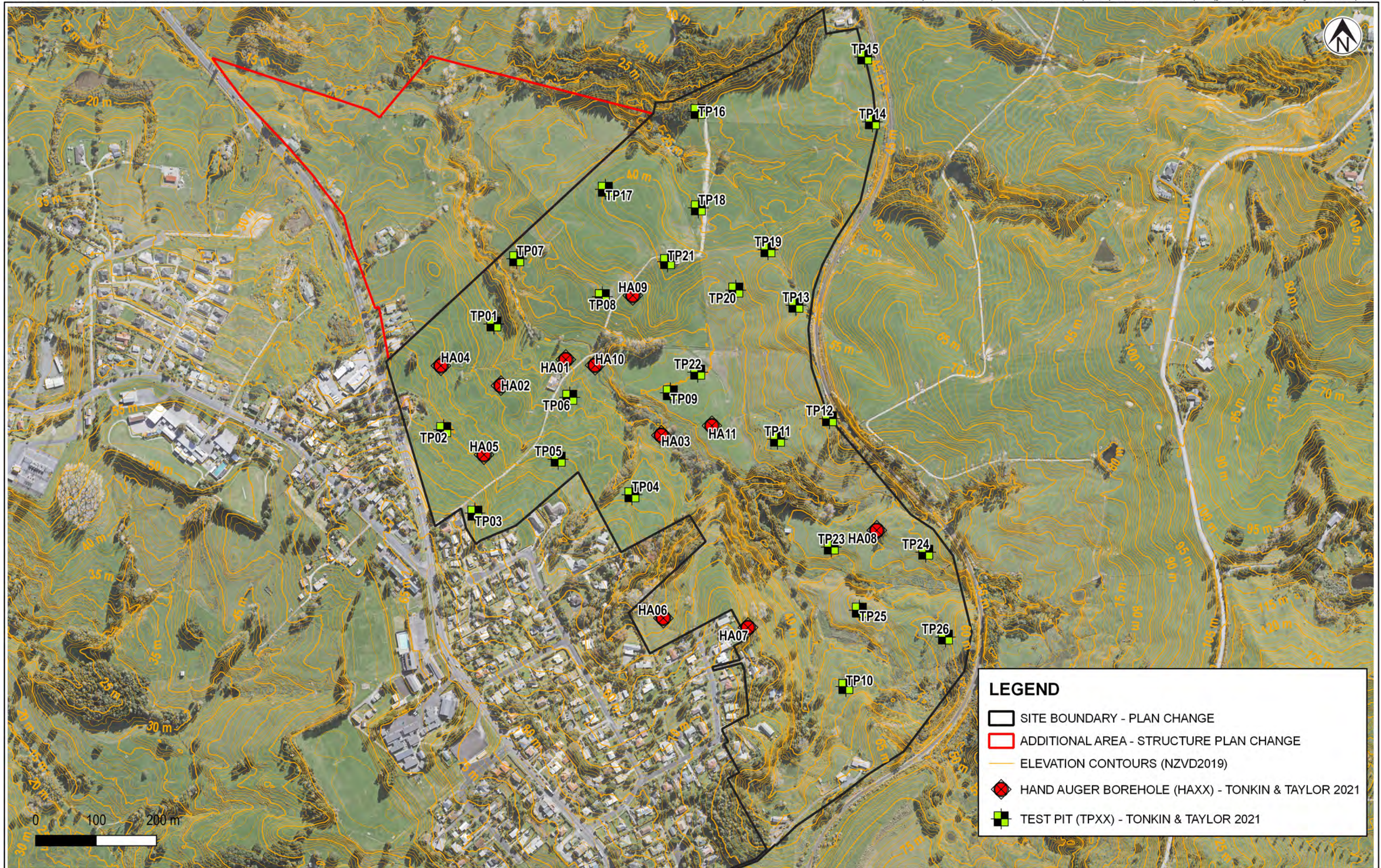
## Appendix A: Figures

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**LEGEND**

- SITE BOUNDARY - PLAN CHANGE
- ADDITIONAL AREA - STRUCTURE PLAN CHANGE
- ELEVATION CONTOURS (NZVD2019)
- ◆ HAND AUGER BOREHOLE (HAXX) - TONKIN & TAYLOR 2021
- TEST PIT (TPXX) - TONKIN & TAYLOR 2021

**NOTES:**  
 AERIAL PHOTO AND LIDAR DATA SOURCED FROM LINZ, LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 NEW ZEALAND LICENSE (CC BY 4.0).  
 SITE BOUNDARY INFERRED FROM B&A WELLSFORD MASTERPLAN INDICATIVE LOT/LANDUSE LAYOUT. SHEET NA DATED 12/07/2021.

REV	DESCRIPTION	GIS	DATE
0	First version	JALA	MCHI 17/11/21
1	Update for structure plan change	JALA	MCHI 6/04/22

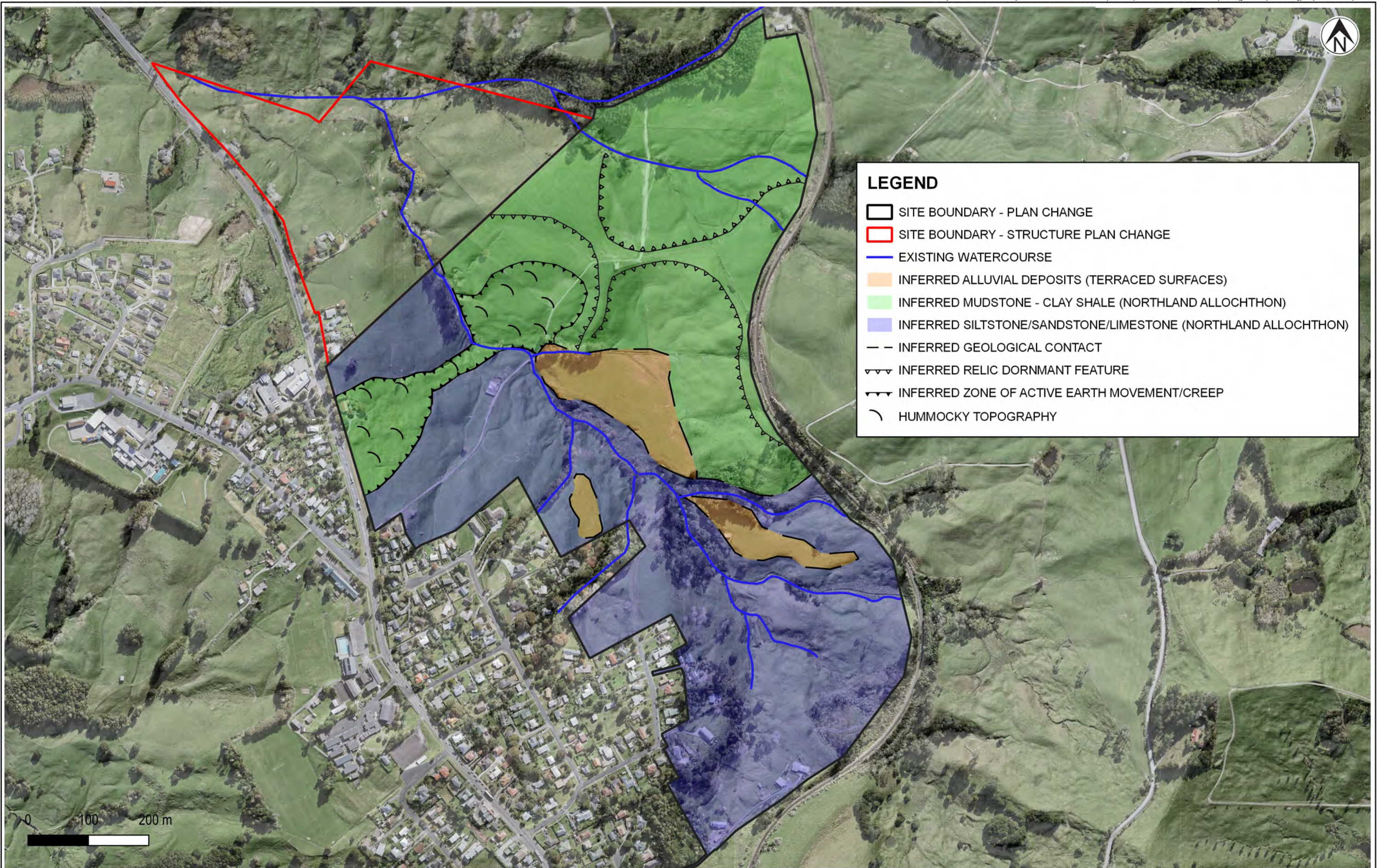
PROJECT No. 1018519	
DESIGNED	JALA APR.22
DRAWN	JALA APR.22
CHECKED	MCHI APR.22
MRT	APR.22
APPROVED	DATE

CLIENT	WELLSFORD WELDING CLUB LTD
PROJECT	WELLSFORD RESIDENTIAL DEVELOPMENT
TITLE	INVESTIGATION LOCATION PLAN
SCALE (A3)	1:5,750
FIG No.	FIGURE 1.
REV	1



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**LEGEND**

- SITE BOUNDARY - PLAN CHANGE
- SITE BOUNDARY - STRUCTURE PLAN CHANGE
- EXISTING WATERCOURSE
- INFERRED ALLUVIAL DEPOSITS (TERRACED SURFACES)
- INFERRED MUDSTONE - CLAY SHALE (NORTHLAND ALLOCHTHON)
- INFERRED SILTSTONE/SANDSTONE/LIMESTONE (NORTHLAND ALLOCHTHON)
- INFERRED GEOLOGICAL CONTACT
- INFERRED RELIC DORMANT FEATURE
- INFERRED ZONE OF ACTIVE EARTH MOVEMENT/CREEP
- HUMMOCKY TOPOGRAPHY

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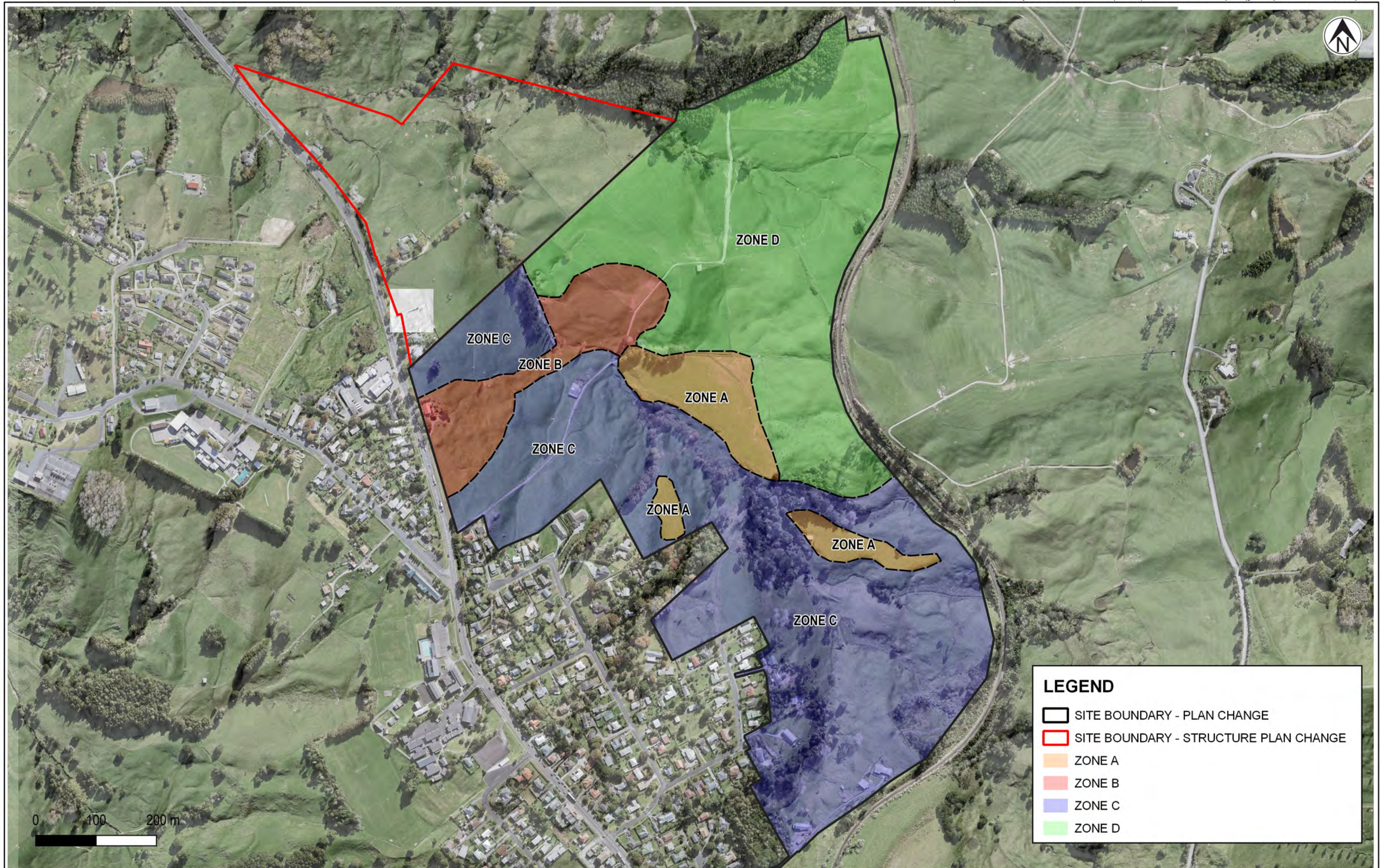
**NOTES:**  
 AERIAL PHOTO AND LIDAR DATA SOURCED FROM LINZ, LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 NEW ZEALAND LICENSE (CC BY 4.0).  
 SITE BOUNDARY AND EXISTING WATERCOURSE INFERRED FROM B&A WELLSFORD MASTERPLAN INDICATIVE LOT/ LANDUSE LAYOUT. SHEET NA DATED 12/07/2021.

0	First version	JALA	MCHI	08/10/21
1	update for structure plan change	JALA	MCHI	06/04/22

PROJECT No. 1018519		
DESIGNED	JALA	APR.22
DRAWN	JALA	APR.22
CHECKED	MCHI	APR.22
MRT	APR.22	
APPROVED	DATE	

CLIENT	WELLSFORD WELDING CLUB LTD
PROJECT	WELLSFORD RESIDENTIAL DEVELOPMENT
TITLE	GEOLOGY AND GEOMORPHOLOGY PLAN
SCALE (A3)	1:5,750
FIG No.	FIGURE 2.
REV	1





**LEGEND**

- SITE BOUNDARY - PLAN CHANGE
- SITE BOUNDARY - STRUCTURE PLAN CHANGE
- ZONE A
- ZONE B
- ZONE C
- ZONE D



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**NOTES:**  
 AERIAL PHOTO AND LIDAR DATA SOURCED FROM LINZ, LICENSED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 NEW ZEALAND LICENSE (CC BY 4.0).  
 SITE BOUNDARY INFERRED FROM B&A WELLSFORD MASTERPLAN INDICATIVE LOT/LANDUSE LAYOUT. SHEET NA DATED 12/07/2021.

0	First version	JALA	MCHI	08/10/21
1	Update to include structure plan area	JALA	MCHI	06/04/22
REV	DESCRIPTION	GIS	CHK	DATE

PROJECT No. 1018519		
DESIGNED	JALA	APR.22
DRAWN	JALA	APR.22
CHECKED	MCHI	APR.22
MRT		APR.22
APPROVED	DATE	

CLIENT	WELLSFORD WELDING CLUB LTD
PROJECT	WELLSFORD RESIDENTIAL DEVELOPMENT
TITLE	ZONE MAP
SCALE (A3)	1:5,750
FIG No.	FIGURE 3.
REV	1





## Appendix B: Aerial photographs

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Figure B-5-1: 1961 Aerial photograph (Retrolens)



Figure B-5-2: 1966 Aerial photograph (Retrolens)



Figure B-5-3: 1976 Aerial photograph (Retrolens)



Figure B-5-4: 1982 Aerial photograph (Retrolens)





Figure B-5-5: 1992 Aerial photograph (Retrolens)



Figure B-5-6: 2006 Aerial photograph (Google Earth)





Figure B-5-7: 2010 Aerial Photograph (LINZ)



Figure B-5-8: 2014 Aerial Photograph (LINZ)





Figure B-5-9: 2017 Aerial Photograph (LINZ)



## **Appendix C: Geotechnical investigation logs**

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# Engineering log terminology

## General

Soil and rock descriptions follow the “Guidelines for the field classification and description of soil and rock for engineering purposes” by the New Zealand Geotechnical Society (2005). Refer to this document for methods of field determination.

<b>Water</b> <p>Water level on date shown</p> <p>Water inflow</p> <p>Water outflow</p>	<b>Graphic logs</b> <p>The graphic log shows soil and rock types. The defect log indicates the location, orientation and abundance of defects of all types.</p> <p><b>Typical material symbols:</b></p> <table border="0"> <tr> <td> Organic material</td> <td> Igneous rock</td> </tr> <tr> <td> Clay</td> <td> Mudstone</td> </tr> <tr> <td> Silt</td> <td> Siltstone</td> </tr> <tr> <td> Sand</td> <td> Sandstone</td> </tr> <tr> <td> Gravel or Conglomerate</td> <td> Metamorphic Rock</td> </tr> </table>	Organic material	Igneous rock	Clay	Mudstone	Silt	Siltstone	Sand	Sandstone	Gravel or Conglomerate	Metamorphic Rock	<b>Tests</b> <ul style="list-style-type: none"> <li><b>N=22:</b>SPT uncorrected blow count for 300 mm</li> <li><b>75/12:</b>Undrained shear strength (peak /residual as measured by field vane.</li> </ul> <p><b>Laboratory test(s) carried out:</b></p> <table border="1"> <tr><td><b>PMT</b></td><td>Pressuremeter test</td></tr> <tr><td><b>LT</b></td><td>Lugeon test</td></tr> <tr><td><b>LV</b></td><td>Laboratory vane</td></tr> <tr><td><b>AL</b></td><td>Atterburg limits</td></tr> <tr><td><b>UU</b></td><td>Undrained triaxial</td></tr> <tr><td><b>PSD</b></td><td>Particle size distribution</td></tr> <tr><td><b>c' Ø'</b></td><td>Effective stress</td></tr> <tr><td><b>CONS</b></td><td>Consolidation</td></tr> <tr><td><b>DS</b></td><td>Direct shear</td></tr> <tr><td><b>COMP</b></td><td>Compaction</td></tr> <tr><td><b>UCS</b></td><td>Unconfined compression</td></tr> <tr><td><b>IS<sub>50</sub></b></td><td>Point load</td></tr> </table>	<b>PMT</b>	Pressuremeter test	<b>LT</b>	Lugeon test	<b>LV</b>	Laboratory vane	<b>AL</b>	Atterburg limits	<b>UU</b>	Undrained triaxial	<b>PSD</b>	Particle size distribution	<b>c' Ø'</b>	Effective stress	<b>CONS</b>	Consolidation	<b>DS</b>	Direct shear	<b>COMP</b>	Compaction	<b>UCS</b>	Unconfined compression	<b>IS<sub>50</sub></b>	Point load
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<b>IS<sub>50</sub></b>	Point load																																			
<b>Core recovery</b> <p>Expressed as percentage of the length of the core run recovered.</p>	<b>Installation type</b> <table border="0"> <tr> <td> Standpipe</td> <td> Slotted screen</td> </tr> <tr> <td> VWP</td> <td> Bentonite seal</td> </tr> <tr> <td> Filter pack</td> <td></td> </tr> </table>	Standpipe	Slotted screen	VWP	Bentonite seal	Filter pack		<b>Sample type</b> <table border="0"> <tr> <td> SPT</td> <td> Core</td> </tr> <tr> <td> Thin-wall tube</td> <td> Other</td> </tr> <tr> <td> Bulk sample</td> <td> Core or Sample loss</td> </tr> </table>	SPT	Core	Thin-wall tube	Other	Bulk sample	Core or Sample loss																						
Standpipe	Slotted screen																																			
VWP	Bentonite seal																																			
Filter pack																																				
SPT	Core																																			
Thin-wall tube	Other																																			
Bulk sample	Core or Sample loss																																			

### Soil description

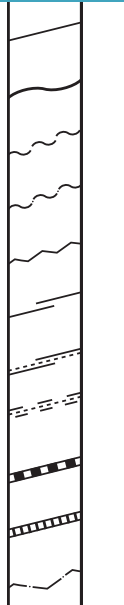
<b>Moisture content</b> <table border="1"> <tr><td><b>D</b></td><td>Dry, looks and feels dry</td></tr> <tr><td><b>M</b></td><td>Moist, no free water on hand when remoulding</td></tr> <tr><td><b>W</b></td><td>Wet, free water on hand when remoulding</td></tr> <tr><td><b>S</b></td><td>Saturated, free water present on sample</td></tr> </table>	<b>D</b>	Dry, looks and feels dry	<b>M</b>	Moist, no free water on hand when remoulding	<b>W</b>	Wet, free water on hand when remoulding	<b>S</b>	Saturated, free water present on sample	<b>Consistency/undrained shear strength</b> <table border="1"> <thead> <tr> <th></th> <th></th> <th><b>S<sub>u</sub> (kPa)</b></th> </tr> </thead> <tbody> <tr><td><b>VS</b></td><td>Very soft</td><td>&lt; 12</td></tr> <tr><td><b>S</b></td><td>Soft</td><td>12 to 25</td></tr> <tr><td><b>F</b></td><td>Firm</td><td>25 to 50</td></tr> <tr><td><b>St</b></td><td>Stiff</td><td>50 to 100</td></tr> <tr><td><b>VSt</b></td><td>Very stiff</td><td>100 to 200</td></tr> <tr><td><b>H</b></td><td>Hard</td><td>&gt; 200</td></tr> </tbody> </table>			<b>S<sub>u</sub> (kPa)</b>	<b>VS</b>	Very soft	< 12	<b>S</b>	Soft	12 to 25	<b>F</b>	Firm	25 to 50	<b>St</b>	Stiff	50 to 100	<b>VSt</b>	Very stiff	100 to 200	<b>H</b>	Hard	> 200	<b>Density index</b> <table border="1"> <thead> <tr> <th></th> <th></th> <th><b>SPT(N) - uncorrected</b></th> </tr> </thead> <tbody> <tr><td><b>VL</b></td><td>Very loose</td><td>0 to 4</td></tr> <tr><td><b>L</b></td><td>Loose</td><td>4 to 10</td></tr> <tr><td><b>MD</b></td><td>Medium dense</td><td>10 to 30</td></tr> <tr><td><b>D</b></td><td>Dense</td><td>30 to 50</td></tr> <tr><td><b>VD</b></td><td>Very dense</td><td>&gt; 50</td></tr> </tbody> </table>			<b>SPT(N) - uncorrected</b>	<b>VL</b>	Very loose	0 to 4	<b>L</b>	Loose	4 to 10	<b>MD</b>	Medium dense	10 to 30	<b>D</b>	Dense	30 to 50	<b>VD</b>	Very dense	> 50
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Proportional terms definition (Coarse soils)			
Fraction	Term	% of soil mass	Example
Major	(UPPER CASE)	Major constituent	GRAVEL
Subordinate	(lower case)	> 20	Sandy
Minor	with some... with minor...	12 - 20 5 - 12	with some sand with minor sand
	with trace of... (or slightly)...	< 5	with trace of sand (slightly sandy)

Grain size criteria							
Type	Coarse				Fine		
	Boulders	Cobbles	Gravel	Sand	Silt	Clay	
			Coarse Medium Fine	Coarse Medium Fine			
Size range (mm)	200	60	20 6	2 0.6 0.2	0.06	0.002	



Significant defects	
<b>B</b>	Bedding
<b>J</b>	Joint
<b>Sc</b>	Schistosity
<b>Cl</b>	Cleavage
<b>BZ</b>	Broken zone/crushed zone
<b>F</b>	Fault
<b>Fg</b>	Fault with gouge
<b>SZ</b>	Shear zone
<b>Iz</b>	Infilled seam
<b>XD</b>	Extremely weathered seam
<b>DD</b>	Drilling - induced defect



Weathering	
<b>UW</b>	Unweathered
<b>SW</b>	Slightly weathered
<b>MW</b>	Moderately weathered
<b>HW</b>	Highly weathered
<b>CW</b>	Completely weathered
<b>RS</b>	Residual soil

Defect shape	
<b>ST</b>	Stepped
<b>UN</b>	Undulating
<b>PL</b>	Planar

Roughness of defect surface	
<b>R</b>	Rough
<b>SM</b>	Smooth
<b>SL</b>	Slickensided

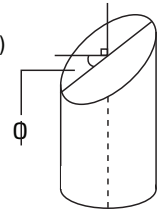
Field strength			
		UCS (MPa)	I <sub>s(50)</sub> (MPa)
<b>EW</b>	Extremely weak	< 1	N/A
<b>VW</b>	Very weak	1 - 5	N/A
<b>W</b>	Weak	5 - 20	N/A
<b>MS</b>	Moderately strong	20 - 50	1 - 2
<b>S</b>	Strong	50 - 100	2 - 5
<b>VS</b>	Very strong	100 - 250	5 - 10
<b>ES</b>	Extremely strong	> 250	> 10

**Defect coding**

Type: Angle (perpendicular to core axis) | Infilling description (as per soil description)

**J 60°, PL, SL, T, CV, STIFF GREEN CLAY**

- Infilling/coating type
- Aperture
- Roughness
- Shape



**Defect Orientation:** for vertical unoriented boreholes defect orientation is measured normal to core axis e.g horizontal = 0°(see diagram). For angled boreholes defect orientation is measured relative to core axis e.g parallel to core axis = 0°.

Aperture		
		Aperture (mm)
<b>T</b>	Tight	nil
<b>VN</b>	Very narrow	0 - 2
<b>N</b>	Narrow	2 - 6
<b>MN</b>	Moderately narrow	6 - 20
<b>MW</b>	Moderately wide	20 - 60
<b>W</b>	Wide	60 - 200
<b>VW</b>	Very wide	> 200

Infillings and coatings		
<b>CG</b>	Clay gouge	Joints have openings between opposing faces of intact rock substance in excess of 1 mm filled with clay gouge. Clay is generally described in terms of soil properties.
<b>CV</b>	Clay veneers	Joints contain clay coating whose maximum thickness does not exceed 1 mm. Note: Describe clay in terms of soil properties.
<b>PL</b>	Penetrative limonite	Joint traces are marked in terms of well defined zones of slightly to moderately weathered ferruginised rock-substance within the adjacent rock.
<b>FeSt</b>	Limonite stained	Joint surfaces are stained or coated with limonite, although the rock substance immediately adjacent to the joints is fresh.
<b>CT, SC</b>	Coated	Joints exhibit coatings other than clay or limonite, e.g. Carbonate (CT) or Silica (SC).
<b>CL, CS, CC</b>	Cemented	Joints are cemented with limonite (CL), Silica (CS), or Carbonates (CC).
<b>CN</b>	Clean	Joint surface show no trace of clay, limonite, or other coatings.

Spacing	
Term	Spacing
Very wide	> 2 m
Wide	0.6 - 2 m
Moderately wide	200 - 600 mm
Close	60 - 200 mm
Very close	20 - 60 mm
Extremely close	> 20 mm

Excavator penetration	
Easy	1
Moderate	2
Difficult	3

**RQD:** Rock Quality Designation - percentage of core run consisting of sound rock longer than 10 cm.



# EXCAVATION LOG

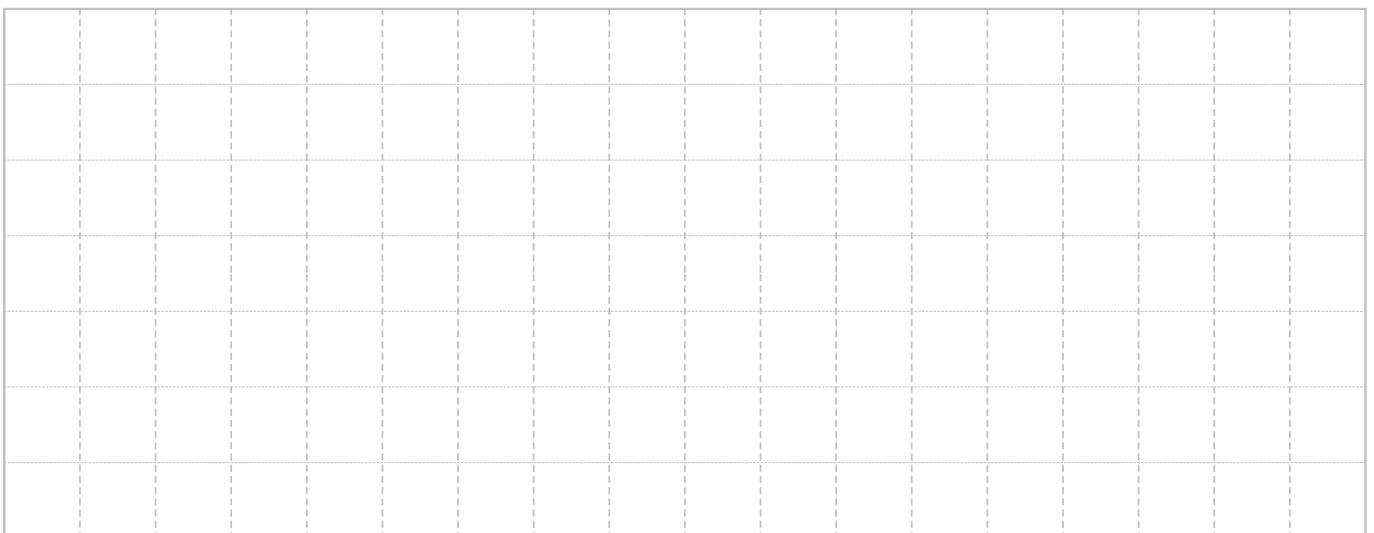
Excavation Id.: **TP01\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983629 mN (NZTM2000) 1736665 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 31.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			● UTP ● UTP ● UTP ● UTP		0.00 0.5 1.0 1.5	<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.20m: SILT, some clay; light brown black oxide stained. Very stiff, moist, medium to high plasticity. (RESIDUAL MAHURANGI LIMESTONE).</p> <p>0.50m: GRAVEL, minor silt; light brown. Tightly packed, moist. Gravel, angular, to 100mm. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).</p> <p>1.00m: GRAVEL; light grey. Tightly packed, moist. (UNDIFFERENTIATED MAHURANGI LIMESTONE)</p> <p>1.30 - 1.50m: White, light grey.</p>			10 25 50 100 200		TS	
		DRY 13/10/2021			2.0 2.5 3.0 3.5 4.0 4.5	1.5m: END OF INVESTIGATION. Difficult to excavate.						Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
1.5m

# EXCAVATION LOG

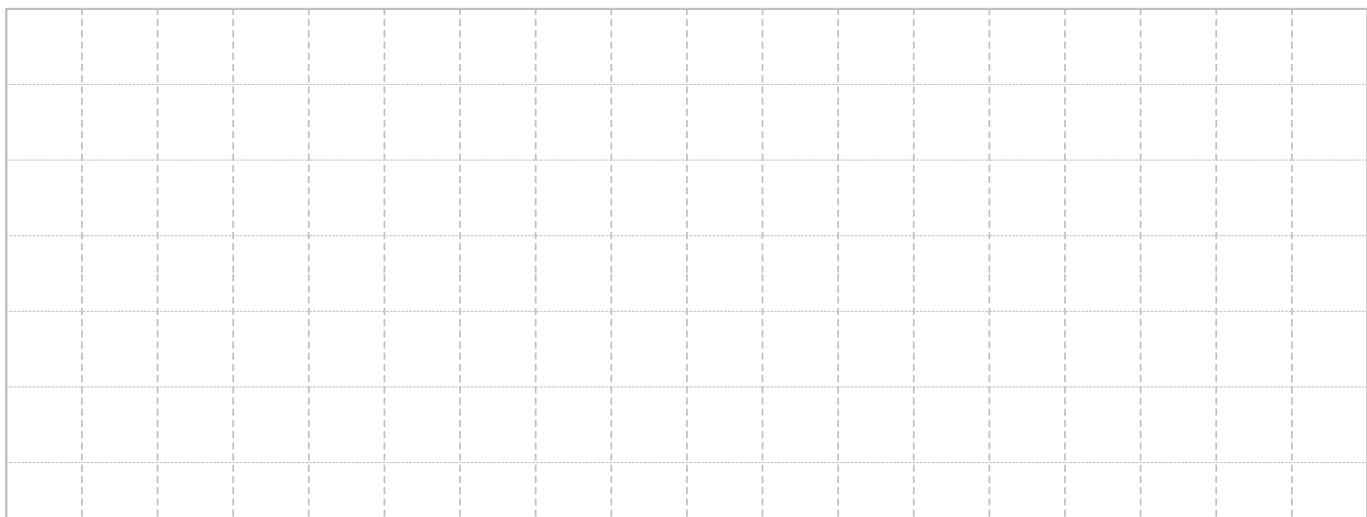
Excavation Id.: **TP02\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES:	5983454 mN (NZTM2000) 1736581 mE	EXPOSURE METHOD:	TP	EXCAV. STARTED:	13/10/2021
R.L.:	47.00m	EQUIPMENT:	14 Tonne Zaxis	EXCAV. FINISHED:	13/10/2021
DATUM:	NZVD2016	OPERATOR:	Mason Contractors	LOGGED BY:	LPA
		DIMENSIONS:	5m by 1.2m	CHECKED BY:	J AEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3										
				0.5	0.00m: Organic SILT. (TOPSOIL). 0.10m: SILT, some clay; grey and dark yellow. Very stiff, moist, medium to high plasticity, with few fibrous roots. (RESIDUAL SOIL).	M		Vst		TS
				1.0	0.80 - 1.00m: Clayey SILT; light grey. 1.00 - 1.40m: Grades to SILT, some clay; grey with light brown.					
				1.5	1.40m: SILT; grey and light brown. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MUDSTONE).			St		
				2.0	1.90m: some gravel, up to 40mm, completely weathered (core-stones); saturated					
				2.5	2.50 - 4.00m: Recovered as gravelly SILT					
				3.0	2.80 - 3.20m: Grey stained red, very stiff.					
				3.5	3.20 - 3.60m: Grey stained red, hard.					
				4.0	3.60 - 4.00m: Grey stained red, hard. With pockets of gravel, highly weathered, white.					
				4.5	4.00m: GRAVEL; grey, fissured (slickensided). Tightly packed, moist. Gravel, mudstone fragments. (UNDIFFERENTIATED MUDSTONE).					
				4.6	4.6m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.6m

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983316 mN (NZTM2000) 1736633 mE		EXPOSURE METHOD: TP		EXCAV. STARTED: 12/10/2021	
R.L.: 56.00m		EQUIPMENT: 14 Tonne Zaxis		EXCAV. FINISHED: 12/10/2021	
DATUM: NZVD2016		OPERATOR: Mason Contractors		LOGGED BY: LPA	
		DIMENSIONS: 5m by 1.2m		CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3						0.00m: Organic SILT. (TOPSOIL).					TS
			● 104/- kPa Sample 1 @ 0.60m ● 116/- kPa	0.5		0.30m: Clayey SILT; light grey and yellow with faint organic staining, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	Vst			Northland Allocthon
			● 193/- kPa	1.0							
			● UTP	1.5		1.30m: SILT, some clay; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).		H			
			● UTP Sample 2 @ 1.80m	2.0		1.60 - 2.60m: Recovered as gravel with tight, oxide stained fissure planes..					
			● UTP	2.5		2.20 - 2.60m: Grading to Highly Weathered.					
			● UTP	2.5							
				3.0		2.6m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS: Slumped slopes. Rushes and surface water. Large macrocarpa stumps.

 Hole Depth  
2.6m



# EXCAVATION LOG

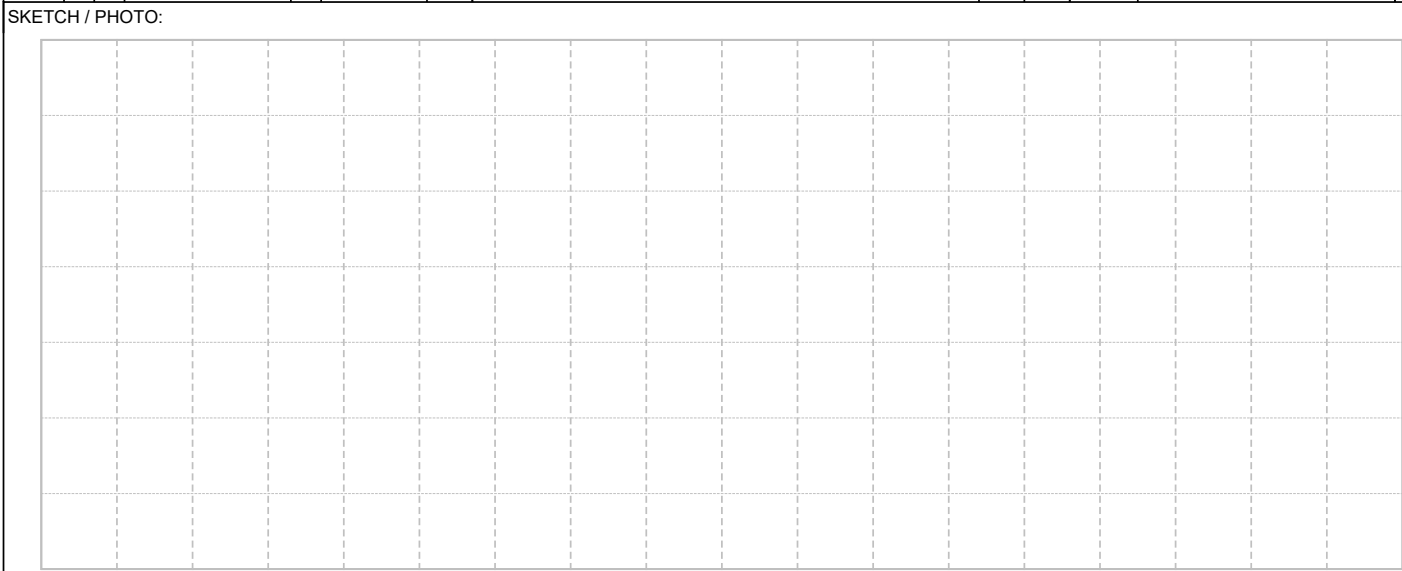
Excavation Id.: **TP04\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983346 mN (NZTM2000) 1736893 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 43.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3						0.00m: Organic SILT. (TOPSOIL).				TS
			● 107/- kPa ● 112/- kPa Sample 1 @ 0.70m ● 136/- kPa	0.5		0.20m: Clayey SILT, some fibrous roots; light brown and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	Vst		
		14/10/2021		1.0		0.80 - 1.30m: Light grey and yellow. 1.10 - 1.30m: Wet.				
			● 125/- kPa Sample 2 @ 1.60m ● >222 kPa	1.5		1.30m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED MUDSTONE).	W			
			● >222 kPa ● >222 kPa ● >222 kPa	2.0		1.60 - 4.00m: Hard.	M			
			● 190/- kPa ● UTP	2.5						
			● UTP Sample 3 @ 3.70m ● UTP	3.0		2.80 - 3.00m: Some gravel. Gravel, up to 40mm, corestones.				
				3.5						
				4.0		4m: END OF INVESTIGATION. Difficult to excavate.				
				4.5						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4m

# EXCAVATION LOG

Excavation Id.: **TP05\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983405 mN (NZTM2000) 1736771 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021			
R.L.: 41.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS		ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m: Organic SILT. (TOPSOIL).				TS
		12/10/2021 Slow inflow at 1.0mbgl		0.30m: SILT, some clay; light grey and yellow with faint organic staining, blocky. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M			Northland Allocthon
		● 92/- kPa Sample 1 @ 0.50m ● 89/- kPa	40	1.00m: Clayey SILT; light yellow and grey. Stiff, wet, medium to high plasticity. (RESIDUAL SOIL).	W			
		● 89/- kPa ● 86/- kPa Sample 2 @ 1.60m ● 76/- kPa	39	1.30m: SILT; grey with dark yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M			
		● 64/- kPa ● 73/- kPa ● UTP	39	1.80m: SILT; grey. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).				
		● UTP	37	2.30 - 2.70m: Hard.				
			38	2.7m: END OF INVESTIGATION				
			35					
			4.0					
			4.5					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
2.7m

# EXCAVATION LOG

Excavation Id.: **TP06\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983507 mN (NZTM2000) 1736790 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 28.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	0.00m: Organic SILT. (TOPSOIL).					TS
			● 87/- kPa Sample 1 @ 0.60m ● 93/- kPa	0.5	0.20m: SILT, some clay; light grey and yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M		St		
			● 85/- kPa ● 103/- kPa	1.0	0.70 - 2.00m: Clayey SILT.					
			Sample 2 @ 1.80m ● 87/- kPa	2.0	2.00m: Clayey SILT; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).					
			● 74/- kPa	2.5	2.50 - 2.90m: Hard.					
			● UTP	3.0	2.90m: Gravelly SILT; grey and brown, blocky. Hard, moist. Gravel, up to 40mm, siltstone rock fragments. (COMPLETELY WEATHERED SILTSTONE).			H		
			● UTP	3.5						
			● UTP	4.0	3.7m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.7m

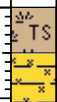


# EXCAVATION LOG

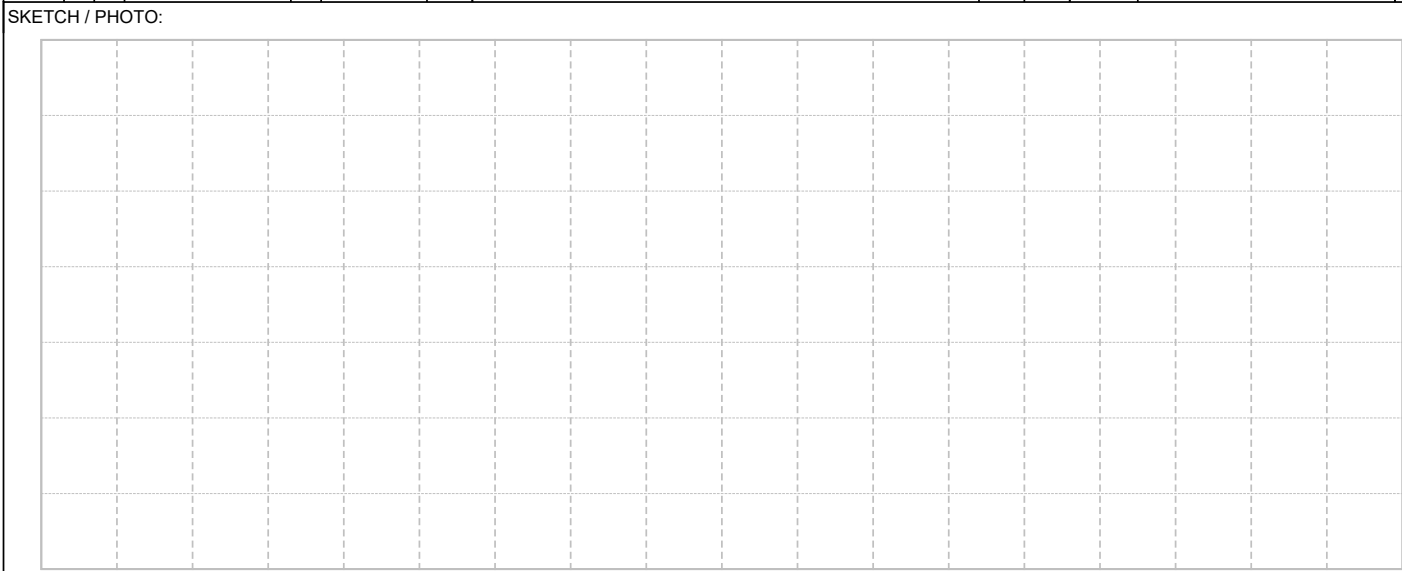
Excavation Id.: **TP07\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983737 mN (NZTM2000) 1736702 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021	
R.L.: 25.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021	
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA	
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL							
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3											10 25 50 100 200		
			● 112/- kPa Sample 1 @ 0.40m		0.5		0.00m: Clayey SILT. (TOPSOIL).			vst			TS
			● 116/- kPa				0.25m: Clayey SILT; light grey and light brown. Very stiff, moist, medium plasticity. (RESIDUAL SOIL).	M					
			● 128/- kPa	24	1.0		0.80 - 1.90m: Light grey and yellow.						
			● 96/- kPa										
			● 128/- kPa		1.5								
			● 106/- kPa		2.0		1.90m: SILT, some clay; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
			Sample 2 @ 2.10m	23									
			● 112/- kPa		2.5								
			● 122/- kPa		3.0		2.70 - 4.10m: Grey. Stiff.			st			
			● 80/- kPa	22									
			Sample 3 @ 3.50m		3.5								
			● 84/- kPa		4.0		4.10m: Gravelly SILT; light grey and green. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE).			H			
			● UTP	21	4.5		4.4m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:


Hole Depth  
4.4m

# EXCAVATION LOG

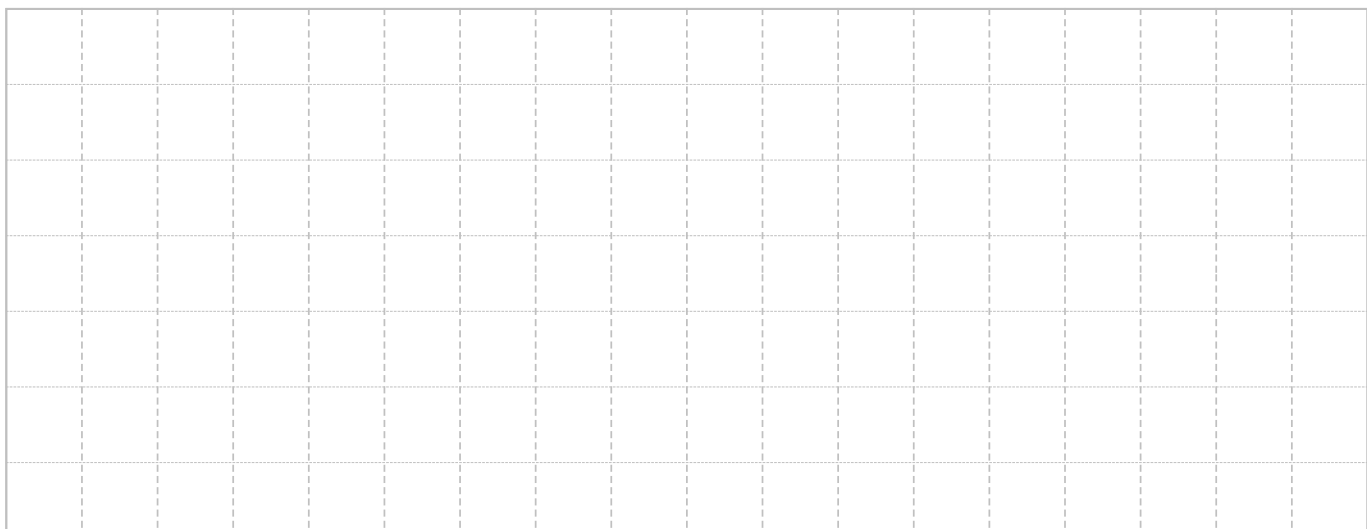
Excavation Id.: **TP08\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983674 mN (NZTM2000) 1736844 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021			
R.L.: 33.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 104/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 112/- kPa</li> <li>● 125/- kPa</li> <li>● 132/- kPa</li> <li>● 119/- kPa</li> <li>● Sample 2 @ 1.80m</li> <li>● 100/- kPa</li> <li>● 106/- kPa</li> <li>● 84/- kPa</li> <li>● 74/- kPa</li> <li>● 67/- kPa</li> <li>● 76/- kPa</li> </ul>	32	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: Clayey SILT; grey and light grey with pockets of organic staining. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; grey and light grey with pockets of organic staining. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>1.90m: Clayey SILT, trace decomposed rootlets; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.50 - 4.50m: Trace decomposed tubular roots.</p>	M		Vst	<ul style="list-style-type: none"> <li>0</li> <li>25</li> <li>50</li> <li>75</li> <li>100</li> <li>200</li> </ul>		TS
							4.8m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

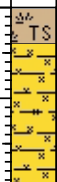


Hole Depth  
4.8m

# EXCAVATION LOG

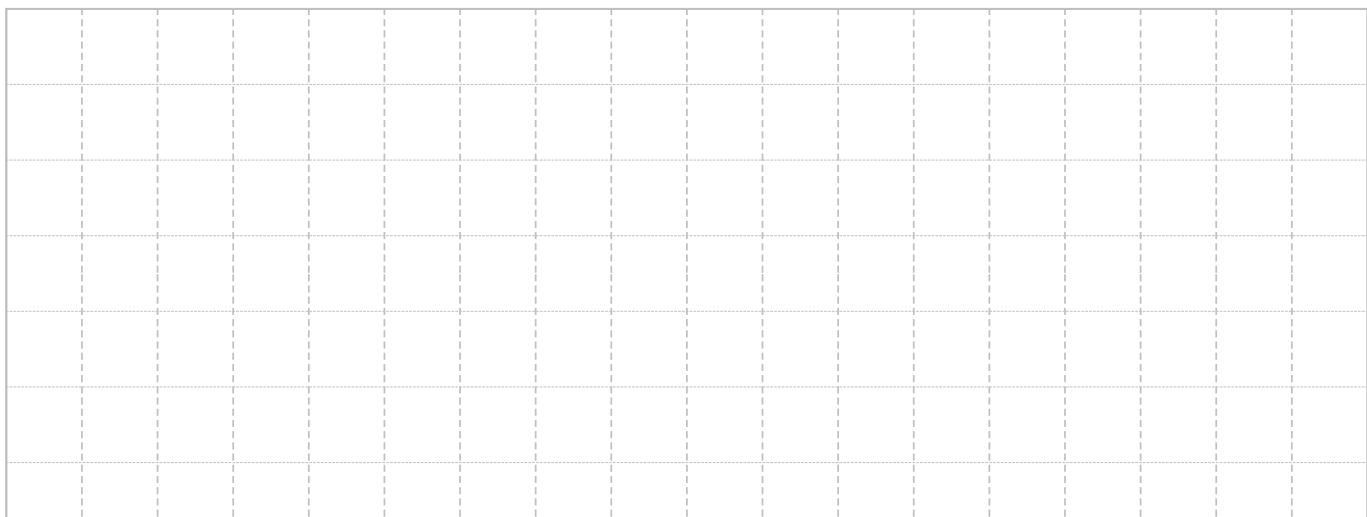
Excavation Id.: **TP09\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983515 mN (NZTM2000) 1736957 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3							0.00m: Organic SILT. (TOPSOIL).						Top
			Sample 1 @ 0.90m	29	0.5		0.20m: Clayey SILT; yellow. Very stiff, moist, medium to high plasticity.	M		Vst			Alluvial Deposits
			Sample 2 @ 2.40m	28	2.0		2.70m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.			St			
			Sample 3 @ 4.00m	26	4.0		3.50 - 4.70m: Very stiff.			Vst			
					4.5		4.7m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.7m



# EXCAVATION LOG

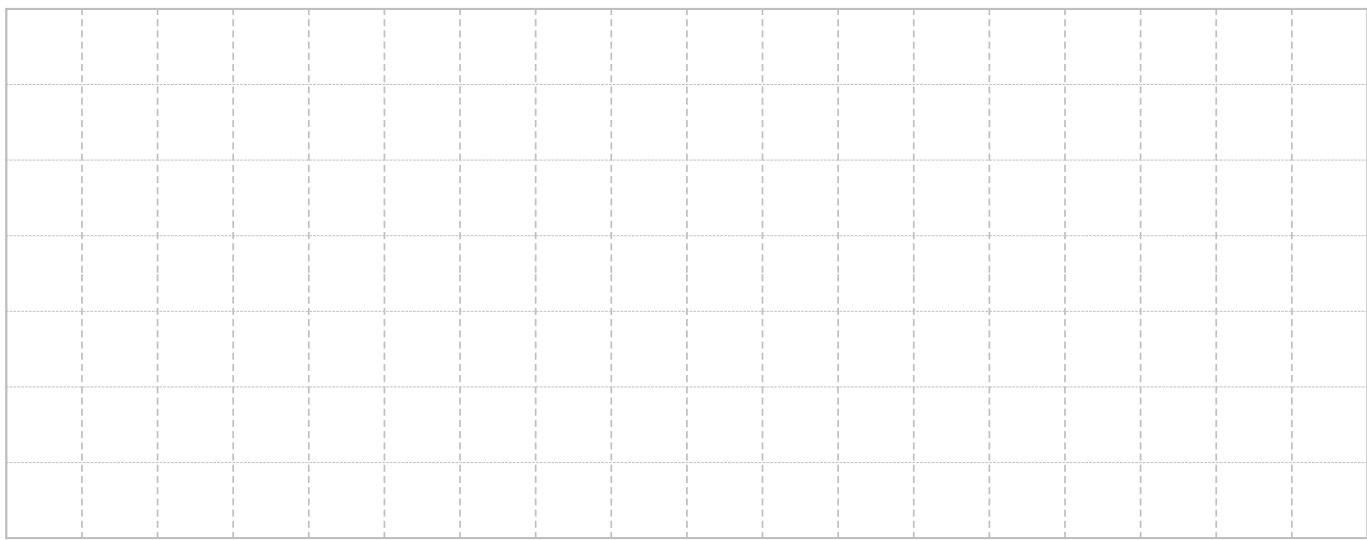
Excavation Id.: TP10\_2021

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983029 mN (NZTM2000) 1737247 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3					0.00m: Organic SILT. (TOPSOIL).				TS
			● 64/- kPa ● 74/- kPa Sample 1 @ 0.60m	0.5	0.20m: Clayey SILT; yellow and light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	St		
			● 80/- kPa ● 67/- kPa ● 106/- kPa ● 125/- kPa ● 128/- kPa ● 177/- kPa	1.0 1.5 2.0	1.30 - 2.60m: Grey stained yellow. Very stiff.		Vst		
			● >222 kPa Sample 2 @ 2.60m ● UTP	2.5 3.0	2.60m: SILT; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE). 2.80m: Highly to completely weathered, grey, blocky, SILTSTONE. Extremely weak (hard).		H		
			● UTP ● UTP	3.5	3.40 - 3.60m: Highly weathered. Slicksided fissure planes.				
				4.0	3.6m: END OF INVESTIGATION				
				4.5					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.6m

# EXCAVATION LOG

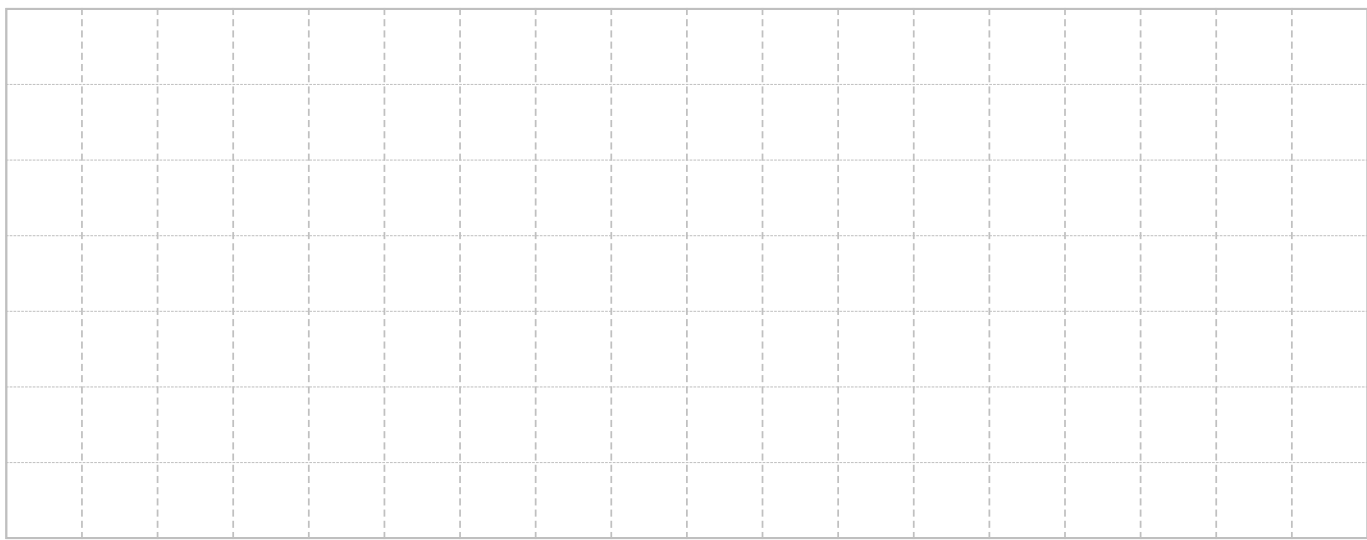
Excavation Id.: **TP11\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983438 mN (NZTM2000) 1737134 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00	0.00m: Organic SILT. (TOPSOIL).	M		Vst	0		TS
				0.10	0.10m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).				25		
				0.50	0.50m: SILT; white. Hard, moist, medium plasticity. (RESIDUAL SOIL).			H	60		
				0.70	0.70m: Clayey SILT; light yellow and grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			Vst	200		
				1.30 - 2.50	1.30 - 2.50m: Light grey and yellow.						
				2.50	2.50m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
				3.20 - 3.50	3.20 - 3.50m: Some clay.						
				3.50	3.50m: SILT, some clay; grey stained dark brown. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED SILTSTONE/MUDSTONE).						
				4.6	4.6m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

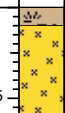


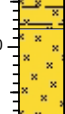
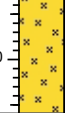



Hole Depth  
4.6m

# EXCAVATION LOG

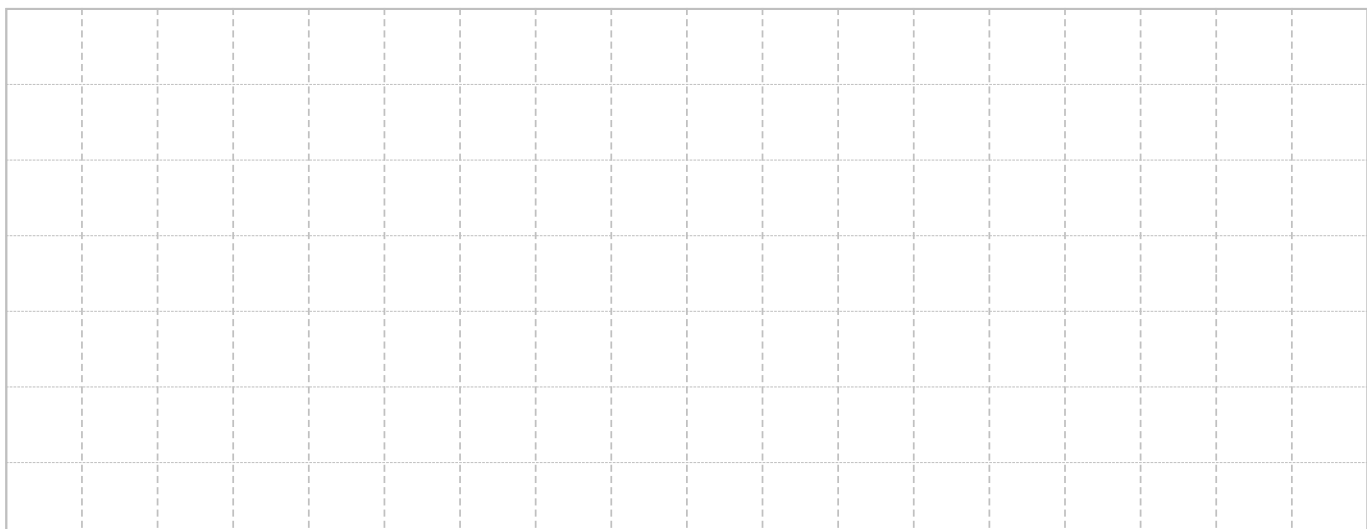
Excavation Id.: **TP12\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983472 mN (NZTM2000) 1737220 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 53.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3											0 25 50 75 100 200		
			● 77/- kPa Sample 1 @ 0.30m		0.5		0.00m: Organic SILT. (TOPSOIL). 0.10m: SILT; orange. Stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).	M		St			TS
			● 112/- kPa				0.60m: Clayey SILT; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			vst			
			● 103/- kPa	52	1.0		1.30 - 2.90m: Stiff.						
			● 109/- kPa										
			● 93/- kPa		1.5								
			● 93/- kPa										
			● 80/- kPa Sample 2 @ 2.20m	51	2.0		2.20 - 2.90m: Grey.						
			● 98/- kPa		2.5								
			● UTP										
			● UTP	50	3.0		2.90m: SILT, some clay; grey stained brown, blocky. Hard, moist, medium to high plasticity. (COMPLETELY WEATHERED SILTSTONE/MUDSTONE).			H			
			● UTP Sample 3 @ 3.50m		3.5		3.60 - 4.30m: Slicksided fissure planes.						
			● UTP										
			● UTP	49	4.0								
							4.3m: END OF INVESTIGATION						
					4.5								

SKETCH / PHOTO:

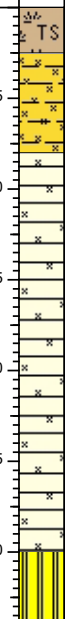


COMMENTS:

Hole Depth  
4.3m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983660 mN (NZTM2000) 1737164 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 50.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 103/- kPa Sample 1 @ 0.30m</li> <li>● 96/- kPa</li> <li>● 89/- kPa</li> <li>● 89/- kPa</li> <li>● 93/- kPa</li> <li>● 90/- kPa Sample 2 @ 1.90m</li> <li>● 98/- kPa</li> <li>● 133/- kPa</li> <li>● 116/- kPa</li> <li>● UTP Sample 3 @ 3.20m</li> <li>● UTP</li> </ul>	49	0.5		<p>0.00m: Clayey SILT. (TOPSOIL).</p> <p>0.25m: Clayey SILT; yellow and light grey, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; light grey stained yellow, blocky. Stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.25 - 3.00m: Very stiff.</p> <p>3.00m: Highly weathered, grey and green, SILTSTONE. Extremely weak (hard). (COMPLETELY WEATHERED SILTSTONE / MUDSTONE).</p>	M		Vst	10 25 50 100 200		TS
				48	2.0					St-Vst			Northland Allocthon
				47	3.0					H			
				46	3.5		3.4m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

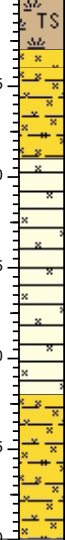
 Hole Depth  
3.4m

# EXCAVATION LOG

Excavation Id.: **TP14\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983963 mN (NZTM2000) 1737291 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 42.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● UTP</li> <li>● 109/- kPa Sample 1 @ 0.50m</li> <li>● 116/- kPa</li> <li>● 112/- kPa</li> <li>● 105/- kPa Sample 2 @ 1.50m</li> <li>● 95/- kPa</li> <li>● 90/- kPa</li> <li>● 109/- kPa</li> <li>● 119/- kPa Sample 3 @ 2.70m</li> <li>● 122/- kPa</li> </ul>	41	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin, cemented layer. (RESIDUAL SOIL).</p> <p>0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.90m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.20m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M	H Vst	10 25 50 100 200		TS
				30	3.0		3m: END OF INVESTIGATION					Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

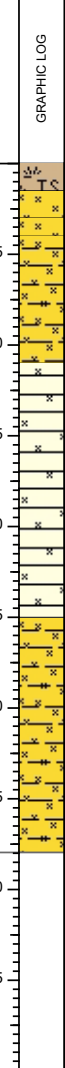
Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP15\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5984071 mN (NZTM2000) 1737278 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 45.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 64/- kPa</li> <li>● UTP</li> <li>● 116/- kPa</li> <li>Sample 1 @ 0.60m</li> <li>● 119/- kPa</li> <li>● 100/- kPa</li> <li>● 90/- kPa</li> <li>Sample 2 @ 2.10m</li> <li>● 122/- kPa</li> <li>● 135/- kPa</li> <li>Sample 3 @ 2.90m</li> <li>● 138/- kPa</li> </ul>	44	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.15m: SILT; light grey. Stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin cemented layer. (RESIDUAL SOIL).</p> <p>0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.10m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.50m: Clayey SILT; dark grey stained brown. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M		St	10-20		TS
				43	2.0					H			
				42	3.0					Vst			
				41	4.0		3.8m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.8m




# EXCAVATION LOG

Excavation Id.: **TP16\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983981 mN (NZTM2000) 1737003 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021			
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS		ENGINEERING DESCRIPTION				GEOLOGICAL							
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 137/- kPa</li> <li>Sample 1 @ 0.40m</li> <li>● 120/- kPa</li> <li>● 154/- kPa</li> <li>● 128/- kPa</li> <li>● 118/- kPa</li> <li>● 122/- kPa</li> <li>Sample 2 @ 1.90m</li> <li>● 106/- kPa</li> <li>● 109/- kPa</li> <li>Sample 3 @ 3.30m</li> <li>● 80/- kPa</li> <li>● 77/- kPa</li> </ul>	29	0.5		<p>0.00m: Clayey SILT. (TOPSOIL).</p> <p>0.20m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).</p> <p>0.50m: Clayey SILT; grey and dark yellow with black oxide stained fissure plains, fissured. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.10 - 1.30m: Dark yellow.</p> <p>1.30 - 1.90m: Light grey. With black oxide stained fissure plains.</p> <p>1.90m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.70m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M		Vst	<ul style="list-style-type: none"> <li>0</li> <li>25</li> <li>50</li> <li>75</li> <li>100</li> <li>125</li> <li>150</li> <li>175</li> <li>200</li> </ul>		TS
				27	4.0		3.8m: END OF INVESTIGATION			St			Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

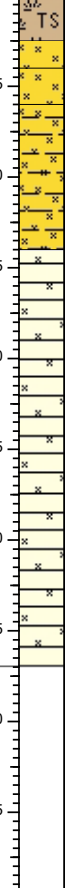
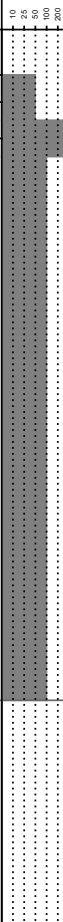
Hole Depth  
3.8m

# EXCAVATION LOG

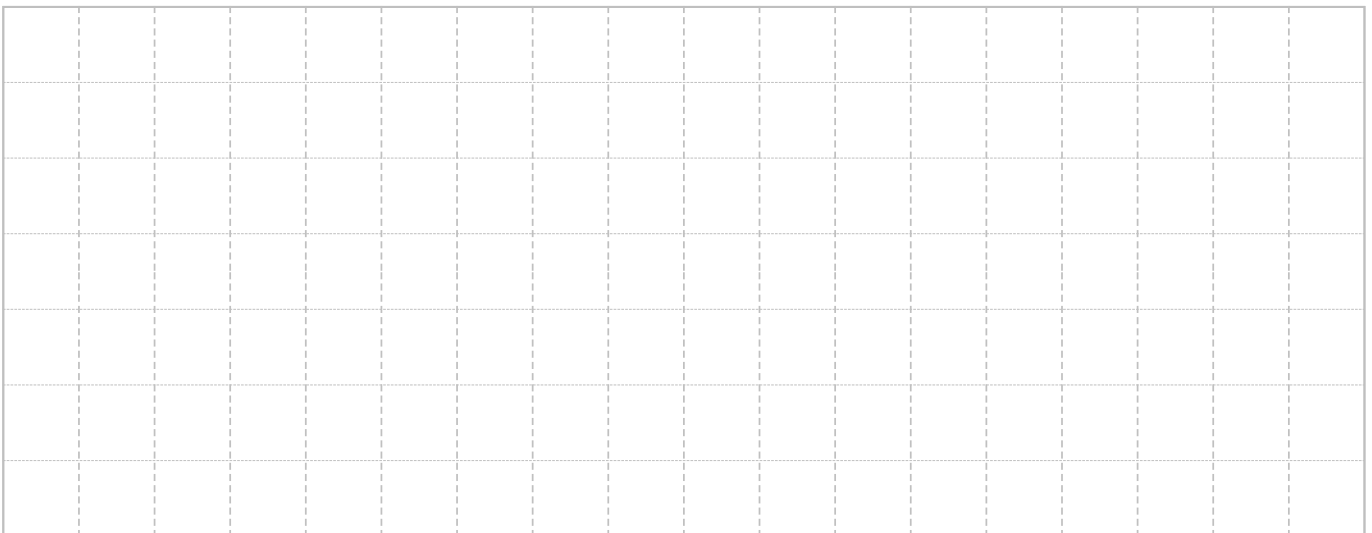
Excavation Id.: **TP17\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983852 mN (NZTM2000) 1736849 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 40.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 89/- kPa Sample 1 @ 0.40m</li> <li>● UTP</li> <li>● 109/- kPa Sample 2 @ 0.80m</li> <li>● 135/- kPa</li> <li>● 132/- kPa</li> <li>● 125/- kPa</li> <li>● 116/- kPa</li> <li>● 106/- kPa</li> <li>● 109/- kPa</li> <li>● 100/- kPa</li> </ul>	39	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.25m: SILT; orange. Stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).</p> <p>0.40m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).</p> <p>0.60m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.40m: Silty CLAY; light grey and yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.10 - 3.70m: Light grey stained yellow.</p>	M	vst H vst			TS
				36	4.0		3.7m: END OF INVESTIGATION					Northland Allcothron

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.7m

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983821 mN (NZTM2000) 1737003 mE		EXPOSURE METHOD: TP		EXCAV. STARTED: 12/10/2021	
R.L.: 36.00m		EQUIPMENT: 14 Tonne Zaxis		EXCAV. FINISHED: 12/10/2021	
DATUM: NZVD2016		OPERATOR: Mason Contractors		LOGGED BY: LPA	
		DIMENSIONS: 5m by 1.2m		CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3					0.00m: Organic SILT. (TOPSOIL).				TS
			● JTP Sample 1 @ 0.40m	0.5	0.20m: SILT, some clay; light grey and yellow. Hard, moist, medium to high plasticity. (RESIDUAL SOIL). 0.50 - 1.60m: Very stiff.	M	H		Northland Allocthon
			● 152/- kPa				Vst		
			● 103/- kPa	1.0	0.90m: Silty CLAY; light grey and yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).		Vst		
			● 109/- kPa	1.5					
		12/10/2021 Slow inflow	● 96/- kPa	2.0	1.60m: Clayey SILT, trace organics; light grey stained yellow. Stiff, moist, medium to high plasticity. Organics, decomposed tubular roots. (RESIDUAL SOIL).		St		
			Sample 2 @ 1.90m	34					
			● 93/- kPa	2.5					
			● 90/- kPa	3.0					
			Sample 3 @ 2.90m	33					
			● 84/- kPa	3.5					
				32	3.7m: END OF INVESTIGATION				
				4.0					
				4.5					

SKETCH / PHOTO:



COMMENTS:

 Hole Depth  
3.7m



# EXCAVATION LOG

Excavation Id.: **TP19\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North      LOCATION: Wellsford      JOB No.: 1018519.0000

CO-ORDINATES: 5983752 mN (NZTM2000) 1737118 mE      EXPOSURE METHOD: TP      EXCAV. STARTED: 12/10/2021

R.L.: 42.00m      OPERATOR: Mason Contractors      LOGGED BY: LPA

DATUM: NZVD2016      DIMENSIONS: 5m by 1.2m      CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 109/- kPa</li> <li>● 112/- kPa</li> <li>● Sample 1 @ 0.80m</li> <li>● 93/- kPa</li> <li>● 106/- kPa</li> <li>● 90/- kPa</li> <li>● 103/- kPa</li> <li>● Sample 2 @ 2.00m</li> <li>● 112/- kPa</li> <li>● 122/- kPa</li> <li>● UTP Sample 3 @ 2.70m</li> <li>● UTP</li> </ul>	41	0.00m	TS	0.00m: Organic SILT. (TOPSOIL).	M	Vst	0		TS
					0.5		0.20m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			25		
					1.0		0.90m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).			60		
					1.5		1.50 - 2.10m: Stiff.		St	100		
					2.0		2.10 - 2.70m: Hard.		H	200		
					2.5							
					3.0		2.70m: Highly weathered, grey with dark yellow stained fissures, fissured, SILTSTONE. Extremely weak (hard).					
					3.0		3m: END OF INVESTIGATION					
					3.5							
					38							
					4.0							
					4.5							

SKETCH / PHOTO:



COMMENTS:

Hole Depth 3m

# EXCAVATION LOG

Excavation Id.: **TP20\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983685 mN (NZTM2000) 1737065 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 38.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			● 112/- kPa				0.00m: Organic SILT. (TOPSOIL).						TS
			● 125/- kPa Sample 1 @ 0.50m		0.5		0.25m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist. (RESIDUAL SOIL).	M		vst			
			● 116/- kPa	37	1.0		0.70m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).						
			● 109/- kPa										
			● 96/- kPa Sample 2 @ 1.50m		1.5		1.50 - 1.70m: Stiff.			St			
			● 125/- kPa				1.70 - 2.70m: Very stiff.			vst			
			● 132/- kPa	36	2.0								
			● 119/- kPa Sample 3 @ 2.70m		2.5								
	DRY	12/10/2021	● UTP	35	3.0		2.70m: Highly weathered, grey with dark yellow stained fissures, fissured with striated surfaces, SILTSTONE. Extremely weak (hard).			H			
							3m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP21\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983732 mN (NZTM2000) 1736952 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 41.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00	0.00m: Organic SILT. (TOPSOIL).					TS
			● 109/- kPa	0.25	0.25m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).	M	vst			Northland Allocation
			● 93/- kPa Sample 1 @ 0.60m	0.50	0.50m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		st			
			● 125/- kPa	1.00						
			● 119/- kPa	1.50						
			● 125/- kPa	2.00	0.90 - 4.20m: Very stiff.		vst			
			● 122/- kPa Sample 2 @ 1.80m	2.50						
			● 100/- kPa	3.00						
			● 126/- kPa	3.50						
			Sample 3 @ 2.90m	4.00	4.20m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		st			
			● 119/- kPa	4.50						
			● 77/- kPa	5.00	5m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
5m



# EXCAVATION LOG

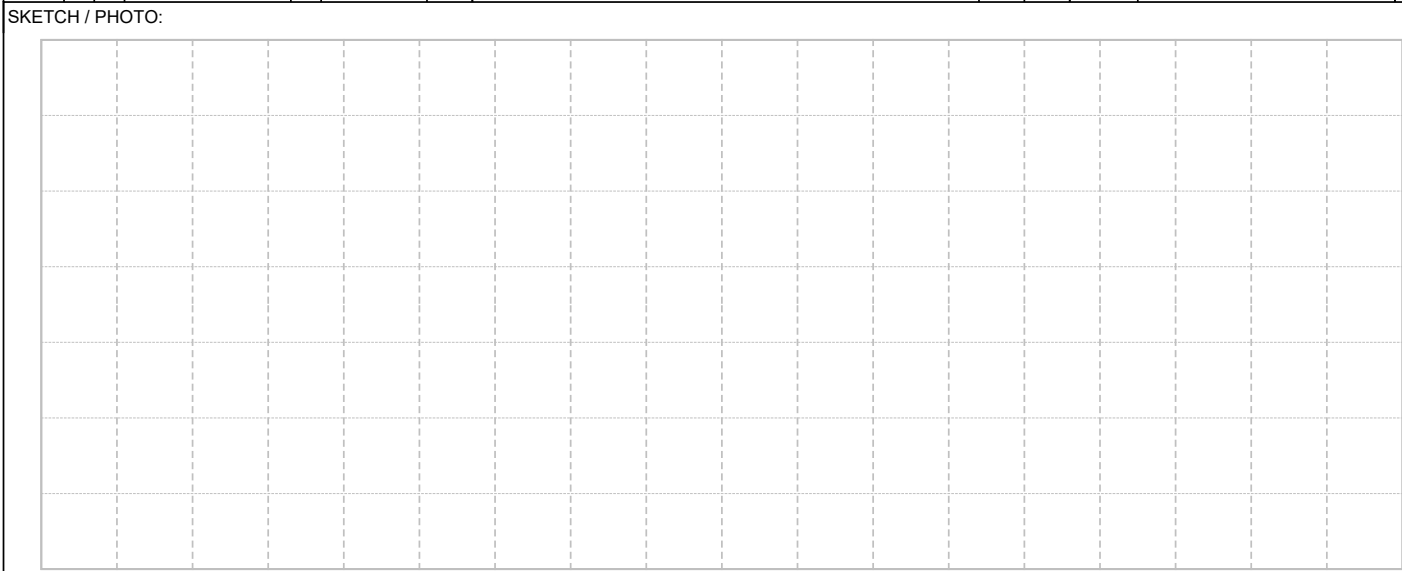
Excavation Id.: **TP22\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983549 mN (NZTM2000) 1737002 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS		ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	0.00m: Organic SILT. (TOPSOIL).						Top
			● 58/- kPa Sample 1 @ 0.30m	0.25m	0.25m: SILT, some clay; light brown and grey. Stiff, moist, medium to high plasticity.	M		St			1.0m: Sides collapsing
			● 86/- kPa	0.50m							
			● 84/- kPa	0.70m	0.70m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity.						
			Sample 2 @ 1.10m	1.10 - 2.90m	1.10 - 2.90m: Light grey stained yellow.						
			● 96/- kPa	1.50m							
			● 93/- kPa	2.00m							
			● 87/- kPa	2.50m	2.60 - 2.90m: Wet.			W			
			● 100/- kPa	3.00m	2.90m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.			M			
			● 93/- kPa	3.50m							
			● 100/- kPa	4.00m	3.70 - 4.60m: Very stiff.			Vst			
			● 77/- kPa	4.50m							
			● 84/- kPa Sample 3 @ 3.50m								
			● 109/- kPa								
			● 116/- kPa								
				4.6m	4.6m: END OF INVESTIGATION						Alluvial Deposits

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.6m



# EXCAVATION LOG

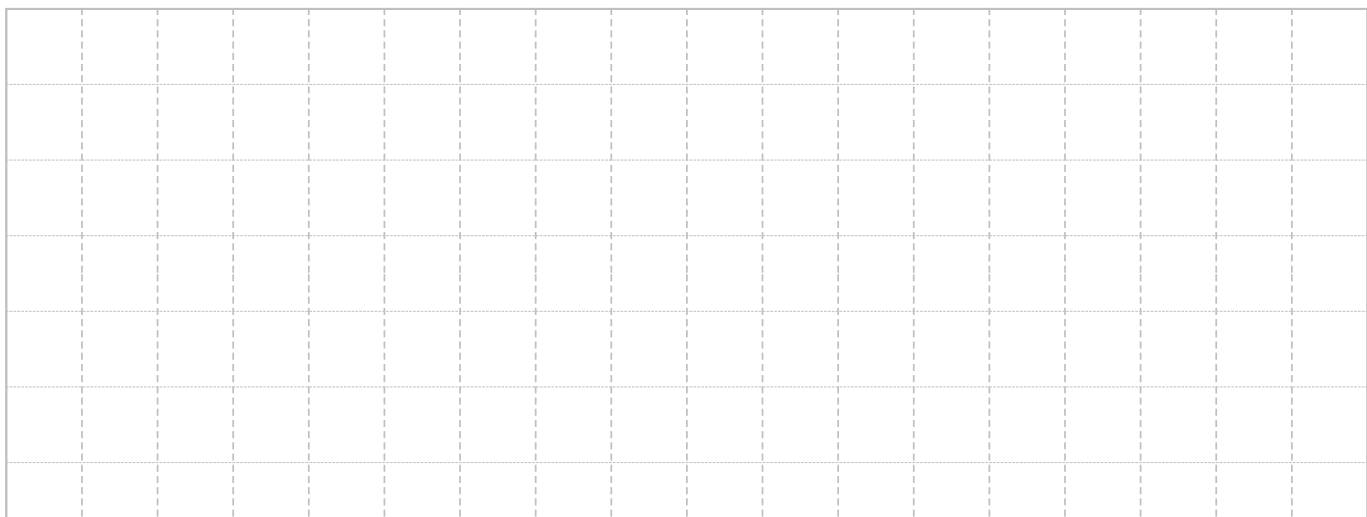
Excavation Id.: **TP24\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983251 mN (NZTM2000) 1737379 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 50.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS		ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m: Organic SILT. (TOPSOIL).				TS
			● 93/- kPa	0.20m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).	M	H		
			● 96/- kPa Sample 1 @ 0.70m	0.30m: Clayey SILT; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		Vst		
			● 109/- kPa	1.10 - 3.00m: With dark yellow staining.				
			● 148/- kPa					
			● 128/- kPa					
			● 112/- kPa Sample 2 @ 1.90m					
			● 136/- kPa					
			● 141/- kPa					
			● 148/- kPa					
			● UTP	3.00m: Completely weathered, grey, blocky and fissured with smooth polished surfaces, SILTSTONE. Extremely weak (hard).		H		
			● UTP Sample 3 @ 3.40m					
			● UTP					
			● UTP					
			● UTP	4.20m: Highly weathered, grey, blocky and fissured with smooth polished surfaces, SILTSTONE. Extremely weak (hard).				
			● UTP	4.5m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.5m



# EXCAVATION LOG

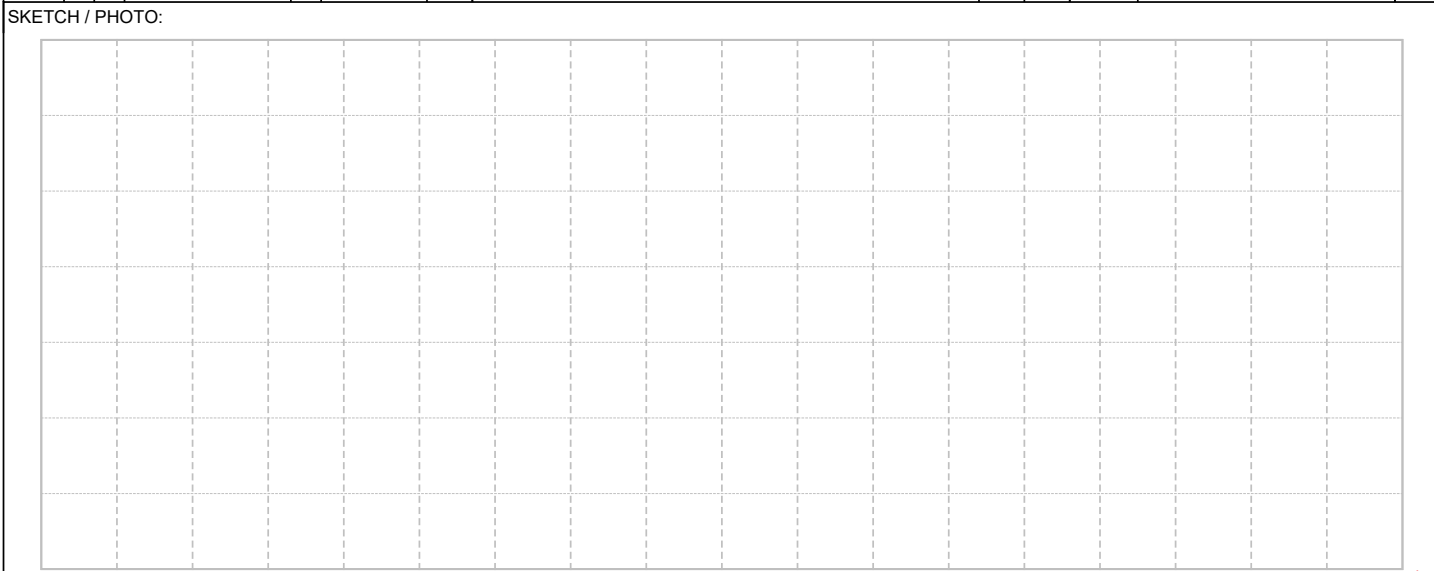
Excavation Id.: **TP25\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983155 mN (NZTM2000) 1737269 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3						0.00m: Organic SILT. (TOPSOIL).	M	H	0		
				0.5		0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).			25		
				1.0		0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Hard, moist, medium to high plasticity. (RESIDUAL SOIL).		St	100		
				1.5		0.90m: Silty CLAY, trace fibrous roots; yellow and light grey. Stiff, moist, high plasticity. (RESIDUAL SOIL).			150		
				2.0		2.00 - 3.00m: Very stiff.		vst	200		
				2.5		2.50 - 3.00m: Dark yellow stained layer.			250		
				3.0		3.00m: SILT; grey. Very stiff, moist, non-plastic to low plasticity. Near transition to granular behaviour. (COMPLETELY WEATHERED SILTSTONE). 3.40 - 3.50m: some gravel up to 50mm, corestones.			300		
				3.5		3.50m: Highly weathered, grey, fissured with planar polished surfaces, SILTSTONE. Extremely weak (hard).		H	350		
				4.0		4.3m: END OF INVESTIGATION			400		
				4.5					450		

SKETCH / PHOTO:



COMMENTS:

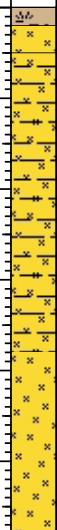
Hole Depth  
4.3m

# EXCAVATION LOG

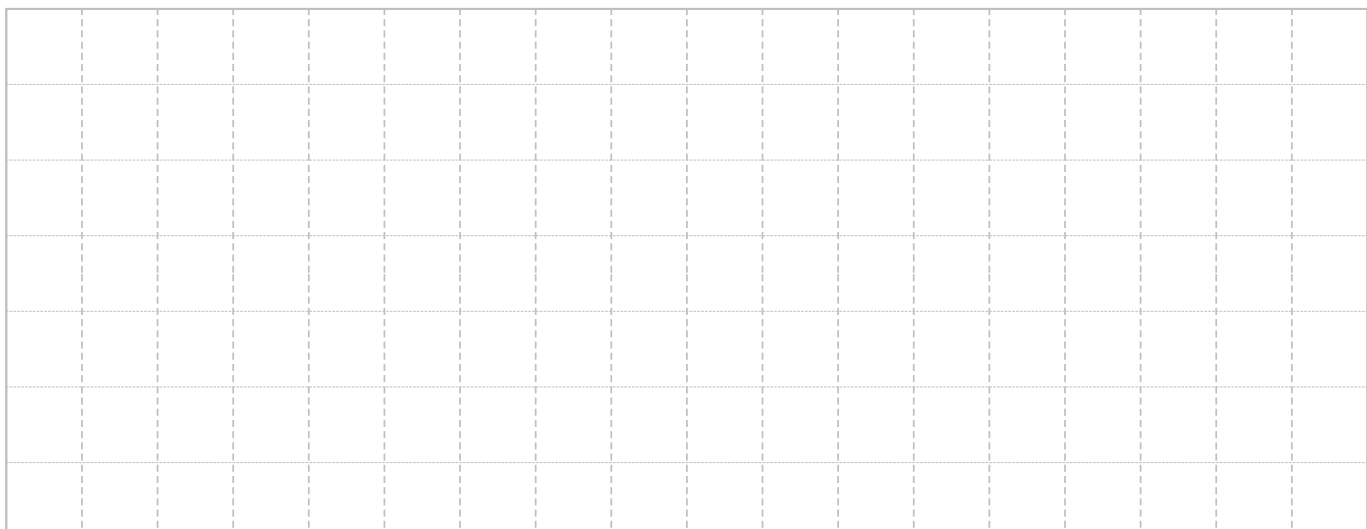
Excavation Id.: **TP26\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983111 mN (NZTM2000) 1737412 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 54.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 161/- kPa</li> <li>● &gt;222 kPa</li> <li>● 125/- kPa Sample 1 @ 0.90m</li> <li>● 100/- kPa</li> <li>● 100/- kPa</li> <li>● 126/- kPa</li> <li>● 141/- kPa</li> <li>● UTP Sample 2 @ 2.40m</li> <li>● UTP</li> <li>● UTP</li> </ul>	53	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer, (RESIDUAL SOIL).</p> <p>0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.00 - 1.90m: Some pockets of gravel; dark yellow and grey.</p> <p>1.60 - 1.90m: Wet.</p> <p>1.90m: SILT; grey with dark yellow, fissured (slickensided). Very stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>2.20 - 2.90m: Hard.</p>	M	H	H	10 25 50 100 200		TS
				52	2.0			W					Northland Allocation
				51	3.0		2.9m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth 2.9m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983570 mN (NZTM2000) 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH
		CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																			M	Vst		0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. Organics, rootlets (partially decomposed). (TOPSOIL)
Alluvium																			M / CW			0.30m: Clayey SILT, trace organics; light brownish orange mottled light grey. Very stiff, moist, low to medium plasticity. Organics, amorphous (carbonaceous) and fibrous (decomposed rootlets). (PLEISTOCENE ALLUVIUM).
																			M			1.00m: Clayey SILT, trace organics; orange brown streaked light grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).
Northland Allochthon																				VSt-H		1.50 - 1.80m: Very stiff to hard
																				H		1.80m: Silty CLAY; light grey streaked orange. Hard, moist, medium plasticity.
																						2.00m: CLAY, some silt; light grey streaked orange. Very stiff, moist, high plasticity.
																				St		3.00 - 3.30m: Grey. Stiff
																				VSt		3.30 - 3.90m: Very stiff
																				D		3.90m: CLAY, some silt and some gravel; grey. Very stiff, moist, medium plasticity. Gravel, fine, sub-angular, limestone.
																						4.70m: Gravelly SILT; grey, friable. Hard, dry, non-plastic. Gravel, fine, sub-angular, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).
																						4.70m: Hand auger terminated due to refusal at 4.70m bgl. Scala Penetrometer advanced at the base of the hole. (UNDIFFERENTIATED MAHURANGI LIMESTONE).
																						4.9m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 4.70m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 4.90m bgl. 3) GW inflow at 2.5m bgl. 4) GW level measured at 2.12m bgl after hand auger was completed. 5) SV #376 (correction factor 1.65).

Hole Depth 4.9m

HandAugerLog - 19/11/2021 5:43:26 pm - Produced with Core-GS by GeRoc Box 1.0.04.7m



# CORE PHOTOS

BOREHOLE No.: HA01\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983570 mN 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-4.70m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983527 mN (NZTM2000) 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL					ENGINEERING DESCRIPTION						
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DESCRIPTION AND ADDITIONAL OBSERVATIONS	
Topsoil						0.00			St	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).	
Northland Allochthon		100		81/35 kPa		0.5			St	0.10m: SILT, some clay, trace organics and trace sand; dark brown. Stiff, moist, medium plasticity. Sand, fine; organics, rootlets (decomposed).	
				71/38 kPa		1.0			St	0.40m: Silty CLAY; light grey mottled orange, bedded. Stiff, moist, high plasticity.	
				76/35 kPa		1.5			St	1.00 - 2.80m: Trace gravel; grades to red and grey. Gravel, fine, sub-rounded, limestone.	
				85/35 kPa		2.0			F-St	1.20 - 2.80m: Fissured (polished).	
				71/28 kPa		2.5			St	1.80 - 2.10m: Firm to stiff.	
				51/35 kPa		3.0			St	2.10 - 2.40m: Stiff.	
				88/26 kPa		3.5			St-VSt	2.40 - 2.70m: Stiff to very stiff.	
				101/63 kPa		4.0			St	2.70 - 3.00m: Stiff.	
				93/35 kPa		3.80					3.00m: Hand auger terminated due to refusal at 3.00m bgl. Scala Penetrometer advanced at the base of the hole.
						3.80					3.8m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 3.00 m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.80 m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth 3.8m

Scale 1:25

145

Rev.: A



# CORE PHOTOS

BOREHOLE No.: HA02\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983527 mN 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH





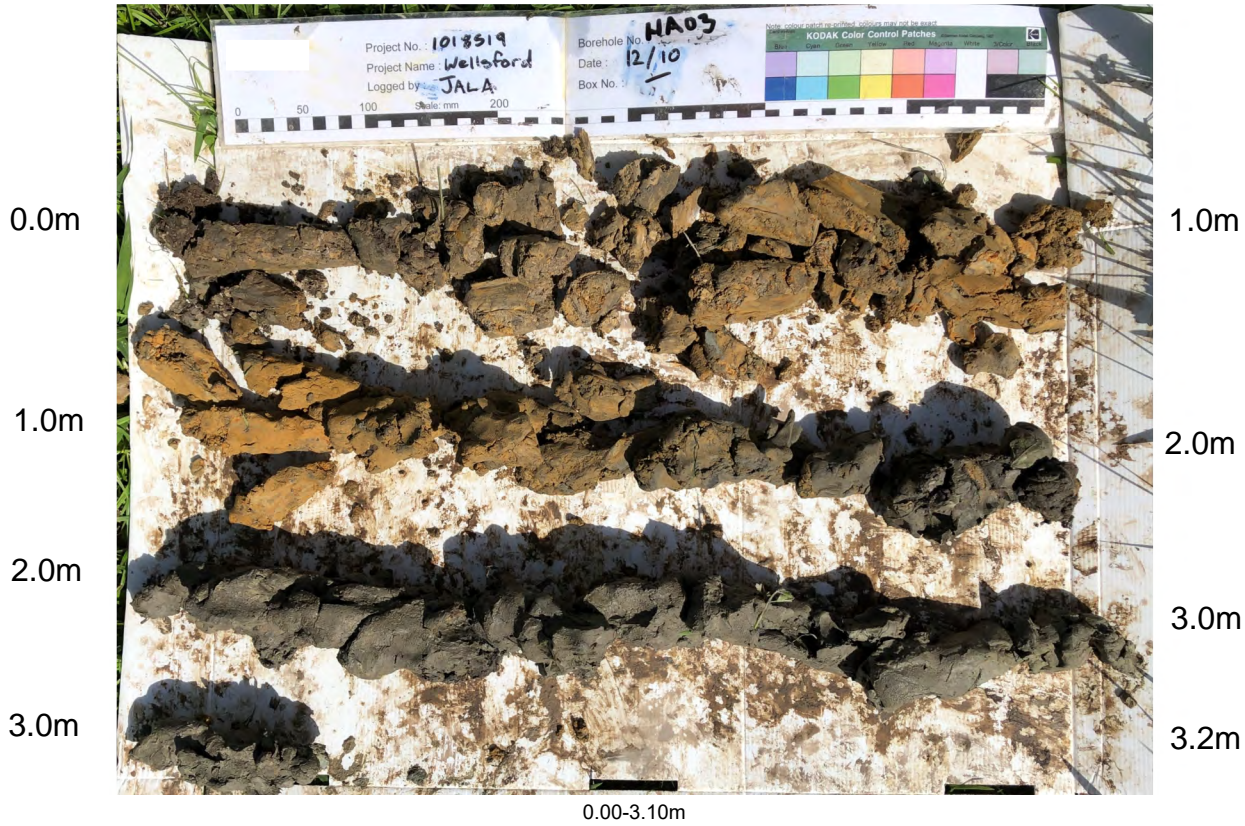
PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983445 mN (NZTM2000) 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION					
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	DESCRIPTION and Additional Observations		
Topsoil						0.00 - 0.05	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).		
Alluvium				● 135/53 kPa		0.05 - 0.50	0.05m: Silty CLAY, trace gravel; dark grey mottled orange. Very stiff, moist, medium plasticity. Gravel, fine, sub-rounded to sub-angular, sandstone. (PLEISTOCENE ALLUVIUM).		
				● 90/50 kPa		0.50 - 1.30m: Orange streaked dark grey.		0.60 - 1.30m: Stiff.	
Northland Allochthon	13/10/2021 WL at 1.51 m bgl at end of day.	100	HA	● 73/41 kPa		1.30 - 1.60	1.30m: Silty CLAY, trace sand; dark grey. Stiff, wet, high plasticity. Sand, fine.		
				● 80/38 kPa		1.60 - 2.20m: Stiff to very stiff.			
				● 101/46 kPa		2.20 - 2.50	2.20m: CLAY, trace sand; dark grey mottled blue. Very stiff, saturated, high plasticity. Sand, fine.		
				● 103/50 kPa		2.50 - 3.10m: Stiff.			
				● 110/60 kPa		3.10 - 3.10m	3.10m: Very stiff.		
				● 78/35 kPa		3.10m: Hand auger terminated due to refusal at 3.10m bgl. Scala Penetrometer advanced at the base of the hole.			
				● 135/26 kPa		4.30 - 4.30m	4.3m: END OF BOREHOLE. Refuse.		

