processes and performance. The WWTP operators will have become aware of the treatment problems and are generally able to remedy the treatment processes long before there is any risk of generating offensive or objectionable odours beyond the WWTP boundaries.

Additionally, the Te Paerahi WWTP is relatively isolated from high sensitivity receptors, with no dwellings located within 400 m of its boundaries. A distance of 400 m is typically sufficient distance to avoid any minor wastewater odours that may occur. Odours outside of this normal range for odour strengths and types are not expected to be greater than odours created by surrounding rural activities.

9.1.7 Effects on Cultural Values

The Māori World view report (How, 2020:A:B.42) provides an interpretation of wastewater management. Clearly discharges of wastes need to be mitigated, with transformations from tapu to noa. This inevitably requires passage through Papatuanuku, a practice that currently occurs. However, the area of the discharge (and treatment plant) is considered to be wāhi tapu and avoidance of discharges in this area should ideally be avoided.

This longer term solution of ceasing the existing Te Paerahi discharge and eventually the removal of the Te Paerahi WWTP entirely, will deliver on the aspiration by iwi. Council have committed to developing a solution for the removal of the Te Paerahi WWTP through this consent application and will continue to liaise with iwi through direct engagement and proposed consent conditions.

It should be noted that from a cultural perspective there are two parties to consider. The land is owned by a Māori Trust; and it is clear that by virtue of being owners they have mana whenua. However, there are wider Māori interests in the area beyond land ownership, and they could be considered to have tāngata whenua status.

The consent application seeks to continue the existing discharge from the Te Paerahi WWTP for Stage 0 (existing conditions), with Stage 1 onwards seeing 100 % of flows from Te Paerahi redirected to the Discharge Property.

9.1.8 Effects on Natural Hazards

The operation of the current Te Paerahi discharge will not have an impact on natural hazards, however, natural hazards may impact on the system. Should there be an event, such as earthquake, flood or tsunami, then many other infrastructure components in the immediate area will be compromised and the effects of this operation being compromised (and effects) will be largely insignificant.

9.1.9 Summary of Effects on the Environment

The overall effects of the wastewater discharges on the coastal environment will be less than minor to negligible. This will be the case under Stage 0 conditions where effects will be the existing status quo. The ultimate aspiration is to cease discharges to the sand dunes (Stages 1), at which point there will be zero effects on the coastal environment. Table 9.1 provides a summary of the potential risks and actual effects associated with the Te Paerahi discharge.

Table 9.1: Summary of Potential Risk and Actual Effects from Wastewater for the Te Paerahi Discharge

		Sensitivity	Source / Contaminant			
			Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Soil	Potential risk	Low	Moderate	High	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Groundwater	Potential risk	High	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk	High	Moderate	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk	N/A	N/A	N/A	High
		Actual effect	N/A	N/A	N/A	Less than minor
	Air	Potential risk	Moderate	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A

9.2 Evaluation Against Statutory Provisions – Te Paerahi Discharge

The Statutory Evaluation (Beca, 2021:P:D.90) provides a thorough assessment of all planning provisions, including Part 2 of the RMA. The findings of that assessment are not repeated here, however a summary of the outcomes of this assessment are provided below for the Te Paerahi Discharge (provided as Appendix A to the Planning Evaluation (Beca, 2021:P:D.90)).

Overall, it is considered that the Te Paerahi proposal is consistent with the objective and policies of the NPS-FM (refer to section 2.3, Appendix A (Beca, 2021:P:D90)).

The NES-F was considered for the Te Paerahi application to ascertain whether the maintenance and operation of the specified infrastructure is located within 100 m of the natural wetland. However, the wetland associated with the treatment pond is planted for waste treatment purposes and is therefore not considered a natural wetland under the NES-F definition. As such, the NES-F provisions do not apply.

The assessment finds that the Te Paerahi application is broadly consistent with the NZCPS (refer to section 2.4, Appendix A (Beca, 2021:P:D.90) and the relevant objectives and policies of the RPS and RRMP (refer to section 2.5, Appendix A (Beca, 2021:P:D.90).

The continued Te Paerahi discharge to land is broadly consistent with the relevant objectives and policies of the RCEP as the proposal provides:

- The continued operation of the Te Paerahi WWTP which is an essential facility for sewage discharge for the Te Paerahi township providing for the health and needs of the Te Paerahi;
- The assessment of effects concludes that the effects are negligible due to the travel time for groundwater to reach the coast, attenuation of contaminants within the soil, and the dilution and mixing that occurs with regional groundwater and within the coastal zone; and
- Tāngata whenua values have been recognised and provided for through the long-term plan to remove the discharge from the sand dunes.

9.2.1 NPS - FM

The concept of Te Mana o te Wai within the NPS-FM indicates the importance of restoring and preserving the balance between water, the wider environment and the community, and to all aspects of freshwater management. The intent of the NPS-FM includes prioritisation of the management of the natural and physical resources and has a particular focus on the concept of Te Mana o Te Wai. Te Mana o Te Wai refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and wellbeing of the wider environment.

The relevant provisions of the NPS - FM have been considered for Te Paerahi refer to Appendix A in the Statutory Evaluation (Appendix L). In summary, there are no water bodies or freshwater ecosystems within the vicinity that are affected by the discharge to land at this location (Objective1(a)). The nearest drinking water take is the public potable water bore located 820m south-west of the existing oxidation pond. The Te Paerahi WWTP Discharge Assessment (Beca) finds that there is no migration of contaminants towards the public water supply bore. This proposal also forms part of and provides for a lifeline utility (WWTP) for the community of Te Paerahi (Objective 1(b)). The proposal forms part of the staging of a long-term solution that will provide for the social and cultural wellbeing of the community into the future through improved wastewater treatment and management (Objective 1(c)).

9.2.2 National Environmental Standard for Freshwater 2020 (NES-F)

The proposed works meet the definition of specified infrastructure in the NPS-FM (Subpart 3 Section 3.21(1)) as the WWTP is a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002).

NES-F regulations 46 and 47 apply to the maintenance and operation of specified infrastructure within 100 m of a natural wetland. Guidance on the definition of natural wetland' has recently been provided in the *Interpretation guidance on the wetlands definition in the NPS-FM and Freshwater NES* (Exposure draft 7 April 2021).

The guidance document clarifies the definition of 'Artificially constructed wetlands' which are excluded from the provisions of the NES-F. Examples of 'constructed wetlands' have been provided in the guidance document and include areas of wetland habitat in or around bodies of water created for, or in connection with, any of the following purposes: effluent treatment and disposal systems.

The HRLP used for the discharge of treated effluent referred to in this document meets the definition of artificially constructed wetlands. Therefore, the existing discharge and proposed works are not located within 100 m of natural wetlands and the regulations under the NES-F do not apply.

9.2.3 National Environmental Standard for Sources of Human Drinking Water 2007 (NES-DW)

The proposed works are subject to the provisions NES-DW as the nature of the discharge (being treated wastewater) has the potential to contaminate registered sources of drinking water to greater than 501 people.

Regulations 7, 8 and 10 of the NES-DW apply to activities specifically upstream of an abstraction point. The nearest drinking water take from the Te Paerahi dunes WWTP is the public potable water bore located 820m south-west of the existing oxidation pond. The Te Paerahi WWTP Discharge Assessment (Beca) finds that there is no migration of contaminants towards the upstream public water supply bore.

9.2.4 Hawkes Bay Regional Resource Management Plan (RRMP)

The RRMP incorporates the provisions of the Regional Policy Statement (RPS). The relevant objectives and policies have been assessed in the Statutory Evaluation (Beca, 2021:P:D.90) report. The objectives and policies of the RPS assessed include;

- Integrated Land Use and Freshwater Management;
- Managing the Built Environment;
- The Sustainable Management of Coastal Resources;
- Surface Water Resources;
- Maintenance and Enhancement of Physical Infrastructure; and
- Recognition of Matters Significant to Iwi and Hapu.

The Land, Air Quality, Groundwater Quality and Surface Water Quality objectives and policies of the RRMP have been assessed. Overall, the potential adverse environmental effects of the proposal are minimised such that they are less than minor. The Te Paerahi continued discharge to land is broadly consistent with the relevant objectives and policies of the RPS and RRMP.

9.2.5 Hawkes Bay Regional Coastal Environmental Plan (RCEP)

The Hawke Bay Regional Coastal Plan (RCEP) is to enable the HBRC to promote the sustainable management of the natural and physical resources of Hawke's Bay's coastal environment. The Te Paerahi dunes lie within the coastal environment and are subject to the objectives and policies of the RCEP. The assessment of the relevant RCEP objectives and policies concludes that the Te Paerahi proposal is consistent with the objectives and policies identified in the RCEP for activities subject to Rule 29 - Existing high discharge volume wastewater systems.

10 ASSESSMENTS – PŌRANGAHAU (STAGES 0, 1 AND 2)

10.1 Effects on the Environment - Pōrangahau

10.1.1 Receiving Environment

The Pōrangahau River receiving environment is tidally influenced and has existing water quality issues with elevated levels of nutrients and faecal coliforms. Diffuse agricultural runoff is assumed to be the major upstream contributor of dissolved nutrients and bacterial contamination. Downstream, the Pōrangahau Estuary is the largest and least modified estuary in Hawke's Bay, which is an important feeding and wintering area for migratory waders and an inanga spawning site.

10.1.2 Positive Effects

Positive effects can be considered in two regards with respect to this application. Firstly, the wastewater treatment and discharge system provides for the health and wellbeing of the Pōrangahau community; and without it there is the potential for localised effects from poorly functioning onsite wastewater facilities leading to public health effects.

Secondly, the reduction in direct discharge to the Pōrangahau River is driven strongly by the local community and, regional and national directives. For Pōrangahau, the potential benefits in a reduction of discharge to surface water are an improvement in water quality and habitat value, improvements in the cultural health of the water ways and the communities' relationship (amenity and recreational) with the waterway.

10.1.3 Effects on River Water Quality

Water quality effects associated with the Pōrangahau WWTP discharge on the Pōrangahau River are analysed in detail in the Beca (2020:P:B.24a) report. Based on historic monitoring data and the assumption that the existing average and maximum daily discharge flow rates will remain stable, the water quality effects associated with the existing discharge are equivalent to the continued discharge: these effects are described below.

Increases in the existing concentrations of nutrients and microbiological contaminants are observed in the Pōrangahau River downstream of the discharge point. However, median concentrations of total nitrogen, nitrate, total phosphorus and dissolved reactive phosphorus were found to be already elevated above relevant guidelines upstream of the WWTP discharge point. The most notable effects of the WWTP discharge are an increase in total ammoniacal nitrogen and faecal coliforms, resulting in modelled exceedances of relevant water quality guidelines downstream of the WWTP discharge during low flow river events. These effects are predicted to occur under low river flow events only.

Increased nutrient and microbiological concentrations for most contaminants of concern are relatively low, resulting in minor adverse effects downstream of the WWTP. The exception is associated with the moderate concentration increase for faecal coliforms (above the HBRC RRMP trigger value[2]) and ammoniacal nitrogen (above the ANZECC physical stressor guideline value) during modelled low river flow scenarios, resulting in a moderate effect on water quality under these conditions.

10.1.4 Effects on River Ecology

The Pōrangahau River is a nutrient enriched environment upstream of the WWTP discharge, with poor water quality negatively impacting on ecological values. Additionally, the soft and silty tidally influenced riverbed provides a low-quality habitat for freshwater macroinvertebrates.

[2] The faecal coliform environmental guideline value for the Pōrangahau River is 200 cfu/100mL in the HBRC RRMP (Table 8).

As noted in Section 10.1.3 above, at times of low river flows, faecal coliforms and ammoniacal nitrogen concentrations are predicted to exceed relevant guideline values downstream of the discharge point. However, the discharge does not appear to result in the formation of excessive plant, algae and slime growths in the Pōrangahau River relative to upstream. As part of the application for the existing discharge consent (Opus, 2007) it was noted that the effects on stream ecology were considered less than minor as the entire section of the Pōrangahau River (upstream and downstream) was classified by Macro-invertebrate Community Index (MCI) analysis as having degraded water quality (MCI < 100).

Additionally, as part of the existing discharge consent, Opus conducted an ecological investigation (Opus, 2012) in 2012 (as summarised in Beca 2020:P:B.24a) to study the effects of the discharge on the biota at two sites: one near the discharge point and a downstream control site in the Pōrangahau estuary. Biological diversity was relatively poor at both sites, however a higher diversity was observed at the WWTP, due in part to additional freshwater taxa at the site. Sediment quality at both sites corresponded to an estuarine condition of 'good' to 'very good' and the concentrations of contaminants were low in terms of both effects and also relative to other NZ estuaries. The poor biological diversity was attributed as a likely consequence of the salinity gradient and influence of the strong tidal actions rather than the WWTP discharge.

Overall, historical studies indicate that while the WWTP discharge results in a modest increase nutrient concentrations in the river, this increase is anticipated to have a less than minor effect on river ecology in the vicinity.

10.1.5 Effects on Public Health Risks

As discussed in Section 10.1.4, under low flow conditions the modelled downstream concentration of faecal coliforms is predicted to exceed the HBRC RRMP trigger value of 200 cfu/100mL after reasonable mixing. However, this exceedance has not been observed in the in-stream monitoring undertaken as part of the existing consent both upstream and downstream of the discharge.

There are several known recreational uses of the Pōrangahau River downstream from the Pōrangahau WWTP that have been identified as a result of feedback from the community (as shown in Figure 10.1), including:

- Boat access and swimming near the Beach Road bridge;
- Fishing and whitebaiting approximately 0.5km upstream of the bridge; and
- Shellfish gathering in the Pōrangahau estuary.

These areas are a considerable distance downstream and further dilution will occur between the point of discharge and these downstream receiving environments. Previous investigations (Opus, 2012) determined under normal flow conditions it would take about 1.5 tidal cycles for a parcel of treated wastewater to reach the Beach Rd Bridge downstream of the discharge.

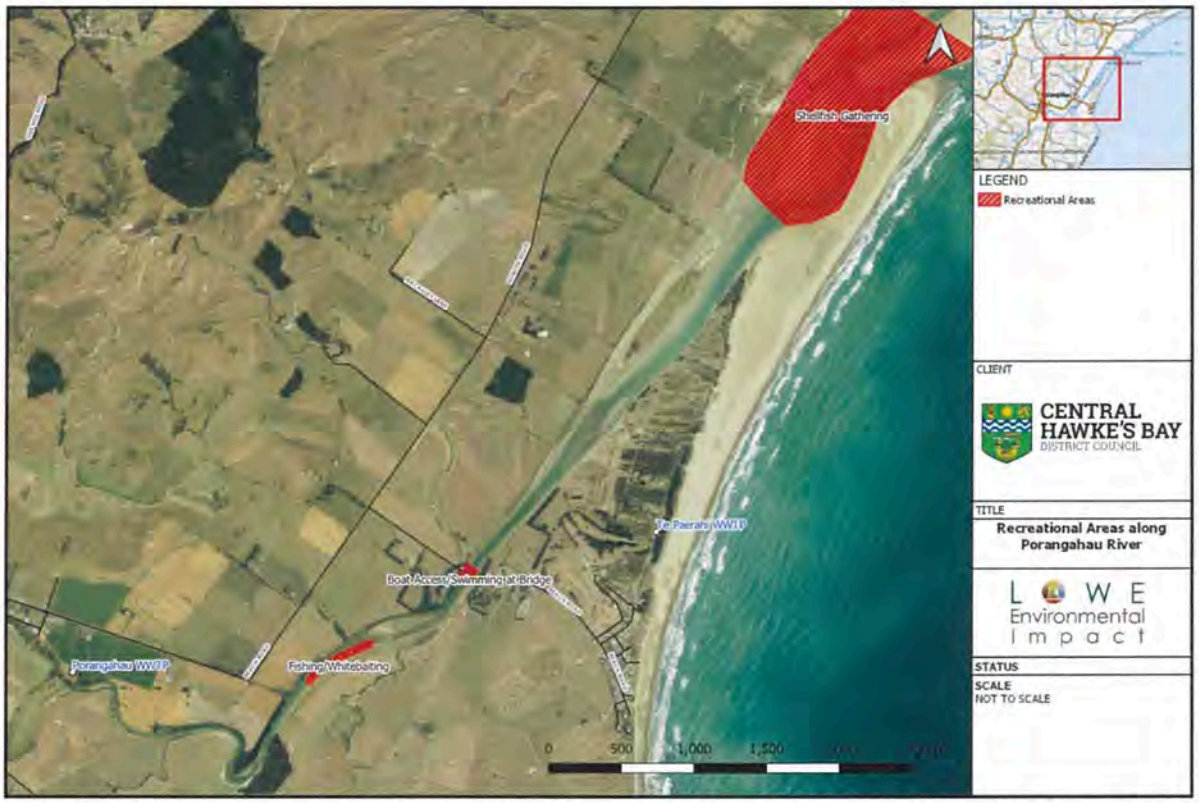

Figure 10.1: Known recreational uses of the Pōrangahau River downstream from the Pōrangahau WWTP

10.1.6 Effects on Amenity, Community, Recreational, and Social Values

The discharge is through a drain and to the river which is not accessible by the community. The discharge itself will have a negligible effect on amenity, community, recreational and social values.

10.1.7 Effects on Air Quality

Odours from the WWTP are generally of low intensity and readily dissipate within the WWTP's boundaries. Where odours become apparent these usually indicate significant failures of treatment processes and performance. The WWTP operators will have become aware of the treatment problems and are generally able to remedy the treatment processes long before there is any risk of generating offensive or objectionable odours beyond the WWTP boundaries.

Additionally, the Pōrangahau WWTP is relatively isolated from high sensitivity receptors, with no dwellings located within 200 m and of its boundaries. The outer extent of the Pōrangahau township is within 500 m of the plant, however it is likely odours outside of the normal range for odour strengths and types are not expected to be greater than typical odours created by surrounding rural activities. There are no records of complaints from odour.

10.1.8 Effects on Cultural Values

The Māori World view report (How, 2020:A:B.42) provides an interpretation of wastewater management. Clearly discharges of wastes need to be mitigated, with transformations from tapu to noa. This inevitably requires passage through Papatuanuku, a practice that currently occurs.

This longer term solution of ceasing the existing Pōrangahau discharge and eventually the removal of the Pōrangahau WWTP entirely, will deliver on the aspiration by iwi. Council have committed to developing a solution for the removal of the Pōrangahau WWTP through this consent application and will continue to liaise with iwi through direct engagement and proposed consent conditions.

This consent application seeks to continue the existing discharge from the Pōrangahau WWTP for Stage 0 (existing conditions), Stage 1 and potentially a partial discharge for Stage 2, with Stage 3 onwards seeing 100 % of wastewater flows from Pōrangahau being directed to the Discharge Property.

10.1.9 Effects on Natural Hazards

The operation of the current Pōrangahau discharge will not have an impact on natural hazards, however, natural hazards may impact on the system. Should there be an event, such as earthquake, flood or tsunami, then many other infrastructure components in the immediate area will be compromised and the effects of this operation being compromised (and effects) will be largely insignificant.

10.1.10 Summary of Effects on the Environment

Overall, the effects of the wastewater discharges from the Pōrangahau wastewater treatment plant on the local receiving environment, namely the Pōrangahau River, will be less than minor for of the majority of river flow conditions. However, during certain conditions there is a theoretical potential for moderate effects, namely faecal coliforms and nitrogen. Table 10.1 provides a summary of the potential risks and actual effects associated with the Pōrangahau discharge.

Table 10.1: Summary of Potential Risk and Actual Effects from Wastewater for the Pōrangahau Discharge

		Sensitivity	Source / Contaminant			
			Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Surface water	Potential risk	High	High	Low	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk	High	Moderate	Low	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk	N/A	N/A	N/A	High
		Actual effect	N/A	N/A	N/A	Less than minor
	Air	Potential risk	Moderate	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A

10.2 Evaluation Against relevant statutory provisions – Pōrangahau Discharge

The Statutory Evaluation (refer to Appendix A in the report (Beca, 2021:P:D.90) provides a thorough assessment of all planning provisions, including Part 2 of the RMA. The findings of that assessment are not repeated here, however a summary of the outcomes of this assessment are provided below for the Pōrangahau Discharge.

10.2.1 NPS - FM

The concept of Te Mana o te Wai within the NPS-FM indicates the importance of restoring and preserving the balance between water, the wider environment and the community, and to all aspects of freshwater management. The proposal is not expected to impact the health of freshwater, and in fact is expected to assist with improving its health.

Overall, it is considered that the Pōrangahau proposal is consistent with the objective and policies of the NPS-FM (Refer to section 3.3) as the continued operation of the WWTP provides an essential facility for

sewage disposal for Pōrangahau (i.e. providing for the health and needs of the Pōrangahau community) while having a less than minor effect. The continued discharge of wastewater to the Pōrangahau River is limited to a short duration and it is considered that these effects are acceptable for this period until such time as the long-term solution is in place.

10.2.2 National Environmental Standard for Freshwater 2020 (NES-F)

The proposed works meet the definition of specified infrastructure in the NPS-FM (Subpart 3 Section 3.21(1)) as the WWTP is a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002).

NES-F regulations 46 and 47 apply to the maintenance and operation of specified infrastructure within 100 m of a natural wetland. Guidance on the definition of natural wetland' has recently been provided in the *Interpretation guidance on the wetlands definition in the NPS-FM and Freshwater NES* (Exposure draft 7 April 2021).

The guidance document clarifies the definition of 'Artificially constructed wetlands' which are excluded from the provisions of the NES-F. Examples of 'constructed wetlands' have been provided in the guidance document and include areas of wetland habitat in or around bodies of water created for, or in connection with, any of the following purposes: effluent treatment and disposal systems. Therefore, the existing discharge and proposed works are not located within 100 m of natural wetlands and the regulations under the NES-F do not apply.

10.2.3 National Environmental Standard for Sources of Human Drinking Water 2007 (NES-DW)

The proposed works are subject to the provisions NES-DW as the nature of the discharge (being treated wastewater) has the potential to contaminate registered sources of drinking water to greater than 501 people.

Regulation 12 applies to an activity that has the potential to affect a registered drinking-water supply which the proposed activity in this instance applies (discharge of treated wastewater to land that enters the Pōrangahau River). When considering a resource consent application, a consent authority must consider whether the activity could lead to an event occurring that may have a significant adverse effect on the quality of the water at any abstraction point or, as a consequence of an event (for example, an unusually heavy rainfall) have a significant adverse effect on the quality of the water at any abstraction point.