COMMENTS: 1) Hand Auger terminated at 3.10m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 4.30m bgl. 3) Groundwater level measured at 1.51m bgl. 4) SV #111 (correction factor 1.69).

Hole Depth 4.3m

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983445 mN 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION			
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	DESCRIPTION AND ADDITIONAL OBSERVATIONS
Topsoil						0.00 - 0.10	0.00m: SILT, minor organics and minor clay and minor sand; dark brown. Stiff, wet, medium plasticity. Sand, fine. (TOPSOIL).
Northland Allochthon	100	HA		<ul style="list-style-type: none"> <li>68/33 kPa</li> <li>60/20 kPa</li> <li>51/26 kPa</li> </ul>		0.10 - 1.30	0.10m: Silty CLAY, trace sand; dark brown streaked reddish orange, fissured. Stiff, moist, high plasticity. Sand, fine. (RESIDUAL MAHURANGI LIMESTONE).  0.70 - 1.30m: Light grey streaked orange.  0.90 - 1.30m: Firm to stiff.
	0	DCP	20	21 >>		1.30 - 2.00	1.30m: Clayey fine to coarse SAND, minor gravel; light blue mottled red. Very dense, moist. Gravel, fine, sub-rounded, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).  1.80m: Hand auger terminated due to refusal at 1.80m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).
						2.00 - 2.00	2m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 1.80m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 2.00m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth  
2m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA04\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-1.80m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983412 mN (NZTM2000) 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations			
				0	1	2	3	4	5	6	7	8	9												
Topsoil																							0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist. (TOPSOIL).		
Northland Allochthon	100	HA	DCP												● 135/38 kPa	43	0.5	[Graphic Log]	M	VSt			0.25m: Clayey SILT, trace organics; orange brown mixed with trace light grey. Very stiff, moist. Organics, rootlets (partially decomposed).		
															● 132/59 kPa								0.90 - 1.20m: Stiff to very stiff		
																● 96/53 kPa		1.0		St-VSt					1.20 - 1.50m: Very stiff
																● 140/58 kPa	42	1.5		VSt					1.50m: Silty CLAY; light grey streaked light brown. Very stiff, moist, high plasticity.
														● 157/104 kPa											
														● 115/41 kPa		2.0								2.05m: SILT, some gravel; light grey, friable. Hard, dry, non-plastic. Gravel, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).	
														● UTP									2.20m: Hand auger terminated due to refusal at 2.20m bgl. Scala Penetrometer advanced at the base of the hole. [UNDIFFERENTIATED MAHURANGI LIMESTONE].		
	0		DCP											23 >>									2.3m: END OF BOREHOLE. Refuse.		

COMMENTS: 1) Hand Auger terminated at 2.20m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 2.30m bgl. 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 2.3m  
Scale 1:25

HandAugerLog - 12/11/2021 11:13:21 am - Produced with Core-GS by GeRoc

# CORE PHOTOS

BOREHOLE No.: HA05\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983412 mN 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

2.2m

0.00-2.20m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983142 mN (NZTM2000) 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION																		
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations						
				0	1	2	3	4	5	6	7	8	9															
Topsoil																			M	Vst		0.00m: Clayey SILT, some organics; dark orange. Very stiff, moist, medium plasticity. (TOPSOIL).						
Northland Allochthon	100	HA													● 157/81 kPa	47	0.5	[Graphic Log: Yellow with 'x' marks]	M	Vst		0.30m: Clayey SILT, some organics; light grey streaked orange. Very stiff, moist, medium plasticity. Organics, rootlets.						
															● 107/48 kPa							46	1.0	[Graphic Log: Yellow with 'x' marks]	M	Vst		1.20m: Silty CLAY; light grey mottled orange. Very stiff, moist, high plasticity.
															● 110/58 kPa													2.0
															● 107/66 kPa							45	2.5	[Graphic Log: Yellow with 'x' marks]	D	H		
● 127/59 kPa	44	3.0	[Graphic Log: Yellow with 'x' marks]	D	H		2.4m: END OF BOREHOLE. Refuse.																					
● 145/87 kPa							43	3.5	[Graphic Log: Yellow with 'x' marks]	D	H																	
● 165/92 kPa																												
															● UTP													

COMMENTS: 1) Hand Auger terminated at 2.40m bgl due to refusal. 2) Hole was dry on completion. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 2.4m  
Scale 1:25

HandAugerLog - 12/11/2021 11:14:34 am - Produced with Core-GS by GeRoc

# CORE PHOTOS

BOREHOLE No.: HA06\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983142 mN 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m  
0.00-2.40m

3.0m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983127 mN (NZTM2000) 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations		
				0	1	2	3	4	5	6	7	8	9											
Topsoil															● 148/41 kPa		57.80	0.00	TS	M	Vst	0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).		
Northland Allochthon	14/10/2021 WL at 1.12 m bgl measured 30 mins after EOH.	100	HA												● 137/68 kPa		57.50	0.50				0.30m: Clayey SILT, trace organics; light orangish brown mottled dark grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).		
															● 145/49 kPa		57.00	1.00				1.10m: Silty CLAY; orange brown mottled light grey. Very stiff, moist, high plasticity.		
																	● 142/49 kPa		56.50	1.50				
																	● 157/43 kPa		56.00	2.00		W	H	1.90m: Sandy SILT; orange brown mottled light grey. Very stiff, wet, non-plastic. Sand, fine.
																	● 190/59 kPa		55.50	2.50				2.10 - 2.60m: Hard
														● UTP		55.00	3.00			VSt-H	2.60m: Clayey sandy SILT; light grey streaked orange. Very stiff to hard, wet, low plasticity. Sand, fine.			
														● UTP		54.50	3.20			H	3.00 - 3.20m: Hard			
														● 198/115 kPa		54.00	3.40			MD	3.20m: Silty fine SAND; dark orange speckled black. Medium dense, wet. Trace black limonite stained specks.			
														● UTP		53.50	3.50				3.4m: END OF BOREHOLE. Refuse.			

COMMENTS: 1) Hand Auger terminated at 3.40m bgl due to refusal. 2) GW level measured at 1.12m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 3.4m

HandAugerLog - 12/11/2021 11:15:31 am - Produced with Core-GS by GeRoc



PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983127 mN 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		LOGGED BY: OYCH      CHECKED: MTJH



1.0m

2.0m

3.0m

3.4m

0.00-3.40m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983288 mN (NZTM2000) 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations	
				0	1	2	3	4	5	6	7	8	9										
Topsoil																45	0.00m	TS	M	St		0.00m: SILT, some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).	
Northland Allochthon	14/10/2021 W/L measured at 2.95 m bgl 30 mins after EOH.	100	HA												● 157/86 kPa	44	0.25m	MD				0.25m: Silty fine SAND; light grey. Medium dense, moist. Sand, pumiceous. 0.50 - 0.85m: Orange brown mottled dark grey.	
															● 152/97 kPa	43	1.00m	VSt			0.85m: Fine SAND, some silt; white mottled grey. Medium dense, moist. Sand, pumiceous.		
																	● 115/73 kPa	42	1.00m				1.00m: Silty CLAY, trace sand; light brown streaked dark grey and orange. Very stiff, moist, high plasticity.
																	● 124/66 kPa	41	2.65m	H			2.65m: Silty CLAY, some gravel; orange brown mottled dark grey. Hard, moist, medium to high plasticity. Gravel, fine, clasts of weathered mudstone.
														● 124/68 kPa		2.95m	D				2.95m: Silty CLAY; dark grey. Hard, dry, medium to high plasticity.		
														● >231 kPa									
														● UTP									
														● 216/96 kPa									
																3.6m						3.6m: END OF BOREHOLE. Refuse.	

COMMENTS: 1) Hand Auger terminated at 3.60m bgl due to refusal. 2) GW level measured at 2.95m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 3.6m  
Scale 1:25



**CORE PHOTOS**

BOREHOLE No.: HA08\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983288 mN 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m                      2.0m                      3.0m                      3.6m

0.00-3.60m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983676 mN (NZTM2000) 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH
		CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION											
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9								
Topsoil															● 214/82 kPa	28.5	TS	M	H		0.00m: SILT, some organics and some clay; dark brown. Hard, moist, low plasticity. (TOPSOIL).
Northland Allochthon	100	HA	HA												● 185/82 kPa	33	[Graphic Log]	M	H	VSt	0.30m: Clayey SILT, trace organics; light brown mottled orange. Hard, moist, medium plasticity. Organics, rootlets (partially decomposed).
														● 181/66 kPa	0.60 - 1.10m: Very stiff.						
														● 214/115 kPa	1.10m: Silty CLAY, trace sand; light grey mottled orange. Very stiff to hard, moist, high plasticity.						
														● 201/124 kPa	1.80 - 3.00m: Very stiff.						
														● 157/91 kPa							
														● 181/110 kPa	3.00m: CLAY, some silt; dark grey. Very stiff, moist, high plasticity.						
														● 181/115 kPa							
														● 180/109 kPa	3.90 - 4.20m: Stiff. 4.00 - 5.00m: Wet.						
														● 132/86 kPa							
														● 124/82 kPa	4.20 - 4.80m: Stiff to very stiff.						
										● 130/87 kPa											
										● 91/41 kPa	4.80 - 5.00m: Very stiff.										
										● 97/69 kPa											
										● 104/66 kPa	5.00m: Hand auger terminated due to target depth being reached at 5.0m bgl. Scala Penetrometer advanced at the base of the hole.										
										● 115/69 kPa											
															29						
															28					5.9m: END OF BOREHOLE. Target depth.	

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 2) Scala was advanced at the base of the hole and achieved target depth of 6.00m bgl (did not achieve refusal). 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 5.9m

HandAugerLog - 12/11/2021 11:16:33 am - Produced with Core-GS by GeRoc Box 1 0.05-5.0m

# CORE PHOTOS

BOREHOLE No.: HA09\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983676 mN 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	MOISTURE CONDITION	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations			
Topsoil														0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).			
Alluvium	100	HA	13/10/2021 WL at 3.40 m bgl at end of day.		● 184/26 kPa		21	0.5				VSt		0.10m: Clayey SILT, minor organics and minor sand; dark brown mottled orange. Very stiff, moist, medium plasticity. Sand, fine; organics, wood fragments (decomposed). (PLEISTOCENE ALLUVIUM).			
					● 63/28 kPa								St		0.60 - 0.90m: Stiff.		
					● 38/25 kPa									F		0.90 - 1.00m: Firm.	
					● 68/31 kPa									St		1.00m: CLAY, trace sand; orange mottled dark brown. Stiff, moist, high plasticity. Sand, fine.	
					● 146/51 kPa										VSt		1.50 - 1.80m: Very stiff.
					● 88/58 kPa										St		1.80 - 3.00m: Stiff.
					● 68/33 kPa												2.10 - 3.00m: Trace organics and grades to light grey. Organics, wood fragments (decomposed).
					● 68/35 kPa												
					● 68/35 kPa												
					● 183/26 kPa						19	3.0				W	H
Northland Allochthon				8 12 15 20	● UTP								3.20m: Hand auger terminated due to refusal at 3.20m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).				
													3.6m: END OF BOREHOLE. Refuse.				

COMMENTS: 1) Hand Auger terminated at 3.20m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.60m bgl. 3) Groundwater level measured at 3.40m bgl. 4) SV #111 (correction factor 1.69)

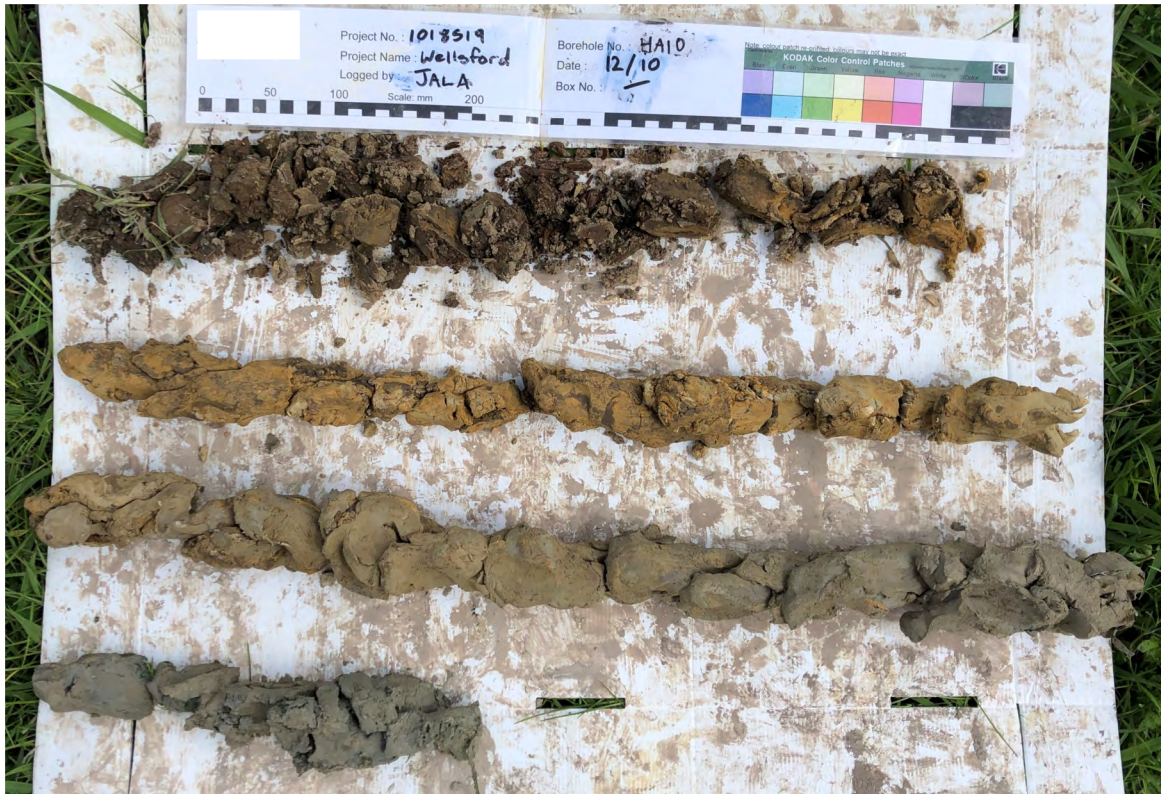
Hole Depth 3.6m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA10\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-3.20m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983460 mN (NZTM2000) 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 31.30m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH      CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	MOISTURE CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations	
				0	1	2	3	4	5	6	7	8	9											
Topsoil														● 181/59 kPa	31		TS	M	Vst		0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low to medium plasticity. (TOPSOIL).			
Alluvium	14/10/2021 GW at 2.58m bgl measured 30 minutes after completion of	100	HA											● 180/74 kPa								0.30m: Clayey SILT, trace organics; light orangish brown mottled light grey. Very stiff, moist, medium plasticity. Organics, rootlets (partially decomposed). (PLEISTOCENE ALLUVIUM).		
														● 160/66 kPa	1							1.00m: Silty CLAY; brownish orange streaked grey. Very stiff, moist, medium plasticity.		
																	● 190/104 kPa	30						2.10m: CLAY, some silt, trace sand; grey. Very stiff, moist, high plasticity. Sand, pumiceous.
																	● 148/99 kPa							3.90 - 4.20m: Stiff to very stiff, wet.
																	● 176/102 kPa	2						4.20 - 4.50m: Very stiff
																	● 148/87 kPa	29						4.50 - 4.80m: Stiff
																	● 181/124 kPa							4.60m: CLAY, some sand and some gravel; dark grey. Stiff, wet, medium to high plasticity. Gravel, fine, sub-angular, limestone.
																	● 165/115 kPa	3						5m: END OF BOREHOLE. Target depth.
																	● 132/82 kPa	28						
																	● 129/56 kPa							
													● 129/59 kPa	4										
													● 99/41 kPa	27										
													● 112/48 kPa											
													● 66/30 kPa											
													● 78/23 kPa	5										

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 3) GW inflow at 3.40m bgl. 4) GW level measured at 2.58m bgl after HA was completed. 5) SV #376 (correction factor 1.65). 6) No Scala Penetrometer undertaken at base of hole.

HandAugerLog - 12/11/2021 11:17:51 am - Produced with Core-GS by GeRoc  
Box 1 0.050m  
Scale 1:30



# CORE PHOTOS

BOREHOLE No.: HA11\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983460 mN 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021 HOLE FINISHED: 14/10/2021
R.L.:	31.30m	DRILL METHOD: HA	DRILLED BY: T+T
DATUM:	NZVD2016		LOGGED BY: OYCH CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983570 mN (NZTM2000) 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil														● 157/48 kPa		24	0.00	M	VSt	0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. Organics, rootlets (partially decomposed). (TOPSOIL)		
Alluvium														● 188/82 kPa		1	M / CW		0.30m: Clayey SILT, trace organics; light brownish orange mottled light grey. Very stiff, moist, low to medium plasticity. Organics, amorphous (carbonaceous) and fibrous (decomposed rootlets). (PLEISTOCENE ALLUVIUM).			
													● 178/84 kPa				M		1.00m: Clayey SILT, trace organics; orange brown streaked light grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).			
Northland Allochthon														● 181/79 kPa		2			1.50 - 1.80m: Very stiff to hard			
													● 195/107 kPa				VSt-H					
														● 200/97 kPa		3			1.80m: Silty CLAY; light grey streaked orange. Hard, moist, medium plasticity.			
													● 132/81 kPa				H		2.00m: CLAY, some silt; light grey streaked orange. Very stiff, moist, high plasticity.			
														● 160/96 kPa		4						
													● 148/101 kPa						3.00 - 3.30m: Grey. Stiff			
														● 89/53 kPa		5			3.30 - 3.90m: Very stiff			
													● 135/92 kPa				St					
														● 148/78 kPa		6			3.90m: CLAY, some silt and some gravel; grey. Very stiff, moist, medium plasticity. Gravel, fine, sub-angular, limestone.			
													● 181/69 kPa						4.70m: Gravelly SILT; grey, friable. Hard, dry, non-plastic. Gravel, fine, sub-angular, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).			
															7			4.70m: Hand auger terminated due to refusal at 4.70m bgl. Scala Penetrometer advanced at the base of the hole. (UNDIFFERENTIATED MAHURANGI LIMESTONE).				
																			4.9m: END OF BOREHOLE. Refuse.			

COMMENTS: 1) Hand Auger terminated at 4.70m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 4.90m bgl. 3) GW inflow at 2.5m bgl. 4) GW level measured at 2.12m bgl after hand auger was completed. 5) SV #376 (correction factor 1.65).

Hole Depth 4.9m

HandAugerLog - 19/11/2021 5:43:26 pm - Produced with Core-GS by GeRoc Box 1.0.04.7m

# CORE PHOTOS

BOREHOLE No.: HA01\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983570 mN 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-4.70m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983527 mN (NZTM2000) 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL					ENGINEERING DESCRIPTION					
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DESCRIPTION AND ADDITIONAL OBSERVATIONS
Topsoil						0.00			St	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).
Northland Allochthon		100		81/35 kPa		0.5			St	0.10m: SILT, some clay, trace organics and trace sand; dark brown. Stiff, moist, medium plasticity. Sand, fine; organics, rootlets (decomposed).
				71/38 kPa		1.0			St	0.40m: Silty CLAY; light grey mottled orange, bedded. Stiff, moist, high plasticity.
				76/35 kPa		1.5			St	
				85/35 kPa		2.0			F-St	1.00 - 2.80m: Trace gravel; grades to red and grey. Gravel, fine, sub-rounded, limestone.
				71/28 kPa		2.5			St	1.20 - 2.80m: Fissured (polished).
				51/35 kPa		3.0			St	1.80 - 2.10m: Firm to stiff.
				88/26 kPa		3.5			St	2.10 - 2.40m: Stiff.
				101/63 kPa		4.0			St-VSt	2.40 - 2.70m: Stiff to very stiff.
				93/35 kPa		4.5			St	2.70 - 3.00m: Stiff.
						3.0				
					3.8					3.8m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 3.00 m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.80 m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth 3.8m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA02\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983527 mN 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH

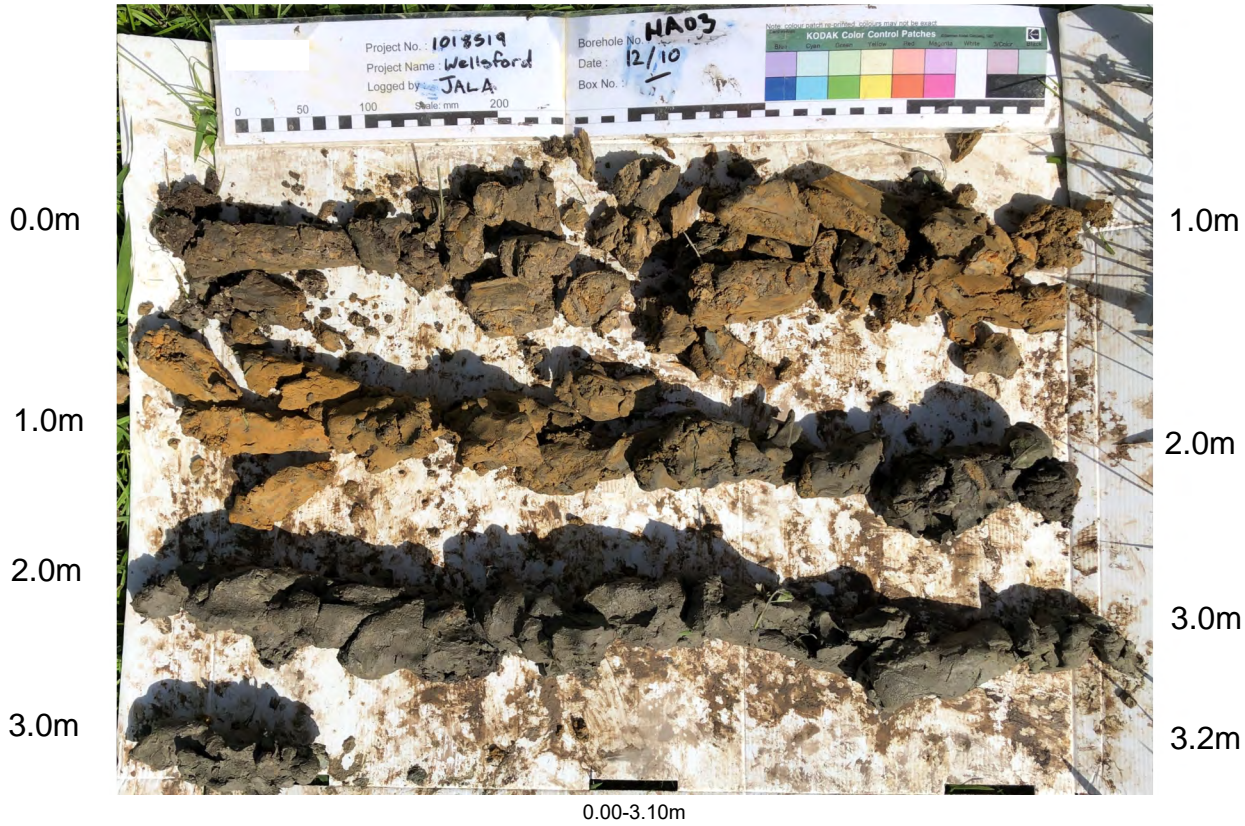


PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983445 mN (NZTM2000) 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION			
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	DESCRIPTION and Additional Observations
Topsoil						0.00 - 0.05	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).
Alluvium				● 135/53 kPa		0.05 - 0.10	0.05m: Silty CLAY, trace gravel; dark grey mottled orange. Very stiff, moist, medium plasticity. Gravel, fine, sub-rounded to sub-angular, sandstone. (PLEISTOCENE ALLUVIUM).
				● 90/50 kPa		0.10 - 0.20	0.50 - 1.30m: Orange streaked dark grey. 0.60 - 1.30m: Stiff.
Northland Allochthon	13/10/2021 WL at 1.51 m bgl at end of day.	100	HA	● 73/41 kPa		0.20 - 0.30	
				● 80/38 kPa		0.30 - 0.40	
				● 101/46 kPa		0.40 - 0.50	1.30m: Silty CLAY, trace sand; dark grey. Stiff, wet, high plasticity. Sand, fine.
				● 103/50 kPa		0.50 - 0.60	1.60 - 2.20m: Stiff to very stiff.
Northland Allochthon				● 110/60 kPa		0.60 - 0.70	
				● 78/35 kPa		0.70 - 0.80	2.20m: CLAY, trace sand; dark grey mottled blue. Very stiff, saturated, high plasticity. Sand, fine.
				● 135/26 kPa		0.80 - 0.90	2.50 - 3.10m: Stiff.
Northland Allochthon						0.90 - 1.00	3.10m: Very stiff.
						1.00 - 1.10	3.10m: Hand auger terminated due to refusal at 3.10m bgl. Scala Penetrometer advanced at the base of the hole.
						1.10 - 1.20	
						1.20 - 1.30	
						1.30 - 1.40	
						1.40 - 1.50	
						1.50 - 1.60	
						1.60 - 1.70	
						1.70 - 1.80	
						1.80 - 1.90	
						1.90 - 2.00	
						2.00 - 2.10	
						2.10 - 2.20	
						2.20 - 2.30	
						2.30 - 2.40	
						2.40 - 2.50	
						2.50 - 2.60	
						2.60 - 2.70	
						2.70 - 2.80	
						2.80 - 2.90	
						2.90 - 3.00	
						3.00 - 3.10	
						3.10 - 3.20	
						3.20 - 3.30	
						3.30 - 3.40	
						3.40 - 3.50	
						3.50 - 3.60	
						3.60 - 3.70	
						3.70 - 3.80	
						3.80 - 3.90	
						3.90 - 4.00	
						4.00 - 4.10	
						4.10 - 4.20	
						4.20 - 4.30	
						4.30 - 4.40	
						4.40 - 4.50	
						4.50 - 4.60	
						4.60 - 4.70	
						4.70 - 4.80	
						4.80 - 4.90	
						4.90 - 5.00	
						5.00 - 5.10	
						5.10 - 5.20	
						5.20 - 5.30	
						5.30 - 5.40	
						5.40 - 5.50	
						5.50 - 5.60	
						5.60 - 5.70	
						5.70 - 5.80	
						5.80 - 5.90	
						5.90 - 6.00	
						6.00 - 6.10	
						6.10 - 6.20	
						6.20 - 6.30	
						6.30 - 6.40	
						6.40 - 6.50	
						6.50 - 6.60	
						6.60 - 6.70	
						6.70 - 6.80	
						6.80 - 6.90	
						6.90 - 7.00	
						7.00 - 7.10	
						7.10 - 7.20	
						7.20 - 7.30	
						7.30 - 7.40	
						7.40 - 7.50	
						7.50 - 7.60	
						7.60 - 7.70	
						7.70 - 7.80	
						7.80 - 7.90	
						7.90 - 8.00	
						8.00 - 8.10	
						8.10 - 8.20	
						8.20 - 8.30	
						8.30 - 8.40	
						8.40 - 8.50	
						8.50 - 8.60	
						8.60 - 8.70	
						8.70 - 8.80	
						8.80 - 8.90	
						8.90 - 9.00	
						9.00 - 9.10	
						9.10 - 9.20	
						9.20 - 9.30	
						9.30 - 9.40	
						9.40 - 9.50	
						9.50 - 9.60	
						9.60 - 9.70	
						9.70 - 9.80	
						9.80 - 9.90	
						9.90 - 10.00	
						10.00 - 10.10	
						10.10 - 10.20	
						10.20 - 10.30	
						10.30 - 10.40	
						10.40 - 10.50	
						10.50 - 10.60	
						10.60 - 10.70	
						10.70 - 10.80	
						10.80 - 10.90	
						10.90 - 11.00	
						11.00 - 11.10	
						11.10 - 11.20	
						11.20 - 11.30	
						11.30 - 11.40	
						11.40 - 11.50	
						11.50 - 11.60	
						11.60 - 11.70	
						11.70 - 11.80	
						11.80 - 11.90	
						11.90 - 12.00	
						12.00 - 12.10	
						12.10 - 12.20	
						12.20 - 12.30	
						12.30 - 12.40	
						12.40 - 12.50	
						12.50 - 12.60	
						12.60 - 12.70	
						12.70 - 12.80	
						12.80 - 12.90	
						12.90 - 13.00	
						13.00 - 13.10	
						13.10 - 13.20	
						13.20 - 13.30	
						13.30 - 13.40	
						13.40 - 13.50	
						13.50 - 13.60	
						13.60 - 13.70	
						13.70 - 13.80	
						13.80 - 13.90	
						13.90 - 14.00	
						14.00 - 14.10	
						14.10 - 14.20	
						14.20 - 14.30	
						14.30 - 14.40	
						14.40 - 14.50	
						14.50 - 14.60	
						14.60 - 14.70	
						14.70 - 14.80	
						14.80 - 14.90	
						14.90 - 15.00	
						15.00 - 15.10	
						15.10 - 15.20	
						15.20 - 15.30	
						15.30 - 15.40	
						15.40 - 15.50	
						15.50 - 15.60	
						15.60 - 15.70	
						15.70 - 15.80	
						15.80 - 15.90	
						15.90 - 16.00	
						16.00 - 16.10	
						16.10 - 16.20	
						16.20 - 16.30	
						16.30 - 16.40	
						16.40 - 16.50	
						16.50 - 16.60	
						16.60 - 16.70	
						16.70 - 16.80	
						16.80 - 16.90	
						16.90 - 17.00	
						17.00 - 17.10	
						17.10 - 17.20	
						17.20 - 17.30	
						17.30 - 17.40	
						17.40 - 17.50	
						17.50 - 17.60	
						17.60 - 17.70	
						17.70 - 17.80	
						17.80 - 17.90	
						17.90 - 18.00	
						18.00 - 18.10	
						18.10 - 18.20	
						18.20 - 18.30	
						18.30 - 18.40	
						18.40 - 18.50	
						18.50 - 18.60	
						18.60 - 18.70	
						18.70 - 18.80	
						18.80 - 18.90	
						18.90 - 19.00	
						19.00 - 19.10	
						19.10 - 19.20	
						19.20 - 19.30	
						19.30 - 19.40	



PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983445 mN 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH





PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION								
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
Topsoil							0.00		W	St		0.00m: SILT, minor organics and minor clay and minor sand; dark brown. Stiff, wet, medium plasticity. Sand, fine. (TOPSOIL).
Northland Allochthon		100	HA		<ul style="list-style-type: none"> <li>68/33 kPa</li> <li>60/20 kPa</li> <li>51/26 kPa</li> </ul>		0.50		M			0.10m: Silty CLAY, trace sand; dark brown streaked reddish orange, fissured. Stiff, moist, high plasticity. Sand, fine. (RESIDUAL MAHURANGI LIMESTONE).
							1.00			F-St		0.70 - 1.30m: Light grey streaked orange. 0.90 - 1.30m: Firm to stiff.
							1.50			VD		1.30m: Clayey fine to coarse SAND, minor gravel; light blue mottled red. Very dense, moist. Gravel, fine, sub-rounded, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).
		0	DCP		20		2.00					1.80m: Hand auger terminated due to refusal at 1.80m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).
							2.00					2m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 1.80m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 2.00m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth  
2m

HandAugerLog - 12/11/2021 11:12:28 am - Produced with Core-GS by GeRoc

# CORE PHOTOS

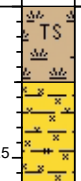
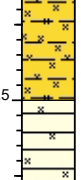
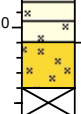
BOREHOLE No.: HA04\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-1.80m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983412 mN (NZTM2000) 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations		
				0	1	2	3	4	5	6	7	8	9											
Topsoil																						0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist. (TOPSOIL).		
Northland Allochthon	100	HA	DCP												● 135/38 kPa	43	0.5		M	VSt		0.25m: Clayey SILT, trace organics; orange brown mixed with trace light grey. Very stiff, moist. Organics, rootlets (partially decomposed).		
															● 132/59 kPa							0.90 - 1.20m: Stiff to very stiff		
																● 96/53 kPa	1.0			St-VSt				1.20 - 1.50m: Very stiff
																● 140/58 kPa	1.5			VSt				1.50m: Silty CLAY; light grey streaked light brown. Very stiff, moist, high plasticity.
														● 157/104 kPa	42	2.0					2.05m: SILT, some gravel; light grey, friable. Hard, dry, non-plastic. Gravel, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).			
														● 115/41 kPa							2.20m: Hand auger terminated due to refusal at 2.20m bgl. Scala Penetrometer advanced at the base of the hole. [UNDIFFERENTIATED MAHURANGI LIMESTONE].			
														● UTP				D	H		2.3m: END OF BOREHOLE. Refuse.			
	0		DCP											23 >>										

COMMENTS: 1) Hand Auger terminated at 2.20m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 2.30m bgl. 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 2.3m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA05\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983412 mN 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

2.2m

0.00-2.20m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983142 mN (NZTM2000) 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil															● 157/81 kPa	47	0.0	TS	M	Vst	10	0.00m: Clayey SILT, some organics; dark orange. Very stiff, moist, medium plasticity. (TOPSOIL).
Northland Allochthon	100	HA												● 107/48 kPa	47	0.5				2.5	0.30m: Clayey SILT, some organics; light grey streaked orange. Very stiff, moist, medium plasticity. Organics, rootlets.	
														● 110/58 kPa	47	1.0				5.0	1.20m: Silty CLAY; light grey mottled orange. Very stiff, moist, high plasticity.	
														● 107/66 kPa	46	1.5				7.5	2.00m: Silty CLAY, some gravel; grey. Very stiff, moist, medium plasticity. Gravel, fine, limestone.	
														● 127/59 kPa	46	2.0				10.0	2.30m: Gravelly SILT; light grey, friable. Hard, dry, non-plastic. Gravel, fine, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).	
													● 145/87 kPa	45	2.5				10	2.40m: END OF BOREHOLE. Refuse.		
													● 165/92 kPa	44	3.0				10			
													● UTP	43	4.0				10			

COMMENTS: 1) Hand Auger terminated at 2.40m bgl due to refusal. 2) Hole was dry on completion. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 2.4m

# CORE PHOTOS

BOREHOLE No.: HA06\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983142 mN 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m  
0.00-2.40m

3.0m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983127 mN (NZTM2000) 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH      CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING MOISTURE CONDITION	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																						0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).
Northland Allochthon	14/10/2021 WL at 1.12 m bgl measured 30 mins after EOH.	100	HA												● 148/41 kPa		57		M	Vst		0.30m: Clayey SILT, trace organics; light orangish brown mottled dark grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).
															● 137/68 kPa						1.10m: Silty CLAY; orange brown mottled light grey. Very stiff, moist, high plasticity.	
																● 145/49 kPa						1.90m: Sandy SILT; orange brown mottled light grey. Very stiff, wet, non-plastic. Sand, fine.
																● 142/49 kPa						2.10 - 2.60m: Hard
																● 157/43 kPa						2.60m: Clayey sandy SILT; light grey streaked orange. Very stiff to hard, wet, low plasticity. Sand, fine.
														● 190/59 kPa							3.00 - 3.20m: Hard	
														● UTP							3.20m: Silty fine SAND; dark orange speckled black. Medium dense, wet. Trace black limonite stained specks.	
														● UTP							3.4m: END OF BOREHOLE. Refuse.	
														● 198/115 kPa								
														● UTP								

COMMENTS: 1) Hand Auger terminated at 3.40m bgl due to refusal. 2) GW level measured at 1.12m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth  
3.4m

HandAugerLog - 12/11/2021 11:15:31 am - Produced with Core-GS by GeRoc

Box 1, 0.03.4m

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983127 mN 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

3.4m

0.00-3.40m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983288 mN (NZTM2000) 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH
		CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																45	0.00m - 0.25m	M	St		0.00m: SILT, some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).	
Northland Allochthon	100	HA	14/10/2021 W/L measured at 2.95 m bgl 30 mins after EOH.												● 157/86 kPa	44	0.25m - 0.50m	MD			0.25m: Silty fine SAND; light grey. Medium dense, moist. Sand, pumiceous. 0.50 - 0.85m: Orange brown mottled dark grey.	
															● 152/97 kPa	43	0.85m - 1.00m	VSt		0.85m: Fine SAND, some silt; white mottled grey. Medium dense, moist. Sand, pumiceous.		
																	● 115/73 kPa	42	1.00m - 2.65m	H		1.00m: Silty CLAY, trace sand; light brown streaked dark grey and orange. Very stiff, moist, high plasticity.
																	● 124/66 kPa ● 124/68 kPa ● >231 kPa	41	2.65m - 2.95m	D		2.65m: Silty CLAY, some gravel; orange brown mottled dark grey. Hard, moist, medium to high plasticity. Gravel, fine, clasts of weathered mudstone.
														● UTP		2.95m - 3.60m				2.95m: Silty CLAY; dark grey. Hard, dry, medium to high plasticity.		
														● 216/96 kPa		3.60m - 3.60m				3.60m: END OF BOREHOLE. Refuse.		

COMMENTS: 1) Hand Auger terminated at 3.60m bgl due to refusal. 2) GW level measured at 2.95m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 3.6m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA08\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983288 mN 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		LOGGED BY: OYCH      CHECKED: MTJH



1.0m                      2.0m                      3.0m                      3.6m

0.00-3.60m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983676 mN (NZTM2000) 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH
		CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations			
				0	1	2	3	4	5	6	7	8	9											
Topsoil															● 214/82 kPa	28.5	TS	M	H		0.00m: SILT, some organics and some clay; dark brown. Hard, moist, low plasticity. (TOPSOIL).			
Northland Allochthon	100	HA	HA												● 185/82 kPa	33	[Graphic Log]	VSt	H	[Shear Strength]	0.30m: Clayey SILT, trace organics; light brown mottled orange. Hard, moist, medium plasticity. Organics, rootlets (partially decomposed).			
														● 181/66 kPa	0.60 - 1.10m: Very stiff.									
														● 214/115 kPa	1.10m: Silty CLAY, trace sand; light grey mottled orange. Very stiff to hard, moist, high plasticity.									
														● 201/124 kPa	32						VSt	1.80 - 3.00m: Very stiff.		
														● 157/91 kPa										
														● 181/110 kPa	31						VSt	H	[Shear Strength]	3.00m: CLAY, some silt; dark grey. Very stiff, moist, high plasticity.
														● 181/115 kPa										
														● 180/109 kPa	30						W	St	[Shear Strength]	3.90 - 4.20m: Stiff.
														● 132/86 kPa										4.00 - 5.00m: Wet.
														● 124/82 kPa	29						St-VSt	H	[Shear Strength]	4.20 - 4.80m: Stiff to very stiff.
										● 130/87 kPa	4.80 - 5.00m: Very stiff.													
										● 91/41 kPa	28	VSt	H	[Shear Strength]	5.00m: Hand auger terminated due to target depth being reached at 5.0m bgl. Scala Penetrometer advanced at the base of the hole.									
										● 97/69 kPa					5.9m: END OF BOREHOLE. Target depth.									
										● 104/66 kPa														
										● 115/69 kPa														

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 2) Scala was advanced at the base of the hole and achieved target depth of 6.00m bgl (did not achieve refusal). 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 5.9m

HandAugerLog - 12/11/2021 11:16:33 am - Produced with Core-GS by GeRoc Box 1 0.05-5.0m



# CORE PHOTOS

BOREHOLE No.: HA09\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983676 mN 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION			
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	DESCRIPTION and Additional Observations
Topsoil						0.00 - 0.10	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).
Alluvium	100	HA		● 184/26 kPa		0.10 - 0.60	0.10m: Clayey SILT, minor organics and minor sand; dark brown mottled orange. Very stiff, moist, medium plasticity. Sand, fine; organics, wood fragments (decomposed). (PLEISTOCENE ALLUVIUM).
				● 63/28 kPa		0.60 - 0.90m: Stiff.	
				● 38/25 kPa		0.90 - 1.00m: Firm.	
				● 68/31 kPa		1.00m: CLAY, trace sand; orange mottled dark brown. Stiff, moist, high plasticity. Sand, fine.	
				● 146/51 kPa		1.50 - 1.80m: Very stiff.	
Northland Allochthon	0	DCP	8, 12, 15, 20	● 88/58 kPa		1.80 - 3.00m: Stiff.	
				● 68/33 kPa		2.10 - 3.00m: Trace organics and grades to light grey. Organics, wood fragments (decomposed).	
				● 68/35 kPa		3.00m: Sandy CLAY, trace gravel; light blue. Hard, wet, high plasticity. Gravel, fine to medium, sub-rounded, limestone. (RESIDUAL MAHURANGI LIMESTONE).	
				● 183/26 kPa		3.20m: Hand auger terminated due to refusal at 3.20m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).	
				● UTP		3.6m: END OF BOREHOLE. Refuse.	

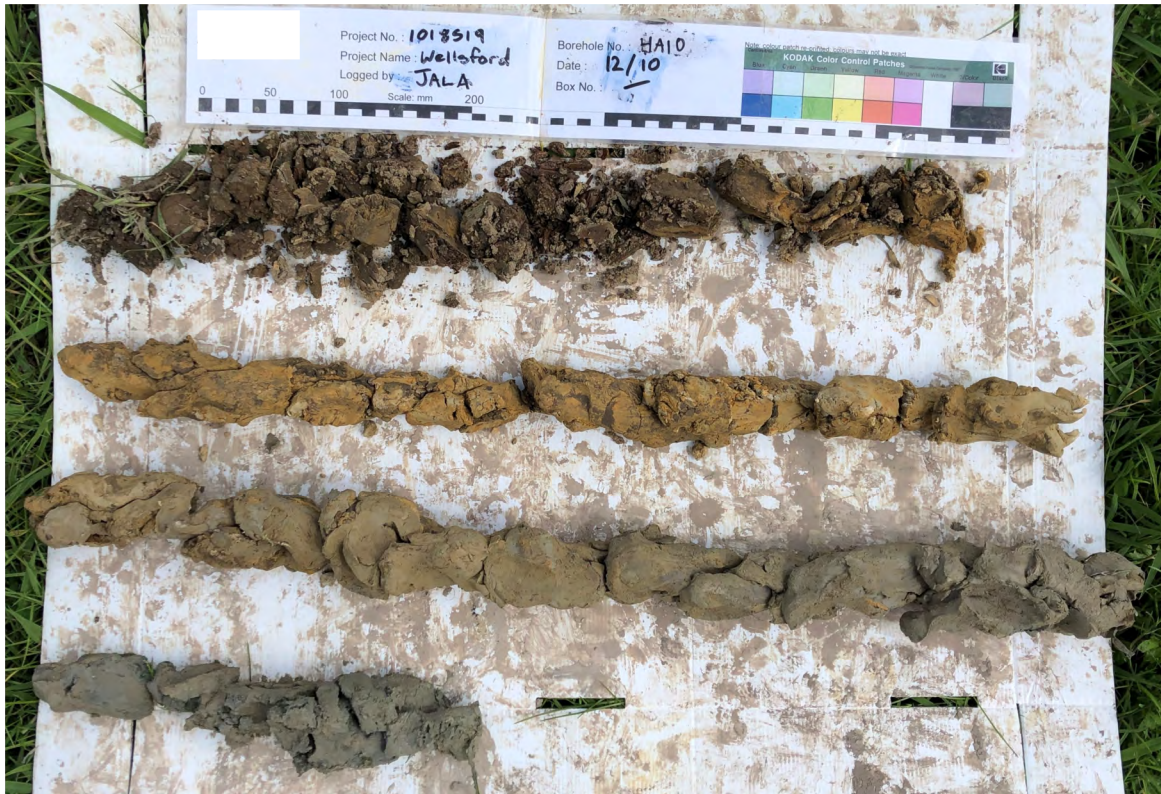
COMMENTS: 1) Hand Auger terminated at 3.20m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.60m bgl. 3) Groundwater level measured at 3.40m bgl. 4) SV #111 (correction factor 1.69)

Hole Depth 3.6m  
Scale 1:25

# CORE PHOTOS

BOREHOLE No.: HA10\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-3.20m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983460 mN (NZTM2000) 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 31.30m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	MOISTURE CONDITION	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations		
				0	1	2	3	4	5	6	7	8	9												
Topsoil															● 181/59 kPa	31		TS	M	Vst	10	0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low to medium plasticity. (TOPSOIL).			
Alluvium	14/10/2021 GW at 2.58m bgl measured 30 minutes after completion of	100	HA												● 180/74 kPa								0.30m: Clayey SILT, trace organics; light orangish brown mottled light grey. Very stiff, moist, medium plasticity. Organics, rootlets (partially decomposed). (PLEISTOCENE ALLUVIUM).		
															● 160/66 kPa	1							1.00m: Silty CLAY; brownish orange streaked grey. Very stiff, moist, medium plasticity.		
																	● 190/104 kPa	30							2.10m: CLAY, some silt, trace sand; grey. Very stiff, moist, high plasticity. Sand, pumiceous.
																	● 148/99 kPa								
																		● 176/102 kPa	2						
																		● 148/87 kPa	29						
																		● 181/124 kPa							
																		● 165/115 kPa	3						
																		● 132/82 kPa	28						
																		● 129/56 kPa							
														● 129/59 kPa	4										
														● 99/41 kPa	27										
														● 112/48 kPa											
														● 66/30 kPa											
														● 78/23 kPa	5										
															26							5m: END OF BOREHOLE. Target depth.			

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 3) GW inflow at 3.40m bgl. 4) GW level measured at 2.58m bgl after HA was completed. 5) SV #376 (correction factor 1.65). 6) No Scala Penetrometer undertaken at base of hole.

HandAugerLog - 12/11/2021 11:17:51 am - Produced with Core-GS by GeRoc  
Box 1 0.050m

Hole Depth  
5m  
Scale 1:30



# CORE PHOTOS

BOREHOLE No.: HA11\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983460 mN 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	31.30m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m

# Engineering log terminology

## General

Soil and rock descriptions follow the “Guidelines for the field classification and description of soil and rock for engineering purposes” by the New Zealand Geotechnical Society (2005). Refer to this document for methods of field determination.

<h3>Water</h3> <p>Water level on date shown</p> <p>Water inflow</p> <p>Water outflow</p>	<h3>Graphic logs</h3> <p>The graphic log shows soil and rock types. The defect log indicates the location, orientation and abundance of defects of all types.</p> <p><b>Typical material symbols:</b></p> <table border="0"> <tr> <td> Organic material</td> <td> Igneous rock</td> </tr> <tr> <td> Clay</td> <td> Mudstone</td> </tr> <tr> <td> Silt</td> <td> Siltstone</td> </tr> <tr> <td> Sand</td> <td> Sandstone</td> </tr> <tr> <td> Gravel or Conglomerate</td> <td> Metamorphic Rock</td> </tr> </table>	Organic material	Igneous rock	Clay	Mudstone	Silt	Siltstone	Sand	Sandstone	Gravel or Conglomerate	Metamorphic Rock	<h3>Tests</h3> <ul style="list-style-type: none"> <li><b>N=22:</b>SPT uncorrected blow count for 300 mm</li> <li><b>75/12:</b>Undrained shear strength (peak /residual as measured by field vane.</li> </ul> <p><b>Laboratory test(s) carried out:</b></p> <table border="1"> <tr><td><b>PMT</b></td><td>Pressuremeter test</td></tr> <tr><td><b>LT</b></td><td>Lugeon test</td></tr> <tr><td><b>LV</b></td><td>Laboratory vane</td></tr> <tr><td><b>AL</b></td><td>Atterburg limits</td></tr> <tr><td><b>UU</b></td><td>Undrained triaxial</td></tr> <tr><td><b>PSD</b></td><td>Particle size distribution</td></tr> <tr><td><b>c' Ø'</b></td><td>Effective stress</td></tr> <tr><td><b>CONS</b></td><td>Consolidation</td></tr> <tr><td><b>DS</b></td><td>Direct shear</td></tr> <tr><td><b>COMP</b></td><td>Compaction</td></tr> <tr><td><b>UCS</b></td><td>Unconfined compression</td></tr> <tr><td><b>IS<sub>50</sub></b></td><td>Point load</td></tr> </table>	<b>PMT</b>	Pressuremeter test	<b>LT</b>	Lugeon test	<b>LV</b>	Laboratory vane	<b>AL</b>	Atterburg limits	<b>UU</b>	Undrained triaxial	<b>PSD</b>	Particle size distribution	<b>c' Ø'</b>	Effective stress	<b>CONS</b>	Consolidation	<b>DS</b>	Direct shear	<b>COMP</b>	Compaction	<b>UCS</b>	Unconfined compression	<b>IS<sub>50</sub></b>	Point load
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<h3>Core recovery</h3> <p>Expressed as percentage of the length of the core run recovered.</p>	<h3>Installation type</h3> <table border="0"> <tr> <td> Standpipe</td> <td> Slotted screen</td> </tr> <tr> <td> VWP</td> <td> Bentonite seal</td> </tr> <tr> <td> Filter pack</td> <td></td> </tr> </table>	Standpipe	Slotted screen	VWP	Bentonite seal	Filter pack		<h3>Sample type</h3> <table border="0"> <tr> <td> SPT</td> <td> Core</td> </tr> <tr> <td> Thin-wall tube</td> <td> Other</td> </tr> <tr> <td> Bulk sample</td> <td> Core or Sample loss</td> </tr> </table>	SPT	Core	Thin-wall tube	Other	Bulk sample	Core or Sample loss																						
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## Soil description

<h3>Moisture content</h3> <table border="1"> <tr><td><b>D</b></td><td>Dry, looks and feels dry</td></tr> <tr><td><b>M</b></td><td>Moist, no free water on hand when remoulding</td></tr> <tr><td><b>W</b></td><td>Wet, free water on hand when remoulding</td></tr> <tr><td><b>S</b></td><td>Saturated, free water present on sample</td></tr> </table>	<b>D</b>	Dry, looks and feels dry	<b>M</b>	Moist, no free water on hand when remoulding	<b>W</b>	Wet, free water on hand when remoulding	<b>S</b>	Saturated, free water present on sample	<h3>Consistency/undrained shear strength</h3> <table border="1"> <thead> <tr> <th></th> <th></th> <th><b>S<sub>u</sub> (kPa)</b></th> </tr> </thead> <tbody> <tr><td><b>VS</b></td><td>Very soft</td><td>&lt; 12</td></tr> <tr><td><b>S</b></td><td>Soft</td><td>12 to 25</td></tr> <tr><td><b>F</b></td><td>Firm</td><td>25 to 50</td></tr> <tr><td><b>St</b></td><td>Stiff</td><td>50 to 100</td></tr> <tr><td><b>VSt</b></td><td>Very stiff</td><td>100 to 200</td></tr> <tr><td><b>H</b></td><td>Hard</td><td>&gt; 200</td></tr> </tbody> </table>			<b>S<sub>u</sub> (kPa)</b>	<b>VS</b>	Very soft	< 12	<b>S</b>	Soft	12 to 25	<b>F</b>	Firm	25 to 50	<b>St</b>	Stiff	50 to 100	<b>VSt</b>	Very stiff	100 to 200	<b>H</b>	Hard	> 200	<h3>Density index</h3> <table border="1"> <thead> <tr> <th></th> <th><b>SPT(N) - uncorrected</b></th> </tr> </thead> <tbody> <tr><td><b>VL</b></td><td>Very loose 0 to 4</td></tr> <tr><td><b>L</b></td><td>Loose 4 to 10</td></tr> <tr><td><b>MD</b></td><td>Medium dense 10 to 30</td></tr> <tr><td><b>D</b></td><td>Dense 30 to 50</td></tr> <tr><td><b>VD</b></td><td>Very dense &gt; 50</td></tr> </tbody> </table>		<b>SPT(N) - uncorrected</b>	<b>VL</b>	Very loose 0 to 4	<b>L</b>	Loose 4 to 10	<b>MD</b>	Medium dense 10 to 30	<b>D</b>	Dense 30 to 50	<b>VD</b>	Very dense > 50
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### Proportional terms definition (Coarse soils)

Fraction	Term	% of soil mass	Example
Major	(UPPER CASE)	Major constituent	GRAVEL
Subordinate	(lower case)	> 20	Sandy
Minor	with some... with minor...	12 - 20 5 - 12	with some sand with minor sand
	with trace of... (or slightly)...	< 5	with trace of sand (slightly sandy)

### Grain size criteria

Type	Coarse						Fine		
	Boulders	Cobbles	Gravel			Sand		Silt	Clay
			Coarse	Medium	Fine	Coarse	Medium	Fine	
<b>Size range (mm)</b>	200	60	20	6	2	0.6	0.2	0.06	0.002

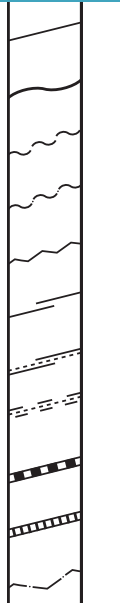




# Engineering log terminology

## Rock description

Significant defects	
<b>B</b>	Bedding
<b>J</b>	Joint
<b>Sc</b>	Schistosity
<b>Cl</b>	Cleavage
<b>BZ</b>	Broken zone/crushed zone
<b>F</b>	Fault
<b>Fg</b>	Fault with gouge
<b>SZ</b>	Shear zone
<b>Iz</b>	Infilled seam
<b>XD</b>	Extremely weathered seam
<b>DD</b>	Drilling - induced defect



Weathering	
<b>UW</b>	Unweathered
<b>SW</b>	Slightly weathered
<b>MW</b>	Moderately weathered
<b>HW</b>	Highly weathered
<b>CW</b>	Completely weathered
<b>RS</b>	Residual soil

Defect shape	
<b>ST</b>	Stepped
<b>UN</b>	Undulating
<b>PL</b>	Planar

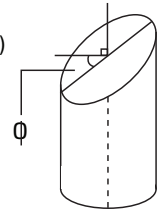
Roughness of defect surface	
<b>R</b>	Rough
<b>SM</b>	Smooth
<b>SL</b>	Slickensided

Field strength			
		UCS (MPa)	I <sub>s(50)</sub> (MPa)
<b>EW</b>	Extremely weak	< 1	N/A
<b>VW</b>	Very weak	1 - 5	N/A
<b>W</b>	Weak	5 - 20	N/A
<b>MS</b>	Moderately strong	20 - 50	1 - 2
<b>S</b>	Strong	50 - 100	2 - 5
<b>VS</b>	Very strong	100 - 250	5 - 10
<b>ES</b>	Extremely strong	> 250	> 10

**Defect coding**

Type  
 Angle (perpendicular to core axis)  
**J 60°, PL, SL, T, CV, STIFF GREEN CLAY**

Infilling description (as per soil description)  
 Infilling/coating type  
 Aperture  
 Roughness  
 Shape



**Defect Orientation:** for vertical unoriented boreholes defect orientation is measured normal to core axis e.g horizontal = 0°(see diagram). For angled boreholes defect orientation is measured relative to core axis e.g parallel to core axis = 0°.

Aperture		
		Aperture (mm)
<b>T</b>	Tight	nil
<b>VN</b>	Very narrow	0 - 2
<b>N</b>	Narrow	2 - 6
<b>MN</b>	Moderately narrow	6 - 20
<b>MW</b>	Moderately wide	20 - 60
<b>W</b>	Wide	60 - 200
<b>VW</b>	Very wide	> 200

Infillings and coatings		
<b>CG</b>	Clay gouge	Joints have openings between opposing faces of intact rock substance in excess of 1 mm filled with clay gouge. Clay is generally described in terms of soil properties.
<b>CV</b>	Clay veneers	Joints contain clay coating whose maximum thickness does not exceed 1 mm. Note: Describe clay in terms of soil properties.
<b>PL</b>	Penetrative limonite	Joint traces are marked in terms of well defined zones of slightly to moderately weathered ferruginised rock-substance within the adjacent rock.
<b>FeSt</b>	Limonite stained	Joint surfaces are stained or coated with limonite, although the rock substance immediately adjacent to the joints is fresh.
<b>CT, SC</b>	Coated	Joints exhibit coatings other than clay or limonite, e.g. Carbonate (CT) or Silica (SC).
<b>CL, CS, CC</b>	Cemented	Joints are cemented with limonite (CL), Silica (CS), or Carbonates (CC).
<b>CN</b>	Clean	Joint surface show no trace of clay, limonite, or other coatings.

Spacing	
Term	Spacing
Very wide	> 2 m
Wide	0.6 - 2 m
Moderately wide	200 - 600 mm
Close	60 - 200 mm
Very close	20 - 60 mm
Extremely close	> 20 mm

Excavator penetration	
Easy	1
Moderate	2
Difficult	3

**RQD:** Rock Quality Designation - percentage of core run consisting of sound rock longer than 10 cm.




# EXCAVATION LOG

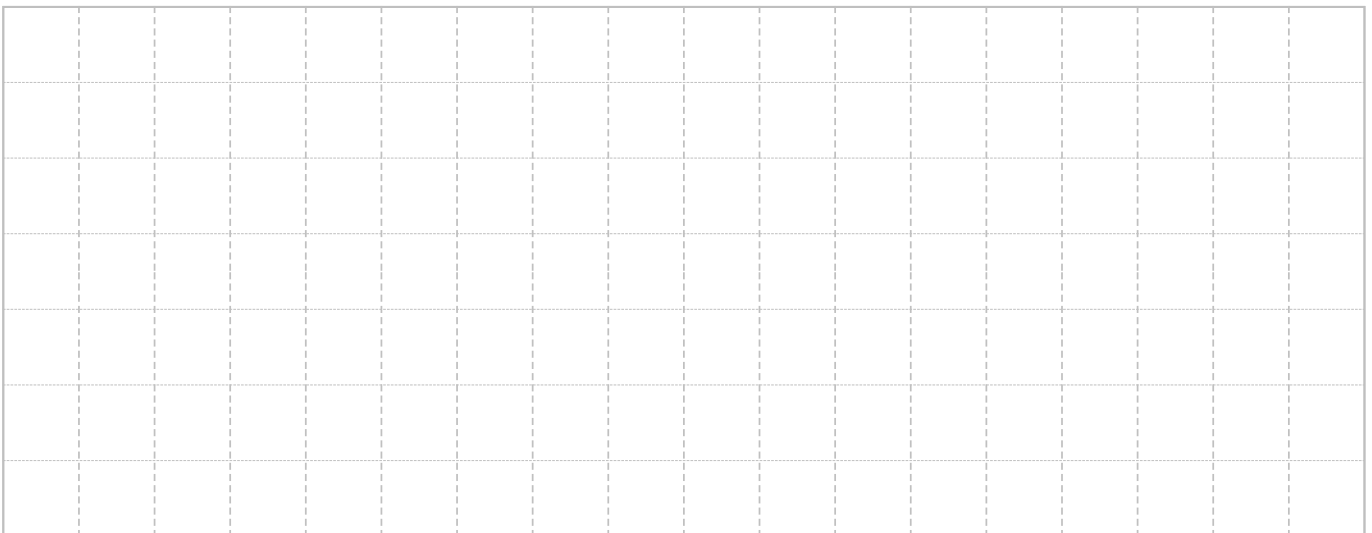
Excavation Id.: **TP01\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983629 mN (NZTM2000) 1736665 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 31.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			● UTP ● UTP ● UTP ● UTP				<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.20m: SILT, some clay; light brown black oxide stained. Very stiff, moist, medium to high plasticity. (RESIDUAL MAHURANGI LIMESTONE).</p> <p>0.50m: GRAVEL, minor silt; light brown. Tightly packed, moist. Gravel, angular, to 100mm. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).</p> <p>1.00m: GRAVEL; light grey. Tightly packed, moist. (UNDIFFERENTIATED MAHURANGI LIMESTONE)</p> <p>1.30 - 1.50m: White, light grey.</p>		M				TS
		DRY 13/10/2021			30		1.5m: END OF INVESTIGATION. Difficult to excavate.						Northland Allocthon
				29	2.0								
					2.5								
				28	3.0								
					3.5								
				27	4.0								
					4.5								

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
1.5m

# EXCAVATION LOG

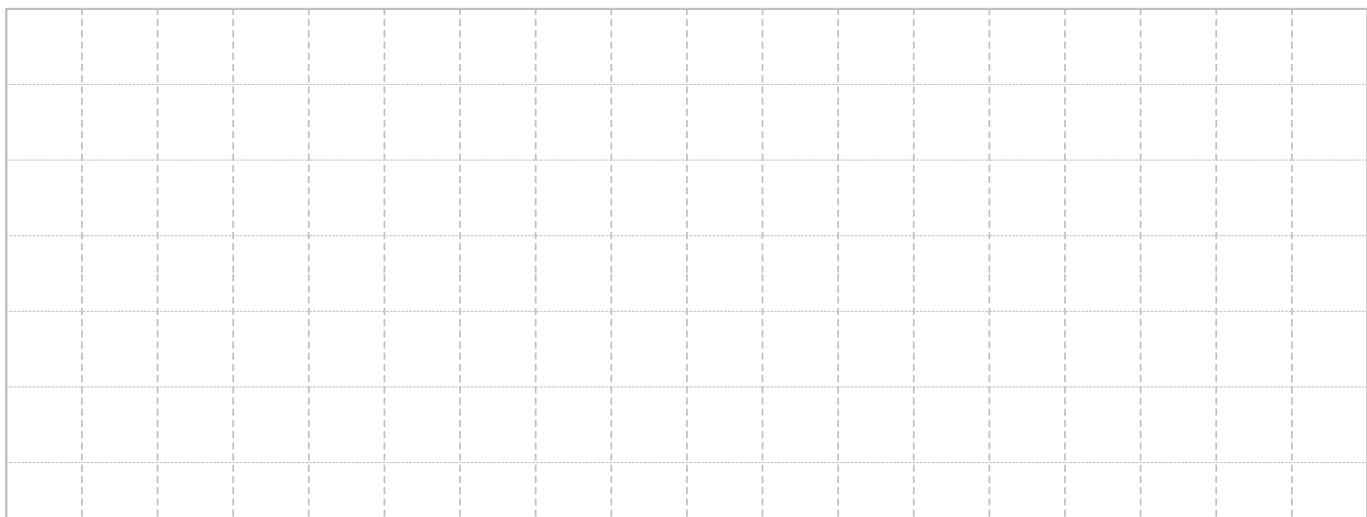
Excavation Id.: **TP02\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983454 mN (NZTM2000) 1736581 mE	EXPOSURE METHOD: TP EQUIPMENT: 14 Tonne Zaxis	EXCAV. STARTED: 13/10/2021 EXCAV. FINISHED: 13/10/2021
R.L.: 47.00m	OPERATOR: Mason Contractors	LOGGED BY: LPA
DATUM: NZVD2016	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 95/- kPa Sample 1 @ 0.40m</li> <li>● 114/- kPa</li> <li>● 118/- kPa</li> <li>● 89/- kPa</li> <li>● 92/- kPa</li> <li>● 102/- kPa</li> <li>● 92/- kPa</li> <li>● 97/- kPa</li> <li>● 127/- kPa</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> </ul>	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5	0.00m: Organic SILT. (TOPSOIL). 0.10m: SILT, some clay; grey and dark yellow. Very stiff, moist, medium to high plasticity, with few fibrous roots. (RESIDUAL SOIL). 0.80 - 1.00m: Clayey SILT; light grey. 1.00 - 1.40m: Grades to SILT, some clay; grey with light brown. 1.40m: SILT; grey and light brown. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MUDSTONE). 1.90m: some gravel, up to 40mm, completely weathered (core-stones); saturated 2.50 - 4.00m: Recovered as gravelly SILT 2.80 - 3.20m: Grey stained red, very stiff. 3.20 - 3.60m: Grey stained red, hard. 3.60 - 4.00m: Grey stained red, hard. With pockets of gravel, highly weathered, white. 4.00m: GRAVEL; grey, fissured (slickensided). Tightly packed, moist. Gravel, mudstone fragments. (UNDIFFERENTIATED MUDSTONE).	M		Vst		TS
					4.6m: END OF INVESTIGATION					


SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.6m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983316 mN (NZTM2000) 1736633 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 56.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 104/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 116/- kPa</li> <li>● 193/- kPa</li> <li>● UTP</li> <li>● UTP Sample 2 @ 1.80m</li> <li>● UTP</li> <li>● UTP</li> </ul>	55	0.5		0.00m: Organic SILT. (TOPSOIL).  0.30m: Clayey SILT; light grey and yellow with faint organic staining, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).  1.30m: SILT, some clay; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).  1.60 - 2.60m: Recovered as gravel with tight, oxide stained fissure planes..  2.20 - 2.60m: Grading to Highly Weathered.	M	Vst	10 25 50 75 100 125 150 175 200		TS
				54	2.0		2.6m: END OF INVESTIGATION					Northland Allocthon

SKETCH / PHOTO:



COMMENTS: Slumped slopes. Rushes and surface water. Large macrocarpa stumps.

 Hole Depth  
2.6m



# EXCAVATION LOG

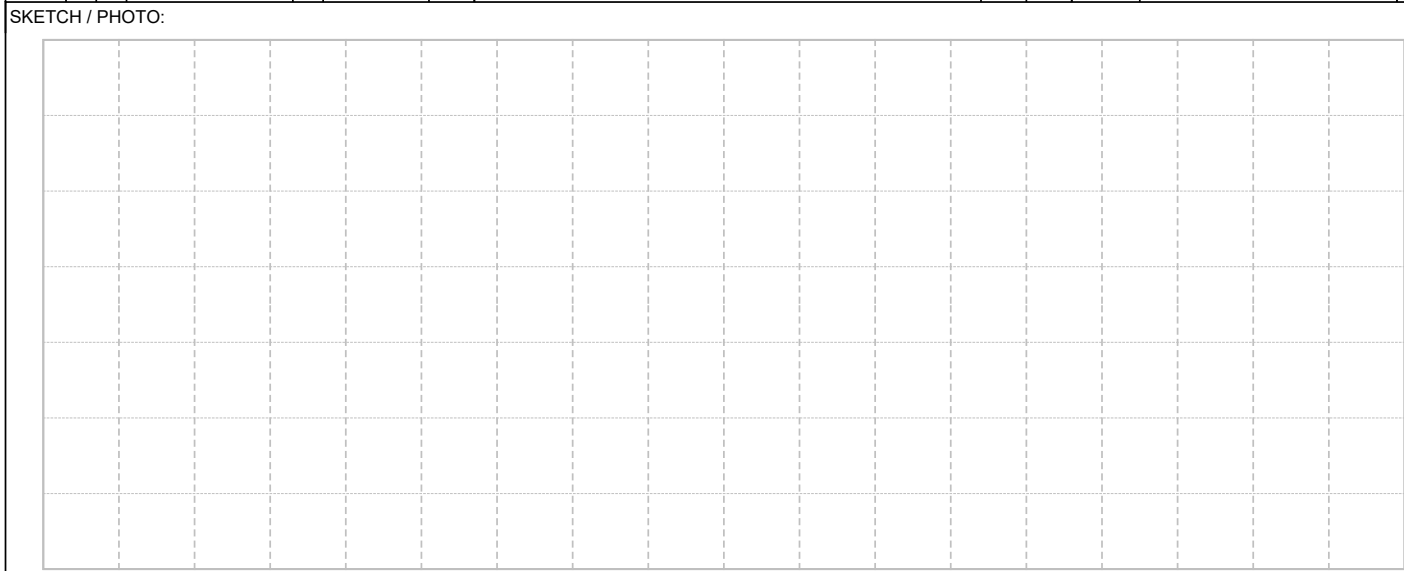
Excavation Id.: **TP04\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983346 mN (NZTM2000) 1736893 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 43.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3						0.00m: Organic SILT. (TOPSOIL).				TS
			● 107/- kPa ● 112/- kPa Sample 1 @ 0.70m ● 136/- kPa	0.5		0.20m: Clayey SILT, some fibrous roots; light brown and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	Vst		
		14/10/2021		42		0.80 - 1.30m: Light grey and yellow.				
			● 125/- kPa Sample 2 @ 1.60m ● >222 kPa	1.5		1.10 - 1.30m: Wet.	W			
			● >222 kPa ● >222 kPa ● >222 kPa	2.0		1.30m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED MUDSTONE).	M			
			● >222 kPa ● 190/- kPa	2.5		1.60 - 4.00m: Hard.				
			● UTP ● UTP Sample 3 @ 3.70m ● UTP	3.0		2.80 - 3.00m: Some gravel. Gravel, up to 40mm, corestones.				
				39		4m: END OF INVESTIGATION. Difficult to excavate.				
				40						
				41						
				42						
				43						
				44						
				45						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4m

# EXCAVATION LOG

Excavation Id.: **TP05\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983405 mN (NZTM2000) 1736771 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 41.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS		ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00m: Organic SILT. (TOPSOIL).				TS
	12/10/2021 Slow inflow at 1.0mbgl	● 92/- kPa Sample 1 @ 0.50m ● 89/- kPa	0.5	0.30m: SILT, some clay; light grey and yellow with faint organic staining, blocky. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M			Northland Alloction
		● 89/- kPa	1.0	1.00m: Clayey SILT; light yellow and grey. Stiff, wet, medium to high plasticity. (RESIDUAL SOIL).	W			
		● 86/- kPa Sample 2 @ 1.60m ● 76/- kPa	1.5	1.30m: SILT; grey with dark yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M			
		● 64/- kPa ● 73/- kPa ● UTP	2.0	1.80m: SILT; grey. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).				
		● UTP	2.5	2.30 - 2.70m: Hard.				
			3.0	2.7m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
2.7m

# EXCAVATION LOG

Excavation Id.: **TP06\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983507 mN (NZTM2000) 1736790 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 28.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL							
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 87/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 93/- kPa</li> <li>● 85/- kPa</li> <li>● 103/- kPa</li> <li>● Sample 2 @ 1.80m</li> <li>● 87/- kPa</li> <li>● 74/- kPa</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> </ul>	27	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.20m: SILT, some clay; light grey and yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>0.70 - 2.00m: Clayey SILT.</p> <p>2.00m: Clayey SILT; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.50 - 2.90m: Hard.</p> <p>2.90m: Gravelly SILT; grey and brown, blocky. Hard, moist. Gravel, up to 40mm, siltstone rock fragments. (COMPLETELY WEATHERED SILTSTONE).</p>	M	St		<p>10</p> <p>25</p> <p>50</p> <p>100</p> <p>200</p>		TS
				26	2.0		3.7m: END OF INVESTIGATION						Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.7m



# EXCAVATION LOG

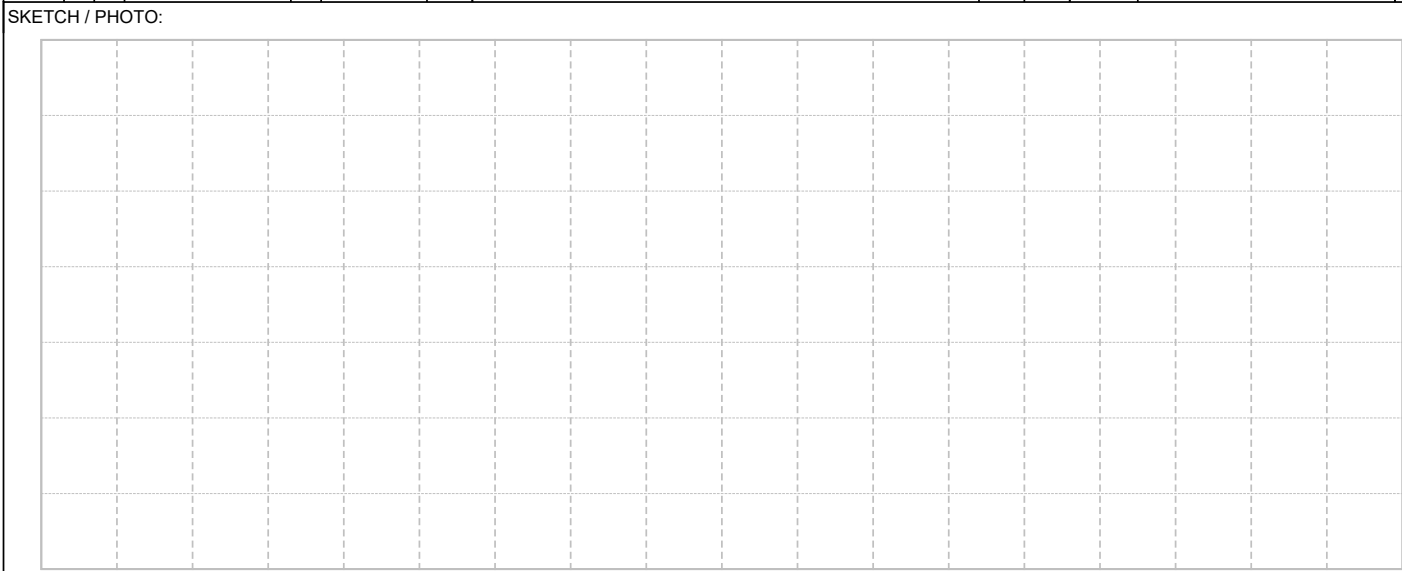
Excavation Id.: **TP07\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983737 mN (NZTM2000) 1736702 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021			
R.L.: 25.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00	0.00m: Clayey SILT. (TOPSOIL).						TS
			● 112/- kPa Sample 1 @ 0.40m	0.5	0.25m: Clayey SILT; light grey and light brown. Very stiff, moist, medium plasticity. (RESIDUAL SOIL).	M		vst			
			● 116/- kPa								
			● 128/- kPa	1.0	0.80 - 1.90m: Light grey and yellow.						
			● 96/- kPa								
			● 128/- kPa	1.5							
			● 106/- kPa	2.0	1.90m: SILT, some clay; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
			Sample 2 @ 2.10m	2.5							
			● 112/- kPa								
			● 122/- kPa	3.0	2.70 - 4.10m: Grey. Stiff.			st			
			● 80/- kPa								
			Sample 3 @ 3.50m	3.5							
			● 84/- kPa	4.0	4.10m: Gravelly SILT; light grey and green. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE).			h			
			● UTP	4.5	4.4m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.4m

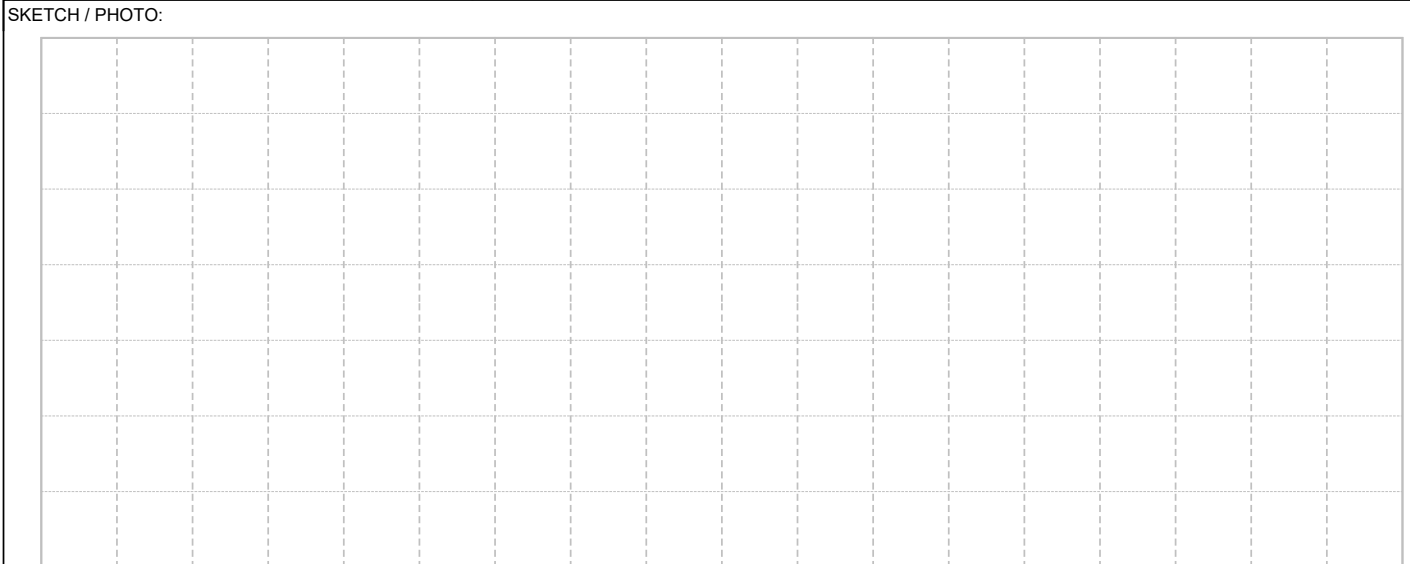
# EXCAVATION LOG

Excavation Id.: **TP08\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983674 mN (NZTM2000) 1736844 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 33.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 104/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 112/- kPa</li> <li>● 125/- kPa</li> <li>● 132/- kPa</li> <li>● 119/- kPa</li> <li>● Sample 2 @ 1.80m</li> <li>● 100/- kPa</li> <li>● 106/- kPa</li> <li>● 84/- kPa</li> <li>● 74/- kPa</li> <li>● 67/- kPa</li> <li>● 76/- kPa</li> </ul>	0.00m 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5	<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: Clayey SILT; grey and light grey with pockets of organic staining. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; grey and light grey with pockets of organic staining. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>1.90m: Clayey SILT, trace decomposed rootlets; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.50 - 4.50m: Trace decomposed tubular roots.</p>	M		Vst		TS
				4.8	4.8m: END OF INVESTIGATION					



COMMENTS:

Hole Depth  
4.8m

# EXCAVATION LOG

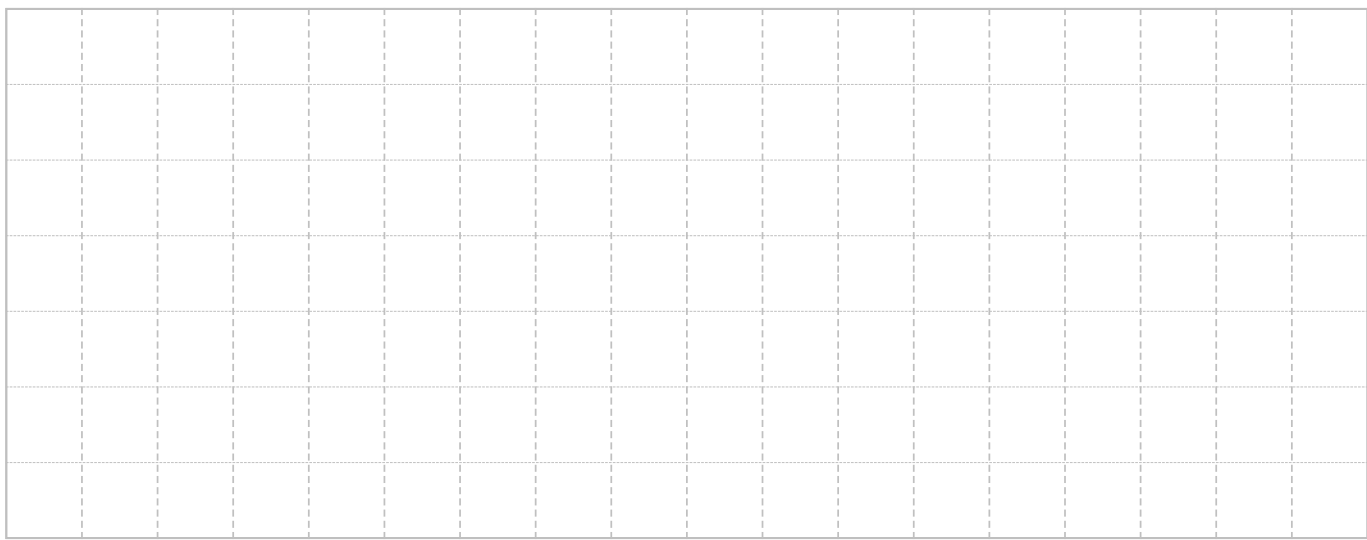
Excavation Id.: **TP09\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983515 mN (NZTM2000) 1736957 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3											10 25 50 100 200		
							0.00m: Organic SILT. (TOPSOIL).						Top
			Sample 1 @ 0.90m	29	0.5		0.20m: Clayey SILT; yellow. Very stiff, moist, medium to high plasticity.	M		Vst			Alluvial Deposits
			Sample 2 @ 2.40m	28	2.0		2.70m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.			St			
			Sample 3 @ 4.00m	26	4.0		3.50 - 4.70m: Very stiff.			Vst			
							4.7m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

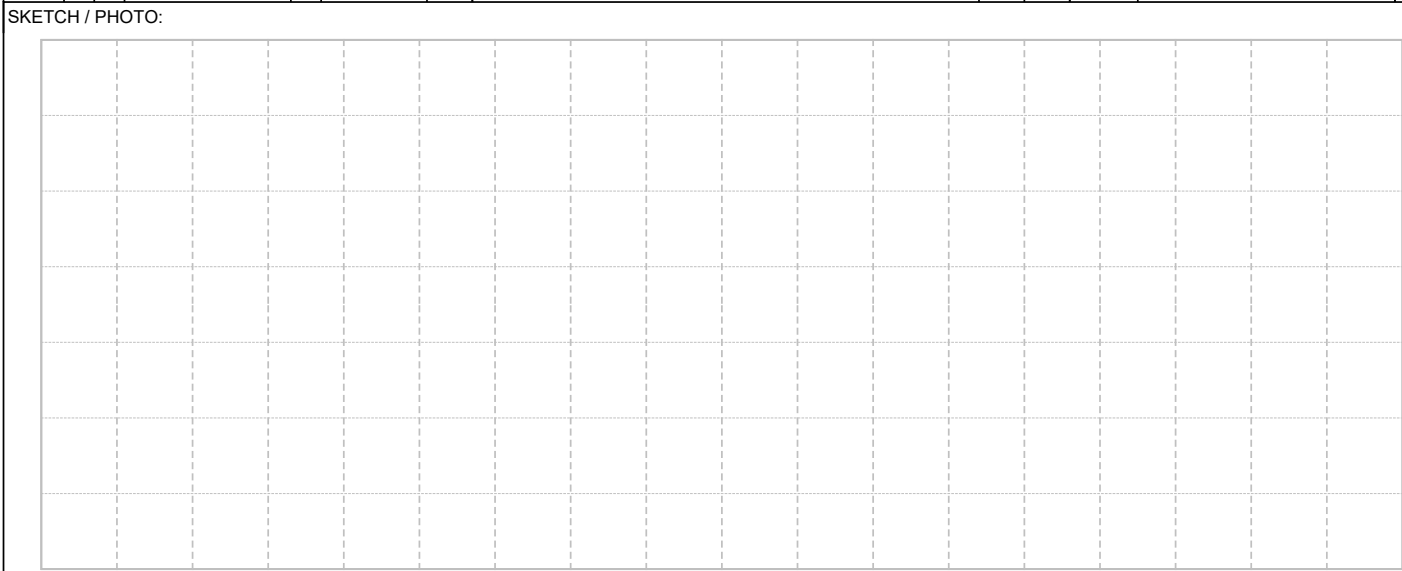
Hole Depth  
4.7m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983029 mN (NZTM2000) 1737247 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3					0.00m: Organic SILT. (TOPSOIL).					TS
			● 64/- kPa ● 74/- kPa Sample 1 @ 0.60m	0.5	0.20m: Clayey SILT; yellow and light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M		St		
			● 80/- kPa ● 67/- kPa ● 106/- kPa ● 125/- kPa ● 128/- kPa ● 177/- kPa	1.0 1.5 2.0	1.30 - 2.60m: Grey stained yellow. Very stiff.			Vst		
			● >222 kPa Sample 2 @ 2.60m ● UTP	2.5	2.60m: SILT; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE).			H		
			● UTP	3.0	2.80m: Highly to completely weathered, grey, blocky, SILTSTONE. Extremely weak (hard).					
			● UTP	3.5	3.40 - 3.60m: Highly weathered. Slicksided fissure planes.					
				4.0	3.6m: END OF INVESTIGATION					
				4.5						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.6m

# EXCAVATION LOG

Excavation Id.: TP11\_2021

SHEET: 1 OF 1

PROJECT: Wellsford North      LOCATION: Wellsford      JOB No.: 1018519.0000

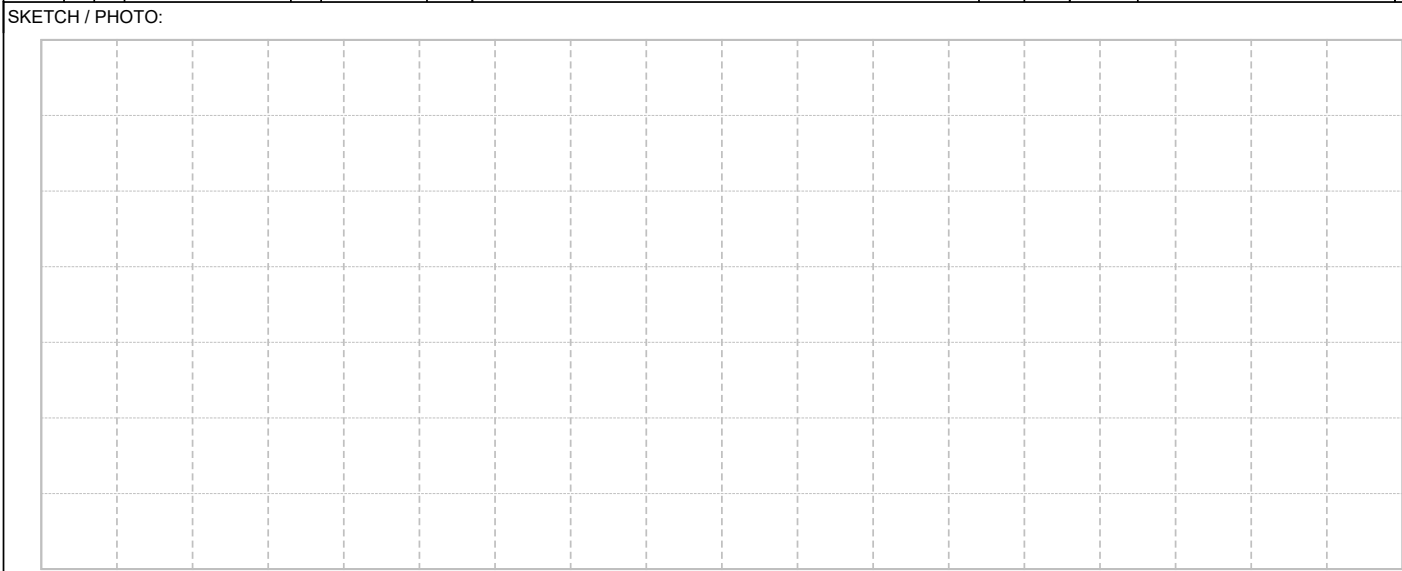
CO-ORDINATES: 5983438 mN (NZTM2000) 1737134 mE      EXPOSURE METHOD: TP      EXCAV. STARTED: 13/10/2021

R.L.: 47.00m      OPERATOR: Mason Contractors      LOGGED BY: LPA

DATUM: NZVD2016      DIMENSIONS: 5m by 1.2m      CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00	0.00m: Organic SILT. (TOPSOIL).	M		VSt		TS
				0.10	0.10m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).					
				0.50	0.50m: SILT; white. Hard, moist, medium plasticity. (RESIDUAL SOIL).			H		
				0.70	0.70m: Clayey SILT; light yellow and grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			VSt		
				1.30 - 2.50	1.30 - 2.50m: Light grey and yellow.					
				2.50	2.50m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).					
				3.20 - 3.50	3.20 - 3.50m: Some clay.					
				3.50	3.50m: SILT, some clay; grey stained dark brown. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED SILTSTONE/MUDSTONE).					
				4.6	4.6m: END OF INVESTIGATION					

SKETCH / PHOTO:



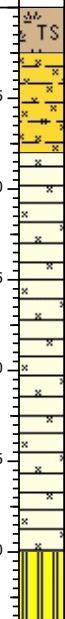
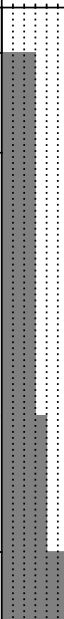
COMMENTS:

Hole Depth 4.6m





PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983660 mN (NZTM2000) 1737164 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 50.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL							
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT	
1-3			<ul style="list-style-type: none"> <li>● 103/- kPa Sample 1 @ 0.30m</li> <li>● 96/- kPa</li> <li>● 89/- kPa</li> <li>● 89/- kPa</li> <li>● 93/- kPa</li> <li>● 90/- kPa Sample 2 @ 1.90m</li> <li>● 98/- kPa</li> <li>● 133/- kPa</li> <li>● 116/- kPa</li> <li>● UTP Sample 3 @ 3.20m</li> <li>● UTP</li> </ul>	49	0.00m		<p>0.00m: Clayey SILT. (TOPSOIL).</p> <p>0.25m: Clayey SILT; yellow and light grey, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; light grey stained yellow, blocky. Stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.25 - 3.00m: Very stiff.</p> <p>3.00m: Highly weathered, grey and green, SILTSTONE. Extremely weak (hard). (COMPLETELY WEATHERED SILTSTONE / MUDSTONE).</p>	M	Vst				TS
				48	3.4m		3.4m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

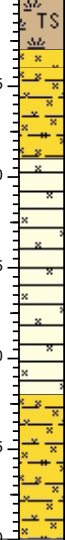
 Hole Depth  
3.4m

# EXCAVATION LOG

Excavation Id.: **TP14\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983963 mN (NZTM2000) 1737291 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 42.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● UTP</li> <li>● 109/- kPa Sample 1 @ 0.50m</li> <li>● 116/- kPa</li> <li>● 112/- kPa</li> <li>● 105/- kPa Sample 2 @ 1.50m</li> <li>● 95/- kPa</li> <li>● 90/- kPa</li> <li>● 109/- kPa</li> <li>● 119/- kPa Sample 3 @ 2.70m</li> <li>● 122/- kPa</li> </ul>	41	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin, cemented layer. (RESIDUAL SOIL).</p> <p>0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.90m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.20m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M	H Vst	10 25 50 100 200		TS
				30	3.0		3m: END OF INVESTIGATION					Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP15\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5984071 mN (NZTM2000) 1737278 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 45.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	0.00m: Organic SILT. (TOPSOIL).	M		St		TS
				0.15m	0.15m: SILT; light grey. Stiff, moist, medium plasticity. (RESIDUAL SOIL).			H		
				0.30m	0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin cemented layer. (RESIDUAL SOIL).			Vst		
				0.40m	0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).					
				1.10m	1.10m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).					
				2.50m	2.50m: Clayey SILT; dark grey stained brown. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).					
				3.8m	3.8m: END OF INVESTIGATION					

SKETCH / PHOTO:


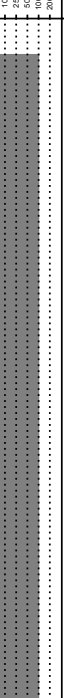


COMMENTS:

Hole Depth  
3.8m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983981 mN (NZTM2000) 1737003 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 137/- kPa</li> <li>Sample 1 @ 0.40m</li> <li>● 120/- kPa</li> <li>● 154/- kPa</li> <li>● 128/- kPa</li> <li>● 118/- kPa</li> <li>● 122/- kPa</li> <li>Sample 2 @ 1.90m</li> <li>● 106/- kPa</li> <li>● 109/- kPa</li> <li>Sample 3 @ 3.30m</li> <li>● 80/- kPa</li> <li>● 77/- kPa</li> </ul>	29	0.5		<p>0.00m: Clayey SILT. (TOPSOIL).</p> <p>0.20m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).</p> <p>0.50m: Clayey SILT; grey and dark yellow with black oxide stained fissure plains, fissured. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.10 - 1.30m: Dark yellow.</p> <p>1.30 - 1.90m: Light grey. With black oxide stained fissure plains.</p> <p>1.90m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.70m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M		Vst			TS
				27	4.0		3.8m: END OF INVESTIGATION			St			Northland Allocthon

SKETCH / PHOTO:



COMMENTS:


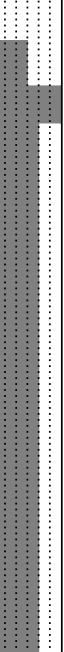
 Hole Depth  
3.8m

# EXCAVATION LOG

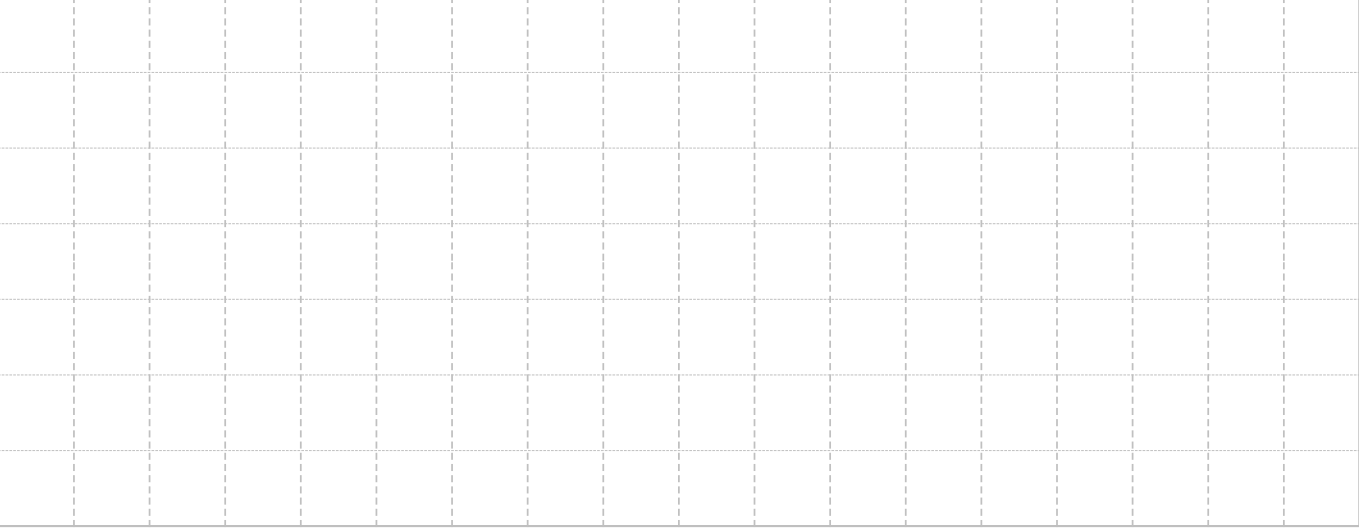
Excavation Id.: **TP17\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983852 mN (NZTM2000) 1736849 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 40.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 89/- kPa Sample 1 @ 0.40m</li> <li>● UTP</li> <li>● 109/- kPa Sample 2 @ 0.80m</li> <li>● 135/- kPa</li> <li>● 132/- kPa</li> <li>● 125/- kPa</li> <li>● 116/- kPa</li> <li>● 106/- kPa</li> <li>● 109/- kPa</li> <li>● 100/- kPa</li> </ul>	39	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.25m: SILT; orange. Stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).</p> <p>0.40m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).</p> <p>0.60m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.40m: Silty CLAY; light grey and yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.10 - 3.70m: Light grey stained yellow.</p>	M	vst H vst			TS
				36	4.0		3.7m: END OF INVESTIGATION					Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth 3.7m