If the consent authority considers that the above circumstances could occur, then a condition on the consent must be imposed. As noted in the proposed conditions of consent (Appendix E), there are numerous mitigation measures that will be imposed as conditions of consent that will address Regulation 12 of the NES-DW.

10.2.4 Hawkes Bay Regional Resource Management Plan (RRMP)

The RRMP incorporates the provisions of the Regional Policy Statement (RPS). The relevant objectives and policies have been assessed in the Statutory Evaluation (Beca, 2021:P:D.90) report. The objectives and policies of the RPS assessed include;

- Integrated Land Use and Freshwater Management;
- Managing the Built Environment;
- Surface Water Resources;
- Maintenance and Enhancement of Physical Infrastructure; and
- Recognition of Matters Significant to Iwi and Hapu.

The Land, Air Quality and Surface Water Quality objectives and policies of the RRMP have been assessed (refer to section 3.5, Appendix A of the Beca report (Beca, 2021:P:D.90)).

The continued discharge from the Pōrangahau WWTP is broadly consistent with the relevant objectives and policies of the RRMP. The environmental guidelines and implementation of those guidelines are set out in Policies 71-72A. At times of average river flow, the guidelines values of Policy 71 are predicted to be met for all parameters. The activity will not cause any significant adverse effects on aquatic ecosystems and contact recreation consistent with Policy 72.

Policy 72A provides for existing activities and acknowledges the need to allow time to achieve the required improvements associated with the implementation of the long-term solution. This will result in an improvement in water quality in the Pōrangahau River. The associated RRMP environmental guidelines are mostly being met. The effect of the proposal is considered consistent with these policies.

11 ASSESSMENT – DISCHARGE PROPERTY (STAGES 1, 2 AND 3)

11.1 Effects on the Environment

11.1.1 Receiving Environment

Receiving environments associated with the existing discharges for Pōrangahau and Te Paerahi which are both to be phased out have previously been discussed in Sections 9 and 10. Relating to the Discharge Property, there are two immediate receiving environments as shown in Figure 4.2. Firstly, the initial environment of the land application area, specifically the soil and plant system of the Discharge Property and area around the future combined WWTP. If the treated wastewater is not retained or renovated in the soil it may travel to shallow groundwater, or by overland flow to local surface water (Pōrangahau River and/or farm drains entering the Pōrangahau River). Secondly, when land application under a combination of deficit and/or non-deficit conditions using typical irrigation application rates cannot occur, wastewater can then be directed to the wet soils application regime system.

Wastewater constituents entering groundwater can be expected to eventually travel to and enter surface water as a diffuse discharge.

It should be noted existing reporting indicates that the water quality of the Pōrangahau River is nutrient enriched with respect to nitrogen and phosphorus, as shown by the elevated TN, TP and DRP concentrations upstream of the discharge point during median flow conditions (Beca, 2020:P:B.24a). Upstream nutrient concentrations of TN, TP and DRP are already elevated above relevant guidelines, with the Pōrangahau WWTP discharge facilitating moderate adverse effect on downstream faecal coliform and ammoniacal nitrogen concentrations at times of low flow.

11.1.2 Positive Effects

Positive effects can be considered in two regards with respect to this application. Firstly, the wastewater treatment and discharge system provides for the health and wellbeing of the Pōrangahau and Te Paerahi communities; and without it there is the potential for localised effects from poorly functioning onsite wastewater facilities leading to public health effects.

Secondly, the reduction in direct discharge to the Pōrangahau River and culturally significant sand dunes is driven strongly by the local community and, regional and national directives. The potential benefits in a reduction of discharge to surface water and dunes are an improvement in water quality and habitat value, improvements in the cultural health of the water ways and the communities relationship (amenity and recreational) with the waterway.

The discharge of wastewater to land is a key measure to avoid adverse effects of direct discharge of wastewater into surface water bodies. In addition, the application of wastewater to land at a rate which allows for filtration, absorption and beneficial use of wastewater components (nutrients, contaminants and water) provides mitigation and avoidance of adverse effects to groundwater. The adoption of an irrigation method with a low application rate and long return period as proposed by the assessed discharge regime achieves the beneficial use (for plants and soil biota) and retention (by soil storage) of wastewater components, thereby minimising their release into the groundwater or surface water environment.

11.1.3 Effects on Soils

The effects of the application of wastewater to the soil and plant system are given in Appendix H, the Assessment of Effects to Land (LEI, 2021:P:D.10). The activities that may produce actual or potential effects to soil that need to be considered relate to:

- Discharge to land of treated wastewater for land treatment; and
- Discharge to air from the WWTP and land discharge of treated wastewater.

The treated wastewater to be irrigated onto the Discharge Property will have the following properties of potential environmental concern:

- Organic material, expressed as carbonaceous biochemical oxygen demand ($CBOD_5$);
- Cations (Sodium, potassium, calcium and magnesium);
- Nitrogen (N as ammoniacal nitrogen (NH_4-N) and nitrite/nitrate nitrogen (NO_x-N));
- Total phosphorus (TP); and
- Water.

The proposed loading rate of the wastewater discharge to land will enable soil remediation and plant uptake of applied contaminants including:

- Filtration and incorporation of any suspended solids;
- Assimilation of organic material;
- Plant uptake, microbe use, and soil occlusion of nitrogen and phosphorus, and gaseous loss of nitrogen;
- Cation adsorption; and
- Filtration and attrition of pathogens.

The methods that have been adopted to avoid adverse effects to soils of the Discharge Property are:

- The selection of a property whose soils are dominated by silty to sandy topsoils, with variable draining subsoils, enabling a range of irrigation management practices to be adopted (at least in the case of IMU3 which is to be used for year round irrigation);
- Application rates per event that are around 25 % of the soils water holding capacity;
- Managing stock and cropping activities to enable with holding periods before and after irrigation to avoid soil damage and maintain adequate vegetative cover; and
- Withholding of irrigation when rainfall or prolonged wetness occurs.

In summary, there will be no effects to the soil and landform that are not capable of satisfactory avoidance, remediation or mitigation. The individual effects concluded from the assessments completed are all less than minor.

11.1.4 Effects on Groundwater Quality

The effects of the application of wastewater on groundwater quality are provided in Appendix H, the Assessment of Effects to Land (LEI, 2021:P:D.10).

Effects on groundwater can be significantly mitigated by adopting an appropriate irrigation regime that avoids field capacity being excessively exceeded following irrigation and the adoption of an instantaneous application rate that avoids preferential or bypass flow through large soil pores and cracks. Testing of the soil properties on the Discharge Property has been undertaken (LEI, 2020:P:B.15) to develop an application rate (LEI, 2021:P:C.15) to minimise the potential for preferential flow and loss of applied contaminants directly to groundwater.

Additionally, Tonkin and Taylor (2021:P:B.14a) provide an assessment of the risk of groundwater contamination from the discharge property and the potential risks to the Pōrangahau/Te Paerahi drinking supply bore (Bore No. 4993). This assessment concludes that although contamination of the drinking supply bore cannot be wholly ruled out, the risk to this is very low and that the land discharge regime

poses less risk than the existing river discharge from Pōrangahau to the drinking supply bore (Tonkin and Taylor, 2021:P:B.14a).

There will be no effects on groundwater that are not capable of satisfactory avoidance, remediation or mitigation. **The effects on groundwater quality are expected to be less than minor.**

11.1.5 Effects on River Water Quality

The Pōrangahau River will be the receiving environment of any drainage or overland flow from the irrigation property via either surface waterways (overland flow), or through a diffuse discharge via groundwater.

Effects to Pōrangahau River

The current and future water quality effects associated with the Pōrangahau WWTP discharge on the Pōrangahau River are analysed in detail in the Beca (2021:P:D.25) report, Appendix I.

The existing Pōrangahau WWTP discharge has been shown to have a less than minor effect on river water quality during median flow conditions, with a calculated moderate effect in ammoniacal nitrogen and faecal coliform concentrations during low flow conditions downstream of the discharge point. Total phosphorus, dissolved reactive phosphorus and total nitrogen concentrations were found to be elevated above relevant guidelines upstream of the Pōrangahau WWTP discharge.

Given the diffuse discharge to groundwater and subsequently the Pōrangahau River, adverse effects of the proposed discharge on the water quality of the Pōrangahau River are **predicted to be negligible** (Beca, 2021:P:D.25).

In summary, the proposed development is considered to be consistent with the HBRC RRMP water quality objectives. By removing a significant amount of nutrients from the catchment, the development will contribute towards improving the downstream water quality and ecology of the Pōrangahau River and its catchment.

Effects to Pōrangahau River Catchment

Beca (2021:P:D.25) states that the existing Pōrangahau WWTP, Te Paerahi WWTP and the Discharge Property contributes a mass-load of 3.42 T/yr of total nitrogen and 0.23 T/yr of total phosphorus to the Pōrangahau River Catchment respectively. This amounts to 2.49 % and 2.01 % of the total Pōrangahau Catchment nutrient load, measured at the nearest HBRC water quality monitoring location at Kate's Quarry.

From the Discharge Property, the mass load of total nitrogen is predicted to be greatest at Stage 2, with this reducing at Stage 3. Nitrogen loads increase from the baseline (Stage 0) 2.35 T/yr, 2.55 T/yr in Stage 1, to 3.49 T/yr Stage 2a and 3.30 T/yr at Stage 3. Discharge Property phosphorus load contributions increase from 0.07 T/yr (baseline), to 0.09 T/yr in Stage 1 to 0.16 T/yr in Stage 2 and 0.21 T/yr at Stage 3. Table 11.1 summarises the mass loads at each stage and Figure 11.1 shows them graphically. This is a notable improvement in a catchment where high phosphorus concentrations have been noted historically.

Table 11.1: Total Nitrogen and Total Phosphorus mass load calculations for each development stage for Pōrangahau, Te Paerahi and Discharge Property Farm (Beca, 2021:P:D.25).

	Total Nitrogen (T/yr)				Total Phosphorus (T/yr)			
	Pōrangahau WWTP	Te Paerahi WWTP	Discharge Property	Total	Pōrangahau WWTP	Te Paerahi WWTP	Discharge Property	Total
Stage 0	0.70	0.37	2.35	3.42	0.10	0.05	0.07	0.23
Stage 1	0.49	0.00	2.55	3.14	0.07	0.00	0.09	0.18
Stage 2	0.00	0.00	3.49	3.49	0.00	0.00	0.16	0.16
Stage 3	0.00	0.00	3.30	3.30	0.00	0.00	0.21	0.21

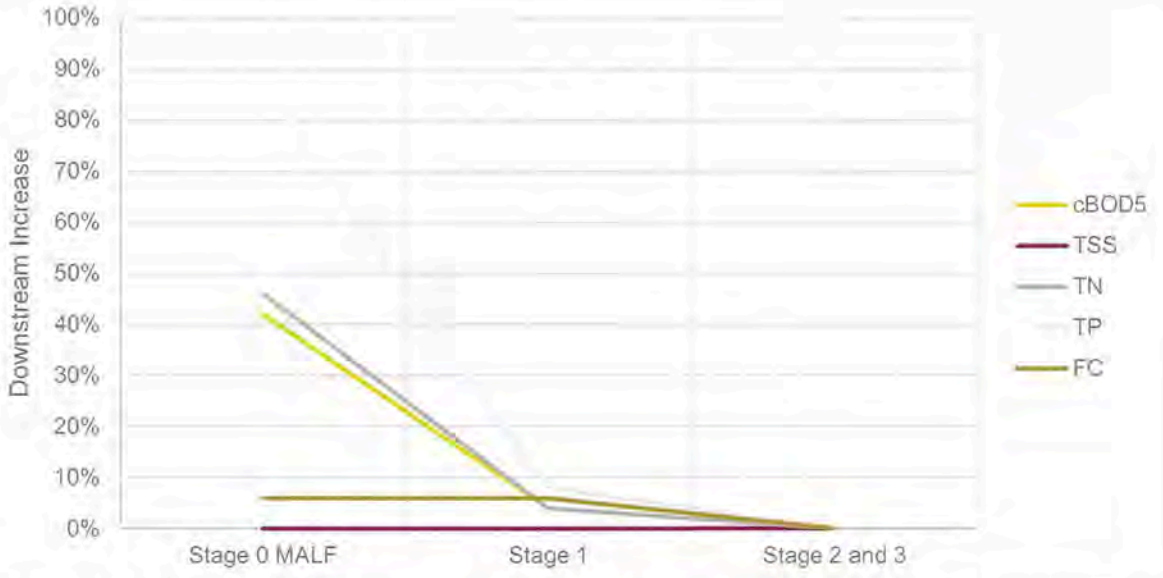

Table 11.1: Downstream contaminant mass-balance percentage increases for each development stage (Beca, 2021:P:D.25).

Overall, the expected effects of the Stage 3 component on surface water is considered to be less than minor.

11.1.6 Effects on River Ecology

There are four potential ecological effects that have been considered for the discharge property (Beca, 2021:P:D.66). These are degradation of water and habitat quality, alterations to hydrology and risk of erosion, excessive growth of nuisance aquatic plants and altered vegetation composition.

The overall ecological effect of the proposal is considered to be very low assuming the recommendations outlined in Beca (2021:P:D.66) are implemented. This includes:

- Ongoing monitoring to ensure eco-toxicity thresholds for freshwater fauna are not exceeded in watercourses through the Discharge Property;
- Fencing of intermittent watercourses to exclude stock; and
- Riparian planting of intermittent watercourses to mitigate any potentially adverse effects on water and habitat quality.

This means that there is only anticipated to be a very slight change from existing baseline conditions. Over long-term time scales (15 - 25 years), a net gain in ecological value is likely due to reductions in pollutants entering the Pōrangahau River and Estuary (Beca, 2021:P:D.66).

11.1.7 Effects on Coastal Environment

The overall ecological effects on coastal ecology are assessed as low as outlined in Beca (2021:P:D.65). This assessment is based on the water quality assessment across the three stages of upgrade (Beca, 2021:P:D.25) that demonstrates that there is no significant increase in nutrients discharged in the Pōrangahau estuary and that in the long-term, a reduction in nutrient mass loads discharged via land into the estuary (when compared to the existing surface water discharges) is highly likely.

11.1.8 Effects on Air Quality

Odours from the existing WWTPs, as well as the future combined WWTP are/will be generally of low intensity and readily dissipate within the WWTP's boundaries. Where odours become apparent these usually indicate significant failures of treatment processes and performance. The WWTP operators will have become aware of the treatment problems and are generally able to remedy the treatment processes long before there is any risk of generating offensive or objectionable odours beyond the WWTP boundaries.

The combined WWTP to be constructed is still to be designed with its layout to be determined. As mentioned, this will be constructed on the sand dune ridgeline running through the property with a conceptual layout shown in Figure A4. From this position, the nearest dwelling will be located >500 m north of the property. The outer extent of the Te Paerahi township will be within 1.5 km of the constructed plant, however it is likely odours outside of the normal range for odour strengths and types are not expected to be greater than typical odours created by surrounding rural activities.

The nearest dwellings to the irrigated property boundary are approximately 270 m north and south of the property as shown in LEI (2021:P:D.10).

The mitigation methods to avoid adverse effects to air quality due to discharges from the irrigation of wastewater are:

- Maintain aerobic conditions in treatment facilities and storage ponds;
- UV treatment of wastewater to reduce pathogen levels;
- Adoption of separation distances between irrigation and any receptors. Across the property, there will be a minimum separation distance of 5 m from the wastewater irrigated area to any property boundary, 20 m to any sensitive environment or waterway, and 150 m separation to any dwelling for all wastewater application; and
- The Discharge Property is located in a down-wind position from the townships based on the predominant wind directions.

11.1.9 Effects on Cultural Values

The Māori World view report (How, 2020:A:B.42) provides an interpretation of wastewater management. Clearly discharges of wastes need to be mitigated, with transformations from tapu to noa. This inevitably requires passage through Papatuanuku, a practice that will occur.

A CIA is being finalised, which will assess the aspects of the land application system and diffuse discharge to the Pōrangahau River. In the absence of the CIA, it is clear that the proposal would see 100 % of Pōrangahau and Te Paerahi's wastewater irrigated to land (by Stage 3). This seeks to address the direction given by tāngata whenua in the initial engagement.

11.1.10 Effects on Natural Hazards

The operation of the current discharges and future discharges will not have an impact on natural hazards, however, natural hazards may impact on the system. Should there be an event, such as earthquake, flood, or tsunami then many other infrastructure components in the immediate area will be compromised and the effects of this operation being compromised (and effects) will be largely insignificant.

The most significant impact may be that of flooding, and for two reasons. Firstly, the lower alluvial plain (parts of IMU1 and IMU2) is within the HBRC identified 1:100 flood plain. The most recent instance of flooding of this flood plain was the 2004 February floods which severely impacted the Lower North Island. Despite no recent records of flooding in the years following this event, there is nevertheless the potential for inundation of a portion of the irrigation area to occur again. Should this area flood there are easily applied mitigation measures that will allow the area to be quickly remediated. Further, there will remain a large area (higher elevated sand dunes in excess of 40 ha) that can continue to be used which will not be flooded. The future WWTP and storage pond will be located on these higher elevated sand dunes and are not expected to be at risk of flooding.

In addition to flooding, a tsunami in response to an earthquake event poses a risk to the irrigation property and infrastructure. Although infrequently occurring, these events could cause significant damage to the Pōrangahau area. HBRC identify the low elevated alluvial plain of the Discharge Property to the north-east (IMU2) as well as the drain channels to the south as being most at risk, with the remaining property area being on alert (Figure 4.3). Within the Pōrangahau/Te Paerahi area in proximity to the two WWTPs, there is no alternative land available for wastewater discharge that is relatively flat and contains rapidly draining sand dunes, that resides outside of these tsunami hazard boundaries.

11.1.11 Summary of Effects on the Environment

Overall, the effects of the wastewater discharges from the Pōrangahau and Te Paerahi and future combined wastewater treatment plants on the local receiving environment, being the soil, groundwater and surface water (Pōrangahau River), will be less than minor. Table 11.1 outlines the potential risk and actual effects associated with the land discharge regime.

Table 11.1: Potential Risk and Actual Effects from Wastewater to Land

		Sensitivity	Source / Contaminant			
			Organic matter Nitrogen Phosphorus	Pathogens	Water	Wastewater
Receptor / Pathway / Vector	Soil	Potential risk	Low	Moderate	High	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Groundwater	Potential risk	High	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Surface water	Potential risk	High	Low	Low	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Coast	Potential risk	High	Moderate	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Habitat	Potential risk	High	Moderate	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A
	Cultural	Potential risk	N/A	N/A	N/A	High
		Actual effect	N/A	N/A	N/A	Less than minor
	Air	Potential risk	Moderate	High	Moderate	N/A
		Actual effect	Less than minor	Less than minor	Less than minor	N/A

11.2 Evaluation Against relevant statutory provisions

The Statutory Evaluation (Beca, 2021:P:D.90) provided in Appendix L provides a thorough assessment of all planning provisions, including Part 2 of the RMA.

The following provides a summary of that evaluation including the relevant NPS, NES, RPS and RRMP provisions.

11.2.1 National Policy Statement – Freshwater Management (NPS-FM)

The concept of Te Mana o te Wai within the NPS-FM indicates the importance of restoring and preserving the balance between water, the wider environment and the community, and to all aspects of freshwater management. The proposal is not expected to impact the health of freshwater, and in fact is expected to assist with improving its health.

The relevant provisions of the NPS - FM have been considered for the Discharge Property and are included in the Statutory Evaluation (Appendix L). In summary, the proposal represents a staged approach to improving and preserving the surface water quality of the Pōrangahau River by transferring treated wastewater flows to land irrigation (Objective 1(a)).

The Te Paerahi and Pōrangahau public water treatment plant supply is located across and predominantly upgradient of the Discharge Property as confirmed by the conceptual groundwater model and assessment of proposed Pōrangahau wastewater disposal field (T+T, 2021:P:B.14a), and concludes that the ground infiltrated wastewater is not expected to migrate towards the public water supply bore. This proposal also forms part of and provides for a lifeline utility (WWTP) for the community of Te Paerahi and Pōrangahau (Objective 1(b)).

The proposal is a long-term solution that will provide for the social and cultural wellbeing of the community into the future through improved wastewater treatment and management by removing discharges from the Te Paerahi dunes and Pōrangahau River to a combined Discharge Property. The continued operation of the Te Paerahi and Pōrangahau WWTPs provides essential facilities for sewage disposal for both Te Paerahi and Pōrangahau townships providing for the health and needs of both communities (Objective 1 (c)).

11.2.2 National Environmental Standard for Freshwater 2020 (NES-F)

The NES-F regulates the undertaking of activities that pose risks to freshwater and freshwater ecosystems and rules specifically relate to works in, or adjacent to, wetlands, structures in waterbodies that may impact on fish passage and the diversion or reclamation of water bodies.

NES-F regulations 46 and 47 apply to the maintenance and operation of specified infrastructure within 100 m of a natural wetland. Guidance on the definition of natural wetland' has recently been provided in the *Interpretation guidance on the wetlands definition in the NPS-FM and Freshwater NES* (Exposure draft 7 April 2021).

The Discharge Property ecological report (Beca 2021:P:D.66) addresses the NES – F provisions with a desktop and field assessment of ecology, hydrology, wetland and catchment characteristics in accordance with the Landcare Research wetland delineation procedure. Two potential wetland areas within the Discharge Property were identified, however, the results of the wetland classification in relation to the wetland delineation protocol and NPS-FM (Clarkson, 2018; NPS-FM, 2020) indicate that both potential sites fail the pasture test of 'natural wetlands' as the Discharge Property has been used and managed for livestock grazing pre NPS-FM.

The proposed irrigation is therefore not located within 100 m of 'natural' wetlands (failed pasture test) and the regulations under the NES-F do not apply. Nevertheless, the Discharge Property ecological report

(Beca 2021:P:D.66) has assessed the impacts of the proposal on the wetland beside the Pōrangahau River and concludes that the overall level of effect is *low* (i.e. less than minor) and not expected to result in any loss of potential ecological value.