# EXCAVATION LOG

Excavation Id.: **TP18\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983821 mN (NZTM2000) 1737003 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021			
R.L.: 36.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	Organic SILT. (TOPSOIL).					TS
			● JTP Sample 1 @ 0.40m	0.5	0.20m: SILT, some clay; light grey and yellow. Hard, moist, medium to high plasticity. (RESIDUAL SOIL). 0.50 - 1.60m: Very stiff.	M	H			Northland Allocthon
			● 152/- kPa				Vst			
			● 103/- kPa	1.0	0.90m: Silty CLAY; light grey and yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).		Vst			
			● 109/- kPa	1.5						
		12/10/2021 Slow inflow	● 96/- kPa	2.0	1.60m: Clayey SILT, trace organics; light grey stained yellow. Stiff, moist, medium to high plasticity. Organics, decomposed tubular roots. (RESIDUAL SOIL).		St			
			Sample 2 @ 1.90m	3.0						
			● 93/- kPa							
			● 90/- kPa	2.5						
			Sample 3 @ 2.90m	3.5						
			● 84/- kPa	4.0	3.7m: END OF INVESTIGATION					
				4.5						

SKETCH / PHOTO:



COMMENTS:

Hole Depth 3.7m



# EXCAVATION LOG

Excavation Id.: **TP19\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North      LOCATION: Wellsford      JOB No.: 1018519.0000

CO-ORDINATES: 5983752 mN (NZTM2000) 17371118 mE      EXPOSURE METHOD: TP      EXCAV. STARTED: 12/10/2021

R.L.: 42.00m      OPERATOR: Mason Contractors      LOGGED BY: LPA

DATUM: NZVD2016      DIMENSIONS: 5m by 1.2m      CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 109/- kPa</li> <li>● 112/- kPa</li> <li>Sample 1 @ 0.80m</li> <li>● 93/- kPa</li> <li>● 106/- kPa</li> <li>● 90/- kPa</li> <li>● 103/- kPa</li> <li>Sample 2 @ 2.00m</li> <li>● 112/- kPa</li> <li>● 122/- kPa</li> <li>● UTP Sample 3 @ 2.70m</li> <li>● UTP</li> </ul>	41	0.00m	TS	0.00m: Organic SILT. (TOPSOIL).	M		Vst	0		TS
					0.5		0.20m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).				25		
					1.0		0.90m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).				50		
					1.5		1.50 - 2.10m: Stiff.			St	100		
					2.0		2.10 - 2.70m: Hard.			H	200		
					2.5								
					3.0		2.70m: Highly weathered, grey with dark yellow stained fissures, fissured, SILTSTONE. Extremely weak (hard).						
					3.0		3m: END OF INVESTIGATION						
					3.5								
					38								
					4.0								
					4.5								

SKETCH / PHOTO:



COMMENTS:

Hole Depth 3m

# EXCAVATION LOG

Excavation Id.: **TP20\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983685 mN (NZTM2000) 1737065 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 38.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			● 112/- kPa	0.00m	0.00m: Organic SILT. (TOPSOIL).				TS
			● 125/- kPa Sample 1 @ 0.50m	0.25m	0.25m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist. (RESIDUAL SOIL).	M	vst		
			● 116/- kPa	0.70m	0.70m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).				
			● 109/- kPa	1.50 - 1.70m	1.50 - 1.70m: Stiff.		St		
			● 96/- kPa Sample 2 @ 1.50m	1.70 - 2.70m	1.70 - 2.70m: Very stiff.		vst		
			● 125/- kPa						
			● 132/- kPa						
			● 119/- kPa Sample 3 @ 2.70m	2.70m	2.70m: Highly weathered, grey with dark yellow stained fissures, fissured with striated surfaces, SILTSTONE. Extremely weak (hard).		H		
			● UTP	3.0m	3m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP21\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983732 mN (NZTM2000) 1736952 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021			
R.L.: 41.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3							0.00m: Organic SILT. (TOPSOIL).					TS
			● 109/- kPa				0.25m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).	M	vst			Northland Allocation
			● 93/- kPa Sample 1 @ 0.60m		0.5		0.50m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		st			
			● 125/- kPa		1.0		0.90 - 4.20m: Very stiff.		vst			
			● 119/- kPa	40	1.5							
			● 125/- kPa		2.0							
			● 122/- kPa Sample 2 @ 1.80m	39	2.5							
			● 100/- kPa		3.0							
			● 126/- kPa		3.5							
			Sample 3 @ 2.90m	38	4.0		4.20m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		st			
			● 119/- kPa		4.5							
			● 77/- kPa		5.0		5m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
5m



# EXCAVATION LOG

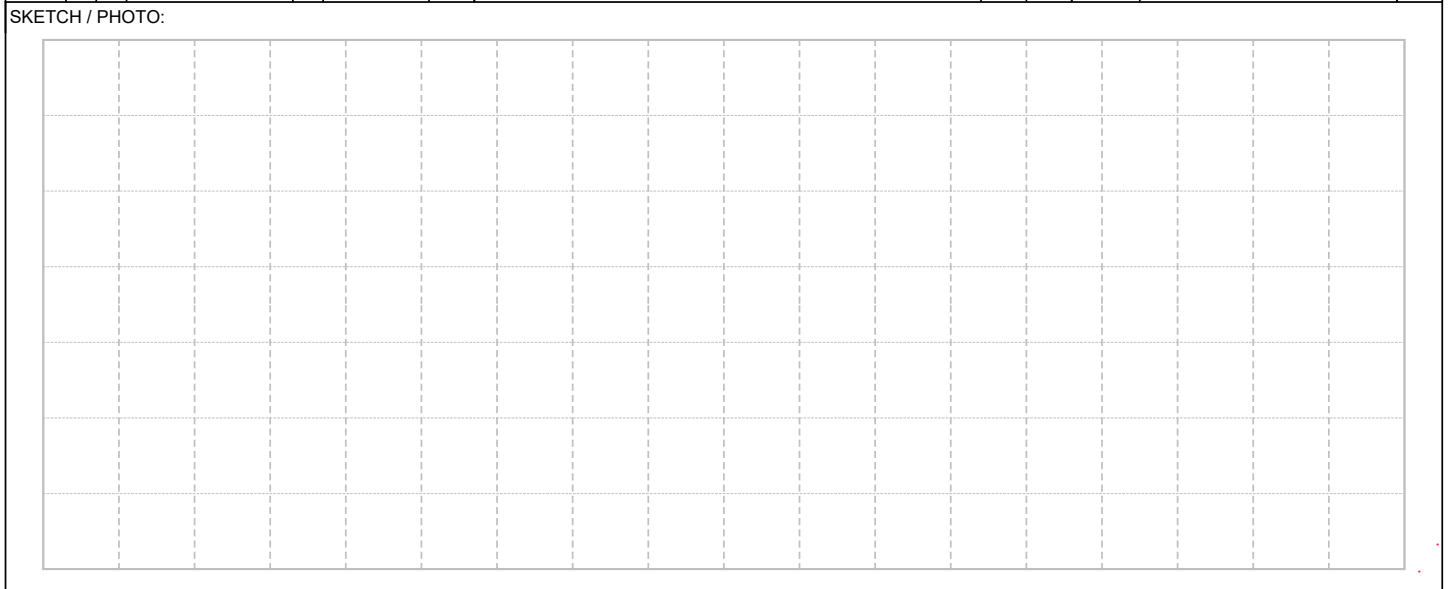
Excavation Id.: **TP22\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983549 mN (NZTM2000) 1737002 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	0.00m: Organic SILT. (TOPSOIL).						Top
			● 58/- kPa Sample 1 @ 0.30m	0.25m	0.25m: SILT, some clay; light brown and grey. Stiff, moist, medium to high plasticity.	M		St			1.0m: Sides collapsing
			● 86/- kPa	0.50m							
			● 84/- kPa	0.70m	0.70m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity.						
			Sample 2 @ 1.10m	1.10 - 2.90m	1.10 - 2.90m: Light grey stained yellow.						
			● 96/- kPa	1.50m							
			● 93/- kPa	2.00m							
			● 87/- kPa	2.50m	2.60 - 2.90m: Wet.			W			
			● 100/- kPa	3.00m	2.90m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.			M			
			● 93/- kPa	3.50m							
			● 100/- kPa	4.00m	3.70 - 4.60m: Very stiff.			Vst			
			● 77/- kPa	4.50m							
			● 84/- kPa Sample 3 @ 3.50m								
			● 109/- kPa								
			● 116/- kPa								
				4.6m	4.6m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.6m

# EXCAVATION LOG

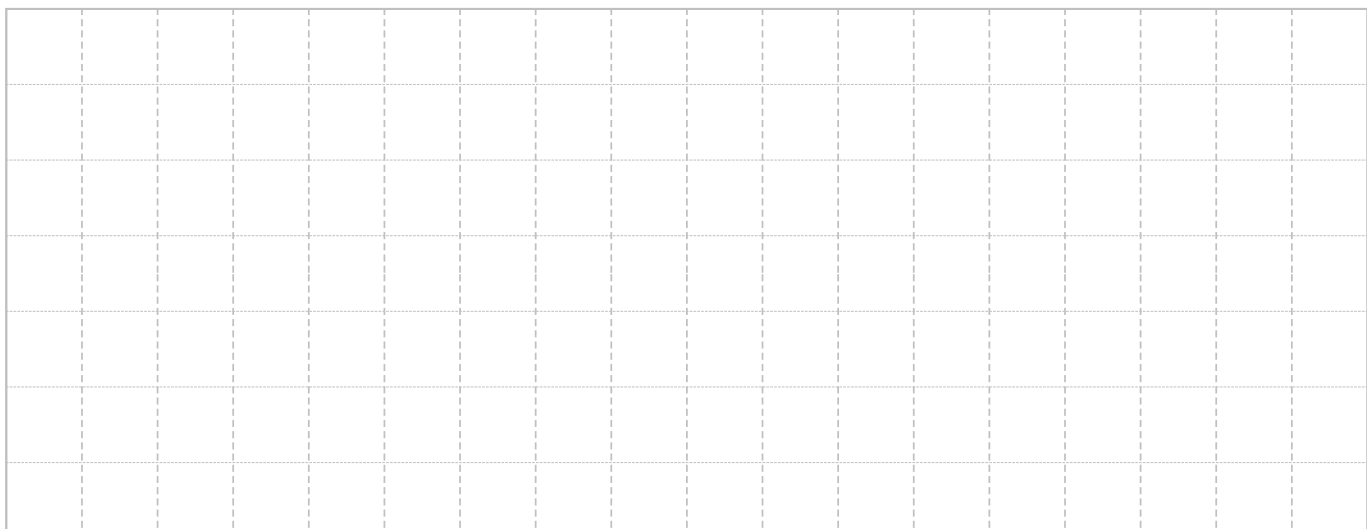
Excavation Id.: **TP23\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983260 mN (NZTM2000) 1737223 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021			
R.L.: 46.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3						0.00m: Organic SILT. (TOPSOIL). 0.10m: Clayey SILT; yellow and grey with organic staining. Stiff, moist, medium to high plasticity. 0.30 - 0.90m: Very stiff.	M	St	0 25 50 75 100 125 150 175 200		Top
			● 96/- kPa ● 106/- kPa ● 119/- kPa Sample 1 @ 0.90m ● 93/- kPa ● 96/- kPa ● 116/- kPa Sample 2 @ 1.90m ● 135/- kPa ● 148/- kPa ● 145/- kPa ● 103/- kPa ● 84/- kPa ● 157/- kPa ● 177/- kPa	45 44 43 42		0.90m: Silty CLAY; yellow and grey with organic staining. Stiff, moist, high plasticity.  1.40 - 2.00m: Very stiff.  2.00m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity.  2.50 - 3.10m: trace decomposed tubular roots; stained dark yellow.  3.10m: Clayey SILT, trace organics; grey. Stiff, moist, medium to high plasticity. Organics, decomposed tubular roots.  3.60 - 4.40m: Very stiff.		VSt St VSt			Alluvial Deposits
				4.5		4.4m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

Hole Depth 4.4m

# EXCAVATION LOG

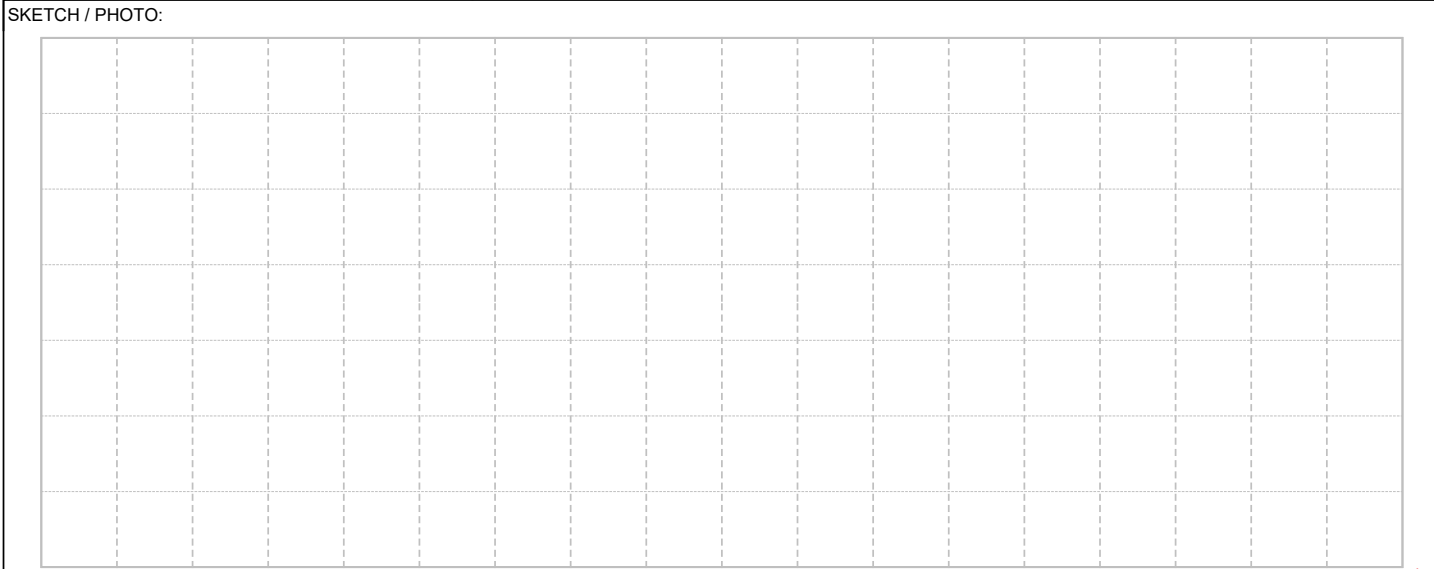
Excavation Id.: **TP24\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983251 mN (NZTM2000) 1737379 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021			
R.L.: 50.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00	0.00m: Organic SILT. (TOPSOIL).				TS
			● 93/- kPa	0.20	0.20m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).	M	H		
			● 96/- kPa Sample 1 @ 0.70m	0.30	0.30m: Clayey SILT; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).		Vst		
			● 109/- kPa	1.00	1.10 - 3.00m: With dark yellow staining.				
			● 148/- kPa	1.50					
			● 128/- kPa	2.00					
			● 112/- kPa Sample 2 @ 1.90m	2.00					
			● 136/- kPa	2.50					
			● 141/- kPa	2.50					
			● 148/- kPa	3.00					
			● UTP	3.00	3.00m: Completely weathered, grey, blocky and fissured with smooth polished surfaces, SILTSTONE. Extremely weak (hard).		H		
			● UTP Sample 3 @ 3.40m	3.40					
			● UTP	3.50					
			● UTP	4.00					
			● UTP	4.00	4.20m: Highly weathered, grey, blocky and fissured with smooth polished surfaces, SILTSTONE. Extremely weak (hard).				
			● UTP	4.20					
				4.50	4.5m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.5m



# EXCAVATION LOG

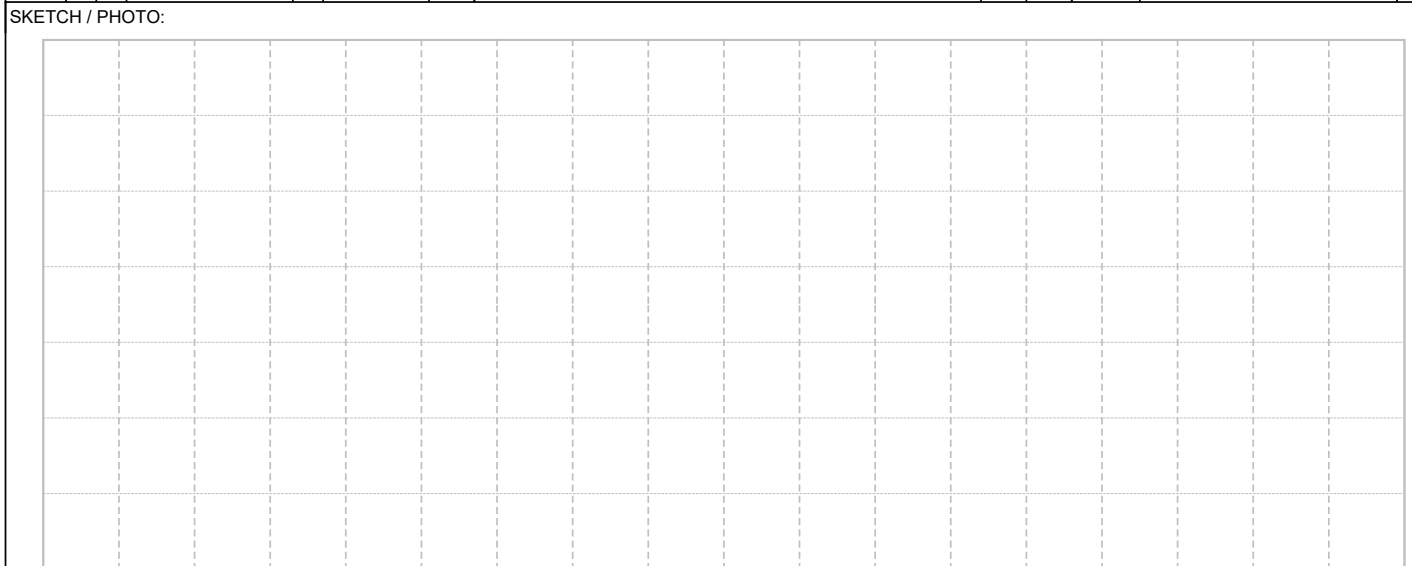
Excavation Id.: **TP25\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983155 mN (NZTM2000) 1737269 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00	0.00m: Organic SILT. (TOPSOIL).	M	H			TS
	● UTP			0.10	0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).					
	● >222 kPa			0.25	0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Hard, moist, medium to high plasticity. (RESIDUAL SOIL).					
	● >222 kPa Sample 1 @ 0.90m		46	0.90	0.90m: Silty CLAY, trace fibrous roots; yellow and light grey. Stiff, moist, high plasticity. (RESIDUAL SOIL).		St			
	● 89/- kPa			1.50						
	● 96/- kPa			2.00	2.00 - 3.00m: Very stiff.		vst			
	● 96/- kPa			2.50	2.50 - 3.00m: Dark yellow stained layer.					
	● 112/- kPa		45	3.00	3.00m: SILT; grey. Very stiff, moist, non-plastic to low plasticity. Near transition to granular behaviour. (COMPLETELY WEATHERED SILTSTONE). 3.40 - 3.50m: some gravel up to 50mm, corestones.					
	● 116/- kPa			3.50	3.50m: Highly weathered, grey, fissured with planar polished surfaces, SILTSTONE. Extremely weak (hard).		H			
	● 109/- kPa		44	4.00						
	● 100/- kPa Sample 2 @ 3.00m			4.30	4.3m: END OF INVESTIGATION					
	● 148/- kPa									
	● >222 kPa									
	● UTP		43							
	● UTP									
	DRY 14/10/2021									

SKETCH / PHOTO:



COMMENTS:

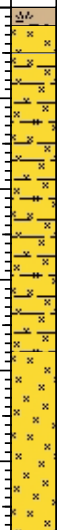
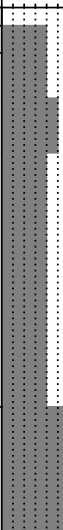
Hole Depth  
4.3m

# EXCAVATION LOG

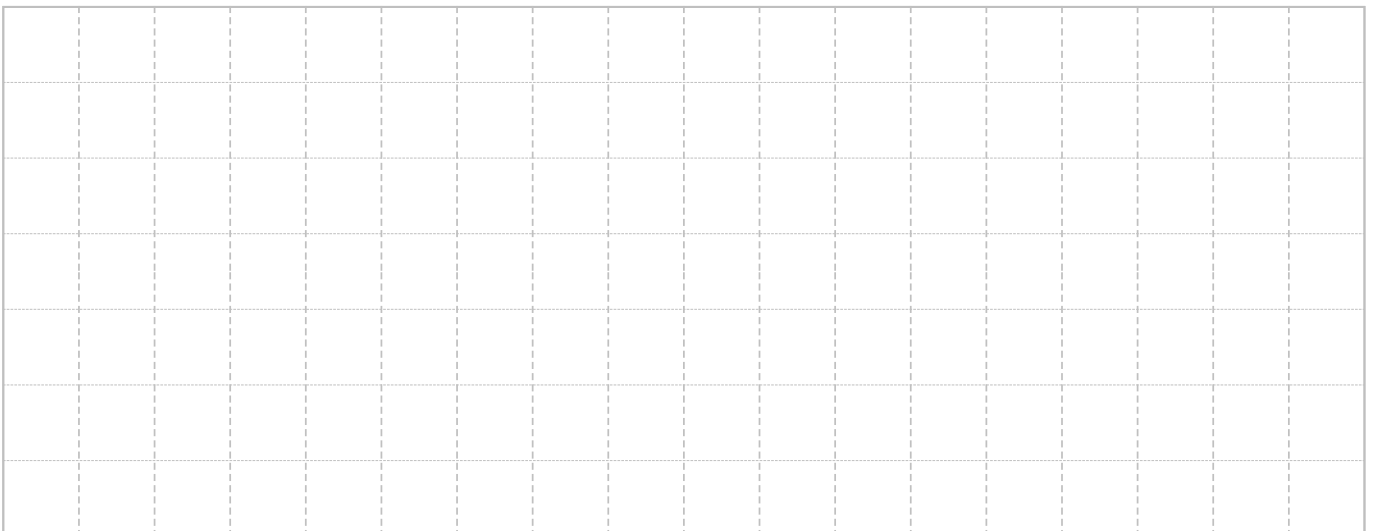
Excavation Id.: **TP26\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983111 mN (NZTM2000) 1737412 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 54.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 161/- kPa</li> <li>● &gt;222 kPa</li> <li>● 125/- kPa Sample 1 @ 0.90m</li> <li>● 100/- kPa</li> <li>● 100/- kPa</li> <li>● 126/- kPa</li> <li>● 141/- kPa</li> <li>● UTP Sample 2 @ 2.40m</li> <li>● UTP</li> <li>● UTP</li> </ul>	53	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer, (RESIDUAL SOIL).</p> <p>0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.00 - 1.90m: Some pockets of gravel; dark yellow and grey.</p> <p>1.60 - 1.90m: Wet.</p> <p>1.90m: SILT; grey with dark yellow, fissured (slickensided). Very stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>2.20 - 2.90m: Hard.</p>	M	H	vst			TS
				52	2.0			W					Northland Allocation
				51	3.0		2.9m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
2.9m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983570 mN (NZTM2000) 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																			M	Vst		0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. Organics, rootlets (partially decomposed). (TOPSOIL)
Alluvium																			M / CW			0.30m: Clayey SILT, trace organics; light brownish orange mottled light grey. Very stiff, moist, low to medium plasticity. Organics, amorphous (carbonaceous) and fibrous (decomposed rootlets). (PLEISTOCENE ALLUVIUM).
																			M			1.00m: Clayey SILT, trace organics; orange brown streaked light grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).
Northland Allocthon																				VSt-H		1.50 - 1.80m: Very stiff to hard
																				H		1.80m: Silty CLAY; light grey streaked orange. Hard, moist, medium plasticity.
																						2.00m: CLAY, some silt; light grey streaked orange. Very stiff, moist, high plasticity.
																				St		3.00 - 3.30m: Grey. Stiff
																				VSt		3.30 - 3.90m: Very stiff
																				D		3.90m: CLAY, some silt and some gravel; grey. Very stiff, moist, medium plasticity. Gravel, fine, sub-angular, limestone.
																						4.70m: Gravelly SILT; grey, friable. Hard, dry, non-plastic. Gravel, fine, sub-angular, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).
																						4.70m: Hand auger terminated due to refusal at 4.70m bgl. Scala Penetrometer advanced at the base of the hole. (UNDIFFERENTIATED MAHURANGI LIMESTONE).
																						4.9m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 4.70m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 4.90m bgl. 3) GW inflow at 2.5m bgl. 4) GW level measured at 2.12m bgl after hand auger was completed. 5) SV #376 (correction factor 1.65).

Hole Depth 4.9m  
Scale 1:30

HandAugerLog - 19/11/2021 5:43:26 pm - Produced with Core-GS by GeRoc Box 1.0.04.7m



# CORE PHOTOS

BOREHOLE No.: HA01\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983570 mN 1736784 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	24.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-4.70m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983527 mN (NZTM2000) 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL					ENGINEERING DESCRIPTION					
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DESCRIPTION AND ADDITIONAL OBSERVATIONS
Topsoil						0.00			St	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).
Northland Allochthon		100		● 81/35 kPa		0.5			St	0.10m: SILT, some clay, trace organics and trace sand; dark brown. Stiff, moist, medium plasticity. Sand, fine; organics, rootlets (decomposed).
				● 71/38 kPa		1.0			St	0.40m: Silty CLAY; light grey mottled orange, bedded. Stiff, moist, high plasticity.
				● 76/35 kPa		1.5			St	
				● 85/35 kPa		2.0			F-St	1.00 - 2.80m: Trace gravel; grades to red and grey. Gravel, fine, sub-rounded, limestone.
				● 71/28 kPa		2.5			St	1.20 - 2.80m: Fissured (polished).
				● 51/35 kPa		3.0			St	1.80 - 2.10m: Firm to stiff.
				● 88/26 kPa		3.5			St	2.10 - 2.40m: Stiff.
				● 101/63 kPa		4.0			St-VSt	2.40 - 2.70m: Stiff to very stiff.
				● 93/35 kPa		4.5			St	2.70 - 3.00m: Stiff.
						5.0				
					5.5					3.8m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 3.00 m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.80 m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth 3.8m

HandAugerLog - 12/11/2021 11:10:35 am - Produced with Core-GS by GeRoc



# CORE PHOTOS

BOREHOLE No.: HA02\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983527 mN 1736676 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	31.46m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH





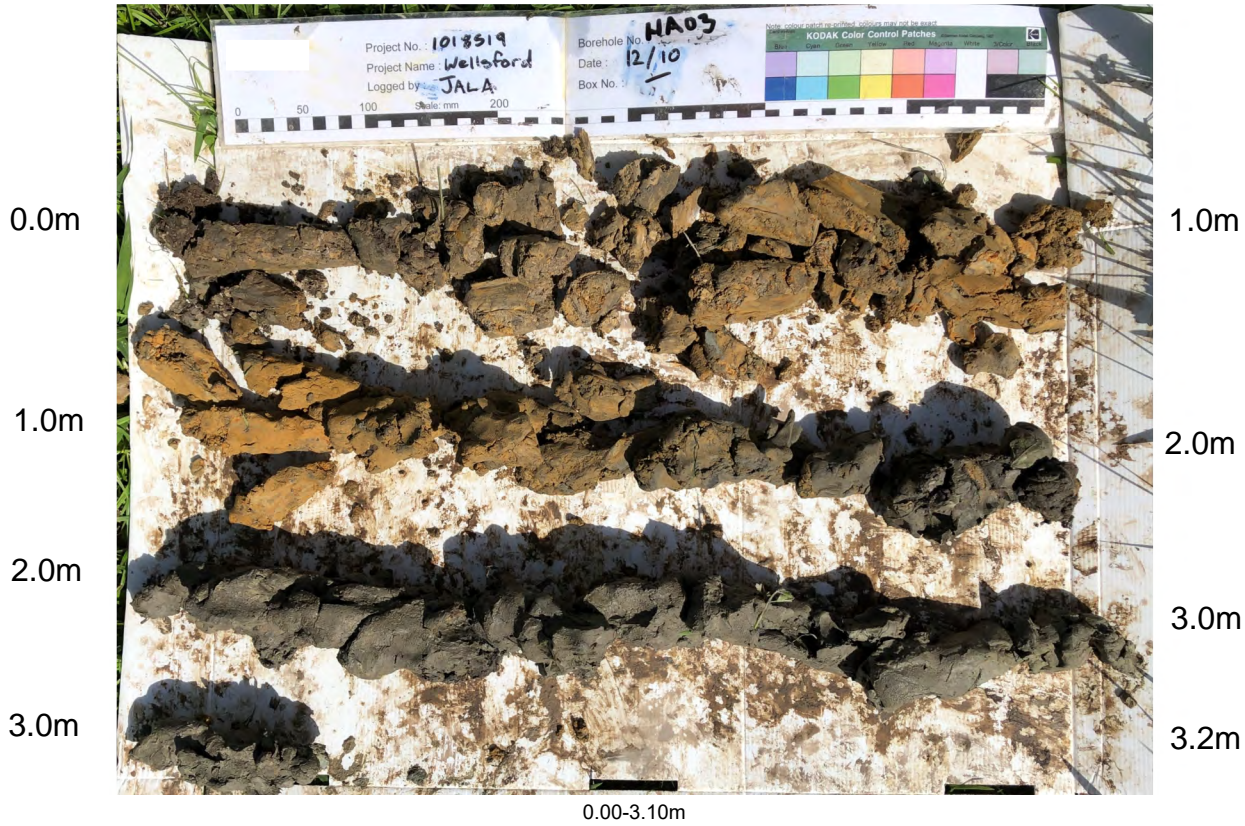
PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983445 mN (NZTM2000) 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION			
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	DESCRIPTION and Additional Observations
Topsoil						0.00 - 0.05	0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).
Alluvium				● 135/53 kPa		0.05 - 0.50	0.05m: Silty CLAY, trace gravel; dark grey mottled orange. Very stiff, moist, medium plasticity. Gravel, fine, sub-rounded to sub-angular, sandstone. (PLEISTOCENE ALLUVIUM).
				● 90/50 kPa		0.50 - 1.30m: Orange streaked dark grey.	
Northland Allochthon	13/10/2021 WL at 1.51 m bgl at end of day.	100	HA	● 73/41 kPa		1.30 - 1.60	1.30m: Silty CLAY, trace sand; dark grey. Stiff, wet, high plasticity. Sand, fine.
				● 80/38 kPa		1.60 - 2.20m: Stiff to very stiff.	
				● 101/46 kPa		2.20 - 2.50	2.20m: CLAY, trace sand; dark grey mottled blue. Very stiff, saturated, high plasticity. Sand, fine.
				● 103/50 kPa		2.50 - 3.10m: Stiff.	
				● 110/60 kPa		3.10m: Very stiff.	
				● 78/35 kPa		3.10m: Hand auger terminated due to refusal at 3.10m bgl. Scala Penetrometer advanced at the base of the hole.	
				● 135/26 kPa		4.3m: END OF BOREHOLE. Refuse.	

COMMENTS: 1) Hand Auger terminated at 3.10m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 4.30m bgl. 3) Groundwater level measured at 1.51m bgl. 4) SV #111 (correction factor 1.69).

Hole Depth 4.3m

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983445 mN 1736942 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	26.34m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

GEOLOGICAL				ENGINEERING DESCRIPTION								
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
Topsoil							0.00		W	St		0.00m: SILT, minor organics and minor clay and minor sand; dark brown. Stiff, wet, medium plasticity. Sand, fine. (TOPSOIL).
Northland Allochthon		100	HA		<ul style="list-style-type: none"> <li>68/33 kPa</li> <li>60/20 kPa</li> <li>51/26 kPa</li> </ul>		0.50		M			0.10m: Silty CLAY, trace sand; dark brown streaked reddish orange, fissured. Stiff, moist, high plasticity. Sand, fine. (RESIDUAL MAHURANGI LIMESTONE).
							1.00			F-St		0.70 - 1.30m: Light grey streaked orange. 0.90 - 1.30m: Firm to stiff.
							1.50			VD		1.30m: Clayey fine to coarse SAND, minor gravel; light blue mottled red. Very dense, moist. Gravel, fine, sub-rounded, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).
		0	DCP		20		2.00					1.80m: Hand auger terminated due to refusal at 1.80m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).
							2.00					2m: END OF BOREHOLE. Refuse.

COMMENTS: 1) Hand Auger terminated at 1.80m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 2.00m bgl. 3) Hole was dry on completion. 4) SV #111 (correction factor 1.69)

Hole Depth  
2m

221

HandAugerLog - 12/11/2021 11:12:28 am - Produced with Core-GS by GeRoc



# CORE PHOTOS

BOREHOLE No.: HA04\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736577 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	39.82m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-1.80m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983412 mN (NZTM2000) 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																			M	VSt		0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist. (TOPSOIL).
Northland Allochthon	100	HA	DCP												● 135/38 kPa	43	0.5			St-VSt		0.25m: Clayey SILT, trace organics; orange brown mixed with trace light grey. Very stiff, moist. Organics, rootlets (partially decomposed).
															● 132/59 kPa						0.90 - 1.20m: Stiff to very stiff	
																● 96/53 kPa	1.0					1.20 - 1.50m: Very stiff
																● 140/58 kPa						1.50m: Silty CLAY; light grey streaked light brown. Very stiff, moist, high plasticity.
														● 157/104 kPa	42	1.5			VSt			
														● 115/41 kPa		2.0					2.05m: SILT, some gravel; light grey, friable. Hard, dry, non-plastic. Gravel, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).	
														● UTP				D	H		2.20m: Hand auger terminated due to refusal at 2.20m bgl. Scala Penetrometer advanced at the base of the hole. [UNDIFFERENTIATED MAHURANGI LIMESTONE].	
	0		DCP										23								2.3m: END OF BOREHOLE. Refuse.	

COMMENTS: 1) Hand Auger terminated at 2.20m bgl due to refusal. 2) Scala was advanced at the base of the hole to an effective refusal depth of 2.30m bgl. 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 2.3m  
Scale 1:25

**CORE PHOTOS**

BOREHOLE No.: HA05\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983412 mN 1736648 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	43.49m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

2.2m

0.00-2.20m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983142 mN (NZTM2000) 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations			
				0	1	2	3	4	5	6	7	8	9												
Topsoil															● 157/81 kPa		47	0.0	TS	M	Vst	10	0.0m: Clayey SILT, some organics; dark orange. Very stiff, moist, medium plasticity. (TOPSOIL).		
Northland Allochthon	100	HA													● 107/48 kPa		0.5							0.30m: Clayey SILT, some organics; light grey streaked orange. Very stiff, moist, medium plasticity. Organics, rootlets.	
															● 110/58 kPa		1.0								1.20m: Silty CLAY; light grey mottled orange. Very stiff, moist, high plasticity.
															● 107/66 kPa		1.5								2.00m: Silty CLAY, some gravel; grey. Very stiff, moist, medium plasticity. Gravel, fine, limestone.
															● 127/59 kPa		2.0								2.30m: Gravelly SILT; light grey, friable. Hard, dry, non-plastic. Gravel, fine, limestone. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).
														● 145/87 kPa		46							2.4m: END OF BOREHOLE. Refuse.		
														● 165/92 kPa		45									
														● UTP		44	2.5								
																43	4.0								

COMMENTS: 1) Hand Auger terminated at 2.40m bgl due to refusal. 2) Hole was dry on completion. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 2.4m  
Scale 1:25

HandAugerLog - 12/11/2021 11:14:34 am - Produced with Core-GS by GeRoc

# CORE PHOTOS

BOREHOLE No.: HA06\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983142 mN 1736945 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	47.78m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m  
0.00-2.40m

3.0m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983127 mN (NZTM2000) 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH      CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations	
				0	1	2	3	4	5	6	7	8	9										
Topsoil																							0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).
Northland Allochthon	14/10/2021 WL at 1.12 m bgl measured 30 mins after EOH.	100	HA												● 148/41 kPa		57		M	Vst			0.30m: Clayey SILT, trace organics; light orangish brown mottled dark grey. Very stiff, moist, medium plasticity. Organics, rootlets (decomposed).
															● 137/68 kPa							1.10m: Silty CLAY; orange brown mottled light grey. Very stiff, moist, high plasticity.	
																● 145/49 kPa							1.90m: Sandy SILT; orange brown mottled light grey. Very stiff, wet, non-plastic. Sand, fine.
																● 142/49 kPa							2.10 - 2.60m: Hard
																● 157/43 kPa							2.60m: Clayey sandy SILT; light grey streaked orange. Very stiff to hard, wet, low plasticity. Sand, fine.
														● 190/59 kPa								3.00 - 3.20m: Hard	
														● UTP									3.20m: Silty fine SAND; dark orange speckled black. Medium dense, wet. Trace black limonite stained specks.
														● UTP									3.4m: END OF BOREHOLE. Refuse.
														● 198/115 kPa									
														● UTP									

COMMENTS: 1) Hand Auger terminated at 3.40m bgl due to refusal. 2) GW level measured at 1.12m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth  
3.4m

HandAugerLog - 12/11/2021 11:15:31 am - Produced with Core-GS by GeRoc



PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983127 mN 1737085 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	57.80m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

3.4m

0.00-3.40m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983288 mN (NZTM2000) 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9									
Topsoil																45	0.00m	TS	M	St		0.00m: SILT, some clay; dark brown. Very stiff, moist, low plasticity. (TOPSOIL).
Northland Allochthon	100	HA	14/10/2021 W/L measured at 2.95 m bgl 30 mins after EOH.												● 157/86 kPa	44	0.25m		MD		0.25m: Silty fine SAND; light grey. Medium dense, moist. Sand, pumiceous. 0.50 - 0.85m: Orange brown mottled dark grey.	
															● 152/97 kPa	43	1.00m		VSt		0.85m: Fine SAND, some silt; white mottled grey. Medium dense, moist. Sand, pumiceous. 1.00m: Silty CLAY, trace sand; light brown streaked dark grey and orange. Very stiff, moist, high plasticity.	
																● 115/73 kPa	42	2.00m		H		2.65m: Silty CLAY, some gravel; orange brown mottled dark grey. Hard, moist, medium to high plasticity. Gravel, fine, clasts of weathered mudstone.
																● 124/66 kPa ● 124/68 kPa ● >231 kPa	41	3.00m		D		2.95m: Silty CLAY; dark grey. Hard, dry, medium to high plasticity.
														● UTP ● 216/96 kPa	40	3.60m				3.6m: END OF BOREHOLE. Refuse.		

COMMENTS: 1) Hand Auger terminated at 3.60m bgl due to refusal. 2) GW level measured at 2.95m bgl after hand auger was completed. 3) SV #376 (correction factor 1.65). 4) No Scala Penetrometer undertaken at base of hole.

Hole Depth 3.6m  
Scale 1:25



# CORE PHOTOS

BOREHOLE No.: HA08\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983288 mN 1737298 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	45.13m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		LOGGED BY: OYCH      CHECKED: MTJH



1.0m                      2.0m                      3.0m                      3.6m

0.00-3.60m



PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983676 mN (NZTM2000) 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: OYCH
		CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION											
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations
				0	1	2	3	4	5	6	7	8	9								
Topsoil															● 214/82 kPa	28.5	TS	M	H		0.00m: SILT, some organics and some clay; dark brown. Hard, moist, low plasticity. (TOPSOIL).
Northland Allochthon	100	HA	HA												● 185/82 kPa	33	[Graphic Log]	M	H	VSt	0.30m: Clayey SILT, trace organics; light brown mottled orange. Hard, moist, medium plasticity. Organics, rootlets (partially decomposed).
														● 181/66 kPa	0.60 - 1.10m: Very stiff.						
														● 214/115 kPa	1.10m: Silty CLAY, trace sand; light grey mottled orange. Very stiff to hard, moist, high plasticity.						
														● 201/124 kPa	1.80 - 3.00m: Very stiff.						
														● 157/91 kPa							
														● 181/110 kPa	3.00m: CLAY, some silt; dark grey. Very stiff, moist, high plasticity.						
														● 181/115 kPa							
														● 180/109 kPa	3.90 - 4.20m: Stiff. 4.00 - 5.00m: Wet.						
														● 132/86 kPa							
														● 124/82 kPa	4.20 - 4.80m: Stiff to very stiff.						
										● 130/87 kPa											
										● 91/41 kPa	4.80 - 5.00m: Very stiff.										
										● 97/69 kPa											
										● 104/66 kPa	5.00m: Hand auger terminated due to target depth being reached at 5.0m bgl. Scala Penetrometer advanced at the base of the hole.										
										● 115/69 kPa											
															29						
															30						
															31						
															32						
															33						
															34						
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															36						
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															95						
															96						
															97						
															98						
															99						
															100						

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 2) Scala was advanced at the base of the hole and achieved target depth of 6.00m bgl (did not achieve refusal). 3) Hole was dry on completion. 4) SV #376 (correction factor 1.65).

Hole Depth 5.9m

HandAugerLog - 12/11/2021 11:16:33 am - Produced with Core-GS by GeRoc Box 1 0.05-5.0m

# CORE PHOTOS

BOREHOLE No.: HA09\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983676 mN 1736894 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	34.02m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: OYCH
			CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983560 mN (NZTM2000) 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.: 21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM: NZVD2016		DRILLED BY: T+T
		LOGGED BY: JALA CHECKED: MTJH

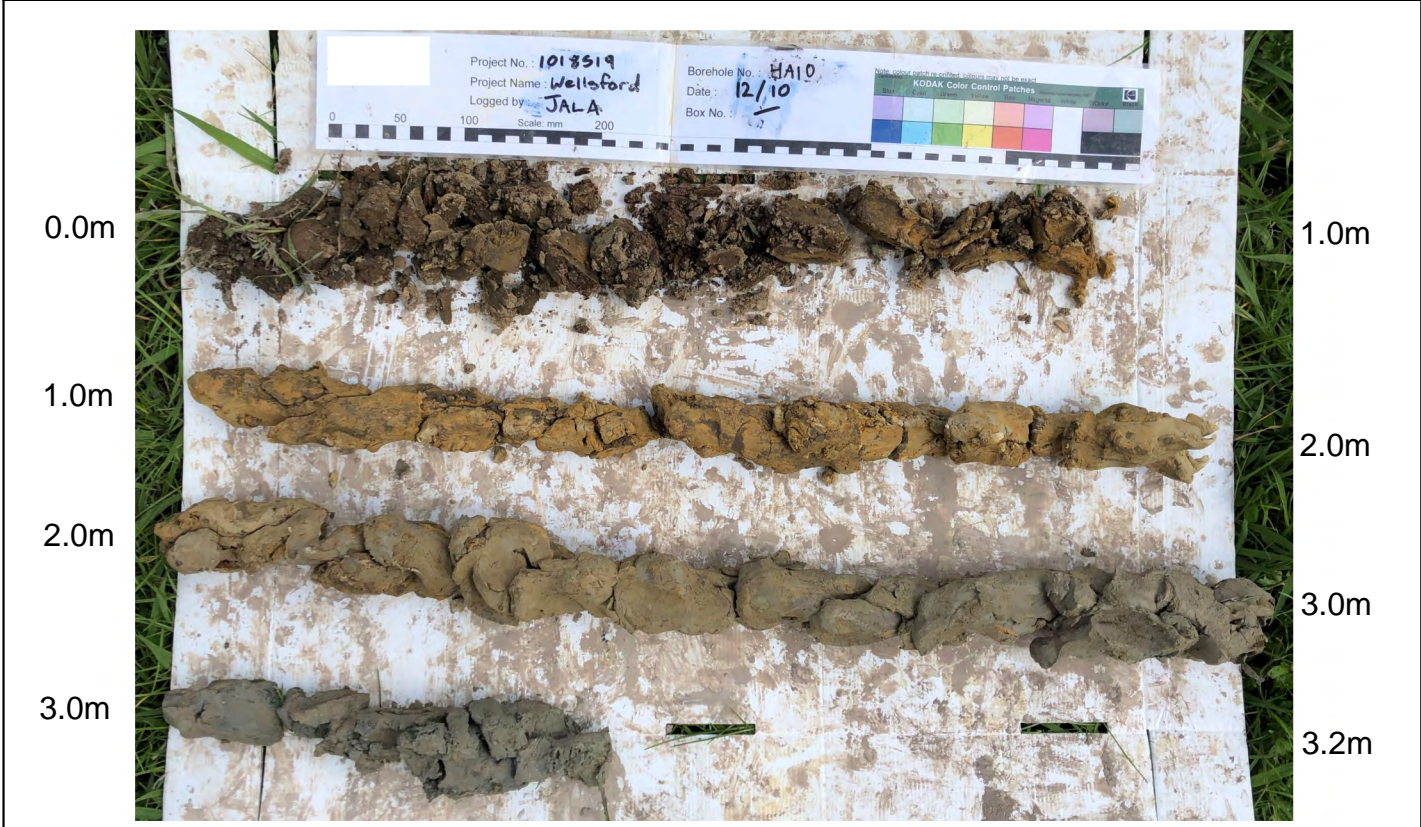
GEOLOGICAL				ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	MOISTURE CONDITION	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations			
Topsoil														0.00m: SILT, some organics, minor clay; dark brown. Stiff, moist, low plasticity. (TOPSOIL).			
Alluvium	100	HA	13/10/2021 WL at 3.40 m bgl at end of day.		● 184/26 kPa		21	0.5				VSt		0.10m: Clayey SILT, minor organics and minor sand; dark brown mottled orange. Very stiff, moist, medium plasticity. Sand, fine; organics, wood fragments (decomposed). (PLEISTOCENE ALLUVIUM).			
					● 63/28 kPa								St		0.60 - 0.90m: Stiff.		
					● 38/25 kPa									F		0.90 - 1.00m: Firm.	
					● 68/31 kPa									St		1.00m: CLAY, trace sand; orange mottled dark brown. Stiff, moist, high plasticity. Sand, fine.	
					● 146/51 kPa										VSt		1.50 - 1.80m: Very stiff.
					● 88/58 kPa										St		1.80 - 3.00m: Stiff.
					● 68/33 kPa												2.10 - 3.00m: Trace organics and grades to light grey. Organics, wood fragments (decomposed).
					● 68/35 kPa												
					● 68/35 kPa												
					● 183/26 kPa												
Northland Allochthon				8 12 15 20	● UTP		19	3.0			W	H		3.20m: Hand auger terminated due to refusal at 3.20m bgl. Scala Penetrometer advanced at the base of the hole (UNDIFFERENTIATED MAHURANGI LIMESTONE).			
							18	4.0						3.6m: END OF BOREHOLE. Refuse.			

COMMENTS: 1) Hand Auger terminated at 3.20m bgl due to refusal. 2) Scala Penetrometer was advanced at the base of the hole to an effective refusal depth of 3.60m bgl. 3) Groundwater level measured at 3.40m bgl. 4) SV #111 (correction factor 1.69)

Hole Depth 3.6m  
Scale 1:25



PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983560 mN 1736832 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 13/10/2021
R.L.:	21.97m	DRILL METHOD: HA+DCP	HOLE FINISHED: 13/10/2021
DATUM:	NZVD2016		DRILLED BY: T+T
			LOGGED BY: JALA
			CHECKED: MTJH



0.00-3.20m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983460 mN (NZTM2000) 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.: 31.30m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM: NZVD2016		DRILLED BY: T+T LOGGED BY: OYCH CHECKED: MTJH

GEOLOGICAL										ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MATERIAL COMPOSITION	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm)										TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING	STRENGTH DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	Description and Additional Observations		
				0	1	2	3	4	5	6	7	8	9											
Topsoil														● 181/59 kPa	31		TS	M	Vst		0.00m: SILT, some organics and some clay; dark brown. Very stiff, moist, low to medium plasticity. (TOPSOIL).			
Alluvium	14/10/2021 GW at 2.58m bgl measured 30 minutes after completion of	100	HA											● 180/74 kPa								0.30m: Clayey SILT, trace organics; light orangish brown mottled light grey. Very stiff, moist, medium plasticity. Organics, rootlets (partially decomposed). (PLEISTOCENE ALLUVIUM).		
														● 160/66 kPa	1							1.00m: Silty CLAY; brownish orange streaked grey. Very stiff, moist, medium plasticity.		
																● 190/104 kPa	30							
																● 148/99 kPa								
																● 176/102 kPa	2							
																● 148/87 kPa	29							2.10m: CLAY, some silt, trace sand; grey. Very stiff, moist, high plasticity. Sand, pumiceous.
																● 181/124 kPa								
																● 165/115 kPa	3							
																● 132/82 kPa	28							3.90 - 4.20m: Stiff to very stiff, wet.
																● 129/56 kPa								4.20 - 4.50m: Very stiff
												● 129/59 kPa								4.50 - 4.80m: Stiff				
												● 99/41 kPa	4			W	St-Vst			4.60m: CLAY, some sand and some gravel; dark grey. Stiff, wet, medium to high plasticity. Gravel, fine, sub-angular, limestone.				
												● 112/48 kPa	27				Vst							
												● 66/30 kPa					St							
												● 78/23 kPa	5				St							
													26							5m: END OF BOREHOLE. Target depth.				

COMMENTS: 1) Hand Auger terminated at 5.00m bgl due to the target depth being reached. 3) GW inflow at 3.40m bgl. 4) GW level measured at 2.58m bgl after HA was completed. 5) SV #376 (correction factor 1.65). 6) No Scala Penetrometer undertaken at base of hole.

Hole Depth 5m  
Scale 1:30

HandAugerLog - 12/11/2021 11:17:51 am - Produced with Core-GS by GeRoc



# CORE PHOTOS

BOREHOLE No.: HA11\_2021  
SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: (NZTM2000)	5983460 mN 1737025 mE	DRILL TYPE: 50mm Auger	HOLE STARTED: 14/10/2021
R.L.:	31.30m	DRILL METHOD: HA	HOLE FINISHED: 14/10/2021
DATUM:	NZVD2016		LOGGED BY: OYCH      CHECKED: MTJH



1.0m

2.0m

3.0m

4.0m

5.0m

0.00-5.00m



# EXCAVATION LOG

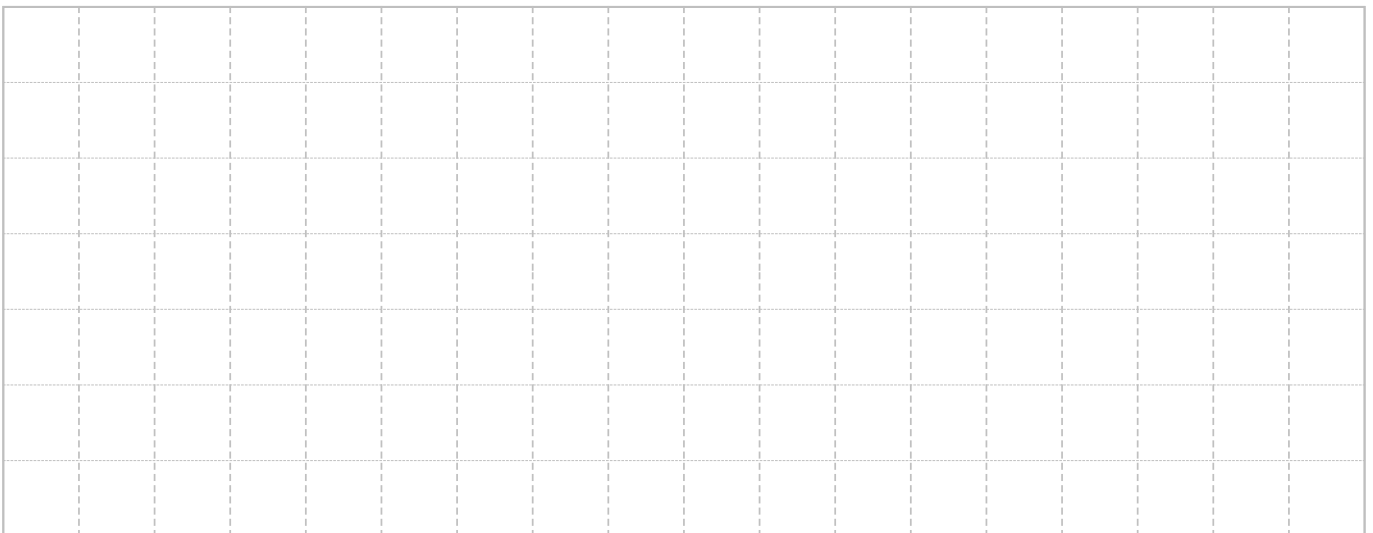
Excavation Id.: **TP01\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983629 mN (NZTM2000) 1736665 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 31.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS		ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00m: Organic SILT. (TOPSOIL).				TS
			● UTP	0.20m: SILT, some clay; light brown black oxide stained. Very stiff, moist, medium to high plasticity. (RESIDUAL MAHURANGI LIMESTONE).	M			Northland Allochthon
			● UTP	0.50m: GRAVEL, minor silt; light brown. Tightly packed, moist. Gravel, angular, to 100mm. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).				
			● UTP	1.00m: GRAVEL; light grey. Tightly packed, moist. (UNDIFFERENTIATED MAHURANGI LIMESTONE)				
		DRY 13/10/2021	● UTP	1.30 - 1.50m: White, light grey.				
			● UTP	1.5m: END OF INVESTIGATION. Difficult to excavate.				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
1.5m

# EXCAVATION LOG

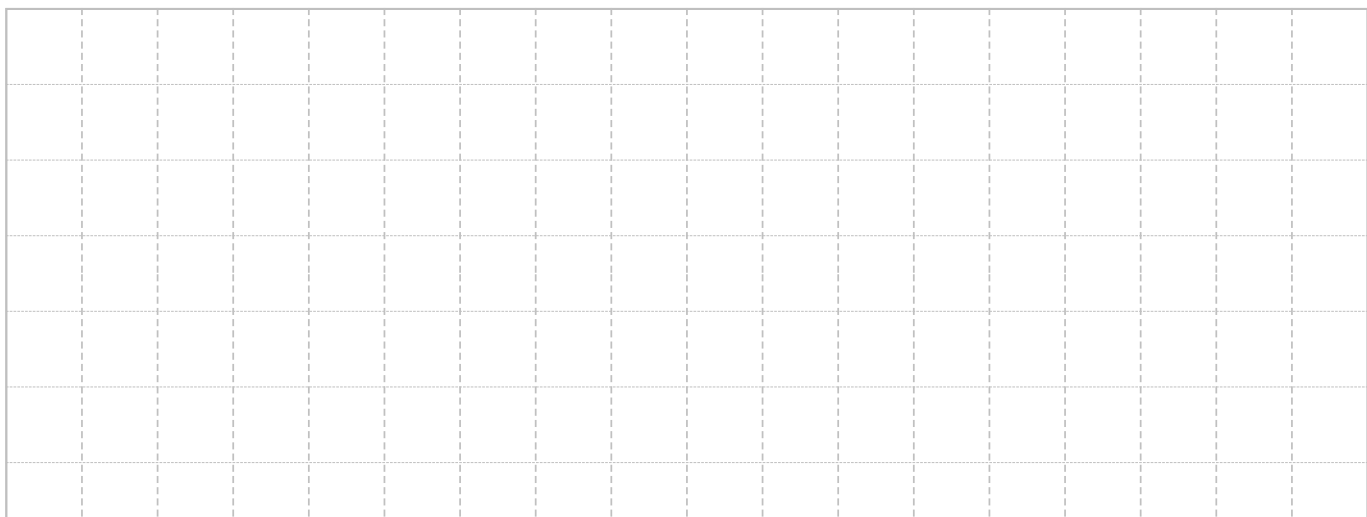
Excavation Id.: **TP02\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983454 mN (NZTM2000) 1736581 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021	
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021	
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA	
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 95/- kPa Sample 1 @ 0.40m</li> <li>● 114/- kPa</li> <li>● 118/- kPa</li> <li>● 89/- kPa</li> <li>● 92/- kPa</li> <li>● 102/- kPa</li> <li>● 92/- kPa</li> <li>● 97/- kPa</li> <li>● 127/- kPa</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> </ul>	0.5 46 1.0 1.5 45 2.0 2.5 44 3.0 3.5 43 4.0 4.5	0.00m: Organic SILT. (TOPSOIL). 0.10m: SILT, some clay; grey and dark yellow. Very stiff, moist, medium to high plasticity, with few fibrous roots. (RESIDUAL SOIL). 0.80 - 1.00m: Clayey SILT; light grey. 1.00 - 1.40m: Grades to SILT, some clay; grey with light brown. 1.40m: SILT; grey and light brown. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MUDSTONE). 1.90m: some gravel, up to 40mm, completely weathered (core-stones); saturated 2.50 - 4.00m: Recovered as gravelly SILT 2.80 - 3.20m: Grey stained red, very stiff. 3.20 - 3.60m: Grey stained red, hard. 3.60 - 4.00m: Grey stained red, hard. With pockets of gravel, highly weathered, white. 4.00m: GRAVEL; grey, fissured (slickensided). Tightly packed, moist. Gravel, mudstone fragments. (UNDIFFERENTIATED MUDSTONE).	M		Vst		TS
					4.6m: END OF INVESTIGATION					


SKETCH / PHOTO:



COMMENTS:

Hole Depth 4.6m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983316 mN (NZTM2000) 1736633 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 56.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3							0.00m: Organic SILT. (TOPSOIL).					TS
			<ul style="list-style-type: none"> <li>● 104/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 116/- kPa</li> <li>● 193/- kPa</li> <li>● UTP</li> <li>● UTP Sample 2 @ 1.80m</li> <li>● UTP</li> <li>● UTP</li> </ul>	55	0.5		0.30m: Clayey SILT; light grey and yellow with faint organic staining, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	Vst			
				54	1.0		1.30m: SILT, some clay; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).		H			
				54	2.0		1.60 - 2.60m: Recovered as gravel with tight, oxide stained fissure planes..					
				54	2.5		2.20 - 2.60m: Grading to Highly Weathered.					
				53	3.0		2.6m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS: Slumped slopes. Rushes and surface water. Large macrocarpa stumps.

 Hole Depth  
2.6m

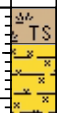

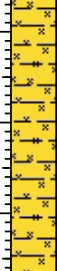




# EXCAVATION LOG

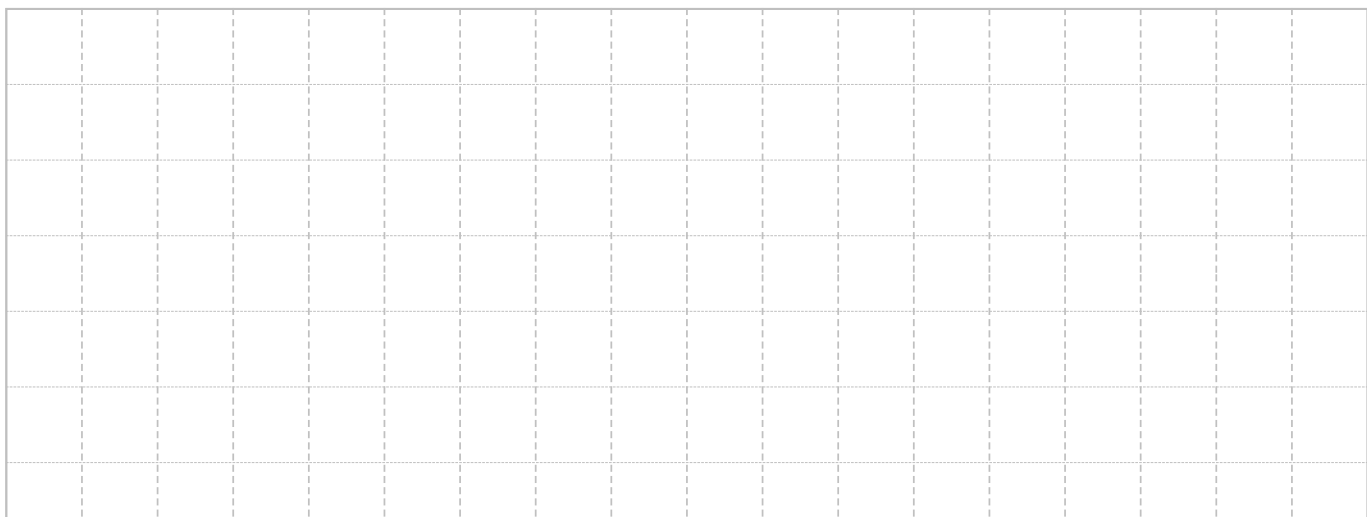
Excavation Id.: **TP04\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983346 mN (NZTM2000) 1736893 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 43.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3							0.00m: Organic SILT. (TOPSOIL).			0		TS
			● 107/- kPa ● 112/- kPa Sample 1 @ 0.70m ● 136/- kPa		0.5		0.20m: Clayey SILT, some fibrous roots; light brown and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	Vst	25		
		14/10/2021	● 125/- kPa Sample 2 @ 1.60m ● >222 kPa	42	1.0		0.80 - 1.30m: Light grey and yellow. 1.10 - 1.30m: Wet.					
			● >222 kPa ● >222 kPa ● >222 kPa ● 190/- kPa ● UTP	41	2.0		1.30m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED MUDSTONE). 1.60 - 4.00m: Hard.	W				
			● UTP Sample 3 @ 3.70m ● UTP	40	3.0		2.80 - 3.00m: Some gravel. Gravel, up to 40mm, corestones.	M				
				39	4.0		4m: END OF INVESTIGATION. Difficult to excavate.					
					4.5							

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4m

# EXCAVATION LOG

Excavation Id.: **TP05\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983405 mN (NZTM2000) 1736771 mE		EXPOSURE METHOD: TP		EXCAV. STARTED: 12/10/2021	
R.L.: 41.00m		EQUIPMENT: 14 Tonne Zaxis		EXCAV. FINISHED: 12/10/2021	
DATUM: NZVD2016		OPERATOR: Mason Contractors		LOGGED BY: LPA	
		DIMENSIONS: 5m by 1.2m		CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3							0.00m: Organic SILT. (TOPSOIL).					TS
		12/10/2021 Slow inflow at 1.0mbgl			0.5		0.30m: SILT, some clay; light grey and yellow with faint organic staining, blocky. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M				Northland Allocthon
		● 92/- kPa Sample 1 @ 0.50m ● 89/- kPa		40	1.0		1.00m: Clayey SILT; light yellow and grey. Stiff, wet, medium to high plasticity. (RESIDUAL SOIL).	W				
		● 89/- kPa ● 86/- kPa Sample 2 @ 1.60m ● 76/- kPa		39	1.5		1.30m: SILT; grey with dark yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).	M				
		● 64/- kPa ● 73/- kPa ● UTP		39	2.0		1.80m: SILT; grey. Stiff, moist, medium plasticity. (COMPLETELY WEATHERED MAHURANGI LIMESTONE).					
		● UTP			2.5		2.30 - 2.70m: Hard.					
					3.0		2.7m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:


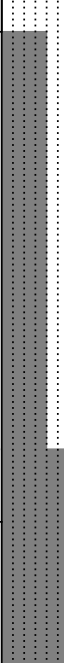
Hole Depth  
2.7m

# EXCAVATION LOG

Excavation Id.: **TP06\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983507 mN (NZTM2000) 1736790 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 28.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL							
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 87/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 93/- kPa</li> <li>● 85/- kPa</li> <li>● 103/- kPa</li> <li>● Sample 2 @ 1.80m</li> <li>● 87/- kPa</li> <li>● 74/- kPa</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> <li>● UTP</li> </ul>	27	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.20m: SILT, some clay; light grey and yellow. Stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>0.70 - 2.00m: Clayey SILT.</p> <p>2.00m: Clayey SILT; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.50 - 2.90m: Hard.</p> <p>2.90m: Gravelly SILT; grey and brown, blocky. Hard, moist. Gravel, up to 40mm, siltstone rock fragments. (COMPLETELY WEATHERED SILTSTONE).</p>	M	St				TS
				26	2.0		3.7m: END OF INVESTIGATION						Northland Allocthon
				25	3.0					H			
				24	4.0								

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.7m



# EXCAVATION LOG

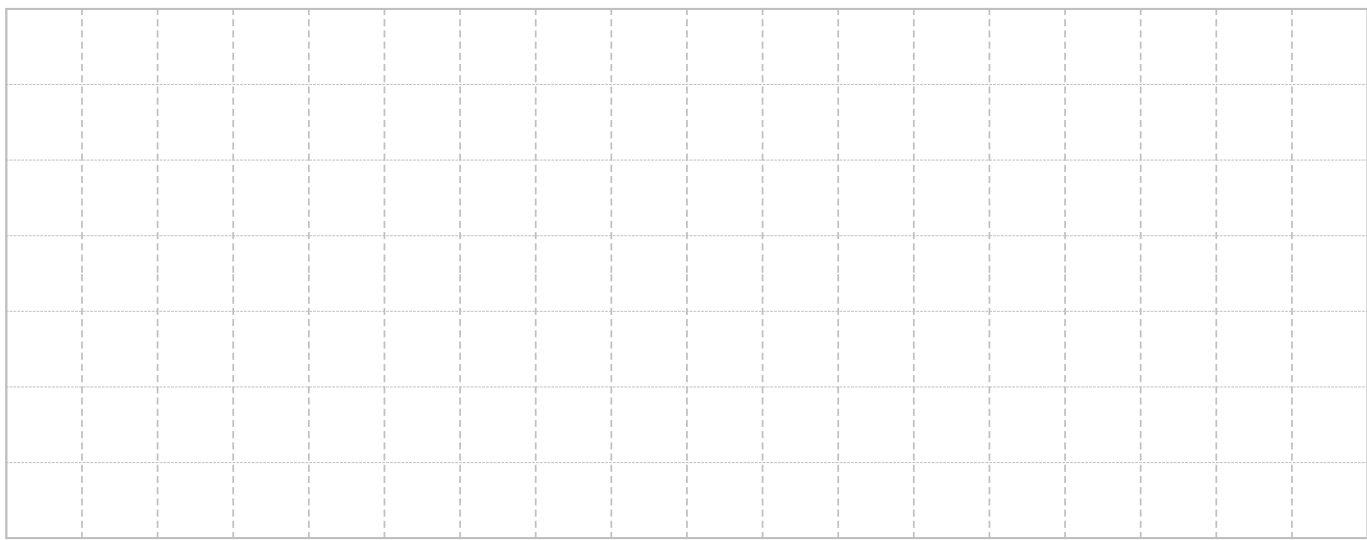
Excavation Id.: **TP07\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983737 mN (NZTM2000) 1736702 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021			
R.L.: 25.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m	Clayey SILT. (TOPSOIL).						TS
			● 112/- kPa Sample 1 @ 0.40m	0.5	0.25m: Clayey SILT; light grey and light brown. Very stiff, moist, medium plasticity. (RESIDUAL SOIL).	M		vst			Northland Allocthon
			● 116/- kPa								
			● 128/- kPa	1.0	0.80 - 1.90m: Light grey and yellow.						
			● 96/- kPa	1.5							
			● 128/- kPa	2.0	1.90m: SILT, some clay; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
			● 106/- kPa	2.5							
			Sample 2 @ 2.10m	3.0	2.70 - 4.10m: Grey. Stiff.			st			
			● 112/- kPa	3.5							
			● 122/- kPa	4.0	4.10m: Gravelly SILT; light grey and green. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE).			H			
			● 80/- kPa	4.5	4.4m: END OF INVESTIGATION						
			Sample 3 @ 3.50m								
			● 84/- kPa								
			● UTP								
	DRY										
	13/10/2021										

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.4m

# EXCAVATION LOG

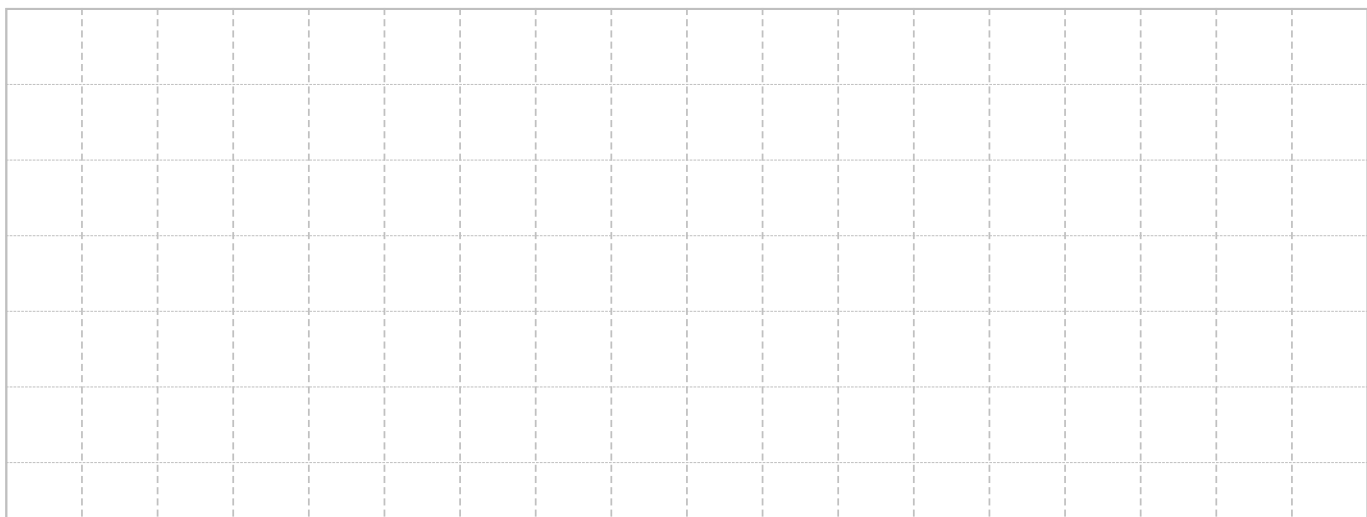
Excavation Id.: **TP08\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983674 mN (NZTM2000) 1736844 mE		EXPOSURE METHOD: TP		EXCAV. STARTED: 13/10/2021	
R.L.: 33.00m		EQUIPMENT: 14 Tonne Zaxis		EXCAV. FINISHED: 13/10/2021	
DATUM: NZVD2016		OPERATOR: Mason Contractors		LOGGED BY: LPA	
		DIMENSIONS: 5m by 1.2m		CHECKED BY: JAEL	

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 104/- kPa</li> <li>● Sample 1 @ 0.60m</li> <li>● 112/- kPa</li> <li>● 125/- kPa</li> <li>● 132/- kPa</li> <li>● 119/- kPa</li> <li>● Sample 2 @ 1.80m</li> <li>● 100/- kPa</li> <li>● 106/- kPa</li> <li>● 84/- kPa</li> <li>● 74/- kPa</li> <li>● 67/- kPa</li> <li>● 76/- kPa</li> </ul>	0.00m 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5	<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: Clayey SILT; grey and light grey with pockets of organic staining. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; grey and light grey with pockets of organic staining. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>1.90m: Clayey SILT, trace decomposed rootlets; grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>2.50 - 4.50m: Trace decomposed tubular roots.</p>	M		Vst		TS
				4.8	4.8m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

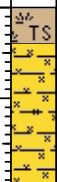

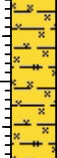
Hole Depth  
4.8m

# EXCAVATION LOG

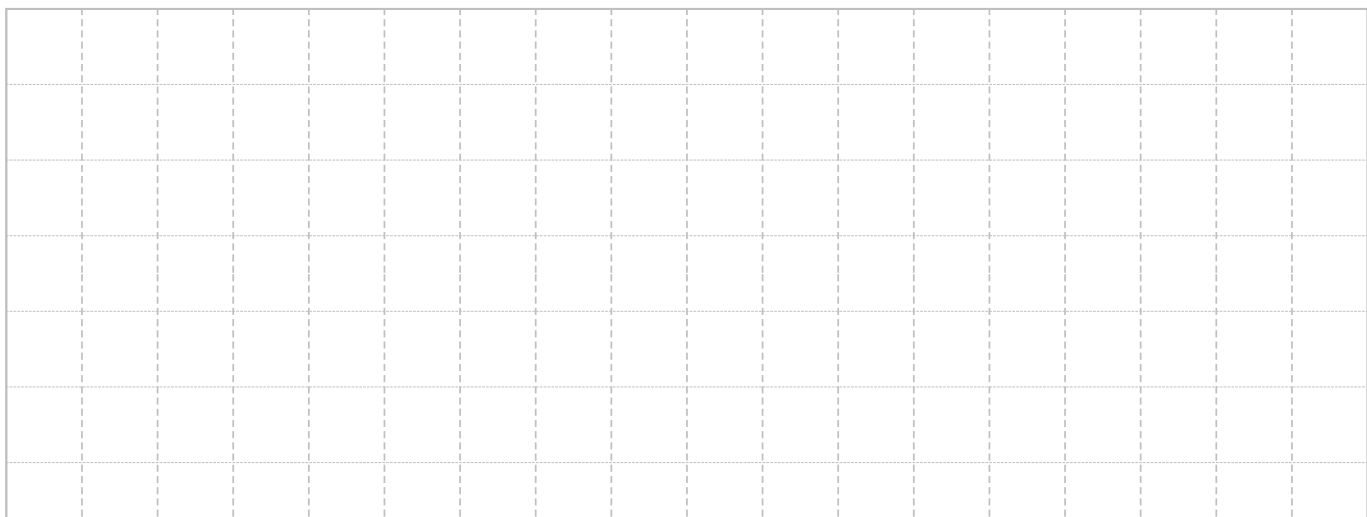
Excavation Id.: **TP09\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983515 mN (NZTM2000) 1736957 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3							0.00m: Organic SILT. (TOPSOIL).						Top
			Sample 1 @ 0.90m	29	0.5		0.20m: Clayey SILT; yellow. Very stiff, moist, medium to high plasticity.	M		Vst			Alluvial Deposits
			Sample 2 @ 2.40m	28	2.0		2.70m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.			St			
			Sample 3 @ 4.00m	26	4.0		3.50 - 4.70m: Very stiff.			Vst			
					4.5		4.7m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.7m



# EXCAVATION LOG

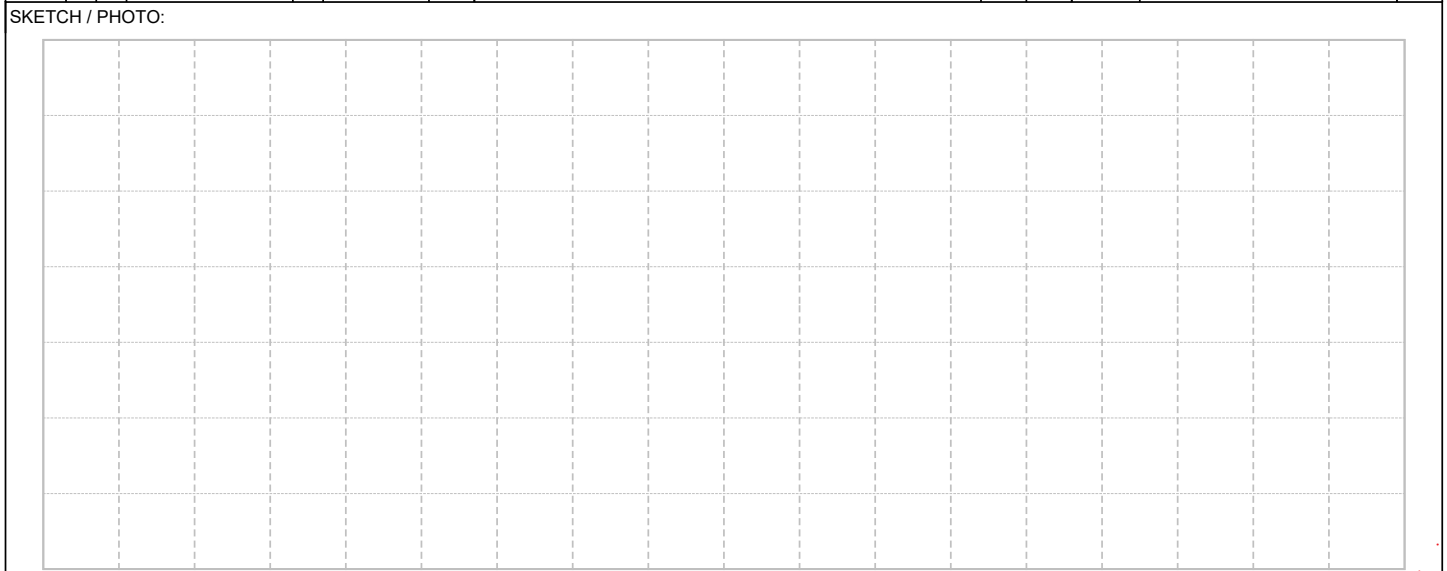
Excavation Id.: **TP10\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983029 mN (NZTM2000) 1737247 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00	0.00m: Organic SILT. (TOPSOIL).				TS
			● 64/- kPa ● 74/- kPa Sample 1 @ 0.60m	0.5	0.20m: Clayey SILT; yellow and light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M	St		
			● 80/- kPa ● 67/- kPa ● 106/- kPa ● 125/- kPa ● 128/- kPa ● 177/- kPa	1.0 1.5 2.0	1.30 - 2.60m: Grey stained yellow. Very stiff.		VSt		
			● >222 kPa Sample 2 @ 2.60m ● UTP	2.5	2.60m: SILT; grey. Hard, moist, medium plasticity. (COMPLETELY WEATHERED SILTSTONE).		H		
			● UTP	3.0	2.80m: Highly to completely weathered, grey, blocky, SILTSTONE. Extremely weak (hard).				
			● UTP	3.5	3.40 - 3.60m: Highly weathered. Slicksided fissure planes.				
				4.0	3.6m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.6m

# EXCAVATION LOG

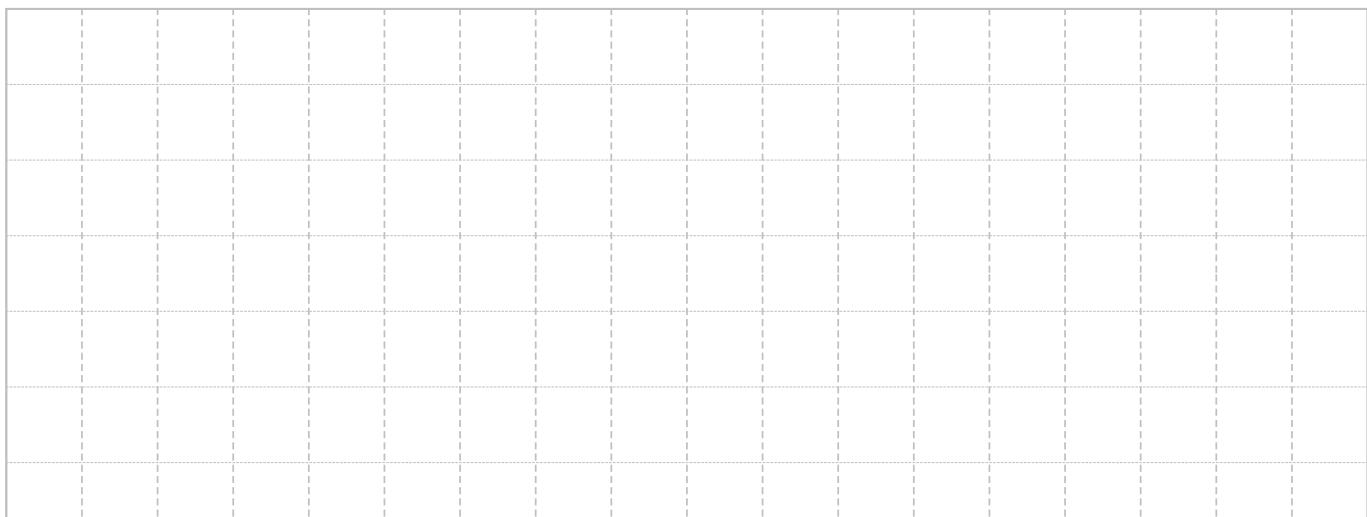
Excavation Id.: **TP11\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983438 mN (NZTM2000) 1737134 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021			
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3				0.00	0.00m: Organic SILT. (TOPSOIL).	M		Vst	0		TS
				0.10	0.10m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).				25		
				0.50	0.50m: SILT; white. Hard, moist, medium plasticity. (RESIDUAL SOIL).			H	60		
				0.70	0.70m: Clayey SILT; light yellow and grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			Vst	100		
				1.30 - 2.50	1.30 - 2.50m: Light grey and yellow.				200		
				2.50	2.50m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
				3.20 - 3.50	3.20 - 3.50m: Some clay.						
				3.50	3.50m: SILT, some clay; grey stained dark brown. Very stiff, moist, medium to high plasticity. (COMPLETELY WEATHERED SILTSTONE/MUDSTONE).						
				4.6	4.6m: END OF INVESTIGATION						

SKETCH / PHOTO:



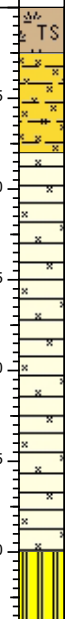
COMMENTS:

Hole Depth  
4.6m





PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983660 mN (NZTM2000) 1737164 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 50.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● 103/- kPa Sample 1 @ 0.30m</li> <li>● 96/- kPa</li> <li>● 89/- kPa</li> <li>● 89/- kPa</li> <li>● 93/- kPa</li> <li>● 90/- kPa Sample 2 @ 1.90m</li> <li>● 98/- kPa</li> <li>● 133/- kPa</li> <li>● 116/- kPa</li> <li>● UTP Sample 3 @ 3.20m</li> <li>● UTP</li> </ul>	49	0.00m		<p>0.00m: Clayey SILT. (TOPSOIL).</p> <p>0.25m: Clayey SILT; yellow and light grey, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.80m: Silty CLAY; light grey stained yellow, blocky. Stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.25 - 3.00m: Very stiff.</p> <p>3.00m: Highly weathered, grey and green, SILTSTONE. Extremely weak (hard). (COMPLETELY WEATHERED SILTSTONE / MUDSTONE).</p>	M	vst	<ul style="list-style-type: none"> <li>0</li> <li>25</li> <li>50</li> <li>75</li> <li>100</li> <li>125</li> <li>150</li> <li>175</li> <li>200</li> </ul>		TS
				48	3.4m		3.4m: END OF INVESTIGATION					

SKETCH / PHOTO:



COMMENTS:

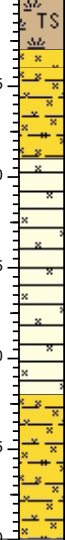
 Hole Depth  
3.4m

# EXCAVATION LOG

Excavation Id.: **TP14\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983963 mN (NZTM2000) 1737291 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 42.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3			<ul style="list-style-type: none"> <li>● UTP</li> <li>● 109/- kPa Sample 1 @ 0.50m</li> <li>● 116/- kPa</li> <li>● 112/- kPa</li> <li>● 105/- kPa Sample 2 @ 1.50m</li> <li>● 95/- kPa</li> <li>● 90/- kPa</li> <li>● 109/- kPa</li> <li>● 119/- kPa Sample 3 @ 2.70m</li> <li>● 122/- kPa</li> </ul>	41	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin, cemented layer. (RESIDUAL SOIL).</p> <p>0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.90m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.20m: Clayey SILT; grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p>	M		H Vst	10 25 50 100 200		TS
				30	3.0		3m: END OF INVESTIGATION						Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3m

250

# EXCAVATION LOG

Excavation Id.: **TP15\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5984071 mN (NZTM2000) 1737278 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 45.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION			GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT	
1 2 3					0.00m: Organic SILT. (TOPSOIL). 0.15m: SILT; light grey. Stiff, moist, medium plasticity. (RESIDUAL SOIL). 0.30m: SILT; light grey and white. Hard, moist, medium plasticity. Very thin cemented layer. (RESIDUAL SOIL). 0.40m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL). 1.10m: Silty CLAY; light grey stained yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL). 2.50m: Clayey SILT; dark grey stained brown. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).	M		St H Vst	10 25 50 100 200			TS
			● 64/- kPa ● UTP  ● 116/- kPa Sample 1 @ 0.60m  ● 119/- kPa  ● 100/- kPa ● 90/- kPa  Sample 2 @ 2.10m ● 122/- kPa ● 135/- kPa  Sample 3 @ 2.90m  ● 138/- kPa	44 43 42								
				41	3.8m: END OF INVESTIGATION							

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.8m



# EXCAVATION LOG

Excavation Id.: **TP16\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983981 mN (NZTM2000) 1737003 mE		EXPOSURE METHOD: TP		EXCAV. STARTED: 12/10/2021	
R.L.: 30.00m		EQUIPMENT: 14 Tonne Zaxis		EXCAV. FINISHED: 12/10/2021	
DATUM: NZVD2016		OPERATOR: Mason Contractors		LOGGED BY: LPA	
		DIMENSIONS: 5m by 1.2m		CHECKED BY: JAEL	

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3							0.00m: Clayey SILT. (TOPSOIL).						TS
			● 137/- kPa Sample 1 @ 0.40m		0.5		0.20m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).	M		Vst			
			● 120/- kPa				0.50m: Clayey SILT; grey and dark yellow with black oxide stained fissure plains, fissured. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
			● 154/- kPa	29	1.0		1.10 - 1.30m: Dark yellow.						
			● 128/- kPa		1.5		1.30 - 1.90m: Light grey. With black oxide stained fissure plains.						
			● 118/- kPa										
			● 122/- kPa Sample 2 @ 1.90m	28	2.0		1.90m: Clayey SILT; light grey and yellow. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).						
			● 106/- kPa		2.5								
			● 109/- kPa	27	3.0		2.70m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			St			
			Sample 3 @ 3.30m		3.5								
			● 80/- kPa										
			● 77/- kPa		4.0		3.8m: END OF INVESTIGATION						
				26	4.5								

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.8m

# EXCAVATION LOG

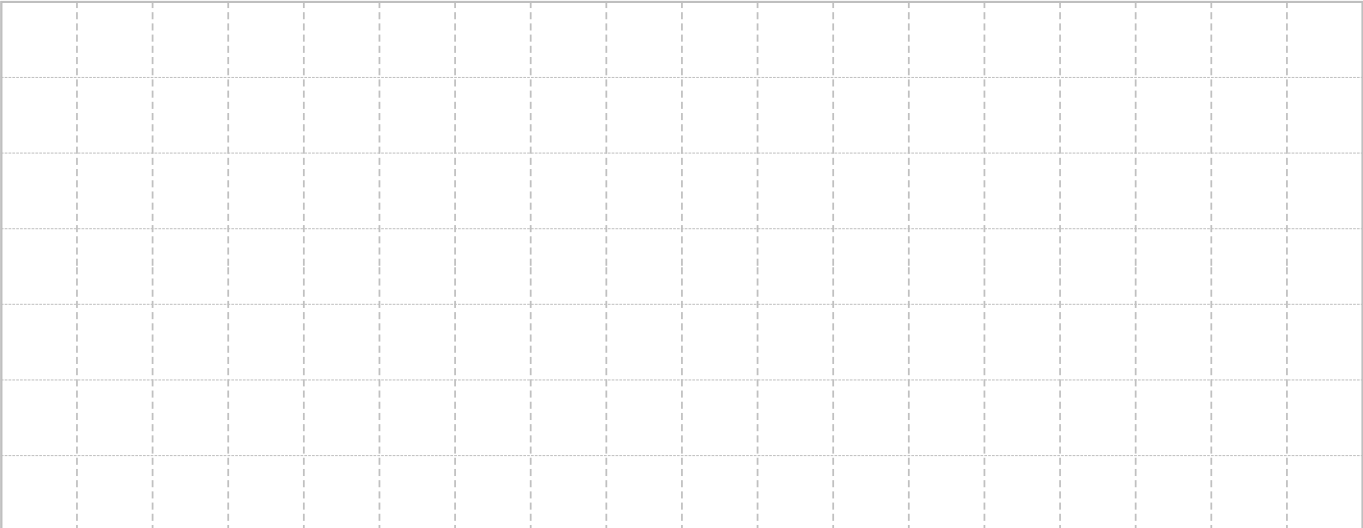
Excavation Id.: **TP17\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983852 mN (NZTM2000) 1736849 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 40.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 89/- kPa Sample 1 @ 0.40m</li> <li>● UTP</li> <li>● 109/- kPa Sample 2 @ 0.80m</li> <li>● 135/- kPa</li> <li>● 132/- kPa</li> <li>● 125/- kPa</li> <li>● 116/- kPa</li> <li>● 106/- kPa</li> <li>● 109/- kPa</li> <li>● 100/- kPa</li> </ul>	39	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.25m: SILT; orange. Stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).</p> <p>0.40m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).</p> <p>0.60m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.40m: Silty CLAY; light grey and yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>2.10 - 3.70m: Light grey stained yellow.</p>	M	vst H vst	10 25 50 100 200		TS
				36	4.0		3.7m: END OF INVESTIGATION					Northland Allocthon

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3.7m

# EXCAVATION LOG

Excavation Id.: **TP18\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North		LOCATION: Wellsford		JOB No.: 1018519.0000	
CO-ORDINATES: 5983821 mN (NZTM2000) 1737003 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021			
R.L.: 36.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021			
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA			
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL			

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3						0.00m: Organic SILT. (TOPSOIL).					TS
			● JTP Sample 1 @ 0.40m	0.5		0.20m: SILT, some clay; light grey and yellow. Hard, moist, medium to high plasticity. (RESIDUAL SOIL). 0.50 - 1.60m: Very stiff.	M	H			Northland Allocthon
			● 152/- kPa					Vst			
			● 103/- kPa	1.0		0.90m: Silty CLAY; light grey and yellow. Very stiff, moist, high plasticity. (RESIDUAL SOIL).		Vst			
			● 109/- kPa	1.5							
		12/10/2021 Slow inflow	● 96/- kPa	1.5							
			Sample 2 @ 1.90m	2.0		1.60m: Clayey SILT, trace organics; light grey stained yellow. Stiff, moist, medium to high plasticity. Organics, decomposed tubular roots. (RESIDUAL SOIL).		St			
			● 93/- kPa	2.0							
			● 90/- kPa	2.5							
			Sample 3 @ 2.90m	3.0							
			● 84/- kPa	3.0							
				3.5							
				4.0		3.7m: END OF INVESTIGATION					
				4.5							

SKETCH / PHOTO:



COMMENTS:

Hole Depth 3.7m

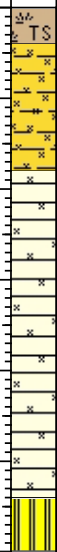


# EXCAVATION LOG

Excavation Id.: **TP19\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983752 mN (NZTM2000) 17371118 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 42.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 109/- kPa</li> <li>● 112/- kPa</li> <li>Sample 1 @ 0.80m</li> <li>● 93/- kPa</li> <li>● 106/- kPa</li> <li>● 90/- kPa</li> <li>● 103/- kPa</li> <li>Sample 2 @ 2.00m</li> <li>● 112/- kPa</li> <li>● 122/- kPa</li> <li>● UTP Sample 3 @ 2.70m</li> <li>● UTP</li> </ul>	41	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.20m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>0.90m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>1.50 - 2.10m: Stiff.</p> <p>2.10 - 2.70m: Hard.</p> <p>2.70m: Highly weathered, grey with dark yellow stained fissures, fissured, SILTSTONE. Extremely weak (hard).</p>	M	Vst	10 25 50 100 200		TS
				40	2.0				St			Northland Allocthon
				30	3.0		3m: END OF INVESTIGATION		H			

SKETCH / PHOTO:



COMMENTS:

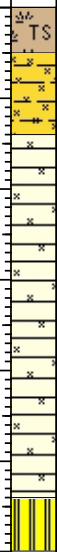
Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP20\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983685 mN (NZTM2000) 1737065 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 12/10/2021
R.L.: 38.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 12/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT	
1-3			<ul style="list-style-type: none"> <li>● 112/- kPa</li> <li>● 125/- kPa Sample 1 @ 0.50m</li> <li>● 116/- kPa</li> <li>● 109/- kPa</li> <li>● 96/- kPa Sample 2 @ 1.50m</li> <li>● 125/- kPa</li> <li>● 132/- kPa</li> <li>● 119/- kPa Sample 3 @ 2.70m</li> <li>● UTP</li> </ul>	37	0.5		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.25m: Clayey SILT; light grey and yellow, blocky. Very stiff, moist. (RESIDUAL SOIL).</p> <p>0.70m: Silty CLAY; light grey stained yellow, blocky. Very stiff, moist, high plasticity. (RESIDUAL SOIL).</p> <p>1.50 - 1.70m: Stiff.</p> <p>1.70 - 2.70m: Very stiff.</p> <p>2.70m: Highly weathered, grey with dark yellow stained fissures, fissured with striated surfaces, SILTSTONE. Extremely weak (hard).</p>	M	vst	10-20			TS
				36	1.0								
				35	2.0								
				34	3.0								
				33	3.5								
				32	4.0								
				31	4.5								
				30	5.0								
				29	5.5								
				28	6.0								
				27	6.5								
				26	7.0								
				25	7.5								
				24	8.0								
				23	8.5								
				22	9.0								
				21	9.5								
				20	10.0								
				19	10.5								
				18	11.0								
				17	11.5								
				16	12.0								
				15	12.5								
				14	13.0								
				13	13.5								
				12	14.0								
				11	14.5								
				10	15.0								
				9	15.5								
				8	16.0								
				7	16.5								
				6	17.0								
				5	17.5								
				4	18.0								
				3	18.5								
				2	19.0								
				1	19.5								
				0	20.0								
							3m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
3m

# EXCAVATION LOG

Excavation Id.: **TP21\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North      LOCATION: Wellsford      JOB No.: 1018519.0000

CO-ORDINATES: 5983732 mN (NZTM2000) 1736952 mE      EXPOSURE METHOD: TP      EXCAV. STARTED: 12/10/2021

R.L.: 41.00m      EQUIPMENT: 14 Tonne Zaxis      EXCAV. FINISHED: 12/10/2021

DATUM: NZVD2016      OPERATOR: Mason Contractors      LOGGED BY: LPA

DIMENSIONS: 5m by 1.2m      CHECKED BY: JAEL

EXCAVATION TESTS				ENGINEERING DESCRIPTION				GEOLOGICAL					
PENETRATION	SUPPORT	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-1 1-2 1-3											10 25 50 100 200		
			● 109/- kPa				0.00m: Organic SILT. (TOPSOIL).						
			● 93/- kPa Sample 1 @ 0.60m		0.5		0.25m: SILT; orange. Very stiff, moist, medium plasticity, friable. (RESIDUAL SOIL).	M		vst			
			● 125/- kPa				0.50m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			st			
			● 119/- kPa	40	1.0		0.90 - 4.20m: Very stiff.			vst			
			● 125/- kPa		1.5								
			● 122/- kPa Sample 2 @ 1.80m		2.0								
			● 100/- kPa	39	2.0								
			● 126/- kPa		2.5								
			Sample 3 @ 2.90m	38	3.0								
			● 119/- kPa		3.5								
				37	4.0								
					4.5		4.20m: Clayey SILT; light grey. Stiff, moist, medium to high plasticity. (RESIDUAL SOIL).			st			
			● 77/- kPa				5m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
5m



# EXCAVATION LOG

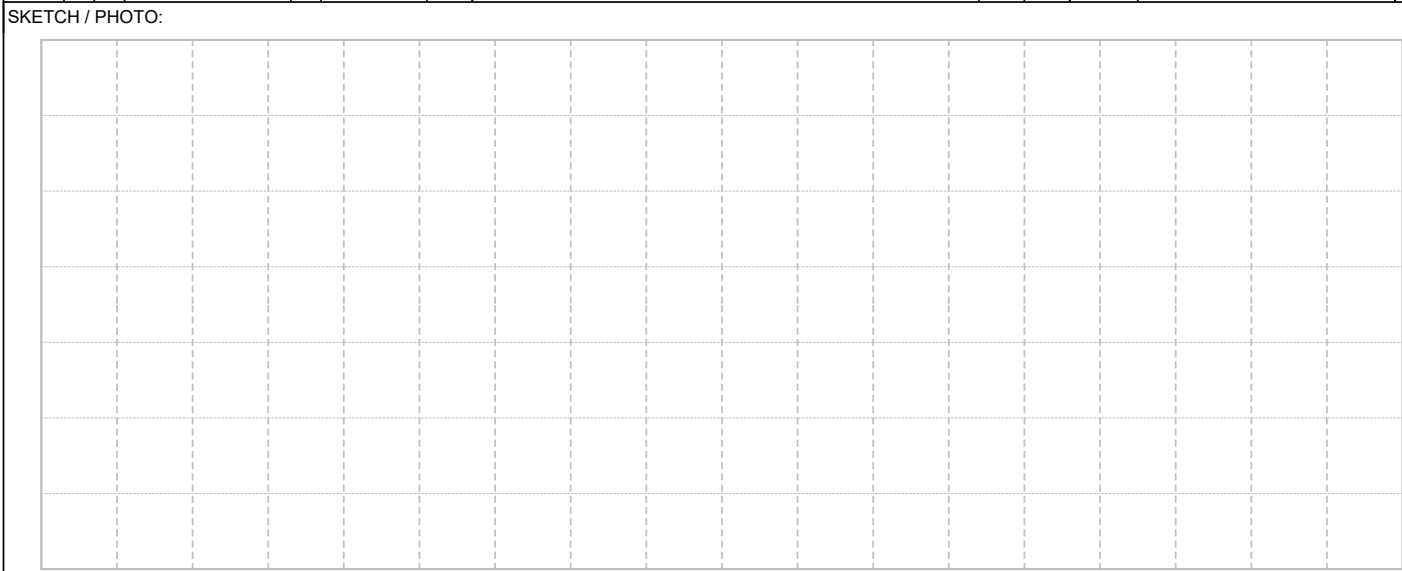
Excavation Id.: **TP22\_2021**

SHEET: 1 OF 1

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983549 mN (NZTM2000) 1737002 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 13/10/2021
R.L.: 30.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 13/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS		ENGINEERING DESCRIPTION			GEOLOGICAL			
PENETRATION	SUPPORT	WATER	SAMPLES	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH/DENSITY CLASSIFICATION	DEFECTS, STRUCTURE, COMMENTS	UNIT
1-3				0.00m: Organic SILT. (TOPSOIL).				Top
				0.25m: SILT, some clay; light brown and grey. Stiff, moist, medium to high plasticity.	M	St		Alluvial Deposits
				0.70m: Clayey SILT; light grey and yellow. Stiff, moist, medium to high plasticity.			1.0m: Sides collapsing	
				1.10 - 2.90m: Light grey stained yellow.				
				2.60 - 2.90m: Wet.	W			
				2.90m: Clayey SILT; grey. Stiff, moist, medium to high plasticity.	M			
				3.70 - 4.60m: Very stiff.		Vst		
				4.6m: END OF INVESTIGATION				

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
4.6m



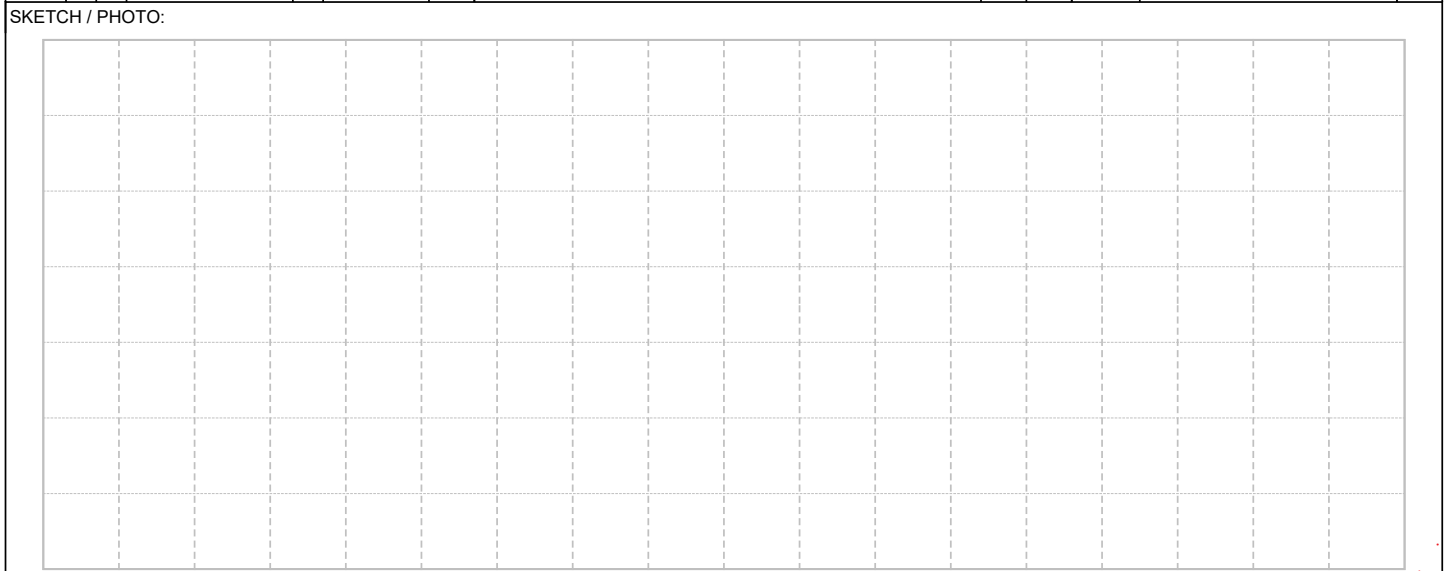




PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983155 mN (NZTM2000) 1737269 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 47.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL				
PENETRATION	SUPPORT	WATER	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3						0.00m: Organic SILT. (TOPSOIL).	M	H	0-200		TS
				0.5		0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer. (RESIDUAL SOIL).					
				0.5		0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Hard, moist, medium to high plasticity. (RESIDUAL SOIL).					
				1.0		0.90m: Silty CLAY, trace fibrous roots; yellow and light grey. Stiff, moist, high plasticity. (RESIDUAL SOIL).		St			
				1.5							
				2.0		2.00 - 3.00m: Very stiff.		vst			
				2.5		2.50 - 3.00m: Dark yellow stained layer.					
				3.0		3.00m: SILT; grey. Very stiff, moist, non-plastic to low plasticity. Near transition to granular behaviour. (COMPLETELY WEATHERED SILTSTONE). 3.40 - 3.50m: some gravel up to 50mm, corestones.					
				3.5		3.50m: Highly weathered, grey, fissured with planar polished surfaces, SILTSTONE. Extremely weak (hard).		H			
				4.0							
				4.5		4.3m: END OF INVESTIGATION					

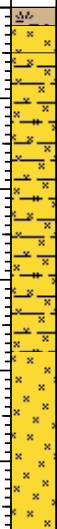
SKETCH / PHOTO:



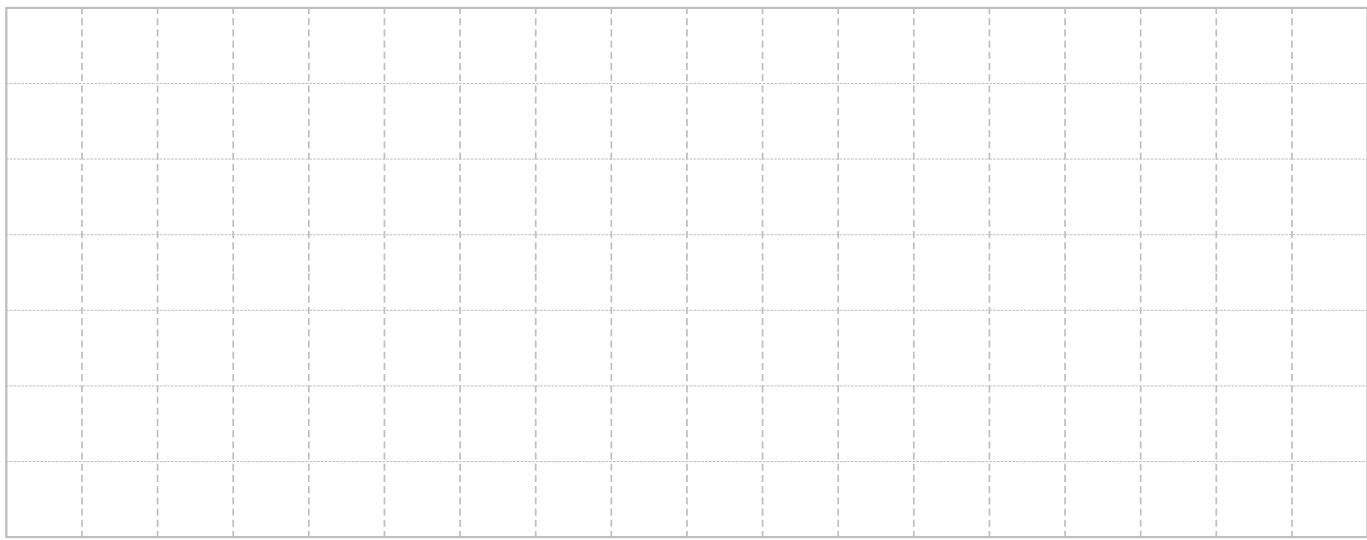
COMMENTS:

Hole Depth  
4.3m

PROJECT: Wellsford North	LOCATION: Wellsford	JOB No.: 1018519.0000
CO-ORDINATES: 5983111 mN (NZTM2000) 1737412 mE	EXPOSURE METHOD: TP	EXCAV. STARTED: 14/10/2021
R.L.: 54.00m	EQUIPMENT: 14 Tonne Zaxis	EXCAV. FINISHED: 14/10/2021
DATUM: NZVD2016	OPERATOR: Mason Contractors	LOGGED BY: LPA
	DIMENSIONS: 5m by 1.2m	CHECKED BY: JAEL

EXCAVATION TESTS			ENGINEERING DESCRIPTION				GEOLOGICAL						
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH (kPa)	DEFECTS, STRUCTURE, COMMENTS	UNIT
1 2 3			<ul style="list-style-type: none"> <li>● 161/- kPa</li> <li>● &gt;222 kPa</li> <li>● 125/- kPa Sample 1 @ 0.90m</li> <li>● 100/- kPa</li> <li>● 100/- kPa</li> <li>● 126/- kPa</li> <li>● 141/- kPa</li> <li>● UTP Sample 2 @ 2.40m</li> <li>● UTP</li> <li>● UTP</li> </ul>		53		<p>0.00m: Organic SILT. (TOPSOIL).</p> <p>0.10m: SILT; white. Hard, moist, medium plasticity. Very thin layer, (RESIDUAL SOIL).</p> <p>0.25m: Clayey SILT, trace fibrous roots; yellow and light grey. Very stiff, moist, medium to high plasticity. (RESIDUAL SOIL).</p> <p>1.00 - 1.90m: Some pockets of gravel; dark yellow and grey.</p> <p>1.60 - 1.90m: Wet.</p> <p>1.90m: SILT; grey with dark yellow, fissured (slickensided). Very stiff, moist, medium plasticity. (RESIDUAL SOIL).</p> <p>2.20 - 2.90m: Hard.</p>	M		H	10 25 50 100 200		TS
					52			W					Northland Allocation
					51		2.9m: END OF INVESTIGATION						

SKETCH / PHOTO:



COMMENTS:

Hole Depth  
2.9m







**ATTACHMENT 15**

**APPENDIX 12  
PRELIMINARY SITE INVESTIGATION REPORT**





# Preliminary Site Investigation Report

**Proposed Wellsford North Structure Plan Area**

**Client:**

Barker & Associates

**Date of report:**

06 May 2022

**Report reference:**

158010322.1

**Report prepared and certified by:**

*Kelly Deihl, Principal Scientist*

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## Executive Summary

Barker & Associates are preparing a Structure Plan for the Wellsford North area which encompasses approximately 77.5ha of land located between State Highway 1 and Rodney Street and the North Auckland Railway Line, to the north of the Wellsford Town Centre. The land subject to the Wellsford North Structure Plan sits within the Future Urban Zone, Rural – Countryside Living Zone or Rural Production Zone under the Auckland Unitary Plan (AUP). A total of 20 lots comprise the Wellsford North Structure Plan area.