11.2.3 National Environmental Standard for Sources of Human Drinking Water 2007 (NES-DW)

The proposed works are subject to the provisions of the NES-DW as the nature of the discharge (being treated wastewater) has the potential to contaminate registered sources of drinking water to greater than 501 people.

Regulations 7, 8 and 10 of the NES-DW apply to activities specifically upstream of an abstraction point. As noted previously, the hydrogeological memo (LEI, 2021:P:B.14c) and the T+T groundwater report (T+T, 2021:P:B.14a) has identified that the Discharge Property is adjacent and predominantly down gradient from the Te Paerahi Pōrangahau Water Treatment Plant (WTP) located at 425A Beach Road, Pōrangahau (400m east of the nearest point of the Discharge Property). The report concludes that the risk of contaminants from the Discharge Property migrating through the shallow aquifer to the bore is very low and poses less risk than the existing discharge directly to the river.

Regulation 12 applies to an activity that has the potential to affect a registered drinking-water supply which the proposed activity in this instance applies (discharge of treated wastewater to land that enters groundwater). When considering a resource consent application, a consent authority must consider whether the activity could lead to an event occurring that may have a significant adverse effect on the quality of the water at any abstraction point or, as a consequence of an event (for example, an unusually heavy rainfall) have a significant adverse effect on the quality of the water at any abstraction point.

If the consent authority considers that the above circumstances could occur, then a condition on the consent must be imposed. As noted in section 6 and in the proposed conditions of consent (Appendix E), there are numerous mitigation measures that will be imposed as conditions of consent that will address Regulation 12 of the NES-DW.

11.2.4 New Zealand Coastal Policy Statement (NZCPS)

The New Zealand Coastal Policy Statement (NZCPS) is a national policy statement under the RMA. One of the key issues identified in the NZCPS is poor and declining coastal water quality in many areas as a consequence of point and diffuse sources of contamination, including stormwater and wastewater discharges. An assessment against the objective and policies of the NZCPS relevant to this proposal is provided in the Planning Evaluation report (Beca,2021:P:D.90).

In summary the proposal will remove direct discharges to the Pōrangahau River and coastal estuary and the discharge to the Te Paerahi dune environment and transfer it to a land-based irrigation system within a pastural site. The removal of these direct discharges will enhance natural biological and physical processes in the coastal environment and will safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land.

Overall, through the conclusions provided in the relevant technical assessments it is considered that the proposal is consistent with the objectives and policies of the NZCPS.

11.2.5 Regional Coastal Environment Plan (RCEP)

The Hawke Bay Regional Coastal Plan (RCEP) enables the HBRC to promote the sustainable management of the natural and physical resources of Hawke's Bay's coastal environment. The Discharge Property is located within the Coastal Margin in between mean high water springs and the Coastal Environment Inland Boundary identified on the Planning Maps. Hence the provisions of the RCEP apply and these have

been assessed in the Statutory Evaluation (Beca, 2021:P:D.90) report. The following is a summary of the RCEP provisions.

The proposal is consistent with the objectives and policies of the RCEP. The discharge property soils are suitable for the application of wastewater under appropriate management practices consistent with the land resources Policy 8.1. Based on the findings of the surface water quality report the proposal exhibits an overall improvement of water quality and catchment nutrient budgets in the lower Pōrangahau River and coastal environment and the effect on surface water quality is consistent with the environmental guidelines set out in Objective 9.1 and Policy 9.1 and 9.2A. The proposal is consistent with the groundwater quality objectives 11.1, 11.2 and policies 11.1 and policy 11.2A. The proposal is consistent with the air quality Policy 14.1 as odour from the irrigated wastewater is expected to be undetectable at the property boundary.

Overall, the proposal is considered consistent with Policies 2.4, 2.6 and 2.9, associated with the adjacent Significant Conservation Area (SCA) Natural Character as the improved water quality outcomes in the Pōrangahau River will contribute towards preserving the natural character of the coastal environment, providing for wastewater services while maintaining and enhancing the coastal environment existing amenity and cultural values. The coastal and Discharge Property ecological assessments provide overarching assessments on indigenous species and habitats in the coastal environment and with the implementation of fencing and planting of riparian and coastal margins and monitoring of freshwater indicators the proposal is consistent with the indigenous species and habitats RCEP Policies 4.1 – 4.4.

The existing WWTP discharge to the Te Paerahi dunes will cease and the existing treatment and discharge infrastructure will be removed. Restoration of the natural dune environment including restoration planting using indigenous species will likely be undertaken consistent with Policy 4.5. Management of the Discharge Property includes buffer setbacks around identified coastal hazard areas will mitigate the risks associated with coastal erosion and inundation, consistent with Policy 15.1.

11.2.6 Hawkes Bay Regional Resource Management Plan (RRMP)

The RRMP incorporates the provisions of the Regional Policy Statement (RPS). The relevant objectives and policies have been assessed in the Statutory Evaluation (Beca, 2021:P:D.90) report. The objectives and policies of the RPS assessed include;

- Integrated Land Use and Freshwater Management;
- Managing the Built Environment;
- Surface Water Resources;
- Maintenance and Enhancement of Physical Infrastructure; and
- Recognition of Matters Significant to Iwi and Hapu.

The relevant RRMP policies for the proposal include **groundwater** Policies 17, 18, 75 and 76, **surface water** Policies 71 and 72 and **air quality** Policy 69.

Other policies considered relevant include PC7 Outstanding Water Bodies (OWB) policies which address specific cultural and spiritual values and ecology (habitat for native aquatic birds)) associated with the OWB. The Pōrangahau River and Estuary downstream of the Beach Road Bridge has been identified as an OWB (OWB 11) in Schedule 25 of the RRMP (PC7). These policies are assessed in the Statutory Evaluation (Beca, 2021:P:D.90) report.

The following table provides a summary of the technical assessments that address each policy and the matters to address under the RRMP (includes RPS).

Table 11.2: Technical reports addressing relevant RRMP policies

RRMP Policy	Matters to Address	Technical Reports/Assessments	Report ID
Policies 47a, 71, 72 and 72A (Surface Water Quality)	Water quality assessment against the Environmental guidelines set out in the RRMP (Table 7 and Table 8). This will address the impacts on the surface water quality of the Pōrangahau River.	*Pōrangahau and Te Paerahi Wastewater - Water Quality Assessment*	Beca, 2021:P:D.25
		Pōrangahau Wastewater Discharge to Land - Ecological Impact Assessment	Beca, 2021:P:D.66
Policy 17, 18, 75 and 76 (Groundwater Quality)	Groundwater quality assessment against the Environmental guidelines set out in the RRMP (Table 10).	*Background Groundwater Conceptual Model*	T+T, 2021:P:B.14a
Policy 69 (Air Quality)	The discharge should not cause offensive or objectionable odour, beyond the boundary of the subject property.	*Discharge to Land of Pōrangahau and Te Paerahi Wastewater Assessment of Environmental Effects: Land Application.*	LEI, 2021:P:D.10
PC7 – Outstanding Water Bodies (OWB) Policies LW3A 1(a), C2 1(a) and C2 1(e)(i)	Extent of the effects specifically on the cultural and spiritual values (CIA) and ecology (habitat for native aquatic birds) of OWB11 need to be assessed. The appropriateness of the location of the activity needs to be articulated (BPO report) in consideration of the identified OBW values and whether the adverse effects on the indigenous biological diversity (biodiversity) values description set out in Policy 11(a) and 13of the NZCPS can be avoided	*Pōrangahau Wastewater Discharge to Land: Coastal Ecology Assessment.*	Beca 2021:P:D.65
		Pōrangahau and Te Paerahi Wastewater - Water Quality Assessment	Beca, 2021:P:D.25
		Cultural Impact Assessment - **PENDING**	**PENDING**
		Pōrangahau and Te Paerahi Wastewater Treatment and Discharge - Best Practicable Option Report	LEI, 2021:P:C.12
POL 62, 64, 65, 66 (Matters of Significance to iwi/ hapu)	Assessment of adverse effects on cultural aspects and matters considered significant to iwi and hapu.	*Cultural Impact Assessment* **PENDING**	**PENDING**

Overall, the proposal is consistent with the RPS and RRMP policies including groundwater Policies 17, 18, 75 and 76, surface water Policies 71 and 72 and air quality Policy 69 and OWB policies LW3A 1(a), C2 1(a) and C2 1(e)(i).

12 NOTIFICATION

The process for determining notification of resource consents by Councils processing resource consents is set out in section 95 of the RMA. The premise of notification is to provide affected parties and stake holders the opportunity to comment and input into the proposed activity and how the proposed activity may affect them.

The notification test set out in section 95 includes determining whether public notification is mandatory, precluded or required in certain circumstances. If a resource consent is not publicly notified there is then a determination as to whether the consent should be limited notified to those parties required to be notified (i.e. customary rights groups and/or customary marine title groups) or those parties deemed affected, or if there are special circumstances to warrant limited notification.

For the land discharge consenting of the proposed short and long-term solution for Te Paerahi and Pōrangahau, it is recommended that the land discharge application is publicly notified as the works involve community infrastructure i.e. holds public interest in terms of investment, and the proposal has potential adverse effects on the Pōrangahau River and coastal environment (which holds public and cultural interests).

The general consenting approach has been to publicly notify the consents in the past to allow community interests to be considered through due process.

13 CONCLUSIONS

13.1 Pōrangahau

Overall, the effects of the wastewater discharges from the Pōrangahau wastewater treatment plant on the local receiving environment, namely the Pōrangahau River, will be less than minor for of the majority of river flow conditions. However, during certain conditions there is a theoretical potential for moderate effects, namely faecal coliforms and nitrogen.

Specific consideration has been given to the proposed short-term consent durations of 9 years for Pōrangahau WWTP discharge, and taking Section 8.2.4 of the RRMP into account, this is considered an appropriate approach to take regarding the term of the consents sought.

It is considered that the interim discharge consent application is broadly consistent with the relevant objectives and policies of the relevant statutory provisions. The exception is Policy 71 of the RRMP for faecal coliforms and ammoniacal nitrogen during low flows of the Pōrangahau River. However, it is noted that the existing water quality of the Pōrangahau River is degraded above the discharge location and Policy 72 provides a process for assessing degraded water quality, provided the activity does not cause significant adverse effects on aquatic ecology and contact recreation.

13.2 Te Paerahi

The overall effects of the wastewater discharges on the coastal dune will be less than minor. Specific consideration has been given to the proposed short-term consent durations of 6 years for Te Paerahi WWTP discharge, and taking Section 8.2.4 of the RRMP into account, this is considered an appropriate approach to take regarding the term of the consents sought. It is considered that the interim discharge consent application is broadly consistent with the relevant objectives and policies of the relevant statutory provisions.

13.3 Combined

The overall effects of the discharge to land are considered to be less than minor, with many positive effects likely as a result of the irrigation.

Despite a potential for some nutrient loss from the discharge to land system to groundwater and then the river, the wider impact of the proposal is considered less than minor and will contribute towards achieving beneficial social and cultural outcomes through the steady diversion of treated wastewater discharge from the river and dunes to adjacent farmland.

The UV treatment and likely nutrient attenuation of treated wastewater through on-site soils will further contribute to water quality improvements for the Pōrangahau Catchment, thus, satisfying positive water quality directives outlined in the NPS:FM, the RCEP, and the future HBRC RRMP Plan Changes. The beneficial effects associated with the reduction of the direct discharge to the Pōrangahau River is consistent with the local communities, tāngata whenua and regional and national directives.

The proposal is consistent with Part II of the RMA and the objectives and policies of the NPS-FM, NZCPS and RPS. The proposal is largely consistent with the relevant objectives and policies of the RRMP. The proposal has considered and addressed the relevant provisions of the NES-F and NES-DW.

Overall, it is therefore considered appropriate to grant consent pursuant to section 104B and 108 of the RMA.

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APPENDIX A

Figure A0: Reporting Structure
Figure A1a: Te Paerahi Site Location
Figure A1b: Pōrangahau Site Location
Figure A1c: Discharge Property Location
Figure A2: Irrigation Layout
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APPENDIX B

Community Engagement Record

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APPENDIX C

Affected Party Approval

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX D

Records of Title

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APPENDIX E

Proposed Consent Conditions

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APPENDIX F

Schedule IV RMA Checklist

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APPENDIX G

Customary Marine Title Applicant

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APPENDIX H

Discharge to Land of Pōrangahau and Te Paerahi Wastewater – Assessment of Environmental Effects: Land Application (LEI, 2021:P:D.10)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX I

Pōrangahau and Te Paerahi Wastewater – Water Quality Assessment (Beca, 2021:P:D.25)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX J

Pōrangahau Wastewater Discharge to Land – Ecological Impact Assessment (Beca, 2021:P:D.66)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX K

Pōrangahau Wastewater Discharge to Land: Coastal Ecology Assessment (Beca, 2021:P:D.65)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX L

Pōrangahau and Te Paerahi Long Term – Planning Evaluation (Part B) Discharge to Land Consent – Discharge Site (Beca, 2021:P:D.90)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX M

Pōrangahau and Te Paerahi Community Wastewater – Discharge Conceptual Design (LEI, 2021:P:C.15)

CENTRAL HAWKE'S BAY DISTRICT COUNCIL

APPENDIX N

Te Paerahi Wastewater Treatment Plant Discharge – Water Quality Assessment (Beca, 2021:P:D.60)

CENTRAL HAWKE'S BAY
DISTRICT COUNCIL

REPORT ON:
186 BEACH ROAD, PORANGAHAU

PROJECT:
GEOTECHNICAL ASSESSMENT

CLIENT: MATTHEW DOUGLAS FAMILY TRUST

C/- SURVEYING THE BAY

PO Box 611

HASTINGS 4156

RDCL

EXECUTIVE SUMMARY

The Matthew Douglas Family Trust engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for a proposed subdivision at 186 Beach Road, Porangahau (Legal Descriptions: LOTS 1 3 DP 7439 LOT 1 DP 11607 LOT 4 DDP 515 PT SUB SECS 49 73 SO 3360 PT SUB SEC 49 PORANGAHAU).

From a subdivision plan prepared by Surveying the Bay (Drawing number: 4753-1, dated October 2018).that, the proposed lots generally comprise:

- Road fronting "township sections" on Jones St (Lots 1-3); and
- Lifestyle blocks, located either on:
  - Terrace edge, near to the riverbank (Lots 4 & 5); or
  - Flat ground more than 200m from the riverbank (Lot 7).

The proposed subdivision is located in a zone mapped as having "high liquefaction vulnerability", requiring assessment of the liquefaction susceptibility.

Significant soil creep and uneven ground are observed on steep slopes on the Porangahau Riverbank;

- The river margin area (Figure 1), directly adjacent to the river channel, is inferred to be at risk of slope instability due to soil creep and potential slumping.

Our liquefaction assessment indicates, for proposed house sites:

- The site is generally at "low risk" of liquefaction; with
  - Vertical settlements not expected greater than 15 mm under SLS or ULS conditions; with
  - A "non-liquefiable" crust of nominally 3m likely present above the water table; and
- Lateral displacements:
  - Estimated between 50-300mm across Lots 1-5 under ULS conditions;
  - Likely driven by semi-continuous liquefiable layers identified at nominally 4-5m and 9-10m depth.

Based on the results of these investigations we consider the site is suitable for the proposed development from a geotechnical perspective, provided:

- House sites should be situated on the main terrace for Lots 4 and 5;
  - i.e., Building footprints should not extend into the river margin area (Figure 1), which is considered not suitable for foundations.
- Foundations for Lots 1-5 should be constructed with due consideration to the potential for liquefaction induced ground damage;
  - Particularly lateral stretch which may occur under ULS earthquake conditions;
  - In terms of the MBIE Guidelines for Christchurch (MBIE, 2015), we consider the expected liquefaction ground damage for Lots 1-5 equates to "Technical Category 2/3 Hybrid" property;
  - Requiring confirmation of appropriate foundations based on specifics of proposed developments; and
- Subsoil drainage should be installed and/or contouring should be undertaken to prevent ponding and waterlogging on Lots 1-3.

Specific engineering design of foundations is required for Lots 1, 2, 3, 4 and 5;

- The appropriate level of ground improvement and/or foundation reinforcement will depend on the scale, layout, and complexity of proposed houses;
- We consider a suitably qualified geotechnical engineer should be engaged to confirm appropriate foundation solutions at concept design stage, and in consultation with other design/engineering professionals for the project.

Driven timber piles in accordance with NZS3604:2011 are appropriate for Lot 7; with

- 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil.

CONTENTS

FIGURES

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1 OVERVIEW

The Matthew Douglas Family Trust engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for a proposed subdivision at 186 Beach Road, Porangahau (Legal Descriptions: LOTS 1 3 DP 7439 LOT 1 DP 11607 LOT 4 DDP 515 PT SUB SECS 49 73 SO 3360 PT SUB SEC 49 PORANGAHAU).

1.1 UNDERSTANDING OF THE PROJECT

We understand the intent is to subdivide six (6) new residential lots (Figure 1), and that a geotechnical investigation is required to assess the suitability of the proposed lots for subdivision consent.

RDCL has been supplied with a Subdivision Plan prepared by Surveying the Bay (Drawing number: 4753-1, dated October 2018).

From that, the proposed lots generally comprise:

- Road fronting "township sections" on Jones St (Lots 1-3); and
- Lifestyle blocks, located either on:
  - Terrace edge, near to the riverbank (Lots 4 & 5); or
  - Flat ground more than 200m from the riverbank (Lot 7).

The proposed subdivision is located in a zone mapped as having "high liquefaction vulnerability", requiring assessment of the liquefaction susceptibility.

1.2 SCOPE OF WORK

Work was undertaken in general accordance with RDCL proposal 18802, dated 3 December 2018.

2 SITE DESCRIPTION

2.1 GENERAL

The proposed subdivision is located to the southeast of the township of Porangahau, comprising flat terraced ground bounded by the steep northern bank of the Porangahau River.

The surrounding area generally comprises a broad flood plain emerging from coastal hills, with low terraces formed by the meandering river.

All proposed house sites are located on flat ground on a raised terrace currently in crop;

- Lots 1-3 to be subdivided from a flat vacant section generally in grass;
- Lots 4-5 located near the southern edge of the terrace, bounded by a gentle to moderate, south facing slope; and
- Lot 7 on flat ground in crop at least 200 m north of the riverbank.

The "river margin" area (Figure 1), comprises a stepped geometry, with moderate to steep slopes achieving on the order of 9 m elevation difference, over 47 m horizontally between the main terrace and river level.

Significant soil creep is observed on the over-steepened southern riverbank, across the channel from the proposed subdivision. Uneven ground in the river margin area on the subdivision side of the river (Figure 1) likely indicates similar instability on the northern bank.

Marshy and uneven ground was observed on proposed Lots 1-3, particularly towards the eastern boundary, likely indicating the area is prone to waterlogging.

Some cracks observed where soil is exposed, potentially indicate a shrink-swell clay component to near-surface materials.

2.2 REGIONAL GEOLOGY

Regional geological mapping (GNS Science, 2011; 1998) indicates the site is underlain by

- Holocene river deposits, comprising loose gravel sand silt and clay in modern flood plains and low terraces with subsidiary sand, silt, and clay.

The hills surrounding Porangahau characteristically expose weathered and deformed sedimentary rocks, including extensive sequences of massive mudstone alternating with sandstone and marl. Young river sediments derived from surrounding hills are expected to comprise generally fine-grained, muddy/clayey deposits.

2.3 ACTIVE FAULTING

No active faults directly the development are identified in the GNS Science Active Faults Database (Langridge & Ries, 2016).

The nearest mapped active fault traces are located >15km to the west.

3 SITE INVESTIGATION

Sub-surface testing completed for this investigation (Figure 1) comprised:

- Engineering geological mapping;
- Engineering geological logging of materials encountered in six (6) test pits;
- A total of ten (10) Dynamic Cone Penetrometer (DCP) tests; and
- Five (5) Cone Penetration Tests (CPT).

Results of subsurface investigations are attached as Appendix A.

3.1 NEAR SURFACE MATERIALS

3.1.1 MAIN TERRACE (HOUSE SITES)

The results of test pit investigations suggest the main terrace is generally underlain by:

- Silty TOPSOIL to between 0.4-0.6 m bgl; underlain by
- Firm clayey SILT to 1.6-1.7 m bgl; underlain by
- Soft to firm CLAY to at least 3.2 m bgl.

The results of CPT investigations suggest the site is consistently underlain by:

- CLAY and silty CLAY to at least 20m bgl.

Non-engineered fill was encountered in the near surface (<0.7m) on proposed Lot 4, incorporating predominantly topsoil with some brick fragments.

We expect this material is localised in the southwest corner, where a track is formed around the perimeter of the existing paddock.

3.1.2 RIVER MARGIN

The river margin area is generally underlain by

- Silty TOPSOIL to between 0.3-0.6m bgl; underlain by
- Firm, friable, low plasticity SILT with trace shells and gravel;
  - To at least 3.3m bgl adjacent to the river (TP05); and
  - Lapping on to stiff silty CLAY forming the main terrace.

3.2 DCP TESTING

DCP testing at the proposed house site suggests:

- Soft soils in the near surface (DCP blows <3 per 100 mm penetration) generally extend to on the order of 1.1 m bgl; and
- Localised areas of decreased bearing capacity are observed; suggesting
  - Relatively thin layers of soft soils may be present at depth; and
  - Soft soils may extend to greater depths (<2m) in localised areas.

An indicative assessment of available soil bearing capacity at each proposed house sites is in Section 4.3.

3.3 GROUNDWATER

Groundwater was encountered as seepage at depth between 2.5-3.0m bgl, and not encountered in test pits closest to the riverbank (>3.3m bgl).

For the purposes of our liquefaction assessment, we consider a representative ground water level to be 3.0 m bgl.

4 GEOTECHNICAL ASSESSMENT

4.1 RIVER MARGIN SLOPE STABILITY

Significant soil creep and uneven ground are observed on steep slopes on the Porangahau Riverbank;

- The river margin area (Figure 1), directly adjacent to the river channel, is inferred to be at risk of slope instability due to soil creep and potential slumping.

4.2 LIQUEFACTION

A liquefaction assessment was carried out using the CPT data and industry standard software (CLiq). Liquefaction assessment outputs are attached in Appendix B.