Barker & Associates are also preparing a private plan change (Wellsford North Plan Change) for a smaller area of approximately 52.3ha which sits entirely within the larger Wellsford North Structure Plan area. The land subject to the Wellsford North Plan Change area includes all Rural - Countryside Living zoned land in the south, and Future Urban zoned land north up to (and including) 338 Rodney Street, comprising 12 lots, the majority of which is owned by Wellsford Welding Club Limited (refer Figure 1). This company is a group of landowners and is unrelated to welding as an activity. The plan change seeks to rezone the land to a mix of residential zones (Residential – Large Lot Zone, Residential - Mixed Housing Suburban Zone and Residential – Mixed Housing Urban Zone) with a small neighbourhood centre (Business – Neighbourhood Centre Zone).

Environmental Management Solutions Ltd (EMS) has been engaged by Barker & Associates to undertake a Preliminary Site Investigation (PSI) of the subject land to determine whether the land has been, was likely to have been, or is being, adversely affected by land use activities that can be found on the Ministry for the Environment Hazardous Activities and Industries List (HAIL) and accordingly, whether undertaking any proposed future development of the land is considered likely to pose a risk to human health.

This PSI considers the future development of the land which forms part of the Wellsford North Structure Plan area (which includes the Wellsford North Private Plan Change area) under the provisions of the (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

Contaminated Land reporting provided by the Contamination, Air and Noise Team at Auckland Council (dated 12<sup>th</sup> of April 2022) confirms that no contamination information is held for any of the properties within the proposed Structure Plan area, however, it is noted within reporting, that due to the adjacent railway on the eastern boundary, there is the potential for uncertified/non-engineered fill to be present on properties adjoining this.

A review of historical aerial photography and property records, coupled with site walkover has identified that the land has generally been used for pastoral grazing purposes historically and is generally considered suitable for the intended land use. There are however, several areas within the proposed Wellsford North Structure Plan area, where HAIL activities may have occurred and further investigation of the land at these locations should be carried out prior to any site development. These include:

- The southern portion of the development area will be rezoned for large lot residential development and as such, Cadmium screening associated with the historic and prolonged application of super phosphate application to the pastoral land (which has included dairy farming activities), is a consideration. Screening across the pastoral land in this portion of the development area is recommended to ensure that Cadmium levels can meet the applicable Soil Contaminant Standard set by the NES.
- There are several existing buildings within the development area that were constructed in the 1970's and during the timeframes where leaded paint was still widely in use and construction materials may



have contained asbestos. No asbestos in deteriorated condition was noted during site inspection. Aged construction materials have the potential to leach Lead from old paint into surrounding soils.

- A farm workshop was identified in building permits at 374 Rodney Street, Wellsford.
- The potential for contamination in relation to soils adjoining the railway on the eastern boundary of the site, including any uncertified soils has also been considered due to the potential for migration of contaminants into surrounding soils from railway activities.

Based on the above, several sites within the development area may be subject to the following unverified HAIL activities (full description relative to each Lot provided in Table 5 of this report):

- *HAIL I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment*, associated with the potential leaching of heavy metals from aged construction materials, in particular Lead, and from Cadmium released as an impurity into soils from the regular and prolonged application of superphosphate fertiliser associated with former pastoral farming activities (only applicable to proposed lifestyle lots in southern portion of Structure Plan);
- *Hail H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment* in association with potential migration of contaminants into soils and uncertified fill, adjoining the railway on the eastern boundary of the development area.
- *HAIL F4: Motor vehicle workshops* associated with farm workshop at 374 Rodney Street, Wellsford.

It is noted that the use of white leaded paint was banned in 1979 and on this basis, only buildings constructed prior to 1979 have been considered as unverified *HAIL I* in relation to the potential leaching of lead from the use of lead-based paints. Residential sites will only require further investigation should dwellings be proposed for removal and where further development is to occur in the same location. Where homes are to remain in situ in the same land use, no further investigation is required.

It is recommended that prior to the demolition of any buildings constructed prior to 1984, an asbestos survey be carried out by a suitably qualified professional. Prior to the demolition of any building constructed prior to 1979, it is recommended that a lead survey be carried out by a suitably qualified professional. All demolition works shall be carried out in accordance with the recommendations of these surveys. If either contaminant is detected, then soil sampling may be required in this location.

Overall, it is concluded that the majority of the land within the area encompassed by the proposed Structure Plan can be considered fit for the intended land use. It is likely that further detailed site investigation will be required where HAIL activities have been identified, in the form of a detailed site investigation prepared by a suitably qualified and experienced practitioner (SQEP) in accordance with the provisions set out within the current edition of the Ministry for the Environment Contaminated Land Management Guidelines.

## 1 Introduction

### 1.1 Background

Barker & Associates are preparing a Structure Plan for the Wellsford North area which encompasses approximately 77.5 ha of land zoned either Future Urban Zone or the Rural – Countryside Living Zone under the Auckland Unitary Plan (AUP). A total of 20 lots comprise the Wellsford North Structure Plan area.

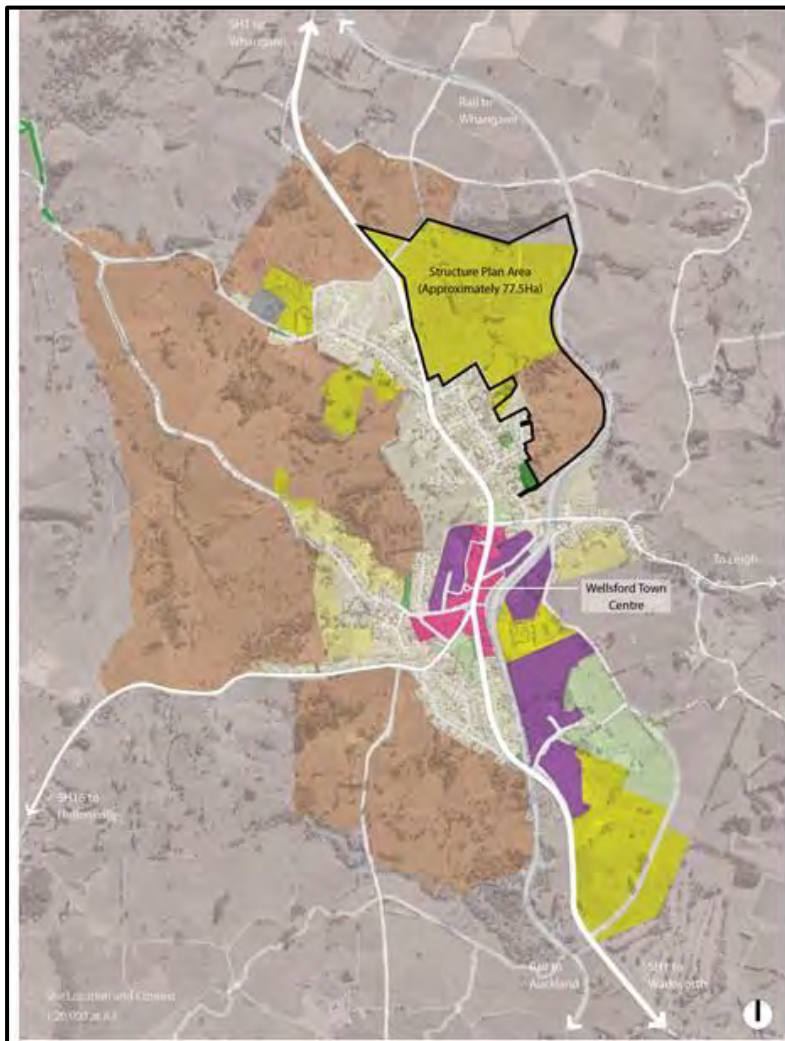
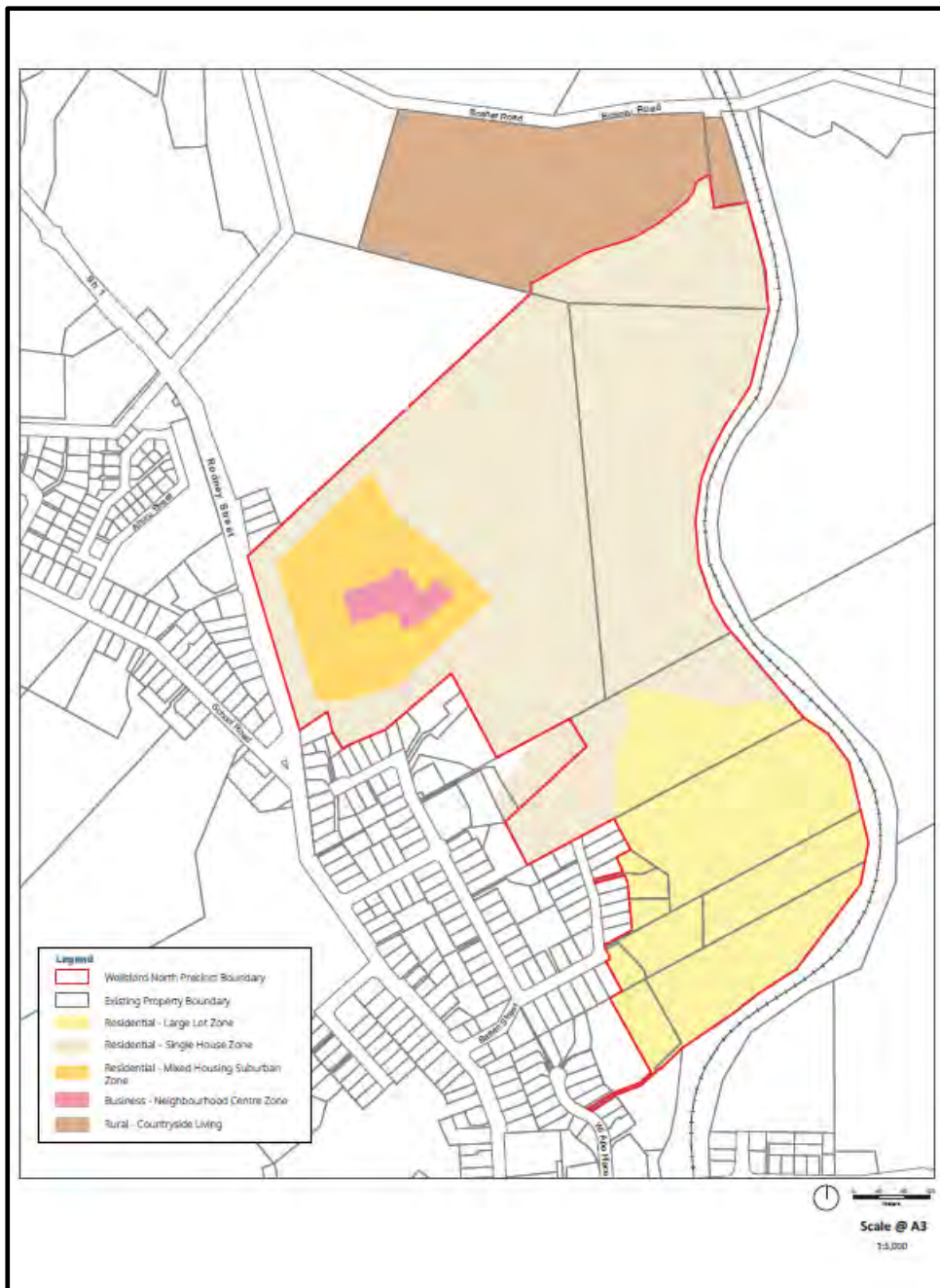


Figure 1: Wellsford North Structure Plan Area

Barker & Associates are also preparing a private plan change (Wellsford North Plan Change) for a smaller area of approximately 52.3 ha which sits entirely within the Wellsford North Structure Plan area. The land subject to the Wellsford North Plan Change area includes all Rural - Countryside Living zoned land in the south, and the Future Urban zone land north up to (and including) 338 Rodney Street, comprising 12 lots, the majority of which is owned by Wellsford Welding Club Limited. The plan change seeks to rezone the land to a mix of residential zones (Residential – Large Lot Zone, Residential - Mixed Housing Suburban Zone and Residential – Mixed Housing Urban Zone) with a small neighbourhood centre (Business – Neighbourhood Centre Zone). The neighbourhood centre is to be located on the land at 338 Rodney Street (Pt Allot SE118, Psh of Oruawharo).



**Figure 2: Proposed Wellsford North Zoning Map**



The subject land is located on the northern margin of the Wellsford town centre and is located between State Highway 1 and Rodney Street and the North Auckland Railway Line. A larger copy of the proposed Structure Plan map and Private Plan Change Map for this land are also provided in **Appendix 1**. A copy of the Records of Titles for the lots are provided in **Appendix 2**.

## 1.2 Objectives of the Investigation and Scope of Work

Environmental Management Solutions Ltd (EMS) was engaged by Barker & Associates Ltd to undertake a preliminary site investigation to consider the future development of this land under the provisions of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS). This preliminary site investigation is to accompany the proposed Wellsford North Structure Plan and Plan Change proposals and will provide a comprehensive account of site history and identify likely sources of potential contamination on the subject sites, if any. The report will also provide advice surrounding NESCS requirements for future development of this land, if applicable.

Scope of work included:

- Reviewing available historical aerial photography for the land (dating back to 1961)
- Reviewing all available Auckland Council records for the site
- Reviewing previous contaminated land reports for the land, if any
- Reviewing Records of Title for the land
- Landowner interview
- Site walkover
- Report preparation summarising findings

## 1.3 Report Preparation

This report has been prepared in general accordance with the requirements of the current edition of the Ministry for the Environment Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand and all soil investigation has been conducted in general accordance with the requirements of the current edition of the Ministry for the Environment Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils.

The person certifying this report is a qualified environmental scientist with over 15 years' experience working in the field of contaminated land investigation, remediation and management. She holds a Bachelors Degree in Science from Auckland University (2004) and specialises in the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS). She spent two terms as an elected member of the WasteMINZ National Contaminated Land Sector Group Steering Committee, was a member of the NES Working Group, a member of the reference group selected for the review of the Ministry for the Environment Contaminated Land Management Guideline No. 5. and sat on the focus group in Wellington that was responsible for the NESCS reforms, yet to be implemented. She is a member of the Australasian Land and Groundwater Association (ALGA) and WasteMINZ. In addition, she holds contracts with, and undertakes review work for, Waipa and Waikato District Councils. These are both long standing and on-going contracts.

## 2 Site Description

The land that sits within the proposed Wellsford North Structure Plan area generally comprises undulating pastoral land with moderate slopes. Two prominent watercourses are located along the base of existing gullies and flow from the south-east to north-west across the site. Several existing farm structures including an old and very small milking shed which is of timber, iron and concrete construction with concrete floor, and a corrugated iron half round hay barn are located on the land. The southern boundary of the site contains existing residential development as discussed in detail within this report. The western margin of the development area is bound by State Highway 1 and Rodney Street and the eastern margin of the property is bound by Kiwirails North Auckland

railway line. There were no farm dumps, burn piles, chemical storage areas or areas indicating contamination such as staining or discolouration of soils or grass noted during site walkover.

## 2.1 Site Identification

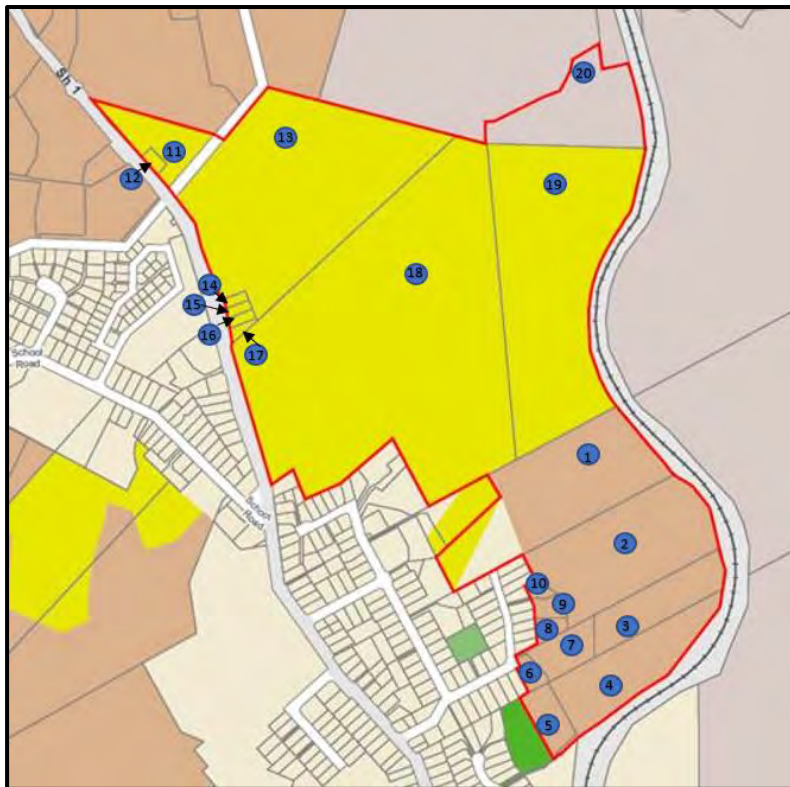


Figure 3: Map of lots within proposed Wellsford North Structure site Plan area

Please refer to Table 1 below for property details, noting that red outline in Figure 3 above denotes Structure Plan area



**Table 1: Site Identification**

Property Reference number	Address	Legal description	Current Zoning	Proposed Zoning
1	Pt Lot 4 DP 9919, Monowai Street*	Pt Lot 4 DP 9919	Split Zoning: Rural – Countryside Living Future Urban Zone Residential – Single House Zone	Residential – Large Lot Zone  Residential – Mixed Housing Suburban Zone
2	Pt Lot 2 DP 26722, Monowai Street*	Pt Lot 2 DP 26722	Rural – Countryside Living	Residential – Large Lot Zone
3	Pt Sec 25 DP 9682, Monowai Street *	Pt DP 9682	Rural – Countryside Living	Residential – Large Lot Zone
4	11 Wi Apo Place *	Lot 23 DP 85114	Rural – Countryside Living	Residential – Large Lot Zone
5	15 Wi Apo Place *	Lot 22 DP 85114	Rural – Countryside Living	Residential – Large Lot Zone
6	22 Batten Street *	Lot 1 DP 179213	Rural – Countryside Living	Residential – Large Lot Zone
7	26 Batten Street *	Lot 2 DP 179213	Rural – Countryside Living	Residential – Large Lot Zone
8	2 Monowai St *	Lot 18 DP 47752	Rural – Countryside Living	Residential – Large Lot Zone
9	18 Monowai St *	Lot2 DP 152849	Rural – Countryside Living	Residential – Large Lot Zone
10	20 Monowai St *	Lot 1 DP152849	Rural – Countryside Living	Residential – Large Lot Zone
11	56 Boshier Road	Lot 5 DP 338255	Future Urban Zone	Indicative lower density residential
12	10 State Highway 1	Lot 1, DP 61904	Future Urban Zone	Indicative lower density residential
13	374 Rodney Street	Pt Allot SW118 Psh Oruawharo	Future Urban Zone	Indicative lower density residential



14	364 Rodney Street	Lot 1, DP 46858	Future Urban Zone	Indicative lower density residential
15	362 Rodney Street	Lot 2, DP 46858	Future Urban Zone	Indicative lower density residential
16	360 Rodney Street	Lot 3, DP 46858	Future Urban Zone	Indicative lower density residential
17	358 Rodney Street	Lot 4, DP 46858	Future Urban Zone	Indicative lower density residential
18	338 Rodney Street *	Part South Eastern Allotment 118 118 Psh of Oruawharo	Future Urban Zone	Business – Neighbourhood Centre Zone  Residential – Mixed Housing Urban Zone  Residential – Mixed Housing Suburban Zone
19	Pt Allot 117 SO 22925, State Highway 1 *	Part Allotment 117 Oruawharo Parish	Future Urban Zone	Residential – Mixed Housing Suburban Zone
20	96 Boshier Road	Lot 1 DP 69586	Rural Production Zone	Indicative lower density residential

\* Lots within the proposed Wellsford North Private Plan Change area (refer Figure 2).




A copy of the proposed Wellsford North Structure Plan map and Private Plan Change Map for this land are provided in **Appendix 1**. A copy of the Records of Titles for the lots are provided in **Appendix 2**.




### 3 Historical Aerial Photography Review

Table 2: Historical Aerial Review

Date	Aerial Image	Observations	Image courtesy
1961		<p>Land appears predominantly pastoral. Several buildings evident along Monowai Street. Three dwellings evident on western boundary of Structure Plan Area.</p>	Retrolens
1966		<p>Land remains predominantly pastoral. Farm track more prominent running centrally west to east across site. Several additional dwellings noted on Monowai Street. Matheson Road now traverses southern portion of area. Railway evident to east of development area.</p>	Retrolens



1976		<p>Land remains predominantly pastoral. Image unclear, although potential soil disturbance on south-eastern and southern portion of site. Monowai Street now fully residential. Railway evident to east of site.</p>	Retrolens
1982		<p>Site remains relatively unchanged from the 1976 image. White patches that may indicate soil disturbance, no longer evident. Some residential development in Wi Apo place evident.</p>	Retrolens
1992		<p>Site remains predominantly pastoral and as it did in 1982. Additional residential development evident in Wi Apo Place.</p>	Retrolens

2006		Sites remain unchanged from the 1992 image.	Auckland GIS Maps
2010		Sites remain unchanged from the 2006 image.	Auckland GIS Maps
2017		Sites remain unchanged from the 2010 image. Residential development is establishing on surrounding land.	Auckland GIS Maps

2021		Sites remains unchanged from the 2017 image.	Google Maps
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#### 4 Geology

The published geology for the area indicates that the majority of the land within the Rural – Countryside Living Zone is underlain by Motatau Complex group, consisting of Micritic muddy limestone, calcareous mudstone and glauconitic sandstone. Please refer to *Figure 4* below.

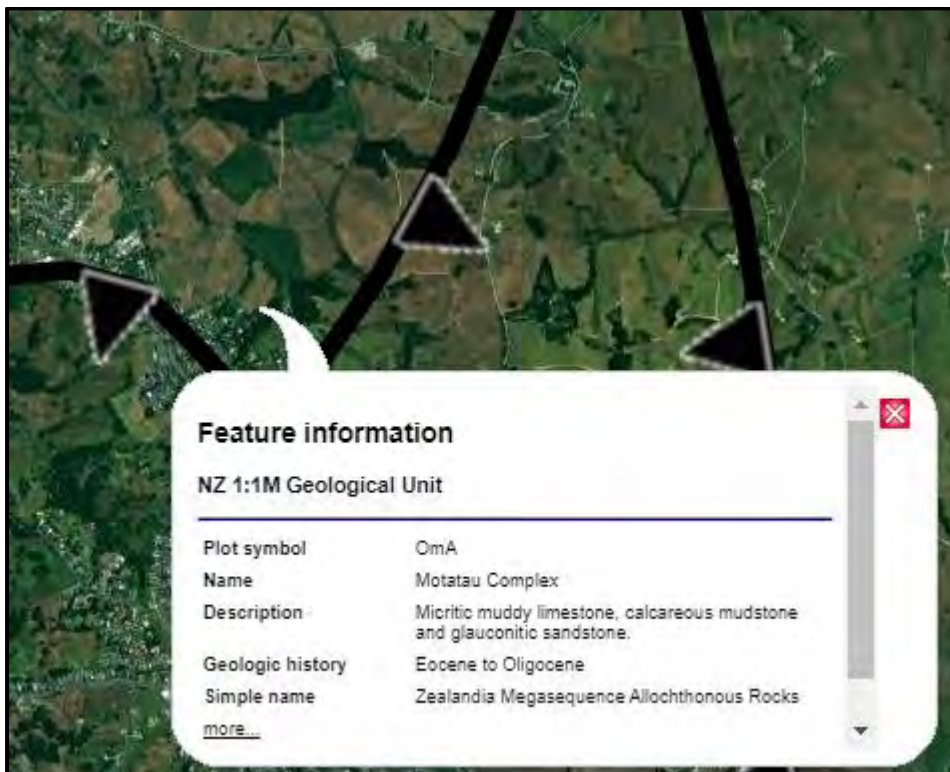


Figure 4: Geological Information



*Image courtesy of New Zealand Geology Web Map, GNS Science 2014*

Tonkin and Taylor prepared a Geotechnical Assessment Report for the Wellsford Residential Development Plan Change in December 2021, job reference 1018519.v2. This report covered five properties being 338 Rodney Street; PT Allot 117 SO22925; PT Lot 4 DP 9919; PT Lot 2 DP 26722; PT Sec 25 DP 9682. In this report they state as follows:

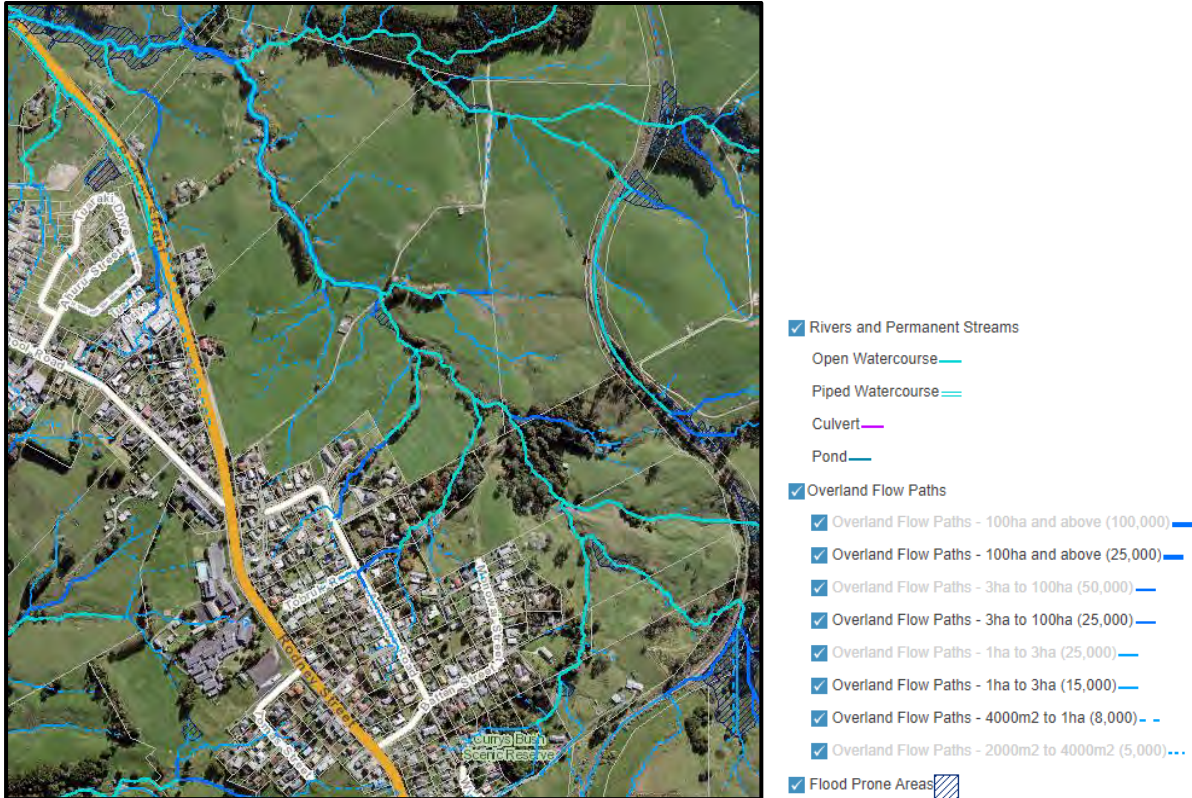
The GNS Science 1:250,000 geological map of the Auckland area<sup>2</sup> shows part of the site underlain by Mahurangi Limestone (Omm) of the Northland Allochthon. This material is described as a series of pale grey to white, laminated muddy limestones, commonly interbedded with graded sandstone beds. Mangakahia Complex (kk) of the Northland Allochthon is mapped to the east and west of the site.

Across the site, subsurface investigations generally indicate alluvium and residually weathered soils are present overlying Northland Allochthon rock at depth, which is generally consistent with the published geology. Northland Allochthon derived mudstone/siltstone was encountered at the northern portion of the site and in a small area which extends to the southwestern boundary. Northland Allochthon material described as siltstone, sandstone and limestone were also encountered across most of the sites southern portion, particularly in the moderately inclined areas of the site.

TP14 and TP15 of T&T's investigation were bounding the railway on the north-eastern portion of the proposed Structure Plan area. Both test pits contained a normal soil profile with no fill encountered. While this cannot be considered representative of the entire length of the railway bounding the site, it does provide some context to the potential for uncertified fill to be found on this boundary adjoining the railway.

## **5 Hydrology**

Auckland Council GeoMaps identifies two major tributaries and numerous branches traversing the site (*Figure 5*). Surface water and groundwater are to be considered at the time of any Detailed Site Investigation.



**Figure 5: Hydrology Information**

*Image courtesy of Auckland Council GeoMaps, March 2022*

## 6 Site Condition and Surrounding Environment

The land within the Wellsford North Structure Plan area is currently a mixture of pastoral farming and residential development, located to the north of Wellsford town centre. Kiwirail's North Auckland Railway Line runs adjacent to part of the eastern boundary of the proposed Wellsford North Structure Plan area. Several dwellings and small farm accessory buildings are located across the land area, as described within this report. During site walkover, no areas of filling, discolouration or staining, chemical storage, farm dumps or burn pile areas were identified.

## 7 Landowner Interview

The previous landowner of the farm that forms the majority of the land within the structure plan area, Paul Shephard, was interviewed in relation to this investigation. Paul has had an association with this land for his whole life. He remembers low intensity dairy herd milking occurring on the property ~55 years ago. He was not aware of any farm dumps or potentially contaminating activities occurring across the land. He did advise that the Farm Workshop was used by the former owner Graham Powell who owned the property for ~30 years and was located in a basement workshop under the main dwelling at 374 Rodney Street Wellsford and had a concrete floor. The land is currently used by them for pastoral grazing of beef animals under a lease contract. He confirmed that the presence of the very small timber, iron and concrete constructed milking shed with concrete floor was associated with former milking activities on the land. Detailed information has been

provided on buildings within the Structure Plan area and it is considered suitable to undertake specific site history interviews at the time of further investigation of sites that have been subject to unverified HAIL activities.

## 8 Contaminated Land Report

A Contaminated Land report by the Contamination, Air and Noise Team at Auckland Council prepared on the 12<sup>th</sup> of April 2022 states there is **no contamination information within Council records** for any of the sites included within the Wellsford North Structure Plan area. The report did identify however, that due to the adjacent railway on the eastern boundary of the proposed structure plan area, those properties adjoining this may have the potential for uncertified/non-engineered fill to be present on site. Refer Appendix 4.

## 9 Property Information

Property information is referenced below based upon Property Reference Number presented in Figure 3 and in Column 1, Table 1. Please refer to these sections of the report to confirm location of property within Structure Plan Area.

### 9.1 Property 1: Pt Allot 4 DP 9919, Monowai Street, Wellsford

#### Site Condition

The site is partly covered in bush with a very small farm accessory building, located in the centre of the site. This is visible from 2006 in historical aerial photography, although Auckland Council holds no record of this building. It is considered given the age and scale of the structure, that it is very unlikely to pose any risk to human health. The eastern border of the site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. Fencing separates the paddocks. Nil of concern noted in site walkover. Cadmium screening recommended as site will become residential large lot zone.



Figure 6: Aerial image of Pt Allot 4 DP 9919, Monowai Street, Wellsford

*Image courtesy of Auckland Council GIS Maps*



### Auckland Council Records Review

Council holds no records for the structure on this lot.

Date	Reference	Applicant	Details
1992	Rodney District Council R15935	WM Heays Estate	Subdivision from larger holding

There are no other records of note held by Council for this property.

### Record of Title

Legal Description	Part Lot 4 DP 9919 RT NA1358/94
Site Owner	Wellsford Welding Club Ltd
Site Area	6.7213ha
AUP Zoning	Rural – Countryside Living Zone Residential - Single House Zone Future Urban Zone

There is nil of concern on the Record of Title.

## 9.2 Property 2: Pt Allot 2 DP 26722, Monowai Street, Wellsford

### Site condition

The site is vacant pastoral land, with the North Auckland Railway Line adjoining the eastern boundary. The eastern border of the site is adjacent to KiwiRail’s existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. The site is fenced into paddocks with water troughs for stock. Nil of concern was noted during site walkover. Cadmium screening recommended as site will become residential large lot zone.



**Figure 7: Aerial Image of Pt Allot 2 DP 26722, Monowai Street, Wellsford**

*Image courtesy of Auckland Council GIS Maps*

**Auckland Council Records Review**

Auckland Council hold no records for this lot. Records from adjoining sites show the site was subdivided in 1995.

**Record of Title**

Legal Description	Part Lot 2 DP 26722 RT NA1888/29
Site Owner	Wellsford Welding Club Ltd
Site Area	5.7503ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

**9.3 Property 3: Pt Sec 25 DP 9682, Monowai Street, Wellsford**

**Site condition**

The site is vacant pastoral land, and the eastern boundary of the site adjoins the North Auckland Railway Line. The eastern border of the site is adjacent to KiwiRail’s existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. Nil of concern was noted during site walkover. Cadmium screening recommended as site will become residential large lot zone.



**Figure 8: Aerial image of Pt Sec 25 DP 9682, Monowai Street**

*Image courtesy of Auckland Council GIS Maps*

**Auckland Council Records Review**

Auckland Council’s Property Team hold no records for this lot.

**Record of Title**

Legal Description	Part Deposited Plan 9682 RT NA1118/228
Site Owner	Wellsford Welding Club Ltd
Site Area	2.0991ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

**9.4 Property 4: 11 Wi Apo Place, Wellsford (Lot 23 DP 85114)**

**Site condition**

Two dwellings are situated in the south-eastern corner of the property with vehicle access gained from Wi Apo Place. The western dwelling is of fibrolite construction and in good condition. The second dwelling is of hardiplank construction with an attached carport garage. Also in good condition. Along with 11 Wi Apo Place, this site forms the southern edge of the proposed Wellsford North Structure Plan area. The eastern border of the site is adjacent to KiwiRail’s existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. Inspection was undertaken from driveway only. Cadmium screening recommended as site will become residential large lot zone.



**Figure 9: Aerial image of 11 Wi Apo Place, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*





**Image 1: Western most dwelling of fibrolite construction 11 Wi Apo Place**



**Image 2: Second dwelling 11 Wi Apo Place visible to east of fibrolite dwelling, of hardiplank construction with iron roof.**

#### **Auckland Council Records Review**

Date	Reference	Applicant	Details
1982	Rodney District Council BPA43278	Alan Sheriff	Construction of a new Dwelling and garage/carport
1983	Rodney District Council BPA19497	Alan Sheriff	Construction of farm shed 36.4m <sup>2</sup>
2004	Rodney District Council ABA42386	Stanley Cowpland	Additions to existing dwelling and new garage

There are no other records of note held by Council for this property.

**Record of Title**

Legal Description	Lot 23 DP 8511 RT NA41B/822
Site Owner	Shanjesh Prasad
Site Area	3.4087ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

**9.5 Property 5: 15 Wi Apo Place, Wellsford (Lot 22 DP 85114)**

**Site condition**

A hardiplank home with aluminium joinery which was constructed in 1984 is located centrally near the southern boundary of the site, with the remainder of the site being vacant and pastoral with mature vegetation. A small timber clad garden shed is situated on the southern boundary. Protected native bush is located on the western boundary. Nil of concern noted at time of site visit. Visual inspection was undertaken from the driveway only. Cadmium screening recommended as site will become residential large lot zone.



**Figure 10: Aerial image of 15 Wi Apo Place, Wellsford**

*Image courtesy of Auckland Council GIS Maps*



**Image 3: Dwelling 15 Wi Apo Place**

#### **Auckland Council Records Review**

Date	Reference	Applicant	Details
1984	Rodney District Council BPA77870	JC & AR Cowpland	Consent to relocate a 30m <sup>2</sup> skyline garage onto site
1984	Rodney District Council BPA263841	JC & AR Cowpland	Construction of timber frame and concrete foundation dwelling with basement block garage 194m <sup>2</sup>

There are no other records of note held by Council for this property.

#### **Record of Title**

Legal Description	Lot 22 DP 85114 RT NA41B/821
Site Owner	Benjamin Leroy Wedgwood and Simone-Ann Watling
Site Area	0.8086ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.



### 9.6 Property 6: 22 Batten Street, Wellsford (Lot 1 DP 179213)

#### Site condition

A dwelling is located centrally on the site and is surrounded by established trees and vegetation. The house is constructed of orange brick, with concrete surrounds. Nil of concern noted. Site sits within a residential neighbourhood with vehicle access gained from Batten Street, with the southern boundary of the site adjoining 15 Wi Apo Place.



**Figure 11: Aerial image of 22 Batten Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*



**Image 4: Dwelling 22 Batten Street, Wellsford**

**Auckland Council Records Review**

Auckland Council holds no records for the existing dwelling.

Date	Reference	Applicant	Details
1995	Rodney District Council R20893	GK Treadwell	Subdivided off Part Deposited Plan 9682 NA1118/228.

There are no other records of note held by Council for this property.

**Record of Title**

Legal Description	Lot 1 DP 179213 RT NA110C/222
Site Owner	Heather Anne George
Site Area	0.2637ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

### 9.7 Property 7: 26 Batten Street, Wellsford (Lot 2 DP179213)

#### Site condition

A large site situated on the edge of the residential area with rural land on the eastern boundary. Coloursteel constructed barn constructed in 2005 and converted to a dwelling is located on the western portion of the site with the remainder of the site being grass and established trees and vegetation. Nil of concern noted. Visual inspection conducted from drive only.



Figure 12: Aerial image of 26 Batten Street, Wellsford

*Image courtesy of Auckland Council GIS Maps*



Image 5: Barn dwelling 26 Batten Street, Wellsford



### Auckland Council Records Review

Date	Reference	Applicant	Details
1995	Rodney District Council R20893	GK Treadwell	Subdivided off Pt Sec 25 BLK XV1 Otamatea Survey District DP 9682 RT NA1118/228
2005	Rodney District Council ABA56130	Michael Kane Jacomb	Construction of New Barn (Totalspan) 12m x 24m – stage one
2006	Rodney District Council LAN50627	M & A Jacomb	Resource Consent – Change of Land Use, from barn to dwelling and form a driveway over the required 1 in 5 gradient in the Wellsford Structure Plan Area
2007	Rodney District Council ABA1001914	M & A Jacomb	Proposed barn conversion – Stage two converting barn into dwelling
2012	Auckland Transport TR1430	Gary John Lawford	Application to construct a vehicle crossing

There are no other records of note held by Council for this property.

### Record of Title

Legal Description	Lot 2 DP 179213 RT NA110C/223
Site Owner	Gary John Lawford
Site Area	0.9214ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

## 9.8 Property 8: 2 Monowai Street, Wellsford (Lot 18 DP 47752)

### Site condition

A dwelling (constructed pre-1971) is located on the eastern portion of the site with the western portion containing established trees and vegetation. A garage was constructed in 2002. The site is situated down a right of way and is located on the edge of a residential area with rural land on the eastern boundary. Dwelling appears to be hardiplank construction with iron roof, no records are held on Council files for the dwelling, despite additional enquiry. A scheme plan held on file however, showing a proposed subdivision of the surrounding land, shows the house in-situ in 1971. Refer Appendix 5. Visual inspection was undertaken from road only.



**Figure 13: Aerial image of 2 Monowai Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*



**Image 6: Dwelling 2 Monowai Street, Wellsford**

**Auckland Council Records Review**

Auckland Council holds no records for the dwelling.

Date	Reference	Applicant	Details
1971	Rodney District Council TPA710224	P R Millar	Subdivision consent - Part Deposited Plan 9682 DP 9682 RT NA1118/228

1972	Rodney District Council TP87/72	Mrs AM Millar	Consent to erect and operate boarding kennels for dogs.
2002	Rodney District Council ABA23386	CH Van Der Net	Building consent for garage/workshop 52m <sup>2</sup>

There are no other records of note held by Council for this property.

#### Record of Title

Legal Description	Lot 18 DP 47752 RT NA7A/91
Site Owner	Aline Margaret Van Der Net
Site Area	0.2512ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

### 9.9 Property 9: 18 Monowai Street, Wellsford (Lot 2 DP 152849)

#### Site condition

The site contains a dwelling (constructed in 1972) located in the western portion of the site which is surrounded by established trees and vegetation. A garage was constructed in 2002. Access to the site is via a right of way gaining access from Monowai Street. All adjoining sites contain established residential development with the exception of the site adjoining the eastern boundary, which is rural. Home is hardiplank construction with a concrete basement. Visual inspection of site undertaken from driveway only.



**Figure 14: Aerial image of 18 Monowai Street, Wellsford**  
Image courtesy of Auckland Council GIS Maps





**Image 7: Dwelling at 18 Monowai Street, Wellsford**

**Auckland Council Records Review**

Date	Reference	Applicant	Details
1970	Rodney District Council TPA710224	P R Millar	Subdivided off Part Deposited Plan 9682 RT NA1118/228
1972	Rodney District Council BPA39986	G D Phillips	Consent Building Permit - Dwelling
2002	Rodney District Council BPA95167	G D Phillips	Building consent for Garage 42m <sup>2</sup>

There are no other records of note held by Council for this property.

**Record of Title**

Legal Description	Lot 2 DP 152849 RT NA91B/209
Site Owner	Buxton Farm Trustee Limited
Site Area	0.2806ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

### 9.10 Property 10: 20 Monowai Street, Wellsford (Lot 1 DP 152849)

#### Site condition

The site contains a dwelling and a stand-alone garage constructed in 1993. Home is orange brick with concrete surrounds. Nil of concern noted. The site is situated down a right of way which gains access from Monowai Street. The land adjoining the eastern boundary is rural, with all other adjoining land containing established residential development.



**Figure 15: Aerial image of 20 Monowai Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*



**Image 8: Dwelling 20 Monowai Street, Wellsford**

#### Auckland Council Records Review

Date	Reference	Applicant	Details
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1992	Rodney District Council SUB15899	G D Phillips	Resource Consent - Site subdivided off 18 Monowai Road.
1993	Rodney District Council BPA38554	P Waterman	Consent Building Permit – Dwelling and garage

There are no other records of note held by Council for this property.

#### Record of Title

Legal Description	Lot 1 DP 152849 RT NA91B/208
Site Owner	Anthony John Armit & Annabelle Joan Armit
Site Area	0.1549ha
AUP Zoning	Rural – Countryside Living Zone

There is nil of concern on the Record of Title.

### 9.11 Property 11: 56 Boshier Road, Wellsford (Lot 5 DP 338255)

#### Site condition

Only a small portion of this site is included in this report as indicated in red below. The portion of land is currently vacant pastoral land.



Figure 16: Aerial image of 56 Boshier Road, Wellsford



*Image courtesy of Auckland Council GIS Maps*

### **Auckland Council Records Review**

The part of the site that is included in this report is vacant pastoral land.

Date	Reference	Applicant	Details
2002	Rodney District Council R34359	GT & JF Sullivan	Subdivision from larger holding

There were no other records of note held by Auckland Council for this property.

### **Record of Title**

Legal Description	Lot 5 DP 338255 RT 157227
Site Owner	George Dragicevich and Lynette Dragicevich
Site Area	8.3925ha
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

## **9.12 Property 12: 10 State Highway 1, Wellsford (Lot 1 DP 61904)**

### **Site condition**

Dwelling located on the main State Highway with a separate garage. The property is on tank water with 2 large tanks visible. The home is brick with fibrolite soffits and wooden joinery. Auckland Council do not hold any permits for the dwelling despite additional enquiry, however, the home is visible in 1976 imagery. No HAIL activities have been identified on this site as the home is brick, however, asbestos should be a consideration, should the buildings ever be removed.



**Figure 17: Aerial image of 10 State Highway 1, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

#### **Auckland Council Records Review**

Auckland Council hold no records for the dwelling.

Date	Reference	Applicant	Details
2005	Rodney District Council	Pistol Properties	Consent for new fireplace

There were no other records of note held by Auckland Council for this property.

#### **Record of Title**

Legal Description	Lot 1 DP 61904 RT NA18D/400
Site Owner	Mark Steven Dodd
Site Area	1247m <sup>2</sup>
AUP Zoning	Future Urban Zone

Nil of concern noted in the Record of Title.

### **9.13 Property 13: 374 Rodney Street, Wellsford (Pt Allot SW118 Psh Oruawharo)**

#### **Site condition**

There are two dwellings recorded on the property, constructed in 1957 and 1967. There is also a permit for additions to a dwelling in 1972 where brick veneer and concrete block walls were added. The description of works specifies that fibrolite asbestos shall be used on soffits in this building. A workshop for farm vehicle maintenance is located on the property. The remainder of the site is predominately pastoral and separated into paddocks with established trees. Access to view buildings could not be gained at the time of site visit but nil of concern noted on pastoral land. HAIL activities to be addressed at the time of further investigation.

Asbestos survey required if buildings are to be demolished or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Site to be classified as Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site, and Unverified HAIL F4 applicable to this property in relation to the workshop, noting that this had a concrete pad.



**Figure 18: Aerial image of 374 Rodney Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

**Auckland Council Records Review**

Date	Reference	Applicant	Details
1957	Rodney Country Council 554	KI & LG Curel	Building Permit – Dwelling
1959	Rodney County Council 978	KI & LG Curel	Building Permit for farm workshop. Constructed of pine and metalex, with a concrete base (as shown on site plan).
1967	Rodney County Council A006385	VP & JA Dickson	Building Permit – Dwelling
1972	Rodney County Council E39843	Mr P Payne	Building Permit – Residential Alterations: brick veneer walls and concrete block. Wooden joinery, soffit lining is fibrolite asbestos (as identified within the description of works).



1972	Rodney County Council H94868	Mr P Payne	Building Permit – swimming pool
1990	Rodney County Council 90/1052	NA & DM Adams	Application for Chimney Permit
2004	Rodney District Council ABA42635	Michael Charles Brown	Application for Chimney/Fireplace permit

There were no other records of note held by Auckland Council for this property.

#### Record of Title

Legal Description	Part South West Allotment 118 Parish of Oruawharo NA1656/67
Site Owner	RAMS Investments 2008 Ltd
Site Area	11.9008ha
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

### 9.14 Property 14: 364 Rodney Street, Wellsford (Lot 1 DP46858)

#### Site condition

Dwelling built in 1964, primary surrounded by pastoral land. Dwelling is white weatherboard in good condition. The home has a block and hardiplank carport attached and wooden joinery. Site is flat with established trees.



**Figure 19: Aerial image of 364 Rodney Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

#### Auckland Council Records Review

Date	Reference	Applicant	Details
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1964	Rodney District Council	Marjorie Pebbles	Consent for dwelling and new fireplace
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There were no other records of note held by Auckland Council for this property.

#### Record of Title

Legal Description	Lot 1 Deposited Plan 46858 RT NA1656/64
Site Owner	Wendy Joan Palmer
Site Area	868m <sup>2</sup>
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Site can be classified as Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

#### 9.15 Property 15: 362 Rodney Street, Wellsford (Lot 2 DP 46858)

Dwelling constructed centrally on site in 1959. Garage constructed in 1964. Residential dwellings are located on surrounding land to north and south, with pastoral land on eastern boundary.

#### Site condition



**Figure 20: Aerial image of 362 Rodney Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

#### Auckland Council Records Review

Date	Reference	Applicant	Details
1959	Rodney District Council	Alexander Graham Nathan	Consent for Dwelling with fireplace

1964	Rodney District Council	Alexander Graham Nathan	Consent for garage
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There were no other records of note held by Auckland Council for this property.

#### Record of Title

Legal Description	Lot 2 Deposited Plan 46858 RT NA1656/64
Site Owner	Andrew Sydney Dyer
Site Area	936m <sup>2</sup>
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

### 9.16 Property 16: 360 Rodney Street, Wellsford (Lot 3 DP 46858)

#### Site condition

Dwelling constructed on site in 1960. Residential dwellings are located to the north and south, and pastoral land bounds the eastern margin of the property.



**Figure 21: Aerial image of 360 Rodney Street, Wellsford**  
Image courtesy of Auckland Council GIS Maps

#### Auckland Council Records Review

Date	Reference	Applicant	Details
1960	Rodney District Council	Maurice Claude Melville	Consent for Dwelling with fireplace

There were no other records of note held by Auckland Council for this property.



**Record of Title**

Legal Description	Lot 3 DP 46858 RT NA1918/85
Site Owner	Yeoman Wayne Dowson, Rowena Shirley Dowson, Lance Stuart Dowson and Sharon Maree Middleton
Site Area	1004m <sup>2</sup>
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

**9.17 Property 17: 358 Rodney Street, Wellsford (Lot 4 DP 46858)**

**Site condition**

Dwelling located centrally on site, constructed in 1960, pastoral land on southern and eastern boundary.



**Figure 22: Aerial image of 358 Rodney Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

**Auckland Council Records Review**

Date	Reference	Applicant	Details
1960	Rodney District Council	Lewis Grice	Consent for Dwelling

1979	Rodney District Council	Lewis Grice	Consent for swimming pool and extension to dwelling
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There were no other records of note held by Auckland Council for this property.

#### Record of Title

Legal Description	Lot 4 DP 46858 RT NA1864/29
Site Owner	Thomas Herbert Iles and Heather Iles
Site Area	986m <sup>2</sup>
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

### **9.18 Property 18: 338 Rodney Street, Wellsford (Part South Eastern Portion Allotment 118 Parish of Oruawhoro)**

#### Site condition

The site is predominately pastoral with a dwelling located on the western boundary. A farm race runs through the entire site from west to east with a farm building (small milking shed) or timber, iron and concrete construction with concrete floor, located in the centre of the site and a second smaller accessory building on the eastern boundary, half round corrugated hay barn. The site is surrounded by farmland to the north and east and residential housing to the west and south.



**Figure 23: Aerial image of 338 Rodney Street, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

#### **Auckland Council Records Review**

No records are held for the dwelling, historic aerial photography shows that the dwelling and sheds are visible from 1961.

Date	Reference	Applicant	Details
1967	Rodney Country Council 92453	ML Watson	Building Permit – Alterations to Milking shed
1970	Rodney County Council 32035	Noel Kelly Investments	Building Permit Alterations to car shed (garage)
1980	Rodney County Council R12740	Ken Simpson Surveyors On behalf of owners A Payne	Resource Consent to subdivide (dwellings to south of site)
1986	Rodney County Council 9727	G Powell	Building Permit – Extension to Dwelling

There were no other records of note held by Auckland Council for this property.



**Record of Title**

Legal Description	Part South Eastern Portion Allotment 118 Parish of Oruawharo RT NA47A/1223
Site Owner	Wellsford Welding Club Limited
Site Area	24.754ha
AUP Zoning	Future Urban Zone

Nil of concern noted in the Records of Title.

Asbestos survey required if buildings are to demolished on site or removed from the site. Leaded paint survey required if buildings are to be demolished or removed and site development is to occur. Unverified HAIL I in relation to potential leaching of lead from leaded paint given the age of the buildings on site.

**9.19 Property 19: Pt Allot 117 SO 22925 State Highway 1, Wellsford (Part Allotment 117 Oruawharo Parish)**

**Site condition**

Vacant pastoral land. The site has a railway line on the eastern boundary.



**Figure 24: Aerial image of Pt Allot 117 SO 22925 State Highway 1, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

**Auckland Council Records Review**

Auckland Council Property Team holds no records for this lot.

**Record of Title**

Legal Description	Part Allotment 117 Oruawharo Parish RT NA1065/132
Site Owner	Wellsford Welding Club Limited
Site Area	11.8768ha

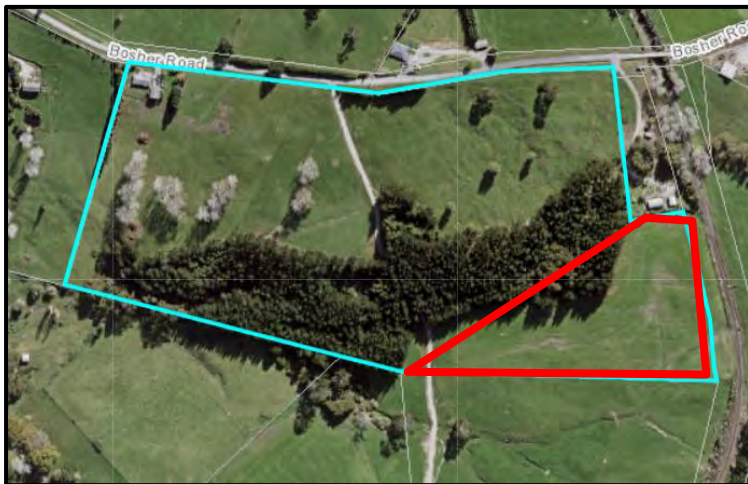
AUP Zoning	Future Urban Zone
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Nothing of concern noted in the Records of Title.

## 9.20 Property 20: 96 Boshier Road, Wellsford (Lot 1 DP 69586)

### Site condition

Only a small portion of this site is included in this report as indicated below and is vacant pastoral land. The site has a railway line on the eastern boundary. Uncertified fill and potential migration of contaminants from railway activities is a consideration.



**Figure 25: Aerial image of Pt Allotment 117 SO 22925, State Highway 1, Wellsford**  
*Image courtesy of Auckland Council GIS Maps*

### Auckland Council Records Review

The part of the site that is included in this report is vacant pastoral land.

### Record of Title

Legal Description	Lot 1 DP 69586 RT NA25C/490
Site Owner	Paul Edward Shepherd and Rachel Anne Louise Petterson
Site Area	15.1041ha (portion of)
AUP Zoning	Future Production Zone

Nil of concern noted in the Records of Title.

## 10 Site Characterisation

**Table 3: Potential Contaminants of Concern**

HAIL Activity	Contaminants of Concern	Comments
<i>HAIL F4: Motor Vehicle Workshop</i>	Hydrocarbons including PAHs, solvents, and metals contained in waste oil	Identified Farm Workshop on main farm at 374 Rodney Street, Wellsford
<i>HAIL I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment</i>	<p>The potential release of heavy metals from aged construction materials in buildings, in particular Lead.</p> <p>Cadmium associated with former super phosphate fertiliser application on pastorally farmed land.</p>	<p>Aged buildings have the potential to release heavy metals from aged construction materials, in particular Lead from the use of leaded paint.</p> <p>Cadmium associated with former super phosphate fertiliser application on pastorally farmed land can lead to accumulation of the heavy metal Cadmium in topsoil. Land that is proposed for future lifestyle development may require screening to ensure that Cadmium levels meet the applicable rural-residential SCS value.</p>
<i>Hail H: Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantities that it could be a risk to human health or the environment</i>	Hydrocarbons including PAH's solvents creosote/phenols, and metals due to migration from the adjacent railway at Pt Lot 2 DP 26722, Pt Lot 4 DP 9919 and Pt Sec 25 DP 9682, Monowai Street, 11 Wi Apo Place and 96 Boshier Road and Pt Allot 117 SO 22925	There is the potential for uncertified/non-engineered fill to be present on sites adjoining railway land. It is considered that this soil may have been impacted by contaminants leeching that are associated with the railway activity.

**Table 4: Conceptual Site Model**

Potential Source	Contaminants of Concern	Potential Pathway	Potential Receptors	Comments
<i>HAIL F4: Motor Vehicle Workshop</i>	Hydrocarbons including PAHs, solvents, and metals contained in waste oil	Dermal absorption of contaminants, inhalation of contaminated dust, consumption of produce grown in contaminated soil.	<i>Humans residing on the land. Earthwork contractors.</i>	Identified Farm Workshop on main farm at 374 Rodney Street, Wellsford
<i>HAIL I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment</i>	<p>The potential release of heavy metals from aged construction materials in buildings, in particular Lead.</p> <p>Cadmium associated with former super phosphate fertiliser application on pastorally farmed land.</p>	<p>Dermal absorption of contaminants, inhalation of contaminated dust, consumption of produce grown in contaminated soil.</p> <p>Ingestion is the primary pathway of exposure for lead. Approximately 10-70% of ingested lead is absorbed by the body (~50% in children and ~10% for adults). Inhalation is the second major pathway of lead</p>	<i>Humans residing on the land. Earthwork contractors.</i>	<p>Further detailed site investigation may be required associated with:</p> <p>(1) the potential release of heavy metals, in particular lead from leaded paint on aged buildings, constructed pre-1980 where applicable.</p>



		exposure; however, unlike ingestion, almost all inhaled lead is absorbed into the body. Dermal lead absorption is not found to be a significant route of exposure <sup>1</sup> , noting the predominant form of lead is inorganic.		(2) pastoral land being rezoned for lifestyle development.  This is to ensure that the contaminants in the soil meet the applicable soil contaminant standards as set by the NESCS.
<i>Hail H: Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantities that it could be a risk to human health or the environment</i>	Hydrocarbons including PAH's, solvents creosote/phenols, and metals due to the adjacent railway at Pt Lot 2 DP 26722, Pt Lot 4 DP 9919 and Pt Sec 25 DP 9682, Monowai Street, 11 Wi Apo Place and 96 Boshier Road and Pt Allot 117 SO 22925	Dermal absorption of contaminants, inhalation of contaminated dust, consumption of produce grown in contaminated soil.	<i>Humans residing and working on the land. Earthwork contractors.</i>	Further detailed site investigation may be required to ensure that the land adjoining the railway activity on the eastern portion of the development area including any uncertified/non-engineered fill is fit for the intended development.

## 9 Regulatory Assessment

In accordance with Regulations 5(4) and 5(6) of the NESCS, soil disturbance and a change in land use are activities to which the standard applies where a HAIL activity is, has, or is more likely than not to have occurred. The following HAIL activities have been identified within the Structure Plan area (which encompasses the Plan Change area):

- *HAIL I: Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment, associated with:*
  - Potential leaching of heavy metals from aged building paint and construction materials, in particular Lead from leaded paint, applied prior to 1979;
  - Cadmium released as an impurity into soils from the regular and prolonged application of superphosphate fertiliser associated with former pastoral farming activities (only applicable to proposed lifestyle lots in southern portion of Structure Plan);
- *Hail H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment* in association with potential migration of contaminants into soils (including uncertified fill if present) adjoining the railway on the eastern boundary of the development area.
- *HAIL F4: Motor vehicle workshops* associated with farm workshop at 374 Rodney Street, Wellsford.

<sup>1</sup> World Health Organisation and Pan American Health Organisation, 2021

Accordingly, future development of these sites and/or a change in land use may be subject to the provisions of the NESCS and require further investigation.

## 10 Conclusions

This investigation has determined that several of the sites within the proposed Wellsford North Structure Plan area may have been subjected to the following Unverified HAIL activities. Accordingly, any soil disturbance, change in land use or subdivision on this land will likely require further investigation under the provisions of the NESCS.

**Table 5: Summary of HAIL Activities identified**

Property Reference number	Address	Identified Unverified HAIL Activities:
1	Pt Lot 4 DP 9919, Monowai Street	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. HAIL I - Cadmium screening recommended as site will become residential large lot zone and has a long standing history of pastoral use, including dairy.
2	Pt Lot 2 DP 26722, Monowai Street	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. HAIL I - Cadmium screening recommended as site will become residential large lot zone and has a long standing history of pastoral use, including dairy.
3	Pt Sec 25 DP 9682, Monowai Street	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. HAIL I - Cadmium screening recommended as site will become residential large lot zone and has a long standing history of pastoral use, including dairy.
4	11 Wi Apo Place	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration. HAIL I - Cadmium screening recommended as site will become residential large lot zone and has a long standing history of pastoral use, including dairy.

5	15 Wi Apo Place	HAIL I - Cadmium screening recommended as site will become residential large lot zone and has a long standing history of pastoral use, including dairy.
6	22 Batten Street	No HAIL identified
7	26 Batten Street	No HAIL identified
8	2 Monowai Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed.
9	18 Monowai Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed
10	20 Monowai Street	No HAIL identified
11	56 Boshier Road	No HAIL identified
12	10 State Highway 1	No HAIL identified, noting that asbestos should be a consideration, should the buildings ever be removed.
13	374 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site, noting that asbestos should be a consideration, should the buildings ever be removed. HAIL F4 - in relation to the workshop, noting that this had a concrete pad.
14	364 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed.
15	362 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed
16	360 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed
17	358 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed
18	338 Rodney Street	HAIL I - in relation to potential leaching of lead from leaded paint given the age of the buildings on site. Asbestos survey recommended if building is to be removed
19	Pt Allot 117 SO 22925 State Highway 1	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential migration of contaminants from railway activities into soil on the eastern boundary may be a consideration.
20	96 Boshier Road	HAIL H - site is adjacent to KiwiRail's existing North Auckland Line and as such uncertified fill and potential



		migration of contaminants from railway activities into soil on the eastern boundary may be a consideration
--	--	--

Further investigation of the land identified as being subject to unverified HAIL activities will be required at the time of site development. It is likely that this will be in the form of a detailed site investigation prepared by a suitably qualified and experienced practitioner (SQEP) in accordance with the provisions of the current edition of the Ministry for the Environment Contaminated Land Management Guidelines may be required to support future development on each of these particular lots. If any further detailed site investigation confirms that contaminant levels on the site exceed the soil contaminant standards set by the NESCS, then a Remedial Action Plan (RAP) / Site Management Plan (SMP) and remediation of the site in accordance with the approved RAP/SMP, as well as site validation sampling and reporting are likely to be required. These reports should also be prepared by a SQEP in accordance with relevant guidelines.

Additionally, it is recommended that prior to the demolition of any buildings constructed prior to 1984, an asbestos survey be carried out by a suitably qualified professional. Prior to the demolition of any building constructed prior to 1979, it is recommended that a lead survey be carried out by a suitably qualified professional. All demolition works shall be carried out in accordance with the recommendations of these surveys. If either contaminant is detected, then soil sampling may be required in this location.

If an area of potential contamination that was previously unidentified within this report is uncovered during site development, then the area is to be immediately cordoned off, works shall cease and the suitably qualified and experienced practitioner (SQEP) notified who shall assess the potential risks associated with this. Typical signs of potential soil contamination may include:

- Soils that appear discoloured (black, green staining most common)
- Soils that have an odour (petroleum hydrocarbons, oil)
- Soils encountered containing separate phase hydrocarbon (consent required)
- Inclusions of materials in soil
- Fragments of fibre cement board that may be indicative of asbestos
- Underground Storage Tanks (USTs)

Where additional contaminants are identified, additional investigation, consenting, controls and/or management may be required.

**Disclaimer:**

*This report has been prepared for the benefit of the client with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement. Findings and recommendations contained within this report are based on a review of existing information and the writer of the report takes no responsibility for any inaccuracies in information supplied by a third party.*

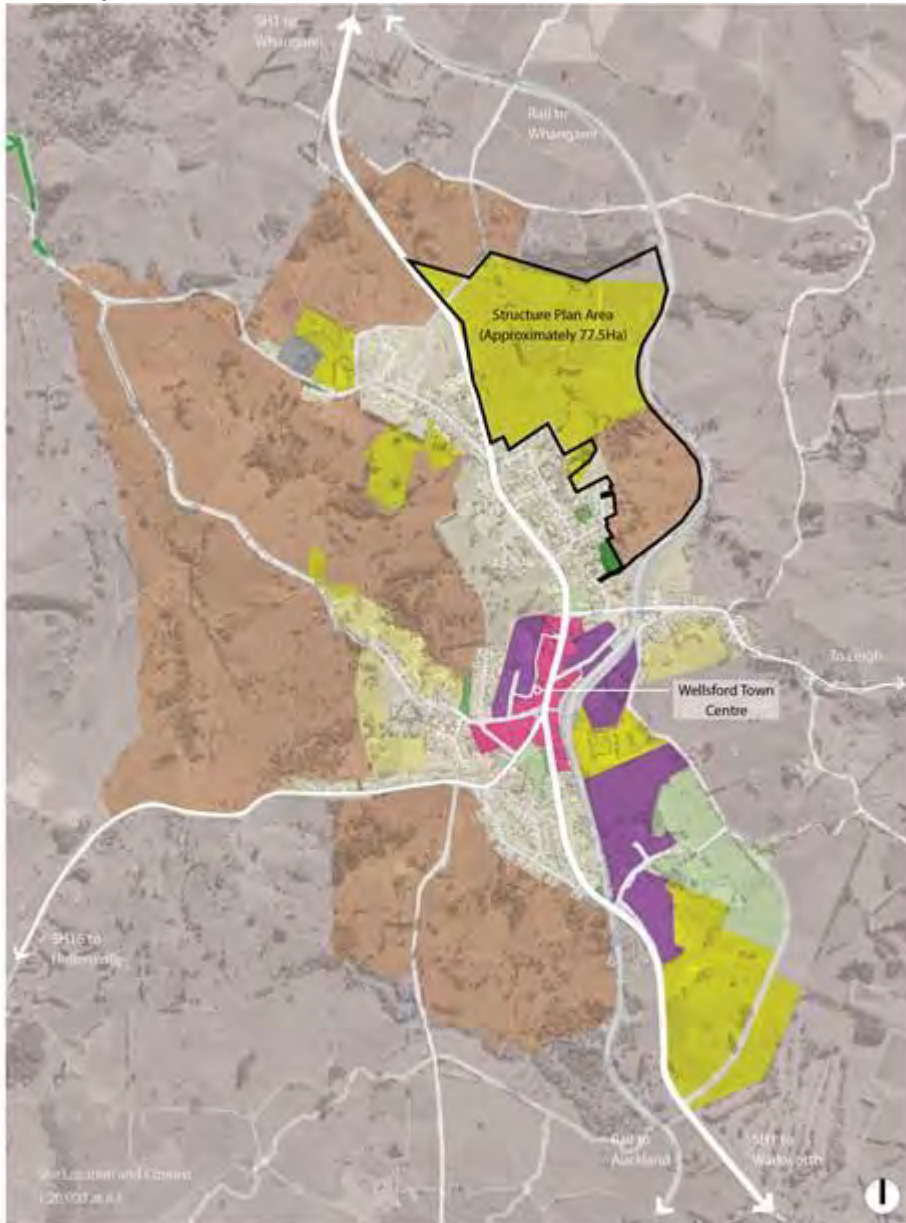
Report prepared and certified by:



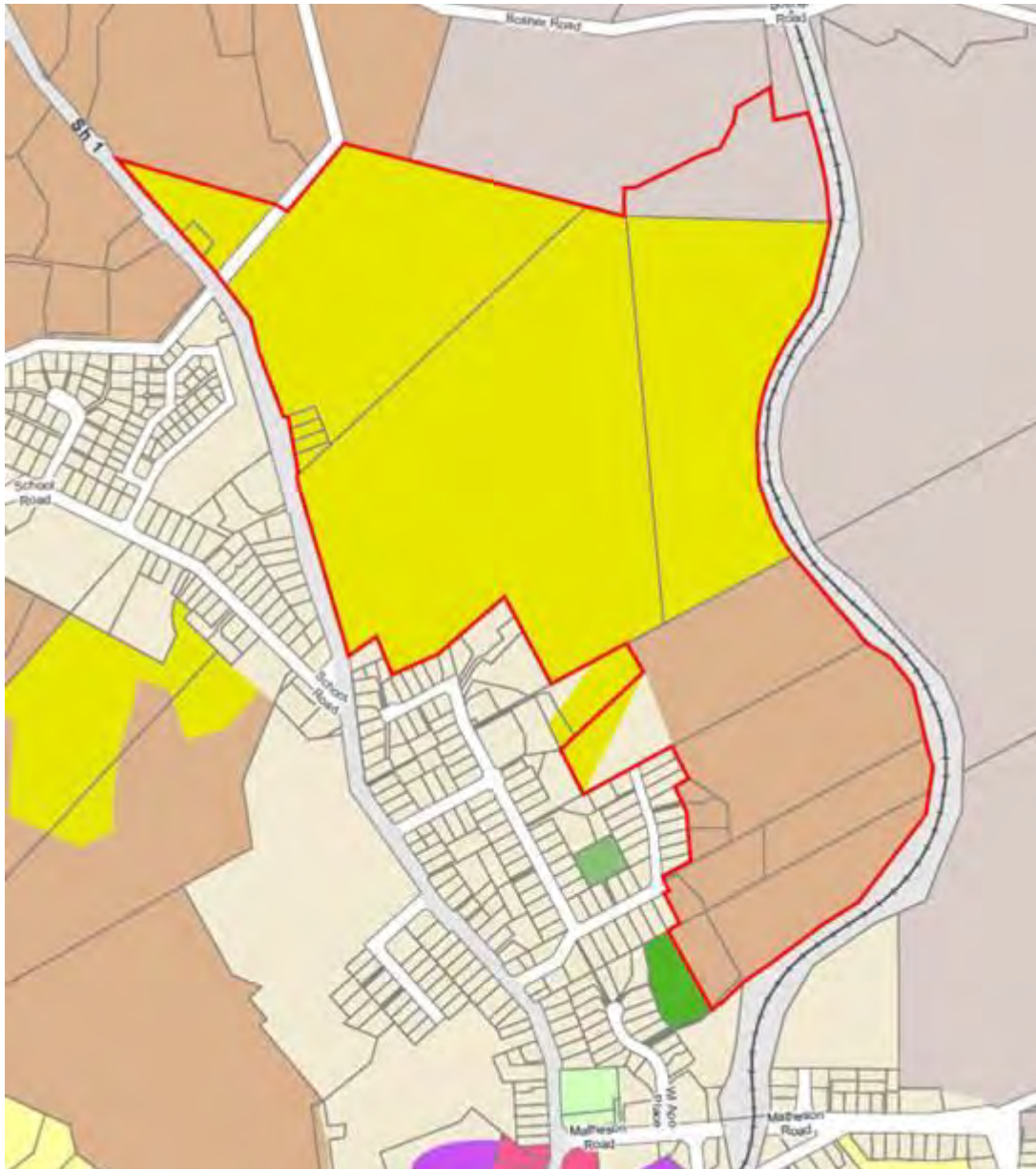
Kelly Deihl  
**Principal Scientist**

## Appendix 1: Site Plan

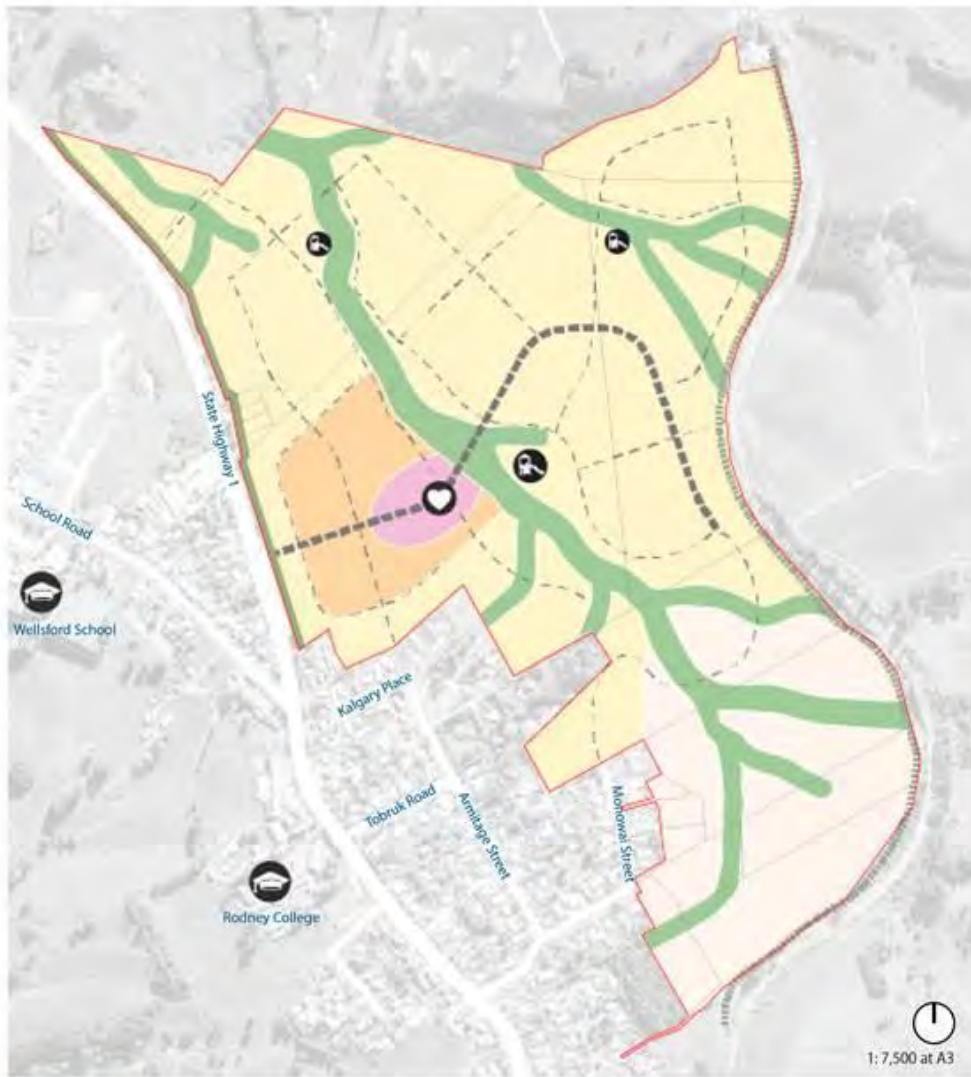
### Land subject to Wellsford North Structure Plan







## Draft Wellsford North Structure Plan



### Structure Plan

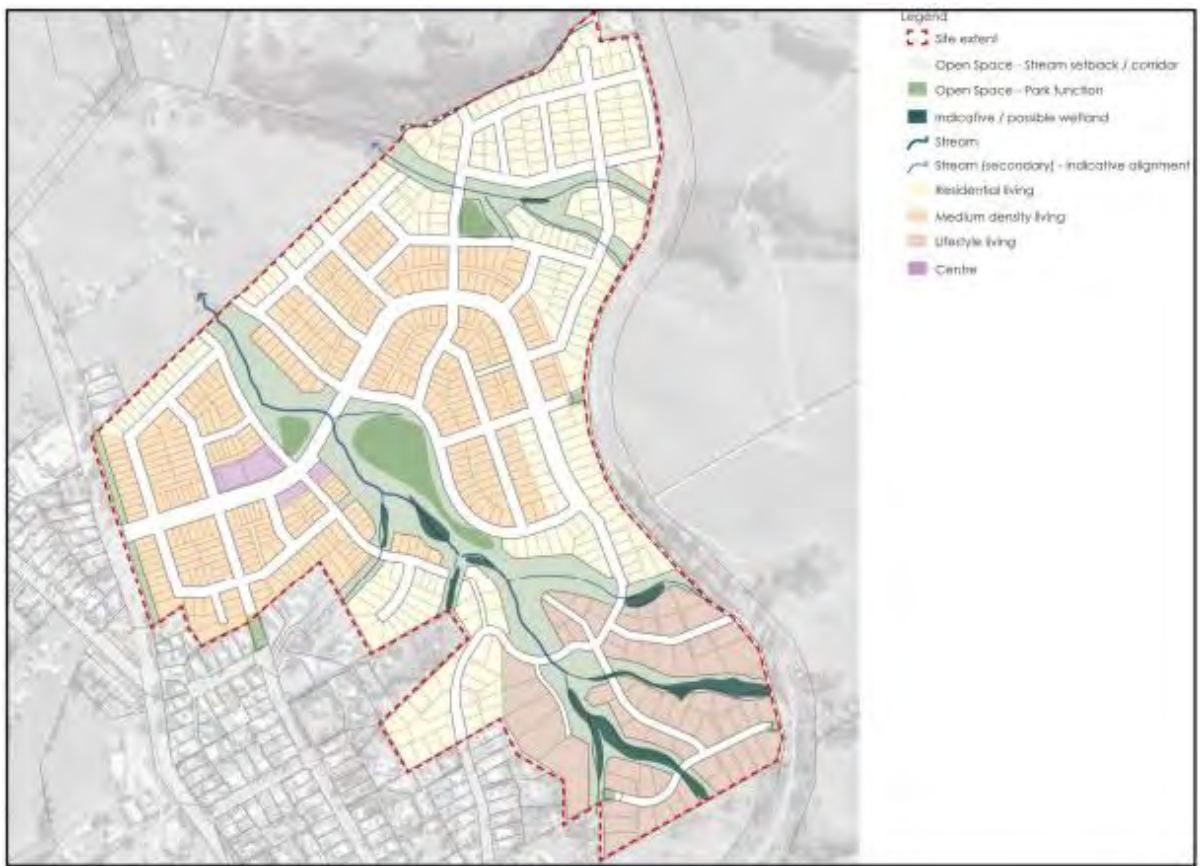
#### Legend

- |   |                                       |   |  |
|---|---------------------------------------|---|--|
|  | Structure plan extent                 |  | Main Collector Road                    |
|  | Property Boundary                     |  | Local Streets                          |
|  | Indicative Lifestyle Living           |  | Greenway Cycleway                      |
|  | Indicative Lower Density Residential  |  | 10m Landscape Buffer                   |
|  | Indicative Medium Density Residential |  | Indicative Playground                  |
|  | Indicative Village Centre             |  | Indicative Village Centre Public Space |
|  | Ecological Areas / Open Spaces        |  | Existing Schools                       |





## Draft Wellsford North Plan Change Area





## Appendix 2: Records of Title

Property 1: Pt Lot 4 DP 9919, Monowai Street, Wellsford



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



*R. W. Muir*  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1358/94  
**Land Registration District** North Auckland  
**Date Issued** 06 February 1957

**Prior References**  
NA994/219

**Estate** Fee Simple  
**Area** 6.7213 hectares more or less  
**Legal Description** Part Lot 4 Deposited Plan 9919  
**Original Registered Owners**  
John Desmond Jones and Georgina Maria Woolston

**Interests**

Fencing Agreement in Transfer 85173  
K75112 Notice of a Building Restriction on part Lot 21 Scheme Plan 7461(N) - 8.2.1960 at 9:00 am  
7253723.1 Mortgage to ASB Bank Limited - 28.2.2007 at 11:00 am  
11252357.2 Discharge of Mortgage 7253723.1 - 24.10.2018 at 3:52 pm  
11252357.3 Transfer to Wellsford Welding Club Limited - 24.10.2018 at 3:52 pm





Identifier

NA1358/94

1358/94

250757.1 Variation of Mortgage  
A506656 - 29.5.1974 at 9.12 on.

*[Signature]* for A.L.R.

782011.1 Transfer to William Mairiand Heays  
of Wellsford retired farmer - 21.1.1981 at  
11.27 o/c

*[Signature]* A.L.R.

782011.2 Mortgage **CHARGED** Investments  
Limited - 21.1.1981  
A.L.R.

B.090662.1 Transmission to Alma Beatrice  
Heays of Wellsford widow as executrix -  
2.8.1982 at 2.29 o/c

*[Signature]* A.L.R.

B.090662.2 Transfer to Alma Beatrice Heays  
abovenamed - 2.8.1982 at 2.29 o/c

*[Signature]* A.L.R.

B.530393.2 Transmission to Keith Noel  
Mairiand Farmer and Lewis Dines Ashford  
insurance representative both of Wellsford  
as executors - 29.4.1986 at 11.11 o/c

*[Signature]* A.L.R.

C.430737.1 Transfer to John Desmond Jones  
mill supervisor and Georgina Maria Woolston  
purchasing officer both of Wellsford  
13.11.1992 at 9.04 o/c

*[Signature]* A.L.R.

**Property 2: Pt Lot 2 DP 26722, Monowai Street**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



*R. W. Muir*  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1888/29  
**Land Registration District** North Auckland  
**Date Issued** 13 October 1960

**Prior References**  
NA780/52

**Estate** Fee Simple  
**Area** 5.7503 hectares more or less  
**Legal Description** Part Lot 2 Deposited Plan 26722  
**Original Registered Owners**  
John Desmond Jones and Georgina Maria Woolston

**Interests**  
Fencing Agreement in Transfer 85174  
11252357.3 Transfer to Wellsford Welding Club Limited - 24.10.2018 at 3:52 pm





Identifier

NA1888/29

Reference: Plan No 661909 Order for N/C No.



NORTH ISLAND REGISTER

Register Book Vol. 1888 Page 29

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

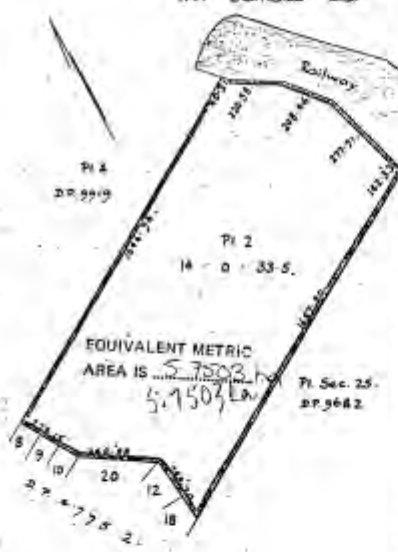
This Certificate, dated the Thirtieth day of October, one thousand nine hundred and SIXTY, under the hand and seal of the District Land Registrar of the Land Registration District of AUCKLAND, WITNESSETH that MAX LINDEN WATSON of Wellisford Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and incumbrances as are notified by memorial and/or written or endorsed hereon, subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land heretofore described, as the same is delineated by the plan hereto hereunder filed...

XVI Oramaka S.D.



Handwritten signature and title: District Land Registrar



agreement as to fencing contained in Transfer 85174... Mortgage to 259753.1... Variation of Mortgage A306656 28,5,1974 at 9,12 oo.

THIS REPRODUCTION ON A REDUCED SCALE CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTERED FOR THE PURPOSES OF THE DISTRICT LAND TRANSFER ACT 1952.

Scale: 3 chains - 1 inch

OVER..



Identifier

NA1888/29

1888/29

782011.1 Transfer to William Mainland Heays of Wellisford, retired farmer - 21.1.1981 at 11.27 o/c

*William Mainland Heays*  
A.L.R.

782011.2 Mortgage ~~CHARGED~~ to Property Investments Limited - 21.1.1981 at 11.27 o/c

*William Mainland Heays*  
A.L.R.

B.090662.1 Transmission to Alma Beatrice Heays of Wellisford widow as executrix - 2.8.1982 at 2.29 o/c

*Alma Beatrice Heays*  
A.L.R.

B.090662.2 Transfer to Alma Beatrice Heays above-named - 2.8.1982 at 2.29 o/c

*Alma Beatrice Heays*  
A.L.R.

B.530393.2 Transmission to Keith Howl Mainland farmer and Lewis Dines Ashford insurance representative both of Wellisford as executors - 29.4.1986 at 11.41 o/c

*Keith Howl*  
A.L.R.

C.430737.1 Transfer to John Desmond Jones mill supervisor and Georgina Maria Boulton purchasing officer both of Wellisford - 13.11.1992 at 9.04 o/c

*John Desmond Jones*  
A.L.R.