Our assessment indicates, for proposed house sites:

- The site is generally at "low risk" of liquefaction (LPI_{SLS}= <0.1, LPI_{ULS}= <3.4); with
  - Little to no surface expression expected (LSN_{SLS}= <0.3, LSN_{ULS}= <2.4);
  - Vertical settlements not expected greater than 15 mm under SLS or ULS conditions; with
  - A "non-liquefiable" crust of nominally 3m likely present above the water table; and
- Lateral displacements:
  - Not expected >10mm under SLS conditions;
  - Estimated between 50-300mm across Lots 1-5 under ULS conditions;
  - Likely driven by semi-continuous liquefiable layers identified at nominally 4-5m and 9-10m depth.

4.2.1 Basis of Liquefaction Assessment

The liquefaction assessment for this site was based on the CPT investigation at site and data analysed using program CLiq, accepted industry software package (Geoligismiki, 2014) using the following input parameters (NZS1170.5 section 3.1.3, 2004):

- Magnitude(M) = 7.5;
- Peak Ground Acceleration (PGA) = 0.11 g (SLS) and 0.45 g (ULS), based on:
  - Ch (T) = 1.12 (Class D – deep or soft soil);
  - Z = 0.4 (based on hazard factor contour; Figure 3.3, NZS1170.5:2016); and
  - R = 0.25 (SLS) and 1.0 (ULS)
- Groundwater level assumed at 3.0 m below ground level, based on seepage observed in test pit investigations.

The design earthquake was chosen on the basis of recurrence probability based on historical earthquakes. A 7.5 magnitude earthquake for an importance level category 2 correlates with a 25 year return period (SLS) and 500 year return period (ULS). A 50 year design life was assigned.

4.3 Shallow Bearing Capacity

Based on the results of DCP testing, we consider:

- 300 kPa ultimate bearing capacity is generally available at a depth of 1.1m bgl; and
- 200kPa ultimate bearing capacity is generally available at a level stripped of topsoil.

5 GEOTECHNICAL CONSIDERATIONS

Recommendations and opinions contained in this report are based on data from site investigations as outlined in Section 3, and our geotechnical assessment as outlined in Section 4. Inferences about the nature and continuity of subsurface geology and ground conditions are made but cannot be guaranteed.

5.1 GEOTECHNICAL SUITABILITY OF HOUSE SITES

Based on the results of these investigations we consider the site is suitable for the proposed development from a geotechnical perspective, provided:

- House sites should be situated on the main terrace for Lots 4 and 5;
  - i.e., Building footprints should not extend into the river margin, which is considered not suitable for foundations.
- Foundations for Lots 1-5 should be constructed with due consideration to the potential for liquefaction induced ground damage;
  - Particularly lateral stretch which may occur under ULS earthquake conditions;
  - In terms of the MBIE Guidelines for Christchurch (MBIE, 2015), we consider the expected liquefaction ground damage for Lots 1-5 equates to "Technical Category 2/3 Hybrid" property;
  - Requiring confirmation of appropriate foundations based on specifics of proposed developments; and
- Subsoil drainage should be installed and/or contouring should be undertaken to prevent ponding and waterlogging on Lots 1-3.

5.2 SLOPE STABILITY

Slope instability is observed in the form of soil creep and inferred slumping on over-steepened riverbank slopes;

- The river margin area (Figure 1), underlain by friable low plasticity silt, is not considered suitable for founding, due to the risk of slope instability.

5.3 FOUNDATION RECOMMENDATIONS

5.3.1 LOTS 1-5

Specific engineering design of foundations is required for Lots 1, 2, 3, 4 and 5.

The appropriate level of ground improvement and/or foundation reinforcement will depend on the scale, layout, and complexity of proposed houses;

- We consider a suitably qualified geotechnical engineer should be engaged to confirm appropriate foundation solutions at concept design stage, and in consultation with other design/engineering professionals for the project.

For small footprint lightweight timber framed structures, minimum "TC2" foundations may be deemed appropriate, likely comprising:

- Enhanced slab foundations (Options 1–4, section 5.3.1; Appendix C) in accordance with MBIE Guidelines (2012); with
  - 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil; and
  - The foundation footprint stripped of organic, loose and deleterious materials prior to construction.

For larger scale, complex and/or heavily loaded structures, further ground improvement may be deemed necessary, likely comprising:

- Excavation and replacement with a reinforced gravel raft;
  - Depth of undercut likely required between 0.8-2.0m;
  - Nominally 2-3 layers of geogrid reinforcing;
  - Backfilled and compacted under engineering control; with
- Foundation options 1-4 as specified in MBIE (Dec 2012) Technical Guidance for Christchurch, Version 3, Part A, section 5.3.1. (Appendix C).

5.3.2 LOT 7

Driven timber piles in accordance with NZS3604:2011 are appropriate for Lot 7; with

- 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil.

5.4 EARTHWORKS

5.4.1 FILL

Should fill placement be required for ground improvement or to alter site levels, we recommend:

- All fills should be placed, and fill surfaces prepared in accordance with standards set out in NZS 4431:1989 "Code of Practice for Earthfill for Residential Development".
- Fills should be designed with finished overall slope angle 2H:1V and placed on natural ground stripped of organic or soft materials, and benched for stability.
- Appropriate subsurface drainage should be installed beneath all engineered fill.

5.4.2 RETAINING WALLS

Should retaining walls be required for any purpose, we recommend:

- Retaining wall design should be completed by a suitably qualified structural engineer;
- Stormwater management will be required to ensure retained soils are well drained.

All retaining walls should be backfilled with free draining materials with "Novaflow" style piping to capture and direct water away for adequate disposal.

Where fills are required to reinstate ground, backfill should be free draining and compacted under engineering supervision to nominally 98% MDD.

Appropriate parameters for the design of retaining walls should be confirmed based on soils encountered in specific locations.

5.5 ACCESS

As it relates to development of access:

- Appropriate surfacing of roadways needs to consider subgrade conditions, drainage, likely traffic loads (especially construction loads during house building), and importantly maintenance over the long term;
  - Subgrade should be stripped of all organic loose and deleterious materials;
- The carriageway should be shaped to manage surface water flows in a controlled manner, including at a minimum:
  - A well-defined "table drain" on the inside of the access-way;
  - Well defined culverts and discharge points to shed water; and
  - Adequate protection of both against erosion.

5.6 STORMWATER

Stormwater disposal should be specifically designed by professionals with competence in the field. Any comments in this report as it relates to stormwater are for guidance only.

As a minimum we recommend:

- All developments should be undertaken in a manner so as to redirect storm water from proposed building platforms and other impervious surfaces;
- Stormwater should discharge to a suitable point away from existing slopes and in a manner that reduces the risk of erosion and / or flooding.

5.7 EFFLUENT DISPOSAL

Effluent disposal fields should be specifically designed by a competent practitioner experienced in such matters; any comments in this report as it relates to effluent fields are for guidance only.

- Discharge rate should be specifically tailored to meet the requirements as they relate to the slope angle and soil conditions on site; and
- Planting between drip-lines should be undertaken with suitable species at density recommended by the effluent specialist.

5.8 FURTHER GEOTECHNICAL INPUT

We recommend a suitably qualified geotechnical professional be engaged:

- For specific design of building foundations on Lots 1, 2, 3, 4 and 5; and/or
- Should ground conditions be found to differ from those contained in this report.

6 REFERENCES

GNS Science. (2011). HAWKE'S BAY. *Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 8.* (J. Lee, K. Blankd, D. Townsend, & P. Kamp, Compilers) GNS Science.

GNS Science (2007) : *Fault Rupture Avoidance Issues at Parkhill Farmpark, Hawke's Bay,* GNS Science consultancy Report 2007/333, dated December 2007

Hawkes Bay Emergency Management Group. (2015). Online Mapping Site.

Langridge, R.M.; Ries, W.F. (2016). Active Fault Mapping and Fault Avoidance Zones for Hastings District and environs, GNS Science Consultancy Report 2015/112. 50 p.

Langridge, R.M., Ries, W.F., NJ Litchfield, N.J., Villamor, P, Van Dissen, R.J, Barrell, D.J.A, Rattenbury, M.S.,Heron, D.W, Haubrock, S, Townsend, D.B, Lee, J.M., Berryman, K.R., Nicol, A, Cox, S.C, & Stirling, M.W. (2016) *The New Zealand Active Faults Database*, New Zealand Journal of Geology and Geophysics, 59:1, p86-96, DOI: 10.1080/00288306.2015.1112818

NZS4431 (1989) *NZS4431:1989 - Code of Practice for Earthfill for Residential Development*. Standards New Zealand.

5 LIMITATIONS

- This report has been prepared for the particular purpose outlined in the project scope and no responsibility is accepted for the use of any part in other contexts or for any other purpose.
- Ground conditions assessed in this report are inferred from published sources, site inspection and the investigation described. Variations from the interpreted conditions may occur, and special conditions relating to the site may not have been revealed by this investigation, and which are therefore not taken into account. No warranty is included either expressed or implied that the actual conditions will conform to the interpretation contained in this report.
- No responsibility is accepted by Resource Development Consultants Ltd for inaccuracies in data supplied by others. Where data has been supplied by others, it has been assumed that this information is correct.
- Groundwater conditions can vary with season or due to other events. Any comments on groundwater conditions are based on observation at the time.
- This report is provided for sole use by the client and their professional advisors. No responsibility whatsoever for the contents of this report shall be accepted for any person other than the client.

7 CLOSURE

We trust this meets your current needs. Should you wish to discuss any aspect of the contents of this document please contact the undersigned on 06 877-1652.

Sincerely,

Prepared by:

EA Cairns
MSc
Engineering Geologist

Approved by:

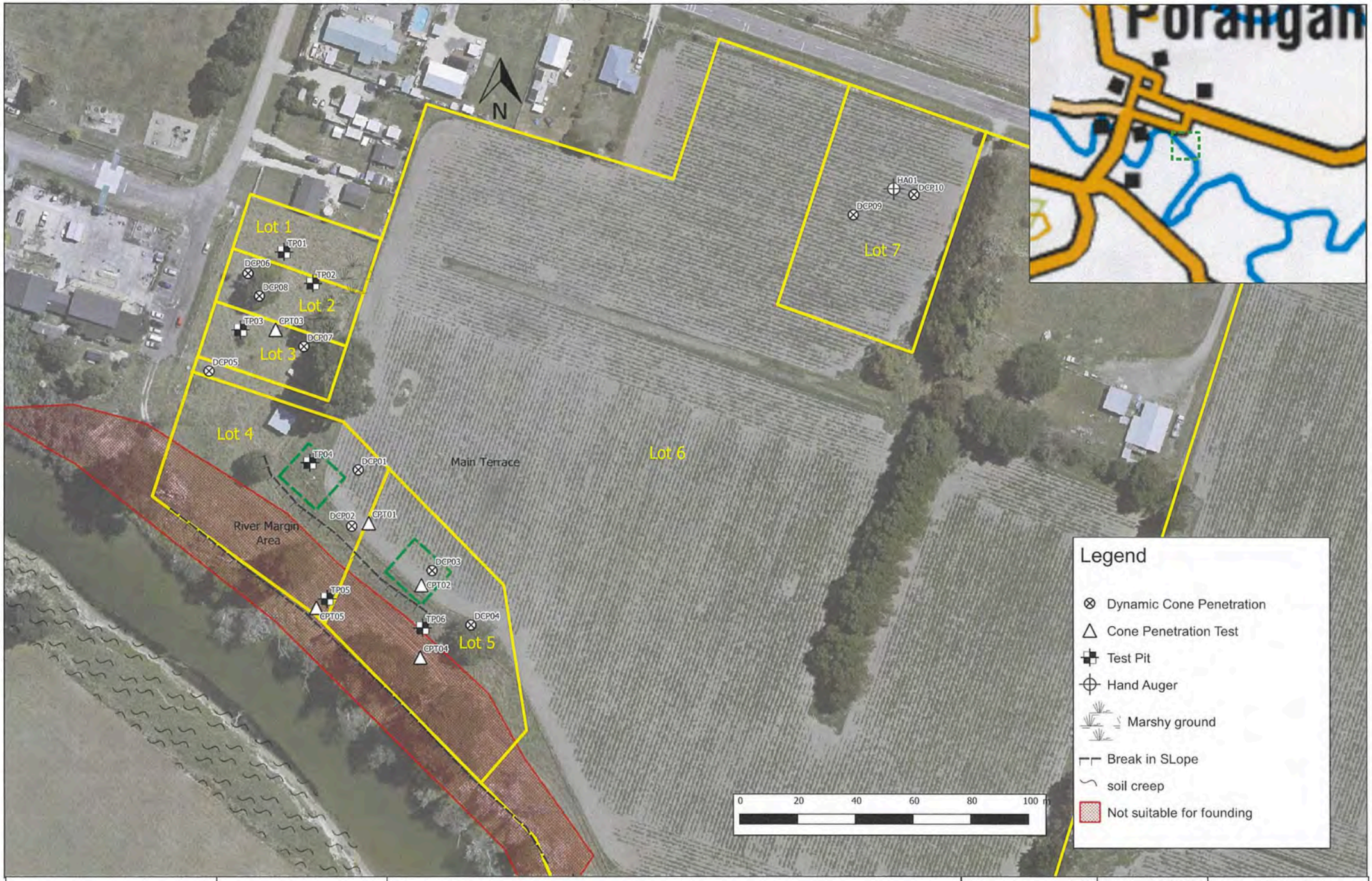
CA Wylie
MSc; MIPENZ, CPEng
Principal

Attached:

Figure 1 – Geotechnical Investigation Layout
Appendix A – Test Pit, DCP & CPT Logs
Appendix B – Liquefaction Assessment Outputs
Appendix C – Foundation Options for Technical Category 2
Important Information about your Geotechnical Report

FIGURES

1907600



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Title:	Investigation Layout	Drawn By: EC	Date 28/01/19	Drawing Size: A4
Site:	186 Beach Road, Porangahau	Approved By: CAW	Date 30/01/19	Project: 188020602
Client:	Matthew Douglas Family Trust			Figure Number: 1

APPENDIX A

TEST PIT, DCP & CPT LOGS

TEST PIT LOG

HA01

SHEET 1 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907711.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532254.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty gravelly TOPSOIL; dark brown. Moist.	M	FM				
1.0	-1.0			Clayey SILT; orange brown with grey mottle. Firm; moderate plasticity; moist. EOH: 1.10m						
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP01

SHEET 2 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907500.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532232.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	-0.5		TS	SiltyTOPSOIL; brown. Moist; with rootlets and roots.						
0.5	-1.0			Clayey SILT; orange brown with grey mottle. Firm; moderate plasticity to high plasticity; moist; with rootlets; becoming clayier with depth.	M	FM				
1.0	-1.5									
1.5	-2.0									
2.0	-2.5			CLAY; orange brown with grey mottle. Soft; high plasticity; moist to wet.	M - W	S				
2.5	-3.0	▼		EOH: 3.00m						
3.0	-3.5									
3.5	-4.0									
4.0	-4.5									
4.5										

REMARKS

SYMBOLS

▼ Standing Water Level
◁ Out flow
▷ In flow

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TEST PIT LOG

TP02

SHEET 3 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907510.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532221.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	0.0		TS	Silty gravelly TOPSOIL; dark brown. Moist.	M					
0.5	-0.5			Clayey SILT; or4angish brown with grey mottle. Firm; moderate plasticity; moist; with rootlets.		FM				
1.0	-1.0									
1.5	-1.5									
2.0	-2.0			CLAY; orangish brown with grey mottle. Soft to firm; high plasticity; moist; trace organics (soft, wet, plastic peat lenses).		S - FM				
2.5	-2.5	▼		EOH: 2.90m						
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP03

SHEET 4 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907485.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532205.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	0.0		TS	Silty TOPSOIL; dark brown. Moist.						
0.5	-0.5			SILT, with trace clay; brown with orange and grey mottle. Firm to stiff; moderate plasticity; moist; with roots.	M	FM - SF				
1.0	-1.0									
1.5	-1.5			Silty CLAY; orangish brown with grey mottle. Firm; moderate plasticity to high plasticity; moist to wet; becoming wet with possible groundwater seepage at 3.0m bgl.	M - W	FM				
2.0	-2.0									
2.5	-2.5									
3.0	-3.0	▶		EOH: 3.20m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP04

SHEET 5 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907509.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532159.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered		Silty FILL; dark brown. Moist; predominantly topsoil with bricks incorporated.	M	FM				
1.0	-1.0			Silty CLAY; orangish brown with grey mottle. Firm; moderate plasticity to high plasticity; moist; with tree roots; becoming soft at 1.5m bgl.						
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0			EOH: 3.20m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP05

SHEET 6 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907515.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532112.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty TOPSOIL; brown. Dry to moist.	D - M					
1.0	-1.0			SILT; brown with slight orange mottle. Soft to firm; low plasticity; moist; with tree roots, and trace shells and gravel.	M	S - FM				
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0			EOH: 3.30m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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TEST PIT LOG

TP06

SHEET 7 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907548.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532102.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty TOPSOIL; brown. Moist.	M					
1.0	-1.0			SILT; brown. Firm; low plasticity; dry to moist; silt, friable; with tree roots.	D - M	FM				
1.5	-1.5			Silty CLAY; grey and orange mottled. Stiff; moderate plasticity; moist.	M	SF				
				EOH: 1.80m						
2.0	-2.0									
2.5	-2.5									
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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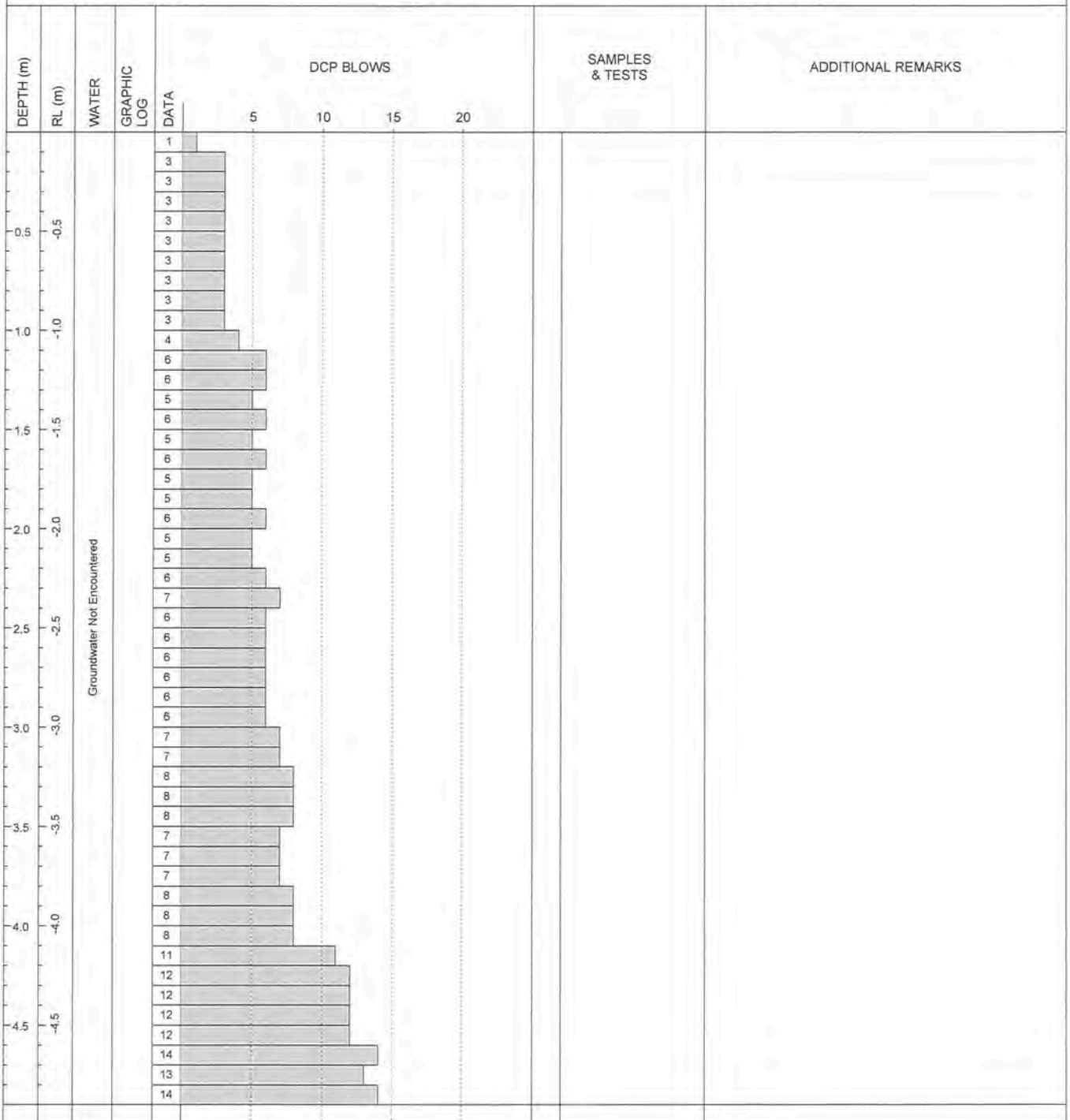
DCP LOG

DCP01

SHEET 1 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907525.73	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532156.50	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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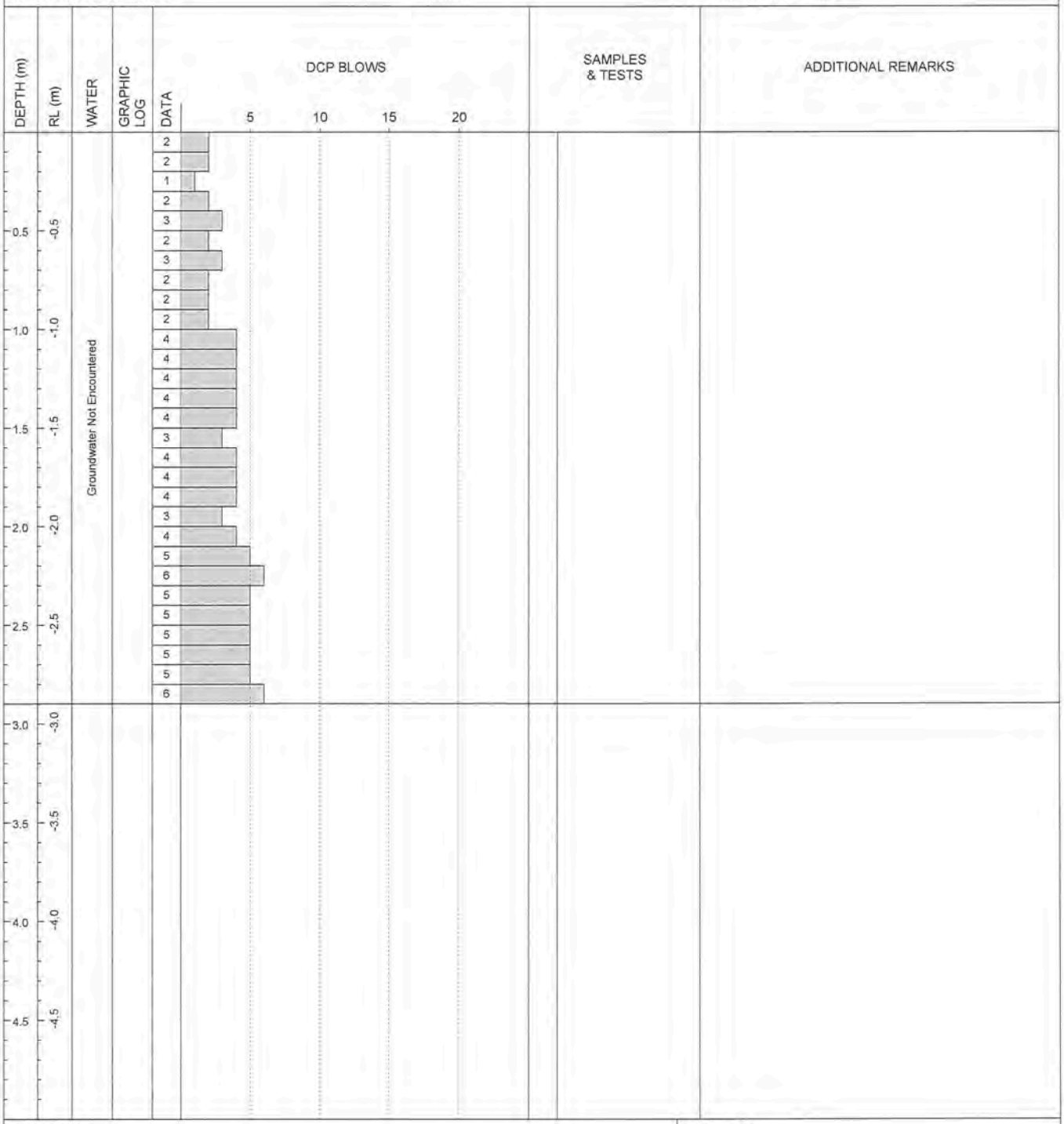
DCP LOG

DCP02

SHEET 2 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907523.52	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532137.13	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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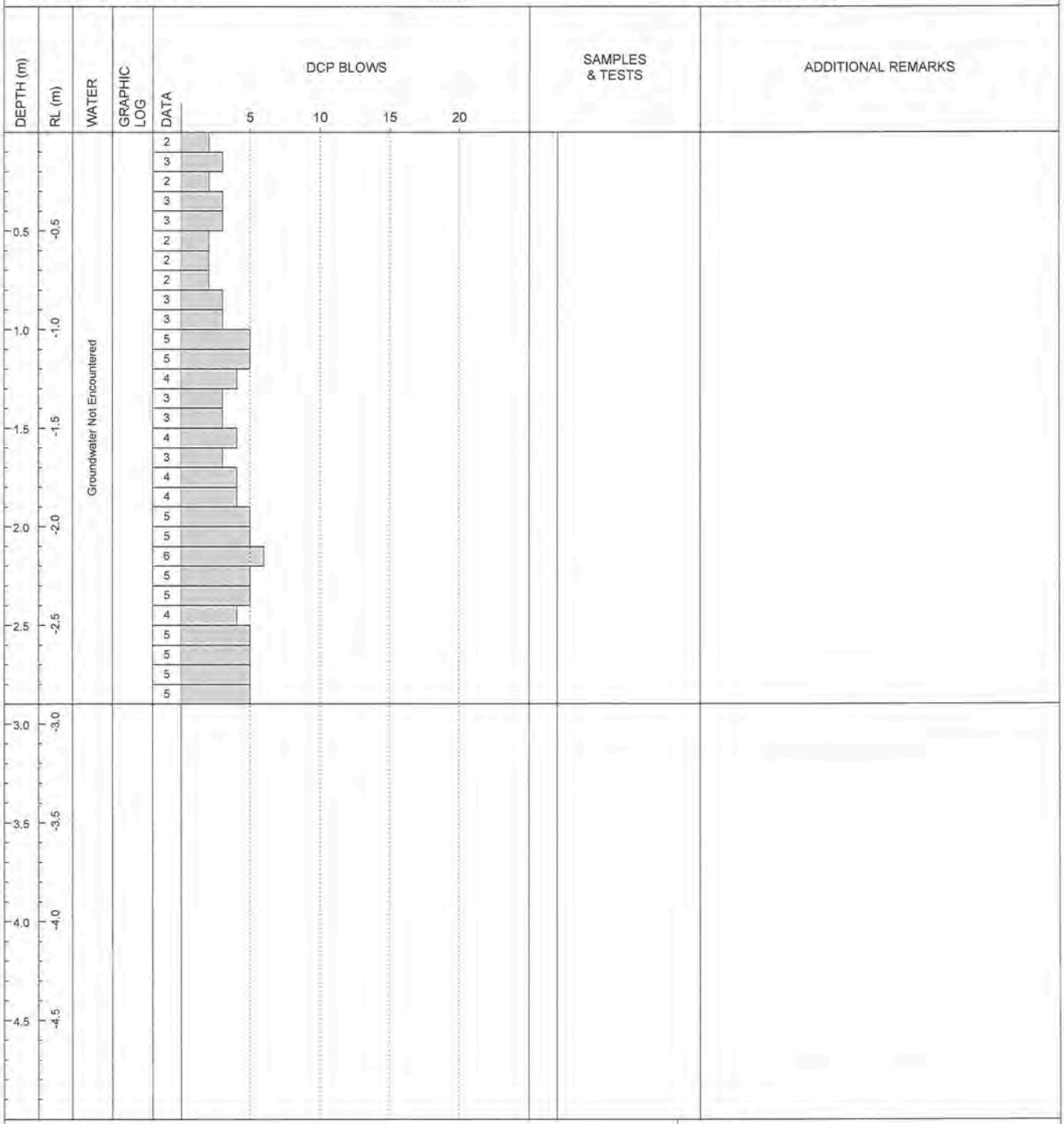
DCP LOG

DCP03

SHEET 3 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907551.27	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532121.78	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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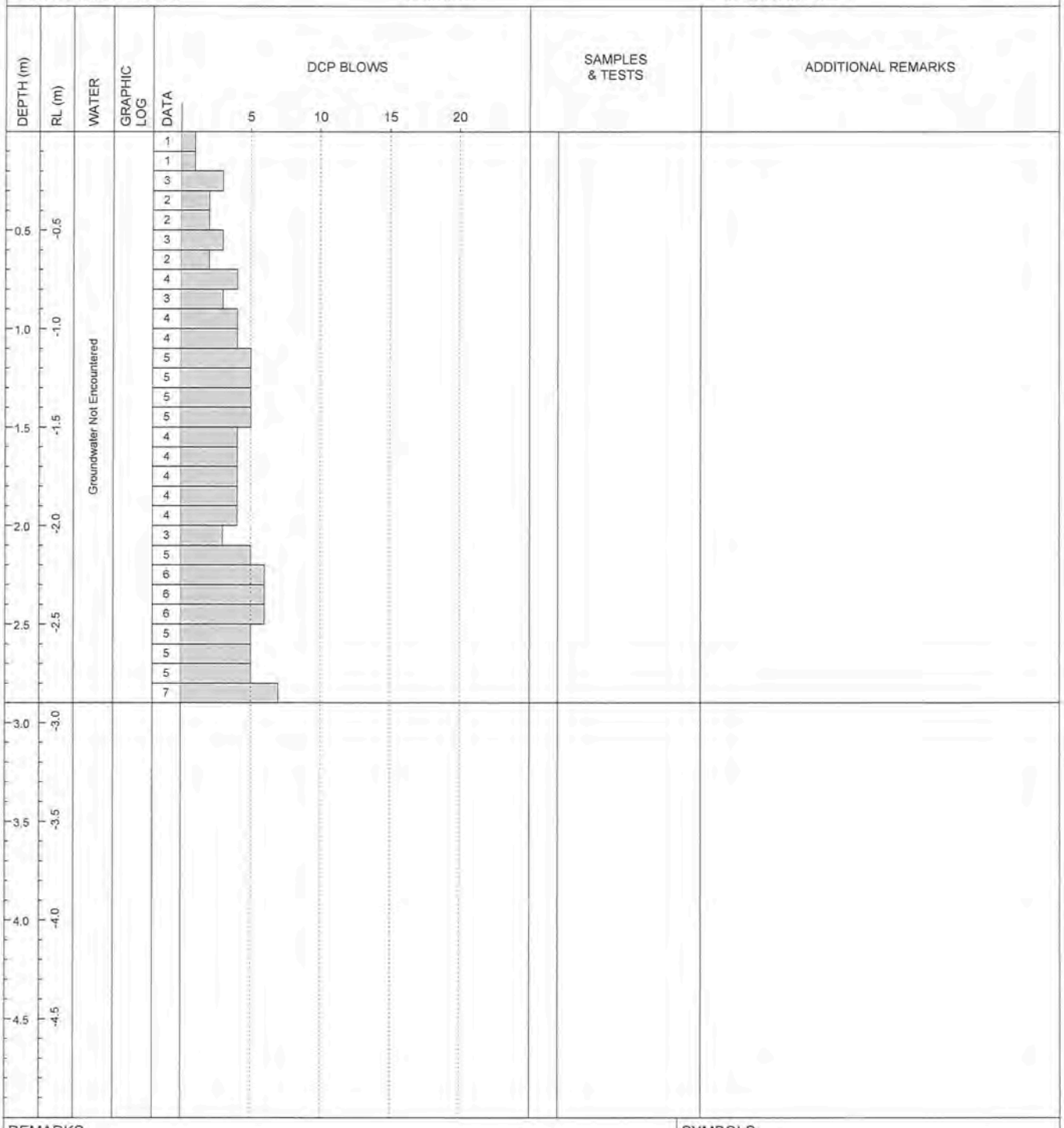
DCP LOG

DCP04

SHEET 4 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907564.70	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532103.01	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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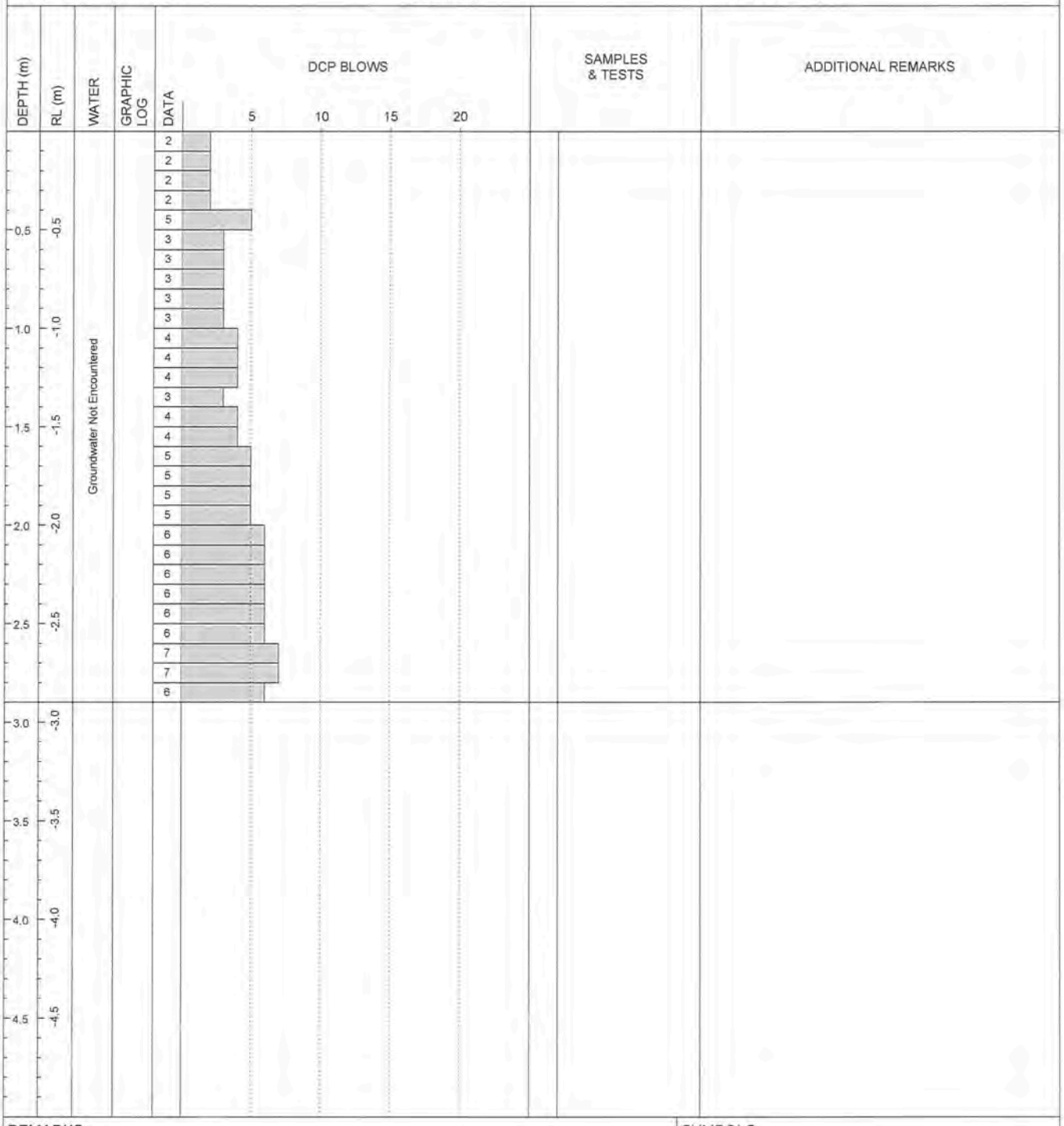
DCP LOG

DCP05

SHEET 5 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907474.15	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532190.74	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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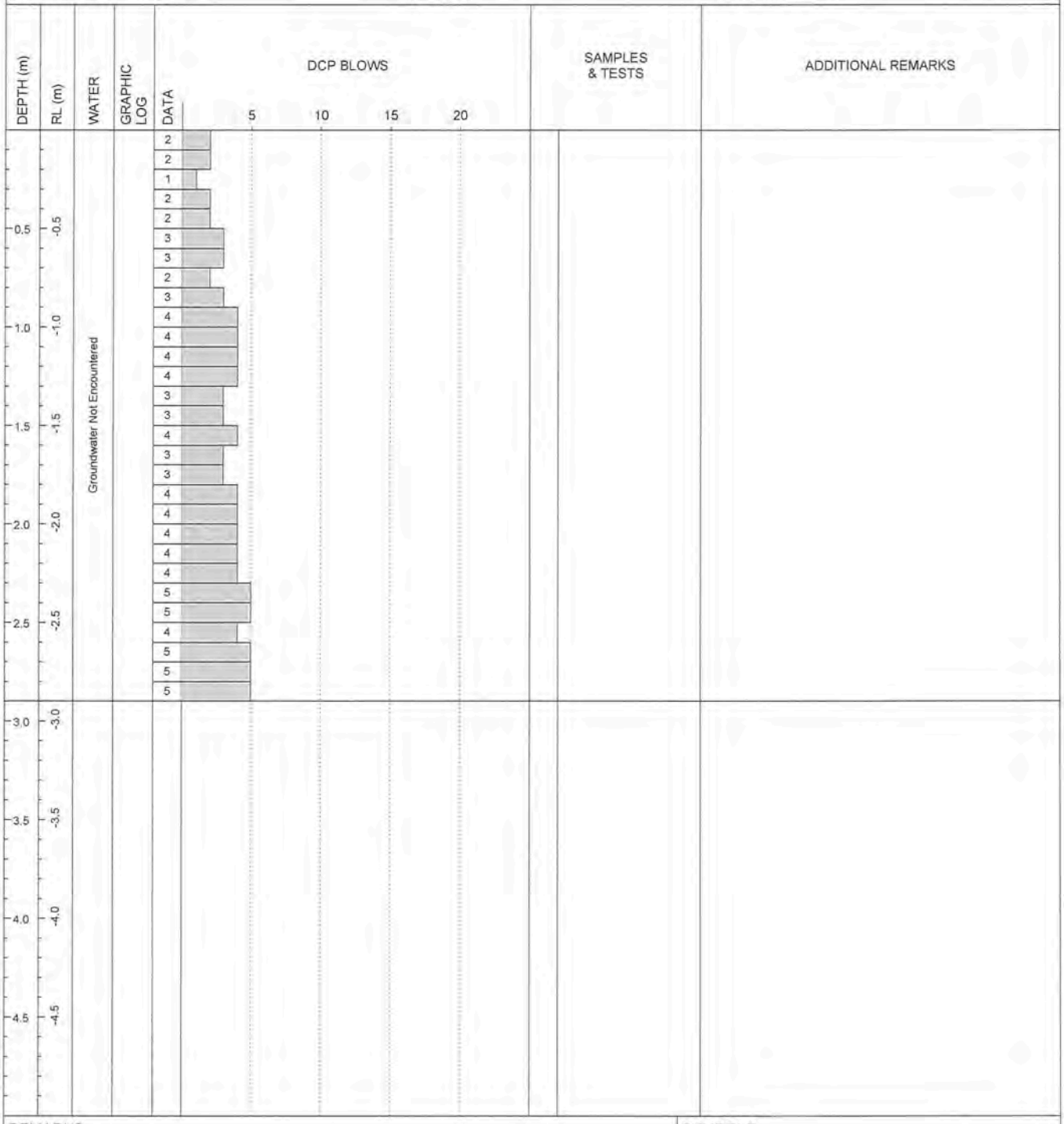
DCP LOG

DCP06

SHEET 6 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907487.59	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532224.49	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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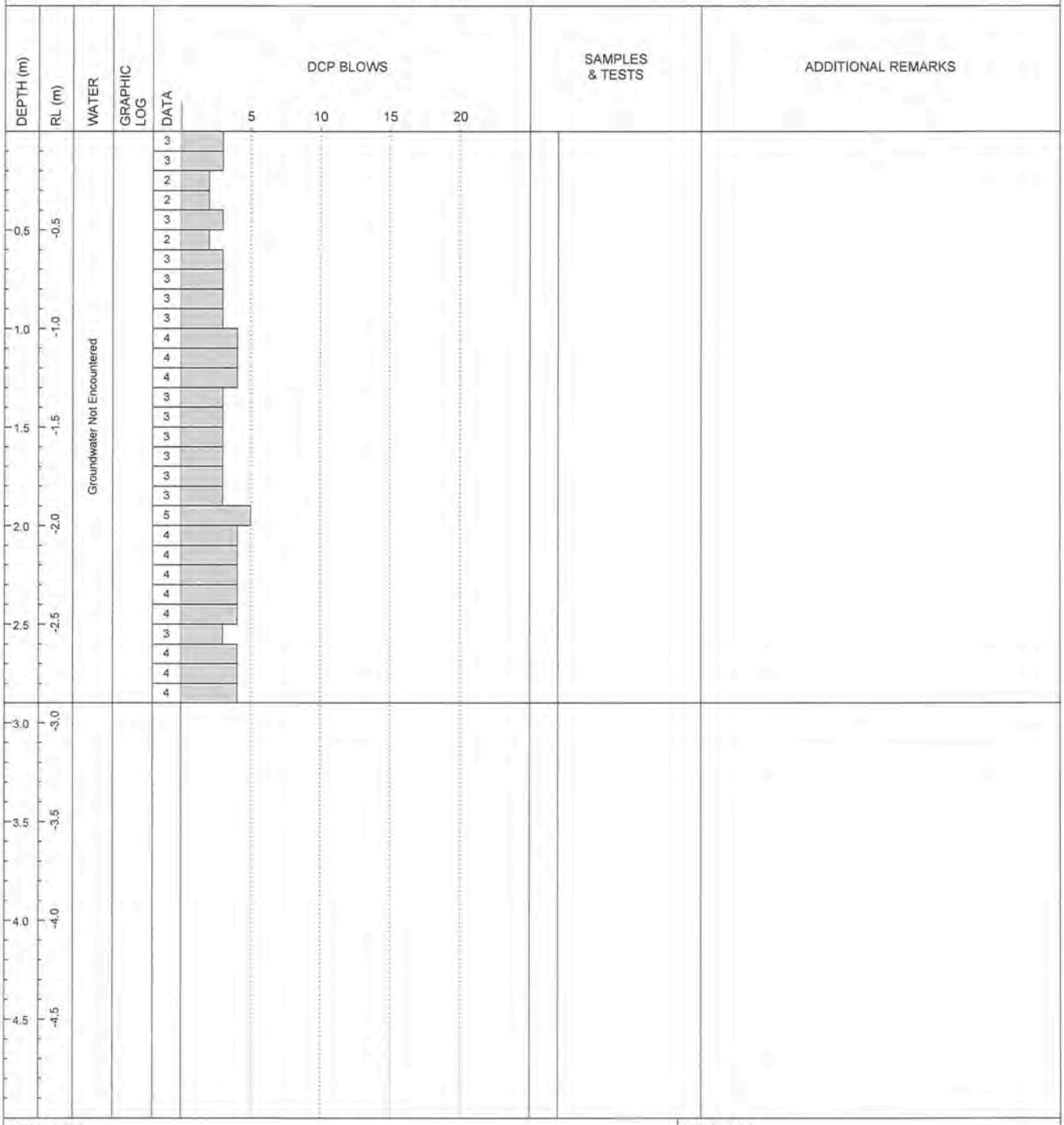
DCP LOG