**Property 3: Pt Sec 25 DP 9682, Monowai Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



*R. W. Muir*  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1118/228  
**Land Registration District** North Auckland  
**Date Issued** 13 August 1954

**Prior References**  
NA709/72

**Estate** Fee Simple  
**Area** 2.0991 hectares more or less  
**Legal Description** Part Deposited Plan 9682

**Original Registered Owners**  
John Desmond Jones and Georgina Maria Woolston

**Interests**  
Fencing Agreement in Transfer 272363  
Fencing Agreement in Transfer 304703  
11252357.3 Transfer to Wellsford Welding Club Limited - 24.10.2018 at 3:52 pm



Identifier

NA1118/228

REGISTER

Land and Income FORM 7

Register-4000

Vol. 1118 July 200

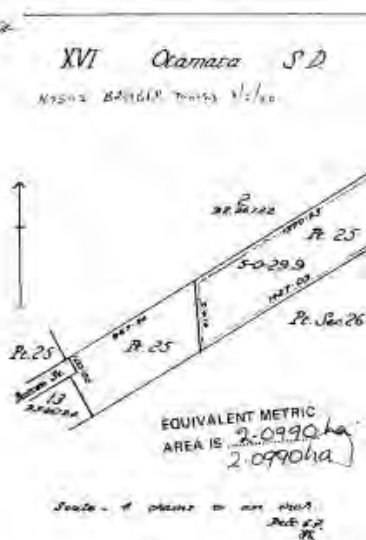
Reference: Vol. 709 Page 72 Transfer No. Order for N/O No. C. 31793



CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the thirteenth day of August one thousand nine hundred and fifty-four under the hand and seal of the District Land Registrar of the Land Registration District of AUCKLAND showing that ARCHIBALD HUNTER DUNCAN of Wellington, owner proprietor,

is holder of an estate in fee-simple (subject to such reservations, restrictions, easements, covenants, leases, and interests as are notified by material notes written or endorsed hereon, subject also to any existing right of the Crown to take and try all roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon hereunto attached to be the several addresses to a title more or less, that is to say: All that parcel of land containing five acres and twenty-nine hundredths perch more or less being part of the land on Deposited Plan 5652 and being more Section 25 Block XVI Otago Survey District.



AGREEMENTS AS TO TENANCY CONTAINED IN TRANSFER 10363 and 504702. W. Benjamin Assistant District Land Registrar. Transfer 584281 to Mary Jane Fishlock of Wellington, widow Woman Produced 25.5.1954 at 1220a. Transfer 607909 to man burden when it was alleged former Produced at 10.10.1954 at 1600a. Transfer 625586 to man burden when it was alleged former Produced at 10.10.1954 at 1600a. Transfer 625586 to man burden when it was alleged former Produced at 10.10.1954 at 1600a. Transfer 625586 to man burden when it was alleged former Produced at 10.10.1954 at 1600a. Transfer 625586 to man burden when it was alleged former Produced at 10.10.1954 at 1600a.

THIS REPRODUCTION ON A PHOTO-DUPLICATION CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER BOOK THE FORGERY OF SECTION 154A TRANSFER ACT 1952 L. G. Gorman D.L.R.

1118/228





Identifier

NA1118/228

1118/228

259753.1 Variation of Mortgage  
A306655 - 28.5.1974 at 9.12 ac.

*[Signature]* for A.L.R.

782011.1 Transfer to William Mainland Heays  
of Wellsford retired farmer - 21.1.1981 at  
11.27 a/c

*[Signature]*  
A.L.R.

782011.2 Mortgage to ~~SEARCHED~~ Investments  
Limited - 21.1.1981 at 11.27 a/c

*[Signature]*  
A.L.R.

B.090662.1 Transmission to Alma Beatrice  
Heays of Wellsford widow as executrix -  
2.8.1982 at 2.29 a/c

*[Signature]*  
A.L.R.

B.090662.2 Transfer to Alma Beatrice Heays  
abovenamed - 2.8.1982 at 2.29 a/c

*[Signature]*  
A.L.R.

B.530393.2 Transmission to Keith Noel  
Mainland farmer and Lewis Dinos Ashford  
insurance representative both of Wellsford  
as executors - 29.4.1986 at 11.27 ac

*[Signature]*  
A.L.R.

C.430737.1 Transfer to John Desmond Jones  
mill supervisor and Georgina Maria Woodley  
purchasing officer both of Wellsford  
13.11.1992 at 9.04 a/c

*[Signature]*  
A.L.R.



**Property 4: 11 Wi Apo Place, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA41B/822  
**Land Registration District** North Auckland  
**Date Issued** 14 July 1978  
**Prior References**  
 NA13A/1356

**Estate** Fee Simple  
**Area** 3.4087 hectares more or less  
**Legal Description** Lot 23 Deposited Plan 85114  
**Original Registered Owners**  
 Stanley Cowpland

**Interests**

380067.1 Building Line Restriction  
 Appurtenant hereto is a right of way specified in Easement Certificate 425309.1  
 Subject to a right of way over parts marked A and B on DP 85114 specified in Easement Certificate 425309.1  
 The easements specified in Easement Certificate 425309.1 are subject to Section 37 (1) (a) Counties Amendment Act 1961  
 Appurtenant hereto is a right of way specified in Easement Certificate 727474.4 - 14.7.1978 at 9:37 am  
 Subject to a right of way over part marked B on DP 85114 specified in Easement Certificate 727474.4 - 14.7.1978 at 9:37 am  
 The easements specified in Easement Certificate 727474.4 are subject to Section 37 (1) (a) Counties Amendment Act 1961  
 C021621.3 Mortgage to ASB Bank Limited - 27.7.1989 at 10:25 am  
 5404017.1 Discharge of Mortgage C021621.3 - 15.11.2002 at 9:00 am  
 7368200.1 Transfer to Shanjesh Prasad - 5.6.2007 at 9:11 am

Identifier NA41B/822

Deeds Office  
 Plan 13A/1356  
 Transfer No  
 N.C. Order No. 727474.1

Land and Deeds Office



**REGISTER**

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 14th day of July 1982 was issued and signed by me (Assistant Land Registrar) under the seal of the District Land Registrar of the Land Registration District of **SOUTH AUCKLAND**

WITNESSETH that **WEARSHINE CONTRACTORS LIMITED** at **Mellalford**

In pursuance of an order in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are specified in the several indentures or releases hereon) in the land hereinafter described, do hereby certify that the plan hereon is the several allotments a title more or less, that is to say: All that parcel of land containing **3.4087 hectares** more or less being **Lot 23 Deposited Plan 85114** and being part **Section 26 Block XVI Otamatea Survey District**



*C. Williams*  
 Assistant Land Registrar

Building line Restriction imposed in 380067.1

Appurtenant hereto is a right of way over part Lot 21 Plan 76660 (C.T.328/1271) shown marked 'C' on Plan 85114 - See Easement Certificate 425309.1 and Transfer 425309.3

Subject to a right of way over part herein shown marked 'A' and 'B' on Plan 85114 appurtenant to Lot 21 Plan 76660 (C.T.328/1271). See Easement Certificate 425309.1 and Transfer 425309.3

The above easements are subject to Section 37 (1)(a) Counties Amendment Act 1961

425308.2 Mortgage and ~~Transfer~~ to Justice Bradley and to ~~Justice Bradley~~ in shares - 2.4.1978 at 9.37 o/c

727474.4 Easement Certificate affecting lots on Plan 85114

Nature	Servient Land	Dominant Land
R.O.W.	pt Lot 22 'A'	herein
R.O.W.	pt herein 'B'	Lot 23 (C.T.418/821)

- 14.7.1978 at 9.37 o/c

Scale: 1 inch = *C. Williams* A.L.R.

The above easements when created will be subject to Section 37 (1)(a) Counties Amendment Act 1961

727474.5 Variation of Mortgage 425308.2 - 14.7.1978 at 9.37 o/c

*C. Williams*  
 A.L.R.

727474.6 Mortgage to Bruce Trotter and Marjory Ethel Trotter (jointly and severally) and to Bruce Trotter and Marjory Ethel Trotter in shares - 14.7.1978 at 9.37 o/c

*C. Williams*  
 A.L.R.

727474.7 Memorandum of Priority making Mortgage 727474.6 a first Mortgage and Mortgage 425308.2 a second Mortgage - 14.7.1978 at 9.37 o/c

*C. Williams*  
 A.L.R.

787036.1 Mortgage to ~~Justice Bradley~~ Harris Securities Limited - 2.4.1978 at 9.37 o/c

*C. Williams*  
 A.L.R.

B.075462.2 Transfer to Allan Leslie Sheriffe of Manurewa driver - 15.6.1982 at 9.00 o/c

*M. Chapman*  
 A.L.R.

- O V E R -

No. 41B / 822







Identifier

NA41B/822

41B/822

B.075440.3 Mortgage to ANZ Banking Group  
(New Zealand) Limited - 16.6.1989 at  
9.00 p'c  
27/7/91  
A.L.R. M. No. 10/89  
A.L.R.

G.091621.2 Transfer to Stanley Cowpland of  
Saudi Arabia engineer - 27.7.1989 at 10.25  
p'c  
A.L.R.

C.021621.1 Mortgage to ASB Bank Limited -  
27.7.1989 at 10.25 p'c  
A.L.R.



**Property 5: 15 Wi Apo Place, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA41B/821  
**Land Registration District** North Auckland  
**Date Issued** 14 July 1978

**Prior References**  
NA13A/1356

**Estate** Fee Simple  
**Area** 8086 square metres more or less  
**Legal Description** Lot 22 Deposited Plan 85114

**Original Registered Owners**  
John Charles Cowpland and Anne Priscilla Cowpland

**Interests**

380067.1 Building Line Restriction  
Appurtenant hereto is a right of way specified in Easement Certificate 425309.1  
Subject to a right of way over parts marked A and B on DP 85114 specified in Easement Certificate 425309.1  
The easements specified in Easement Certificate 425309.1 are subject to Section 37 (1)(a) Counties Amendment Act 1961  
Subject to a right of way over part marked A on DP 85114 specified in Easement Certificate 727474.4 - 14.7.1978 at 9:37 am  
Appurtenant hereto is a right of way specified in Easement Certificate 727474.4 - 14.7.1978 at 9:37 am  
The easements specified in Easement Certificate 727474.4 are subject to Section 37 (1)(a) Counties Amendment Act 1961  
D444046.2 Mortgage to The National Bank of New Zealand Limited - 28.10.1999 at 11:01 am  
8053238.1 Discharge of Mortgage D444046.2 - 30.1.2009 at 11:35 am  
8053238.2 Transfer to Michael Xaviour Conroy and Lucy Conroy - 30.1.2009 at 11:35 am  
8053238.3 Mortgage to Westpac New Zealand Limited - 30.1.2009 at 11:35 am  
9520381.4 Mortgage to Kiwibank Limited - 4.10.2013 at 4:13 pm  
9535683.1 Discharge of Mortgage 8053238.3 - 4.10.2013 at 4:41 pm  
9783377.1 Discharge of Mortgage 9520381.4 - 18.8.2014 at 12:22 pm  
9783377.2 Transfer to Simone-Ann Watling, Benjamin Leroy Wedgwood and Neale Watling - 18.8.2014 at 12:22 pm  
9783377.3 Mortgage to ANZ Bank New Zealand Limited - 18.8.2014 at 12:22 pm  
11530748.1 Discharge of Mortgage 9783377.3 - 27.8.2019 at 4:04 pm  
11530748.2 Transfer to Benjamin Leroy Wedgwood and Simone-Ann Watling - 27.8.2019 at 4:04 pm  
11530748.3 Mortgage to Westpac New Zealand Limited - 27.8.2019 at 4:04 pm



Identifier

NA41B/821

Reference Prior C/T 15A/1556 Transfer No. N/G. Order No. 727474.1



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 14th day of July one thousand nine hundred and seventy eight under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH that SHARONHE CONTRACTORS LIMITED at Wellington

In view of an estate in fee simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified in the material underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, (to be several) subdivisions a title here or less, that is to say: All that parcel of land containing 6066 square metres more or less being Lot 23 Deposited Plan 85114 and being part Section 26 Block XVI Otago Survey District

Assistant Land Registrar

Existing line restriction imposed in 360067.1

Appurtenant hereto is a right of way over part Lot 21 Plan 76660 (C.T. 32B/1271) shown marked "C" on Plan 85114 See Easement Certificate 425309.1 and Transfer 425309.2

Subject to a right of way over part herein shown marked "A" and "B" on Plan 85114 appurtenant to Lot 21 Plan 76660 (C.T. 32B/1271) See Easement Certificate 425309.1 and Transfer 425309.2

The above easements are subject to Section 37 (1)(a) Counties Amendment Act 1961

425309.2 Mortgage to N.A. Bradley and M. Bradley in shares - 2.4.1978 at 9.37 c/o

727474.4 Easement Certificate affecting loss on Plan 85114

Table with columns: Nature, Servient Land, Dominant Land. Row 1: pt herein 'A', Lot 23 (CP41B/822). Row 2: pt Lot 23 'B', herein. Date: 14.7.1978 at 9.37 c/o

Measurements are Metric

The above easements when created will be subject to Section 37 (1)(a) Counties Amendment Act 1961

727474.5 Variation of Mortgage 425309.2 - 14.7.1978 at 9.37 c/o

727474.6 Mortgage to Bruce Trotter and Marjory Ethel Trotter (jointly inter se) and to Bruce Trotter and Marjory Ethel Trotter in shares - 14.7.1978 at 9.37 c/o

727474.7 Memorandum of Priority making Mortgage 727474.6 a first Mortgage and Mortgage 425309.2 a second Mortgage - 14.7.1978 at 9.37 c/o

787054.2 Securities Limited - 2.23.1981 at 2.23 c/o

B.16A290.2 Mortgage of Part Harris Securities Limited - 11.11.1983 at 2.50 c/o

127 B / 821





Identifier

NA41B/821

41B/821

B:522775.1 Transfer to John Charles  
Cowpland of Wellford company director  
and Anne Priscilla Cowpland his wife  
- 8.4.1986 at 2.19 n/c

B:522775.2 Mortgage to National Savings  
Bank - 8.4.1986  
A.L.N.

D144046.2 Mortgage to The National Bank  
of New Zealand Limited  
28.10.1999 at 11.01.  
For RGL

**Property 6: 22 Batten Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NAI10C/222  
**Land Registration District** North Auckland  
**Date Issued** 23 July 1997

**Prior References**  
NA50C/1296

**Estate** Fee Simple  
**Area** 2637 square metres more or less  
**Legal Description** Lot 1 Deposited Plan 179213

**Original Registered Owners**  
Garry Keith Treadwell

**Interests**

C396074.2 Mortgage to ASB Bank Limited - 20.7.1992 at 9:03 am  
C959172.1 CAVEAT BY AUCKLAND FINANCE LIMITED - 26.2.1996 AT 11.00 AM  
6927099.1 Withdrawal of Caveat C959172.1 - 28.6.2006 at 3:50 pm  
6960804.1 Transmission to Leone Carol Treadwell and Charles Connolly as Executors - 25.7.2006 at 9:00 am  
7071380.1 Discharge of Mortgage C396074.2 - 13.10.2006 at 3:56 pm  
7110239.1 Transfer to Leone Carol Treadwell, Lexene Jane Compain and Joanne Marie Marshall - 20.11.2006 at 2:41 pm  
7110289.1 Transfer to Leone Carol Treadwell, Lexene Jane Compain and Joanne Marie Marshall (1/2 share) and Leone Carol Treadwell (1/2 share) - 20.11.2006 at 2:44 pm  
7123421.1 Transfer to Leone Carol Treadwell, Lexene Jane Compain and Joanne Marie Marshall (1/2 share) and Leone Carol Treadwell, Lexene Jane Compain and Joanne Marie Marshall (1/2 share) - 20.11.2006 at 3:59 pm  
7123421.2 Mortgage to ASB Bank Limited - 20.11.2006 at 3:59 pm  
9343900.1 Discharge of Mortgage 7123421.2 - 22.3.2013 at 3:32 pm  
9343900.2 Transfer to Heather Anne George - 22.3.2013 at 3:32 pm  
9343900.3 Mortgage to ASB Bank Limited - 22.3.2013 at 3:32 pm

Identifier: **NA110C/222**

**REGISTER** L111

**110C/222**

Reference: **NA110C/222**  
 Date: **15/07/2011**  
 Document No.: **017489912**



**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952**

This Certificate (dated the 23rd day of July) the THIRTIETH NINETEEN HUNDRED AND ELEVEN day before the last of ONE THOUSAND (one) Registers of the Land Registration District of NORTH AUCKLAND

WITNESSETH that **GARRY KEITH BREADWELL**

is owner of an estate in fee simple (subject to such easements, covenants, restrictions and other matters as are noted by marginal reference herein) in the land hereinafter described, declared on the plan hereon, for the several administrations of ONE HUNDRED AND TEN HUNDRED AND SIXTY SEVEN square metres, more or less being **LOT 1 REPLANIFICATION PLAN 199113**



Given by the Registrar-General of Land at Auckland on the 15th day of July 2011.

Witnessed by the Registrar-General of Land at Auckland on the 15th day of July 2011.

COMPILED AND VERIFIED BY AUCKLAND FINANCE LIMITED ON 15/07/2011

DEPOSITED IN ACCORDANCE WITH SECTION 41 OF THE LAND TRANSFER ACT 1952 BY **LEANE CARROLL** REGISTRAR GENERAL ON 15/07/2011 AT 4:05

**REGISTER**

**110C/222**

**110C/222**





**Property 7: 26 Batten Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



*S. W. Muir*  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA110C/223  
**Land Registration District** North Auckland  
**Date Issued** 23 July 1997

**Prior References**  
NA50C/1296

**Estate** Fee Simple  
**Area** 9214 square metres more or less  
**Legal Description** Lot 2 Deposited Plan 179213

**Original Registered Owners**  
Warren James Thomas and Jayne Thomas

**Interests**

6392205.1 Transfer to Michael Kane Jacobs (1/4 share), Allana Alice Jacobs (1/4 share) and Lorraine Yates (1/2 share) - 21.4.2003 at 9:00 am  
7304177.1 Mortgage to ASB Bank Limited - 2.4.2007 at 9:00 am  
831036.1 Discharge of Mortgage 7304177.1 - 21.10.2009 at 2:16 pm  
831036.2 Transfer to Gary John Lawford - 21.10.2009 at 2:16 pm  
831036.3 Mortgage to ANZ National Bank Limited - 21.10.2009 at 2:16 pm  
8068635.1 CAVEAT BY JOHN ANDREW LAWFORD, MARION WINIFRED LAWFORD AND RICHARD LESLIE BURCHER - 7.6.2013 at 2:15 pm

Identifier

NA110C/223

Reference:  
Prior CT: 50C1296  
Document No.: D174693.2



**REGISTER**

LT69

110C/223

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952**

This Certificate dated the 23rd day of July One Thousand Nine Hundred and Ninety Seven under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND.

WITNESSETH that GARRY KEITH TREADWELL

is seized of an estate in fee simple (subject to such reservations, restrictions, encumbrances and interests as are notified by memorial endorsed hereon) in the land hereinafter described, delineated on the plan hereon, by the several admeasurements a little more or less, that is to say: All that parcel of land containing 9214 square metres, more or less being **LOT 2 DEPOSITED PLAN 179213**



C396074.2 Mortgage to ASIA Bank Limited - 20.7.1992 at 9.03

C621049.1 Mortgage to Ian Leonard Challen - 31.7.1994 at 1.46

C959172.1 CHALLENGER AUCTION AND FINANCE LIMITED - 26.2.1996 at 9.03

D074193.1 NOTICE OF CLAIM UNDER SECTION 42 OF THE MATRIMONIAL DISSENT PROPERTY ACT 1976 BY LEONE CAROL TREADWELL - 13.11.1996 at 9.03

D300164.5 Transfer to Warren James Thomas and Jayne Thomas  
7.8.1998 at 2.05

*A. M. [Signature]*  
For DLR

110C/223



**Property 8: 2 Monowai Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA7A/91  
**Land Registration District** North Auckland  
**Date Issued** 17 January 1966

**Prior References**  
NA1866/42

**Estate** Fee Simple  
**Area** 2512 square metres more or less  
**Legal Description** Lot 18 Deposited Plan 47752

**Original Registered Owners**  
Aline Margaret Van Der Net

**Interests**

Subject to a drainage right (in gross) over part coloured yellow on DP 47752 in favour of The Rodney County Council created by Transfer 646787

Appurtenant hereto is a right of way created by Transfer A126303

The easements created by Transfer 646787 are subject to Section 9A (3) (a) Land Subdivision in Counties Act 1946

The easements created by Transfer A126303 are subject to Section 9A (3) (a) Land Subdivision in Counties Act 1946  
K75112 Building Line Restriction

Appurtenant hereto is a right of way created by Transfer A102562 - 17.1.1966

The easements created by Transfer A102562 are subject to Section 9A (3) (a) Land Subdivision in Counties Act 1946

6159028.1 Transmission to Marilyn May Steel as Executrix - 23.9.2004 at 9:00 am

6209006.1 Transfer to Marilyn May Steel (1/2 share) and Cor Hank Van Der Net (1/2 share) - 9.11.2004 at 9:00 am

9108289.1 Transmission of a 1/2 share/interest Cor Hank Van Der Net to Louise Grace Goff as Executor - 27.6.2012 at 3:50 pm

9204701.1 Transfer to Warren Lindsay Millar and Pamela Jane Millar - 12.10.2012 at 2:31 pm

9204701.2 Mortgage to ASB Bank Limited - 12.10.2012 at 2:31 pm



Identifier **NA7A/91**

References  
 Prior C/T. 1866/42  
 Transfer No. A.102562  
 N/G. Order No.



Land and Deeds 69

**REGISTER**

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 17th day of January one thousand nine hundred and sixty-six under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH that MARTIN ELECTRICAL COMPANY LIMITED at Wellsford

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial indentures or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, by the several admeasurements a little more or less, that is to say: All that parcel of land containing 2 roods 19.3 perches more or less being Lot 18 Deposited Plan 47752 and being part Section 25 Block XVI Otamatea Survey District.



*M. Williams*  
 Assistant Land Registrar.

Memorials brought forward:-  
 Fencing covenant in Transfer 85174.

Building line restriction 33 feet from the middle line of Batten Street contained in S.K. 75112.

XVI Otamatea S.D. Subject to a drainage easement over the part coloured yellow on Plan 47752 in favour of METRIC AREA 2512 m<sup>2</sup>. The Chairman, Councillors and Inhabitants of the County of Rodney created by Transfer 545787.



Appurtenant hereto is a right of way over the part Lot 20 shown coloured yellow on Plan 47752 (C.T.1866/42) created by Transfer A.102562.

*M. Williams*  
 A.L.R.

Appurtenant hereto is a right of way over the part Lot 12 coloured yellow on Plan 47752 (C.T.1866/42) created by Transfer A.126303.

*M. Williams*  
 A.L.R.

The above easements are subject to Section 9A3A Land Subdivision in Counties Act 1946.

*M. Williams*  
 A.L.R.

Scale: 1 inch = 2 chains  
 DEPT. OF LAND

No. 7A/91



Identifier

NA7A/91

7A 91 7A/91

**CERTIFICATE OF TITLE**

A 148995 Transfer to Gary Desmond Martin of Wellsford company manager produced 17.5.1966 at 1.35 o/c.

D.030576.1 Evidence of the marriage of Aline Margaret Miller, abovenamed to Cnr Hank Van Der Mer of Auckland engineer - 1.10.1998 at 4.25 o/c

A 162013 Mortgage to Bank of New Zealand produced 18.7.1966 at 2.00 o/c.

*Charged*  
A.L.R.  
A.L.H.

*M.B.S.*  
A.L.H.

A.460139 Transfer to Peter Robertson Millar of Wellsford traffic officer and Aline Margaret Millar his wife - 20.4.1970 at 2.40 o/c.

*Charged*  
A.L.H.

Pencing covenant contained in Transfer A.460139.

*Charged*  
A.L.H.

A.460140 Mortgage to The State Advances Corporation of New Zealand - 20.4.1970 at 2.40 o/c.

*Charged*  
A.L.H.

5312331

A.460141 Mortgage to Gary Desmond Martin - 20.4.1970 at 2.40 o/c.

*Charged*  
A.L.H.

3432558

A.460142 Family Recharge to The State Advances Corporation of New Zealand - 20.4.1970 at 2.40 o/c.

*Charged*  
A.L.H.

A.460143 settled under the Joint Family Homes Act 1964 - 20.4.1970 at 2.40 o/c.

*Charged*  
A.L.H.

A.550697 Mortgage to The New Zealand Co-operative Terminal Building Society - 7.5.1971 at 1.45 o/c.

*Charged*  
A.L.H.

A.550698 Memorandum of Priority of Mortgage making Mortgage A.550697 a 1st Mortgage, Mortgage A.460141 a 2nd Mortgage and A.460142 a 3rd Charge - 7.5.1971 at 1.45 o/c.

*Charged*  
A.L.H.  
2104

77574

501123.2 Mortgage to Bank of New Zealand - 18.12.1975 at 2.00 o/c.

*Discharged*  
A.L.H.

B00934A.1 Transfer to Aline Margaret Miller abovenamed - 26.11.1991 at 2.40 o/c.

*Charged*  
A.L.H.



**Property 9: 18 Monowai Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA91B/209  
**Land Registration District** North Auckland  
**Date Issued** 23 April 1993

**Prior References**  
 NA4D/471 NA8D/654

**Estate** Fee Simple  
**Area** 2806 square metres more or less  
**Legal Description** Lot 2 Deposited Plan 152849

**Original Registered Owners**  
 Peter John Waterman and Pauline Isabella Waterman

**Interests**

Subject to a right of way over parts marked A, C, D and E on DP 152849 created by Transfer A126303  
 The easements created by Transfer A126303 are subject to Section 37 (1) (a) Counties Amendment Act 1961  
 K75112 Building Line Restriction  
 Appurtenant hereto are rights of way specified in Easement Certificate C473672.6 - 23.4.1993 at 2.18 pm  
 Subject to a right of way over parts marked B and F, and a right to drain sewage over parts marked D and H on DP 152849  
 specified in Easement Certificate C473672.6 - 23.4.1993 at 2.18 pm  
 The easements specified in Easement Certificate C473672.6 are subject to Section 243 (a) Resource Management Act 1991  
 D658611.1 Mortgage to Bank of New Zealand - 21.11.2001 at 9:55 am  
 7364487.1 Discharge of Mortgage D658611.1 - 14.5.2007 at 10:06 am  
 7411014.1 Transfer to Keith Dustin and Nola Elizabeth Dustin - 21.6.2007 at 11:07 am  
 8581255.1 Lease Term Commencing 31.08.2010 and expiring on the death of the Lessees CT 534678 issued - 9.9.2010 at  
 11:07 am  
 8581255.2 Transfer to Ian Clive Dustin - 9.9.2010 at 11:07 am  
 8684831.1 Transfer to Keith Dustin and Nola Elizabeth Dustin - 28.1.2011 at 11:50 am  
 8684831.2 Merger of Lease 8581255.1 - 28.1.2011 at 11:50 am  
 9386472.1 Transfer to Colin Douglas Cooper and Richard Allan Cooper - 17.5.2013 at 12:54 pm  
 9386472.2 Mortgage to ANZ Bank New Zealand Limited - 17.5.2013 at 12:54 pm  
 10595434.1 Discharge of Mortgage 9386472.2 - 11.11.2016 at 12:05 pm  
 10595434.2 Transfer to Amanda Jane Buck and Carl Williams Buck Jr - 11.11.2016 at 12:05 pm  
 10595434.3 Mortgage to ASB Bank Limited - 11.11.2016 at 12:05 pm  
 11225882.1 Discharge of Mortgage 10595434.3 - 12.10.2018 at 10:42 am  
 11225882.2 Transfer to Buxton Farm Trustee Limited - 12.10.2018 at 10:42 am

**Identifier**                      **NA91B/209**

---

11225882.3 Mortgage to ANZ Bank New Zealand Limited · 12.10.2018 at 10:42 am





Identifier

NA91B/209

Reference:  
Plan C/T 4D/47C & 8D/654  
Transfer No.  
NIC. Debit No. C.475872.0



**REGISTER**

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate does the 21st day of April one thousand nine hundred and ninety-three and is the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND.

WITNESSETH that CHARLES DESMOND PHILLIPS of Wellisford farmer and ANNE PHILLIPS his wife are

as listed of an estate in fee simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by marginal underwritten or endorsed herein) in the land hereinafter described, delineated with bold black lines on the plan hereon by the several encumbrances & other parts of fee, that is to say: All that parcel of land containing 2886 square metres more or less being Lot 2 Deposited Plan 152849 and being part Section 25 Block XVI Otamarua Survey District.



Assistant Land Registrar

Interests at Date of Issue:

Fencing Covenant in Transfer 85174 (subject part)

Building Line Restriction in 875112

subject to a right of way over the parts herein marked "A", "C", "D" and "E" on Plan 122849 appurtenant to Lot 18 Plan 47752 (OT 78/91) created by Transfer A126103

The above right of way is subject to Section 17 (1) (a) Companies Amendment Act 1961

C.475872.0 Easement Certificate affecting lots on Plan 152849

Nature	Servient Land	Dominant Land
Right of Way	parts Lot 1 (C) 91B/209 marked "A" and "D"	Herein
Right of Way	parts herein marked "B" and "E"	Lot 1

Right to Drain marked "B" and "E" - 23.4.1993 at 2.16 c/m

The above easements when created will be subject to Section 243 (a) Resource Management Act 1991

C.690148.1 Transfer to Patsy Owen Bennett of Wellisford, contractor and Karen Margaret Bennett his wife - 7.12.1994 at 0.00 c/m

C.690148.2 Mortgage to Mortgage Banking Corporation - 7.12.1994 at 0.00 c/m

D235591.1 Variation of Mortgage C690148.2 25.3.1998 at 17.33.

D381170.2 Transfer to Peter John Westman and Pauline Isabelle Westman 25.4.1999 at 0.15.

D48881.1 Mortgage to Bank of New Zealand 27.11.2001 at 3.75

91B/209

Measurements are Metric



**Property 10: 20 Monowai Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA91B/208  
**Land Registration District** North Auckland  
**Date Issued** 23 April 1993

**Prior References**  
NA8D/654

**Estate** Fee Simple  
**Area** 1549 square metres more or less  
**Legal Description** Lot 1 Deposited Plan 152849

**Original Registered Owners**  
Pauline Isabella Waterman and Peter John Waterman

**Interests**

K75112 Building Line Restriction

Subject to a right of way over part marked A on DP 152849 created by Transfer A102562

The easements created by Transfer A102562 are subject to Section 37 (1) (a) Counties Amendment Act 1961

Appurtenant hereto are rights of way and rights to drain sewage specified in Easement Certificate C473672.6 - 23.4.1993 at 2.18 pm

Subject to a right of way over parts marked A and G on DP 152849 specified in Easement Certificate C473672.6 - 23.4.1993 at 2.18 pm

The easements specified in Easement Certificate C473672.6 are subject to Section 243 (a) Resource Management Act 1991

7313210.1 Transfer to Denis Palmer Earley, Gaye Earley and Robert James Earley - 16.5.2007 at 11:58 am

7719813.1 Transmission to Denis Palmer Earley and Robert James Earley - 20.2.2008 at 9:00 am

7709454.1 Transfer to Denis Palmer Earley, Robert James Earley and Kirsten Jane Taylor-Ruiteman - 21.2.2008 at 12:01 pm

8549774.1 CAVEAT AGAINST THE INTEREST OF ROBERT JAMES EARLEY BY CARTER HOLT HARVEY LIMITED - 27.7.2010 at 11:18 am

8586027.1 Withdrawal of Caveat 8549774.1 - 6.9.2010 at 3:48 pm

9440124.1 Transfer to Denis Palmer Earley and Kirsten Jane Taylor-Ruiteman - 6.8.2013 at 10:44 am

10606182.1 Transfer to Anthony John Armit and Annabelle Joan Armit - 9.11.2016 at 11:18 am

Identifier

NA91B/208

Reference  
Title C/T 80/654

Leaf and Deed No

Transfer No.  
N.C. Order No. C.473672.5



**REGISTER**

No. 91B/208

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 23rd day of April one thousand nine hundred and ninety-three under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH that GRAEME DEBORAH PHILLIPS of Melleford farmer and ANNE PHILLIPS his wife see

Sheweth of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by marginal underwriting or endorsed hereon) to the land hereinafter described, delineated with bold black lines on the plan hereon, to the several dimensions a little more or less, that is to say: All that parcel of land containing 1549 square metres more or less being Lot 1 deposited Plan 152049 and being part Section 25 Block XVI Obsolete Survey District



District Land Registrar

Interests at Date of Issue

Building Line Restriction in #75132

Subject to a right of way over the part herein marked "A" on Plan 152049 appurtenant to Lot 18 Plan 47752 (CV 7A/91) created by Transfer A102562

The above right of way is subject to Section 37 (1) (a) Counties Amendment Act 1961

C.473672.6 Easement Certificate affecting Lots on Plan 152049

Noted	Servient Land	Dominant Land
Right of Way	parts herein marked "A" and "G"	Lot 2 ICT 91B/209

Right of Way	parts Lot 2 marked "B" and "E"	Herein
--------------	--------------------------------	--------

Right to Drain Sewage	parts Lot 1 marked "D" and "F"	Herein
-----------------------	--------------------------------	--------

- 23.4.1993 at 7.18 a/c

The above easements when created will be subject to Section 74 (a) Resource Management Act 1991

*[Signature]*  
A.L.R.

D.070356.1 Transfer to Lorna Rose Kerr of Melleford married woman - 13.12.1996 at 2.15 a/c

*[Signature]*  
A.L.R.

D282126.1 Transfer to William John West 17.6.1998 at 3.11

*[Signature]*  
A.L.R.

D658610.1 Transfer to Pauline Isabella Waterman and Peter John Waterman 21.11.2001 at 9.55

*[Signature]*  
A.L.R.

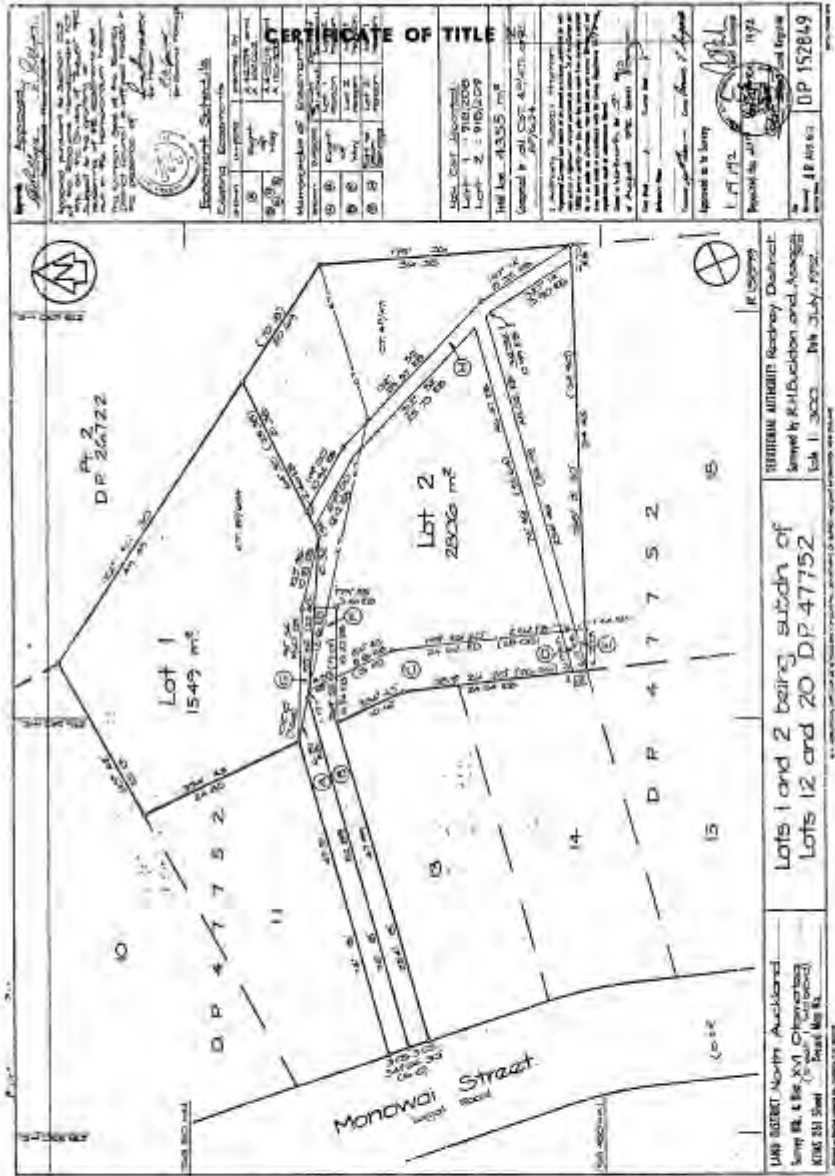
No. 91B/208

Measurements are Metric



Identifier

NA91B/208



**Property 11: 56 Boshier Road, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** 157227  
**Land Registration District** North Auckland  
**Date Issued** 13 December 2004

**Prior References**  
NA18D/401

**Estate** Fee Simple  
**Area** 8.3925 hectares more or less  
**Legal Description** Lot 5 Deposited Plan 338255

**Original Registered Owners**  
Grant Thomas Sullivan and Josephine Frances Sullivan

**Interests**

- 661822.1 Gazette Notice (N.Z. Gazette 30.3.1978 P.730) declaring part State Highway 1 (Awanui-Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm
- D120340.3 Mortgage to Westpac Banking Corporation - 17.3.1997 at 3.56 pm
- D673509.2 Variation of Mortgage D120340.3 - 18.1.2002 at 3.36 pm
- 6097837.1 Variation of Mortgage D120340.3 - 30.7.2004 at 9:00 am
- 6155441.1 Variation of Mortgage D120340.3 - 21.9.2004 at 9:00 am
- 6249452.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 13.12.2004 at 9:00 am
- 7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage D120340.3 in Westpac New Zealand Limited - 2.11.2006 at 9:00 am
- 8532896.1 Discharge of Mortgage D120340.3 - 8.7.2010 at 3:31 pm
- 8532896.2 Transfer to George Dragicevich and Lynette Dragicevich - 8.7.2010 at 3:31 pm

**Property 12: 10 State Highway 1, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA18D/400  
**Land Registration District** North Auckland  
**Date Issued** 20 January 1970

**Prior References**  
NA1137/67

**Estate** Fee Simple  
**Area** 1247 square metres more or less  
**Legal Description** Lot 1 Deposited Plan 61904

**Original Registered Owners**  
Peter Mark Thomas and Christine Frances Joynt

**Interests**

- 661822.1 Gazette Notice (N.Z. Gazette 30.03.1978 p.730) declaring part State Highway 1 (Awanui-Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm
- D647432.3 Mortgage to ASB Bank Limited - 10.10.2001 at 9:03 am
- 5602117.1 Discharge of Mortgage D647432.3 - 28.5.2003 at 9:00 am
- 5602117.2 Transfer to Wellsford Painters Limited - 28.5.2003 at 9:00 am
- 5602117.3 Mortgage to ASB Bank Limited - 28.5.2003 at 9:00 am
- 6481959.3 Discharge of Mortgage 5602117.3 - 5.7.2005 at 9:00 am
- 6481959.4 Transfer to Pistol Properties Limited - 5.7.2005 at 9:00 am
- 6481959.7 Mortgage to ASB Bank Limited - 5.7.2005 at 9:00 am
- 7508098.1 Discharge of Mortgage 6481959.7 - 3.9.2007 at 11:26 am
- 7508098.2 Transfer to Tracey Marie Thomas - 3.9.2007 at 11:26 am
- 7508098.3 Mortgage to ASB Bank Limited - 3.9.2007 at 11:26 am
- 7853816.1 Discharge of Mortgage 7508098.3 - 4.7.2008 at 3:50 pm
- 7853816.2 Transfer to Dean Arthur Thomas - 4.7.2008 at 3:50 pm
- 7853816.3 Mortgage to ANZ National Bank Limited - 4.7.2008 at 3:50 pm
- 9832114.1 Discharge of Mortgage 7853816.3 - 11.9.2014 at 3:09 pm
- 9832114.2 Transfer to Garcia Investments Limited - 11.9.2014 at 3:09 pm
- 9832114.3 Mortgage to Mortgage Holding Trust Company Limited - 11.9.2014 at 3:09 pm
- 10959242.1 Discharge of Mortgage 9832114.3 - 8.12.2017 at 12:33 pm
- 10959242.2 Transfer to Mark Steven Dodd and Elsa Bronwyn Harris - 8.12.2017 at 12:33 pm
- 10959242.3 Mortgage to TSB Bank Limited - 8.12.2017 at 12:33 pm

**Identifier** **NA18D/400**

---

11342283.1 Discharge of Mortgage 10959242.3 - 7.2.2019 at 12:41 pm  
11342283.2 Transfer to Mark Steven Dodd - 7.2.2019 at 12:41 pm  
11342283.3 Mortgage to TSB Bank Limited - 7.2.2019 at 12:41 pm





Identifier

NA18D/400

Deponent  
 Prop. Q/T 113767  
 Transfer No. 5/141 891  
 N/C. Order No.

Location Title 1  
 No. 18D/400

**REGISTER**

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 20th day of January one thousand nine hundred and seventy under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH and SHIRLEY HIGGLEY of Wellsford Farmer

In proof of an estate in fee-simple (subject to such reservations, restrictions, incumbrances, fees, and covenants as are provided by statutory enactments or otherwise) in the land hereafter described, determined with odd parts (set out on the plan hereon, for the several subdivisions a little more or less, that is to say: All that parcel of land containing 1 rood 9 1/2 perches more or less being Lot 1 on Deposited Plan 61901 and being part Allotment B 119 Parish of Oramakea

XII Oramakea 5D

Assistant Land Registrar  
 17201

461822.1 Gazette Notice (N.Z. Gazette 30.3.1978 E.730) declaring part State Highway 1 (Amanu-Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.55 a/c

for N.L.R.

METRIC AREA IS 1247 m<sup>2</sup>  
 1247 m<sup>2</sup>  
 Circumference  
 1 Area = 495m<sup>2</sup>  
 1 Perch = 36.3m<sup>2</sup>  
 1 Rod = 202.5m<sup>2</sup>

B.366519.1 Transfer to Peter Mark Thomas of Wellsford forestry contractor and Shirley Thomas his wife - 4.10.1980 at 1.95 a/c

B.366519.2 Transfer to Pacific Banking Corporation Ltd at 1.17 a/c

C.694288.1 Mortgage to Citibank Limited 7.8.1995 at 12.17 a/c

Scale: 1 inch = 1 Chain

District Land Registrar  
 17201

No. 18D/400

Identifier **NA18D/400**

18D/400

D649923.2 Transfer to Peter Mark Thomas

D649923.3 **DISCHARGED** ASB Bank Limited  
*for 10/10/2002*

Both 17.10.2002 **WORKING**  
*for RSL*

D647432.2 Transfer to Peter Mark Thomas  
and Christine Frances Joynt

D647432.3 Mortgage to ASB Bank Limited

All 16.10.2002 at 4.03  
*for RSL*



**Property 13: 374 Rodney Road, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Limited as to Parcels  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1656/67 **Part-Cancelled**  
**Land Registration District** North Auckland  
**Date Issued** 11 June 1959

**Prior References**  
NA522/287

**Estate** Fee Simple  
**Area** 11.9008 hectares more or less  
**Legal Description** Part South West Allotment 118 Parish of Oruawhoro

**Original Registered Owners**  
Kevin Donald Pugh, Leanne Grace Pugh and Roderick Charles Jenden

**Interests**  
K69901 Building Line Restriction  
18737 Proclamation taking part for road - 18.12.1961 at 2:50 pm  
661822.1 Gazette Notice (N.Z. Gazette 30.3.1978 P.730) declaring part State Highway 1 (Awanui-Bluff) to be a limited access road - 14.4.1978 at 1:56 pm  
5907200.1 Transfer to Kevin Donald Pugh and Leanne Grace Pugh - 23.2.2004 at 9:00 am  
5907200.2 Transfer to Michael Charles Brown (1/2 share) and Susan Claire More (1/2 share) - 23.2.2004 at 9:00 am  
5907200.3 Mortgage to ASB Bank Limited - 23.2.2004 at 9:00 am  
7792221.1 Discharge of Mortgage 5907200.3 - 7.5.2008 at 9:26 am  
7792221.2 Transfer to RAMS INVESTMENTS 2008 LIMITED - 7.5.2008 at 9:26 am  
7792221.3 Mortgage to ANZ National Bank Limited - 7.5.2008 at 9:26 am







Identifier

NA1656/67

1556/67  
A487495 Transfer of Wellsford  
Patricia Ann Payne and her wife  
12.8.1977 at 10.200 c  
**OBSELETE**  
A.L.R. 8056  
A487496 Mortgage to The Northern  
Co-operative Building Society Ltd  
19.7.1983 at 10.200 c  
A.L.R. 8056  
212478 Mortgage to Australia and New Zealand  
Banking Group Ltd  
19.9.1972 at 10.58 c  
A.L.R.  
307973.6 Mortgage to Riley Nominees  
Limited  
19.7.1974 at 9.37 c  
A.L.R.  
307973.7 Mortgage to Australia and  
New Zealand Building Grant Limited  
- 10.9.1974 at 9.37 c  
A.L.R.  
367942.1 Variation of Mortgage 307973.6  
- 22.8.1977 at 2.20 c  
A.L.R.  
661822.1 Gazette Notice (N.Z. Gazette 30.3.1978  
P.730) declaring part State Highway 1 (Akanui-  
Bluff) (adjoining) to be a limited access road  
- 14.4.1978 at 1.56 c  
A.L.R.  
775063.1 Variation of Mortgage 307973.6  
- 19.9.1980 at 2.20 c  
A.L.R.  
B.202529.2 Memorandum of Torrance Corboy &  
Riley Nominees Ltd  
5.8.1983 at  
2.20 c  
A.L.R.  
B.202529.3 Memorandum of Priority making  
mortgage B.202529.2 a first mortgage and  
mortgage 307973.7 a second mortgage -  
5.8.1983 at 2.20 c  
A.L.R.  
B.466525.1 Variation of terms of Mortgage  
B.202529.2 - 4.10.1985 at 1.45 c  
A.L.R.

P.750605.1 Variation of terms of Mortgage  
B.202529.2 - 11.11.1984 at 2.34 c  
A.L.R.  
C.062333.1 Variation of terms of Mortgage B.202529.2  
- 2.11.1989 at 11.58 c  
A.L.R.  
C.173450.3 Transfer to Noel Alexander Adams  
of Topoka farm and Joan Margaret Rosemary  
Adams his wife - 19.8.1994 at 1.45 c  
A.L.R.  
C.860896.1 Transmission to Noel Alexander  
Adams as Survivor - 4.7.1995 at 11.19 c  
A.L.R.  
D479811.2 Transfer to Noel Alexander Adams,  
Richard John Adams and Tracy Jane Withford  
16.2.2000 at 11.41  
For RGL  
D545275.1 Transfer to Kevie Donald Fugh,  
Luanne Grace Fugh and Roderick Charles  
Jensen  
29.9.2000 at 2.20  
For RGL

**Property 14: 364 Rodney Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier**                    **NA1656/64**  
**Land Registration District**   **North Auckland**  
**Date Issued**                    11 June 1959

**Prior References**  
NA522/287

**Estate**                    Fee Simple  
**Area**                    868 square metres more or less  
**Legal Description**       Lot 1 Deposited Plan 46858

**Original Registered Owners**  
Wendy Joan Palmer

**Interests**

Fencing Agreement in Transfer 622093 - 11.6.1959  
661822.1 Gazette Notice (N.Z. Gazette 30.3.1978 P. 730) declaring part State Highway 1 (Awamui - Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm  
D572172.2 Mortgage to ASB Bank Limited - 17.1.2001 at 9.00 am



Identifier

NA1656/64

NORTH ISLAND and Districts  
FORM No. 3

REGISTER

NEW ZEALAND


Reference: Vol. 500, Folio 287  
Transfer No. 600093  
Order for N/C No.

Registered, Vol. 1556, Folio 64

### CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate, dated the eleventh day of June, 1987, was obtained after having paid FIFTY-DOLLARS under the hand and seal of the District Land Registrar of the Land Registration District of GISBORNE WITNESSETH that MARGUERITE WALLACE FRASERS of Glen Eden, married woman

is seized of an estate in heretofore (subject to such reservations, restrictions, encumbrances, liens, and incumbrances as are notified by certified underwritten or endorsed incumbrances, subject also to any existing rights of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land heretofore described, in the size as delineated by the plan hereto attached, STRECH, to the several allotments, a title issue to wit, that it is to wit: All that parcel of land containing 14.1 ACRES more or less being Lot 1 Deposited Plan 40258 and being part South West Allotment 158 Parish of Orouauroa

 *Clara*  
District Land Registrar

No. 211, Hawke Bay D. D.

Agreement as to parties contained in Transfer 600093

*Clara*  
District Land Registrar

THIS INSTRUMENT BEING ON A REDUCED SCALE, CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL INSTRUMENT FOR THE PURPOSES OF THE LAND TRANSFER ACT 1952.

661822-1 Gazette Notice (N.Z. Gazette 30.3.1978 P.730) declaring part State Highway 1 (Awarua-Bluff) (adjoining) to be a limited access road - 14.6.1978 at 1.54 a.m.

6438501-1 Transmission to Murray WILLSON Smith as executor 12.10.1987 at 0.30

*Clara*  
for DLR

1987

1656/64

**Identifier**                      **NA1656/64**

---

1656/64

0572132.1 Transfer to Wendy Joan Falzer

0572132.2 Mortgage to ASB Bank Limited

All 17.1.2001 at 9.00

  
for RGL



**Property 15: 362 Rodney Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



R. W. Adair  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1656/65  
**Land Registration District** North Auckland  
**Date Issued** 11 June 1959

**Prior References**  
NA522/287

**Estate** Fee Simple  
**Area** 936 square metres more or less  
**Legal Description** Lot 2 Deposited Plan 46858

**Original Registered Owners**  
Elizabeth Brenda Lancaster

**Interests**

Fencing Agreement in Transfer 622094 - 11.6.1959  
661822.1 Gazette Notice (N.Z. Gazette 30.3.1978 P.730) declaring part State Highway 1 (Awamui - Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm  
C979063.4 Mortgage to ASB Bank Limited - 10.4.1996 at 2.47 pm  
5488509.1 Discharge of Mortgage C979063.4 - 14.2.2003 at 9:00 am  
5488509.2 Transfer to Elizabeth Brenda Lancaster, Bruce Sellars Wyber, Arthur Ole Lancaster and Barbara Robyn Laird - 14.2.2003 at 9:00 am  
5488509.4 Mortgage to ASB Bank Limited - 14.2.2003 at 9:00 am  
6375786.1 Discharge of Mortgage 5488509.4 - 8.4.2005 at 9:00 am  
6375786.2 Transfer to Elizabeth Anthida Mulligan - 8.4.2005 at 9:00 am  
6375786.3 Mortgage to ANZ National Bank Limited - 8.4.2005 at 9:00 am  
6783965.1 Discharge of Mortgage 6375786.3 - 10.3.2006 at 9:00 am  
6783965.2 Transfer to Andrew Sydney Dyer - 10.3.2006 at 9:00 am  
6783965.3 Mortgage to ANZ National Bank Limited - 10.3.2006 at 9:00 am





Identifier

NA1656/65

1656/65

641822.1 Caretaker Notice IN.1, Gazette 30.3.1978 P.790 declaring part State Highway 1 (Aurum-Hiuff) (adjoning) to be a limited access road - 26.4.1978 at 2.55 o/c

E.407191.2 Evidence of the change of name of the registered proprietor to Brighton Properties Limited - 4.12.1986 at 2.11 o/c

E.826602.1 Transfer to Wayne Patrick Cave quarry manager and Emma Margary Cave (sister) both of Wainfard - 13.5.1988 at 1.35 o/c

G.026642.2 Mortgage to The Housing Corporation of New Zealand - 12.5.1988 at 1.35 o/c

H.826633.1 Mortgage to The Housing Corporation of New Zealand - 13.5.1988 at 1.35 o/c

C.297552.1 Statutory Land Charge under Section 181(1) of the Land Act 1949 - 26.8.1991 at 2.24 o/c

C.299506.1 Statutory Land Charge under Section 181(1) of the Land Act 1949 - 26.8.1991 at 2.24 o/c

Handwritten note: No. 139 of 1991, District of ... 12.11.1991 at 2.11 o/c

V.528455.1 Variation of terms of Mortgage 3,826832.1 - 18.10.1993 at 2.41 o/c

C.925918.3 Transfer to Wayne Patrick Cave storeman - 27.11.1995 at 2.45 o/c

C.977063.1 Transfer to Elizabeth Emma Lancaster of Auckland community support worker - 10.4.1996 at 2.47 o/c

E.975262.4 Mortgage to ANZ Bank Limited 10.4.1996 at 2.47 o/c

**Property 16: 360 Rodney Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1918/85  
**Land Registration District** North Auckland  
**Date Issued** 23 March 1961

**Prior References**  
NA1656/66

**Estate** Fee Simple  
**Area** 1004 square metres more or less  
**Legal Description** Lot 3 Deposited Plan 46858

**Original Registered Owners**  
Maurice Claude Melville

**Interests**

Fencing Agreement in Transfer 656620 - 23.3.1961  
92405 Settled under the Joint Family Homes Act 1950 - 18.7.1961 at 12.05 pm  
661822.1 Gazette Notice ( N.Z. Gazette 30.3.1978 P.730) declaring part State Highway 1 (Awanni-Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm  
5846869.1 Transfer to Yeoman Wayne Dowson and Rowena Shirley Dowson - 19.12.2003 at 9:00 am  
  
5846869.1 Cancellation of Joint Family Home Settlement 92405  
5846869.2 Mortgage to ASB Bank Limited - 19.12.2003 at 9:00 am  
6186078.1 Discharge of Mortgage 5846869.2 - 18.10.2004 at 9:00 am  
6186078.2 Transfer to Yeoman Wayne Dowson, Rowena Shirley Dowson and Craig William Prouting - 18.10.2004 at 9:00 am  
6186078.3 Mortgage to ASB Bank Limited - 18.10.2004 at 9:00 am  
8985903.1 Transfer to Yeoman Wayne Dowson, Rowena Shirley Dowson, Lance Stuart Dowson and Sharon Maree Middleton - 18.6.2012 at 2:33 pm







Identifier

NA1918/85

1918/85

374715.2 Notice CHARGED  
16.12.1977 to the parents Boyd -  
L. J. Boyd  
Doc. J. L. Boyd

661822.1 Gazette Notice (N.Z. Gazette  
30.3.1978 P.730) declaring part State  
Highway 1 (Amanu-Bluff) (adjoining)  
to be a limited access road - 14.4.1978  
at 1.56 o/c

B.156563.2 CHARGED  
- 11.3.1983 as 11.11 o/c  
A.L.H.

B732025.1 Transmission to Maurice Claude  
Melville on survivor - 13.11.1987 at 2:50  
o/c  
A.L.H.

**Property 17: 358 Rodney Street, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD**  
Historical Search Copy



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA1864/29  
**Land Registration District** North Auckland  
**Date Issued** 14 September 1960

**Prior References**  
NA1656/66

**Estate** Fee Simple  
**Area** 986 square metres more or less  
**Legal Description** Lot 4 Deposited Plan 46858

**Original Registered Owners**  
Thomas Herbert Iles and Heather Iles

**Interests**

Fencing Agreement in Transfer 646246 - 14.9.1960  
A199385 Settled under the Joint Family Homes Act 1964 - 7.2.1967 at 2.22 pm  
661822.1 Gazette Notice (N.Z. Gazette 30.3.1978 P.730) declaring State Highway 1 (Awamui-Bluff) (adjoining) to be a limited access road - 14.4.1978 at 1.56 pm  
C061032.3 Mortgage to Westpac Banking Corporation - 1.11.1989 at 12.05 pm  
D131637.1 Variation of Mortgage C061032.3 - 16.4.1997 at 1.00 pm  
7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage C061032.3 in Westpac New Zealand Limited - 2.11.2006 at 9:00 am







**Property 18: 338 Rodney Road, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Limited as to Parcels  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA47A/1223  
**Land Registration District** North Auckland  
**Date Issued** 03 March 1981

**Prior References**  
NA1065/131

**Estate** Fee Simple  
**Area** 24.7543 hectares more or less  
**Legal Description** Part South Eastern Portion Allotment 118  
Parish of Oruawhoro

**Original Registered Owners**  
Graham William Powell

**Interests**

661822.1 Gazette Notice (N.Z. Gazette No.23, 30.3.1978 p.730) declaring part State Highway 1 (Awanui-Bluff) adjoining to be a limited access road - 14.4.1978 at 1.56 pm  
B613259.2 Mortgage to ASB Trust Bank - 18.12.1986 at 1.31 pm  
D632249.1 Compensation Certificate under to Section 19 Public Works Act 1981 by Her Majesty the Queen - 17.8.2001 at 1.40 pm  
8495394.1 Discharge of Compensation Certificate D632249.1 - 17.5.2010 at 12:12 pm  
Subject to a right to drain water (in gross) over part marked A on DP 420659 in favour of Her Majesty the Queen created by Easement Instrument 8495394.2 - 17.5.2010 at 12:12 pm  
9845396.1 CAVEAT BY LIANSEN MAO - 19.9.2014 at 10:40 am  
10321398.1 Withdrawal of Caveat 9845396.1 - 29.2.2016 at 12:32 pm  
10321398.2 Discharge of Mortgage B613259.2 - 29.2.2016 at 12:32 pm  
10321398.3 Transfer to Jesus (2016) Company Limited - 29.2.2016 at 12:32 pm  
10321398.4 Transfer to Chengjiang Wu - 29.2.2016 at 12:32 pm  
10321398.5 Transfer to Liansen Mao - 29.2.2016 at 12:32 pm  
10321398.6 Mortgage to Industrial and Commercial Bank of China (New Zealand) Limited - 29.2.2016 at 12:32 pm  
11109161.1 Discharge of Mortgage 10321398.6 - 17.5.2018 at 3:39 pm  
11109161.2 Transfer to Jiawen Mao - 17.5.2018 at 3:39 pm  
11109161.3 Transfer to Yi Zhou - 17.5.2018 at 3:39 pm  
11109161.4 Mortgage to FM Custodians Limited - 17.5.2018 at 3:39 pm  
11460219.1 Discharge of Mortgage 11109161.4 - 11.6.2019 at 3:26 pm  
11460219.2 Mortgage to ANZ Bank New Zealand Limited - 11.6.2019 at 3:26 pm

**Identifier** **NA47A/1223**

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- 11847362.1 Discharge of Mortgage 11460219.2 - 17.9.2020 at 4:18 pm
- 11847362.2 Transfer to Wellsford Welding Club Limited - 17.9.2020 at 4:18 pm
- 11847362.3 Mortgage to ASB Bank Limited - 17.9.2020 at 4:18 pm



Identifier

NA47A/1223

Land and Deeds NY

**REGISTER**

LIMITED AS TO PARCELS  
**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 3rd day of March, one thousand nine hundred and eighty-one, under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND

WITNESSETH that NOEL KELLY INVESTMENTS LIMITED at Wellsford

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, to the several admeasurements a little more or less, that is to say: All that parcel of land containing 24.7555 ~~7555~~ hectares more or less being part of the South Eastern portion of Allotment 118 Parish of Oranohoro.

  
Assistant Land Registrar

Interests at date of issue:-

Fencing Covenant in Transfer 520961.

661822.1 Gazette Notice (N.Z. Gazette No. 25, 30.3.1978 p.730) declaring part State Highway 1 (Awanui-Bioff) adjoining to be a limited access road - 14.4.1978 at 1.56 ac.

957068.1 CAVENDISH WILLIAM POWELL - 12.4.1980 at 1.79 ac. *W. Powell A.L.R.*

889947.2 Transfer to Graham William Powell of Wellsford, farmer- 22.9.1981 at 11.44 a/c *G. Powell A.L.R.*

Fencing covenant contained in Transfer 889947.2 *G. Powell A.L.R.*

889947.3 Mortgage to Noel Kelly Investments Limited- 22.9.1981 at 11.44 a/c *N. Kelly A.L.R.*

B.613259.2 Mortgage to ASB Trust Bank -18.12.1986 at 1.31ac *O. Baird A.L.R.*

Measurements are Metric

C.C. AP

No. 47A / 1223



Identifier

NA47A/1223



**Property 19: Pt Allot 117 SO 22925, State Highway 1, Wellsford**



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier**                    **NA1065/132**  
**Land Registration District** **North Auckland**  
**Date Issued**                02 March 1953

**Prior References**  
NA857/153

**Estate**                        Fee Simple  
**Area**                         11.8768 hectares more or less  
**Legal Description**        Part Allotment 117 Oruawhoro Parish

**Original Registered Owners**  
Graham William Powell

**Interests**

- Fencing Agreement in Transfer 520962 - 2.3.1953
- B613259.2 Mortgage to ASB Trust Bank - 18.12.1986 at 1:31 pm
- 9845396.1 CAVEAT BY LIANSEN MAO - 19.9.2014 at 10:40 am
- 10321398.1 Withdrawal of Caveat 9845396.1 - 29.2.2016 at 12:32 pm
- 10321398.2 Discharge of Mortgage B613259.2 - 29.2.2016 at 12:32 pm
- 10321398.3 Transfer to Jesus (2016) Company Limited - 29.2.2016 at 12:32 pm
- 10321398.4 Transfer to Chengjiang Wu - 29.2.2016 at 12:32 pm
- 10321398.5 Transfer to Liansen Mao - 29.2.2016 at 12:32 pm
- 10321398.6 Mortgage to Industrial and Commercial Bank of China (New Zealand) Limited - 29.2.2016 at 12:32 pm
- 11118582.1 CAVEAT BY LIYUN CHEN - 16.5.2018 at 12:58 pm
- 11110199.1 Discharge of Mortgage 10321398.6 - 17.5.2018 at 3:53 pm
- 11207033.2 CHARGING ORDER DATED 16.8.2018 BETWEEN LIANSEN MAO AND BEST CAPITAL LIMITED - 21.8.2018 at 7:00 am
- 11322164.2 CHARGING ORDER DATED 06.12.2018 BETWEEN LIANSEN MAO AND HYUN BIN KIM AND DUK YOUNG LEE - 19.12.2018 at 7:00 am
- 11332193.1 CHARGING ORDER DATED 31 DECEMBER 2018 BETWEEN TOP PICKS 2012 LIMITED AND AUCKLAND COUNCIL - 15.1.2019 at 10:57 am
- 11332193.2 CHARGING ORDER DATED 31 DECEMBER 2018 BETWEEN TOP PICKS 2012 LIMITED AND AUCKLAND COUNCIL - 15.1.2019 at 10:57 am
- 11481497.1 Departmental dealing correcting the memorial details for Charging Orders 11332193.1 and 11332193.2 by deleting Top Picks 2012 Limited and adding Liansen Mao - 24.6.2019 at 11:23 am
- 11678473.1 Discharge of Charging Order 11207033.2 - 10.2.2020 at 11:38 am

**Identifier** **NA1065/132**

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11846606.1 CAVEAT BY WELLSFORD WELDING CLUB LIMITED - 28.8.2020 at 4:43 pm  
11842149.1 Withdrawal of Caveat 11118582.1 - 21.9.2020 at 4:05 pm  
11842149.2 Discharge of Charging Order 11322164.2 - 21.9.2020 at 4:05 pm  
11842149.3 Discharge of Charging Order 11332193.1 - 21.9.2020 at 4:05 pm  
11842149.4 Discharge of Charging Order 11332193.2 - 21.9.2020 at 4:05 pm  
11842149.5 Withdrawal of Caveat 11846606.1 - 21.9.2020 at 4:05 pm  
11842149.6 Transfer to Wellsford Welding Club Limited - 21.9.2020 at 4:05 pm  
11842149.7 Mortgage to ASB Bank Limited - 21.9.2020 at 4:05 pm







Identifier

NA1065/132

1065/132

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 218A LAND TRANSFER ACT 1952. L. G. Gorman D.L.R.

259753.1 Variation of Mortgage - 4306656 - 28.5.1974 at 9.12 cc.

[Signature] For A.L.R.

957068.1 CAVEAT ON GRANT WILLIAM POWELL - 12.8.1980 at 2.39 cc

[Handwritten notes and signatures]

889947.2 Transfer to Graham William Powell of Wellaford, farmer- 22.9.1981 at 11.44 cc.

[Signature] A.L.R.

Fencing covenant contained in Transfer 889947.2

[Signature] A.L.R.

889947.3 Mortgage to [Company Name] Investments Limited- 22.9.1981

[Handwritten notes and signatures]

B.617259.2 Mortgage to ASB Trust Bank - 18.12.1981 at 1.11cc

[Signature] A.L.R.

I



Property 20: 96 Boshier Road, Wellsford



**RECORD OF TITLE  
UNDER LAND TRANSFER ACT 2017  
FREEHOLD  
Historical Search Copy**



R. W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier** NA25C/490  
**Land Registration District** North Auckland  
**Date Issued** 16 September 1974

**Prior References**  
NA22D/16 NA376/193

**Estate** Fee Simple  
**Area** 15.1041 hectares more or less  
**Legal Description** Lot 1 Deposited Plan 69586

**Original Registered Owners**  
Paul Edward Shepherd as to a 1/2 share  
Ruth Patricia Shepherd as to a 1/2 share

**Interests**

Saving and excepting from the part Allotment 117 all minerals within the meaning of the Land Act 1924 thereon or thereunder and reserving always to Her Majesty the Queen and all persons lawfully entitled to work the said minerals a right of ingress egress and regress over the said part Allotment 117

749549.1 Mortgage to John Desmond Wharfe - 24.7.1979 at 11:35 am  
C582382.3 Mortgage to The Rural Bank Limited - 25.3.1994 at 1:41 pm  
7924215.1 Discharge of Mortgage C582382.3 - 23.9.2008 at 11:19 am  
11477258.1 Discharge of Mortgage 749549.1 - 9.8.2019 at 9:59 am  
11284690.1 Transmission of a 1/2 share/interest Ruth Patricia Shepherd to Paul Edward Shepherd as Executor - 14.8.2019 at 2:42 pm  
11284690.2 Transfer of a 1/2 share/interest Paul Edward Shepherd as Executor to Paul Edward Shepherd and Ian Ross Blackman - 14.8.2019 at 2:42 pm  
11393573.1 Transfer of a 1/2 share/interest Paul Edward Shepherd and Ian Ross Blackman to Paul Edward Shepherd and Rachel Anne Louise Petterson - 14.8.2019 at 2:46 pm



Identifier

NA25C/490

Referenced Order C/T: 375/193 22D/16 Transfer No. N/C Order No. 307972.1

Land and Deeds 69



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 16th day of September one thousand nine hundred and seventy-four under the seal of the District Land Registrar of the Land Registration District of NORTH AUCKLAND WITNESSETH that BOGHER FARMS LIMITED at Wellsford

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, leases, and interests as are noted by marginal underwriting or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon to be the several admeasurements a little more or less, that is to say: All that parcel of land containing 15.1041 hectares more or less being Lot 1 on Deposited Plan 69586 and being part Allotment 117 and Allotment N.E 118 Parish of Oruawhoro saving and excepting from the part Allotment 117 all minerals within the meaning of the Land Act 1924 thereon or thereunder and reserving always to Her Majesty the Queen and all persons lawfully entitled to work the said minerals a right of ingress egress and regress over the said part Allotment 117



Signature of Assistant Land Registrar

Assistant Land Registrar

Interests at date of issue:-

Appurtenant hereto is a water supply easement over the part of Lot 1/Plan 66573 (C.T. 2280/1453) and the part Lot 2/Plan 40954 (C.T. 1107/233) shown coloured yellow on Plan 66573 created by Transfer 228551.5

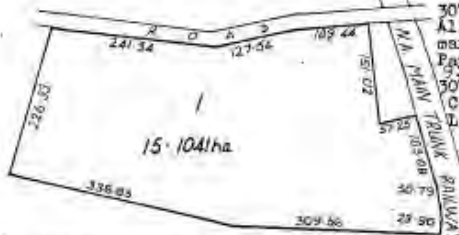
XII Otamatea SD

307973.2 Transfer surrendering the easement created by Transfer 228551.5 16.9.1974 at 9.35 o/c

307973.5 Transfer to Peter Alan Payne of Wellsford garage manager and Patricia Ann Payne his wife - 16.9.1974 at 9.37 o/c

307973.6 Mortgage to Torrance Corboy & Ridd Associates Limited 16.9.1974 at 9.37 o/c

307973.7 Mortgage to Australia and New Zealand Banking Group Limited - 16.9.1974 at 9.37 o/c



MEASUREMENTS ARE SHOWN

APK DP 69586

Plan No. NA 25C/490

SH



Identifier

NA25C/490

25C/490

546542.5 Transfer to Paul Edward Shepherd of Mangawhai Farms and Ruth Patricia Shepherd his wife - 25.6.1976 at 11.32 o/c. as tenants in common in equal shares for A.L.R.

346542.6 Mortgage to The Bank of New South Wales - 25.6.1976 at 11.33 o/c. for A.L.R.

749549.1 Mortgage to Raymond Wharfe - 24.7.1979 at 11.35 o/c for A.L.R.

778461.1 Mortgage to The Rural Banking and Finance Corporation of New Zealand - 13.11.1980 at 10.20 o/c for A.L.R.

H.247596.1 Transmission of Mortgage 749549.1 to John Desmond Wharfe as executor 16.12.1983 at 10.42 o/c for A.L.R.

B.102559.2 Transfer of Mortgage 749549.1 to John Desmond Wharfe - 18.1.1985 at 10.30 o/c for A.L.R.

C.021065.2 Mortgage to The Rural Banking and Finance Corporation of New Zealand - 4.7.1989 at 10.33 o/c for A.L.R.

C.382382.3 Mortgage to The Rural Bank Limited - 25.3.1994 at 1.41 o/c for A.L.R.



### Appendix 3: Historical Aerial Photography



1961



1966



1976





1982





1992



2006



2010





2017



## Appendix 4: Contaminated Land Report



12 April 2022

**Attention: Bron Steenson**

Dear Bron

### Site Contamination Enquiry – Wellsford

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

<https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx>.

#### 1. **Hazardous Activities and Industries List (HAIL) Information**

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

There is no contamination information within Council records for 56 Boshier Road and 374 Rodney Street, Wellsford

There is no contamination information within Council records for 338 Rodney Street however aerial images indicate soil disturbance onsite (see below aerial image)



Private Bag 92300, Victoria Street West, Auckland 1142 | [aucklandcouncil.govt.nz](http://aucklandcouncil.govt.nz) | Ph 09 301 0101

There is no contamination information within Council records for Pt Lot 2 DP 26722, Pt Lot 4 DP 9919 and Pt Sec 25 DP 9682, Monowai Street, 11 Wi Apo Place and 96 Boshier Road, Wellsford however due to the adjacent railway there is potential for uncertified/non-engineered fill to be present on site.

There is no contamination information within Council records for Pt Allot 117 SO 22925, State Highway 1 however aerial images indicate soil disturbance onsite (see below aerial image) Due to the adjacent railway, there is potential for uncertified/non-engineered fill to be present on site.



There is no contamination information within Council records for 15 Wi Apo Place, 22 & 26 Batten Street, 2, 18 & 20 Monowai Street, Wellsford

Due to the age of the buildings on the sites the potential for asbestos and/or lead paint may need to be considered.

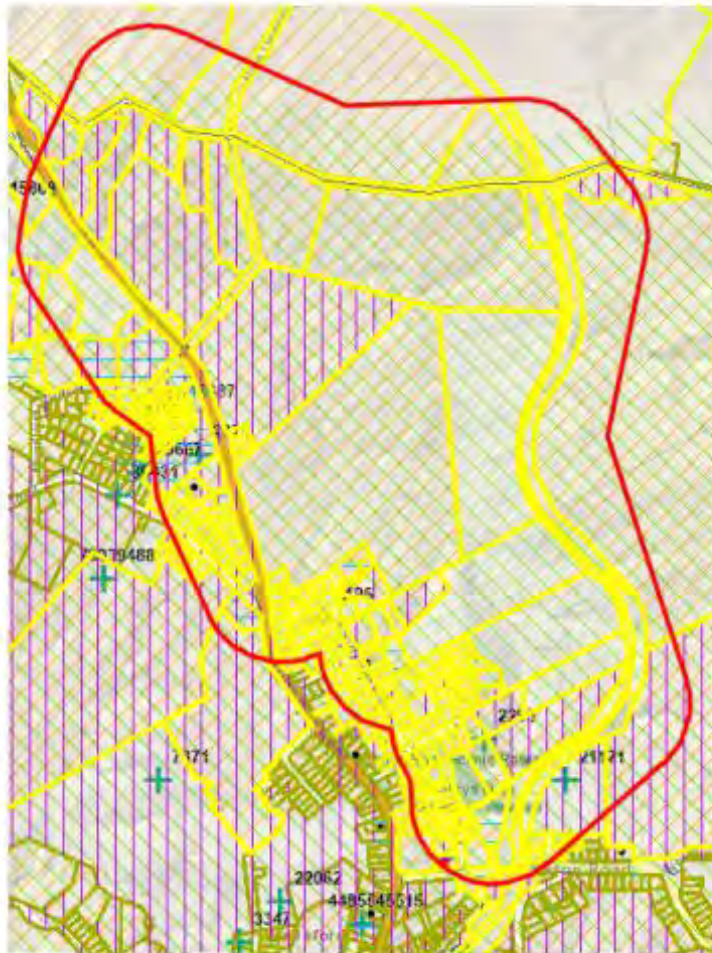
Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

**2. Consents and Incidents Information (200m radius of the selected site)**

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities



**Legend:**

- |                            |  |
|----------------------------|--|
| All Consents +             | Closed Landfill (Auckland Council owned) □ |
| All Applications ■         | Closed Landfill (Privately owned) ■        |
| All Permitted Activities * |  |
| All Bores ★                |  |



Relevant details of any pollution incidents and consents are appended to this letter (Attachment A). Please refer to the column titled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact [contaminatedsites@aucklandcouncil.govt.nz](mailto:contaminatedsites@aucklandcouncil.govt.nz). Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure the files will be available).

Please note Auckland Council cost recovers officer's time for all site enquiries. As such an invoice for \$384 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

**Contamination, Air and Noise Team  
Specialist Unit | Resource Consents  
Auckland Council**



## Appendix 5: Supporting Documents

### Property 1: Pt Allot 4, DP 919 Monowai Street, Wellsford

R O D N E Y     D I S T R I C T     C O U N C I L  
-----

APPLICATION FOR SUBDIVISION CONSENT: SCHEME PLAN R15935

OWNERS: HEAYS ESTATE

I, FREDERICK ROLAND SMITH, Manager - Development (Engineering and Subdivisions) hereby certify that the following resolution was passed at a meeting held on 25 June 1992.

" THAT THE APPLICATION BE CONSENTED TO AND THAT THE FULL TEXT OF THE RESOLUTION BE ENDORSED ON ALL NECESSARY DOCUMENTS:-

THAT BECAUSE IT COMPLIES WITH THE SUBDIVISIONAL ORDINANCES CONTAINED IN THE PROPOSED DISTRICT PLAN, SCHEME PLAN R15935 BEING AN APPLICATION FOR CONSENT TO SUBDIVIDE LOT 2 DP 26722 AND PART LOT 4 DP 9919 COMPRISED IN CERTIFICATES OF TITLE 1358/44 AND 1888/29 TOTTALLING IN AREA 12.47 HECTARES OWNED BY HEAYS ESTATE BE CONSENTED TO PURSUANT TO SECTION 105(1)(a) OF THE RESOURCE MANAGEMENT ACT 1991, SUBJECT TO THE FOLLOWING CONDITIONS:-

- (a) (conditions to be shown on survey title plan) BEFORE THE COUNCIL WILL APPROVE THE SURVEY PLAN PURSUANT TO SECTION 223 OF THE ACT, THE OWNER SHALL:-
- ( i ) (amendment required) LOT 3 IS TO BE INCLUDED IN AND FORM PART OF LOT 4 AS IT IS CONSIDERED IT DOES NOT CONTAIN 2 HECTARES OF SIGNIFICANT NATIVE FOREST.
  - ( ii ) (amendment required) SHOW AS 'LOT 6 - ROAD TO VEST' AN AREA OF LAND GENERALLY IN THE POSITION OF RIGHTS-OF-WAY 'A' AND 'B', OF SUFFICIENT SIZE TO ACCOMMODATE AN URBAN STANDARD, CUL-DE-SAC HEAD.
  - (iii) (easement required) HAVE ENDORSED ON THE SURVEY PLAN UNDER A SCHEDULE OF MEMORANDUM OF EASEMENTS THE RIGHT-OF-WAY EASEMENT LABELLED 'C'.
- (b) (granting or reserving easements) THAT EASEMENTS OVER PARTS OF LOT 4 REFERRED TO IN THE MEMORANDUM OF EASEMENTS ENDORSED ON THE PLAN AND IN CONDITION (a)(iii), SHALL BE DULY GRANTED OR RESERVED.

..../2

**Property 2: Pt Lot 2 DP 2677, Monowai Street, Wellsford and**

**Property 3: Pt Sec 25 DP 9682, Monowai Street, Wellsford**

**Bron**

---

**From:** Siri Rathnayake <siri.rathnayake@aucklandcouncil.govt.nz>  
**Sent:** Wednesday, 13 April 2022 12:32 pm  
**To:** Bron  
**Subject:** Property file requests -8270385026/8270385025/8270385024

Hi Bronwyn,

We have received following three property file request. Unfortunately I couldn't find documents under all three property IDs. If you wish to cancel these three property file requests please let me know. We will be able to make a full refund.

I have completed your property file request for Pt Lot 4 DP 9919 Monowai Street Wellsford 0900 (8270385027)

- Pt Sec 25 DP 9682 Monowai Street Wellsford 0900 - 8270385026
- Pt Allot 117 SO 22925 State Highway 1 Wellsford- 8270385025
- Pt Lot 2 DP 26722 Monowai Street Wellsford 0900 - 8270385024

Ngā mihi | Kind Regards  
Siri

**Siri Rathnayake | Property Product Technician– Henderson**  
**Group Treasury**  
Ph 021 564 504  
Auckland Council, Civic Building, 8 Henders on Valley Road, Henderson  
Visit our website: [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)



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**Property 4: 11 Wi Apo Place, Wellsford**

APPLICATION NO. 3825 / BPM 43278 PERMIT NO. 413278  
 DISTRICT OFFICE NO. 3572/ DATE ISSUED 13-9-82 DATE 6 SEP 1982  
**RODNEY COUNTY COUNCIL**  
 CENTREWAY ROAD, OREWA. PRIVATE BAG, OREWA  
 PHONE HBC 65-169 DISTRICT OFFICES HUAPUA PH 412-9120 WARKWORTH 8539

**BUILDING PERMIT APPLICATION**

IMPORTANT PLEASE READ INSTRUCTIONS ON PAGE 3 AND COMPLETE THE FOLLOWING INFORMATION

**OWNER OF SECTION:** 43269  
 NAME ALAN LESLIE SHERIFF PHONE NO. 8891 WFD  
 (BLOCK CAPITALS)  
 PRESENT POSTAL ADDRESS 178 PORT ALBERT ROAD WELLSFORD.

**BUILDER:**  
 NAME J. N. SHERIFF PHONE NO. 8665144  
 ADDRESS 65 PARTS AVE MANUREWA.  
 (PERMIT WILL BE POSTED TO BUILDER UNLESS OTHERWISE REQUESTED)  
 PREVIOUS OWNER OF SECTION: NAME WARGENTINE CONTRACTORS LTD

**LEGAL DESCRIPTION OF SECTION:** (SEE RATES FORM) 1092612 (7029278)  
 LOT 23 D.P. 85114 VALUATION NO. 860 / 37 - 27

ROAD NAME 11 WI APO PLACE LOCALITY WELLSFORD  
 RIDING  
 AREA OF SECTION 3.4087 HECTARES ROAD FRONTAGE METRES  
 SQ. METRES

DESCRIPTION OF PROPOSED WORK:	FLOOR AREA: 60.8 SQ. METRES
<u>New Dwelling</u>	CARPORT/GARAGE <u>34.2</u>
	ADDITION
	BASEMENT
	GROUND FLOOR
	FIRST FLOOR
	<del>Other</del> OTHERS <u>22.9</u>
	TOTAL AREA <u>117.9</u>

VALUE OF BUILDING WORK ONLY \$ 29,105.  
 (The decision of the Building Inspector shall be final as to estimated cost)

SIGNATURE OF APPLICANT [Signature]

**FOR OFFICE USE ONLY**

PERMIT FEES	WORK	VALUE	FEE	RECEIPT NO.	DATE
	BUILDING	27,505	140.00	073	6/9/82
	DRAINAGE	600	38.00	-	-
	PLUMBING	1,000	58.00	-	-
	<b>SUB-TOTAL</b>	<b>29,105</b>	<b>236.00</b>	-	-
	BUILDING RESEARCH LEVY		30.00	-	-
	TOTAL PERMIT FEE		266.00	-	-
<b>SUNDRY FEES</b>	WATER CONNECTION				
	ROAD DAMAGE DEPOSIT				



APPLICATION NO. L98 / BPA19497  
 PERMIT NO. 319497  
 DISTRICT OFFICE NO. 4228 / DATE ISSUED 6.9.83  
 HEAD OFFICE DATE STAMP  
 LODGED AT DISTRICT OFFICE  
 RECEIVED  
 DATE 31 AUG 1983  
**RODNEY COUNTY COUNCIL**  
 CENTREWAY ROAD, OREWA. PRIVATE BAG, OREWA/W  
 PHONE HBC 65-169 DISTRICT OFFICES HUAPEHU 412-8120 WARKWORTH 8539

**BUILDING PERMIT APPLICATION**

IMPORTANT PLEASE READ INSTRUCTIONS ON PAGE 3 AND COMPLETE THE FOLLOWING INFORMATION

**OWNER OF SECTION:** 43269.  
 NAME Alan Leslie Sheriff PHONE NO. 4194 WFO  
 (BLOCK CAPITALS)  
 PRESENT POSTAL ADDRESS 11 Wi Apo Place, Welsford.

**BUILDER:**  
 NAME John Maurice Sheriff PHONE NO. 2673211 Manurewa  
 ADDRESS 55 Aarts Ave Manurewa  
 (PERMIT WILL BE POSTED TO BUILDER UNLESS OTHERWISE REQUESTED)  
 PREVIOUS OWNER OF SECTION: NAME Wharewhe Contractors Ltd

**LEGAL DESCRIPTION OF SECTION:** (SEE RATES FORM)  
 LOT 23 O.P. 85114 VALUATION NO. 864 / 57/27 536

ROAD NAME 11 Wi Apo Place LOCALITY \_\_\_\_\_  
 RIDING \_\_\_\_\_  
 AREA OF SECTION 3.4087 HA. HECTARES 3.4087 ROAD FRONTAGE \_\_\_\_\_ METRES  
 SQ. METRES

DESCRIPTION OF PROPOSED WORK:	FLOOR AREA: 36.4 SQ. METRES
<u>Farm Shed</u>	CARPORT/GARAGE _____
<u>1097612.</u>	ADDITION _____
<u>7029718</u>	BASEMENT _____
_____	GROUND FLOOR _____
_____	FIRST FLOOR _____
_____	Farm Shed OTHERS <u>36.4</u>
_____	TOTAL AREA <u>36.4 m<sup>2</sup></u>

VALUE OF BUILDING WORK ONLY \$500-00 4000  
 (The decision of the Building Inspector shall be final as to estimated cost)

SIGNATURE OF APPLICANT [Signature]

**FOR OFFICE USE ONLY**

PERMIT FEES	WORK	VALUE	FEE	RECEIPT NO.	DATE
	BUILDING	<u>4000</u>	<u>30.00</u>	<u>047</u>	<u>31.8.83</u>
	DRAINAGE				
	PLUMBING				
	<b>SUB-TOTAL</b>				
	BUILDING RESEARCH LEVY				
	TOTAL PERMIT FEE				
<b>SUNDRY FEES</b>	WATER CONNECTION				
	ROAD DAMAGE DEPOSIT				







**Property 5: 15 Wi Apo Place, Wellsford**

APPLICATION NO. C618 / PERMIT NO. B77870  
 DISTRICT OFFICE NO. 5033 / DATE ISSUED 31.7.84 REGISTERED AT DISTRICT OFFICE  
 DATE 19 JUL 1984 HEAD OFFICE DATE STAMP  
**RODNEY COUNTY COUNCIL**  
 CENTREWAY ROAD, OREWA. PRIVATE BAG 998  
 PHONE HBC 65-169 DISTRICT OFFICES HUAPAI PH 812-8120 WARKWORTH 65-987

**BUILDING PERMIT APPLICATION**

IMPORTANT PLEASE READ INSTRUCTIONS ON PAGE 3 AND COMPLETE THE FOLLOWING INFORMATION

**OWNER OF SECTION:**  
 NAME J.C. & A. COWPLAND Rossell PHONE NO. 8277 WARKWORTH  
 (BLOCK CAPITALS)  
 PRESENT POSTAL ADDRESS P.O. Box 167 WELLSFORD

**BUILDER:**  
 NAME F. POOL PHONE NO. 8413  
 ADDRESS WONGARE RD. WELLSFORD 7029717  
 (PERMIT WILL BE POSTED TO BUILDER UNLESS OTHERWISE REQUESTED)  
 PREVIOUS OWNER OF SECTION: NAME DIACONIS CONTRACTORS 1235260

**LEGAL DESCRIPTION OF SECTION:** (SEE RATES FORM)  
 LOT 22 D.P. 85114 VALUATION NO. 861 / 567-1  
15  
 ROAD NAME 151 Apo Place LOCALITY Rodney  
 AREA OF SECTION 8086m<sup>2</sup> HECTARES  SQ. METRES  
 RIDING ROAD FRONTAGE R.O.V. METRES

**DESCRIPTION OF PROPOSED WORK:**  
To remove skylight garage from 41 Station Rd Wellsford and install on section in Wi Apo Place

FLOOR AREA:	SQ. METRES
CARPORT/GARAGE	<u>30</u>
ADDITION	
BASEMENT	
GROUND FLOOR	
FIRST FLOOR	
OTHERS	
TOTAL AREA	<u>30</u>

VALUE OF BUILDING WORK ONLY \$ 500 - 00  
 (The decision of the Building Inspector shall be final as to estimated cost)

SIGNATURE OF APPLICANT [Signature]

**FOR OFFICE USE ONLY**

PERMIT FEES	WORK	VALUE	FEE	RECEIPT NO.	DATE
	BUILDING	<u>500</u>	<u>8.00</u>	<u>037</u>	<u>19.7.84</u>
	DRAINAGE				
	PLUMBING				
	<b>SUB-TOTAL</b>				
	BUILDING RESEARCH LEVY				
	TOTAL PERMIT FEE				
<b>SUNDY FEES</b>	WATER CONNECTION				
	ROAD DAMAGE DEPOSIT				



APPLICATION NO. 158-11/85 PERMIT NO. 2026384 (FAM 26384)  
 DISTRICT OFFICE NO. 6201 DATE ISSUED 22.11.85 LODGED AT DISTRICT OFFICE  
 HEAD OFFICE DATE STAMP  
 RECEIVED 19 NOV 1985  
 RODNEY COUNTY COUNCIL  
 WARKWORTH 8539

**RODNEY COUNTY COUNCIL**  
 CENTREWAY ROAD, OREWA. PRIVATE BAG, OREWA NOV 1985  
 PHONE HBC 85-189 DISTRICT OFFICES SHAPAI COUNCIL WARKWORTH 8539

**BUILDING PERMIT APPLICATION**

IMPORTANT PLEASE READ INSTRUCTIONS ON PAGE 3 AND COMPLETE THE FOLLOWING INFORMATION

**OWNER OF SECTION:**

NAME MR T.C. & A.P. COWPLAND (BLOCK CAPITALS) PHONE NO. 1782 9272 62nd 3063  
 PRESENT POSTAL ADDRESS P.O. Box 163 WELLSFORD

**BUILDER:**

NAME E. POOL PHONE NO. 8415  
 ADDRESS 70 WORKERS RD. WELLSFORD  
 (PERMIT WILL BE POSTED TO BUILDER UNLESS OTHERWISE REQUESTED)  
 PREVIOUS OWNER OF SECTION: NAME WHAREHINE CONTRACTORS LTD

**LEGAL DESCRIPTION OF SECTION:** (SEE RATES FORM)

LOT 82 D.P. 55114 VALUATION NO. 561 / 567-1 20/11/85  
BK XVI OTAMATEA SD

ROAD NAME L21 APO PLACE LOCALITY WELLSFORD RODNEY  
 RIDING  
 AREA OF SECTION 8086 SQ METRES HECTARES 8086 ROAD FRONTAGE RIGHT OF WAY METRES

**DESCRIPTION OF PROPOSED WORK:**

2nd FLOOR HOME. Dwellings with  
BASEMENT GARAGE.  
The basement will not be completed  
until a later date.

**FLOOR AREA:** 145 SQ. METRES

CARPORT/GARAGE	
ADDITION	
BASEMENT	<u>49 sqm</u>
GROUND FLOOR	
FIRST FLOOR	<u>145 sqm</u>
OTHERS	
TOTAL AREA	<u>194</u>

VALUE OF BUILDING WORK ONLY \$ 37,000

(The decision of the Building Inspector shall be final as to estimated cost)

SIGNATURE OF APPLICANT [Signature]

**FOR OFFICE USE ONLY**

PERMIT FEES	WORK	VALUE	FEE	RECEIPT NO.	DATE
	BUILDING	89500	306	007	7.11.85
	DRAINAGE	960	70	-	"
	PLUMBING	1040	85	-	"
	<b>SUB: TOTAL</b>				
	BUILDING RESEARCH LEVY		92	007	"
	TOTAL PERMIT FEE		553		
<b>SUNDY FEES</b>	WATER CONNECTION		261.25	008	"
	ROAD DAMAGE DEPOSIT		100	007	"

Property 6: 22 Batten Street, Wellsford

79271

**HARRISON GRIERSON**  
**HG**



**APPLICATION FOR A RESOURCE CONSENT UNDER SECTION 88 OF THE  
RESOURCE MANAGEMENT ACT 1991**

R20893

**TO** : **RODNEY DISTRICT COUNCIL**  
Attention: Mr Ron Hewson

SUBJECT	REC
FUNCTION	PLN
COPY	

**G K TREADWELL**

**PROPERTY LOCATION** : **22 BATTEN STREET, WELLSFORD**

**LEGAL DESCRIPTION** : **Pt Sec 25 BLK XVI OTAMATEA S.D.**

**TYPE OF CONSENT SOUGHT** : **SUBDIVISION CONSENT  
(CONTROLLED ACTIVITY)**

**LAND OWNER** : **G K TREADWELL**

**ENVIRONMENTAL  
INFORMATION** : **See attached report**

**ADDITIONAL CONSENT  
REQUIRED** : **NIL**

*P. Gillies*  
Signed **27 November 1995**  
Dated

**ADDRESS FOR SERVICE** : **Harrison Grierson Consultants Ltd**  
**P O Box 84**  
**OREWA** Attn: P B GILLIES  
**Phone: (09) 4267570 Fax (09) 4267572**

**FEE** : **\$500.00 Deposit fee attached**

**ANNEXURES** : **4 Copies of a Scheme plan illustrating the  
proposal plus 4 A4 reductions**  
: **Copy of Certificate of Title**  
: **Supplementary Report**  
: **Geotechnical Report**

Form 5:  
43.5571.1

CONSULTING ENGINEERS SURVEYORS PLANNERS

*Harrison Grierson Consultants Limited, 2 Tamariki Avenue, Orewa, New Zealand.  
P.O. Box 84 Orewa. Telephone: 0-9-426 7570, Facsimile: 0-9-426 7572.*



## Bron

---

**From:** Shivani Narayan <Shivani.Narayan@aucklandcouncil.govt.nz>  
**Sent:** Monday, 2 May 2022 5:59 pm  
**To:** Bron  
**Subject:** FW: Standard - PFP (Property File Product) - 8270385017 - 22 Batten Street Wellsford 0900  
**Attachments:** SWM 4561 Monitor.pdf

Good afternoon Bron

My colleague Karen Paratene had a look at Pathways and Google Maps – she has said the dwelling is possibly 1950's and we probably don't have anything for it.

However, there is a subdivision file RMA20893 and SWM456L (attached) located in Pathways for the property. This is also included in the PFP.

If you wanting her to further look into she will be going back to the office next Thursday and Friday and she can have a look into the recorded cards if we have anything.

Awaiting for your reply.

Ngā mihi

**Shivani Narayan | Property Product Technician**  
**Property File Records and Data**  
**Rates, Valuation and Data Management**  
Ph 09 892 4380 | Extn (42) 4380  
Auckland Council, 6 Henderson Valley Road, Henderson  
Visit our website: [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)



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79271

**HARRISON GRIERSON**



**APPLICATION FOR A RESOURCE CONSENT UNDER SECTION 88 OF THE  
RESOURCE MANAGEMENT ACT 1991**

R20893

**TO** : **RODNEY DISTRICT COUNCIL**  
Attention: Mr Ron Hewson

SUBJECT	REC
FUNCTION	PLN
COPY	

**G K TREADWELL**

**PROPERTY LOCATION** : **22 BATTEN STREET, WELLSFORD**

**LEGAL DESCRIPTION** : **Pt Sec 25 BLK XVI OTAMATEA S.D.**

**TYPE OF CONSENT SOUGHT** : **SUBDIVISION CONSENT  
(CONTROLLED ACTIVITY)**

**LAND OWNER** : **G K TREADWELL**

**ENVIRONMENTAL INFORMATION** : **See attached report**

**ADDITIONAL CONSENT REQUIRED** : **NIL**

*P. Gillies*  
Signed **27 November 1995**  
Dated

**ADDRESS FOR SERVICE** : **Harrison Grierson Consultants Ltd**  
**P O Box 84**  
**OREWA** Attn: P B GILLIES  
Phone: (09) 4267570 Fax (09) 4267572

**FEE** : \$500.00 Deposit fee attached

**ANNEXURES** : 4 Copies of a Scheme plan illustrating the  
proposal plus 4 A4 reductions  
: Copy of Certificate of Title  
: Supplementary Report  
: Geotechnical Report

Form 5:  
43.5571.1

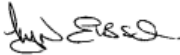
CONSULTING ENGINEERS SURVEYORS PLANNERS

*Harrison Grierson Consultants Limited, 2 Tamariki Avenue, Orewa, New Zealand.  
P.O. Box 84 Orewa. Telephone: 0-9-426 7570, Facsimile: 0-9-426 7572.*

**Property 7: 26 Batten Street, Wellsford**

**BUILDING CONSENT NO: ABA 56130**  
**PROJECT INFORMATION MEMORANDUM NO: ABA 56130**  
**Section 51, Building Act**  
**ISSUED BY: RODNEY DISTRICT COUNCIL**

THE OWNER	BUILDING WORK
<b>Name:</b> JACOMB, MICHAEL KANE <b>Mailing Address:</b> C/- TOTAL SPAN RODNEY P O BOX 687 WARKWORTH	All <input checked="" type="checkbox"/> <b>Description:</b> NEW CONSTRUCTION <b>Nature:</b> OTHER CONSTRUCTION  <b>Intended Use(s) in detail:</b> Farm Buildings  <b>Intended Life:</b> Indefinite, but not less than 50 years
<b>THE BUILDING</b>  <b>Street Address:</b> 26 BATTEN STREET, WELLSFORD, NORTHERN 1242	
<b>LEGAL DESCRIPTION</b>  <b>Property Number:</b> 5508415 <b>Valuation Roll No:</b> 00861 58601 <b>Legal Description:</b> LOT 2 DP 179213	<b>Estimated Value:</b> 83000

Signed for and on behalf of the Council: 

Name: Lyn Gibson

Position: BUILDING CONTROL ADMIN

Date: 22/1/05

This building consent is a consent under the Building Act 2004 to undertake building work in accordance with the attached plans and specifications so as to comply with the provisions of the building code. It does not affect any duty or responsibility under any other Act nor permit any breach of any other Act.

This building consent is issued subject to the conditions specified in the attached pages headed "Conditions of Building Consent No." ABA 56130



**O'Connor Planning Consultants Limited**  
ENVIRONMENTAL PLANNING CONSULTANTS

31 March 2006

Chief Executive  
Rodney District Council  
Private Bag 500  
OREWA

ATTN: Resource Consents

Dear Sir/Madam

**APPLICATION FOR LAND USE RESOURCE CONSENT TO ERECT A DWELLING, THE FIRST STAGE OF WHICH IS A BARN FOR CONVERSION, AND FORM A DRIVEWAY OVER THE REQUIRED 1 IN 5 GRADIENT IN THE WELLSFORD STRUCTURE PLAN AREA**

Please find attached an application on behalf of the M. K. and A. A. Jacombs for consent to the above activity.

The following information is enclosed in support of this application:

- A completed application form
- A receipt for the prepaid application deposit \$500.00 (discretionary activity)
- Two copies of the application report including a copy of the certificates of title and full size A3 plans.
- Four A4 reduced sets of building plans (not to scale).

We understand that our client lodged an application which was then returned due to insufficient information. We have contacted Council regarding the processing fee deposit which was not returned. As suggested by Council we enclose the receipt from the deposit as well as the original application form so that this can be linked with the old application.

Once the application has been allocated to the processing planner we would appreciate it if the Planner could please phone or email the writer.

We look forward to hearing from you in due course.

Yours sincerely

Kathryn Martin  
Senior Planner  
O'Connor Planning Consultants





**APPLICATION FOR PROJECT INFORMATION  
MEMORANDUM AND / OR BUILDING CONSENT**

SECTION 33 OR SECTION 45, BUILDING ACT 2004

For Office Use Only	
ABA/PIM No	1001914
DATE STAMP	Rodney District Council RECEIVED 07 SEP 2007
Cus. Ser. Rep	

Please tick relevant box

PIM only	<input type="checkbox"/>	Building Consent only (PIM obtained)	<input type="checkbox"/>
Combined PIM and Building Consent	<input type="checkbox"/>	House removal/ Demolition only	<input type="checkbox"/>

**THE BUILDING**

Street Address of building:

(For structures that do not have a street address, state the nearest street intersection and the distance and direction from that intersection)

26 BATTEN STREET, WELLSFORD

Legal Description of land where building is located:

(State legal description as at the date of application and, if the land is proposed to be subdivided, include details of relevant lot numbers and subdivision consent. A recent Certificate of Title must be supplied.)

LOT 2 DP 179213

Building Name: (if applicable)

Location of Building within site/block number: (include nearest street access)

REFER SITE PLAN

Number of Levels: (include ground level and any levels below ground) TWO

Level/unit number: (if applicable)

Area: (total floor area; indicate area affected by the building work if less than the total area)

Current, lawfully established, use: (include number of occupants per level and per use if more than 1)

BARN

Year first constructed: (approximate date is acceptable e.g.: c1920's or 1960-1970)

2005/2006

**THE OWNER**

Name of the owner: (include preferred form of Address, e.g. Mr., Miss, Dr if an individual)

M & A JACOMB

Contact person: (insert n/a if the applicant is an individual) N/A

Mailing address: 26 BATTEN STREET, WELLSFORD

Street address/registered office:

TR1430

Use



# Application to construct a vehicle crossing

**Auckland  
Transport**  
An Auckland Council Organisation

AC ref, VXG, PF, other:			
Related consent number:	L 506 27		
<b>Street address of the proposed vehicle crossing:</b>			
26 Batten street Wellsford 0900		Suburb:	LOT DP: Lot 2 DP179213
LOCATION OF BUILDING:	Auckland <input checked="" type="checkbox"/>	Franklin <input type="checkbox"/>	Manukau <input type="checkbox"/> North Shore <input type="checkbox"/> Papakura <input type="checkbox"/> Rodney <input type="checkbox"/> Waitakere <input type="checkbox"/>
<b>Important information:</b>			
<ul style="list-style-type: none"> <li>Excavation must not commence until you receive written approval from Auckland Transport.</li> <li>Please lodge this application and make payment at your nearest Auckland Council office.</li> <li>The application fee is \$261.00 including GST. Please make cheques payable to Auckland Council.</li> </ul>			
<b>APPLICANT'S DETAILS:</b>			
<b>Owner's details:</b> please print clearly			
Full name:	Gary John Lawford		
Physical street address:	26 Batten street Wellsford	Post code:	0900
Postal address (if different from above):	Post code:		
Telephone no. (home):	Telephone no. (work): (09) 476 5586		
Mobile no:	021 422 389	Fax no:	
Email:	garyl@stormwater360.co.nz		
<b>Agent's details:</b>			
Full name:			
Physical street address:	Post code:		
Postal address (if different from above):	Post code:		
Telephone no. (home):	Telephone no. (work):		
Mobile no:	Fax no:		
Email:			
Signature of applicant/agent			Date: 5-3-12

**Property 8: 2 Monowai Street, Wellsford**

RODNEY COUNTY COUNCIL

THE TOWN & COUNTRY PLANNING ACT 1953

APPLICATION FOR CONSENT TO:-

- (a) SPECIFIED DEPARTURE (SEC.35)

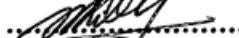


To: The County Clerk,  
Rodney County Council,  
P.O. Box 3,  
WARKWORTH

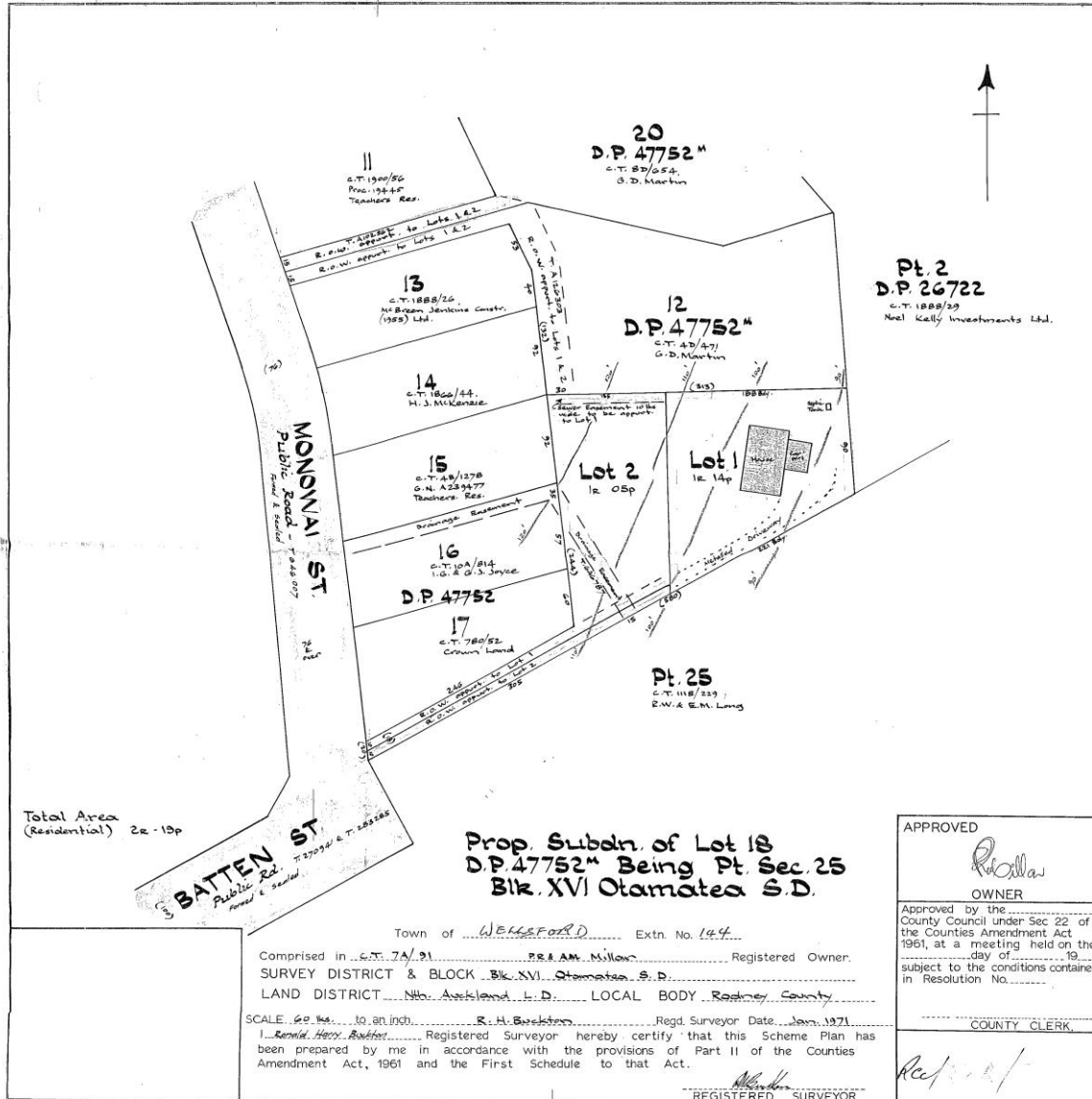
- (a) THIS APPLICATION is made under Section 35 of the Town and Country Planning Act 1953.
- (b) I HEREBY APPLY FOR a specified departure to enable me to construct and operate boarding kennels for dogs within 10 feet of the rear boundary of a rear site.
- (c) THE PROPERTY in respect of which this application is made is situated at Monowai Street, Wellsford and the legal description is TWO ROODS NINETEEN DECIMAL THREE PERCHES (2R.19.3P.) being Lot 18 on Deposited Plan 47752. I am the Joint owner of the property.
- (d) Special conditions, restrictions, or provisions proposed for the application are:- Nil
- (e) NAME OF OWNER: PETER ROBERTSON MILLAR and ALINE MARGARET MILLAR  
ADDRESS: Monowai Street, Wellsford.  
NAME OF OCCUPIER: PETER ROBERTSON MILLAR and ALINE MARGARET MILLAR  
ADDRESS: Monowai Street, Wellsford.
- (f) NAMES AND ADDRESSES OF PERSONS PARTICULARLY AFFECTED BY MY APPLICATION:  
1. NOEL KELLY INVESTMENTS LIMITED, Wellsford.  
2. GRAHAM PHILLIPS, 3 R.D. Wellsford.  
3. R.W. LONG, 22 Batten Street, Wellsford.

DATED at Wellsford this 29th day of September 1972.

SIGNATURE: ALINE MARGARET MILLAR by her solicitor and duly authorised agent.



- (g) FULL NAME OF APPLICANT: ALINE MARGARET MILLAR  
ADDRESS FOR SERVICE: C/- Torrance, Corboy & Riley,  
199 Rodney Street, Wellsford.





**RONALD H. BUCKTON**  
(M.N.Z.I.S.)  
Registered Land and Engineering  
Surveyor

HEAD OFFICE  
MILLSTREAM BUILDINGS  
ELIZABETH STREET  
P.O. BOX 107 WARKWORTH  
TELEPHONE 244D  
PRIVATE 244M  
BRANCH OFFICE  
RODNEY STREET  
P.O. BOX 20 WELLSFORD  
TELEPHONE 8044

Our Ref 785 Your Ref

P.O. Box 107  
Warkworth

18 January 1970

The County Clerk,  
Rodney County Council,  
WARKWORTH.

Dear Sir,

Re: PROPOSED SUBDIVISION OF  
LOT 18 D.P. 47752 BEING PT.  
SECTION 25 BLK XV1 OTAMATEA S.D.  
P.R. MILLAR ESQ.  
E.T. 7A/91

Please find enclosed a scheme plan of proposed subdivision for approval.

My Client's house is on Lot 1 and Lot 2. The new section is surplus to my client's requirements and he wishes to dispose of it. It will provide a good building site.

It is proposed to create reciprocal right of ways over the ingress strips to Lots 1 and 2.

Lots 1 and 2 are appurtenant to an existing right of way over Lots 12 ~~and 13~~ D.P. 47752 but this right of way is not being exercised.

There is a drainage easement in favour of your Council running over Lots 2 and 1 but this easement is not being used. A building line restriction created by K. 75112 will need to be cancelled and re-imposed in terms of Lots 1 and 2 or cancelled. Would you please send your notice to me so that it can be lodged with the plan.

A metalled driveway runs from Monowai Street to my client's house. There appears to be a good thickness of metal and the metal has been well compacted.

*Acc/224/71  
Wfe 144  
Rae 20/85  
\$400*



CONSENT NO. <u>23386</u>	FIM NO.	LODGED AT SERVICE CENTRE	HEAD OFFICE DATE STAMP
DATE ISSUED	DATED ISSUED	DATE	



Mackworth Service Centre  
Boxer Street, Mackworth  
Telephone (09) 425-8579

Huapua Service Centre  
Main Road, Huapua  
Telephone (09) 412-9120

Helenville Service Centre  
Commercial Road, Helenville  
Telephone (09) 429-8845

PRIVATE BAG 500, OREWA  
TELEPHONE (09) 426-5189



210997

**BUILDING CONSENT APPLICATION**

(Complete in all cases)

<b>1. OWNER - As per attached Certificate of Title*</b>	<b>2. CONTACT (if not owner)</b>
Name: <u>C. M. VANDERNET</u>	Contact Name: _____
Postal Address: <u>2 MONOWAI ST.</u> <u>WELLSFORD</u>	Postal Address: _____
Phone Number: <u>423 8861</u>	Phone Number: _____
Fax Number: _____	Fax Number: _____
Previous Owner: _____	

<b>3. PROJECT LOCATION</b>	
Number: <u>2</u>	Locality: _____
Street/Road: <u>MONOWAI STREET</u>	<u>WELLSFORD</u>

<b>4. LEGAL DESCRIPTION</b>	
Valuation Number: _____	Council Property ID: <u>1099771</u>
Lot: <u>1B</u>	DP: <u>4775Z</u>
Certificate of Title: _____	Site Area: _____ square metres hectares

<b>5. PROJECT</b>	
New Building <input checked="" type="checkbox"/>	Description of Work: <u>PROPOSED GARAGE / WORKSHOP.</u>
Alteration <input type="checkbox"/>	
Relocation <input type="checkbox"/>	
Demolition <input type="checkbox"/>	
Intended Life: Indefinite but not less than 50 years or specified as _____ years	
Estimated Value: \$ <u>5000</u> (incl GST)	No. of Units: _____

This application will not be accepted until the Application Deposit Fee is paid. Additional charges may be payable prior to uplifting of the Building Consent, and the issue of the Code of Compliance Certificate. Invoices will not be rendered, nor refunds made for less than \$20.00. The owner shall be responsible for the payment of any charges incurred in conjunction with this application. The owner will also be liable for any reasonable expenses (including legal and debt collection costs) incurred in collecting any money owed.

**SIGNED BY THE OWNER:**

SIGNATURE: [Signature] DATE: 27-11-02

**6. CHARGES**

The Council's charges payable on the making of this application are:

\$: 460.00 Receipt No: \_\_\_\_\_ Date: \_\_\_\_\_

\* Copy of agreement for purchase from owner of title.

425 3539

**Property 9: 18 Monowai Street, Wellsford**

RODNEY COUNTY COUNCIL

THE TOWN & COUNTRY PLANNING ACT 1953

APPLICATION FOR CONSENT TO:-

- (a) SPECIFIED DEPARTURE (SEC.35)



To: The County Clerk,  
Rodney County Council,  
P.O. Box 3,  
WARKWORTH

- (a) THIS APPLICATION is made under Section 35 of the Town and Country Planning Act 1953.
- (b) I HEREBY APPLY FOR a specified departure to enable me to construct and operate boarding kennels for dogs within 10 feet of the rear boundary of a rear site.
- (c) THE PROPERTY in respect of which this application is made is situated at Monowai Street, Wellsford and the legal description is TWO ROODS NINETEEN DECIMAL THREE PERCHES (2R.19.3P.) being Lot 18 on Deposited Plan 47752. I am the Joint owner of the property.
- (d) Special conditions, restrictions, or provisions proposed for the application are:- Nil
- (e) NAME OF OWNER: PETER ROBERTSON MILLAR and ALINE MARGARET MILLAR  
ADDRESS: Monowai Street, Wellsford.  
NAME OF OCCUPIER: PETER ROBERTSON MILLAR and ALINE MARGARET MILLAR  
ADDRESS: Monowai Street, Wellsford.
- (f) NAMES AND ADDRESSES OF PERSONS PARTICULARLY AFFECTED BY MY APPLICATION:  
1. NOEL KELLY INVESTMENTS LIMITED, Wellsford.  
2. GRAHAM PHILLIPS, 3 R.D. Wellsford.  
3. R.W. LONG, 22 Batten Street, Wellsford.

DATED at Wellsford this 29th day of September 1972.

SIGNATURE: ALINE MARGARET MILLAR by her solicitor and duly authorised agent.



- (g) FULL NAME OF APPLICANT: ALINE MARGARET MILLAR  
ADDRESS FOR SERVICE: C/- Torrance, Corboy & Riley,  
199 Rodney Street, Wellsford.



**ENVIRONMENTAL  
MANAGEMENT**  
Solutions

ADVICE · INVESTIGATION · REPORTING  
www.environmentalmanagement.co.nz

246  
148800 ft

BRL \$11-00

FEE \$ 56-00 RECEIPT No. 12511 DATE 1-4-72

VALUATION ROLL No. 86, 234, 1 DATE ISSUED 9-11-72

PERMIT No. 239986

DATE STAMP

RIDING  
WELLS FORD

**RODNEY COUNTY COUNCIL**  
P.O. BOX 3, WARKWORTH

**Application for a Building Permit**

OWNER OF SECTION NAME *Spence Department*  
**G.D. PHILLIPS** PHONE No. 5875  
(BLOCK CAPITALS)

PRESENT POSTAL ADDRESS *R.D. 3, Welleford*

BUILDER NAME *K.R. JURY* PHONE No. 8140

POSTAL ADDRESS *19 Armitage Rd, Welleford*  
(Note: Permit will be posted to builder unless otherwise requested)

INTENDED USAGE OF BUILDING *New Residence*

VALUE OF WORK \$ *ONE BELOW* FEE \$ (See back page).

FULL LEGAL DESCRIPTION OF SECTION (As appears on either rate demand or title deeds).  
*Lot 12 DP 47752 Blk XVI Otamatea RD*

NAME OF PREVIOUS OWNER OF SECTION

AREA OF SECTION Acre(s) Frontage Feet

ROAD NAME *Armitage St.* LOCALITY *Welleford*

SIGNATURE OF APPLICANT *[Signature]* DATE *7-11-72*

**FOR OFFICE USE ONLY**

Footpath-Deposit	Refund
Fee \$	Amount \$
Recpt. _____	To _____
Paid by _____	Date _____

**FOOTINGS:** No concrete to be poured under any circumstances until form work and steel is inspected.

Permit issued subject to the following conditions:

ANALYSIS OF PERMIT FEES		
WORK	VALUATION	FEES
PLUMBING	19.457-00	56-00
DRAINAGE	11.50-00	13-00
URBAINAGE	3.90-00	5-00
TOTAL	34.857-00	74-00

APPROVED BY *[Signature]* BUILDING INSPECTOR *9.11.72* DATE

*Wider c. 20-00*  
*Footpath 50-00*  
*\$155-00*

BRL: 11-00

PLUMBING	APPROVED
DRAINAGE	APPROVED
DATE <i>2.11.72</i>	HEALTH INSP.

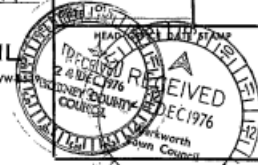




APPLICATION NO. AVY/367 PERMIT NO. H45164 LOGGED AT DISTRICT OFFICE \_\_\_\_\_ DISTRICT \_\_\_\_\_  
DISTRICT OFFICE NO. \_\_\_\_\_ DATE ISSUED 21.5.77

**RODNEY COUNTY COUNCIL**  
P.O. BOX 3, WARKWORTH

Phone WWh 433 111



**BUILDING PERMIT APPLICATION**

OWNER OF SECTION: NAME GRAEME D. PHILIPS PHONE NO. 8901 Welford  
(BLOCK CAPITALS)  
PRESENT POSTAL ADDRESS 18 Monowai Street Welford  
BUILDER: NAME PHILIPS with E.R. Jones Mfg PHONE NO. \_\_\_\_\_  
POSTAL ADDRESS 18 Monowai St Welford  
(Permit will be posted to builder unless otherwise requested)  
SIGNATURE OF APPLICANT G.D.P.

NATURE OF PROPOSED BUILDING WORK
<u>GARAGE</u>

FLOOR AREA OF PROPOSED WORK  
Basement: \_\_\_\_\_  
Ground Floor: \_\_\_\_\_  
First Floor: \_\_\_\_\_  
Others: GARAGE 42.120 m<sup>2</sup>  
Total: \_\_\_\_\_

VALUE OF WORK \$ 1900.00 FEE \$ \_\_\_\_\_ PAYABLE ON APPLICATION.

FULL LEGAL DESCRIPTION OF SECTION  
Lot 30 D.P. 47752

Work	Value	Fee
Building	1900	110.00
Drainage	-	-
Plumbing	-	-
Total	1900	110.00
Building Research Levy	-	110.00

VALUATION ROLL NO. 96 1234 / 1 24  
NAME OF PREVIOUS OWNER OF SECTION G. Martin  
AREA OF SECTION \_\_\_\_\_ Hectare(s) FRONTAGE \_\_\_\_\_ Metres  
Sq Metres  
ROAD NAME Monowai St LOCALITY Welford

IMPORTANT - SEE INSTRUCTIONS ON PAGE FOUR

FOR OFFICE USE ONLY

Permit Issued Subject to the Following Conditions \_\_\_\_\_

Approved by G.V. Bhattarai Building Inspector 19.1.77 Date \_\_\_\_\_  
Approved by \_\_\_\_\_ Health Inspector \_\_\_\_\_ Date \_\_\_\_\_  
Town Planning Zoning/Approval \_\_\_\_\_ Town Planning Officer \_\_\_\_\_ Date \_\_\_\_\_  
Building Permit Fee \$ 10.00 Receipt No. 6744 Date 24.12.76  
Road Damage Deposit Fee \$ \_\_\_\_\_ Receipt No. \_\_\_\_\_ Date \_\_\_\_\_  
Road Damage Deposit Refund \$ \_\_\_\_\_ To \_\_\_\_\_ Date \_\_\_\_\_  
Cost of Vehicular Crossing \$ \_\_\_\_\_ Date \_\_\_\_\_  
Electricity Transmission Lines: Present/Not Present over property\* Sewer, M.T.: Present/Not Present  
\*Delete not applicable. Initials \_\_\_\_\_ Date \_\_\_\_\_

**Property 10: 20 Monowai Street, Wellsford**

**R. H. Buckton & Associates**

Registered Land and Engineering  
Surveyors

Principal: Ronald H. Buckton M.N.Z.I.S.  
Associates: Anthony R. Hayman B. Surv. M.N.Z.I.S.  
Richard T. O'Flaherty B.Sc. (Surv.) M.N.Z.I.S.

Our Ref. 3188  
Mr Hayman

Your Ref.

8 April 1992

The General Manager  
Rodney District Council  
Private Bag  
OREWA

Dear Sir

PROPOSED SUBDIVISION OF LOTS 12 and 20 DP 47752  
NO. 18 MONOWAI STREET WELLSFORD G.D. and A. PHILLIPS

On behalf of our abovementioned clients we wish to apply for a resource consent under the Resource Management Act 1991 to permit the subdivision of our clients property as shown on the enclosed plan.

The property is located at No. 18 Monowai Street, Wellsford, being Lots 12 and 20 DP 47752, comprised in Certificates of Title 4D/471 (2370 square metres) and 8D/654 (1983 square metres). Copies of these titles are enclosed.

The land is zoned Residential-1 and is shown on Council's Planning Map G-15/1.

The proposed subdivision involves a boundary relocation between the two titles. Lot 1 created totals 1590 square metres and Lot 2 created totals 2763 square metres.

Both lots have houses on, and established gardens, driveways, etc. Both lots obtain legal frontage to Monowai Street via reciprocal rights of way. The driveway to the houses on Lots 1 and 2 is concreted.

Rights of way labelled D and E are required to allow use of the concrete driveway for vehicle manoeuvres by the owners of Lots 1 and 2.

A sewage easement, labelled F, is proposed over Lot 2 in favour of Lot 1. Effluent from Lot 1 feeds into a septic tank on the property then along an alkathene pipe over Lot 2 to a sewer manhole located in the southern corner of Part Lot 2 DP 26722.

There is an existing right of way, shown labelled C, over Lot 2 in favour of Lot 18 DP 47752. This easement is to remain.

.../2

NEVILLE STREET  
WARKWORTH 6327

TELEPHONE (09) 425 8956  
PRIVATE (09) 425 8472

P.O. Box 107  
Warkworth

FAX NO: (09) 425-8956



R15899  
Rec Hens  
10.4.92  
G15





PREVIOUS OWNER OF SECTION NAME \_\_\_\_\_ (SEE RATES FORM)

LEGAL DESCRIPTION OF SECTION: \_\_\_\_\_ (SEE RATES FORM)

LOT 20 D.P. 47752 NK VALUATION NO. 200 / 230 / 1

XVI Manawa

ROAD NAME MANAWA ST. LOCALITY WELLSFORD

AREA OF SECTION \_\_\_\_\_ HECTARES \_\_\_\_\_ RIDING \_\_\_\_\_ ROAD FRONTAGE \_\_\_\_\_ METRES

DESCRIPTION OF PROPOSED WORK:

Rear residence

FLOOR AREA: 98.28 SQ. METRES

CARPORT/GARAGE	
ADDITION	
BASEMENT	
GROUND FLOOR	<u>98.28</u>
FIRST FLOOR	
OTHERS	
TOTAL AREA	<u>98.28</u>

VALUE OF BUILDING WORK ONLY \$ 24,100.00  
(The decision of the Building Inspector shall be final as to estimated cost)

SIGNATURE OF APPLICANT [Signature]

**FOR OFFICE USE ONLY**

PERMIT FEE	WORK	VALUE	FEE	RECEIPT NO.	DATE
	BUILDING	<u>25140</u>	<u>116.00</u>	<u>060</u>	<u>20.3.79</u>
	DRAINAGE	<u>300</u>	<u>15.00</u>	<u>11</u>	<u>4</u>
	PLUMBING	<u>640</u>	<u>30.00</u>	<u>11</u>	<u>4</u>
		<u>26000</u>			
	BUILDING RESEARCH LEVY		<u>26.00</u>	<u>11</u>	<u>4</u>
	TOTAL PERMIT FEE				
	WATER CONNECTION				
	ROAD DAMAGE DEPOSIT		<u>100.00</u>	<u>11</u>	<u>4</u>

SUNDRY FEES \_\_\_\_\_

**Property 11: 56 Boshor Road, Wellsford**

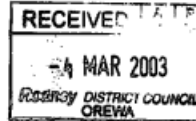


**Buckton Consultants Ltd**

Land Development Consultants  
Registered Surveyors

P.O. Box 107, 20 Neville St., Warkworth  
Ph: (09) 425 8950 Fax: (09) 425 8956  
Email: buckton@wk.planet.gen.nz

Directors:  
Anthony R. Hayman B. Surv. M.N.Z.I.S.  
Richard T. O'Flaherty B.Sc. M.N.Z.I.S.



Our Ref. 4707  
Rick O'Flaherty

Your Ref.

28 February 2003

The Chief Executive  
Rodney District Council  
Private Bag 500  
OREWA

*PROP 1096446, 5503566*  
*PERSON 45259, 201180*  
*PARCEL 7000339, 7000338*  
*RMA R34359*  
*MAP F14*  
*G14/03/04*

Dear Sir

APPLICATION FOR RESOURCE CONSENT  
G T & J F SULLIVAN 56 BOSHER ROAD WELLSFORD  
PROPOSED SUBDIVISION OF PT ALLOTMENT N119 &  
PT ALLOTMENT E120 PARISH OF ORUAWHARO

Please find enclosed an application for resource consent lodged on behalf of Mr G and Mrs J Sullivan.

Application is for approval to subdivide their property for countryside living purposes.

The application is for a non-complying activity under both the Operative District Plan and Plan Change No. 55. Subject to Rule 22.17.3 (Financial Contributions and Works) the application is for a restricted discretionary activity under Proposed District Plan 2000.

The subdivision proposed and this application have been prepared following a full site appraisal consultation with neighbours and assessment against criteria set down in the various planning documents.

Would you please receipt this application and advise of your reference in due course.

Yours faithfully  
Buckton Consultants Ltd

per: *R O'Flaherty*



**Property 13: 374 Rodney Street, Wellsford**

**RODNEY COUNTY COUNCIL**  
**BUILDING APPLICATION FORM**

**FOR OFFICE USE.**  
Permit No.: .....  
Fee: .....  
Valuation: .....  
Receipt No.: .....

I hereby apply for permission to ERECT DWELLING 7 FEB 1954  
at (House No. and street) MAIN RD WELLSFORD  
for (Owner) H I - LG CURCH, of (Address) 11389 WELLSFORD

according to locality plan and detailed plans, elevations, cross-sections, and specifications of building deposited herewith, in duplicate.

Particulars of land: Lot No. .... on Town Section ..... D.P. ....

Length of boundaries: ..... Area: .....

Particulars of building—Foundations: CONCRETE Walls: BRICK Roof: IRON

Area of ground floor: 1289 square feet.

Area of outbuildings: ..... square feet.

Estimated cost—

Building	£ <u>2300</u>
Plumbing and drainage	£ <u>200</u>
<b>Total</b>	<b>£ <u>2500</u></b>

Proposed purposes for which every part of building is to be used or occupied (describing separately each part intended for use or occupation for a separate purpose):  
DWELLING

Proposed use or occupancy of other part of building: .....

Nature of ground on which building is to be placed and of the subjacent strata: CLAY SUBSOIL

Yours faithfully,  
H I - LG CURCH Owner.  
H I - LG CURCH Builder.

Postal Address Armidale Road Wellsford (P.T.O.)



BY 978

DATE STAMP

APPLICATION No. / PERMIT No. 978
FEE £ 1,510 RECEIPT No. E 753 DATE 15/4/57
VALUATION Roll No. / DATE ISSUED 15/4/54

RODNEY COUNTY COUNCIL
P.O. BOX 3 - WAREWORTH

Application for a Building Permit

OWNER OF SECTION, NAME MI-LG CUREK PHONE No. 252
(BLOCK CAPITALS)

PRESENT POSTAL ADDRESS WELLSFORD

BUILDER, NAME J Johnston PHONE No.

POSTAL ADDRESS T. PUNT LEIGH
(Note:—Permit will be posted to builder unless otherwise requested.)

NATURE OF PROPOSED BUILDING WORK WORKSHOP (Farm)

VALUE OF WORK £250 FEE £ (See back page).

FULL LEGAL DESCRIPTION OF SECTION (as appears on either rate demand or title deeds).
Pt Allot SW11B Pch of Oremelabro (SOBRU)

NAME OF PREVIOUS OWNER OF SECTION

AREA OF SECTION 100 Acres. Frontage Feet.

ROAD NAME MAIN RD NORTH LOCALITY WELLSFORD

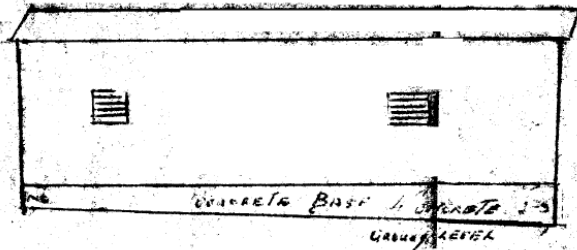
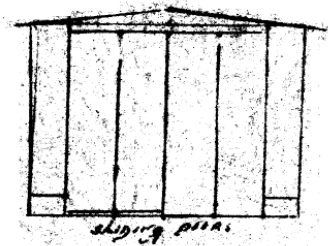
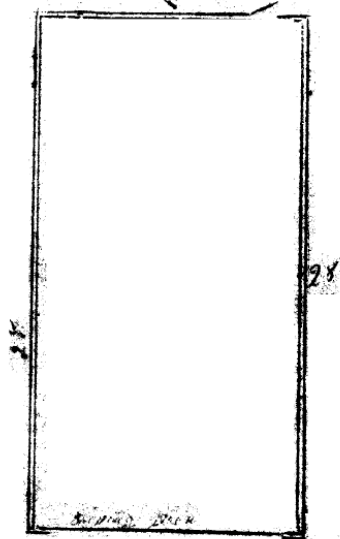
FOR OFFICE USE ONLY

Table with 2 columns: Footpath Deposit, Retard. Rows include Fee, Receipt, Paid By, Date.

Remarks:

Permit issued subject to the following conditions: 4.72 walls in place of 3.82

APPROVED BY [Signature] BUILDING INSPECTOR 15/4/57 DATE



SCALE 1/4" TO 1 FOOT



BPA 63851

PERMIT No. A006385

FEE \$ 38.00 RECEIPT No. 3081 DATE 1-11-67

VALUATION Roll No. 86,591 DATE ISSUED 1-11-67

DATE STAMP

RIDING  
Wellsford

RODNEY COUNTY COUNCIL

P.O. BOX 3 - WARKWORTH

Application for a Building Permit

OWNER OF SECTION NAME MR. J A + MRS V. P. DICKSON PHONE No. \_\_\_\_\_  
(BLOCK CAPITALS)

PRESENT POSTAL ADDRESS Wellsford

BUILDER NAME ELLIS WYATT Ltd PHONE No. 213 M

POSTAL ADDRESS Retraam St Warkworth  
(Note: Permit will be posted to builder unless otherwise requested).

INTENDED USAGE OF BUILDING Residence

VALUE OF WORK \$ 9800 FEE \$ 32.00 (See back page).

FULL LEGAL DESCRIPTION OF SECTION (as appears on either rate demand or title deeds)  
Pt Allotment SW 118 Parcel of Oranohara ST 18715 Bk VII Otumatahi S.D.

NAME OF PREVIOUS OWNER OF SECTION \_\_\_\_\_

AREA OF SECTION 22 acres Acre(s). Frontage \_\_\_\_\_ Feet.

ROAD NAME Main North Rd LOCALITY Wellsford

SIGNATURE OF APPLICANT Ellis Wyatt Ltd for Wyatt DATE Oct 27. 1967

FOR OFFICE USE ONLY

Footpath-Deposit		Refund	
Fee / /		Amount / /	
Receipt		To	
Paid by		Date	
Date		Date	

Permit issued subject to the following conditions:-

FOOTINGS

NO CONCRETE TO BE POURED UNDER ANY CIRCUMSTANCES UNTIL FORM WORK AND STEEL IS INSPECTED.

APPROVED BY JR Moore BUILDING INSPECTOR 2/11/67 DATE





102  
434 27/11

BRL # 2-50

FEE \$ 21 — RECEIPT No. 4538/9 DATE 3/5/72

VALUATION ROLL No. 8651 DATE ISSUED 8/5/72

PERMIT No. E39803

DATE STAMP

RIDING  
Wellsford.

RODNEY COUNTY COUNCIL  
P.O. BOX 3, WARKWORTH

### Application for a Building Permit

OWNER OF SECTION NAME MR. P. PAYNE. PHONE No. \_\_\_\_\_  
(BLOCK CAPITALS)

PRESENT POSTAL ADDRESS P.O. Box 22, WELLSFORD.

BUILDER NAME E.R. JURY PHONE No. 8140

POSTAL ADDRESS 19 ARMITAGE RD. WELLSFORD.  
(Note: Permit will be posted to builder unless otherwise requested)

INTENDED USAGE OF BUILDING RESIDENCE addition

VALUE OF WORK \$ SEE BELOW FEE \$ 21 - 00. (See back page).

FULL LEGAL DESCRIPTION OF SECTION (As appears on either rate demand or title deeds).  
PT ALLOT SW 18 DRUWHARU PAH BIK XII OTAMATEA S D.  
Parcel: 612025

NAME OF PREVIOUS OWNER OF SECTION \_\_\_\_\_

AREA OF SECTION 874 RODNEY ST. (Side way) Acre(s) \_\_\_\_\_ Frontage \_\_\_\_\_ Feet \_\_\_\_\_

ROAD NAME MAIN HIGHWAY LOCALITY WELLSFORD.

SIGNATURE OF APPLICANT [Signature] DATE 2-5-72  
PID: 103316

FOR OFFICE USE ONLY

Footpath-Deposit	Refund
Fee \$	Amount \$
Recpt.	
Paid by	To
Date	Date

FOOTINGS: No concrete to be poured under any circumstances until form work and steel is inspected.

Permit issued subject to the following conditions:

ANALYSIS OF PERMIT FEES		
WORK	PLUS	FEES
CONCRETE	4,350	21-00
PLUMBING		
DRAINAGE		
TOTAL	4,350	21-00

APPROVED BY [Signature] BUILDING INSPECTOR. 5.5.72 DATE

*Check builders footpath deposit*

Plates	4" x 2"	"	"	"	
Studs	4" x 2"	"	"	"	1' 6" max. ctrs.
Dwangs	4" x 2"	"	"	"	2' 3" " "
Trimmers	4" x 2"	"	"	"	
Lintels not exceeding	4'6" = 3"				
From 4'6" to	6'0" = 4"				
" 6'0" to	7'6" = 6"				
" 7'6" to	9'0" = 8"				
Rafters	4" x 2"	"	"	"	3'0" max. ctrs.
Purlins	3" x 2"	"	"	"	2'6" " "
Ceiling joists	6" x 2"	"	"	"	1'8" " "
Ceiling Woggs	2" x 2"	"	"	"	To suit linings
Collar ties	5" x 1"	"	"	"	6'0" max. ctrs.
Ridge & Hip	9" x 1"	"	"	"	-
Valleys	6" x 1"	"	"	"	-
Soffit bearers	3" x 1½"	"	"	"	3'0" max. ctrs.
<u>Finishing Linings:</u>					
Fascia Board	ex 8" x 1"	Heart or Treated Native			
Frieze Board	ex 6" x 1"	" " " "			
Flooring	8" x 3"	½" H.D. Particle Board.			
Architraves	1½" x 1"	O.B. Rimu	To match extg.		
Skirting	2½" x 1"	" "	" " "		
Scotia	1½" x 1"	" "	" " "		

**JOINERY:**

Shall be D.A. Mt. Rimu, Totara or Matai. Heads and jambs shall be ex 6" x 2" sills ex 6" x 2½". Sashes shall be of D.A.Mt. Totara or Redwood to standard runs. All joints shall be flush penetrating tenon with metal or wood dowels, close fitting, close cramped and showing a flush finish on both sides. All sashes shall have a ¼" x ¼" weather groove around and fitted with approved hinges.

Fixed glazing shall be rebated and beaded into frames.

**SOFFIT LINING:**

Roof overhangs shall be lined with 3/16" Fibrolite asbestos, and fixed with galv. clouts. Fibrolite soffit shall be grooved into back of Fascia boards a minimum of ¼". Coverjoins with James Hardies jointing strips.

**EXTERIOR WALL LINING:**

Cover exterior face of stud walls with building paper.

**DOORS AND THEIR FRAMES:**

External door frames and sills shall be of D.A.Mt. Rimu, Totara or Matai. Jambs and heads out of 6 x 2, sills out of 8 x 2½, sunk, weathered and throated with 1½ x ½ G.W.I. weather bars, showing a ½" upstand.

Internal door frames shall be out of 6 x 1 or 4 x 1 dressed Rimu full width with planted stops.

Hang all exterior doors on 1½ pairs 3½" butts with brass pins. Fit selected mortice lockset to exterior door and hang all interior doors on 1½ pairs of 3½" butts with loose pins and fix selected latchsets.



APPLICATION NO. 153/177 PERMIT NO. 153/868  
 DISTRICT OFFICE NO. 153/177 DATE ISSUED 16.3.77

**RODNEY COUNTY COUNCIL**  
 P.O. BOX 2, WAREWORTH Phone W04529

RECORDED AT DISTRICT OFFICE  
 DATE 16.3.77 DISTRICT OFFICE DATE STAMP  
 153/177  
 16 MAR 1977  
 RODNEY COUNTY COUNCIL

**BUILDING PERMIT APPLICATION**

OWNER OF SECTION: NAME Peter Payne PHONE NO. 9049  
 PRESENT POSTAL ADDRESS Main Rd Welford  
 BUILDER: NAME Workworth Pipe Center PHONE NO. 9462  
 POSTAL ADDRESS Woodcote Rd Workworth  
 (Permit will be posted to builder unless otherwise requested)

SIGNATURE OF APPLICANT [Signature]

NATURE OF PROPOSED BUILDING WORK  
Swimming Pool

FLOOR AREA OF PROPOSED WORK  
 Basement: \_\_\_\_\_  
 Ground Floor: \_\_\_\_\_  
 First Flr: \_\_\_\_\_  
 Others: \_\_\_\_\_  
 Total: \_\_\_\_\_

VALUE OF WORK \$ 5500 FEES 29.00

FULL LEGAL DESCRIPTION OF SECTION  
1656-2-29 5 1/8 Hec Horowhoro  
15379 Hec Welford

Work	Value	Fee
Building	15300	29.00
Drainage		
Plumbing		
Total	15300	29.00
Building Research Levy		31.00

VALUATION ROLL NO. 153/177  
 NAME OF PREVIOUS OWNER OF SECTION \_\_\_\_\_  
 AREA OF SECTION 1.8379 Hectares Hectare(s) FRONTAGE \_\_\_\_\_ Metres  
 ROAD NAME Main Rd Welford LOCALITY \_\_\_\_\_

IMPORTANT - SEE INSTRUCTIONS ON PAGE FOUR  
 FOR OFFICE USE ONLY

Permit issued Subject to the Following Conditions  
Drawn to scale of 1:100  
to be used as a guide only

Approved by [Signature] Building Inspector 10 2 77 Date  
 Approved by \_\_\_\_\_ Health Inspector \_\_\_\_\_ Date  
 Town Planning Officer \_\_\_\_\_ Date

Building Permit Fee \$ 29.00 Receipt No. 56969 Date 3.3.77  
 Road Damage Deposit Fee \$ \_\_\_\_\_ Receipt No. \_\_\_\_\_ Date \_\_\_\_\_  
 Road Damage Deposit Refund \$ \_\_\_\_\_ To \_\_\_\_\_ Date \_\_\_\_\_  
 Cost of Vehicle Crossing \$ \_\_\_\_\_ Date \_\_\_\_\_

Electricity Transmission Lines: Present/Not Present over property? \_\_\_\_\_ Meter, M.T. Present/Not Present  
 \*None not applicable. Initials \_\_\_\_\_ Date \_\_\_\_\_



**Rodney DISTRICT COUNCIL**

APPLICATION NO: 90/1052 PERMIT NO: 90/1052 LODGED AT: 91 / 110 / 111 / 112 / 113 / 114 / 115 / 116 / 117 / 118 / 119 / 120 / 121 / 122 / 123 / 124 / 125 / 126 / 127 / 128 / 129 / 130 / 131 / 132 / 133 / 134 / 135 / 136 / 137 / 138 / 139 / 140 / 141 / 142 / 143 / 144 / 145 / 146 / 147 / 148 / 149 / 150 / 151 / 152 / 153 / 154 / 155 / 156 / 157 / 158 / 159 / 160 / 161 / 162 / 163 / 164 / 165 / 166 / 167 / 168 / 169 / 170 / 171 / 172 / 173 / 174 / 175 / 176 / 177 / 178 / 179 / 180 / 181 / 182 / 183 / 184 / 185 / 186 / 187 / 188 / 189 / 190 / 191 / 192 / 193 / 194 / 195 / 196 / 197 / 198 / 199 / 200

SERVICE CENTRE NO: 1627/1 DATE ISSUED: 25.6.90 RECEIVED 21 JUN 1990 RODNEY DISTRICT COUNCIL WWW

HEAD OFFICE DATE STAMP: 25 JUN 1990 RODNEY DISTRICT COUNCIL

APPLICATION FOR CHIMNEY PERMITS AND/OR FIRE PLACE INSTALLATION

**IMPORTANT:** Please read instructions on Page 3 and complete the following information:-

**OWNER OF SECTION**

NAME: N.A. + D.M.R. ADAMS PHONE NO: Bus: \_\_\_\_\_ Pter: \_\_\_\_\_  
(BLOCK CAPITALS)

PRESENT POSTAL ADDRESS: 354 RODNEY ST WELLSFORD

**BUILDER/PLUMBER**

NAME: CONCRETE PHONE NO: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
(The permit will be posted to Builder/Plumber, unless otherwise requested)

PLUMBER'S REGISTRATION NO: \_\_\_\_\_

**LEGAL DESCRIPTION OF SECTION**

LOT: SW 118 D. = STREET/ROAD NO: 354 STREET/ROAD NAME: RODNEY ST.  
LOCALITY: WELLSFORD WARD: WELLSFORD VALUATION NO: 861-817

**DESCRIPTION OF PROPOSED WORK**

INSTALL JOINTLY INSTALLED FIRE

VALUE OF WORK: \$ 2000- (The decision of the inspector shall be final as to estimated cost.)

SIGNATURE OF APPLICANT: N.A. Adams

**FOR OFFICE USE ONLY**

	Value	Fee	Receipt No:	Date
Permit Fee:	<u>2000-</u>	<u>\$51-00</u>	<u>81715</u>	<u>21.6.90</u>

FORM/P067

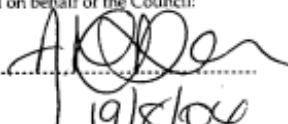


**BUILDING CONSENT NO: ABA 42635**

**PROJECT INFORMATION MEMORANDUM NO: ABA 42635**

**Section 35, Building Act**

**ISSUED BY: RODNEY DISTRICT COUNCIL**

APPLICANT	PROJECT
Name: BROWN, MICHAEL CHARLES Mailing Address: C/- PENINSULA MOWER & HEATING CENTRE 611 WHANGAPARAOA ROAD STANMORE BAY	All <input checked="" type="checkbox"/> X Description: ADDITIONS & ALTERATION Nature: CHIMNEY & FIREPLACE Intended Use(s) in detail: Residential
<b>PROJECT LOCATION</b>	
Street Address: 374 RODNEY STREET SH1, WELLSFORD, NORTHERN	Intended Life: Indefinite, but not less than 50 years
<b>LEGAL DESCRIPTION</b>	
Property Number: 1103316 Valuation Roll No: 00861 81700 Legal Description: PT ALLOT SW118 PSH OF ORUAWHARO (SO 824)	Estimated Value: 3000
<b>COUNCIL CHARGES</b>	
The balance of Council's charges payable on uplifting this building consent, in accordance with the tax invoice are: Total: \$ ..... <b>ALL FEES ARE GST INCLUSIVE</b>	Signed for and on behalf of the Council: Name:  Date: 19/8/04

This building consent is a consent under the Building Act 1991 to undertake building work in accordance with the attached plans and specifications so as to comply with the provisions of the building code. It does not affect any duty or responsibility under any other Act nor permit any breach of any other Act.

This building consent is issued subject to the conditions specified in the attached pages headed "Conditions of Building Consent No." ABA 42635



Property 18: 338 Rodney Street, Wellsford

**BPA 92453**

PERMIT No. B092453

FEE \$ NO FEE RECEIPT No. \_\_\_\_\_ DATE \_\_\_\_\_

VALUATION Roll No. 86/41 DATE ISSUED 23.6.66

DATE STAMP

RIDING

~~WELLS FORD~~

RODNEY COUNTY COUNCIL

P.O. BOX 3 - WARKWORTH

Application for a Building Permit

OWNER OF SECTION, NAME M.L. Watson PHONE No. 8252

PRESENT POSTAL ADDRESS Box 46 Wellsford

BUILDER, NAME M.L. Watson PHONE No. \_\_\_\_\_

POSTAL ADDRESS As above

(Note: Permit will be posted to builder unless otherwise requested)

INTENDED USAGE OF BUILDING MILKING SHED (EXTENSIONS)

VALUE OF WORK \$ 47506 FEE \$ NO FEE (See back page)

FULL LEGAL DESCRIPTION OF SECTION (as appears on either rate demand or title deeds)  
Pt D.P. 4682 also Pt Lot 2 D.P. 20722 of Sec. 36 Blk III Okamoto S.D.  
also Pt Lot 4 D.P. 9919 also Pt Lot 5 E. 118 Okamoto Blk III Okamoto S.D.

NAME OF PREVIOUS OWNER OF SECTION \_\_\_\_\_

AREA OF SECTION 137 Acre(s). Frontage \_\_\_\_\_ Feet.

ROAD NAME S.H. #01 LOCALITY Wellsford

SIGNATURE OF APPLICANT M.L. Watson DATE 21.6.66

FOR OFFICE USE ONLY

Footpath-Deposit		Refund	
Fee / /	Amount / /		
Recpt. _____	To _____		
Paid by _____	Date _____		
Date _____			

Permit issued subject to the following conditions:—

APPROVED BY L.S.B. BUILDING INSPECTOR 23.6.66 DATE

*Handwritten notes:*  
0.8/0.8/0.8/0.8/0.8/0.8  
0.8/0.8/0.8/0.8/0.8/0.8  
0.8/0.8/0.8/0.8/0.8/0.8



600 sq Ft 178

BPA 32035

DATE STAMP

PERMIT No. C032035

FEE \$ 5.00 RECEIPT No. 16834 DATE 30.9.70

VALUATION ROLL No. 86/4/1 DATE ISSUED 30/9/70

RIDING

WELLSFORD

RODNEY COUNTY COUNCIL

P.O. BOX 3, WARKWORTH

Application for a Building Permit

OWNER OF SECTION NAME Noel Kelly Investments Ltd PHONE No. 8066 (BLOCK CAPITALS)

PRESENT POSTAL ADDRESS Box 101 Wellsford.

BUILDER NAME D. Lewis PHONE No.

POSTAL ADDRESS Wellsford. (Note: Permit will be posted to builder unless otherwise requested)

INTENDED USAGE OF BUILDING Car shed. ALTERATIONS

VALUE OF WORK \$ SEE BELOW FEE \$ (See back page).

FULL LEGAL DESCRIPTION OF SECTION (As appears on either rate demand or title deeds).

PT. 2P. 9682 ALSO PT. 1 of 2 D.P. 26792 OF SEC. 25 BIK XVI OTAMATEA S.D. ALSO PTL 00 D.P. 9919 ALSO PT ALLOT S.E. 118. ORUAWHARO PARISH, BIK XII OTAMATEA S.D.

NAME OF PREVIOUS OWNER OF SECTION

AREA OF SECTION Acre(s). Frontage Feet

ROAD NAME MAIN HIGHWAY LOCALITY WELLSFORD.

SIGNATURE OF APPLICANT DATE 24.9.70

FOR OFFICE USE ONLY

Table with columns: Footpath-Deposit, Refund, Fee \$, Amount \$, Recpt., Paid by, Date, To, Date

FOOTINGS: No concrete to be poured under any circumstances until form work and steel is inspected.

Permit issued subject to the following conditions:

ANALYSIS OF PERMIT FEES table with columns: WORK, VALUE, FEES. Rows: BUILDING, PLUMBING, DRAINAGE, TOTAL

APPROVED BY [Signature] BUILDING INSPECTOR. 30.9.70 DATE



**RESOURCE (SUBDIVISION/LAND USE) CONSENT REPORT**

LIR ANALYSIS COVER SHEET

Land use       PRE-224       POST 224

**COUNCIL REFERENCE INFORMATION**

File Ref. No: (External Ref)	Map	Type	No. (GEMS Ref)	Hazard / Info Code Extn Codes for hazards / info used in rpt
WM Grey area	G14	B	800001	
Old HR Ref. No:	G14-3.			
Scheme Plan / Town Plan # (RFS to RFS LINKS)	R12740.			
Additional Report (Y/N):			Date of Original Report:	
Street, Locality (location description):	Amitage Rd Wellford			

**CONSULTANT REPORT INFORMATION** (Request Details)

LIR Report Type (Initial Geotech, Earthworks Completion, Effluent)	Scheme Plan Conditions		
Prepared by: (1st Contact Person)	RDL	Person ID#:	12816.
Reference Number:		Report Date:	

REPORT RECEIVED BY: (receiving officer)		DATE: (date submitted)	
REPORT AUTHORISED BY:		DATE:	
ENTERED ON GEMS BY: (handling officer)		DATE: (start date)	
REPORT ANALYSED BY: (authorising officer)	R.S	DATE:	22-6-99

PLEASE HOLD AT LIR - parcel id's have not been assigned      DATE: \_\_\_\_\_

- Please Attach:**
- a locality map with the lots affected by the report highlighted
  - a copy of the scheme plan (pre-224) or the deposited plan (post 224)
  - one copy of the report (the second copy and a copy of this front page to the SP file)

and forward to the Development Engineer

**CURRENT LEGAL DESC (LOT & DP NO.) + PARCEL ID:**

**CIRCLE: PARENT/SIBLING**

Lot / Allot	DP Number / Parish	Parcel ID Number
✓ 118	80 824 Psh of Onawaro	7049116
2	608248	175490
1	175490	608247

(Surveyor/Planning Assistant is responsible for this sheet)





## Bron

---

**From:** Siri Rathnayake <[siri.rathnayake@aucklandcouncil.govt.nz](mailto:siri.rathnayake@aucklandcouncil.govt.nz)>  
**Sent:** Wednesday, 13 April 2022 12:32 pm  
**To:** Bron  
**Subject:** Property file requests -8270385026/8270385025/8270385024

Hi Bronwyn,

We have received following three property file request. Unfortunately I couldn't find documents under all three property IDs. If you wish to cancel these three property file requests please let me know. We will be able to make a full refund.

I have completed your property file request for **Pt Lot 4 DP 9919 Monowai Street Wellsford 0900 (8270385027)**

- Pt Sec 25 DP 9682 Monowai Street Wellsford 0900 - 8270385026
- Pt Allot 117 SO 22925 State Highway 1 Wellsford- 8270385025
- Pt Lot 2 DP 26722 Monowai Street Wellsford 0900 - 8270385024

Ngā mihi | Kind Regards  
Siri

**Siri Rathnayake | Property Product Technician– Henderson**  
**Group Treasury**  
Ph 021 564 504  
Auckland Council, Civic Building, 6 Henderson Valley Road, Henderson  
Visit our website: [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)



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# **ATTACHMENT 16**

## **APPENDIX 13 ARCHAEOLOGICAL ASSESSMENT**





# **PLAN CHANGE REQUEST AT RODNEY STREET AND MONOWAI ROAD, WELLSFORD: ARCHAEOLOGICAL ASSESSMENT**

Prepared for Wellsford Welding Club Ltd

May 2023  
(Updated from April 2022)



By

Ellen Cameron (MSc)  
Aaron Apfel (BA Hons)

---

**Clough**  
& ASSOCIATES LTD

321 Forest Hill Rd,  
Waiatarua, Auckland 0612  
Telephone: (09) 8141946  
Mobile 0274 850 059  
[www.clough.co.nz](http://www.clough.co.nz)

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## INTRODUCTION

### Project Background

The Wellsford Welding Club Ltd are applying for a Plan Change to rezone properties at Rodney Street and Monowai Road, Wellsford (Figure 1). The addresses and legal descriptions of the properties in the Plan Change Area are shown in Table 1. The Proposed Plan Change consists of rezoning from Future Urban and Rural – Countryside Living Zones to lower density, medium density living and lifestyle living enabled by Residential Large Lot, Mixed Housing Suburban and Urban Zones and Business (Neighbourhood Centre Zone) (with Figure 2 showing the Structure Plan and Figure 3 showing the proposed landuse).

An archaeological assessment was commissioned by Barkers & Associates on behalf of the Wellsford Welding Club Ltd to establish whether future development enabled by the proposed Plan Change is likely to impact on archaeological values. This report has been prepared as part of the required assessment of effects accompanying a plan change application under the Resource Management Act 1991 (RMA) and to identify any requirements under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA). Recommendations are made in accordance with statutory requirements.

### Methodology

The New Zealand Archaeological Association’s (NZAA) site record database (ArchSite), Auckland Council’s Cultural Heritage Inventory (CHI), Auckland Unitary Plan Operative in Part (AUP OP) schedules and the Heritage New Zealand Pouhere Taonga (Heritage NZ) New Zealand Heritage List/Rārangi Kōrero were searched to determine whether any archaeological or other historic heritage sites had been recorded on or in the immediate vicinity of the properties. Literature and archaeological reports relevant to the area were consulted (see Bibliography). Early survey plans and aerial photographs were checked for information relating to past use of the properties.

The Plan Change Area contains properties both owned by the Wellsford Welding Club and also by others, with the latter not able to be accessed. A visual inspection of the Wellsford Welding Club properties was conducted on 18 October 2021 (shown in Table 1). The ground surface was examined for evidence of former occupation (in the form of shell midden, depressions, terracing or other unusual formations within the landscape relating to Māori settlement, or indications of 19th century European settlement remains). Exposed and disturbed soils were examined where encountered for evidence of earlier modification, and an understanding of the local stratigraphy. Subsurface testing with a probe was carried out at regular intervals across the Plan Change Area and spade test pits were located along the streams to determine whether buried archaeological deposits could be identified or establish the nature of possible archaeological features. Photographs were taken to record the area and its immediate surrounds.

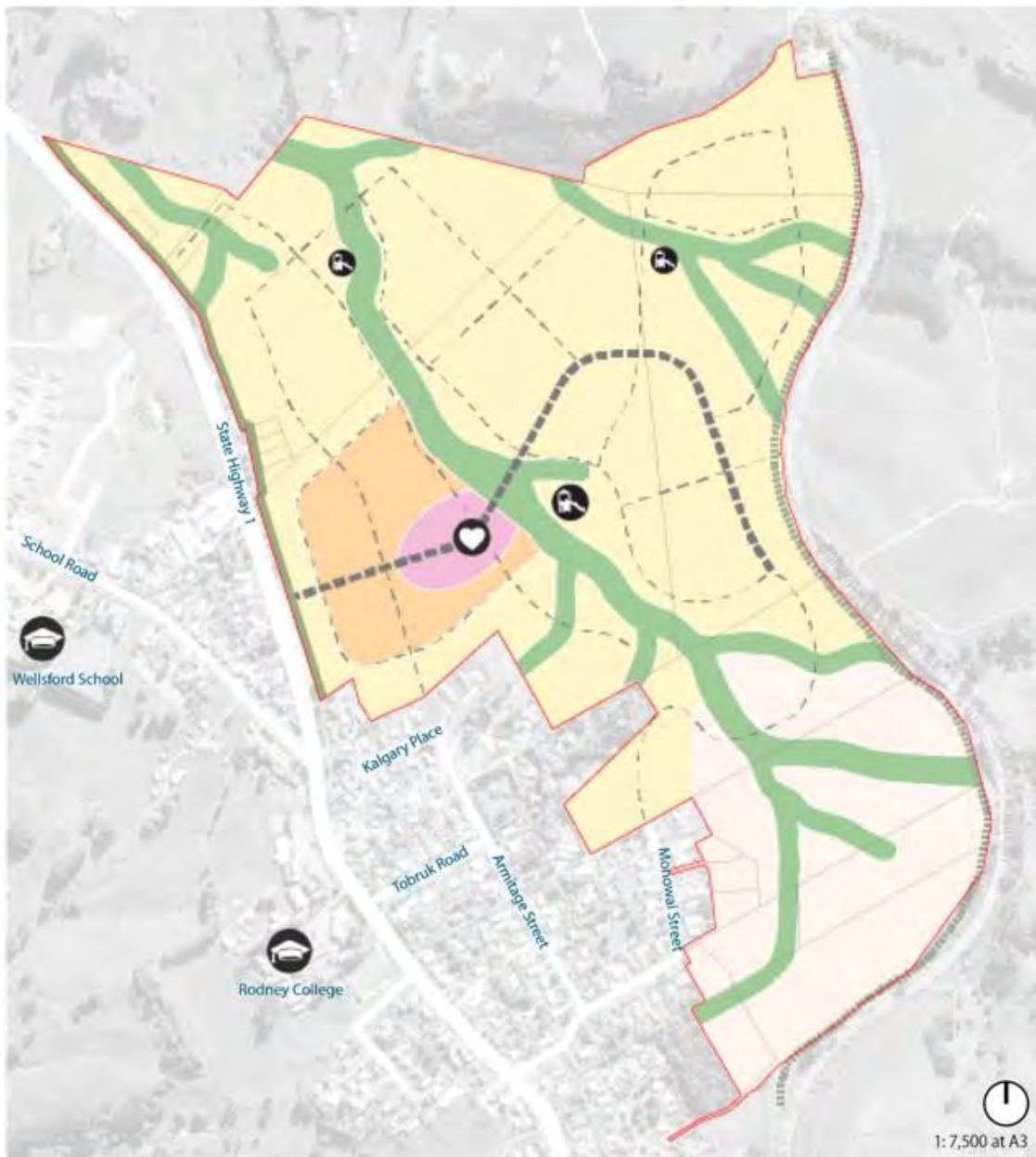
**Table 1. Addresses and Legal Descriptions of the properties in the Plan Change Area with the properties owned by the Wellsford Welding Club and included in the field survey shaded grey**

Address	Legal Description	Area (HA)
338 Rodney Street Wellsford	PT Allot SE 118 PSH of Oruawharo	24.75
96 Boshier Road	Lot 1 DP 69586	15.10
136 Boshier Road	Pt Allot 117A Psh of Oruawharo SO 7143	0.56
11 Wi Apo Place Wellsford	Lot 23 DP 85114	3.40
15 Wi Apo Place Wellsford	Lot 22 DP 85114	0.80
22 Batten Street Wellsford	Lot 1 DP 179213	0.26
26 Batten Street Wellsford	Lot 2 DP 179213	0.92
20 Monowai Street Wellsford	Lot 1 DP 152849	0.15
18 Monowai Street Wellsford	Lot 2 DP 152849	0.28
2 Monowai Street Wellsford	Lot 18 DP47752	0.25
State Highway 1 Wellsford	PT Allot 117 PSH of Oruawharo 22925	11.87
Monowai Street Wellsford	Pt Lot 4 DP 9919	6.72
Monowai Street Wellsford	Pt Lot 2 DP 26722	5.75
Monowai Street Wellsford	PT SEC 25 BLK XVI Otamatea Survey District DP 9682	2.09





Figure 1. Upper map showing the location of the Plan Change Area in the Auckland Region and lower inset showing the details of the properties in the Structure Plan Area (source: Auckland Council Geomaps)



Structure Plan

Legend

	Structure plan extent		Main Collector Road
	Property Boundary		Local Streets
	Indicative Lifestyle Living		Greenway Cycleway
	Indicative Lower Density Residential		10m Landscape Buffer
	Indicative Medium Density Residential		Indicative Playground
	Indicative Village Centre		Indicative Village Centre Public Space
	Ecological Areas / Open Spaces		Existing Schools

Figure 2. Structure Plan for the Plan Change Area (source: Barkers & Associates)



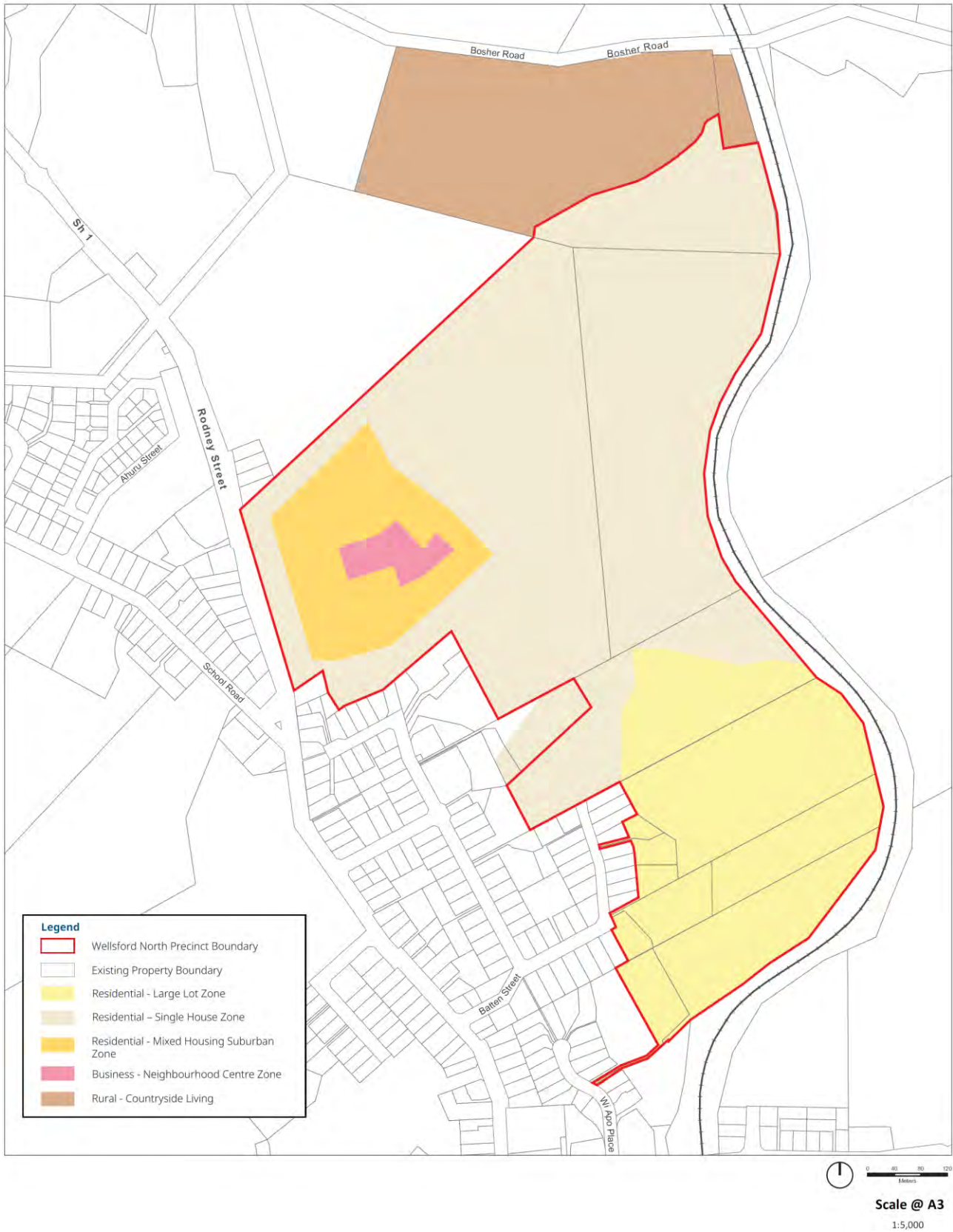


Figure 3. Proposed Landuse Plan (source: Barkers & Associates)

## HISTORICAL BACKGROUND

### **Māori** Settlement

The traditional Māori settlement pattern in the Kaipara and Mahurangi districts involved seasonal movements between kāinga (villages). The east and west coastal areas provided abundant marine resources, whilst the inland forest supplied Māori with hunting and resource gathering opportunities. Rivers such as the Mahurangi supplied plentiful fresh water, and sandy soils near coastal areas were highly suited to kumara cultivation (Murdoch 1992; Dave Pearson Architects 2003: 11).

At various periods, there was competition between tribes for important resources such as winter food sources and this led to a protracted conflict between the Te Kawerau and Hauraki tribes in the 1700s.

Further warfare occurred in the 1820s and 1830s when raiding Ngāpuhi from the north, armed with muskets, launched a series of attacks throughout the tribal territories of Ngāti Whātua. Māori of the Kaipara and Mahurangi, armed only with traditional hand combat weapons such as mere and taiaha, were swiftly defeated. Most fled the invasion, leaving the region virtually deserted for several years (Murdoch 1992). By the late 1830s small numbers of Ngāti Whātua and Te Kawerau/ Ngāti Rongo Māori began to return to their traditional occupation areas in the Kaipara and Mahurangi (Murdoch 1992).

### European Settlement

Missionaries and sawyers began appearing in the Kaipara and Mahurangi districts by the early 1830s, and with the arrival of Europeans Māori came under increasing pressure to relinquish land (Mackintosh 2005: 5). Although several Ngāti Whātua chiefs signed the Treaty of Waitangi in 1840, including Te Roha from Te Uri-O-Hau, large tracts of land were lost through Crown purchases, pre-1840 claims and Native Land Court proceedings (NZMCH 2006: 199).

Further pressure was placed on Māori land after the decision by Governor Hobson to relocate the colonial capital southwards from the Bay of Islands shortly after the signing of the Treaty of Waitangi. Hobson ordered his Surveyor General Felton Mathew to investigate every inlet from the Bay of Islands to the Firth of Thames, including the Mahurangi River, which was surveyed in June 1840. In Mathew's report of the Mahurangi he noted that:

'...it would be highly desirable that the Government should obtain possession of this harbour and a considerable portion of the surrounding country. A settlement once formed here, would I have no doubt, rapidly attain a very flourishing condition. Several Europeans lay claim, I believe, to this portion of the country, but their titles, I am informed, are of no value. And even among the native chiefs a dispute exists to the right of ownership. The government should therefore have no difficulty in taking possession of it. I did not see the slightest trace of native inhabitants during the time I was in the place' (Locker 2001: 61-2).

When the Tamaki isthmus was chosen as the site of the new capital, land in the Mahurangi became even more essential to the Crown, as it was now one of the main gateways to Auckland (Rigby 1998: 11). On 13 April 1841, the Crown acquired its first large tract of land in the area, known as the Mahurangi Purchase. This included the Mahurangi and



Omaha Block (Deed No. 192) comprising 100,000 acres, ‘more or less’, with boundaries stretching from Takapuna in the south to Te Arai Point in the north (Locker 2001: 64). In 1853 the Puhoi (or Te Hemara) Reserve was granted to Ngāti Rongo, the boundaries of which ran ‘from the south shore of the Pukapuka to Waiwera, and inland to the western boundary of the [Mahurangi] Purchase’ (Locker 2001: 80). In 1866 the title to this reserve was granted to Ngāti Rongo at a Native Land Court hearing. The Puhoi Reserve was eventually surveyed into 10 blocks, with Te Hemara retaining the titles to Maungatauhoro (70 acres), Orokaraka (8 acres) and Puhoi (2537 acres) (Mackintosh 2005: 6).

Following the final settlement of claims against the Mahurangi Purchase in 1853, surveying and land sales in the district continued. Ngāti Whātua were among the signatories of several large land purchases by the Crown, including: the Ahuroa–Kourawhero Block (Deed 201) on 22 June 1854 for £1200; the Wainui Block (Deed 200) on 22 June 1854 for a first instalment of £600, with a final payment of £200 made on 22 January 1855; the Komokoriki No. 1 Block (Deed 203) on 29 September 1862 for £3,500 and the Komokoriki No. 2 Block (Deed 204) on 4 November 1862 for £39-10 (Locker 2001: 81). Across the western boundary of the Mahurangi Purchase line, the Oruawharo Block No. 1 and Block No. 2 were sold to the Crown in 1860 (Turton 1877: 212-213). The above discussed blocks are shown in Figure 4.

## Wellsford

Wellsford was founded by non-conformist settlers known as the ‘Albertlanders’, who had arrived under a Special Settlement Scheme within the provisions of the Waste Land Act of 1858. The Oruawharo Block had been set aside for the Albertland Settlement movement, and by September 1862 the arrival of the *Matilda Wattenbach* had brought the first settlers (Mabbett 1977: 197-198). Wellsford was established in two stages, known as ‘Old Wellsford’ and ‘New Wellsford’. ‘Old’ Wellsford stretched between the mouth of the Whakapirau Stream and the eastern boundary line of the Oruawharo Block. Most settlers in this area arrived together on the vessel *Hanover*. It was not until 1885, when the Old Pakiri Block to the east of the Oruawharo Purchase line was sold to the Crown, that settlement spread further inland, and ‘New’ Wellsford was developed (Mabbett 1977: 372).

Industry in early Wellsford was driven by the timber trade. In 1864 Nicholson’s timber mill was opened on the south bank of the Oruawharo River, allowing for cut timber or logs to be floated down the Whakapirau Stream to be milled (Mabbett 1968: 177). Kauri gum, used for the manufacture of linoleum and varnish, was also an important local resource to early settlers. Temporary gumdiggers’ camps were scattered across the district in the 1870s, with notable diggings at Pakiri, Te Arai, Kaipara Flats and Port Albert (Locker 2001: 226). South of Wellsford, the Wayby Kauri Gum Reserve set aside 500 acres for diggers. The present site of Wellsford at this time was known simply as ‘the gum ridge’ (Mabbett 1968: 177).

By 1900 the timber and gum trades had begun to recede. Settlers turned to farming on their cleared land as the primary source of income. Home dairying was widely developed in the district, and by 1902-3 the establishment of the Wayby Co-operative Dairy Co. provided the area with a creamery factory. Butter and cheese were also produced, with butter sent to Auckland by steamer (Mabbett 1977: 322). The arrival of the North Railway to ‘New’ Wellsford in 1909 cemented viable industry in the town, and as settlers continued to move further inland away from the Whakapirau, modern Wellsford became more clearly defined (Mabbett 1977: 372).

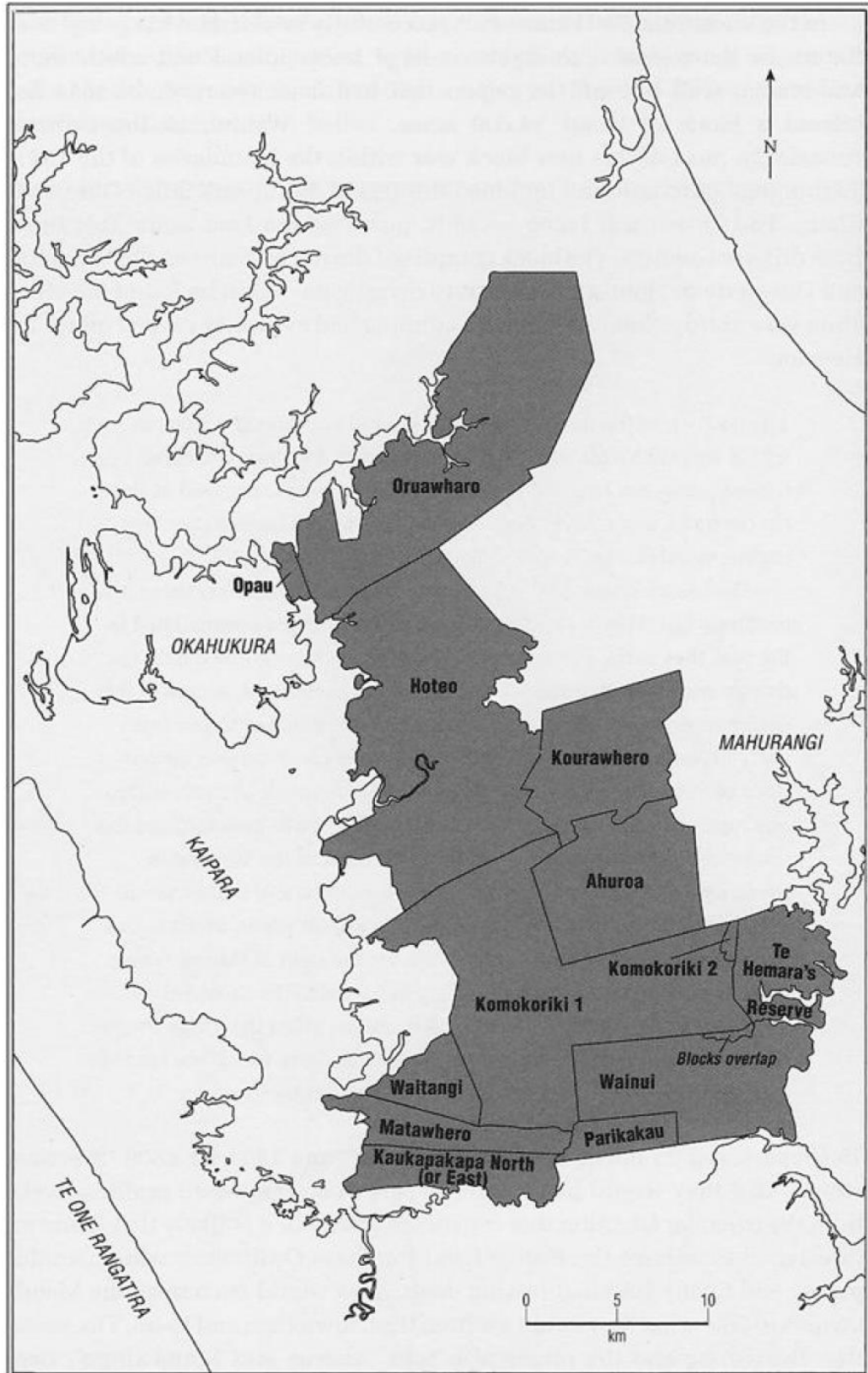


Figure 4. Plan showing the Crown purchases in the Mahurangi and Kaipara, including the Oruawhoro Block in the north (source: Goldsmith 2003: 36)

## HISTORICAL SURVEY

### Information from Early Maps and Plans

As can be seen in the plan in Figure 5, the northern and central parts of the Plan Change Area were all originally surveyed as part of the Oruawharo Block. As can also be seen on this plan, the name 'B. Ramsbottom' is annotated on Allotment SE 118 and 'J. Ramsbottom' on Allotment SW 118. No definite information on was able to be gathered on the two people indicated on the plan during the research for this assessment. However, it is likely that B. Ramsbottom was Benjamin, one of three brothers, the others being Joseph and Walter, who lived in Wellsford during this period (Geni Website). As noted, Block SW 118 (SW) has the initial J. which is considered most likely to be Benjamin's brother Joseph, although it is possible it refers to their father, James. The remainder of the Plan Change Properties which are located in parts of Allot NE 118, Allot 117 and Allot 119 do not have any name annotated on the plan in Figure 5.

A plan dated 1879 in Figure 6 shows that western boundary of the northern and central parts of the Plan Change Area ran alongside the main road north at this time, while the southern section was set back from the road. The plan in Figure 7 which is dated 1894 shows Allot 117A, as can be seen in the plan, 117A contains a house and it is noted this is the only building indicated on any of the 19<sup>th</sup> century plans reviewed. The plan also shows the land within the Plan Change Area which has the description 'Open Fern and Tea Tree' annotated, which indicates it was not under cultivation at this time.

Twentieth century plans were also reviewed and the 1923 plan in Figure 8 shows several of the original allotments included in the Plan Change Area, with allotment NE 118, a small part of which is in the Plan Change Area described as grassland. It is also noted that Allotment SW 118 now has the name Corcoran annotated, although Allotment NW 118 (just outside the Plan Change Area is still owned by a member of the Ramsbottom family). Another plan dated 1947 (Figure 9) shows the north-western part of the Plan Change Area with the name H.W. Watson. It is noted that Grace Fielden Watson married Benjamin Thomas Ramsbottom and it is possible that H.W. Watson was related to the Ramsbottom family through Grace (Geni Website). The plan in Figure 10 dated 1959 shows a subdivision that created four small residential lots in the corner of Allotment SW 118. With regards to the parts of the Plan Change Area in Allotment 119, the 1969 plan in Figure 11 shows the subdivision that created Lot 1 DP 61904 and the 2004 plan also in Figure 11 shows the subdivision that created Lot 5 DP 338255.

The southern part of the Plan Change Area is located in the Otamatea Survey District in Sections 25 and 26. The two plans dated 1914 in Figure 12 show subdivisions of Allotment 25 with both plans bearing the signature of William Armitage and with the names annotated on the lots being L.F. Armitage and P.L. Armitage. The name William Armitage of Wellsford appears in several newspaper articles dated to the late 1880s and 1890s<sup>1</sup>. As well, a William Armitage is noted as having been part of the original Albertland settlement

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<sup>1</sup> Newspaper articles mentioning William Armitage of Wellsford – *New Zealand Herald* 29 October 1884, *New Zealand Herald* 14 September 1888 and *Auckland Star* 20 June 1893.

in 1863 and that he ran the co-op store (Albertland Museum Website). It could not be ascertained during research for this assessment if this was the same individual whose signature was present on the 1914 plans in Figure 12, but it is considered likely. Plans dating from the 1934 and 1936 in Figure 13 show further subdivision of Allotment 25 to the west of the Plan Change Area (along the main North Road) into small residential lots with the land within the Plan Change Area remaining largely intact. Subdivision of the land to the west of the Plan Change Area continued on during the 1940s, 1950s and into the 1970s, with plans<sup>2</sup> (not shown) indicating these subdivisions.

It is noted that a plan dating from 1947 (AK DP 34748) shown in Figure 14 has the applicant signature of Lewis F. Armitage, showing that the land in the area remained in the family well into the middle years of the 20th century. It is also noted that one of the streets to the west of the Plan Change Area bears the name of the Armitage family. At the southernmost part of the Plan Change Area the 1977 plan in Figure 15 shows that Lots 22 and 23 DP 85114 were subdivided in Allotment 26 at that time.

In general, the old plans that were reviewed show that the land in the Plan Change Area was granted to settlers in the 19th century. It is considered likely that at least some of the land was in use for agriculture, and the presence of one house is indicated in Allotment 117A in the north-eastern corner of the Plan Change Area on an 1894 plan. Based on plans dating from the 20<sup>th</sup> century, most of the properties within the Plan Change Area were either not developed or subdivided for residential use after 1900.

## Information from Early Aerials

Aerial photographs were reviewed to gather information on the Plan Change Area. The aerial photographs in Figure 16 show the Plan Change Area in 1961 and 2021. As can be seen in both aerial photographs, there were few changes over this time period, with the land remaining for the most part in pasture with some wooded areas, especially along the main stream that runs through the central part of the Plan Change Area from north to south and the branches of the stream in the south.

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<sup>2</sup> Plans showing subdivision of the land to the west of the southern part of the Plan Change Area – AK DP 34748 (1947), AK DP 37943 (1950), AK DP 83752 (1977) and AK DP 91257 (1979).