DCP07

SHEET 7 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907506.90	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532199.29	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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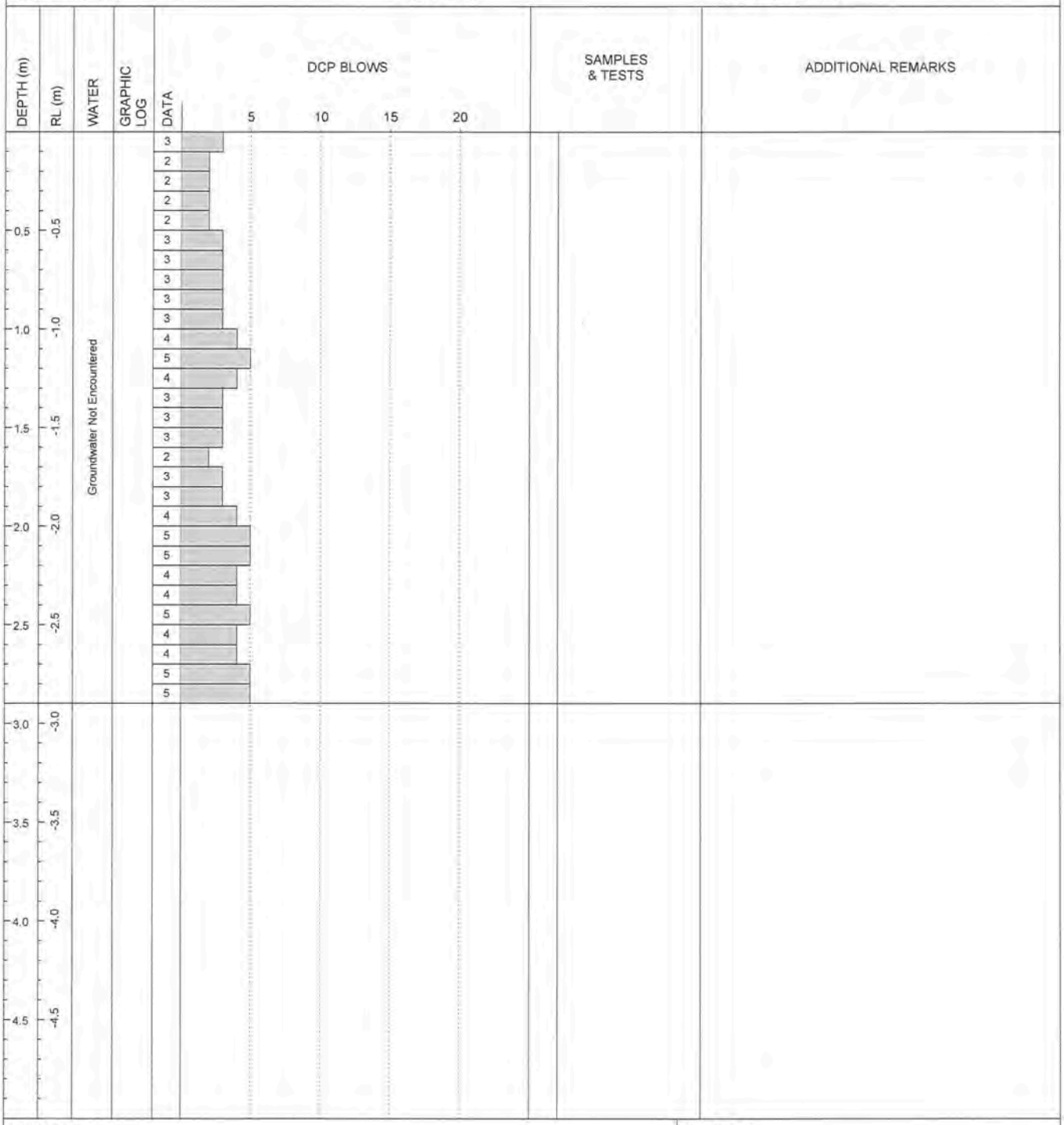
DCP LOG

DCP08

SHEET 8 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907491.53	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532216.60	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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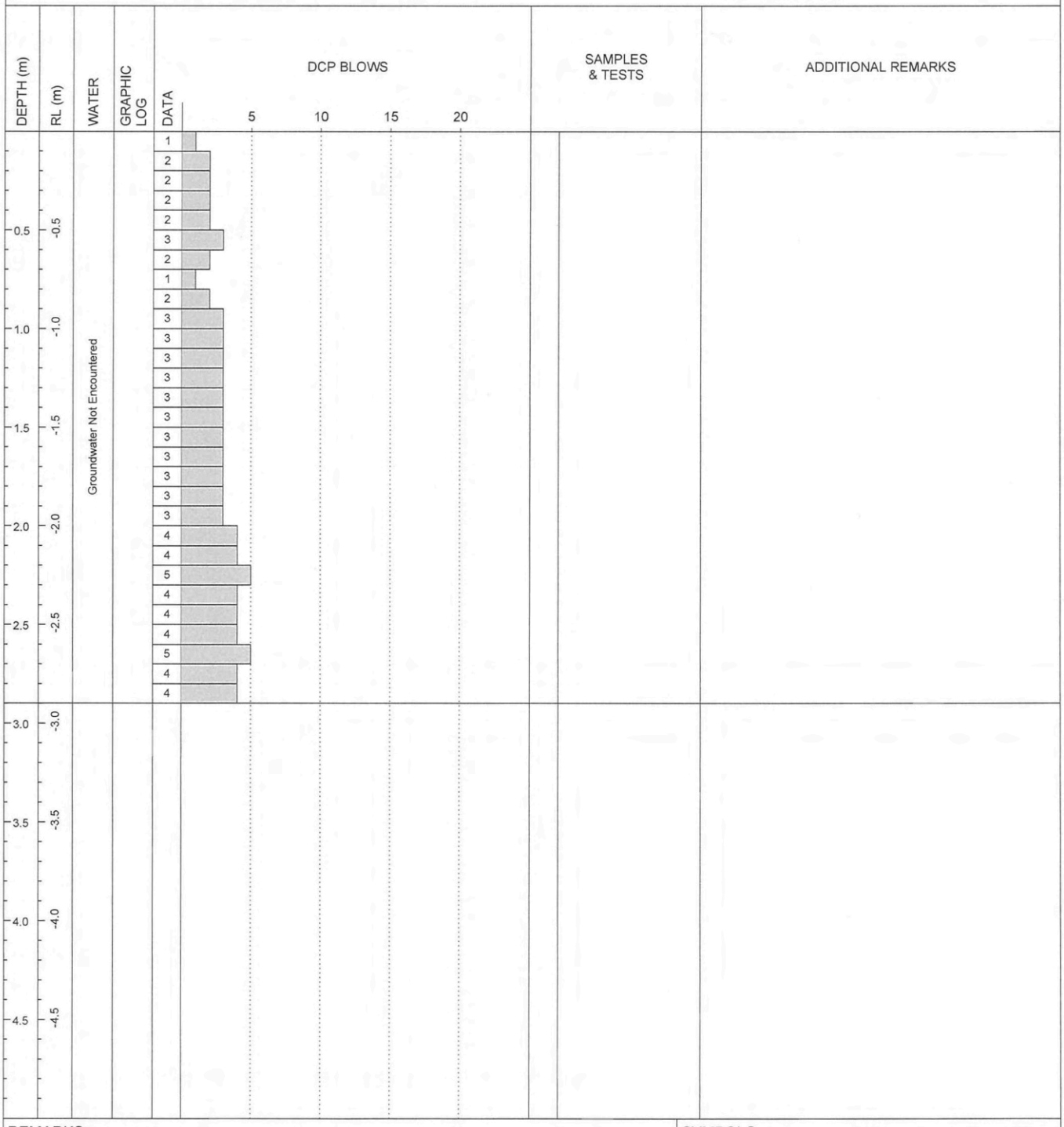
DCP LOG

DCP09

SHEET 9 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907697.00	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532245.00	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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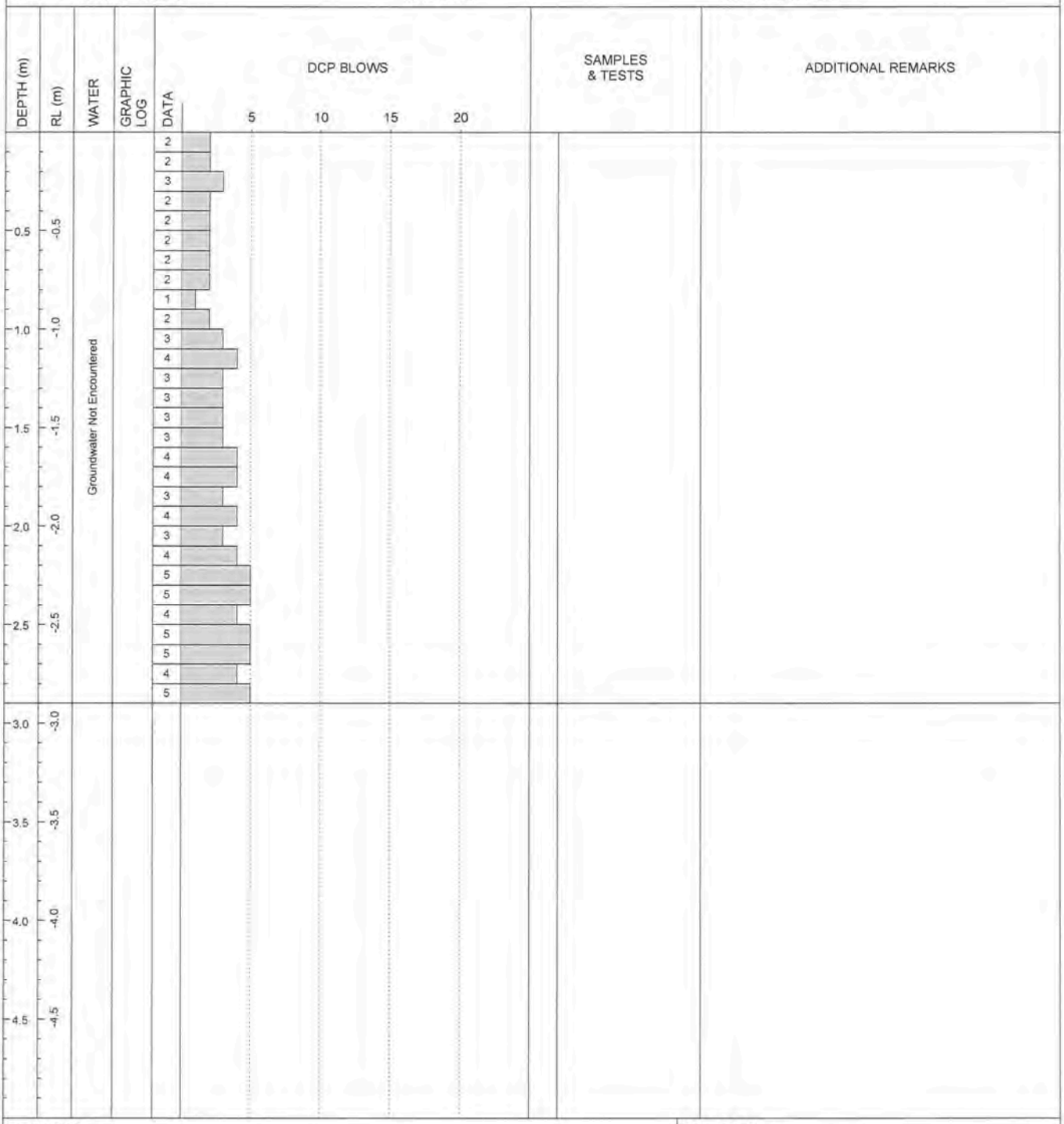
DCP LOG

DCP10

SHEET 10 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907718.00	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532252.00	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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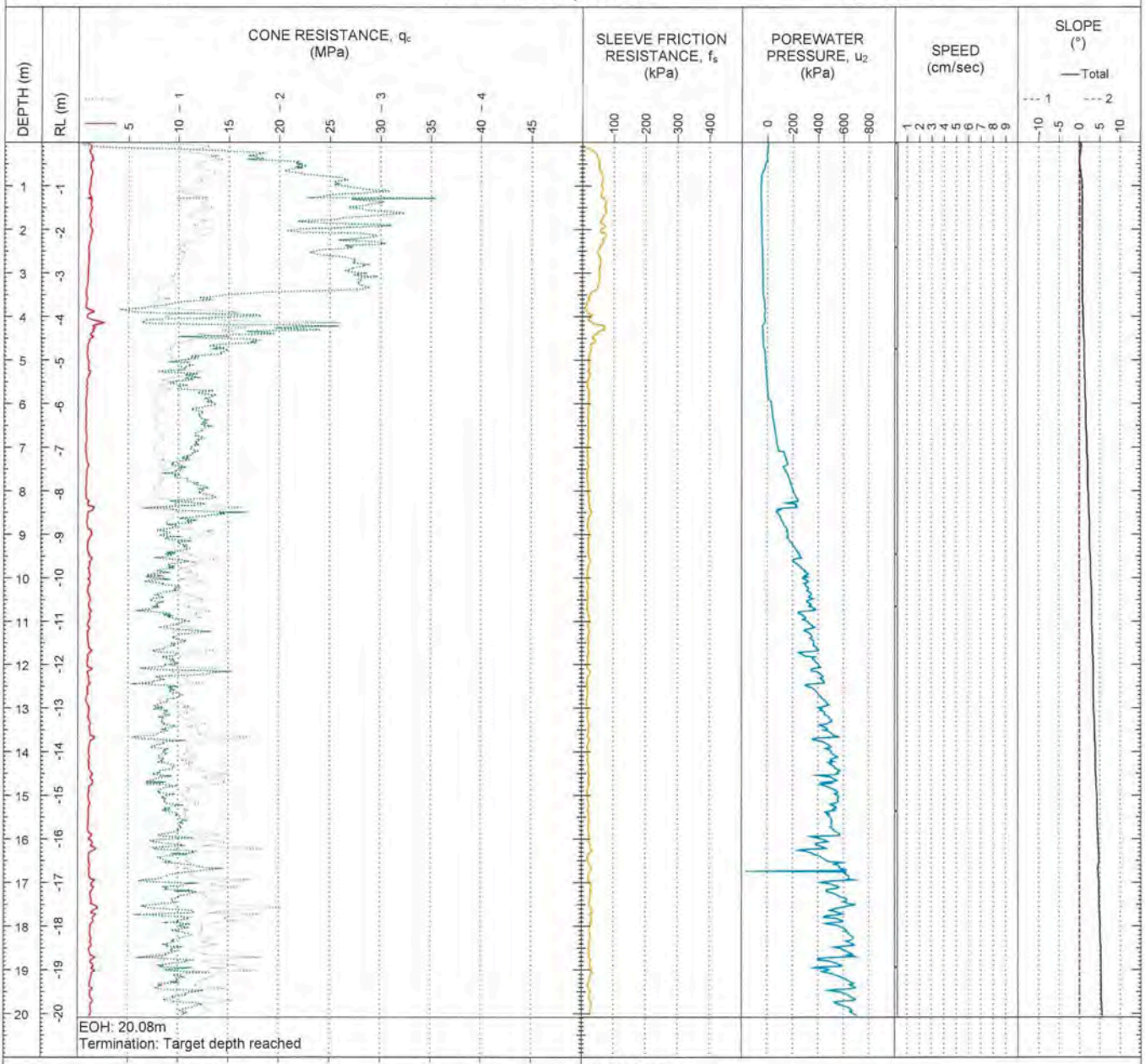
CONE PENETRATION TEST LOG

CPT01

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907529.39	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532138.19	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 4483 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6672	0.031
SLEEVE FRICTION RESISTANCE:	126.9	-0.1
POREWATER PRESSURE:	265.9	-1.3

SYMBOLS

▼ Water level

RDCL

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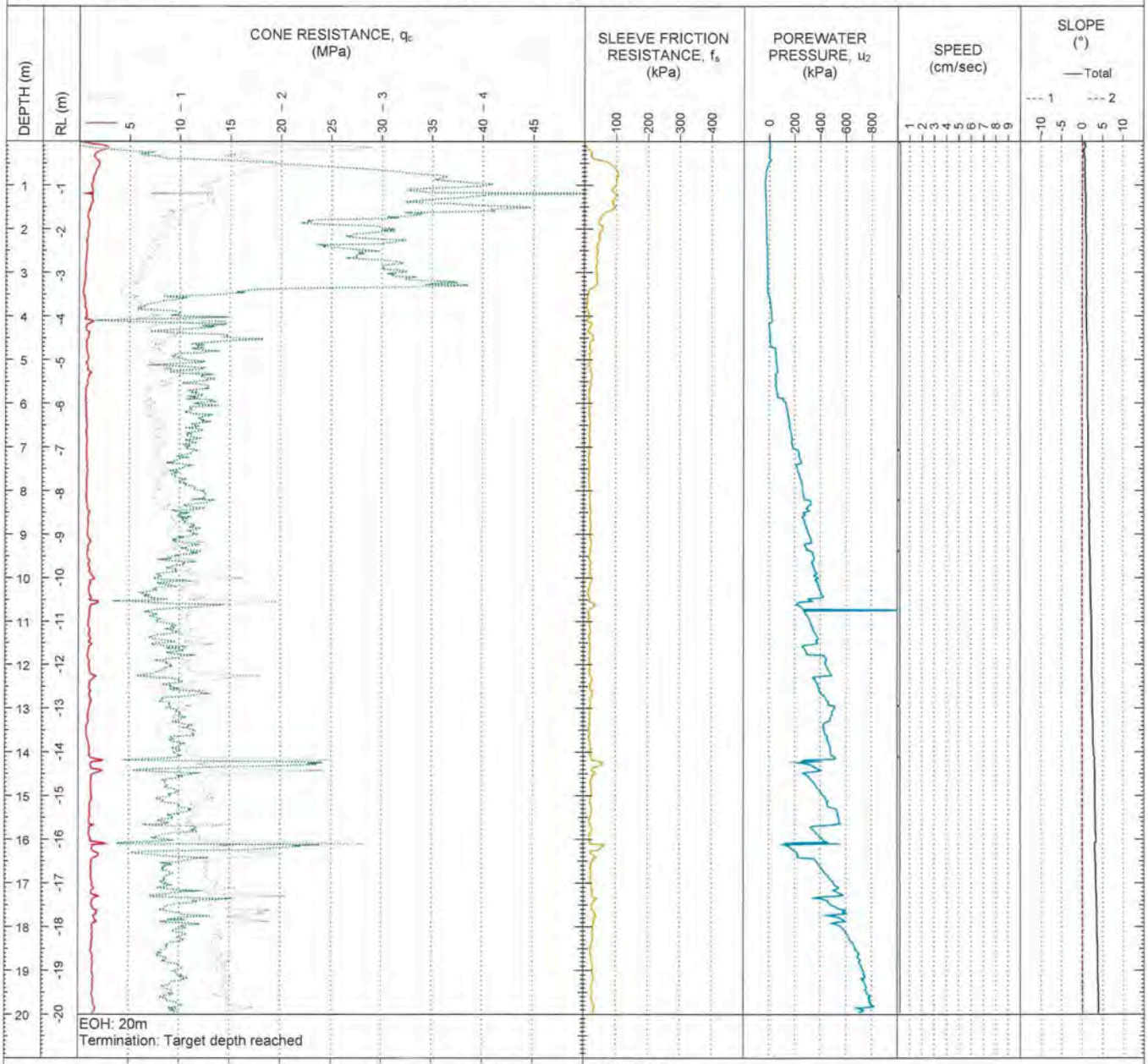
CONE PENETRATION TEST LOG

CPT02

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907547.58	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532116.76	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 5210 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	14.1081	0.0163
SLEEVE FRICTION RESISTANCE:	118.1	0.4
POREWATER PRESSURE:	221.9	-0.8

SYMBOLS

▼ Water level

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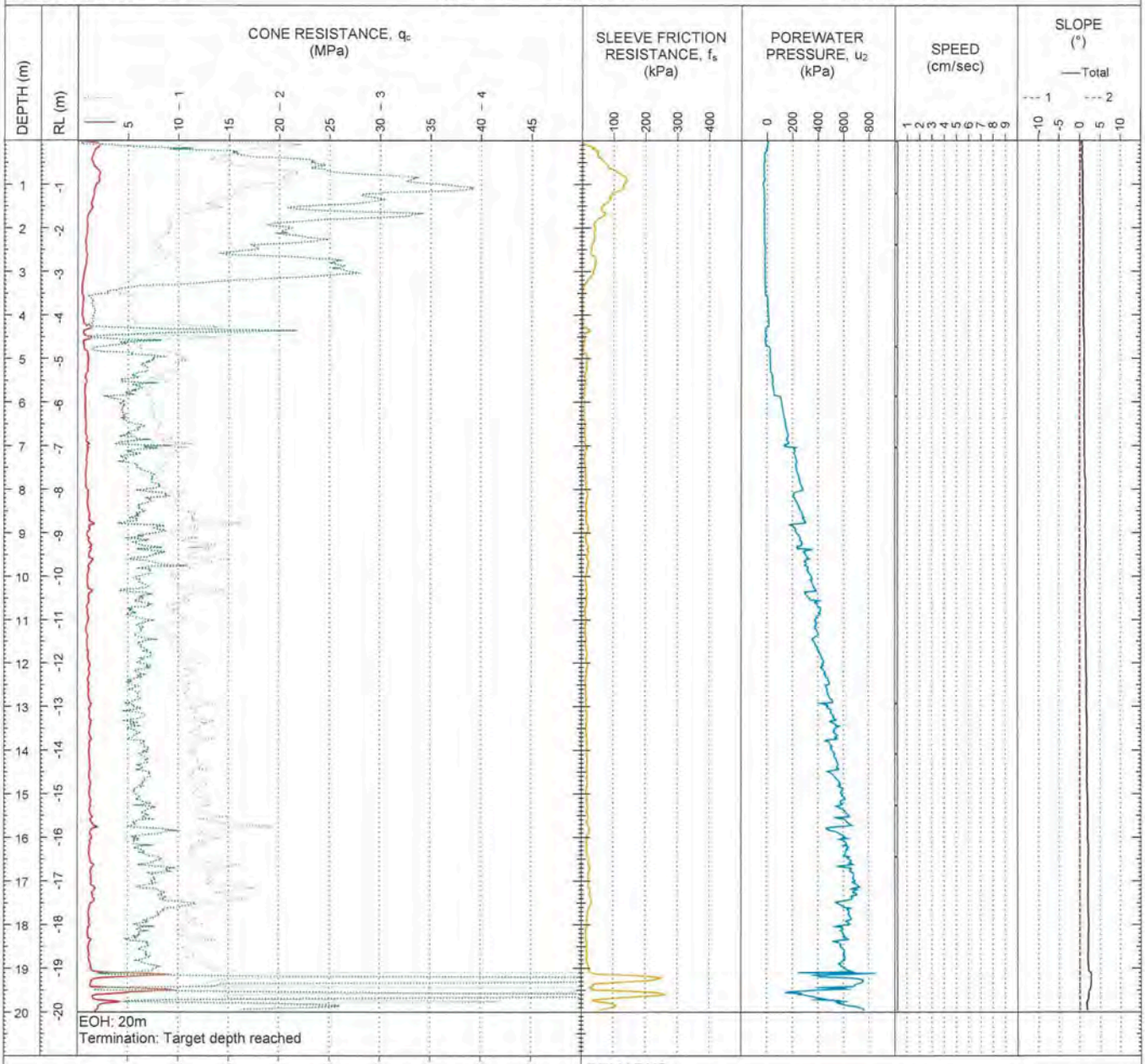
CONE PENETRATION TEST LOG

CPT03

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907497.12	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532205.02	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 4483 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6832	-0.0042
SLEEVE FRICTION RESISTANCE:	126.5	-0.1
POREWATER PRESSURE:	265.8	-0.7

SYMBOLS

▼ Water level

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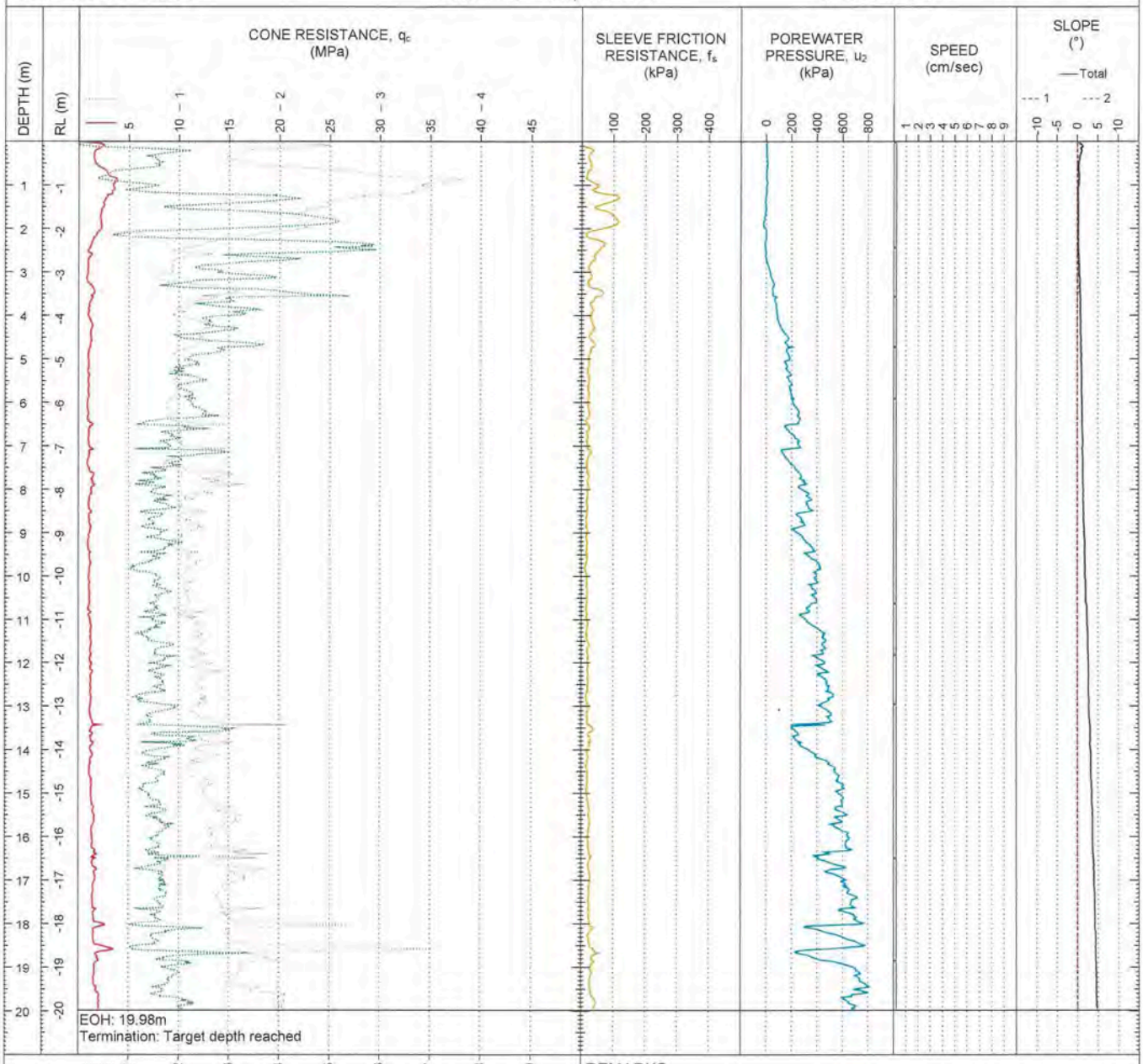
CONE PENETRATION TEST LOG

CPT04

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907547.16	STARTED: 08/01/2019
LOCATION: 186 Beach Rd	NORTHING: 5532091.75	FINISHED: 08/01/2019
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data
CONTRACTOR: RDCL	MACHINE: Geoprobe 54LT	OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 5210 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	14.109	-0.0064
SLEEVE FRICTION RESISTANCE:	119.1	0.1
POREWATER PRESSURE:	223.5	0.7

SYMBOLS

▼ Water level

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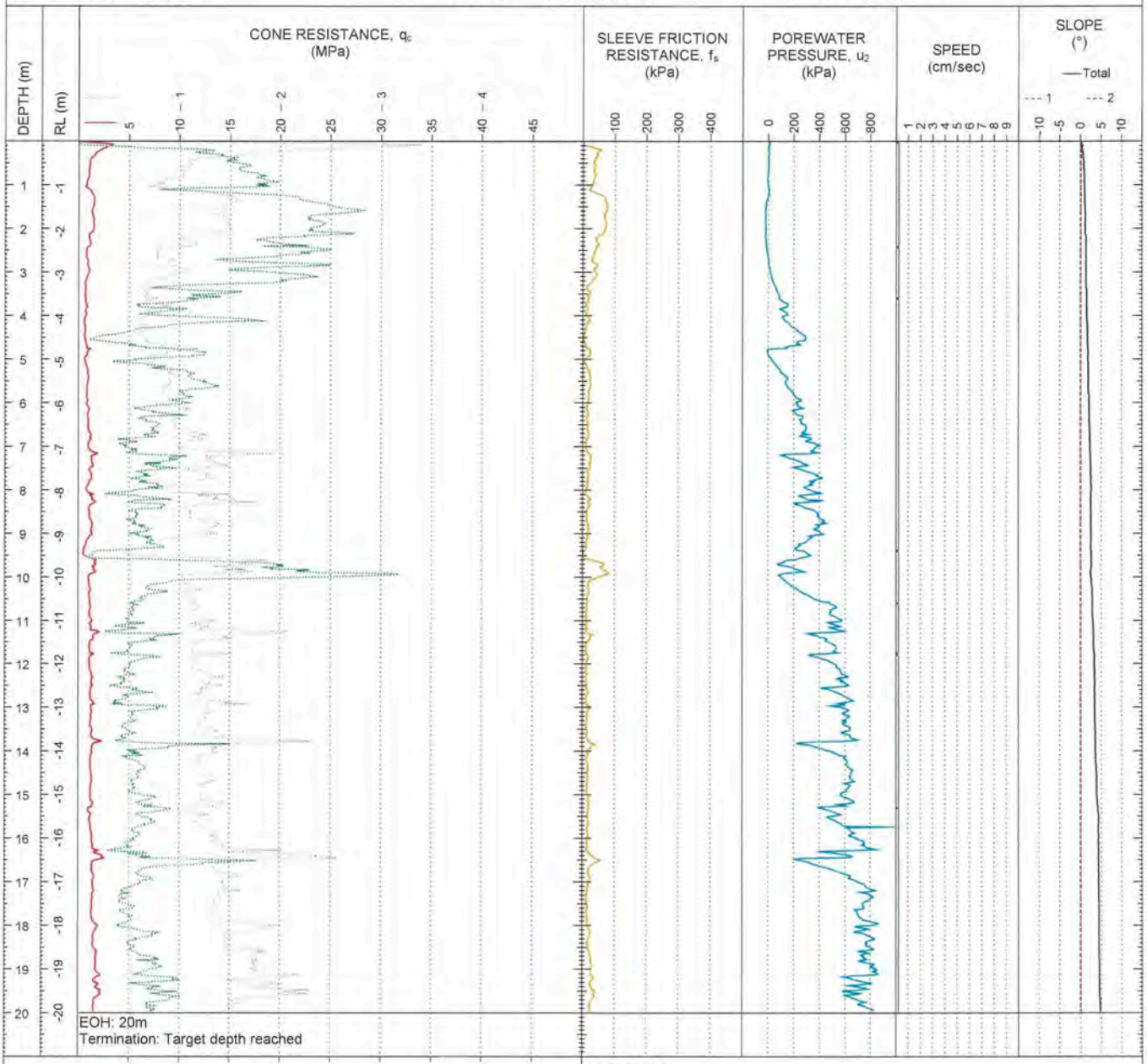
CONE PENETRATION TEST LOG

CPT05

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907511.25	STARTED: 08/01/2019
LOCATION: 186 Beach Rd	NORTHING: 5532108.90	FINISHED: 08/01/2019
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: RDCL1 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6281	0.0145
SLEEVE FRICTION RESISTANCE:	127.4	0
POREWATER PRESSURE:	266.3	0.1

SYMBOLS

▼ Water level

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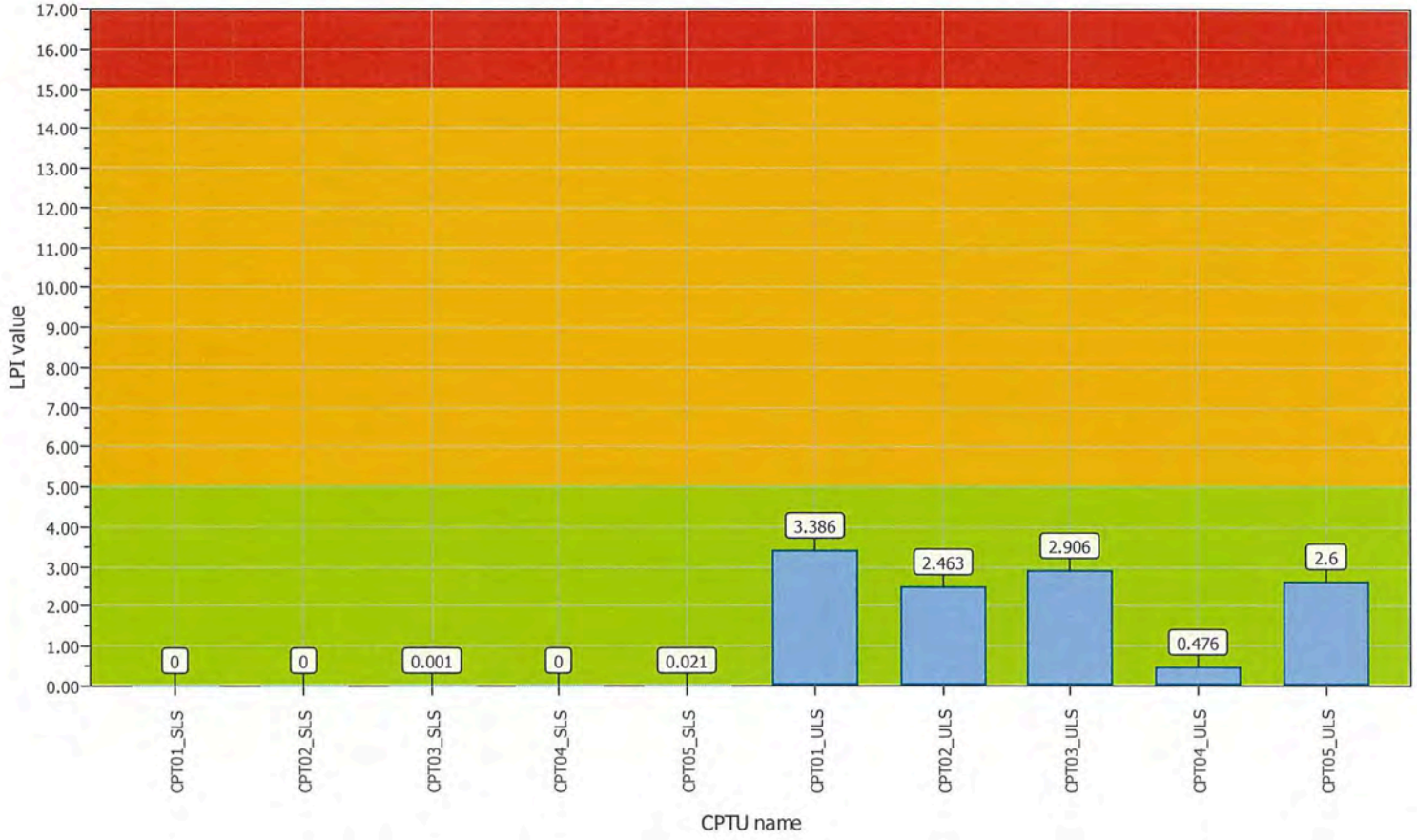
APPENDIX B