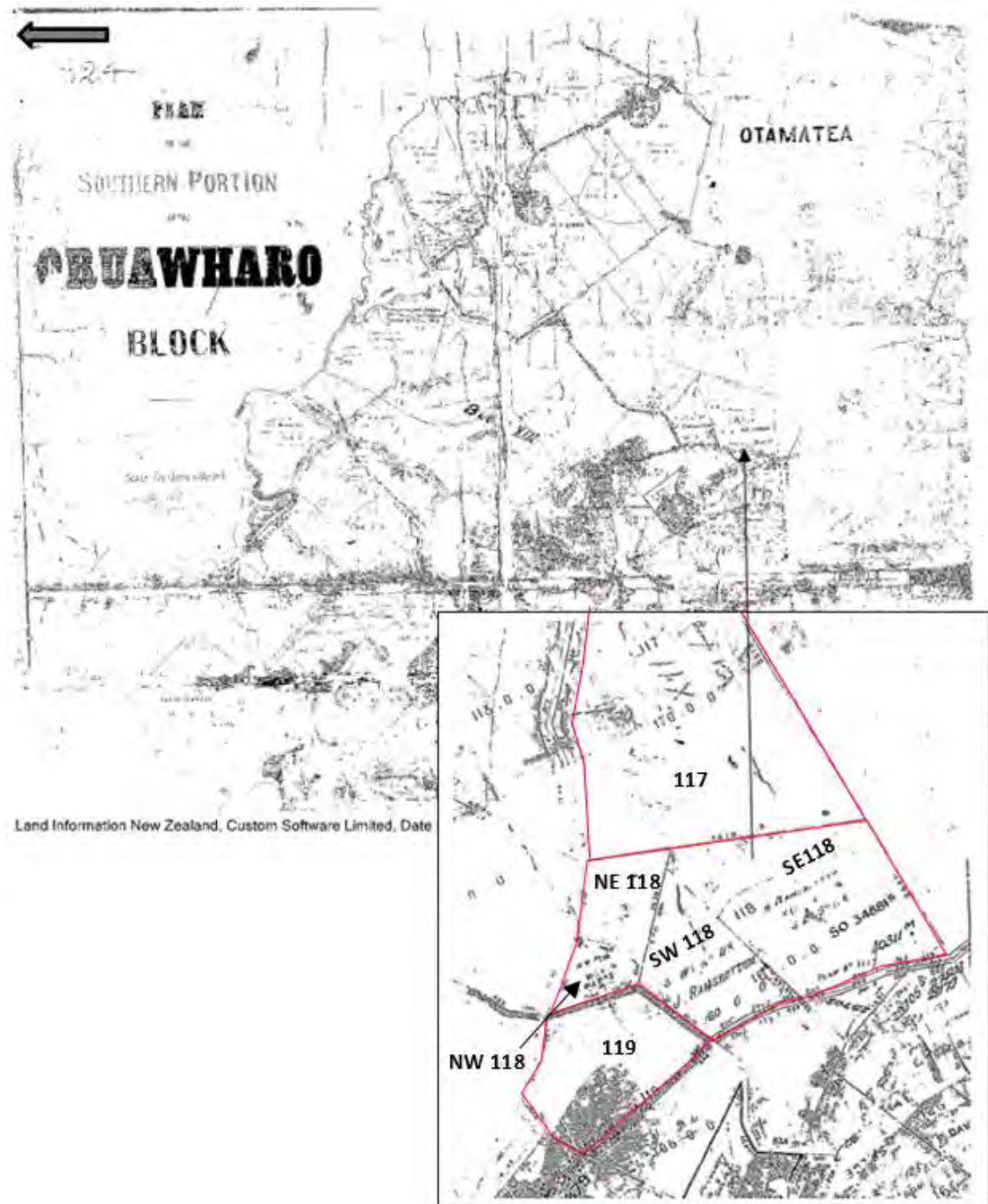


Figure 5. Plan AK SO 824 (not dated) with Allotments within the Oruawharo Block included in the Plan Change Area (circled in red) and with details shown in lower inset – (note orientation of plan- as the allotments shown make up the northern and central parts of the Plan Change Area) (source: Quickmap)

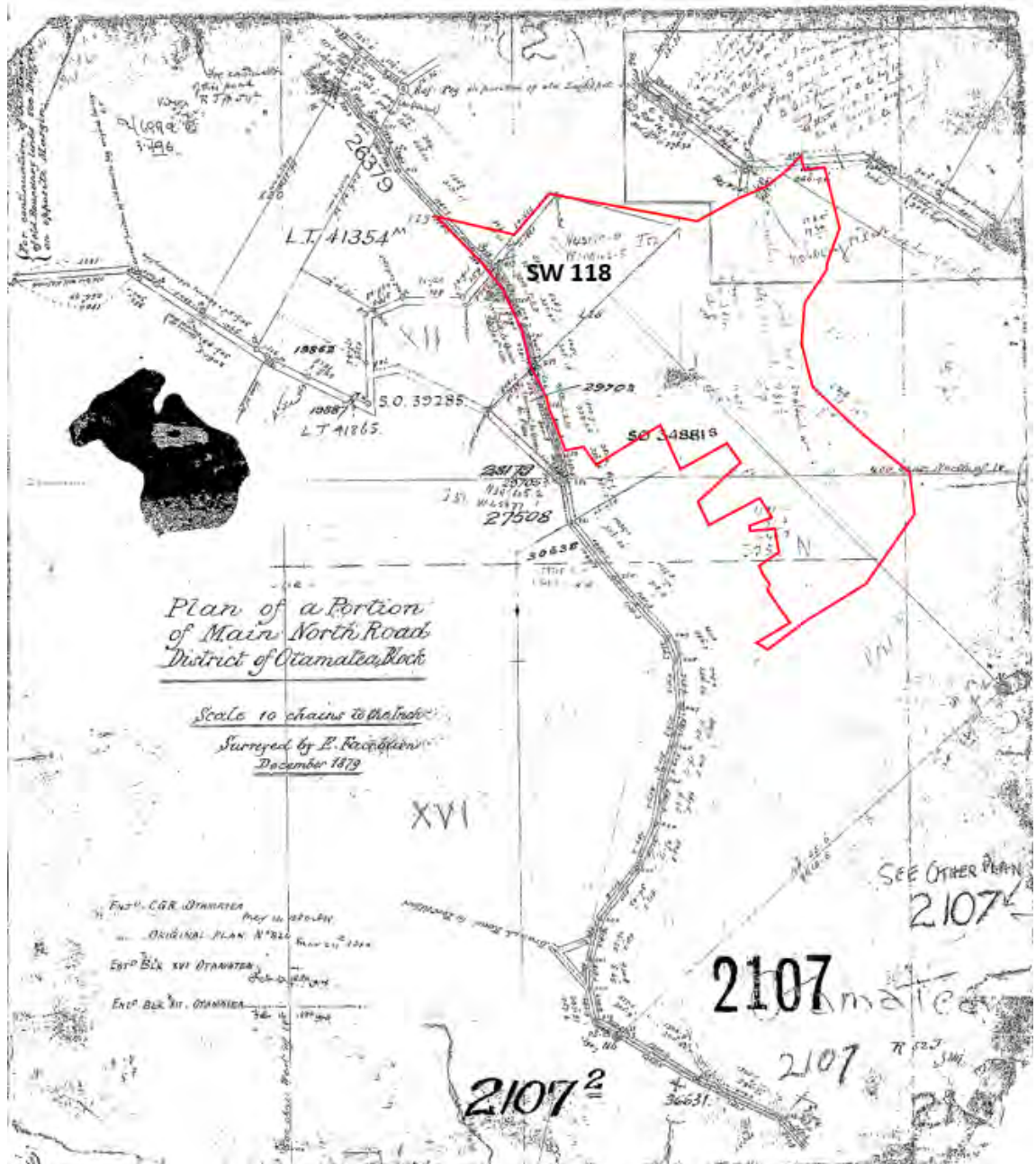


Figure 6. AK SO 2107 plan dated 1879 showing the alignment of the 'Main North Road' with the Plan Change Area outlined in red and Allotment SW 118 indicated (source: Quickmap)

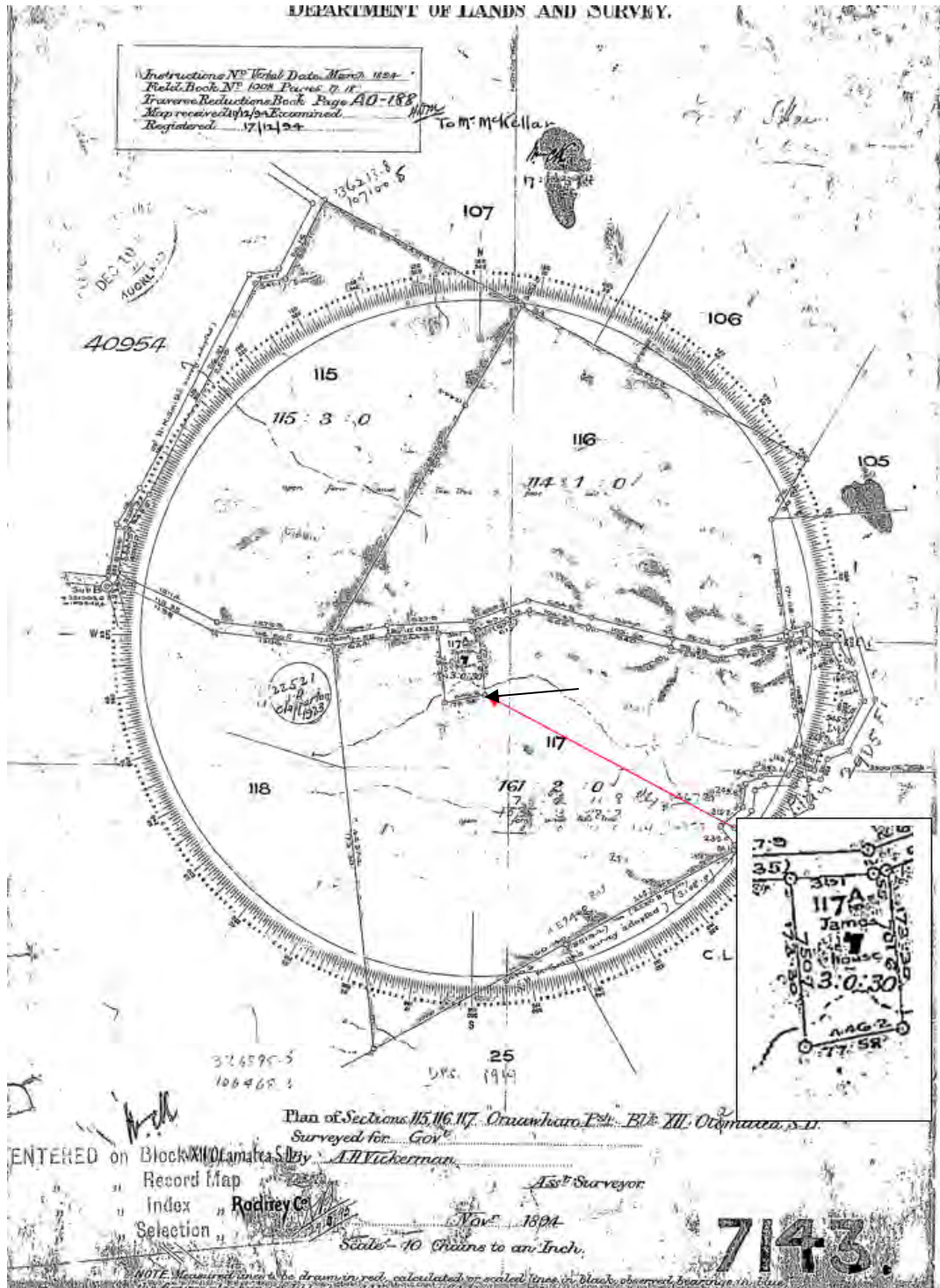
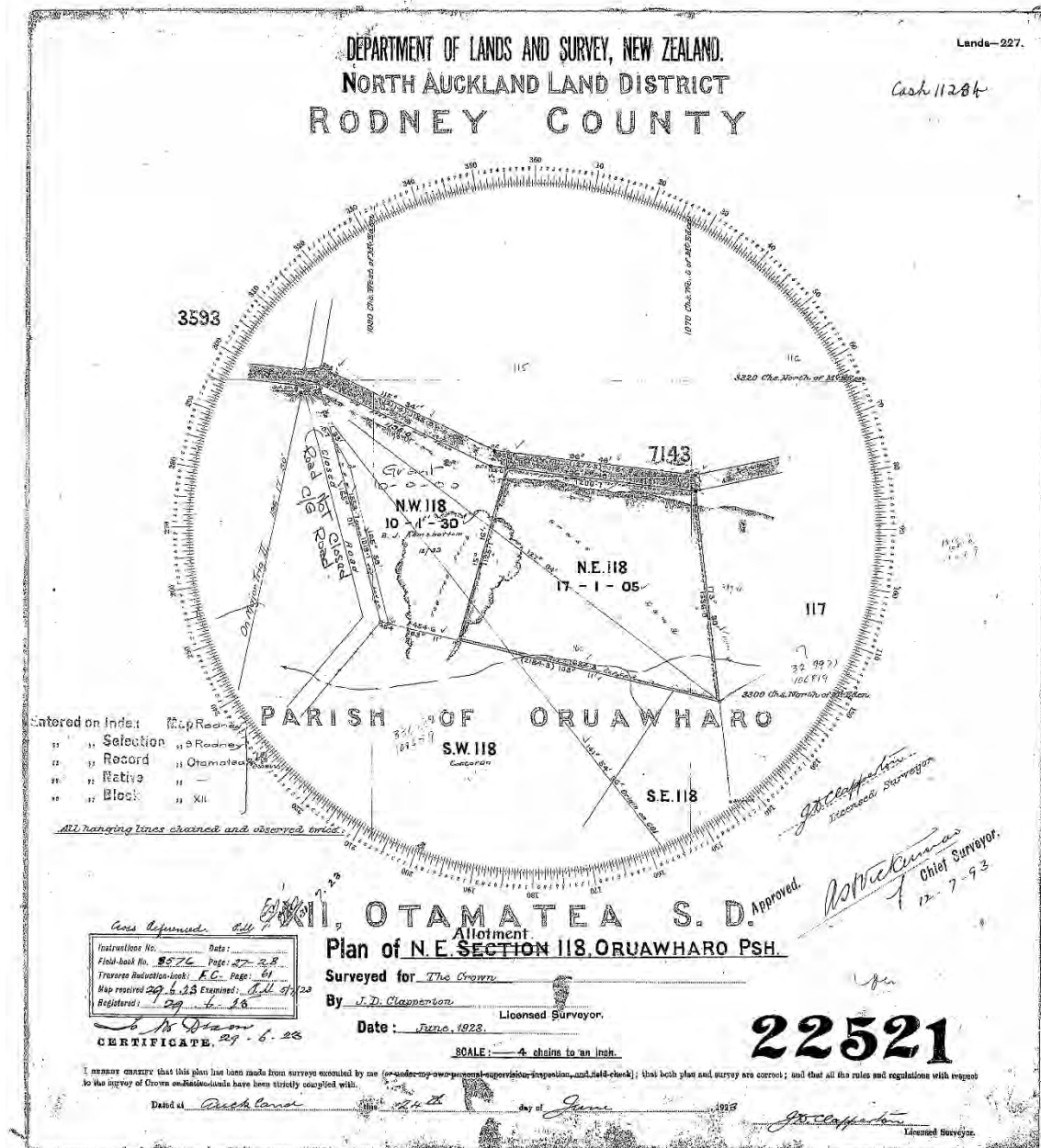


Figure 7. AK SO 7143 plan dated 1894 with the parts of Allotment 117, NE 118 and Allot 117A with a house (detail in inset) (source: Quickmap)

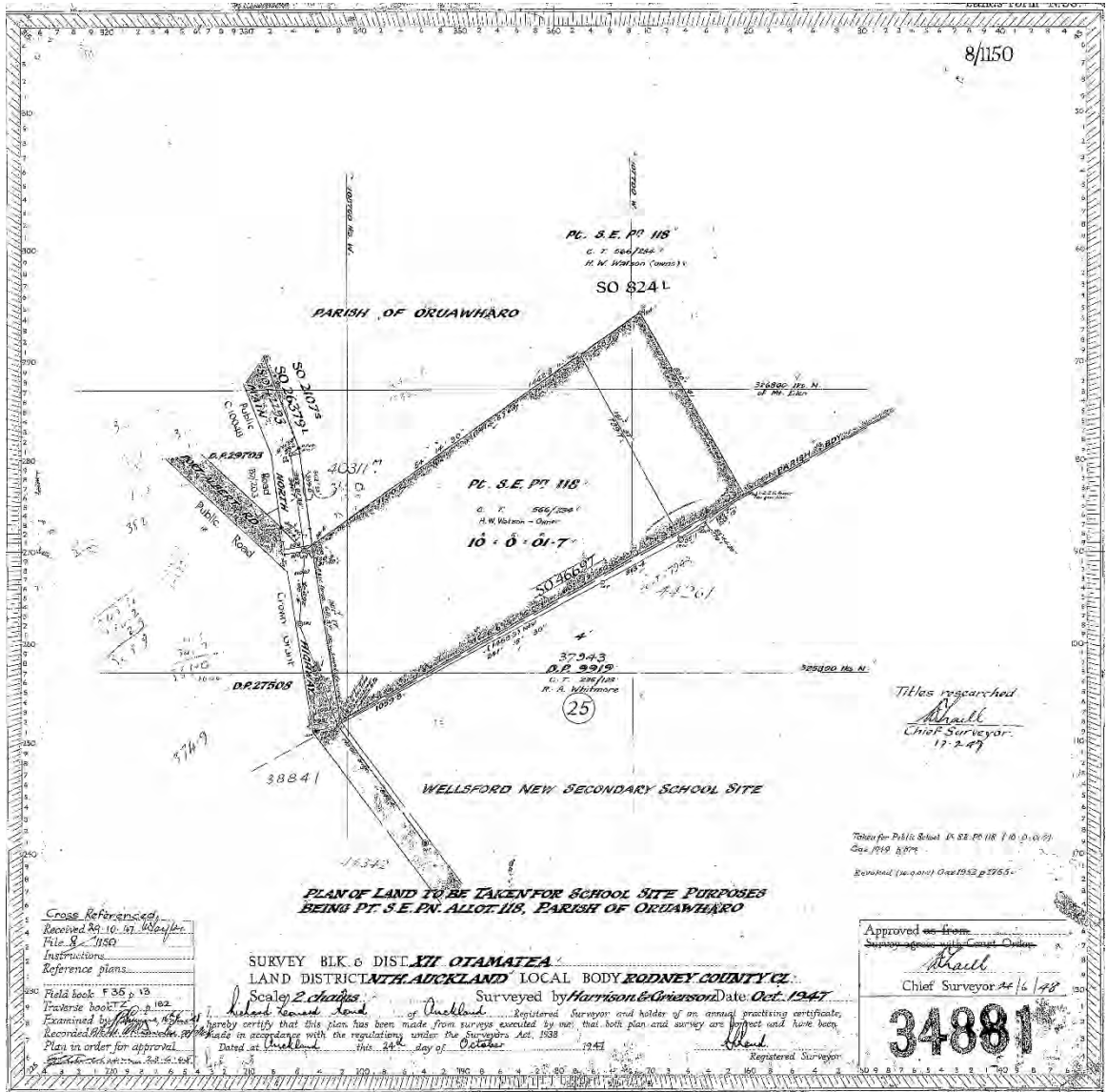




Land Information New Zealand, Custom Software Limited, Date Scanned 2002. Last modified November 2002. Plan is not current as at 18/04/2022

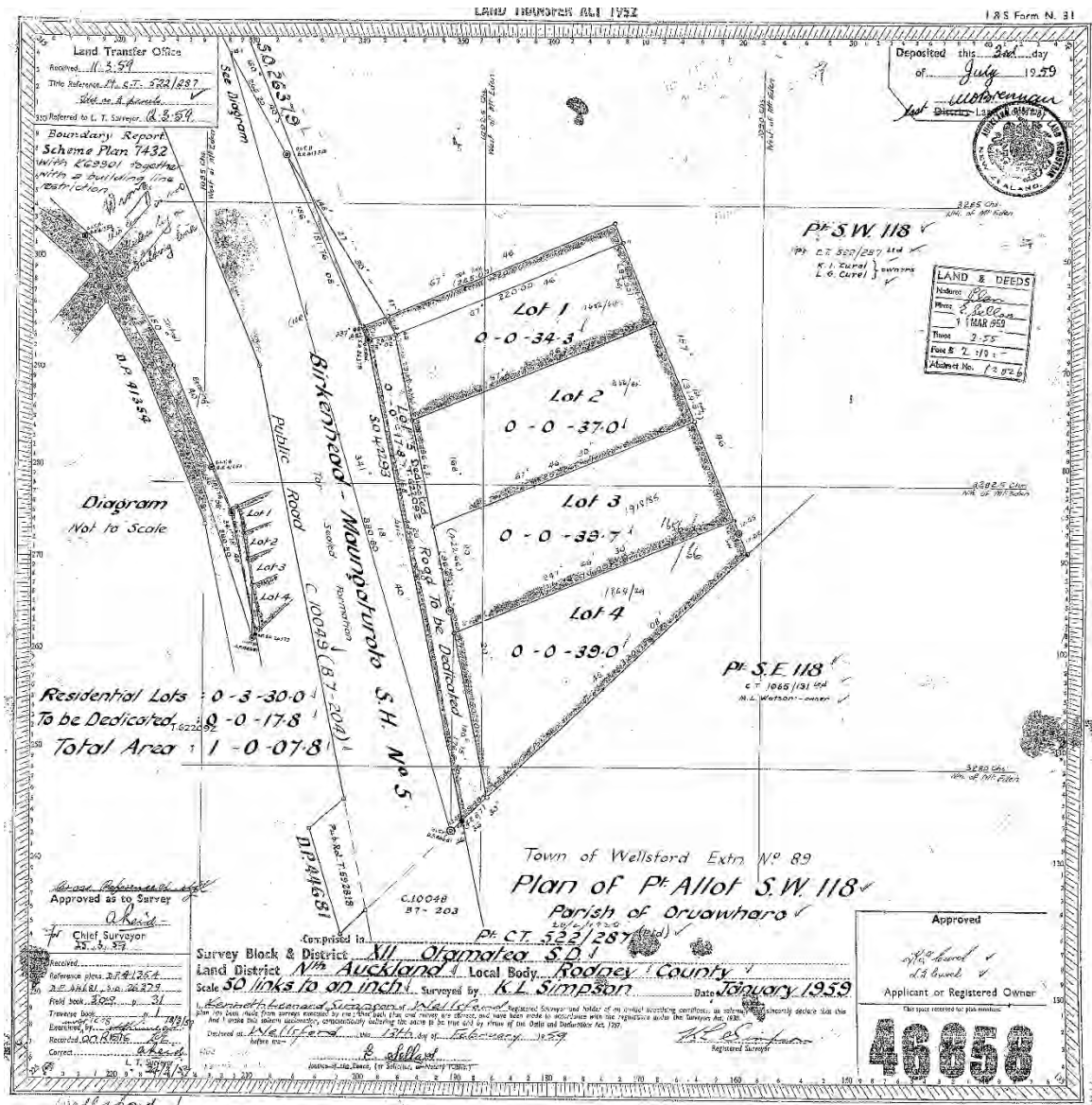
Figure 8. AK SO 22521 plan dated 1923 showing several of the 19<sup>th</sup> century allotments included in the Plan Change Area with Allotment NE 118 having the description 'grassland' annotated and the name 'Corcoran' annotated on Allotment SW 118 (source: Quickmap)





Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002. Plan is probably current as at 07/09/2011

Figure 9. AK SO 34881 plan dated 1947 showing Pt S.E. Allot 118 with 'H. W. Watson owner' annotated (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is probably current as at 21/04/2022

**Figure 10. AK DP 46858 plan dated 1959 showing the subdivision of four small residential lots in the southwest corner of Allotment SW 118 (source: Quickmap)**



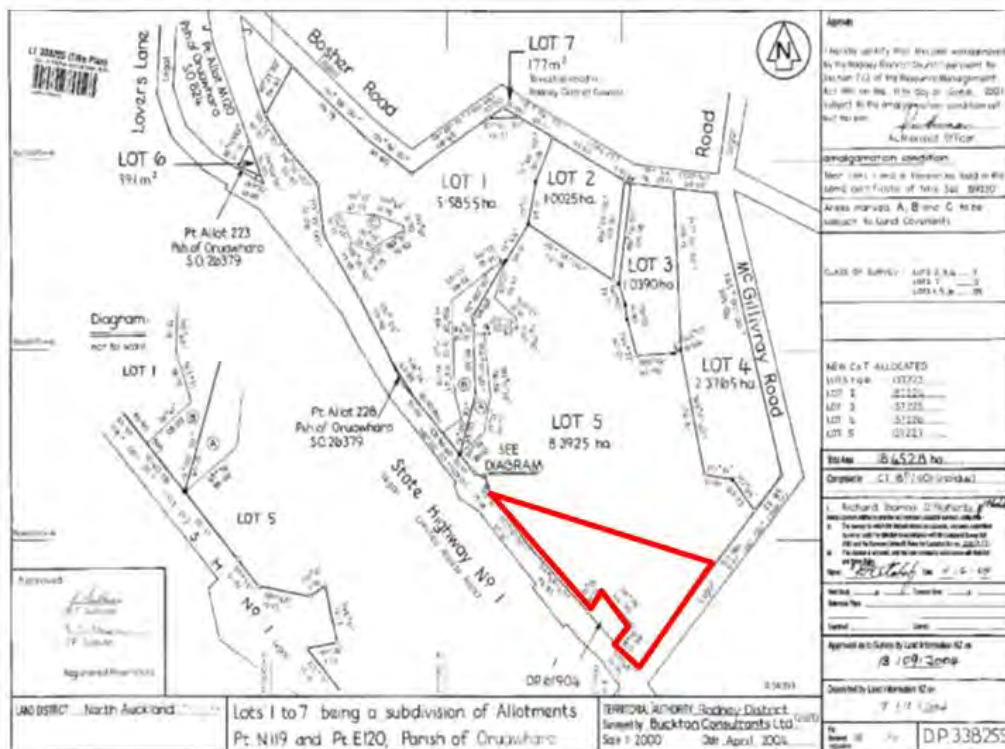
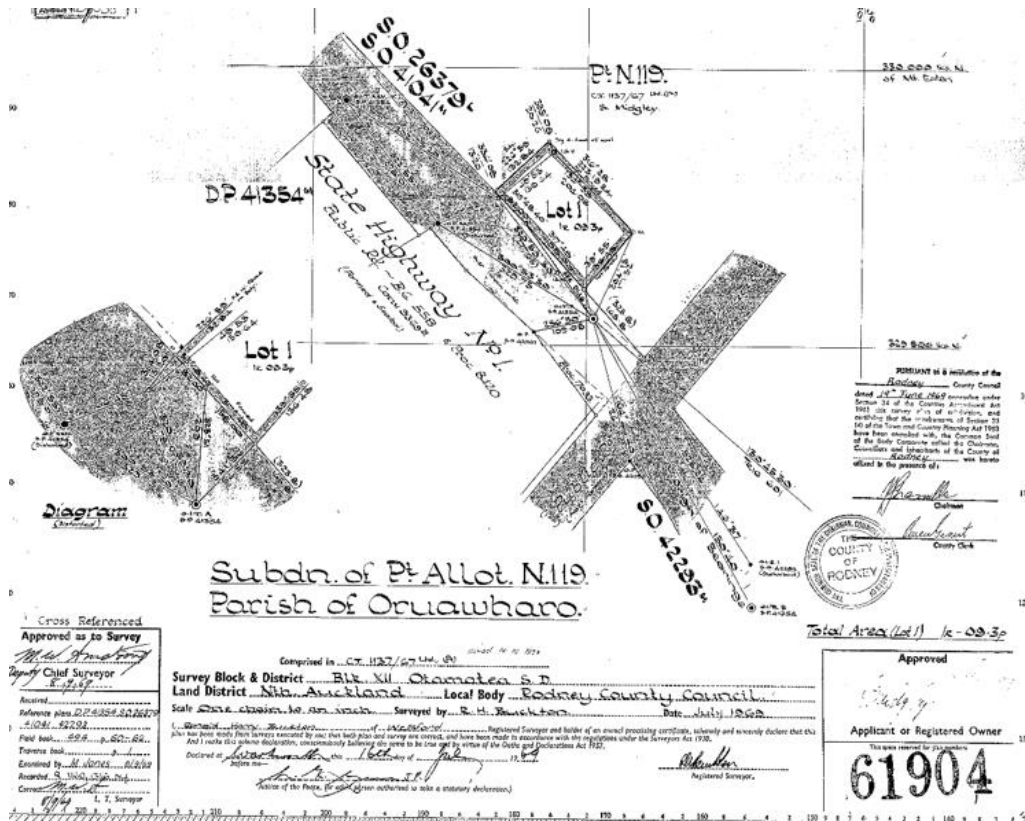
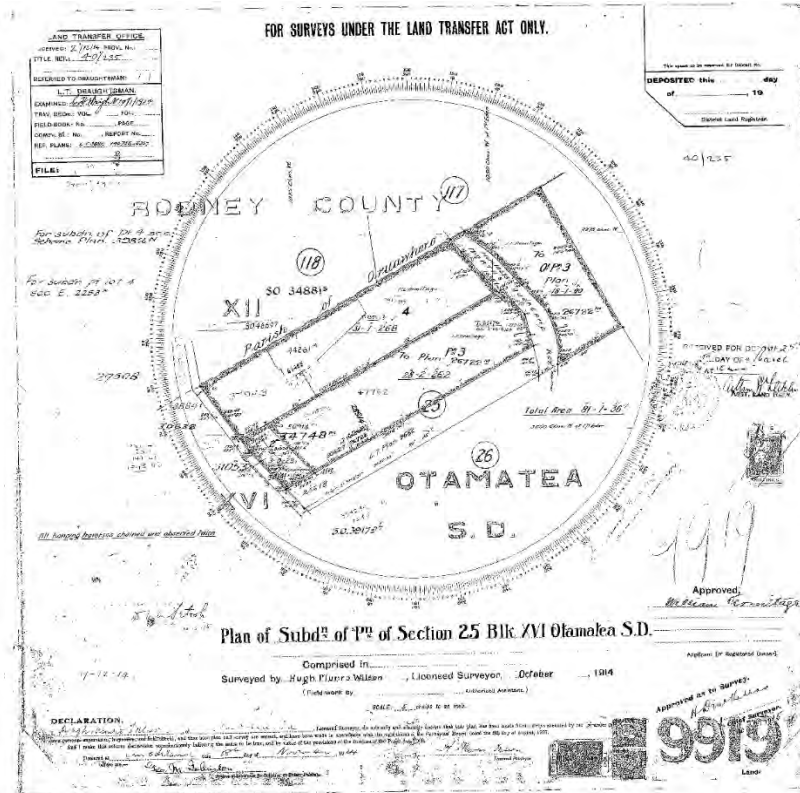
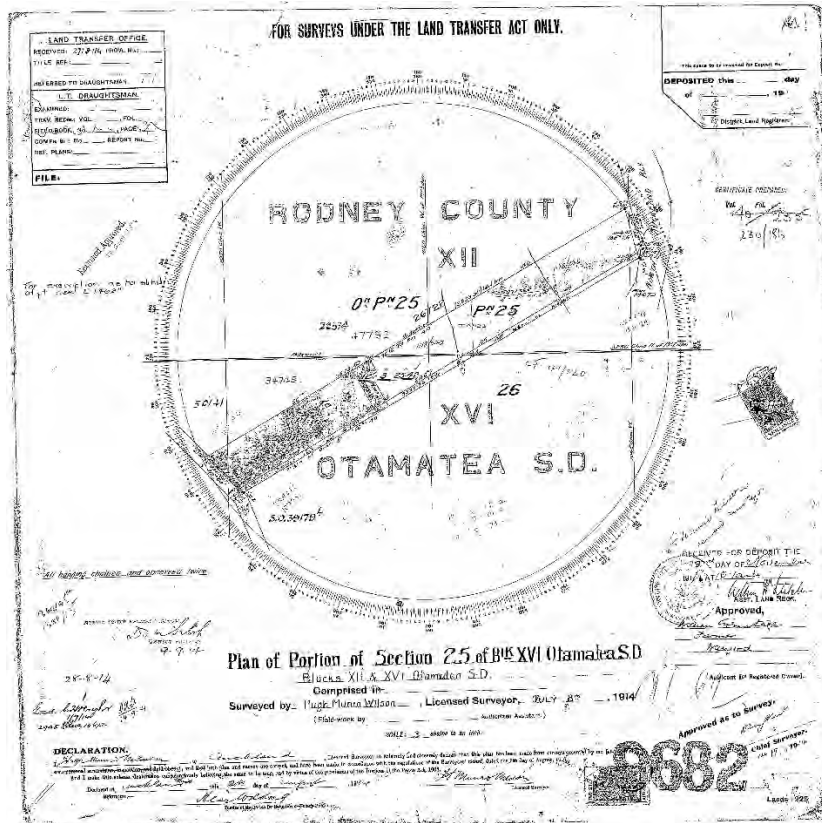


Figure 11. Plans showing subdivision in Allotment 119- Upper plan DP 61904 dated 1969 showing the subdivision that created Lot 1 DP 61904 and lower plan AK DP 338255 dated 2004 showing the subdivision of Lot 5 of which a small part (outlined in red) is relevant to this assessment (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is not current as at 07/09/2021



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is probably current as at 13/10/2021

Figure 12. AK DP 9919 plan dated 1914 (upper) and AK DP 9682 also dated 1914 (lower) showing the southern part of the Plan Change Area (source: Quickmap)



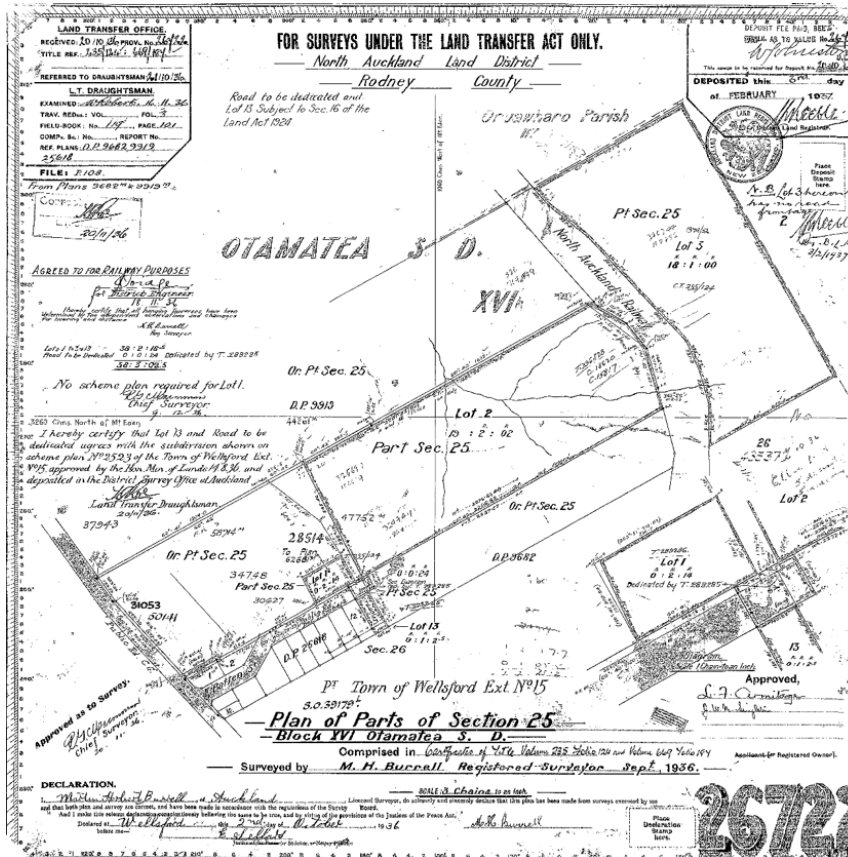
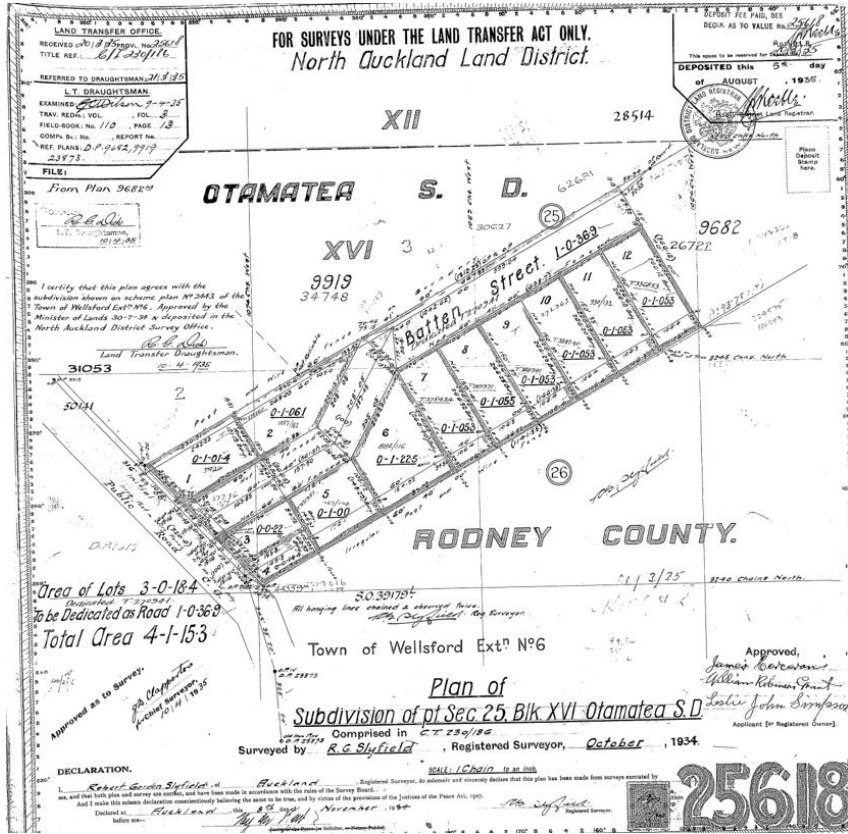


Figure 13. AK DP 25618 dated 1934 (upper plan) and AK DP 26722 (lower plan) dated 1936 showing subdivision in parts of Section 25 in the southern part of the Plan Change Area (source: Quickmap)



Land Information New Zealand, Custom Software Limited, Date Scanned 2002, Last modified November 2002, Plan is probably current as at 18/04/2022

**Figure 14. AK DP 34748 plan dated 1947 showing subdivision to the west of the Plan Change Area (along the main North Road) with the signature of Lewis F. Armitage as applicant (source: Quickmap)**



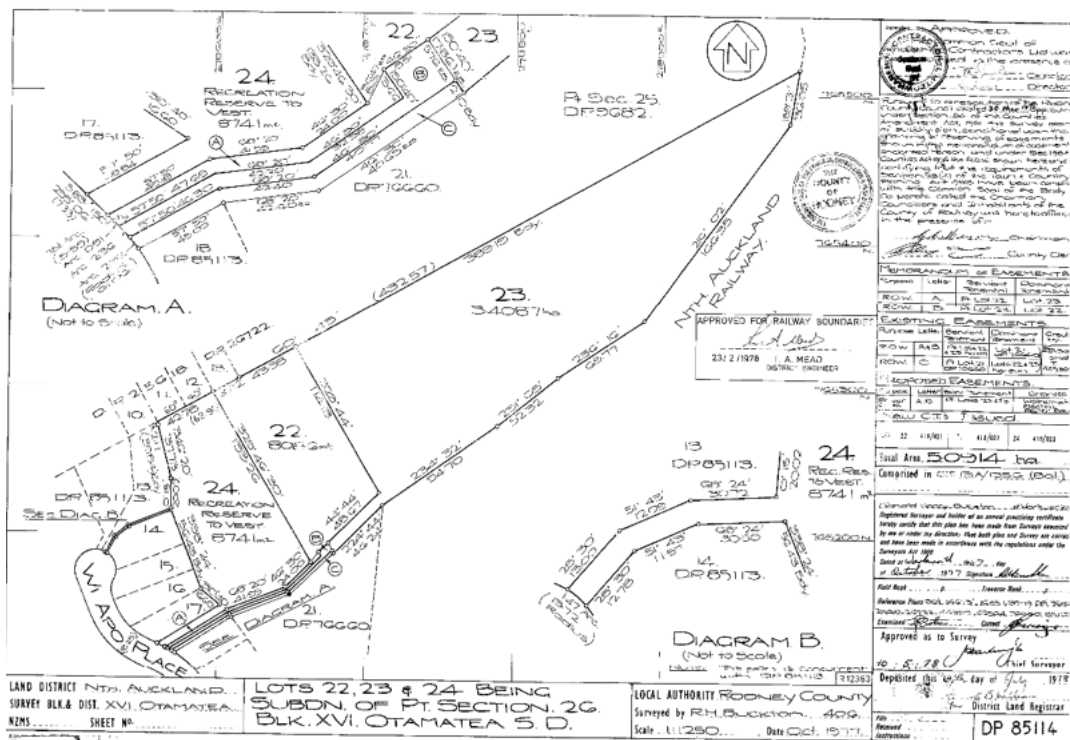


Figure 15. AK DP 85114 dated 1977 showing a subdivision in Allotment 26 (at the southernmost part of the Plan Change Area) creating lots 22 and 23 (source: Quickmap)

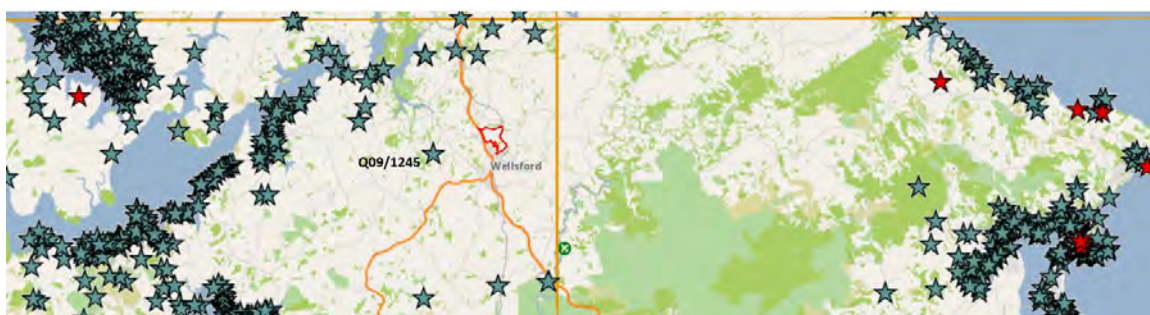


**Figure 16. Upper aerial photograph dated 1961 (Crown 1338 A 2) and lower aerial photograph dated 2021 showing that there has been little change in the Plan Change Area in the last 60 years (upper aerial sourced from: <http://retrolens.nz> and licensed by LINZ CC-BY 3.0 and lower from GoogleEarth)**



## ARCHAEOLOGICAL BACKGROUND

There are no recorded archaeological sites within the Plan Change Area or in the vicinity, with the majority of sites located along the east and west coasts and sections of navigable waterways, as can be seen in the map in Figure 17. The nearest recorded site is a pā (Q09/1245) to the west that was marked on a 1928 Geological Survey Map (Harris, Hannah and Ferrar 1928) and reviewed on aerial photographs but which has not been visited. It is noted on the New Zealand Archaeological Association site record that the general area around the pā has also not been visited. It should be noted that the area around the Plan Change Area has also not been surveyed previously and that the lack of recorded archaeological sites may reflect this.



**Figure 17. Map showing the Plan Change Area (outlined in red) and the general distribution of recorded archaeological sites in the broader area with the pā site (Q09/1245) identified (note that blue stars indicate approved sites and the status of red star sites is pending (source: NZAA ArchSite)**

### Other Historic Heritage Places

There are no recorded historic heritage places in the Plan Change Area. Two historic heritage places have been recorded in the vicinity (within c.400m) on the Auckland Council CHI. These are both historic buildings. CHI: 16574 is a corner bay villa of timber (weatherboard) with a corrugated iron roof, but with no further information provided on the CHI record. The second historic heritage place is the Church of Christ Hall. It was originally the Church of Christ Chapel built in 1906 and was moved to its current site in 1934. It is included in schedule 14.1 of the AUP (ID: 00528). A brief summary of these two historic heritage places and the archaeological site described above is provided in Table 2 and the locations of the two historic heritage places is shown in Figure 18.

**Table 2. Summary description of the recorded historic heritage places in the vicinity of the Plan Change Area (within c. 400m)**

CHI No.	NZAA Ref	AUP Ref	Site Type	Description	NZTM Easting	NZTM Northing
16574	n/a	n/a	Historic Structure	Corner Bay Villa- construction date not established.	1736904	5982837
16567	n/a	00528 Cat B	Historic Structure Ecclesiastical	Church of Christ Hall- relocated building – originally Church of Christ Chapel	1736787	5982770
22798	Q09/1245	n/a	Pā	Site indicated on a 1928 geological map- it has not been visited.	1734525	5982917



Figure 18. Aerial plan showing the location of the two historic heritage places recorded on the CHI in relation to the Plan Change Area (outlined in yellow) (source: Auckland Council Geomaps).



## PHYSICAL ENVIRONMENT

### *Topography, Vegetation and Land use*

The Plan Change Area is characterised by an undulating landscape with rolling hills sloping down to a stream gully that runs through the central section with several branches in the south. The land is mostly grass covered with trees visible along the stream and its branches. These features can be seen in the aerial photographs shown in Figure 19 and Figure 20.



**Figure 19. Aerial photograph with contours showing the Plan Change Area outlined in red (source: Auckland Council Geomaps)**





Figure 20. Aerial plan showing the streams running through the Plan Change Area, which is outlined in red (source: Auckland Council Geomaps)



## FIELD ASSESSMENT

### Field Survey Results

A visual inspection of the Wellsford Welding Club property was undertaken on 18 October 2021 by Aaron Apfel. The ground surface was examined for evidence of former occupation or land use (in the form of shell midden, depressions, terracing or other unusual formations within the landscape relating to Māori settlement; or indications of 19th century European settlement or industrial remains). Subsurface testing with a probe was conducted on a regular basis in approximately 10m intervals in conjunction with test pitting, in order to understand the local stratigraphy. Test pits approximately 20cm by 20cm were placed in the vicinity of the waterways. Photographs were taken to record the landscape and any features of interest, in conjunction with field notes.

The surveyed area consists of a relatively large amount of land with a varied terrain, with a large central stream running in a northwest-southeast orientation through the central section (Figure 21). Another stream is located adjacent to the northeast border running in an approximately east-west orientation. Both of these streams have numerous branches leading into other parts of the property. Additionally, these streams are connected to various overland flow paths. A significant amount of rainfall had occurred around the time of survey and, as a result, the majority of these overland flow paths contained water (Figure 22).

The terrain on the southern side is relatively hilly with slopes that are typically gentle but occasionally steep. These slopes tend to be most significant in the areas immediately surrounding the central stream, its branches and overland flow paths as the slopes lead into the stream. Additionally, there are numerous relatively flat areas amongst the gentle slopes. The southwest side of the property contains a relatively large and long hill that has a steep slope leading down eastwards towards the central stream. The remainder of the entire west side of the property also contains a relatively significant hillside that slopes down east/northeast typically towards the central stream. (See photographs in Figure 23 - Figure 26).

The central east side contains a large amount of flat terrain at a high elevation above the central stream and its branches. The central and northern portions contain relatively flat terrain with occasional rolling slopes. These slopes are again more significant in the areas immediately surrounding the central stream, its branches and overland flow paths as the slopes lead into the stream. The central-east and north-east borders of the property typically contain steep hillsides sloping down to the west. The steepest terrain observed on the property was in the central-southern portion in the area immediately surrounding the central stream, within an area currently covered in dense vegetation. Additionally, considerable areas of erosion caused by the stream were also observed. A significant amount of tree cover is present on the property. However, this is almost exclusive to areas surrounding the streams. The largest area of trees is located on the central-southern portion of the property where dense forest surrounds the central stream. In addition to trees, the presence of various wetland shrubs was also noted along the streams. The rest of the property consists of paddocks that were being grazed by cattle at the time of the survey. (See photographs in Figure 27 and Figure 28).

Impacts to the ground surface from stock movements were observed throughout the property. The only structures present on the property are three relatively large sheds/cattle

enclosures, one of which is rounded in shape and made of corrugated iron on the central north side of property, and the other two of timber/plywood on the central southeast and central west sides of the property. Some tree clearance appears to have taken place adjacent to the western boundary, as a large pile of cut trees/wood was present. (See photographs in Figure 29 and Figure 30).

Eight stratigraphic profiles were undertaken, six from test pits and two from areas exposed through erosion. Figure 31 is an aerial photograph showing permanent streams and overland flow paths and the location of each test pit and exposed soil profile that was recorded during the survey. Table 3 provides the NZTM coordinates. The majority of test pits were placed on the south side of the property adjacent to the central stream, its branches and overland flow paths. This is because this area appeared particularly promising in terms of terrain, which contained numerous flat areas adjacent to the stream in addition to slopes and hills that provided a good view of the surrounding area.

Profile 1 (Figure 32) was obtained from a test pit placed on the south/southwest side of the property at the top of a hill above the central stream. This pit was 15cm deep and the stratigraphy was as follows:

- Layer 1: 11cm of a moderately loose, medium brown soil with minor root disturbance.
- Layer 2: 3cm of a moderately compact, light brown/orange clay slightly mottled with medium brown soil (layer 1), presumably caused by stock trampling.
- Layer 3: 1cm+ of a compact, light brown/orange clay.

Profile 2 (Figure 33) was obtained from a test pit on placed on the south side of the property adjacent to a stream-branch of the central stream. This pit was 17cm deep and the stratigraphy was as follows:

- Layer 1: 10cm of a moderately loose, medium brown soil.
- Layer 2: 6cm of a moderately compact, light brown/orange clay significantly mottled with medium brown soil (layer 1), presumably caused by stock trampling.
- Layer 3: 1cm+ of a compact, light brown/orange clay.

Profile 3 (Figure 34) was obtained via further exposing exposed erosion on the south side of the property adjacent to a stream-branch of the central stream. This portion of exposed erosion was 30cm deep and the stratigraphy was as follows:

- Layer 1: 10cm of a moderately loose, medium brown soil.
- Layer 2: 8cm of a moderately compact, light brown/orange clay significantly mottled with medium brown soil (layer 1), presumably caused by stock trampling.
- Layer 3: 12cm of a compact, light brown/orange clay. A large deposit of layer 2 exists at a depth of 18cm up to the base of the test pit (30cm), presumably formed from particularly deep stock trampling.

Profile 4 (Figure 35) was obtained from a test pit placed on the south side of the property on top of a hill adjacent to a branch of the central stream. This pit was 20cm deep and the stratigraphy was as follows:

- Layer 1: 18cm of a moderately loose, medium brown soil.

- Layer 2: 2cm+ of a compact, light brown/orange clay.

Profile 5 (Figure 36) was obtained via further exposing erosion exposed soils on the east side of the property near the base of a relatively steep slope of a hill, within close proximity to the central stream. This portion of exposed erosion was 52cm deep and the stratigraphy was as follows:

- Layer 1: 10cm of a moderately loose, medium brown soil.
- Layer 2: 10cm of a moderately compact, light brown/orange clay significantly mottled with medium brown soil (layer 1), presumably caused by stock trampling.
- Layer 3: 32cm+ of a compact, light brown/orange clay.

Profile 6 (Figure 37) was obtained by placing a test pit on the east side of the central stream on the central portion of the property. This pit was 15cm deep and the stratigraphy was as follows:

- Layer 1: 5cm of a moderately loose, medium brown soil.
- Layer 2: 5cm of a moderately compact, light brown/orange clay significantly mottled with medium brown soil (layer 1), presumably caused by stock trampling.
- Layer 3: 5cm+ of a compact, light brown/orange clay.

Profile 7 (Figure 38) was obtained by placing a test pit on the west side of the central stream on the central portion of the property. This pit was 15cm deep and the stratigraphy was as follows:

- Layer 1: 3cm of a moderately loose, medium brown soil.
- Layer 2: 11cm of a moderately loose, medium brown soil slightly mottled with clay (layer 3), presumably caused by stock trampling.
- Layer 3: 1cm+ of a compact, light brown/orange clay.

Profile 8 (Figure 39) was obtained by placing a test pit on the south side of the northeast stream on the northeast side of the property. This pit was 16cm deep and the stratigraphy was as follows:

- Layer 1: 14cm of a moderately loose, medium brown soil.
- Layer 2: 2cm+ of a compact, light brown/orange clay.

Both the ground surface and subsurface of the majority of the property appears to be relatively undisturbed. However, the stratigraphy from almost every profile showed evidence of significant stock trampling where clay had mixed with topsoil. Only two areas where a profile was obtained did not appear to display this stock trampling disturbance. These were Profile 4 from the south side of the property on top of a hill adjacent to one of the branches of the central stream, and Profile 8 from the northeast side of the property adjacent to the northeast stream.

No archaeological features or deposits were identified during the survey.





**Figure 21. Top left: central stream surrounded with dense vegetation, standing on central south side of property facing northwest. Bottom left: branch from central stream on south side of property, facing northeast. Top right: branch from central stream on central east side of property, facing northwest. Bottom right: central stream on far south end of property near to where profile 2 (described below) was taken, facing north**



**Figure 22. Stream on northeast side of property, facing northwest**





**Figure 23. Left photograph: standing on south side of property facing north towards central stream showing relatively flat areas. Note slope on southwest side of property in left background. Right photograph: standing on south side of property facing southeast showing gentle slopes**



**Figure 24. Left photograph: standing adjacent to stream-branch of central stream adjacent to profile 3 (described below), facing north showing steep terrain. Right photograph: standing on south side of property adjacent to southern border, facing northeast showing gently rolling slope**



**Figure 25. Left photograph: taken standing on top of hill on southwest side of property facing north/northeast towards central stream. Right photograph: standing on central northwest side of property facing southwest towards west boundary of property**



**Figure 26. Left photograph: standing on slope on southwest side of property, facing south. Right photograph: standing on slope on southwest side of property facing east/northeast towards central stream**



**Figure 27. Photograph: standing on central east side of property adjacent to shed, facing northwest towards central stream and dense vegetation.**



**Figure 28. Top: standing at approximate centre of property near central stream, facing east/northeast. Note slopes to the northeast sloping down westwards. Bottom left: standing on central east side of property adjacent to east border facing northwest. Note slopes leading westwards Bottom right: standing on central east side of property facing northwest**





**Figure 29. Top: standing on west side of central stream on central-south side of property, facing down slope towards stream. Bottom left: standing on east side of central stream on central-south side of property, facing down slope towards stream. Bottom right: significant erosion and large rocks in central stream on central-south side of property, facing north**



**Figure 30. Top: large rounded corrugated iron shed located on central north side of property, facing east. Bottom left: shed located on central south-east side of property adjacent to central stream, facing south. Bottom right: shed located on central west side of property, facing southwest**



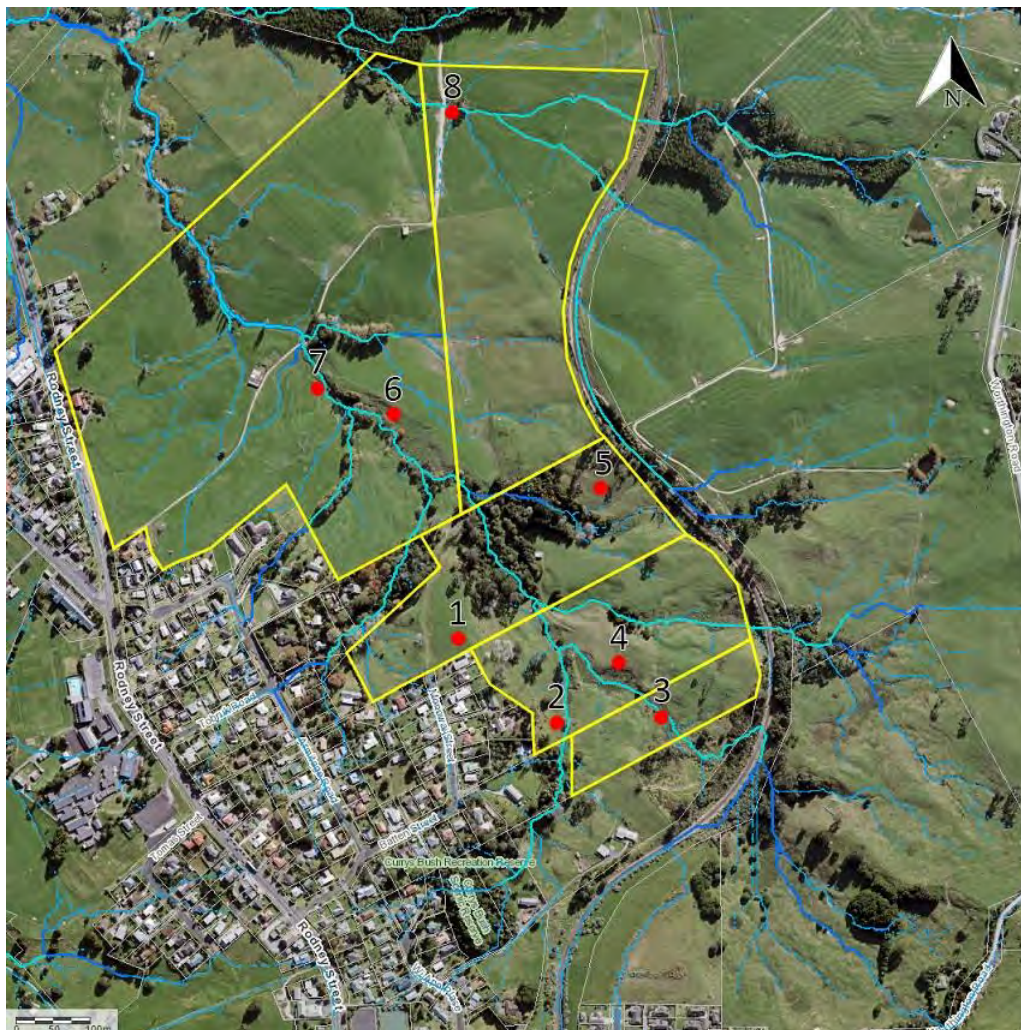


Figure 31. Aerial plan showing permanent streams (turquoise lines) and overland flow paths (blue lines) with the locations of test pits and exposed profiles recorded during the survey indicated by red dots (source: Auckland Council Geomaps)

Table 3. Coordinates of recorded profiles from test pits and exposed soil recorded during the survey

Profile Number	Profile Type	NZTM Coordinates ±3m
1	Test pit	1737050 5983166
2	Test pit	1737180 5983057
3	Exposed erosion	1737319 5983065
4	Test pit	1737259 5983134
5	Exposed erosion	1737237 5983376
6	Test pit	1736953 5983479
7	Test pit	1736850 5983518
8	Test pit	1737035 5983897





Figure 32. Left: stratigraphy of Profile 1. Right: location of Profile 1 facing north



Figure 33. Left: stratigraphy of Profile 2. Right: location of Profile 2, facing north

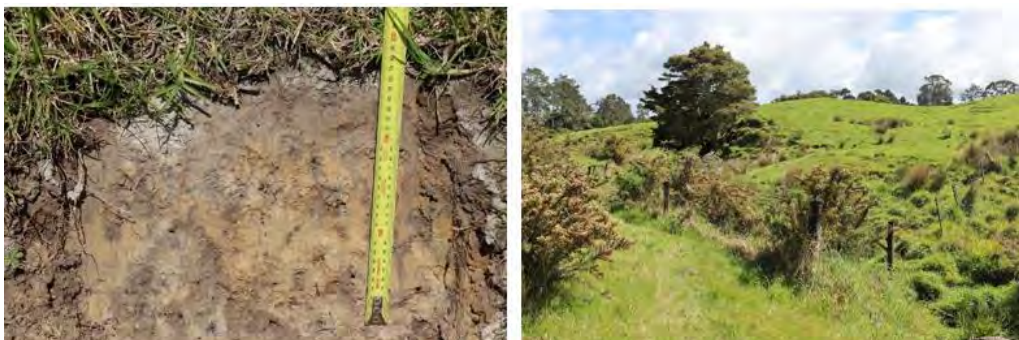


Figure 34. Left: stratigraphy of Profile 3. Right: standing at Profile 3 and facing northwest



Figure 35. Left: stratigraphy of Profile 4. Right: location of Profile 4 facing southwest





**Figure 36. Left: stratigraphy of Profile 5. Right: Profile 5, facing north. Note another patch of erosion further up the hill**



**Figure 37. Left: stratigraphy of Profile 6. Right: location of Profile 6, facing south**



**Figure 38. Left: stratigraphy of Profile 7. Right: location of Profile 7, facing north**



**Figure 39. Left: stratigraphy of Profile 8. Right: location of Profile 8, facing northwest**

## DISCUSSION AND CONCLUSIONS

### Summary of Results

No archaeological sites have previously been recorded in the Plan Change Area and none were identified in the properties included in the survey for this assessment. Recorded archaeological sites associated with Māori settlement and occupation in the general area (apart from isolated find spots) are usually located near major waterways or along the coast. Historical research including a review of early survey plans has shown that the land containing the Plan Change Area was granted to European settlers from the mid-1850s and therefore had some potential to contain archaeological remains associated with early European settlement. As well, a house is indicated on an 1894 plan in Allotment 117A, However, no evidence was found during the research for this assessment that the other parts of the Plan Change Area were used for anything but agricultural purposes from the mid-19th century onwards apart from a small number of subdivisions for residential lots that took place during the 20<sup>th</sup> century.

### **Māori** Cultural Values

It should be noted that archaeological survey techniques (based on visual inspection and minor sub-surface testing) cannot necessarily identify all sub-surface archaeological features, or detect wahi tapu and other sites of traditional significance to Māori, especially where these have no physical remains.

### Survey Limitations

This is an assessment of effects on archaeological values and does not include an assessment of effects on Māori cultural values. Such assessments should only be made by the tangata whenua. Māori cultural concerns may encompass a wider range of values than those associated with archaeological sites. Only properties that are owned by the Wellsford Welding Club were included in the survey. The remaining properties were not able to be accessed.

### Archaeological Value and Significance

The archaeological value of sites relates mainly to their information potential, that is, the extent to which they can provide evidence relating to local, regional and national history using archaeological investigation techniques, and the research questions to which the site could contribute. The surviving extent, complexity and condition of sites are the main factors in their ability to provide information through archaeological investigation. For example, generally pa are more complex sites and have higher information potential than small midden (unless of early date). Archaeological value also includes contextual (heritage landscape) value. Archaeological sites may also have other historic heritage values including historical, architectural, technological, cultural, aesthetic, scientific, social, spiritual, traditional and amenity values.

The Plan Change Area has no known archaeological value or significance as no archaeological sites have been identified within its boundaries. It is considered possible that archaeological remains associated with a house indicated on an 1894 plan may be

present in Allotment 117A, but it is considered unlikely that any additional unidentified subsurface archaeological remains are present in the remainder of the Plan Change Area.

## Effects of the Plan Change Proposal

Future development resulting from the proposed Plan Change will have no known effects on archaeological values as no archaeological sites have previously been recorded within the boundaries of the Plan Change Area and none were identified during the survey of accessible properties for this assessment. The inland location of the Plan Change Area and lack of recorded archaeological sites in close proximity mean that it is unlikely to contain unidentified archaeological sites associated with Māori occupation. It is noted that land was granted to early European settlers in the mid-19th century and the presence of a house on an 1894 plan in Allotment 117A indicates that archaeological remains relating to the use of the house may be present. When this property becomes accessible it is recommended that additional survey is carried out to determine if any archaeological evidence can be identified to provide a more detailed assessment of the level of effects and to recommend appropriate mitigation measures.

## Resource Management Act 1991 Requirements

Section 6 of the RMA recognises as matters of national importance: ‘the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga’ (S6(e)); and ‘the protection of historic heritage from inappropriate subdivision, use, and development’ (S6(f)).

All persons exercising functions and powers under the RMA are required under Section 6 to recognise and provide for these matters of national importance when ‘managing the use, development and protection of natural and physical resources’. There is a duty to avoid, remedy, or mitigate any adverse effects on the environment arising from an activity (S17), including historic heritage.

Historic heritage is defined (S2) as ‘those natural and physical resources that contribute to an understanding and appreciation of New Zealand’s history and cultures, deriving from any of the following qualities: (i) archaeological; (ii) architectural; (iii) cultural; (iv) historic; (v) scientific; (vi) technological’. Historic heritage includes: ‘(i) historic sites, structures, places, and areas; (ii) archaeological sites; (iii) sites of significance to Māori, including wahi tapu; (iv) surroundings associated with the natural and physical resources’.

Regional, district and local plans contain sections that help to identify, protect and manage archaeological and other heritage sites. The plans are prepared under the provisions of the RMA. The Auckland Unitary Plan Operative in Part 2016 (AUP OP) is relevant to the proposed activity.

There are no scheduled historic heritage sites located within the proposed Plan Change Area. This assessment has established that future development resulting from the proposed Plan Change would have no effect on any known archaeological remains, and has little potential to affect unidentified subsurface remains apart from possible subsurface remains associated with a house in Allotment 117A, which is shown on a plan dating from 1894. As such, a field survey and detailed assessment should be undertaken if the property is affected by future development and appropriate mitigation measures recommended. For the remainder of the Plan Change Area, if suspected archaeological remains are exposed



during future development works, the Accidental Discovery Rule (E12.6.1) set out in the AUP OP must be complied with. Under the Accidental Discovery Rule works must cease within 20m of the discovery and the Council, Heritage NZ, Mana Whenua and (in the case of human remains) NZ Police must be informed. The Rule would no longer apply in respect to archaeological sites if an Authority from Heritage NZ was in place.

## Heritage New Zealand Pouhere Taonga Act 2014 Requirements

In addition to any requirements under the RMA, the HNZPTA protects all archaeological sites whether recorded or not, and they may not be damaged or destroyed unless an Authority to modify an archaeological site has been issued by Heritage NZ (Section 42).

### **‘Section 42 Archaeological sites not to be modified or destroyed**

(1) Unless an authority is granted under section 48, 56(1)(b), or 62 in respect of an archaeological site, no person may modify or destroy, or cause to be modified or destroyed, the whole or any part of that site if that person knows, or ought reasonably to have suspected, that the site is an archaeological site.

(2) Subsection (1) applies whether or not an archaeological site is a recorded archaeological site or is entered on— (a) the New Zealand Heritage List/Rārangi Kōrero under subpart 1 of Part 4; or (b) the Landmarks list made under subpart 2 of Part 4.

(3) Despite subsection (1), an authority is not required to permit work on a building that is an archaeological site unless the work will result in the demolition of the whole of the building.’

An archaeological site is defined by the HNZPTA Section 6 as follows:

**‘archaeological site** means, subject to section 42(3)<sup>3</sup>, –

(a) any place in New Zealand, including any building or structure (or part of a building or structure) that –

(i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and

(ii) provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and

(b) includes a site for which a declaration is made under section 43(1)<sup>4</sup>.’

Authorities to modify archaeological sites can be applied for either in respect to archaeological sites within a specified area of land (Section 44(a)), or to modify a specific

<sup>3</sup> Under Section 42(3) an Authority is not required to permit work on a pre-1900 building unless the building is to be demolished.

<sup>4</sup> Under Section 43(1) a place post-dating 1900 (including the site of a wreck that occurred after 1900) that could provide ‘significant evidence relating to the historical and cultural heritage of New Zealand’ can be declared by Heritage NZ to be an archaeological site.

archaeological site where the effects will be no more than minor (Section 44(b)), or for the purpose of conducting a scientific investigation (Section 44(c)). Applications that relate to sites of Māori interest require consultation with (and in the case of scientific investigations the consent of) the appropriate iwi or hapu and are subject to the recommendations of the Māori Heritage Council of Heritage NZ. In addition, an application may be made to carry out an exploratory investigation of any site or locality under Section 56, to confirm the presence, extent and nature of a site or suspected site.

An archaeological authority may be required for future development of Allotment 117A, if further survey and assessment indicates the possibility of subsurface remains associated with use of a house shown on an 1894 plan. An archaeological Authority will not be required for future development associated with the remainder of the proposed Plan Change as no known sites will be affected, and it is unlikely that any undetected sites are present. However, should any sites be exposed during future development the provisions of the HNZPTA must be complied with.

## Conclusions

No previously recorded archaeological sites are located in the Plan Change Area and no unrecorded archaeological sites were identified during the survey for this assessment. It is considered unlikely that any unidentified archaeological sites associated with Māori settlement will be present based on the inland location and lack of navigable waterways in the Plan Change Area. It is noted that land was granted to early European settlers in the mid-19th century, and subsurface remains associated with use of a house indicated on an 1894 plan in Allotment 117A may be present. However, there is no indication that the remainder of the Plan Change Area was used for anything other than general agricultural purposes during the 19th century. If Allotment 117A is affected by future development additional survey should be undertaken along with a detailed assessment to determine appropriate mitigation. For the remainder of the Plan Change Area, if any unrecorded archaeological sites are exposed during future development activities resulting from the proposed Plan Change, the effects are considered likely to be minor and can be appropriately managed under the AUP OP Accidental Discovery Rule (E12.6.1) and mitigated under the archaeological provisions of the HNZPTA.

## RECOMMENDATIONS

- There should be no major constraints on the proposed Plan Change on archaeological grounds, as the Plan Change Area does not contain any known archaeological sites and if archaeological remains are present, the possibility can be appropriately mitigated through the provisions of the HNZPTA.
- A survey and detailed assessment should be undertaken for Allotment 117A prior to any future development, a detailed assessment of effects should be prepared and appropriate mitigation measures recommended.
- No conditions relating to archaeological protection are recommended for the remainder of the Plan Change Area, as the very limited potential for undetected archaeological sites is already provided for under the Accidental Discovery Rule (section E.12.6.1 of the AUP OP).
- If archaeological remains should be exposed during future development resulting from the Plan Change, any adverse effects can be mitigated under the archaeological provisions of the HNZPTA.
- Since archaeological survey cannot always detect sites of traditional significance to Māori, such as wahi tapu, the tangata whenua should be consulted regarding the possible existence of such sites within the proposed Plan Change Area.

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# **ATTACHMENT 17**

## **APPENDIX 14 PRELIMINARY DESKTOP SOIL AND LAND USE CAPABILITY ASSESSMENT**



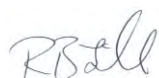
# PRELIMINARY DESKTOP SOIL AND LAND USE CAPABILITY ASSESMENT

## WELLSFORD NORTH SITE

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Assessment undertaken by Landsystems.



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Director  
BeatsonHill Ltd *trading as* Landsystems

Draft version 01/10/2021

Revised version 29/03/2022

**Revised version 29/04/2022**

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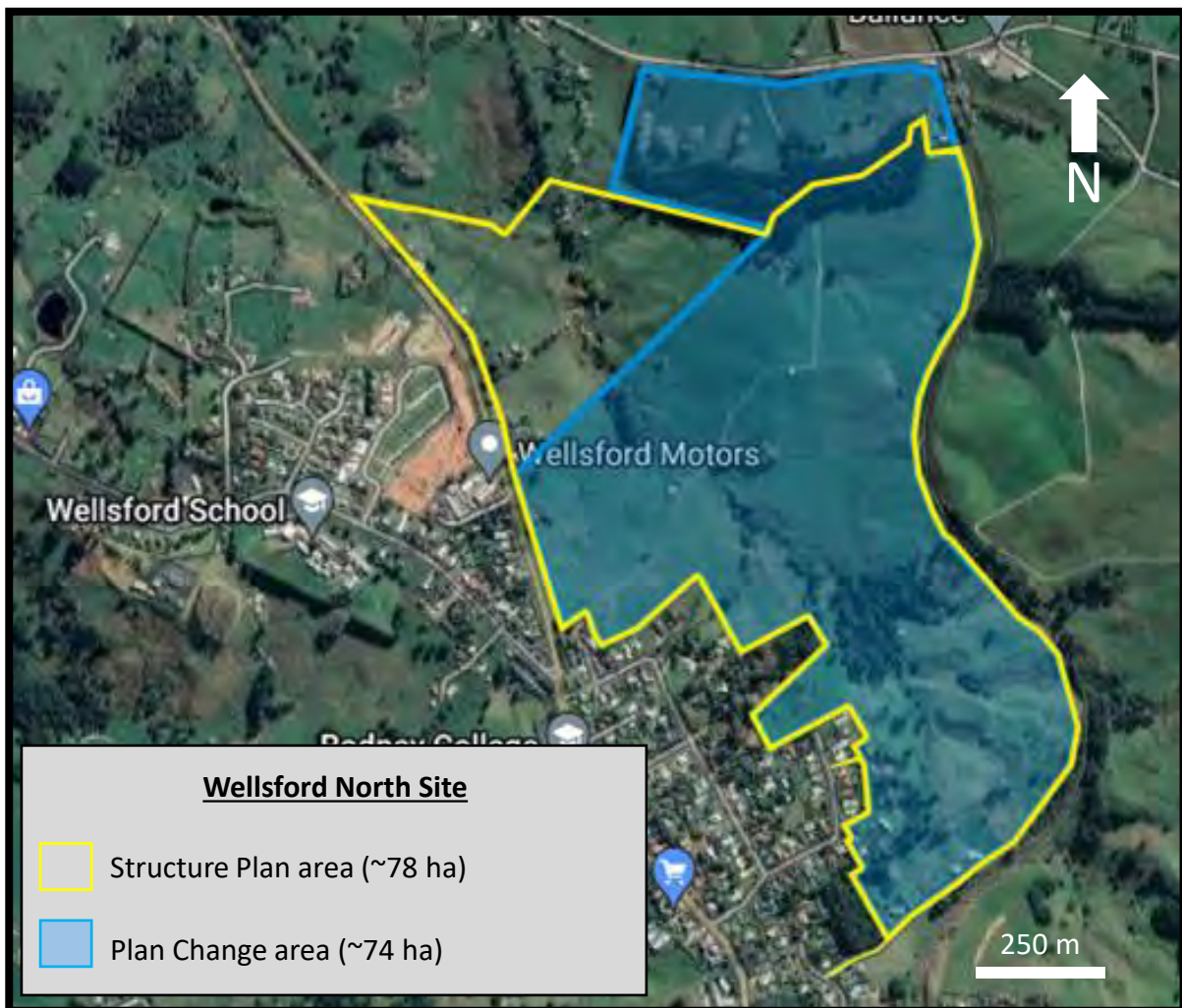
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## INTRODUCTION

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BeatsonHill Limited trading as Landsystems (“Landsystems”) has been engaged to undertake a preliminary desktop soil and Land Use Capability (LUC) assessment of the Wellsford North Site using available soil and LUC map information. The site encompasses land zoned as future urban and rural countryside living under the Auckland Unitary Plan (AUP). The purpose of the assessment is to provide an initial overview of the likely soils and LUC units on site, and the presence of land containing elite and prime soils to assist initial discussions with council.

The Wellsford North Site is located on the north-eastern boundary of Wellsford in Auckland region. The Structure Plan assessment covers an area of approximately 78 ha, and the Plan Change assessment an area of approximately 74 ha (**Figure 1**).



*Figure 1. Location of the Wellsford North site.*

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## MAP INFORMATION AND DEFINITIONS

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### SOIL MAP INFORMATION

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The soils are represented on a map as map units. These map units may contain one or more soils (this varies depending on the complexity of the soil map and the scale of mapping).



Generally, there is one dominant soil in a map unit which will determine the LUC classification for that map unit.

Additionally, soil naming can vary for different sources of soil map information. This is a factor of when the soil mapping was undertaken and the soil classification that was being used nationally at the time of mapping. In most cases the soil names can be correlated across soil map information sources.

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## LAND USE CAPABILITY MAP INFORMATION

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Land Use Capability (LUC) assesses an area's capacity for sustained productive use, considering physical limitations, soil type, management requirements and soil conservation needs.

A LUC assessment is a systematic arrangement of the different types of land according to those properties that affect its capacity for long term and sustained production. It is a system that primarily assesses the land for arable (cropping) use.

The assessment is based on a national land classification system used by soil conservators for farm planning since the 1950s. A detailed description of the system is provided in the Land Use Capability Survey Handbook, a 3rd edition of which was published in 2009 (Lynn et al., 2009)<sup>1</sup>.

The LUC assessment identifies areas with similar rock type, soil, slope, erosion types and degree and vegetation cover. Where any one of these factors changes significantly a boundary is drawn and a new map unit created. Based on this physical inventory, together with an understanding of climate an assessment is made of each unit's capacity for long term sustained use. Thus, the property is completely covered by mapped units which identify areas having similar physical attributes.

There are eight (8) land use capability classes as recognised in the New Zealand Land Resource Inventory with limitations for use and land use versatility increasing from 1 to 8, with 8 considered unsuitable for productive use and best managed for catchment protection.

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## DEFINITION OF LAND CONTAINING ELITE AND PRIME SOIL

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The Auckland Unitary Plan (Updated 24 October 2019) defines elite land as:-

*Land containing elite soil:*

*Land classified as Land Use Capability Class 1 (LUC1). This land is the most highly versatile and productive land in Auckland. It is:*

- *well-drained, friable, and has well-structured soils;*
- *flat or gently undulating; and*
- *capable of continuous cultivation.*

*Includes:*

- *LUC1 land as mapped by the New Zealand Land Resource Inventory (NZLRI);*
- *other lands identified as LUC1 by more detailed site mapping;*
- *land with other unique location or climatic features, such as the frost-free slopes of Bombay Hill;*
- *Bombay clay loam;*
- *Patumahoe clay loam;*
- *Patumahoe sandy clay loam; and*
- *Whatitiri soils.*

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<sup>1</sup> Lynn, IH, Manderson, AK, Harmsworth, GR, Eyles, GO, Douglas, GB, Mackay, AD, Newsome, PJF (2009) Land Use Capability Handbook - a New Zealand handbook for the classification of land 3rd Ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science 163pp.

Prime land is also very good land but with some minor limitations compared to elite land. The Auckland Unitary Plan defines prime land as:-

*Land containing prime soil:*

*Land identified as Land Use Capability classes two and three (LUC2, LUC3) with slight to moderate physical limitations for arable use. Factors contributing to this classification are:*

- *readily available water;*
- *favourable climate;*
- *favourable topography;*
- *good drainage; and*
- *versatile soils easily adapted to a wide range of agricultural uses.*

The definition for elite soils lists features of highly versatile and productive land. The land is described as well-drained, friable, and has well-structured soils. The topography is flat or gently undulating and the soil capable of continuous cultivation. All these conditions need to be met for the land to be elite.

The NZ Soil Description Handbook defines well drained (on p148) and friable (on p84). Flat or gently undulating slopes are defined in the Land Use Capability Survey Handbook (p21) as slopes that are 0 to 3 degrees.

'Well structured' and 'capable of continuous cultivation' are not defined. However, using LUC class 1 soil characteristics as a guide then a suitable definition for 'well structured' would be soil that is moderately or strongly pedal, or has earthy structure (Soil Description Handbook p58 & 60). The continuous cultivation definition that best suits Class 1 land is the arable use definition in the LUC Survey Handbook (on p153). This is land suitable for cultivation for cropping and able to grow at least one crop or more per season without permanently degrading the soil.

Prime land is arable, versatile, has favourable topography and good drainage. There are no serious climate or soil water storage issues. Unfortunately, these characteristics for prime land are not defined and criteria used to assess the land at the site are presented below.

The most versatile soils in New Zealand are Allophanic soils (e.g. Karaka soils). Favourable topography for arable use is commonly regarded as slopes of 0 to 15 degrees. Slopes steeper than 15 degrees have moderate to severe susceptibility to erosion when cultivated and are not ideal for arable use.

Good drainage can be defined as well drained or moderately well drained drainage classes. Under these conditions there is a minimum of 60 to 90 cm to a water table. Having a freely drained soil is required to be able to grow crops sensitive to wet soil (e.g. kiwifruit). Well drained elite soils are ideal for this (water table greater than 90 cm deep), but prime land may also be suitable. Imperfectly and poorly drained soils are too wet for some horticultural crops and the land is not as versatile as prime land.

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## **DESKTOP ASSESSMENT - METHODS**

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An initial desktop LUC assessment was undertaken for the Wellsford North site. Available map information, soil reports and geospatial data included:

- New Zealand Land Resource Inventory (NZLRI) layers (providing map units of dominant soil type and LUC unit)<sup>2</sup>.

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<sup>2</sup> <https://koordinates.com/from/lris.scinfo.org.nz/layer/48134/metadata/>

- Smap Online (providing map units of Soil Sibling)<sup>3</sup>.
- Soil profile data from bore hole logs provided in Wellsford Residential Development Plan Change Geotechnical Assessment Report<sup>4</sup>.

Soil and LUC maps are provided using NZLRI “SOIL” and “LUC” attributes.

Soil maps are provided for Smap soils (soil siblings).

Geotechnical bore log data provided additional point data for checking soil profile texture and drainage characteristics.

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## DESKTOP LUC ASSESSMENT - RESULTS

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### SOIL AND LUC MAP INFORMATION - NZLRI

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The soil map information provided in the NZLRI was originally sourced from the *Northland Peninsula soil survey*<sup>5</sup>. This soil survey was originally mapped at a scale of 1:100 000, and subsequently integrated into the NZLRI (at 1:50,000 scale). The NZLRI soil and LUC distributions for the Wellsford North Site are shown in **Figure 2**.

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<sup>3</sup> <https://smap.landcareresearch.co.nz/app/>

<sup>4</sup> Tonkin and Taylor (2021) Wellsford Residential Development Plan Change Geotechnical Assessment Report.

<sup>5</sup> Cox JE. et al. (1983) Northland Peninsula soil survey, scale 1:100 000.

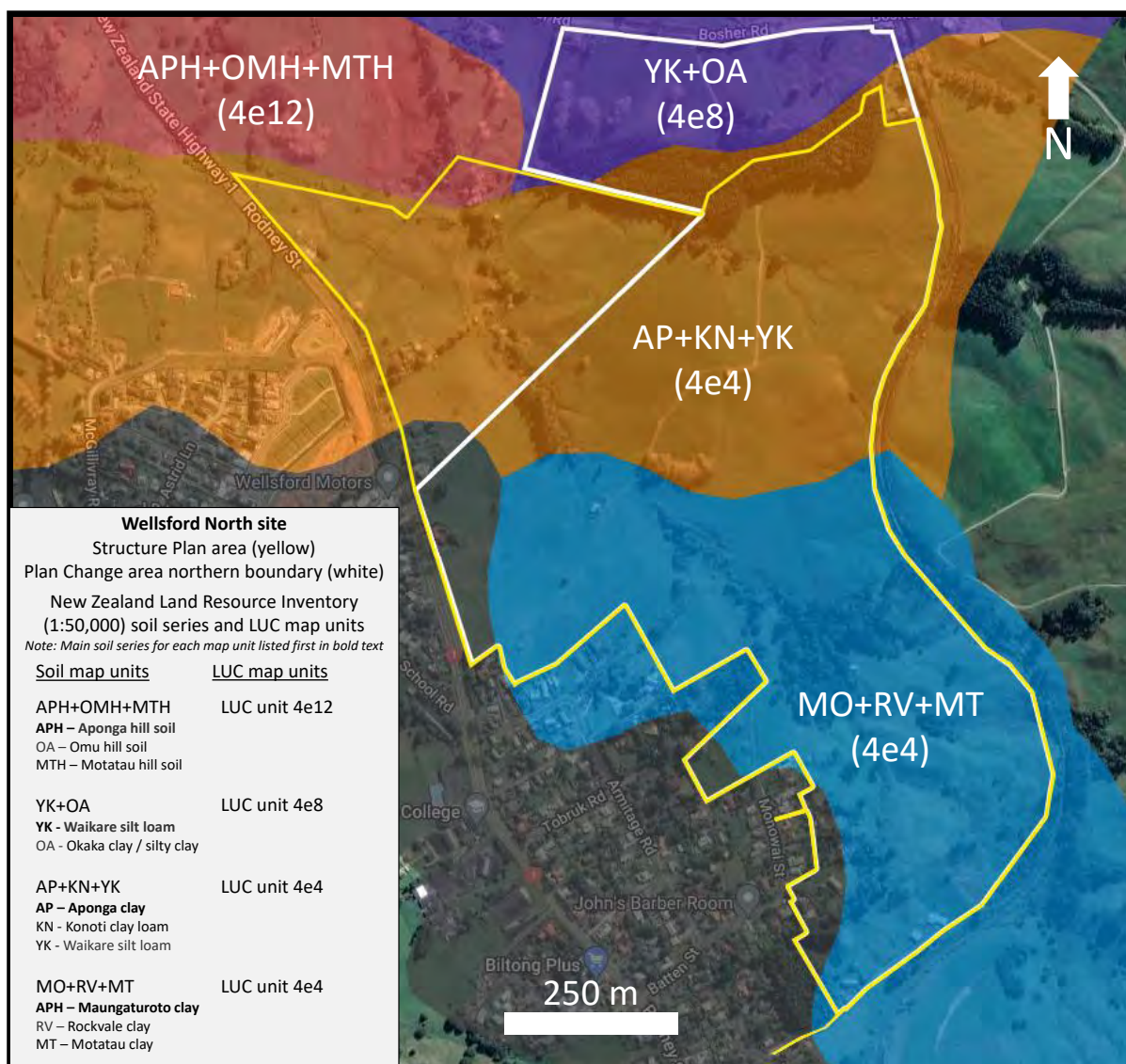


Figure 2. NZLRI soil and LUC map units for the Wellsford North site.

Table 1 provides a summary of the NZLRI soil and LUC map unit characteristics mapped for the site.

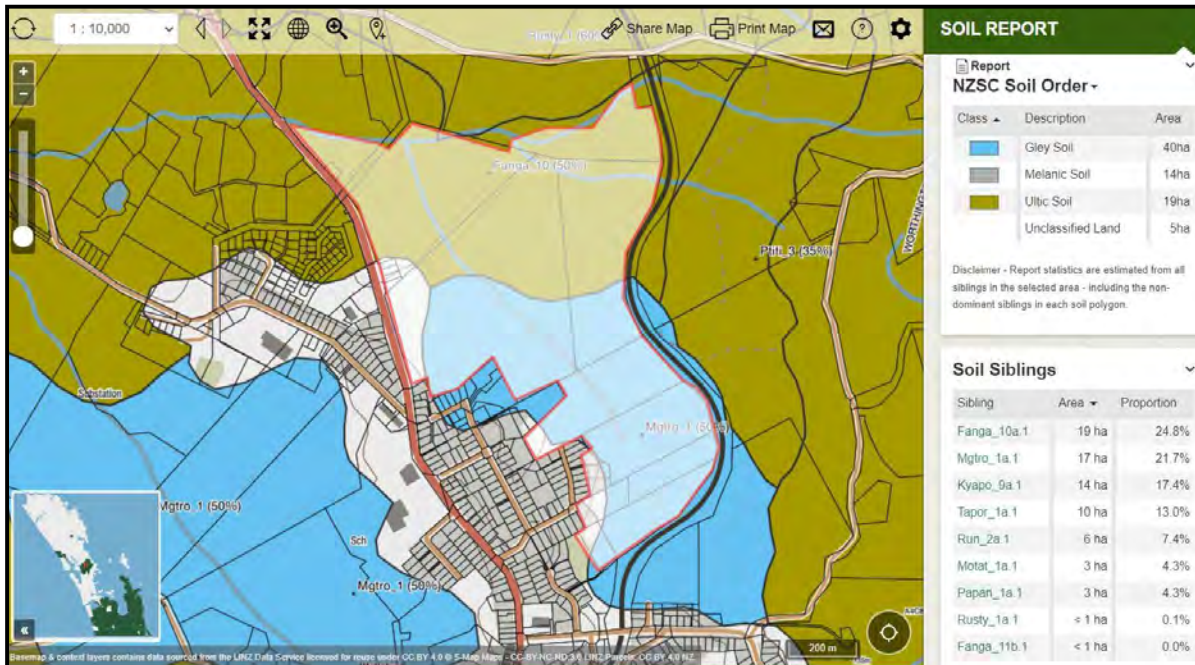
Table 1. Summary of the NZLRI soil and LUC map unit characteristics on the Wellsford North site.

Dominant soil series (soil map unit)	NZSC Soil Order	Parent material	Soil drainage	Slope class	LUC limitation
Waikare (YK+OA)	Ultic	Sheared mixed lithologies	Imperfectly drained	C+B (4 - 15°)	Erosion (e)
Aponga hill soil (APH+OMH+MTH)	Ultic	Sheared mixed lithologies and limestone	Imperfectly drained	E+D (16 - 25°)	Erosion (e)
Aponga (AP+KN+YK)	Ultic	Sheared mixed lithologies and limestone	Imperfectly drained	C+D (8 - 20°)	Erosion (e)
Maungaturoto (MO+RV+MT)	Melanic	Limestone and sheared mixed lithologies	Imperfectly drained	C+D (8 - 20°)	Erosion (e)

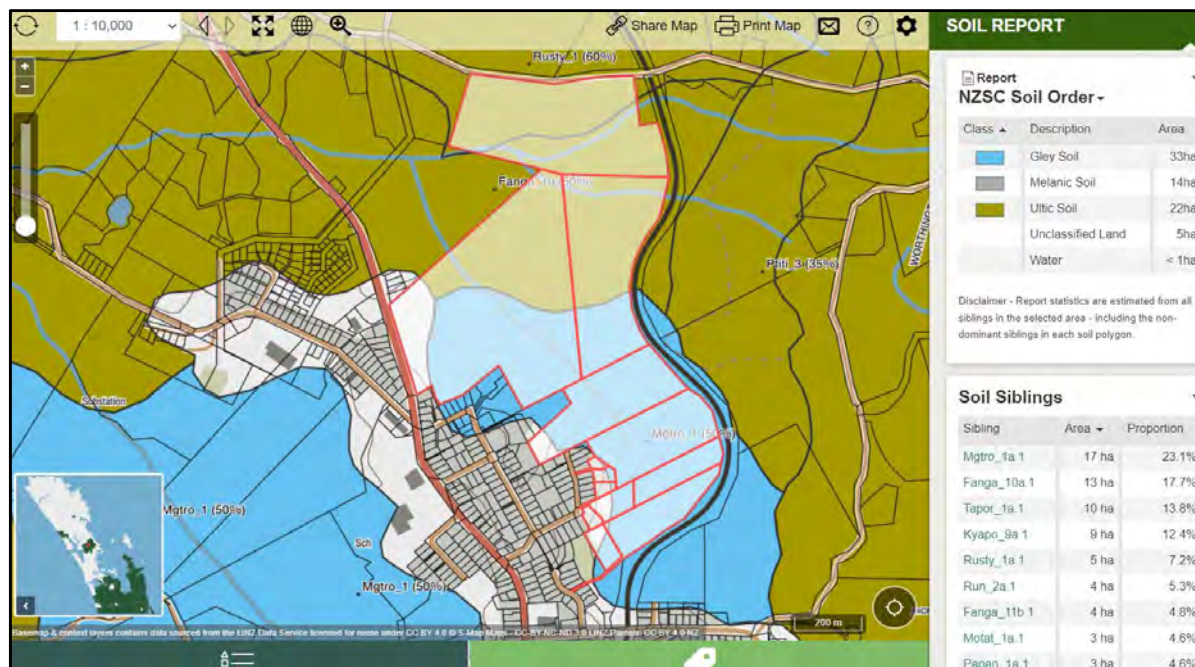


## SOIL AND LUC MAP INFORMATION - SMAP

The Smap soil map information is sourced from Smap Online and is mapped at 1:50,000 scale. Smap soil map polygons are only available on the Smap Online website<sup>6</sup>. The soil names for each map unit are “soil siblings”, with a probability of occurrence (%) in each map unit. The Smap Online soil map information for the Structure Plan area and the Plan Change area for the Wellsford North Site are shown in **Figure 3** and **Figure 4** respectively.



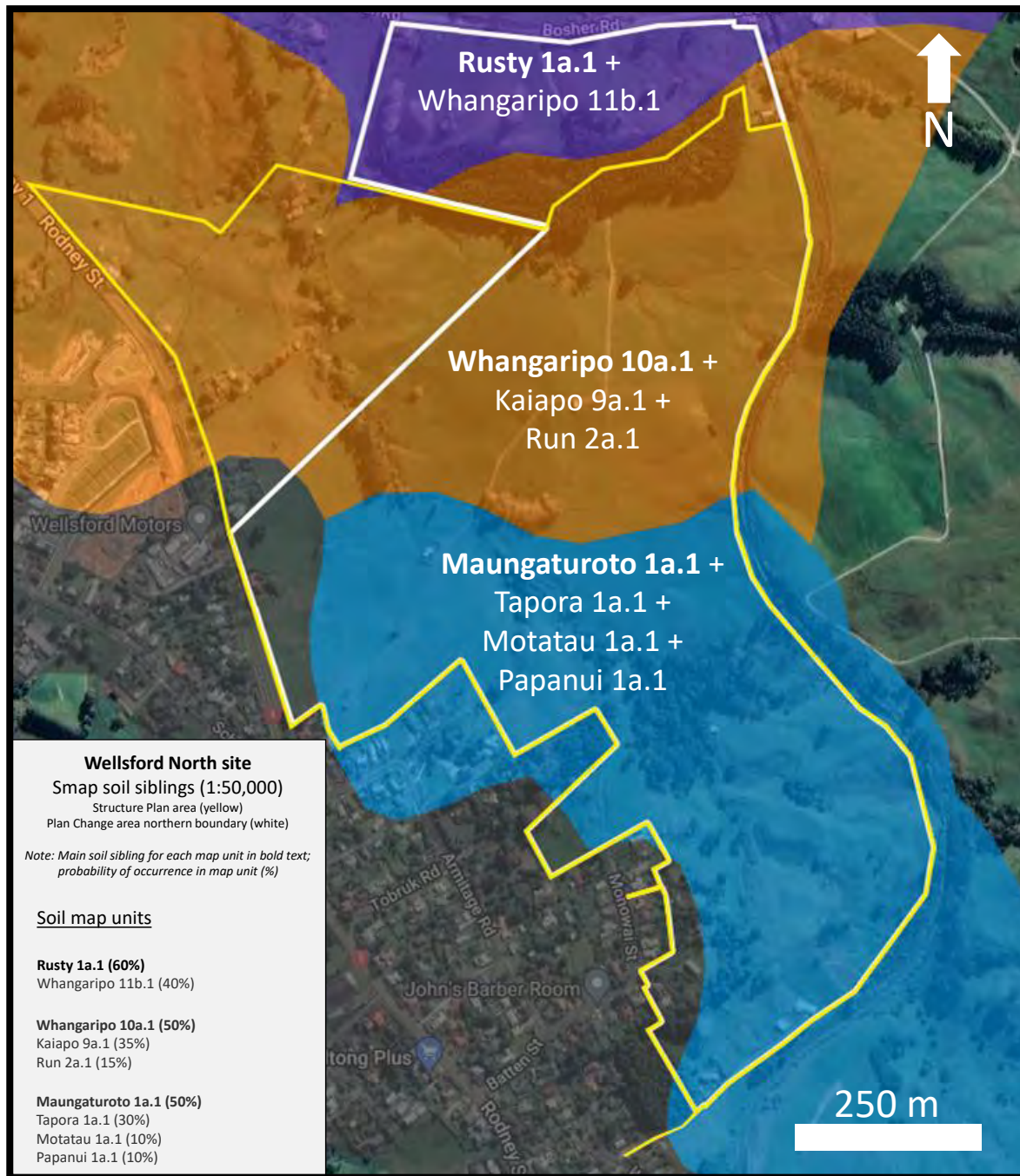
**Figure 3. Smap Online soil map information for the Structure Plan area, Wellsford North site.**



**Figure 4. Smap Online soil map information for the Plan Change area, Wellsford North site.**

<sup>6</sup> <https://smap.landcareresearch.co.nz/maps-and-tools/app/>

Based on the Smap Online soil map information, there are nine soil siblings represented across the Wellsford North Site. A simplified map is provided in **Figure 5**.



**Figure 5.** Smap soil sibling map units for the Wellsford North Site.

**Table 2** provides a summary of the Smap soil sibling map unit characteristics for the Wellsford North Site.



**Table 2. Smap soil sibling map unit characteristics for the Wellsford North site.**

Smap soil map unit (soil siblings)	New Zealand Soil Classification	Parent material	Soil drainage	Correlated soil series name
Rusty 1a.1 +	Typic Perch-gley Ultic Soils	Soft sandstone rock	Poorly drained	Waikare clay loam
Whangaripo 11b.1	Mottled Yellow Ultic Soils	Soft sandstone rock	Imperfectly drained	Aponga clay
Whangaripo 10a.1 +	Mottled Yellow Ultic Soils	Hard sandstone rock	Imperfectly drained	Aponga clay
Kaiapo 9a.1 +	Typic Orthic Gley Soils	Soft mudstone rock	Poorly drained	Aponga clay
Run 2a.1	Ultic Acid Gley Soils	Hard mudstone rock	Poorly drained	Waikare silt loam
Maungaturoto 1a.1 +	Acidic Orthic Gley Soils	Limestone rock	Poorly drained	Maungaturoto clay
Tapora 1a.1 +	Argillic Orthic Melanic Soils	Limestone rock	Moderately well drained	Rockvale clay
Motatau 1a.1 +	Weathered Rendzic Melanic Soils	Limestone rock	Poorly drained	Motatau clay
Papanui 1a.1	Melanic Orthic Gley Soils	Limestone rock	Poorly drained	Motatau clay

The Smap soil map information provides a more detailed representation of the soils on the site than the NZLRI soil map information. However, because of the absence of land characteristics information (e.g. slope) for the soil map units, it is not possible to assign LUC units. Given that most of the Smap soil map units correlate to the soils identified by the NZLRI map information, it is likely the LUC units will be similar. To correctly identify and map the LUC units a property scale assessment using the LUC classification criteria described in Lynn et al. (2009) would be required.

### **GEOTECHNICAL BOREHOLE LOG DATA**

Geotechnical data for the Wellsford North Site was provided by Tonkin and Taylor<sup>7</sup>. The data consisted of description logs from 11 hand auger (HA) boreholes and 26 test pits (TP) excavations. Log descriptions for the upper one metre (0-1 m) were used to identify soil texture. Additionally 19 locations had photos that could be used to visually estimate soil profile drainage.

The log descriptions indicated the soil texture to be predominantly silt, clayey silt or clay within the top 1m. The associated photos indicated that soil profile drainage was predominantly either imperfectly drained or poorly drained (**Table 3**).

<sup>7</sup> Tonkin and Taylor (2021) Wellsford Residential Development Plan Change Geotechnical Assessment Report.

**Table 3. A summary of visually assessed soil profile drainage for geotechnical description log locations with an associated photo, Wellsford North site.**

Location	Soil profile drainage class (visually assessed from associated photo)
HA01	Imperfectly drained
HA02	Poorly drained
HA03	Imperfectly drained
HA04	Imperfectly drained
HA05	Imperfectly drained
HA06	Imperfectly drained
HA07	Imperfectly drained
HA08	Imperfectly drained
HA09	Imperfectly drained
HA11	Imperfectly drained
TP03	Poorly drained
TP05	Poorly drained
TP06	Poorly drained
TP13	Imperfectly drained
TP15	Imperfectly drained
TP16	Imperfectly drained
TP18	Poorly drained
TP19	Imperfectly drained
TP20	Poorly drained

## **ESTIMATE OF LAND CONTAINING ELITE AND PRIME SOIL**

Based on the soil map information provided by the NZLRI and Smap, the soils are predominantly imperfectly to poorly drained across the site. There may be small areas of moderately well drained soil, however, there are likely to be limited in extent.

The slope classes provided by the NZLRI indicated slopes are predominantly greater than 7 degrees.

For land to be considered land containing elite soils, the LUC Class must be LUC 1, slopes must be flat to gently undulating (0-3° slopes) and have good soil drainage (moderately well to well drained).

Based on the information available and used in this preliminary desktop assessment, it is very unlikely that the Wellsford North Site has land containing elite soil, due to slopes being greater than 0-3° and/or imperfect and poor soil drainage.

For land to be considered land containing prime soils, the LUC Class must be either LUC 2 or LUC 3, and slopes must be flat to gently undulating, undulating, or rolling (0-15° slopes) and have good soil drainage (be moderately well to well drained).



Based on the information available and used in this preliminary desktop assessment, it is unlikely that the Wellsford North Site has land containing prime soil, due to areas with slopes greater than 15 degrees, soil drainage limitations and the predominance of clay subsoils.

Based on the information available and used in this preliminary desktop assessment, it is most likely that the Wellsford North Site is classed as other productive land according to the AUP definition of land containing elite and prime soil.

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## COMMENTS

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- The NZLRI soil and LUC map information is regional scale and only provides a general representation of the likely soils and LUC map units for the site. The indicated map unit boundaries should not be considered spatially accurate at property scale, however, the range of soils indicated is likely to be similar to those that would be observed if mapping at property scale.
- Compared with the NZLRI map information, the Smap map information is more detailed in that it identifies more soils present (soil siblings), but its spatial accuracy is not improved.
- The NZLRI LUC map information maps the entire site as LUC sub-class 4e, indicating an erosion limitation (due to both steep slopes and high erosion potential).
- The Smap map information does not have the land characteristics information to allow the classification of LUC units. However, given that most of the Smap soil map units correlate to the soils identified by the NZLRI map information, it is likely the LUC units will be similar to those indicated by the NZLRI map information.
- Property scale mapping of the site may identify additional LUC units (farm scale LUC units), primarily based on finer scale assessment of slope and soil observations. However, given the predominance of imperfectly and poorly drained soils indicated by the soil map information and geotechnical log descriptions, it is unlikely any significant areas of land containing elite or prime soil would be identified on site.



# **ATTACHMENT 18**

## **APPENDIX 14A SOIL AND LAND USE CAPABILITY CLASSIFICATION FIELD ASSESSMENT 96 & 136 BOASHER ROAD, WELLSFORD 0974**





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## Soil and Land Use Capability classification field assessment 96 & 136 Boshier Road, Wellsford 0974.

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**Prepared for:** Cosette Saville – B&A Urban and Environmental

**Prepared by:** Dr Reece Hill - Landsystems

**Field assessment:** 9 November 2022

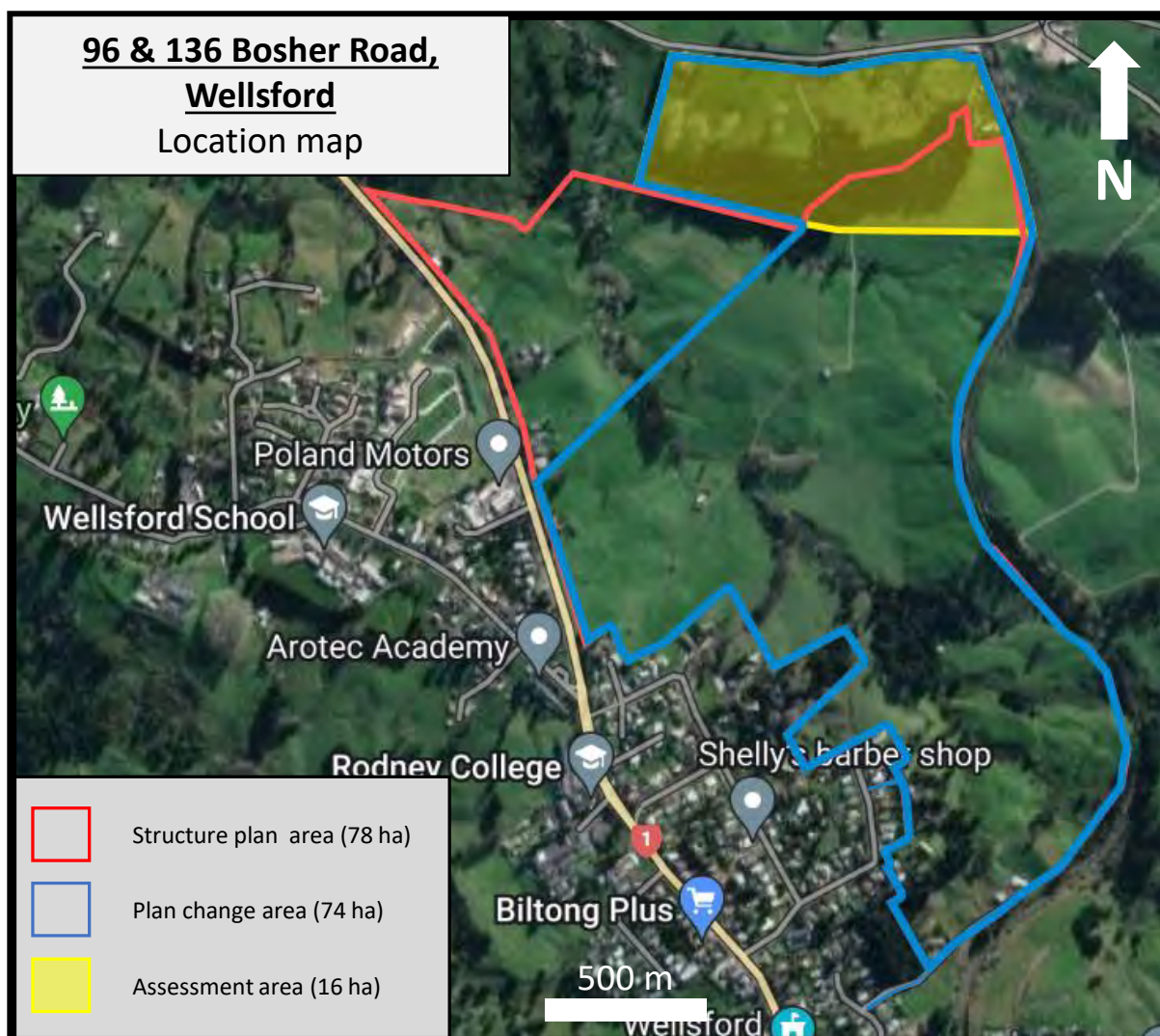
**Report date:** 13 March 2023

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## 1. Introduction

A soil and Land Use Capability (LUC) classification assessment of a 16 ha area at 96 & 136 Boshers Road, Wellsford 0974 (**Figure 1**) was undertaken to comply with Rules of the AUP for land containing elite and prime soil and the National Policy Statement for Highly Productive Land (NPS-HPL).



**Figure 1.** Soil and LUC assessment area for 96 & 136 Boshers Road, Wellsford 0974.

## 2. Classification definitions

### AUP land containing elite and prime soil

The Auckland Unitary Plan (Updated 24 October 2019) defines elite land as: -

#### **Land containing elite soil:**

*Land classified as Land Use Capability Class 1 (LUC1). This land is the most highly versatile and productive land in Auckland. It is:*

- *well-drained, friable, and has well-structured soils;*
- *flat or gently undulating; and*
- *capable of continuous cultivation.*

*Includes:*

- *LUC1 land as mapped by the New Zealand Land Resource Inventory (NZLRI);*
- *other lands identified as LUC1 by more detailed site mapping;*
- *land with other unique location or climatic features, such as the frost-free slopes of Bombay Hill;*
- *Bombay clay loam;*
- *Patumahoe clay loam;*
- *Patumahoe sandy clay loam; and*
- *Whatitiri soils.*

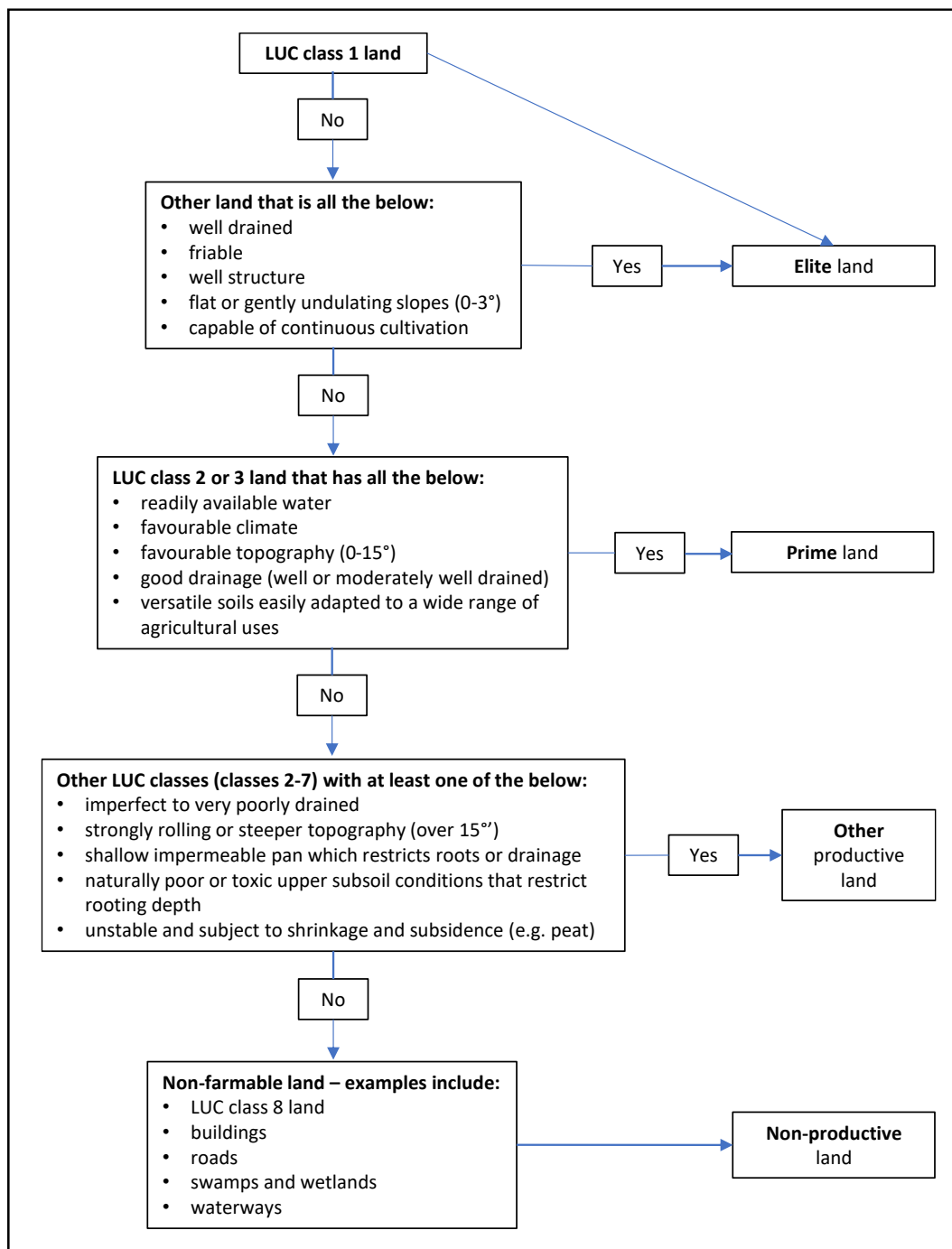
Prime land is also very good land but with some minor limitations compared to elite land. The Auckland Unitary Plan defines prime land as:-

***Land containing prime soil:***

*Land identified as Land Use Capability classes two and three (LUC2, LUC3) with slight to moderate physical limitations for arable use. Factors contributing to this classification are:*

- *readily available water;*
- *favourable climate;*
- *favourable topography;*
- *good drainage; and*
- *versatile soils easily adapted to a wide range of agricultural uses.*

**Figure 2** provides a flow chart of the method used to determine AUP land containing elite and prime soil.



**Figure 2.** Flow chart for determining AUP land containing Elite, Prime and Other productive land.

An alternative interpretation of the definition for AUP land containing elite and prime soil was presented by Auckland Council as part of a legal submission for Plan Change 55. The alternative interpretation classifies land containing elite soil as being all LUC 1 land, and land containing prime soil as being all LUC 2 and 3 land, irrespective of the listed criteria.

All non-productive land was excluded from the classification of AUP elite and Prime land.

AUP land containing elite or prime soil, and other productive land was classified based on the flow chart shown in **Figure 2** and the alternative (PC55) interpretation of the definition.

Maps for both interpretations are provided in this report.



## National Policy Statement for Highly Productive Land

The National Policy Statement for Highly Productive Land (NPS-HPL)<sup>1</sup> came into force on the 17th of October 2022 (clause 1.2(1)).

“Highly productive land” is defined as:

means land that has been mapped in accordance with clause 3.4 and is included in an operative regional policy statement as required by clause 3.5 (but see clause 3.5(7) for what is treated as highly productive land before the maps are included in an operative regional policy statement and clause 3.5(6) for when land is rezoned and therefore ceases to be highly productive land).

My understanding is that NPS-HPL clause 3.5(7) applies because maps produced in accordance with clause 3.4 have not yet been included in an operative regional policy statement as required by clause 3.5. Clause 3.5(7) says:

(7) Until a regional policy statement containing maps of highly productive land in the region is operative, each relevant territorial authority and consent authority must apply this National Policy Statement as if references to highly productive land were references to land that, at the commencement date:

(a) is

(i) zoned general rural or rural production; and

(ii) LUC 1, 2, or 3 land; but

(b) is not:

(i) identified for future urban development; or

(ii) subject to a Council initiated, or an adopted, notified plan change to rezone it from general rural or rural production to urban or rural lifestyle.

The NPS-HPL includes the following guidance in clause 3.4(5):

(5) For the purpose of identifying land referred to in subclause (1):

(a) mapping based on the New Zealand Land Resource Inventory is conclusive of LUC status, unless a regional council accepts any more detailed mapping that uses the Land Use Capability classification in the New Zealand Land Resource Inventory; and

(b) where possible, the boundaries of large and geographically cohesive areas must be identified by reference to natural boundaries (such as the margins of waterbodies), or legal or non-natural boundaries (such as roads, property boundaries, and fence-lines); and

(c) small, discrete areas of land that are not LUC 1, 2, or 3 land, but are within a large and geographically cohesive area of LUC 1, 2, or 3 land, may be included; and

(d) small, discrete areas of LUC 1, 2, or 3 land need not be included if they are separated from any large and geographically cohesive area of LUC 1, 2, or 3 land.

Other NPS-HPL clauses that could be considered relevant to this assessment include clause 3.6(2)(b) and 3.6(2)(c).

All non-productive land was excluded from the classification of NPS-HPL highly productive land.

---

<sup>1</sup> National Policy Statement for Highly Productive Land 2022. September 2022.

Land identified and mapped as LUC classes 1, 2 and 3 was classified as NPS-HPL highly productive land according to NPS-HPL clause 3.5(7).

### 3. LUC and soil classification from available map sources

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The available NZLRI sources of soil and LUC map information<sup>2</sup> maps the soils and LUC units in the assessment area as Waikare silt loam with a LUC classification of LUC 4e8, and Te Aponga clay with a LUC classification of LUC 4e4.

Applying the AUP definition for land containing elite and prime soils, LUC 4e8 and 4e4 are not classed as land containing elite and prime soils.

Applying the NPS-HPL, LUC 4e8 and 4e4 are not highly productive land.

### 4. Field assessment method

---

Landsystems undertook an on-site soil and LUC assessment of the 16 ha site at 96 & 136 Boshier Road, Wellsford 0974 according to standard methods (Milne et al., 1993<sup>3</sup> and Lynn et al., 2009<sup>4</sup>).

The field assessment was undertaken on the 9<sup>th</sup> of November 2022.

Observations of slope angle, topography and soil parent material were made over the relevant area. Soil augering up to 80 cm depth was used to assess soil properties such as soil horizons, drainage, plant root depths, texture, structure, and colour. This information was used to determine soil type and soil boundaries, from which the necessary LUC classification was assigned. The soils were assessed in current condition and areas with modified soils were identified and mapped as non-productive land. The LUC units were applied according to current condition.

### 5. On-site soil and LUC classification

---

A summary of the soils and LUC units identified for the assessment area are provided in **Table 1. Figure 3** shows the distribution of soil and LUC map units at property scale for the 16 ha site at 96 & 136 Boshier Road.

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<sup>2</sup> <https://iris.scinfo.org.nz/layer/48134-nzlri-north-island-edition-2-all-attributes/>

<sup>3</sup> Milne JDG, Clayden B, Singleton P.L, Wilson AD. 1995. Soil Description Handbook. Lincoln, New Zealand, Manaaki Whenua Press. 157p.

<sup>4</sup> Lynn IH, Manderson AK, Page MJ, Harmsworth GR, Eyles GO, Douglas GB, Mackay AD, Newsome PJF. 2009. Land Use Capability survey handbook – a New Zealand handbook for the classification of land. AgResearch Hamilton; Manaaki Whenua Lincoln; GNS Science Lower Hutt, New Zealand.

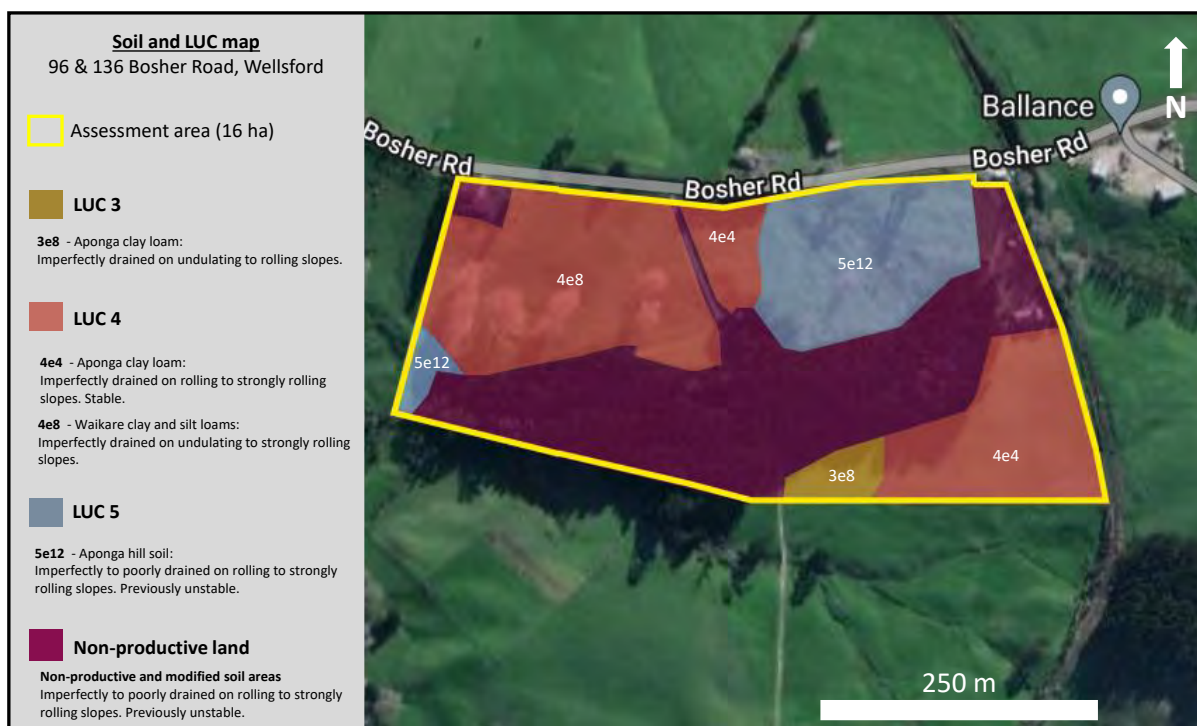
**Table 1.** Soils and LUC units for the assessment area, 96 & 136 Boshier Road.

Soil type (dominant)	Parent material	Soil drainage	Slope class	LUC unit
Aponga clay loam	Sheared mixed lithologies	Imperfectly drained	Undulating to rolling B+C (4 - 15°)	3e8*
Waikare clay loam and silt loam	Soft sandstone	Imperfectly drained	Undulating to strongly rolling B to D (4 - 20°)	4e8
Aponga clay loam	Sheared mixed lithologies	Imperfectly drained	Rolling to strongly rolling C+D (8 - 20°)	4e4
Aponga hill soil (previously unstable)	Sheared mixed lithologies	Imperfectly to poorly drained	Rolling to strongly rolling D+C (8 - 20°)	5e12*
Non-productive land (modified soil and non-productive land)	Retired riparian areas, buildings and curtilage and tracks.	-	-	Non-productive land (NPL)

\*LUC unit from Hicks and Vujcich (2017)<sup>5</sup>

Soil observations and discussion with the landowner also identified that the areas classified LUC 4e4 and LUC 3e8 in the south of the assessment area had undergone extensive recontouring with the infilling of gullies to provided more gentle topography. The soil auger observations indicated that in places the soils had shallow topsoil, were shallow in depth or had mixed subsoil.

<sup>5</sup> Hicks, DL and Vujcich V. (2017). Farm-scale land use capability classification for Auckland. Auckland Council Technical Report TR2017/016.



**Figure 3.** Distribution of soil and LUC map units for the assessment area, 96 & 136 Boshier Road.

## 6. On-site AUP elite and prime land classification

The LUC map units for the site are further classified according to the AUP definition for land containing elite or prime soil, other productive land and non-productive land for both interpretations of the AUP definition (**Table 2**).

**Table 2.** Field assessed AUP land containing elite, prime and other productive land for the assessment area, 96 & 136 Boshier Road.

LUC class	AUP Elite/Prime/Other (Flow chart - Figure 2)	AUP Elite/Prime/Other (PC55 interpretation)	Area (ha)	Area (%)
3e8*	Other	Prime	0.4	3%
4e4	Other	Other	2.8	18%
4e8	Other	Other	3.6	23%
5e12*	Other	Other	2.8	18%
Non-productive land	-	-	6.4	40%

\*LUC unit from Hicks and Vujcich (2017)<sup>6</sup>

<sup>6</sup> Hicks, DL and Vujcich V. (2017). Farm-scale land use capability classification for Auckland. Auckland Council Technical Report TR2017/016.



Based on the interpretation of the AUP definition for land containing elite or prime soil presented in **Figure 2** and the PC55 interpretation there is no land containing elite soil on the site.

Based on the interpretation of the AUP definition for land containing elite or prime soil presented in **Figure 2**, there is no land containing elite or prime soil on the site.

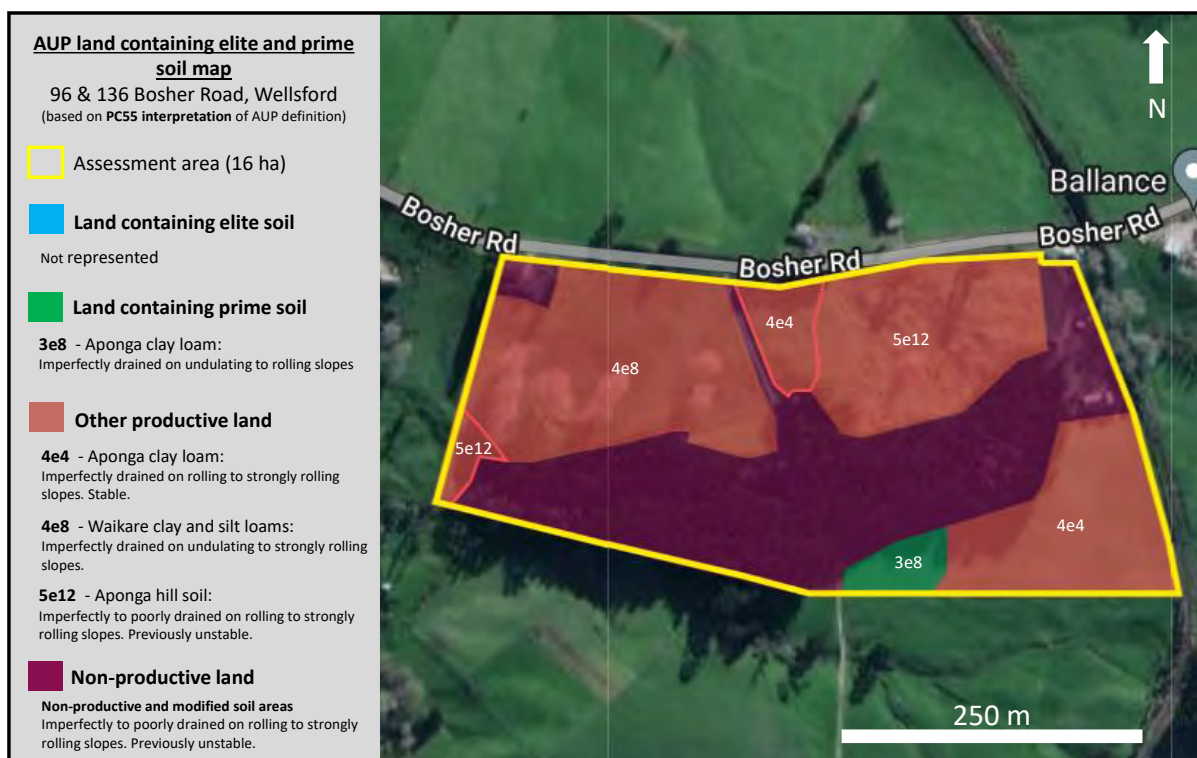
Based on the PC55 interpretation of the AUP definition for land containing elite or prime soil, the site has 0.4 ha (3%) of land containing prime soil, and there is no land containing elite soil on the site.

From a food production perspective, the area of land containing prime soil is small in size with limited extensive production potential. The site is surrounded by less productive land, non-productive land, or land that is not zoned rural, isolating it from other areas of productive land and removing the possibility for it to be amalgamated with adjoining productive land.

**Figure 4** and **Figure 5** show the distribution of soils, LUC units, and land containing elite and prime soil for the site.



**Figure 4.** Distribution of soils and LUC units for the assessment area, 96 & 136 Boshier Road. (based on Figure 2 interpretation of AUP definition).



**Figure 5.** Distribution of soils and LUC units for the assessment area, 96 & 136 Boshier Road (based on PC55 interpretation of AUP definition).

## 7. On-site NPS-HPL highly productive land

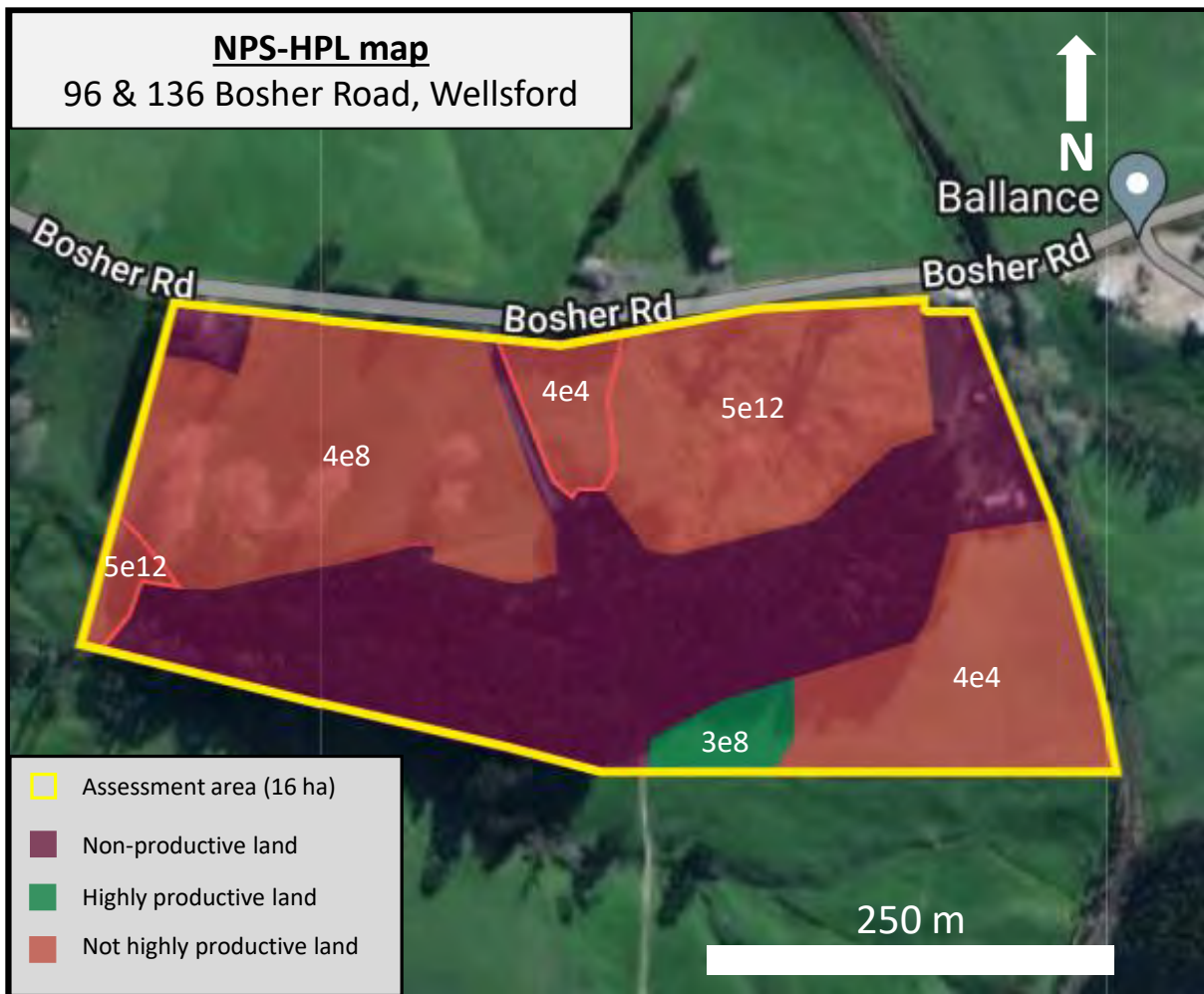
The LUC map units for the site are further classified according to the NPS-HPL highly productive land (**Table 3**).

**Table 3.** Field assessed NPS-HPL highly productive land for the assessment area, 96 & 136 Boshier Road.

LUC class	NPS-HPL highly productive land (HPL)	Area <sup>#</sup> (ha)	Area <sup>#</sup> (%)
3e8	HPL	0.4	3%
Total		0.4	3%
4e4	Not HPL	2.8	18%
4e8	Not HPL	3.6	23%
5e12	Not HPL	2.8	18%
Non-productive land	Not HPL	6.4	40%
Total		15.6	97%

# Area rounded up to 1 DP or whole number.

Based on the interpretation of NPS-HPL clause 3.5(7), the site has 0.4 ha (3%) of highly productive land and 15.6 ha (97%) of land that is not classed as highly productive land, including 6.4 ha (40%) of non-productive land. The estimated distribution of NPS-HPL highly productive land is shown in **Figure 6**.



**Figure 6.** The distribution of NPS-HPL highly productive land identified for the assessment area, 96 & 136 Boshier Road.

## 8. NPS-HPL comments

Although the land on the 96 & 136 Boshier Road site does contain 0.4 ha (3%) of NPS-HPL highly productive land when mapped at property scale, the majority of the site (97%) is not NPS-HPL highly productive land (i.e. is not LUC 1, 2 or 3). Although not applicable while NPS-HPL Clause 3.5 is in place, NPS-HPL clause 3.4(5)(d) notes that these small, discrete areas of LUC 1, 2, or 3 land need not be included if they are separated from any large and geographically cohesive area of LUC 1, 2, or 3 land. Following completion of regional mapping and the implementation of Clause 3.4, the site as a whole could be considered as not being NPS-HPL highly productive land.

The highly productive land on the site (LUC 3e8) is only 0.4 ha in size. The soil is imperfectly drained and has undergone extensive recontouring resulting in areas of shallow soils and thin topsoils. These factors limit the range of primary production land uses that would be viable. Cultivation during wetter periods on this class of land is not sustainable and the soils are not suitable for deeper rooting horticultural crops requiring deep, friable, well drained soils (i.e. the range of sustainable land uses is restricted).

The 96 & 136 Boshier Road site does not contain any LUC class 1 land and could be considered for rural residential subdivision in preference to other land in the Auckland

region with predominantly LUC classes 1 and 2 land which have higher productive capacity [mentioned in NPS-HPL clause 3.6(2)(c)].

## 9. Conclusions

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Based on the field assessment, the soils and LUC units in the assessment area include Waikare soils with a LUC classification of LUC 4e8, and Aponga soils with a LUC classification of LUC 3e8, 4e4, and 5e12. The balance of the area is non-productive land.

Based on the interpretation of the AUP definition for land containing elite or prime soil presented in **Figure 2** and the PC55 interpretation there is no land containing elite soil on the site.

Based on the interpretation of the AUP definition for land containing elite or prime soil presented in **Figure 2**, the productive land on the site is classed as Other productive land.

Based on the PC55 interpretation of the AUP definition for land containing elite or prime soil, the site has 0.4 ha (3%) of land containing prime soil.

From a food production perspective, the area of land containing prime soil is small in size with limited extensive production potential. The site is surrounded by less productive land, non-productive land, or land that is not zoned rural, isolating it from other areas of productive land and removing the possibility for it to be amalgamated with adjoining productive land.

Given the size and non-contiguous distribution of the small area of land containing prime soils on the site, this loss is not significant with regard to the region's productive soils and food production.

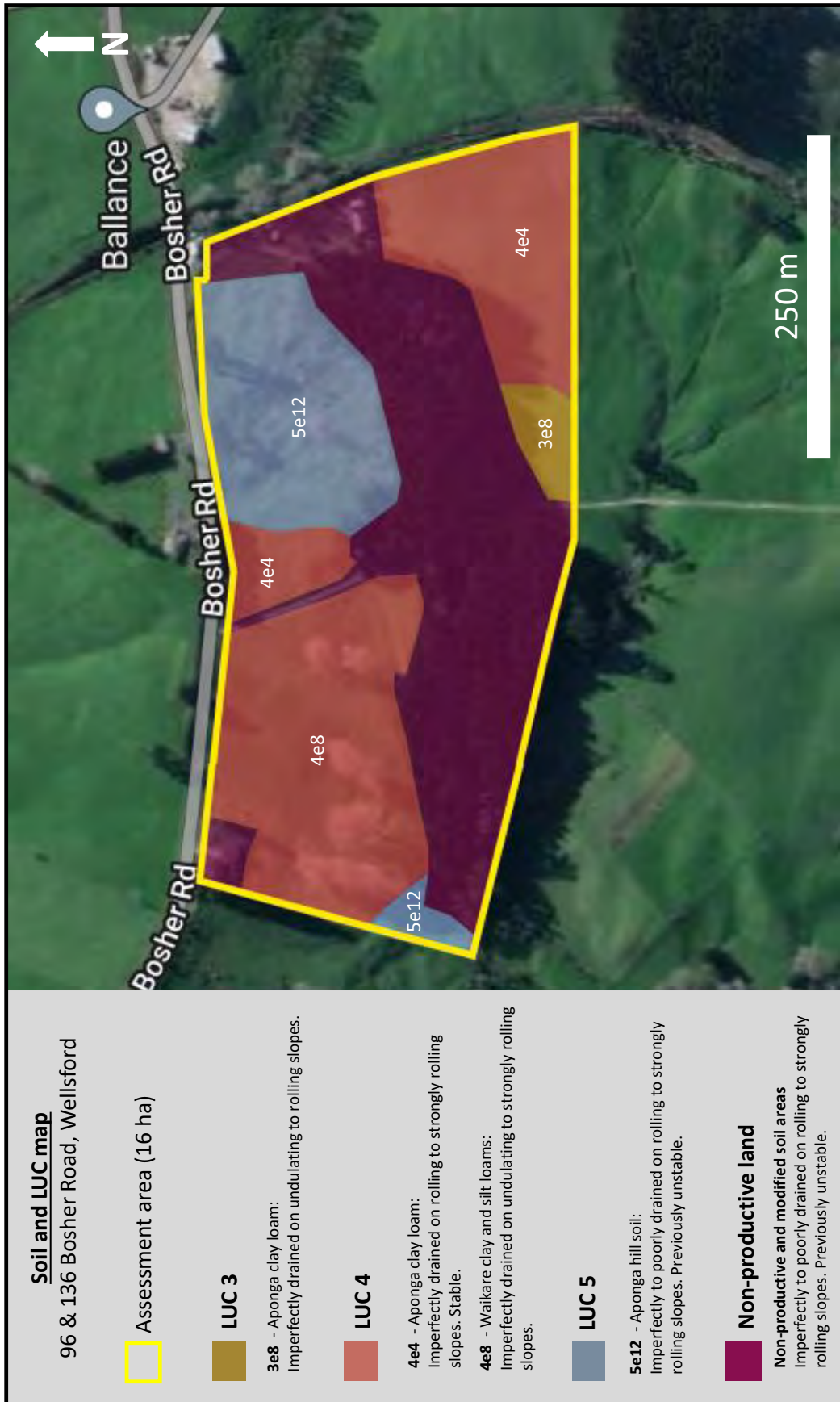
The 96 & 136 Boshier Road site is predominantly (97%) not highly productive land when applying the NPS-HPL.

The site contains a 0.4 ha area of LUC class 3 highly productive land that is isolated, and cannot easily be amalgamated with any surrounding highly productive land.

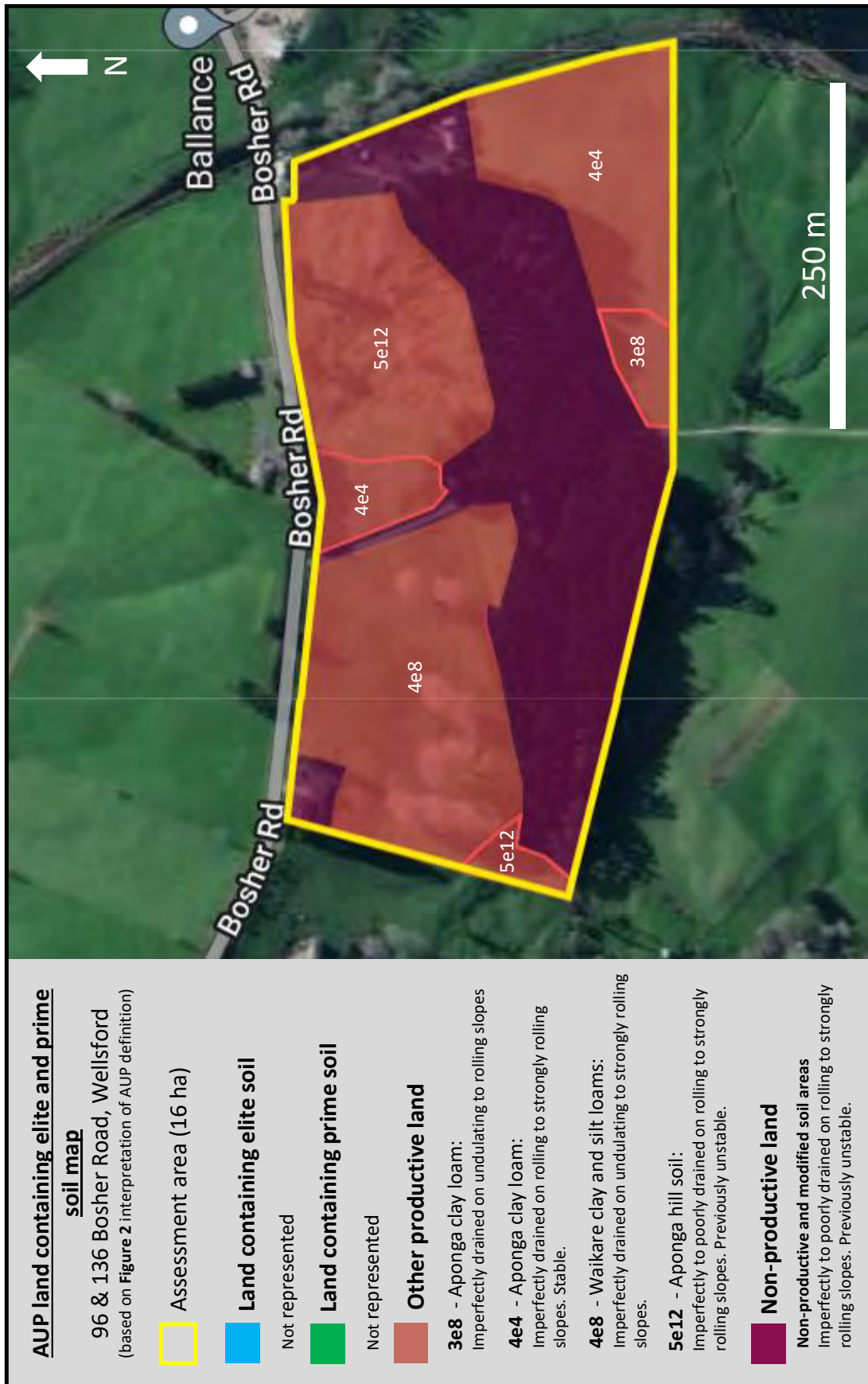
The 96 & 136 Boshier Road site does not contain any LUC class 1 or 2 land and could be considered for subdivision in preference to other land in the Auckland region with predominantly LUC class 1 land and well drained LUC class 2 land which have higher productive capacity.



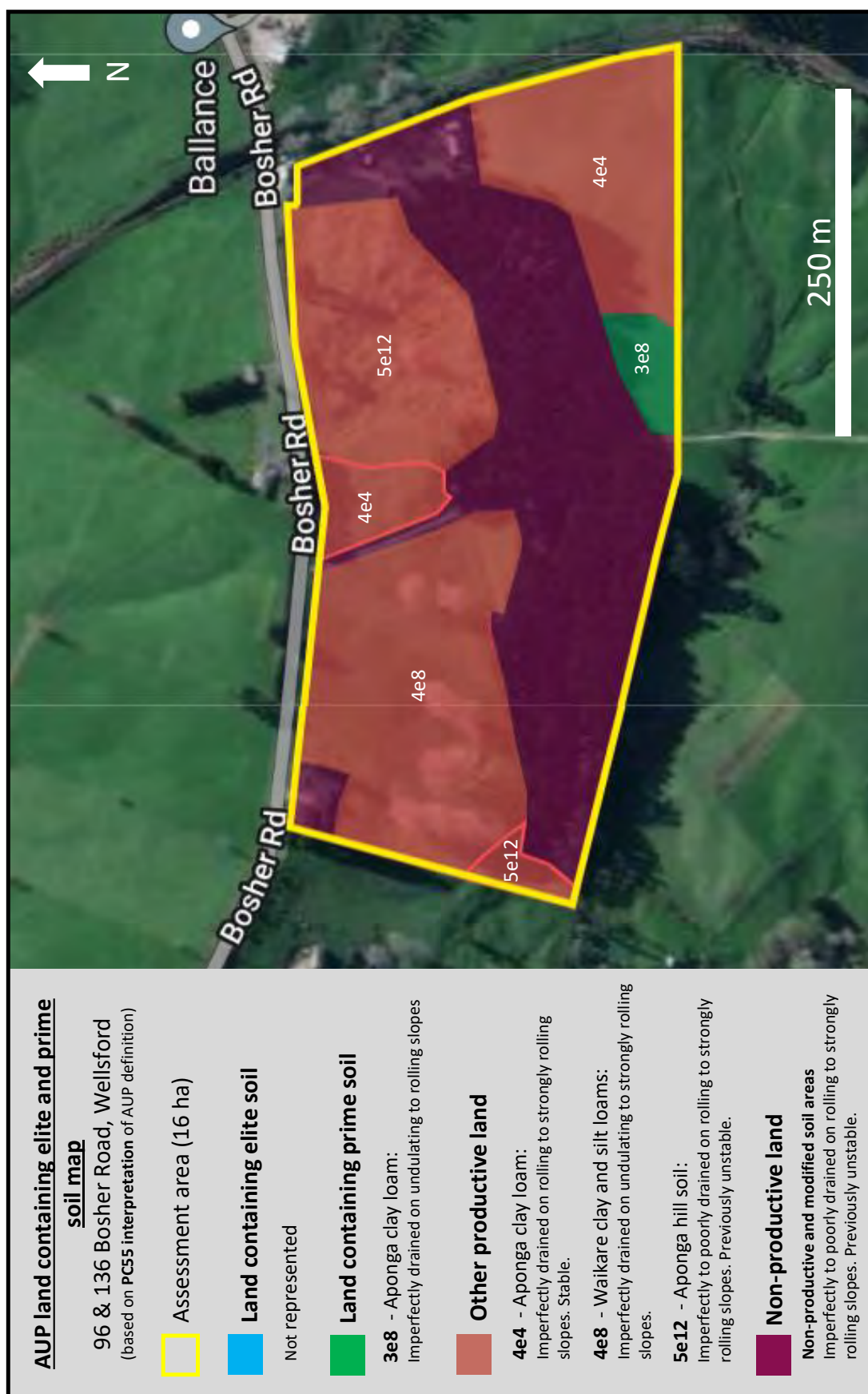
10. Enlarged map from Figure 3.



11. Enlarged map from Figure 4.

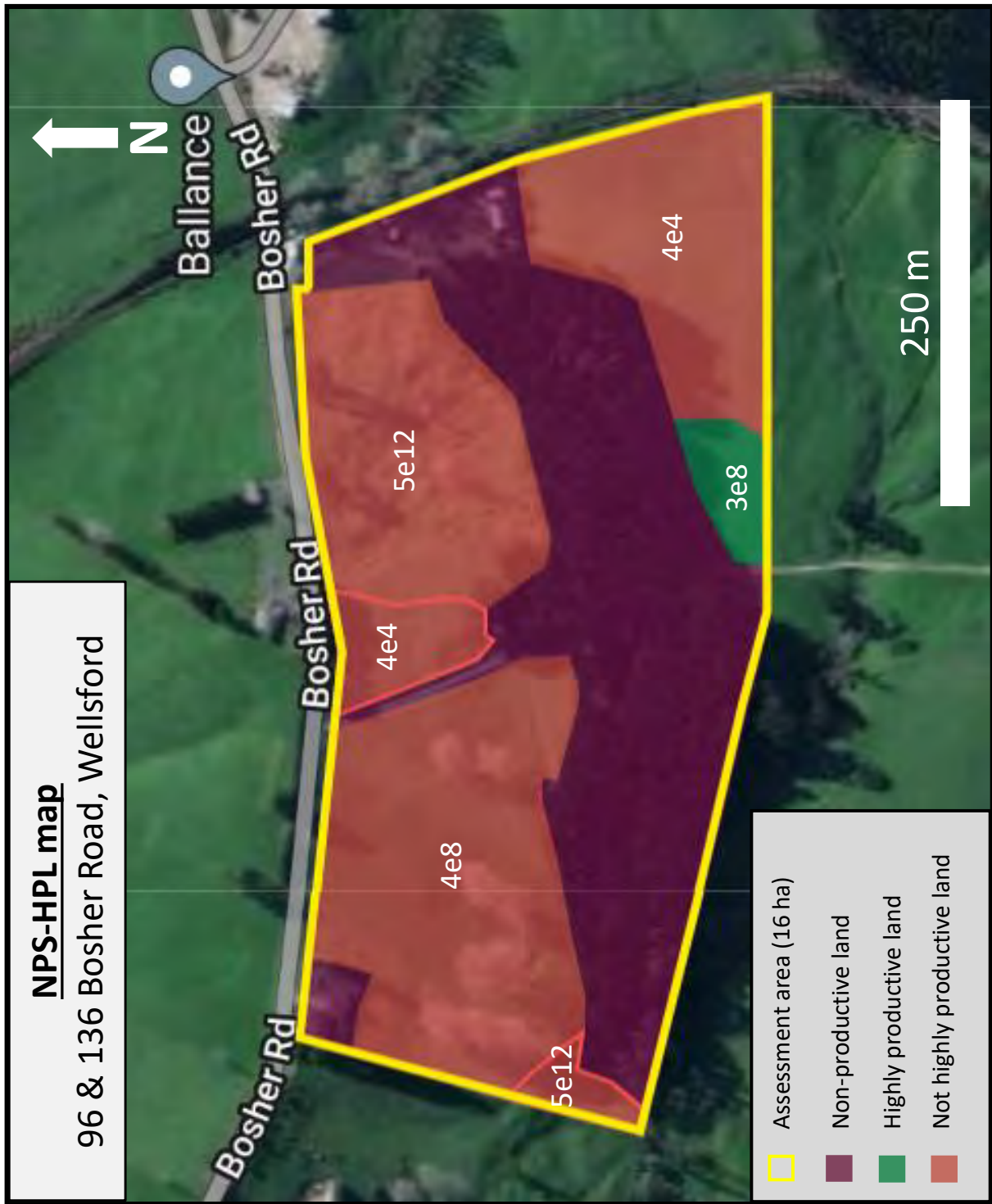


12. Enlarged map from Figure 5.





13. Enlarged map from Figure 6.





# **ATTACHMENT 19**

## **APPENDIX 15 CULTURAL VALUES ASSESSMENT NGĀTI MANUHIRI (CONFIDENTIAL)**



## **PC 92**

Appendix 15 - Cultural Values Assessment – Ngāti Manuhiri – This report has been prepared by Ngāti Manuhiri on a confidential basis. Please contact [unitaryplan@aucklandcouncil.govt.nz](mailto:unitaryplan@aucklandcouncil.govt.nz) for further information





# **ATTACHMENT 20**

## **APPENDIX 16 ARBORICULTURAL ASSESSMENT**





# GREENSCENENZ

ENHANCING AND PROTECTING  
LIVING ENVIRONMENTS

## **Wellsford North Structure Plan**

### **Arboricultural Assessment**

Version 1.2  
March 2023



### Document Status

Responsibility	Name
Author	Allan Holmes

### Revision Status

Version	Date	Reason for Issue
1.1	20 March 2023	First Draft
1.2	23 March 2023	Draft for client review
1.3		Final Report following client review

DRAFT



### Acronyms

Acronym/Term	Description
PRZ	Protected Root Zone
TPZ	Tree Protection Zone
SRZ	Structural Root Zone
CR	Crown Radius
DBH	Diameter at Breast Height
TPM	Tree Protection Methodology
VTA	Visual Tree Assessment
AC	Auckland Council
AUP-OP	Auckland Unitary Plan Operative in part 2016
RC	Resource Consent
TOA	Tree Owner Approval
LOA	Land Owner Approval
RMA	Resource Management Act 1991
SEA	Significant Ecological Area
RPMP	Regional Pest Management Plan 2019-2029
DOC	Department of Conservation
VTA	Visual Tree Assessment

# 1 Introduction

## 1.1 Background

GreensceneNZ Ltd has been engaged by the *Wellsford North Structure Landowner Group* and *Barker and Associates* to survey and assess the trees within and immediately adjacent to the proposed site at Wellsford, see figure 1 below.

This report provides an assessment of the arboriculture associated with *the proposed Plan Change*. This assessment has been prepared to inform the Wellsford North Structure Plan and Plan Change. This report has been compiled with reference to the proposed Structure Plan and Plan Change site boundary, see figure 1 below:

The key matters addressed in this report are as follows:

- (a) Identify and categorise the existing trees within and encroaching into the Project site that would be suitable to access as a notable tree;
- (b) Identify trees that are protected under the **AUP-OP**.

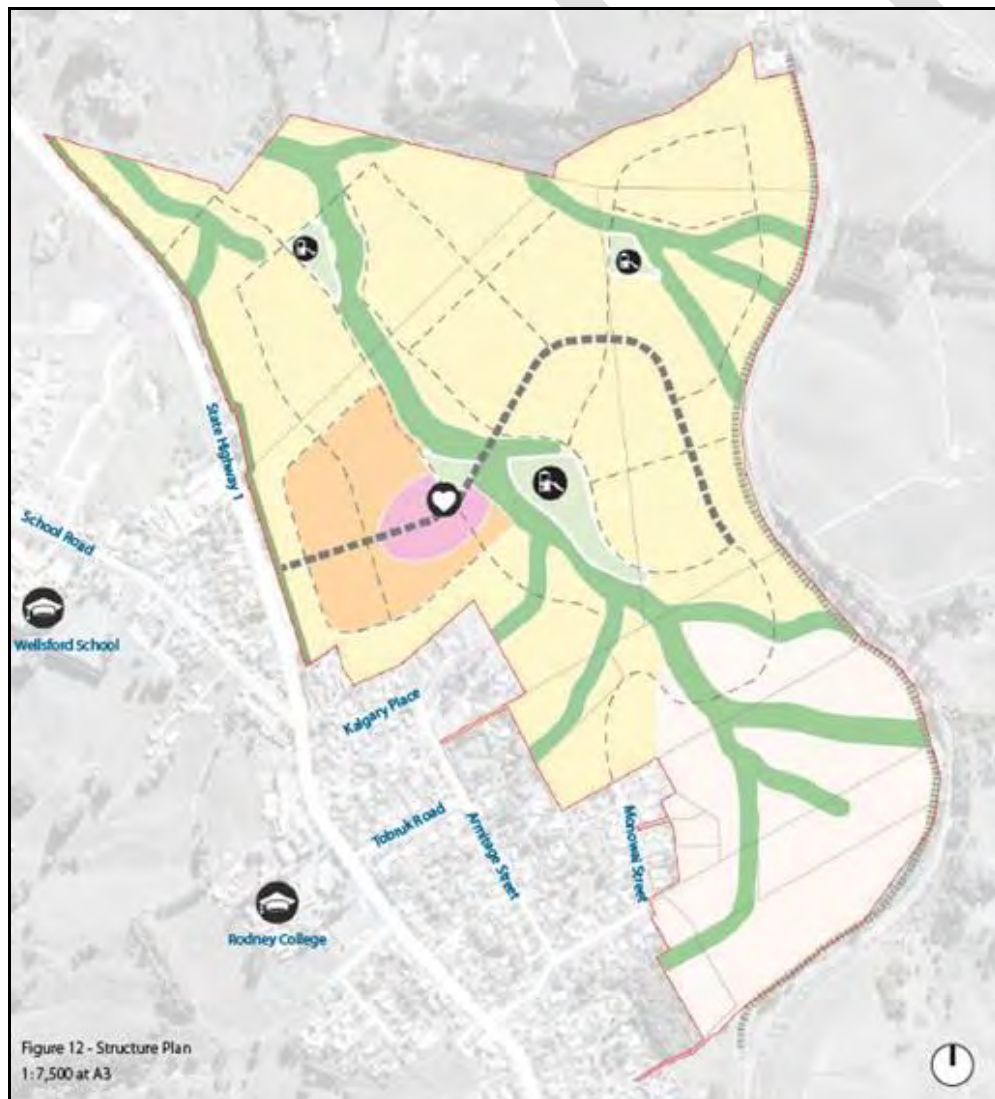
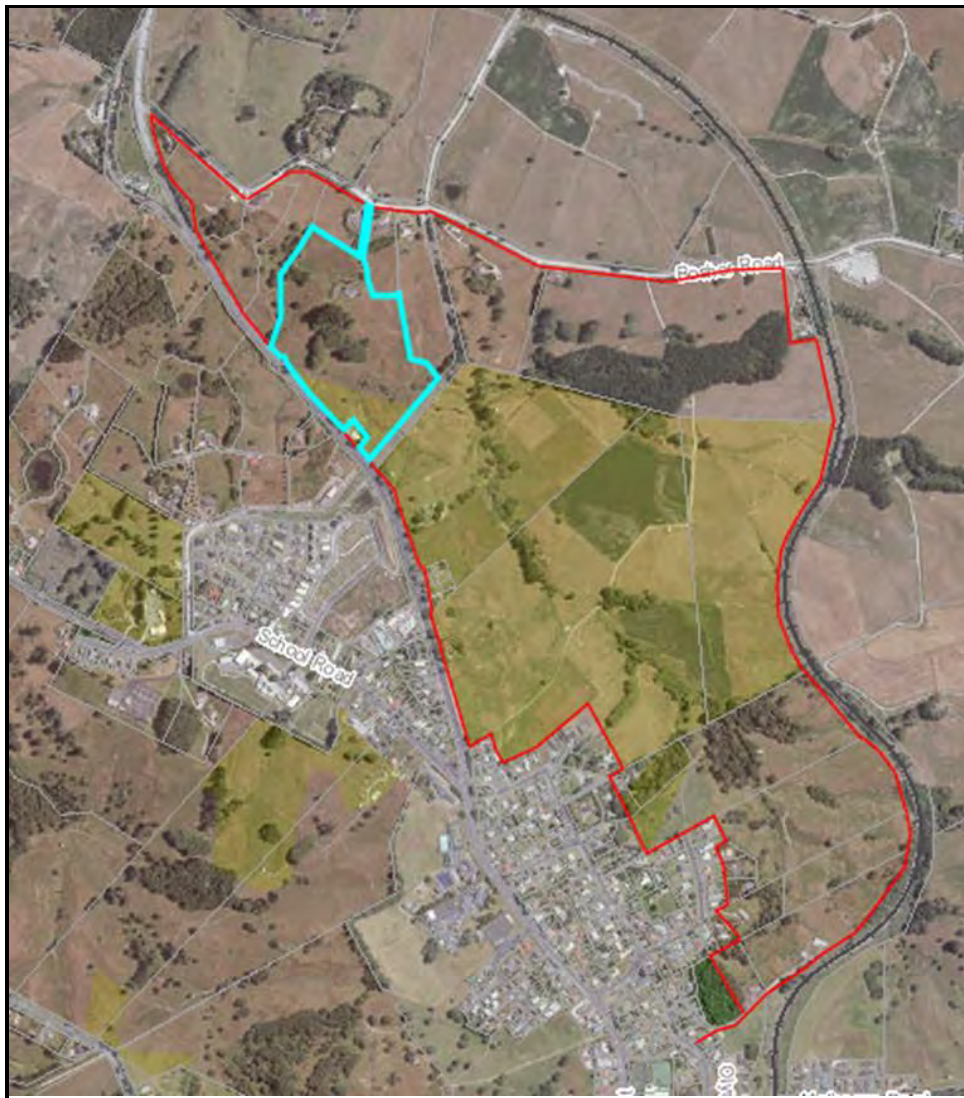


Figure 1: Wellsford Proposed Wellsford Structure Plan area outlined in red.

## 1.2 Project Description

GreensceneNZ Limited has been engaged by the *Wellsford North Structure Landowner Group* and *Barker and Associates* to survey to provide an assessment of the trees on the 78.5ha of sites covered by this plan change for Wellsford Structure Plan and Plan Change area, Wellsford, and to provide the details on the trees that could be considered suitable to be included in the notable tree schedule for the AUP-OP. It is proposed that the 78.5ha area is changed from a combination of Future Urban Zone, Rural Production Zone and Rural Countryside Living Zone to a combination of Residential Large Lot Zone, Residential Single House Zone, Residential Mixed Housing Suburban Zone, Business Neighbourhood Centre Zone, Rural Country Side Living.



**Figure 2: Wellsford Proposed Plan change area outlined in red.**



### 1.3 Site Features

The site comprises of multiple single family dwellings, garages, sheds and out buildings, the use of the land is typical for the area being farmland and lifestyle blocks that are also used for residential purposes. On the land there are, forestry, tree crops, cropping, dry stock and there are numerous established linear shelter belts, wind breaks and boundary plantings to provide protection to the land and buildings behind. Individual exotic and native trees can be found scattered within the site.

The eastern boundary within the railway corridor there is a collection of mainly weed species such as wattle, privet and pine which are managed to be kept clear of the rail lines. The plan change area is relatively clear of trees possibly because the railway is at the high end of the site and provides its own protection to the adjacent area without the shade associated with a tree canopy.



*Figure 3: Looking east across the plan change area to the railway lines.*



The northern end of the site has a large area of mid to late 20yr old pine trees that appear to have been planted as a forestry/commercial crop and have been fenced to keep stock away from the trees.



*Figure 4: Looking south into the pine forest block*

To the north and west of the pines there are passive plantings of poplar and willow trees that have been located to provide protection from the wind to the dwellings in this area and or farm buildings and most are located in the valleys or wet areas of this portion of the site. Poplar and willow are well known for their ability to thrive on wet lands and to draw water from the soil helping to dry it out.



*Figure 5: Looking south towards the pine block and poplar trees.*



To the south of the pine tree block there is a large area of open space/grass with two areas of cropping being maize fields that are again fenced to keep stock out.



*Figure 6: Looking north into the pine forest block across the maize fields.*

To the south of these areas there are multiple groups of trees mainly located along the valley that are located around the water course. It is difficult to determine if they are planted or self-seeded. The groups of trees are a mixture of native and exotic trees and while they appear to have developed quite well, they are also suffering from the canopy competition with each other. The totara have done the best where they are located on the edge of the group although they are not large or dominate trees. Tree 2 assessed for scheduling is from this area and while it has the age and form desired it does not have the size or visibility to be a notable tree.



*Figure 7: Looking east, through the valley south of the maize fields.*



## 2 Statutory Context

### 2.1.1 Native Fauna and Flora

Trees provide a source of food, habitat, breeding and dispersal methods for native fauna as well as potential habitat for native flora e.g. epiphytes such as mistletoe, orchids and lichen. Native fauna which includes birds, bats, lizards and some invertebrates are protected under the Wildlife Act 1953. Management of natural resources including any significant indigenous vegetation and significant habitats of indigenous fauna are covered under the **RMA**. This provides sustainable management for the use and development of natural resources by avoiding, remedying, or mitigating any adverse effects.

### 2.1.2 Auckland Unitary Plan- Operative

Under the **AUP-OP** assessment criteria for trees and vegetation include rules, activities and standards covered in a number of chapters most notably;

- **D13:** Notable Trees Overlay
- **E15:** Vegetation management and biodiversity
- **E16:** Trees in open space zones
- **E17:** Trees in roads
- **E26:** Infrastructure

Any discretionary or restricted discretionary activities will require **RC**, while permitted activities do not. Notwithstanding any trees affected by proposed works which **AC** maintains a regulatory interest (such as open space trees or trees in roads) will require a **TOA**.

### 2.1.3 Pest Plants

Where appropriate invasive plant species have been identified that are listed in the **RPMP**, this also includes animal pests and diseases such as kauri dieback (*Phytophthora agathadica*). While pest species may be recommended for removal they also provide habitat and ecosystem services, control of pest plants should be part of a management plan to ensure the ecosystem services they provide are not compromised by removal.

## 3 Arboricultural Planning

### 3.1 Approach to Arboricultural Planning

A key objective of the Project is to provide a sustainable, liveable, compact and accessible place with successful centres and residential options close to a variety of employment opportunities. That is well connected to the wider Auckland region through the rail and road networks where cultural and heritage values are respected.

Table 1: AUP-OP planning chapters, activities and standards

Planning chapters and assessment standards	
<b>D13: Notable trees</b>	<ul style="list-style-type: none"> <li>• <i>There are no scheduled notable trees within or encroaching into the site.</i></li> <li>• <i>There are 5 sites with Notable trees as detailed below</i></li> <li>• <i>NTO 2363 Pōhutukawa 3 Monowai Street</i></li> <li>• <i>NTO 2368 Pōhutukawa 7 Monowai Street</i></li> <li>• <i>NTO 2352 Cypress 42 Armitage Road</i></li> <li>• <i>NTO 2353 Hoop Pine 44 Armitage Road</i></li> <li>• <i>NTO 2366 Pōhutukawa 6 Batten Street</i></li> </ul>
<b>E15: Vegetation management and biodiversity</b>	<ul style="list-style-type: none"> <li>• <i>There are no Significant Ecological Area (SEA) overlay to be considered.</i></li> <li>• <i>There is no Wetland Management Area overlay to be considered.</i></li> </ul>
<b>E17: Trees in roads</b>	<ul style="list-style-type: none"> <li>• Rodney Street at the north western end with Boshier Road and south to almost School Road there are numerous trees that appear to be located within the site that are actually located within the road reserve and this includes the third and fourth tree, both Norfolk Island pine trees, assessed for scheduling in this assessment.</li> </ul>

## 4 Methodology and Analysis

### 4.1 Assessment Methodology

#### 4.1.1 Surveying

As recognised by the New Zealand Arboricultural Association, GreensceneNZ utilise the British Standard BS5837:2012 Trees in relation to Design, Demolition and Construction on development sites for tree surveying.

Except where permission to gain site access had been obtained, surveying was undertaken from publicly accessible sites using the following equipment:

- Nikon Forestry Pro Rangefinder
- Million Diameter Tape
- PLS laser
- Thor 710 Hammer (as appropriate)
- 450mm probe (as appropriate)

Tree biometric data included tree height, crown radius, diameter at **DBH** and relevant basal diameters were collected from the four trees considered most appropriate to be considered for assessment for the notable tree nomination. These four trees were inspected from the ground level, utilising the Visual Tree Assessment (**VTA**) method expounded by Mattheck and Breloer 1994 and Lonsdale 1999.

All observations including dieback, obvious signs of defects or pathogenic fungal associations were recorded and investigated where deemed necessary. Individual tree life stages were determined as either young, semi mature, mature, over mature or veteran, post survey. Life stage is based upon the maximum achievable size and age recorded for each native species in New Zealand, (J. Dawson, R. Lucas New Zealand's Native Trees 2011).

This tree assessment is a snapshot of the trees at the time of surveying, as trees are dynamic living organisms they are subject to change. It is possible that some changes may occur throughout the course of this proposed development.

#### 4.1.2 Tree Categorization

All trees were classified as either category A, category B, category C or category U in accordance with the British Standard method for trees in relation to design, demolition and construction (BS5837:2012). A numerical subcategory denoting the trees arboricultural, landscape, cultural and conservation value was also designated to the trees, *see appendix 2*.

Trees are categorized according to British Standard BS 5837:2012 and fall under four categories:

- **Category U:** Trees in such a condition that they cannot realistically be retained for longer than 10 years
- **Category A:** Trees of high quality with an estimated life expectancy of at least 40 years
- **Category B:** Trees of moderate quality with an estimated life expectancy of at least 20 years
- **Category C:** Trees of low quality with an estimated life expectancy of at least 10 years or young trees with a DBH of <150mm

The category A, category B and category C trees are of a high, moderate or low quality respectively and are a material constraint. Category U trees are deemed unworthy of being a material constraint and cannot be realistically retained due to their severe decline, associated biosecurity issues, high risk or excessive nuisance. It is recognised that there may still be some cultural or ecological value, however this falls outside.

### 4.1.3 Neighbouring and Non-protected Vegetation

A duty of care will apply in relation to neighbouring privately owned trees. In respect of neighbouring trees, a similar tree protection methodology afforded to generally protected trees should apply and, in particular:

- Identification of the tree (vegetation) protection zone;
- Consultation with the neighbouring property owner(s), should any adverse effects be identified or removal required;
- All works within the TPZ should be under the direction of a qualified arborist;

### 4.1.4 Limitations

The British Standard BS5837:2012 for the assessment of trees in relation to design, demolition and construction is not a tree hazard assessment, therefore this survey does not constitute a quantified risk assessment.



## 5 Conclusion

- According to the AUP-OP there are no protected trees within the Structure Plan and Plan Change area.
- There are no significant trees located within the Structure Plan and Plan Change area that have been assessed as being worthy of protection as a Notable tree. Neither of the four trees assessments achieves a score qualifying to be nominated as a Notable Tree under the AUP-OP.

While there are several larger trees or trees that you would think would make the criteria to be included in the notable tree schedule over these sites, the notable tree assessment criteria is very tight and is quite restrictive in its application.

As detailed in the Auckland Council Guideline for Nominating a Notable tree, a tree can be scheduled as a notable tree if it achieves a score of 20 or more which is quite difficult to achieve without the tree being both older and having a visual contribution as three of the four scoring elements have a mid-value of 5. The first element has a matrix of vigour and vitality against age and health from which to draw a score with the value range between 2 and 10. To keep with a score of 5 the tree needs to be 41-60 years old and have a vitality and vigour top score to get the 5 points.

Tree size is also a limiting factor as only those trees that are up to 25% larger than average are able to be scored at a 5. Less than 24% get 0 and greater than 25% get 10 points

Within the Guidelines for Nominating a Notable Tree for Evaluation, this document provides the following Special Factors

- A Heritage,
- B Scientific,
- C Ecosystem service,
- D Cultural,
- E Intrinsic,
- F Negative effects

Where there are no special factors values provided by the above table to be added to the scores from the tree specific factors table there will be no change to the score of each tree assessed.

# Appendix I

Individually assessed trees

Tree Id	Life Stage	BS5837 Category	Common name	Botanical name	Location Description	Height (m)	DBH (mm)	Canopy radius (m)	AUP (OP) Protection status
1	Mature	C1	Pine	Pinus sp	Farm	31	1767	15.0	Not Protected
2	Young	B1	Totara	Podocarpus totara	Farm	11.8	1400	7	Not Protected
3	Young	B1	Norfolk Island Pine	Araucaria heterophylla	Road Zone	23	1200	8	Protected
4	Young	B1	Norfolk Island Pine	Araucaria heterophylla	Road Zone	25	1800	8	Protected

DRAFT

## Appendix 2

### Notable Tree Assessment

DRAFT



# Tree 1 of 4

Heritage Tree Nomination No. 1

Tree Species Pine

**Section 6: Tree-specific factors (see following page for scoring)**

A tree can be scheduled as Notable if it achieves a score of 20 or more

	Score (see explanatory notes)	Comments
<b>Age and health</b> It is notable because of its age (e.g. the oldest of its species in Auckland) and there is something about the vigour and vitality of the tree or group of trees which makes it notable given other factors (such as its age)	4	41-60 yrs old sparse canopy  larger than the Pine trees on site  Typical for the area  100 - 5000 people
<b>Character and form</b> It is an exceptional example of the species in character and/or form (i.e. tree book shape or has a particular relationship with its environment) or attributes that makes it unique	5	
<b>Size</b> It is an exceptional size for the species in this location (including height, girth or lateral spread)	0	
<b>Visual contribution</b> It makes a significant contribution to the visual character of an area or to the vista from elsewhere in Auckland	5	

**Section 7: Negative effects**

Are there any matters that weigh against the tree's long term protection at this location?

Hazard and negative effects	YES	NO
Does the tree present negative impacts upon human health and / or property?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are these negative effects manageable through arboricultural or property management means?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the tree species listed in the Regional Pest Management Strategy as a Total Control or Containment Plant or listed under the Biosecurity Act 1993 as an Unwanted Organism?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Dead wood

**Section B: Special factors (stand alone)**

For a tree to be scheduled or Notable it needs to meet only one of these special factors

	YES	NO	Comments	
<b>Heritage</b>				
Is associated with or commemorates an historic event (including Maori history or legend)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has strong public associations or has an historic association with a well known historic or notable figure	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is strongly associated with a local historic feature and now forms a significant part of that feature	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Scientific</b>				
Is the only example of the species in Auckland or the largest known specimen of the species in Auckland (including height and lateral spread) (only applies to individual trees)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by DOC or on the regional threatened species list)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has outstanding value because of its scientific significance	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Ecosystem service</b>				
Provides critical habitat for a threatened native species population e.g. bats, chevron skinks, kiwi, yellow mistletoe etc	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Cultural</b>				
Demonstrates a custom, way of life or process that was common but is now rare, is in danger of being lost or has been lost	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has an important role in defining the communal identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance, the meanings of which should not be forgotten	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a landmark, or marker that the community identifies with	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Intrinsic</b>				
Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Tree Location



Comments





Photo of the Pine tree

Within the Guidelines for Nominating a Notable Tree for Evaluation, this document provides the following Special Factors

A Heritage, this is not known for this tree and or site at this point.

B Scientific, this is not the largest pine tree in Auckland.

C Ecosystem service, it is not known if this tree provides a critical habitat for threatened species and it is an exotic tree.

D Cultural, It is not known if this tree meets this criteria.

E Intrinsic, This is the main reason for accessing this tree, its size, age, vigour, vitality and visual contribution.

### F Negative effects

There are several factors that could weigh against this trees long term protection and they could be considered negative impacts on human health and or property with shade, leaf fall and root development of the tree, which are all manageable through arboricultural management with shade being the most difficult to achieve with an evergreen tree.

There is also deadwood through the tree canopy, but this could be removed.

### G Age and health

This is a tree that is not greater than 60 years old and has a sparse canopy.

### H Character and form

This tree is one of the larger pine trees on site.

### I Size

This tree is typical sized pine tree for the area.

### J Visual contribution

This tree is highly visible from a main road where between 100 and 5000 people will see the tree daily

## Tree 2 of 4

Heritage Tree Nomination No. 2

Tree Species Totara

**Section 6: Tree-specific factors (see following page for scoring)**

A tree can be scheduled as Notable if it achieves a score of 20 or more

	Score (see explanatory notes)	Comments
<b>Age and health</b> It is notable because of its age (e.g., the oldest of its species in Auckland) and there is something about the vigour and vitality of the tree or group of trees which makes it notable given other factors (such as its age)	4	61-80yrs old
<b>Character and form</b> It is an exceptional example of the species in character and/or form (i.e., tree form, shape or has a particular relationship with its environment) or attributes that makes it unique	5	Sparse canopy
<b>Size</b> It is an exceptional size for the species in this location (including height, girth or lateral spread)	0	Typical for the area
<b>Visual contribution</b> It makes a significant contribution to the visual character of an area or to the vista from somewhere in Auckland	2	Sits low in the valley

**Section 7: Negative effects**

Are there any matters that weigh against the tree's long term protection at this location?

Hazard and negative effects	YES	NO
Does the tree present negative impacts upon human health and / or property?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are there negative effects manageable through arboricultural or property management means?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the tree species listed in the Regional Pest Management Strategy as a Total Control or Containment Plant or listed under the Biosecurity Act 1993 as an Unwanted Organism?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Deadwood



Section B: Special factors (stand alone)				
For a tree to be scheduled or Notable it needs to meet only one of these special factors				
	YES	NO	Comments	
<b>Heritage</b>				
Is associated with or commemorates an historic event (including Maori history or legend)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has strong public associations or has an historic association with a well known historic or notable figure	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is strongly associated with a local historic feature and now forms a significant part of that feature	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Scientific</b>				
Is the only example of the species in Auckland or the largest known specimen of the species in Auckland (including height and lateral spread) (only applies to individual trees)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by DOC or on the regional threatened species list)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has outstanding value because of its scientific significance	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Ecosystem service</b>				
Provides critical habitat for a threatened native species population (e.g. bats, diurnal birds, kiwi, yellow robin etc)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Cultural</b>				
Demonstrates a custom, way of life or process that was common but is now rare, is in danger of being lost or has been lost	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has an important role in defining the community identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance, the meanings of which should not be forgotten	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a landmark, or marker that the community identifies with	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Intrinsic</b>				
Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Tree Location



Comments



Photo of the Totara tree

Within the Guidelines for Nominating a Notable Tree for Evaluation, this document provides the following Special Factors

A Heritage, this is not known for this tree and or site at this point.

B Scientific, this is not the largest totara tree in Auckland.

C Ecosystem service, it is not known if this tree provides a critical habitat for threatened species.

D Cultural, It is not known if this tree meets this criteria.

E Intrinsic, This is the main reason for accessing this tree, its size, age, vigour, vitality and visual contribution.

### F Negative effects

There are several factors that could weigh against this trees long term protection and they could be considered negative impacts on human health and or property with shade, leaf fall and root development of the tree, which are all manageable through arboricultural management with shade being the most difficult to achieve with an evergreen tree.

### G Age and health

This is a tree that is not greater than 80 years old and has a sparse canopy.

### H Character and form

This tree is one of the larger totara trees on site.

### I Size

This tree is typical sized totara tree for the area.

### J Visual contribution

This tree is visible from a main road where between 100 and 5000 people may see the tree daily although it is nestled in amongst other trees as well.



## Tree 3 of 4

Heritage Tree Nomination No. 3  
 Tree Species Norfolk Island Pine

**Section 6: Tree-specific factors (see following page for scoring)**  
 A tree can be scheduled as Notable if it achieves a score of 20 or more.

	Score (see explanatory notes)	Comments
<b>Age and health</b> It is notable because of its age (e.g. the oldest of its species in Auckland) and there is something about the vigour and vitality of the tree or group of trees which makes it notable given other factors (such as its age)	4	61-80 yrs old  sparse upper canopy  adjacent to main road
<b>Character and form</b> It is an exceptional example of the species in character and/or form (i.e. text book shape or has a particular relationship with its environment) or attributes that makes it unique	0	
<b>Size</b> It is an exceptional size for the species in the location (including height, girth or basal spread)	5	
<b>Visual contribution</b> It makes a significant contribution to the visual character of an area, or to the vista from elsewhere in Auckland	5	
<b>Section 7: Negative effects</b>		
Are there any matters that weigh against the tree's long term protection at this location?		
<b>Hazard and negative effects</b>	YES	NO
Does the tree present negative impacts upon human health and/or property?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are these negative effects manageable through arboricultural or property management means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the tree species listed in the Regional Pest Management Strategy as a Total Control or Containment Plant or listed under the Biosecurity Act 1993 as an Unwanted Organism?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Section 8: Special factors (stand alone)</b>				
For a tree to be scheduled or Notable it needs to meet only one of these special factors				
	YES	NO	Comments	
<b>Heritage</b>				
Is associated with or commemorates an historic event (including Māori history or legend)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has strong public associations or has an famous association with a well known historic or notable figure	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is strongly associated with a local historic feature and now forms a significant part of that feature	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Scientific</b>				
Is the only example of the species in Auckland or the largest (or one specimen) of the species in Auckland (including height and lateral spread) (only applies to individual trees)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by DOC or on the regional threatened species list)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has outstanding value because of its scientific significance	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Ecosystem service</b>				
Provides critical habitat for a threatened native species population e.g., bats, chevron skinks, kiwi, yellow mottletail etc	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Cultural</b>				
Demonstrates a custom, way of life or process that was common but is now rare, is in danger of being lost or has been lost	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has an important role in defining the communal identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance, the meanings of which should not be forgotten	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a landmark or marker that the community identifies with	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Intrinsic</b>				
Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Tree Location



Comments





Photo of the Norfolk Island pine tree

Within the Guidelines for Nominating a Notable Tree for Evaluation, this document provides the following Special Factors

A Heritage, this is not known for this tree and or site at this point.

B Scientific, this is not the largest Norfolk Island pine tree in Auckland.

C Ecosystem service, it is not known if this tree provides a critical habitat for threatened species.

D Cultural, It is not known if this tree meets this criteria.

E Intrinsic, This is the main reason for accessing this tree, its size, age, vigour, vitality and visual contribution.

### F Negative effects

There are several factors that could weigh against this trees long term protection and they could be considered negative impacts on human health and or property with shade, leaf fall cone fall and root development of the tree, which are all manageable through arboricultural management with shade being the most difficult to achieve with an evergreen tree.

### G Age and health

This is a tree that is not greater than 80 years old and has a sparse canopy.

### H Character and form

This tree is one of the larger trees on site.

### I Size

This tree is typical sized tree for the area.

### J Visual contribution

This tree is visible from a main road where between 100 and 5000 people may see the tree daily.

It is located within the road reserve.

# Tree 4 of 4





Section B: Special factors (stand alone)				
For a tree to be scheduled or Notable it needs to meet only one of these special factors				
	YES	NO	Comments	
<b>Heritage</b>				
Is associated with or commemorates an historic event (including Wars/ Wars' on legend)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has strong public associations or has an historic association with a well known historic or notable figure	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is strongly associated with a local historic feature and now forms a significant part of that feature	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Scientific</b>				
Is the only example of the species in Auckland or the largest known specimen of the species in Auckland (including height and lateral spread) (only applies to individual trees)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by DOC or on the regional threatened species list)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has outstanding value because of its scientific significance	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Ecosystem service</b>				
Provides critical habitat for a threatened native species population (e.g., bats, thomson skink, kiwi, yellow moutere etc)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Cultural</b>				
Demonstrates a custom, way of life or practice that was common but is now rare, is in danger of being lost or has been lost	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Has an important role in defining the communal identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance the meanings of which should not be forgotten	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a landmark, or marker that the community identifies with	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Intrinsic</b>				
Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Tree Location



Comments



Photo of the Norfolk Island pine tree

Within the Guidelines for Nominating a Notable Tree for Evaluation, this document provides the following Special Factors

A Heritage, this is not known for this tree and or site at this point.

B Scientific, this is not the largest Norfolk Island pine tree in Auckland.

C Ecosystem service, it is not known if this tree provides a critical habitat for threatened species.

D Cultural, It is not known if this tree meets this criteria.

E Intrinsic, This is the main reason for accessing this tree, its size, age, vigour, vitality and visual contribution.

### F Negative effects

There are several factors that could weigh against this trees long term protection and they could be considered negative impacts on human health and or property with shade, leaf fall cone fall and root development of the tree, which are all manageable through arboricultural management with shade being the most difficult to achieve with an evergreen tree.

### G Age and health

This is a tree that is not greater than 80 years old and has a sparse canopy.

### H Character and form

This tree is one of the larger trees on site.

### I Size

This tree is typical sized tree for the area.

### J Visual contribution

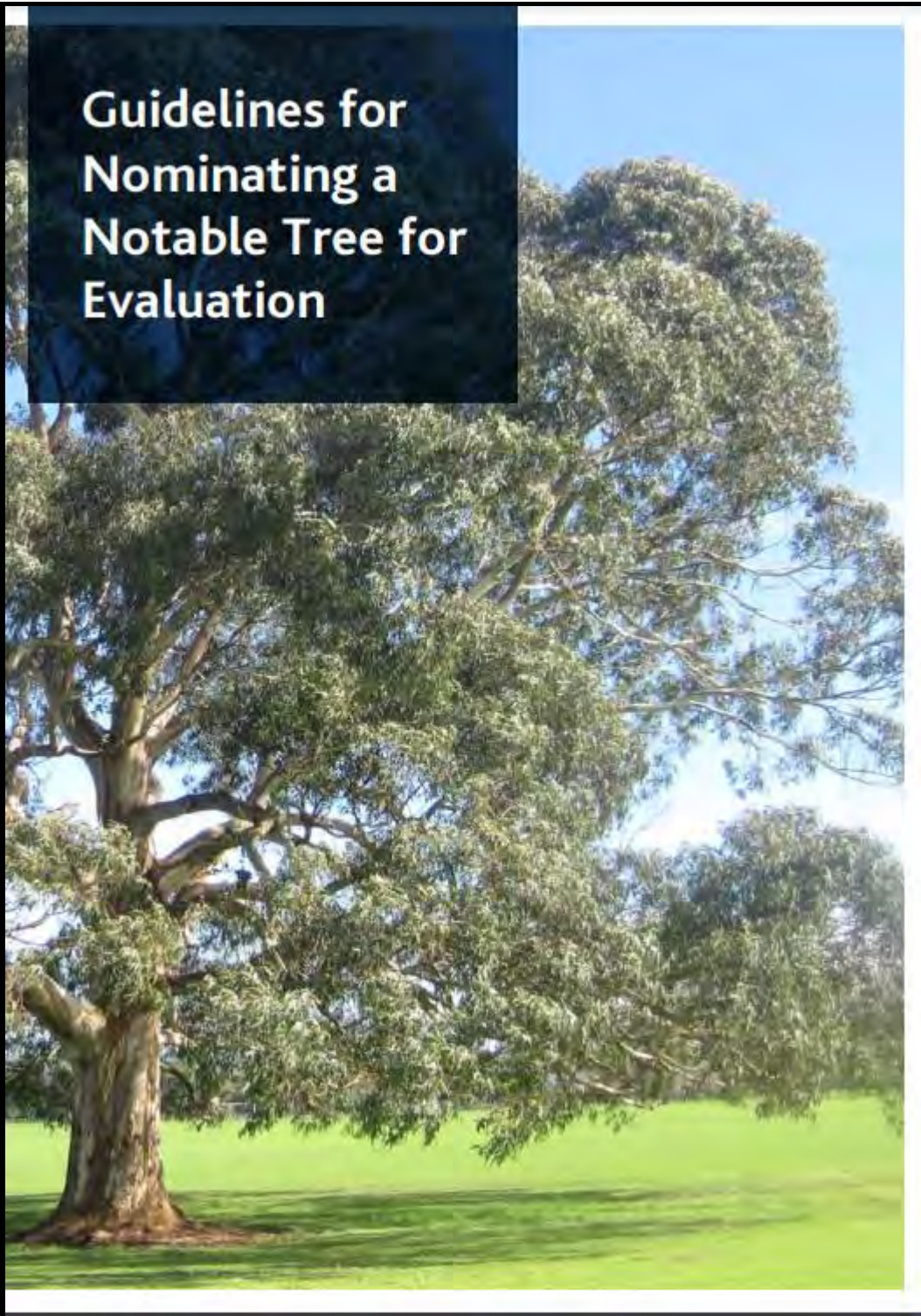
This tree is visible from a main road where between 100 and 5000 people may see the tree daily.

This tree is located within the road reserve.

I have attached a copy of the Guideline for further reference below.



## Guidelines for Nominating a Notable Tree for Evaluation



# Nomination Guidelines

These guidelines outline the requirements for nominating a notable tree for evaluation by Auckland Council for inclusion on the region's Notable Tree Schedule. This document will assist you in completing and submitting the nomination form.

## Nominating a tree

Any person or organisation may nominate a tree or group of trees for evaluation by completing and submitting the nomination form.

Before you submit a nomination, please read these guidelines to check whether nomination is appropriate, and to ensure that you complete the form correctly. You should only nominate a tree or group of trees if you consider it has significant value and would be a worthy addition to Auckland's Notable Tree Schedule.

## Purpose of evaluation

The purpose of this evaluation is to identify notable trees for inclusion in Auckland's Notable Tree Schedule, or for other appropriate management to protect the tree such as a legal covenant.

Nomination of a tree or group of trees does not automatically guarantee that it will be evaluated or considered for scheduling. Priority will be given to nominations for trees on the nominator's property or on public land (open space, reserves or streets) and to those that are not already scheduled as part of a Significant Ecological Area. Priority will also be given to nominations that clearly identify the values of the tree and are supported by relevant background information. Therefore you are encouraged to make a persuasive case for the significance of the tree.

## What is a Notable Tree?

Practically all trees play important economic, environmental and social roles in any district of New Zealand. However, some trees are often thought of as being of greater value than others. That is, there are some specimen trees, or groups of trees, that stand out as being notable, significant or distinguished. It is those trees that, for various reasons, are selected by territorial local authorities, throughout New Zealand, for inclusion on a notable tree schedule in a district plan. Through this mechanism they gain greater legal protection.

Notable trees are generally those that a community or nation regard as being of special importance because they commemorate important events in a nation's history, are exceptional or unique examples of a species, are critical to the survival of other species or are of such age, stature, character and visibility that they are regarded as the best in the district.

## What is the Notable Tree Schedule?

Auckland's Notable Tree Schedule is a list of significant trees or groups of trees in the Auckland region. Inclusion of a tree or group of trees in the Schedule means that:

- It has been officially recognised by the Auckland Council as being a Notable Tree
- It is protected by provisions in district or unitary plans to ensure it is not damaged or destroyed
- It may be eligible for grants and other incentives.



### Criteria for scheduling Notable Trees

Auckland Council has proposed criteria for evaluating the importance of trees and the level of significance required to be considered for inclusion in the Notable Tree Schedule. There are three types of criteria: Special factors (stand alone), Negative factors and Tree Specific factors.

The special factor criteria are stand alone which means that if a tree or group of trees meets any one criterion then it is deemed notable. The tree-specific criteria require a cumulative assessment. That means, for a tree or group of trees to be notable, it must have a cumulative score of 20 or more out of 40 using the scoring systems described in Appendix 1.

Both the special factor and tree-specific criteria are used in combination to determine whether a tree or group of trees is notable. A tree will be notable if it meets only one of the special factors or the score threshold for tree-specific criteria.

In addition, the assessment against the Special factor and tree-specific criteria is then balanced by taking into account the potential negative effects of the tree. In situations where negative effects occur then these must be offset against the benefits of protecting a notable tree. This methodology does not provide a definitive way to make this decision but it relies on the expertise of trained arborists assessing the risk of the negative effects occurring and the overall significance of the tree. The critical part of this assessment is determining whether the hazard or negative effects are unmanageable. Most hazards and all nuisance effects can be managed but in instances where they are unmanageable a tree will not be scheduled as notable. Pest plants listed in the Regional Pest Management Strategy or Plan will not be scheduled.



### Special Factors (stand alone)

#### A. Heritage

- Is associated with or commemorates an historic event (including Maori history or legend)
- Has strong public associations or has an historic association with a well known historic or notable figure
- Is strongly associated with a local historic feature and now forms a significant part of that feature

#### B. Scientific

- Is the only example of the species in Auckland or the largest known specimen of the species in Auckland (including height and lateral spread) (only applies to individual trees)
- Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by the Department of Conservation (DOC) or on the regional threatened species list)
- Has outstanding value because of its scientific significance

#### C. Ecosystem service

- Provides critical habitat for a threatened native species population e.g., bats, chevron skinks, kiwi, yellow mistletoe etc

#### D. Cultural

- Demonstrates a custom, way of life or process that was common but is now rare, is in danger of being lost or has been lost
- Has an important role in defining the communal identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance, the meanings of which should not be forgotten
- Is a landmark, or marker that the community identifies with

#### E. Intrinsic

- Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees

### Negative Effects

#### F. Negative effects

- Are there any matters that may weigh against the tree's long term protection at this location?
- Does the tree present negative impacts upon human health and / or property?
- Are these negative effects manageable through arboricultural or property management means?
- Is the tree species listed in the Regional Pest Management Strategy as a Total Control or Containment Plant or listed under the Biosecurity Act 1993 as an Unwanted Organism?

### Tree-specific factors (see below for scoring)

#### G. Age and health

- Is notable because of its age (e.g., the oldest of its species in Auckland) and there is something about the vigour and vitality of the tree or group of trees which makes it notable given other factors (such as its age)

#### H. Character and form

- Is an exceptional example of the species in character and/or form (i.e., text book shape or has a particular relationship with its environment) or attributes that makes it unique

#### I. Size

- It is an exceptional size for the species in this location (including height, girth or lateral spread)

#### J. Visual contribution

- It makes a significant contribution to the visual character of an area or to the vista from elsewhere in Auckland





### Thresholds

When applying tree-specific factors to groups of trees an average assessment for all trees in the group should be used. At least one individual in a group must be scheduled independently as notable and all trees in the group must be physically close to each other or form a collective or functional unit through meeting at least one of the following criteria: 1. Canopies touch; 2. Canopies overlap; 3. Canopies are not further than 5 metres apart.

To be considered eligible for inclusion in Auckland's Notable Tree Schedule, a tree or group of trees must meet at least one of the special factor criteria or achieve a score of 20 or more for tree-specific criteria.

Other tree specific factors are also taken into account in the decision to recommend a tree for scheduling.

Sometimes scheduling is not the most appropriate way of protecting an important tree. For example, it may be part of a significant indigenous plant community and it would be more appropriate to schedule as a Significant Ecological Area (SEA) or it may already be within one of these SEAs and therefore a lower priority for evaluation.

The final decision over whether to schedule a notable tree or group of trees is made by the Council after assessing the information obtained from this process.

### What trees can be nominated?

Any tree or groups of trees may be nominated including those in towns, streetscapes and settlements, gardens, trees and plantings or they may be naturally occurring trees in parks, reserves or covenants.

Frivolous or vexatious nominations will not be accepted including nominations for:

- Any tree or groups of trees that has been planted and is less than 20 years old, other than in exceptional circumstances
- Moveable or portable trees such as those in planter boxes.
- Any tree that cannot be accurately located or identified.

Priority will be given to trees nominated for inclusion in Auckland's schedule of Notable Trees that occur on the property of the nominee or in a public reserve. Detailed nominations supported with good information will have an increased chance of being processed quickly for acceptance into the schedule and will be peer reviewed. Nominations providing limited information, or those for trees on another person's private property will be processed as and when resources are made available.



**Completing the nomination form  
(see Appendix 1)**

**Before completing the form**

Before you complete the nomination form (see Appendix 1) you should check your existing Notable Tree Schedule to ensure that the tree or group of trees is not already scheduled.

**Completing the form**

You are encouraged to complete and submit the nomination form in electronic format. You can download an electronic copy of the form from the Auckland Council website (<http://www.aucklandcouncil.govt.nz>)

**Section 1 (Contact details)**

We need to be able to acknowledge receipt of your nomination, verify information if needed, and keep you informed. We cannot accept anonymous nominations.

**Section 2 (Address)**

We need to know where the tree is. If it doesn't have a street address, you can provide the legal description or grid reference (using NZ Transverse Mercator coordinates). You can access these through the council's GIS viewer: <http://maps.aucklandcouncil.govt.nz/aucklandcouncilviewer/>

Legal description: use the 'identify' button on the toolbars on the right of the screen Grid reference: go to Tools/capture map coordinates. Print out and attach an aerial photo of the site with the tree clearly circled. If there are multiple trees please show where each tree is located,

**Section 3 (Owner/occupier)**

Complete this section if you have access to this information.

**Section 4 (Description)**

You should include a description of the tree and its location. For example provide a description of the estimated height, age, species and context for the tree.

**Section 5 (Threats)**

It is useful to identify known threats to the tree, because this will assist in prioritising nominations. For example, pressure from development, risk of being removed to create views etc.

**Sections 6 - 8 (Tree specific and special factors and negative effects)**

You should evaluate the tree or group of trees against each of the criteria. This will be the primary means by which we will evaluate a tree.

**Section 9 (Conclusions)**

Summarise your conclusions about the tree or group of trees here.

**Further assistance**

If you need assistance with the form, please contact the Council's Heritage team by email at [heritage@aucklandcouncil.govt.nz](mailto:heritage@aucklandcouncil.govt.nz)

Please complete the form in as much detail as possible.



# Frequently Asked Questions

## **Can I provide information in confidence?**

Generally not. Evaluation of Auckland's heritage is a public process. All members of the public, including the owner of a tree, are entitled to access all information held by the Council on a property. Councils are only required to restrict access to sensitive information about places of significance to tangata whenua as this is a statutory requirement under the Resource Management Act 1991. All other information relating to a property is public information, and is therefore available to members of the public upon request. If you have concerns about providing information that is, or may be sensitive or subject to copyright, you should discuss this with staff in the Council's Heritage Unit before providing the information.

## **What about my personal details?**

The Council has a responsibility to comply with the Privacy Act 1993 and the Local Government Official Information and Meetings Act 1987. All information provided to, and held by Council as public records, is public information and is subject to disclosure upon request unless there are reasons why it should not be disclosed. If you have concerns, you should refer to the relevant Acts, and seek independent advice.

## **What if I don't have the time or knowledge to provide all the information you require?**

The more supporting evidence you can provide the better. Nominations that lack sufficient information may be assigned a low priority for evaluation. You could approach your Local Board, botanical society or other community group to assist with the nomination or to make it on your behalf.

## **Why can't the Council evaluate all nominated trees?**

The process of evaluating trees requires specialised personnel and resources. As well as public nominations, the council identifies potentially significant trees through its own work. All nominations receive an initial appraisal. Those that are unlikely to meet the significance thresholds or lack sufficient information will be assigned a low priority or may not proceed. In some cases nominated trees have been previously evaluated, so unless new information becomes available they will not be re-evaluated.

## **What is the best format for sending information to the Council?**

Electronic files are preferred. Original photographs or documents should be scanned or copied. If you have large files (over 10MB) send them in parts or convert them to smaller file sizes (e.g. by converting them to PDF files) or copy them onto a CD.

## **Can I protect my tree even if my tree is not notable?**

If you have a tree and you think it is special but is unlikely to be scheduled as notable then there are alternatives to enable it protection such as a private legal covenant.

# Notable Tree Nomination Form

This nomination form is to be used for assessing trees or groups of trees. When applying tree-specific factors to groups of trees an average assessment for all trees in the group should be used. At least one individual in a group must be scheduled independently as notable and all trees in the group must be physically close to each other or form a collective or functional unit through meeting at least one of the following criteria: 1. Canopies touch; 2. Canopies overlap; 3. Canopies are not further than 5 metres apart.

## Section 1: Your Contact Details

## Section 2: Address of the tree

## Section 3: Owner/occupier

## Section 4: Description

## Section 5: Threats to the tree



**Section 6: Tree-specific factors (see following page for scoring)**

A tree can be scheduled as Notable if it achieves a score of 20 or more

	Score (see explanatory notes)	Comments
<p><b>Age and health</b> Is notable because of its age (e.g., the oldest of its species in Auckland) and there is something about the vigour and vitality of the tree or group of trees which makes it notable given other factors (such as its age)</p>	<input type="checkbox"/>	
<p><b>Character and form</b> Is an exceptional example of the species in character and/or form (i.e., text book shape or has a particular relationship with its environment) or attributes that makes it unique</p>	<input type="checkbox"/>	
<p><b>Size</b> It is an exceptional size for the species in this location (including height, girth or lateral spread)</p>	<input type="checkbox"/>	
<p><b>Visual contribution</b> It makes a significant contribution to the visual character of an area or to the vista from elsewhere in Auckland</p>	<input type="checkbox"/>	
<p><b>Section 7: Negative effects</b></p> <p>Are there any matters that weigh against the tree's long term protection at this location?</p>		
<p><b>Hazard and negative effects</b></p>	YES	NO
Does the tree present negative impacts upon human health and / or property?	<input type="checkbox"/>	<input type="checkbox"/>
Are these negative effects manageable through arboricultural or property management means?	<input type="checkbox"/>	<input type="checkbox"/>
Is the tree species listed in the Regional Pest Management Strategy as a Total Control or Containment Plant or listed under the Biosecurity Act 1993 as an Unwanted Organism?	<input type="checkbox"/>	<input type="checkbox"/>

### Scoring of tree specific factors

These scoring systems are to be used when evaluating a tree against the tree-specific factors in Section 6 (see page 10).

#### Age and health

Vigour and vitality	High	3	5	6	8	10
	↑	2	4	6	8	8
		2	4	6	6	7
		2	4	4	5	5
Low	2	2	2	3	3	
Age in Years	<40	41-60	61-80	81-100	>100	

This scoring system should be used when assessing the age and health of a tree. It allows for trees that are old and healthy to score much more highly than trees that are either unhealthy or young. The degree of vigour and vitality for any tree is assessed given the age of the tree. Therefore, a tree that is over 100 years old and showing high vigour and vitality, for a tree that age, will score a 10.

#### Character or form

Not exceptional	0
Exceptional example locally	5
Exceptional example in Auckland	10

This scoring system should be used when assessing the character or form of a tree. It allows for trees that are exceptional examples at two spatial scales (from local to Auckland-wide) to score more highly than trees that are regarded as normal.

#### Size

Average size for the species in this location	0
Greater than average size (up to 25% larger)	5
Substantially greater than average size (>25% larger)	10

This scoring system should be used when assessing the size of a tree (including height, girth and lateral spread). It allows for trees that are larger than would be expected (on average) for a particular location to be scored more highly than trees that are at, or close to (or below), their average height.

#### Visual contribution

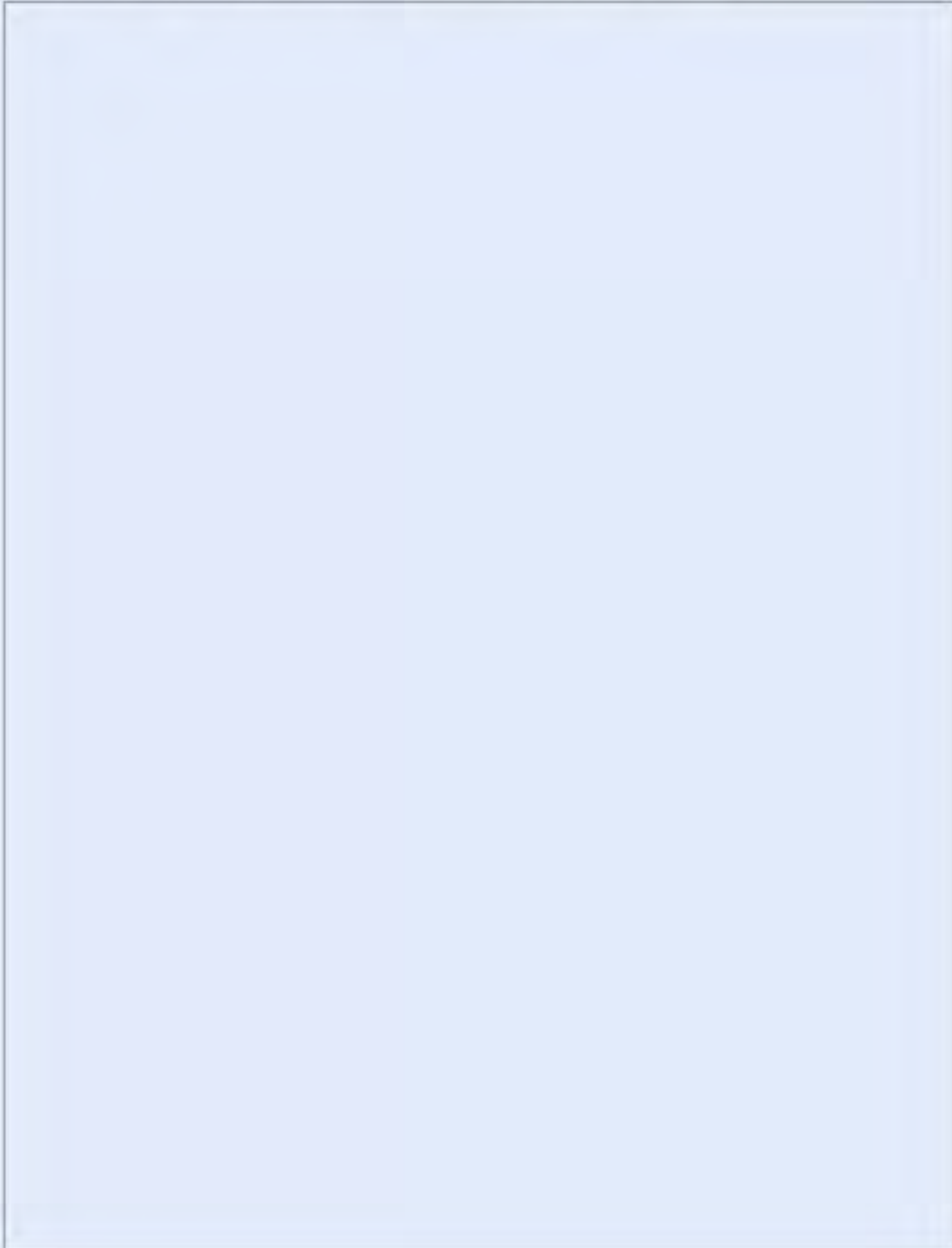
In backyard or gully	2	e.g. fewer than 100 people see the tree daily
Local park/community/ beside minor road or feeder road/catchment	5	e.g. between 100 and 5000 people see the tree daily
Main Road/motorway or highly visible landform	10	e.g. more than 5000 people see the tree daily

This scoring system should be used when assessing the visual contribution of a tree. It allows for trees that are seen by more people on a daily basis to score more highly than trees that are rarely seen.

<b>Section 8: Special factors (stand alone)</b>				
For a tree to be scheduled or Notable it needs to meet only one of these special factors	YES	NO	Comments	
<b>Heritage</b>				
Is associated with or commemorates an historic event (including Maori history or legend)	<input type="checkbox"/>	<input type="checkbox"/>		
Has strong public associations or has an historic association with a well known historic or notable figure	<input type="checkbox"/>	<input type="checkbox"/>		
Is strongly associated with a local historic feature and now forms a significant part of that feature	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Scientific</b>				
Is the only example of the species in Auckland or the largest known specimen of the species in Auckland (including height and lateral spread) (only applies to individual trees)	<input type="checkbox"/>	<input type="checkbox"/>		
Is a significant example of a species rare in Auckland or a native species that is nationally or regionally threatened (as assessed by DOC or on the regional threatened species list)	<input type="checkbox"/>	<input type="checkbox"/>		
Has outstanding value because of its scientific significance	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Ecosystem service</b>				
Provides critical habitat for a threatened native species population e.g., bats, chevron skinks, kiwi, yellow mistletoe etc	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Cultural</b>				
Demonstrates a custom, way of life or process that was common but is now rare, is in danger of being lost or has been lost	<input type="checkbox"/>	<input type="checkbox"/>		
Has an important role in defining the communal identity and distinctiveness of the community through having special symbolic, spiritual, commemorative, traditional or other cultural value or represents important aspects of collective memory, identity or remembrance, the meanings of which should not be forgotten	<input type="checkbox"/>	<input type="checkbox"/>		
Is a landmark, or marker that the community identifies with	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Intrinsic</b>				
Is intrinsically notable because of a combination of factors including the size, age, vigour and vitality, stature and form or visual contribution of the tree or group of trees	<input type="checkbox"/>	<input type="checkbox"/>		

**Section 9: Conclusions**

Include your final assessment of whether or not the tree is notable and any additional comments. Note that under the Tree-Specific factors, a score of 20 or more is needed before it can be scheduled or Notable.





Please call me on (09) 623-3514 if further comment is required.

Kind regards,

A handwritten signature in black ink, appearing to be 'AH', enclosed in a thin black rectangular border.

Allan Holmes

**GreensceneNZ Limited**