LIQUEFACTION ASSESSMENT OUTPUTS

Project title : 188020602

Location : 186 Beach Road, Porangahau

Overall Liquefaction Potential Index report



LPI color scheme

- Very high risk
- High risk
- Low risk

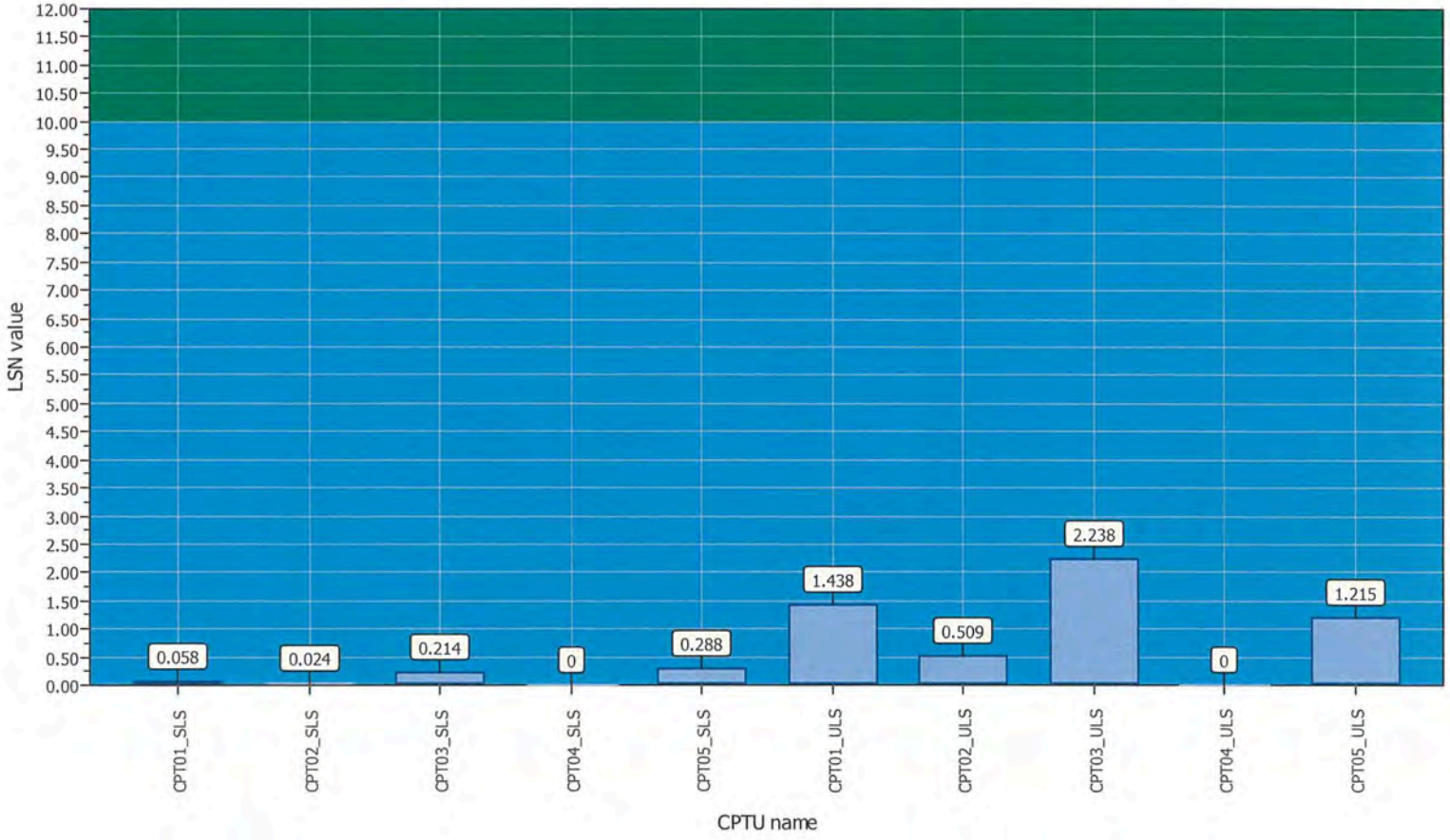
Basic statistics

Total CPT number: 10
100.00% low risk
0.00% high risk
0.00% very high risk

Project title : 188020602

Location : 186 Beach Road, Porangahau

Overall Liquefaction Severity Number report



LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

Basic statistics

Total CPT number: 10

100.00% little liquefaction

0.00% minnor liquefaction

0.00% moderate liquefaction

0.00% moderate to major liquefaction

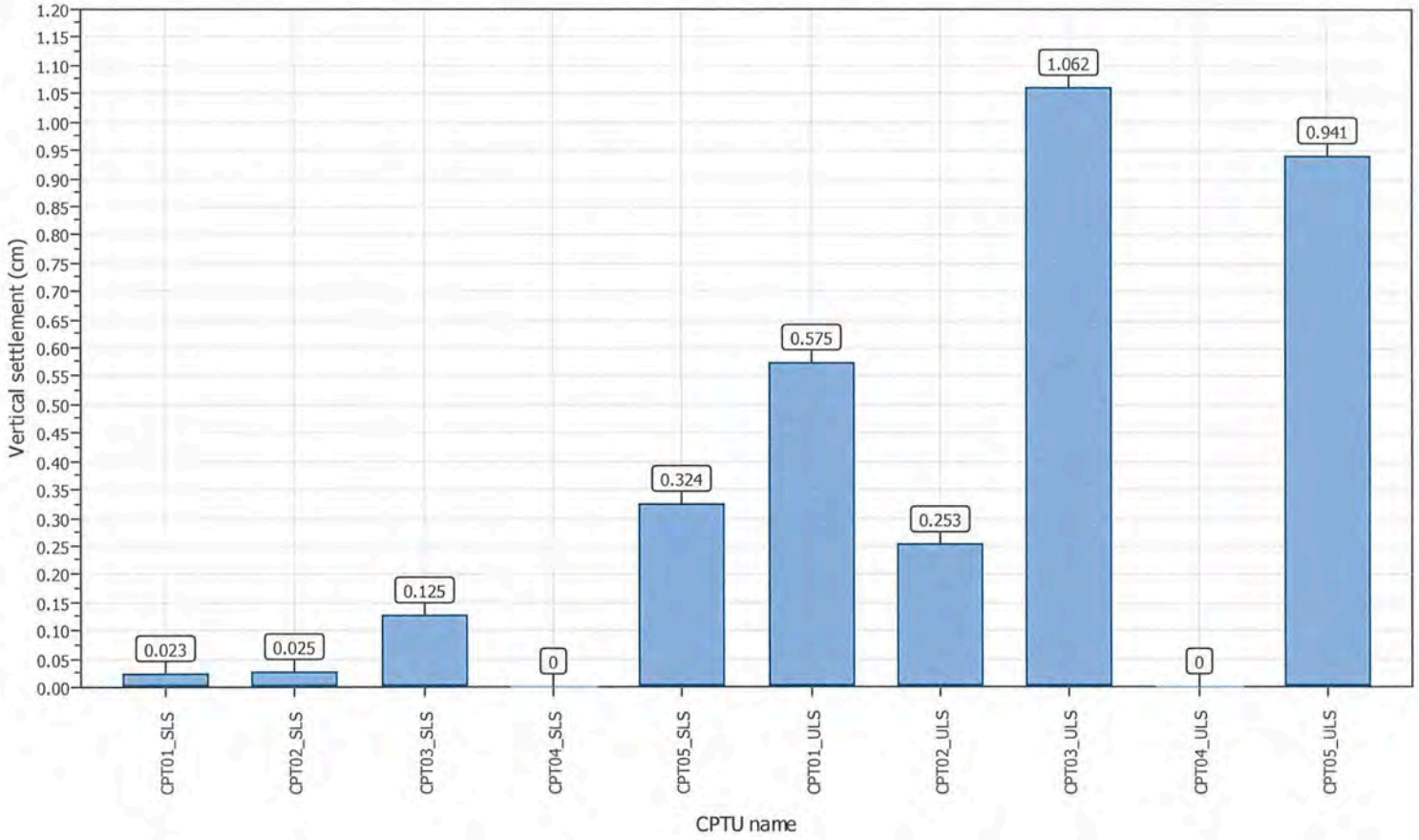
0.00% major liquefaction

0.00% severe liquefaction

Project title : 188020602

Location : 186 Beach Road, Porangahau

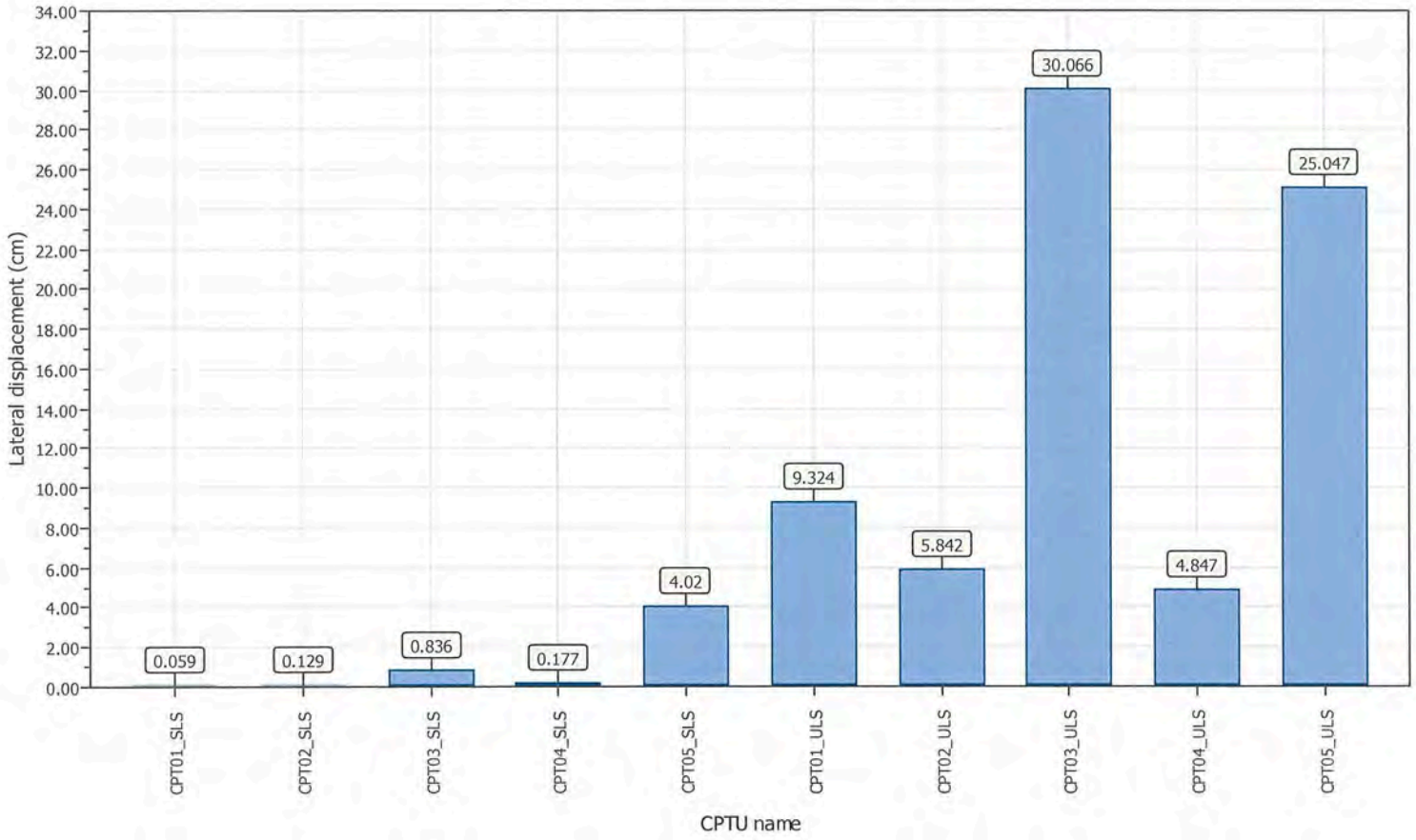
Overall vertical settlements report



Project title : 188020602

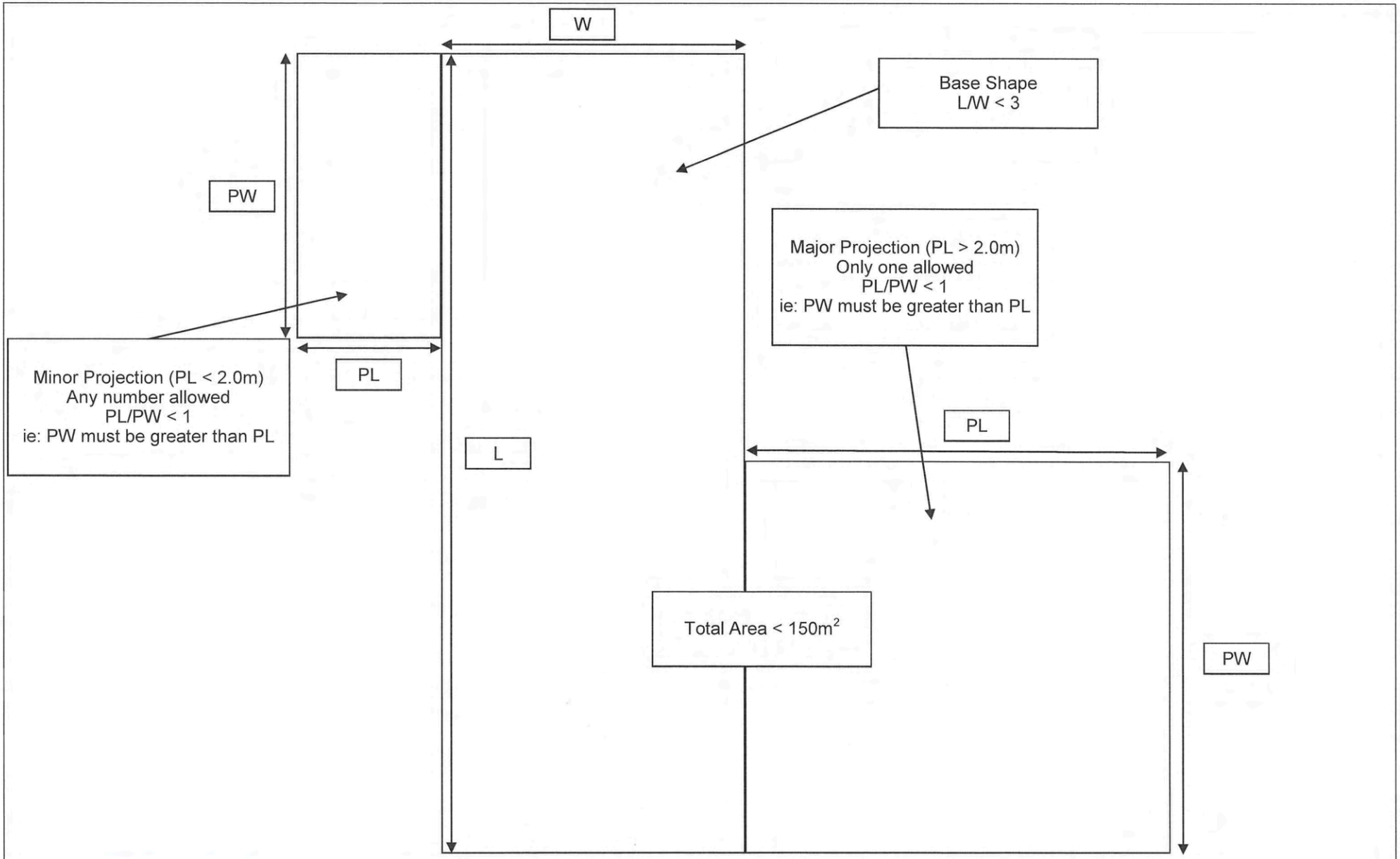
Location : 186 Beach Road, Porangahau

Overall lateral displacements report



APPENDIX C

FOUNDATION OPTIONS FOR TECHNICAL CATEGORY 2



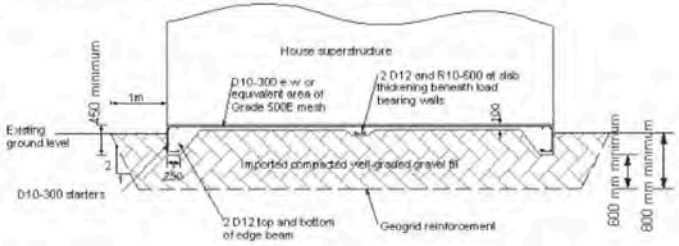
RDCL	TITLE	Foundation Layout Restrictions	PROJECT	184660602			
	PROJECT	Tuki Tuki Road Subdivision	DRAWN BY	JJN	DATE	07/06/18	PAGE
	CLIENT	Judith & Richard Holland	CHECKED BY	CAW	DATE	08/06/18	1

Option 1 – Excavation and replacement of the upper layers of soil with compacted, well-graded gravels and construction of a reinforced NZS 3604 slab foundation.

The ground immediately beneath the compacted gravel fill must have a minimum geotechnical ultimate bearing capacity of 200 kPa, or the slab should be subject to specific engineering design (see section 3.4.1).

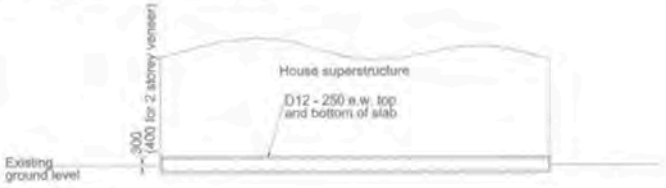
External service lines will need to be beyond the outer extent of the gravel raft and/or have flexible connections (refer to section 5.6).

Figure 5.5: Enhanced foundation slab – Option 1



Option 2 – Construct a thick slab foundation over the existing soil

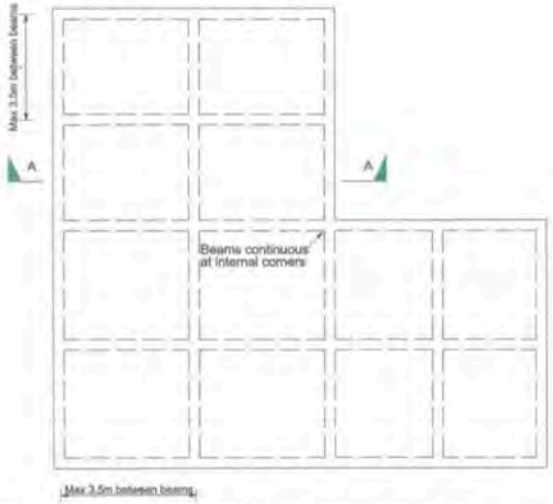
Figure 5.6: Enhanced foundation slab – Option 2



Note: NZS ground clearances adjacent to house foundation must be complied with. DPC omitted for clarity.

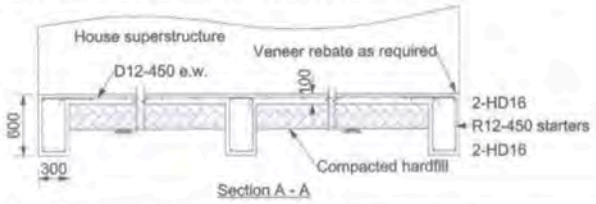
Option 3 – Construct a generic beam grid and slab foundation

Figure 5.7: Enhanced foundation slab – Option 3 plan



Note: Reinforcing details are not sufficient for two-storey heavy-weight cladding (brick veneer) with a heavy roof but can be used for a two-storey heavy-weight cladding with a light-weight roof.

Figure 5.8: Enhanced foundation slab – Option 3 cross-section

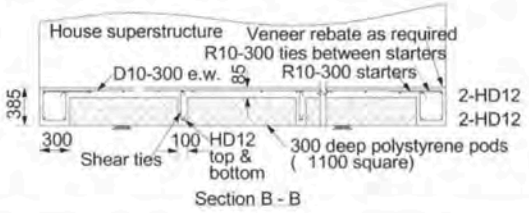


Option 4 – Construct a waffle slab over the existing soil

Figure 5.10: Enhanced foundation slab – Option 4 plan

Note: Reinforcing details are not sufficient for two-storey heavy-weight cladding (brick veneer) with either a heavy or light roof.

Figure 5.11: Enhanced foundation slab – Option 4 cross-section



Images sourced from MBIE Guidelines (2017)

RDCL

TITLE	Enhanced Foundation Slab Options	PROJECT	184660602			
PROJECT	Tuki Tuki Road Subdivision	DRAWN BY	EC	DATE	26/10/18	PAGE
CLIENT	Judith & Richard Holland	CHECKED BY	CAW	DATE	26/10/18	2

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

REPORT ON:

186 BEACH ROAD, PORANGAHAU

PROJECT:

GEOTECHNICAL ASSESSMENT

CLIENT: MATTHEW DOUGLAS FAMILY TRUST

C/- SURVEYING THE BAY

PO Box 611

HASTINGS 4156

RDCL

EXECUTIVE SUMMARY

The Matthew Douglas Family Trust engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for a proposed subdivision at 186 Beach Road, Porangahau (Legal Descriptions: LOTS 1 3 DP 7439 LOT 1 DP 11607 LOT 4 DDP 515 PT SUB SECS 49 73 SO 3360 PT SUB SEC 49 PORANGAHAU).

From a subdivision plan prepared by Surveying the Bay (Drawing number: 4753-1, dated October 2018).that, the proposed lots generally comprise:

- Road fronting "township sections" on Jones St (Lots 1-3); and
- Lifestyle blocks, located either on:
  - Terrace edge, near to the riverbank (Lots 4 & 5); or
  - Flat ground more than 200m from the riverbank (Lot 7).

The proposed subdivision is located in a zone mapped as having "high liquefaction vulnerability", requiring assessment of the liquefaction susceptibility.

Significant soil creep and uneven ground are observed on steep slopes on the Porangahau Riverbank;

- The river margin area (Figure 1), directly adjacent to the river channel, is inferred to be at risk of slope instability due to soil creep and potential slumping.

Our liquefaction assessment indicates, for proposed house sites:

- The site is generally at "low risk" of liquefaction; with
  - Vertical settlements not expected greater than 15 mm under SLS or ULS conditions; with
  - A "non-liquefiable" crust of nominally 3m likely present above the water table; and
- Lateral displacements:
  - Estimated between 50-300mm across Lots 1-5 under ULS conditions;
  - Likely driven by semi-continuous liquefiable layers identified at nominally 4-5m and 9-10m depth.

Based on the results of these investigations we consider the site is suitable for the proposed development from a geotechnical perspective, provided:

- House sites should be situated on the main terrace for Lots 4 and 5;
  - i.e., Building footprints should not extend into the river margin area (Figure 1), which is considered not suitable for foundations.
- Foundations for Lots 1-5 should be constructed with due consideration to the potential for liquefaction induced ground damage;
  - Particularly lateral stretch which may occur under ULS earthquake conditions;
  - In terms of the MBIE Guidelines for Christchurch (MBIE, 2015), we consider the expected liquefaction ground damage for Lots 1-5 equates to "Technical Category 2/3 Hybrid" property;
  - Requiring confirmation of appropriate foundations based on specifics of proposed developments; and
- Subsoil drainage should be installed and/or contouring should be undertaken to prevent ponding and waterlogging on Lots 1-3.

Specific engineering design of foundations is required for Lots 1, 2, 3, 4 and 5;

- The appropriate level of ground improvement and/or foundation reinforcement will depend on the scale, layout, and complexity of proposed houses;
- We consider a suitably qualified geotechnical engineer should be engaged to confirm appropriate foundation solutions at concept design stage, and in consultation with other design/engineering professionals for the project.

Driven timber piles in accordance with NZS3604:2011 are appropriate for Lot 7; with

- 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil.

CONTENTS

FIGURES

APPENDICES

1 OVERVIEW

The Matthew Douglas Family Trust engaged Resource Development Consultants Ltd (RDCL) to undertake a geotechnical assessment for a proposed subdivision at 186 Beach Road, Porangahau (Legal Descriptions: LOTS 1 3 DP 7439 LOT 1 DP 11607 LOT 4 DDP 515 PT SUB SECS 49 73 SO 3360 PT SUB SEC 49 PORANGAHAU).

1.1 UNDERSTANDING OF THE PROJECT

We understand the intent is to subdivide six (6) new residential lots (Figure 1), and that a geotechnical investigation is required to assess the suitability of the proposed lots for subdivision consent.

RDCL has been supplied with a Subdivision Plan prepared by Surveying the Bay (Drawing number: 4753-1, dated October 2018).

From that, the proposed lots generally comprise:

- Road fronting "township sections" on Jones St (Lots 1-3); and
- Lifestyle blocks, located either on:
  - Terrace edge, near to the riverbank (Lots 4 & 5); or
  - Flat ground more than 200m from the riverbank (Lot 7).

The proposed subdivision is located in a zone mapped as having "high liquefaction vulnerability", requiring assessment of the liquefaction susceptibility.

1.2 SCOPE OF WORK

Work was undertaken in general accordance with RDCL proposal 18802, dated 3 December 2018.

2 SITE DESCRIPTION

2.1 GENERAL

The proposed subdivision is located to the southeast of the township of Porangahau, comprising flat terraced ground bounded by the steep northern bank of the Porangahau River.

The surrounding area generally comprises a broad flood plain emerging from coastal hills, with low terraces formed by the meandering river.

All proposed house sites are located on flat ground on a raised terrace currently in crop;

- Lots 1-3 to be subdivided from a flat vacant section generally in grass;
- Lots 4-5 located near the southern edge of the terrace, bounded by a gentle to moderate, south facing slope; and
- Lot 7 on flat ground in crop at least 200 m north of the riverbank.

The "river margin" area (Figure 1), comprises a stepped geometry, with moderate to steep slopes achieving on the order of 9 m elevation difference, over 47 m horizontally between the main terrace and river level.

Significant soil creep is observed on the over-steepened southern riverbank, across the channel from the proposed subdivision. Uneven ground in the river margin area on the subdivision side of the river (Figure 1) likely indicates similar instability on the northern bank.

Marshy and uneven ground was observed on proposed Lots 1-3, particularly towards the eastern boundary, likely indicating the area is prone to waterlogging.

Some cracks observed where soil is exposed, potentially indicate a shrink-swell clay component to near-surface materials.

2.2 REGIONAL GEOLOGY

Regional geological mapping (GNS Science, 2011; 1998) indicates the site is underlain by

- Holocene river deposits, comprising loose gravel sand silt and clay in modern flood plains and low terraces with subsidiary sand, silt, and clay.

The hills surrounding Porangahau characteristically expose weathered and deformed sedimentary rocks, including extensive sequences of massive mudstone alternating with sandstone and marl. Young river sediments derived from surrounding hills are expected to comprise generally fine-grained, muddy/clayey deposits.

2.3 ACTIVE FAULTING

No active faults directly the development are identified in the GNS Science Active Faults Database (Langridge & Ries, 2016).

The nearest mapped active fault traces are located >15km to the west.

3 SITE INVESTIGATION

Sub-surface testing completed for this investigation (Figure 1) comprised:

- Engineering geological mapping;
- Engineering geological logging of materials encountered in six (6) test pits;
- A total of ten (10) Dynamic Cone Penetrometer (DCP) tests; and
- Five (5) Cone Penetration Tests (CPT).

Results of subsurface investigations are attached as Appendix A.

3.1 NEAR SURFACE MATERIALS

3.1.1 MAIN TERRACE (HOUSE SITES)

The results of test pit investigations suggest the main terrace is generally underlain by:

- Silty TOPSOIL to between 0.4-0.6 m bgl; underlain by
- Firm clayey SILT to 1.6-1.7 m bgl; underlain by
- Soft to firm CLAY to at least 3.2 m bgl.

The results of CPT investigations suggest the site is consistently underlain by:

- CLAY and silty CLAY to at least 20m bgl.

Non-engineered fill was encountered in the near surface (<0.7m) on proposed Lot 4, incorporating predominantly topsoil with some brick fragments.

We expect this material is localised in the southwest corner, where a track is formed around the perimeter of the existing paddock.

3.1.2 RIVER MARGIN

The river margin area is generally underlain by

- Silty TOPSOIL to between 0.3-0.6m bgl; underlain by
- Firm, friable, low plasticity SILT with trace shells and gravel;
  - To at least 3.3m bgl adjacent to the river (TP05); and
  - Lapping on to stiff silty CLAY forming the main terrace.

3.2 DCP TESTING

DCP testing at the proposed house site suggests:

- Soft soils in the near surface (DCP blows <3 per 100 mm penetration) generally extend to on the order of 1.1 m bgl; and
- Localised areas of decreased bearing capacity are observed; suggesting
  - Relatively thin layers of soft soils may be present at depth; and
  - Soft soils may extend to greater depths (<2m) in localised areas.

An indicative assessment of available soil bearing capacity at each proposed house sites is in Section 4.3.

3.3 GROUNDWATER

Groundwater was encountered as seepage at depth between 2.5-3.0m bgl, and not encountered in test pits closest to the riverbank (>3.3m bgl).

For the purposes of our liquefaction assessment, we consider a representative ground water level to be 3.0 m bgl.

4 GEOTECHNICAL ASSESSMENT

4.1 RIVER MARGIN SLOPE STABILITY

Significant soil creep and uneven ground are observed on steep slopes on the Porangahau Riverbank;

- The river margin area (Figure 1), directly adjacent to the river channel, is inferred to be at risk of slope instability due to soil creep and potential slumping.

4.2 LIQUEFACTION

A liquefaction assessment was carried out using the CPT data and industry standard software (CLiq). Liquefaction assessment outputs are attached in Appendix B.

Our assessment indicates, for proposed house sites:

- The site is generally at "low risk" of liquefaction (LPI_{SLS}= <0.1, LPI_{ULS}= <3.4); with
  - Little to no surface expression expected (LSN_{SLS}= <0.3, LSN_{ULS}= <2.4);
  - Vertical settlements not expected greater than 15 mm under SLS or ULS conditions; with
  - A "non-liquefiable" crust of nominally 3m likely present above the water table; and
- Lateral displacements:
  - Not expected >10mm under SLS conditions;
  - Estimated between 50-300mm across Lots 1-5 under ULS conditions;
  - Likely driven by semi-continuous liquefiable layers identified at nominally 4-5m and 9-10m depth.

4.2.1 Basis of Liquefaction Assessment

The liquefaction assessment for this site was based on the CPT investigation at site and data analysed using program CLiq, accepted industry software package (Geoligismiki, 2014) using the following input parameters (NZS1170.5 section 3.1.3, 2004):

- Magnitude(M) = 7.5;
- Peak Ground Acceleration (PGA) = 0.11 g (SLS) and 0.45 g (ULS), based on:
  - Ch (T) = 1.12 (Class D – deep or soft soil);
  - Z = 0.4 (based on hazard factor contour; Figure 3.3, NZS1170.5:2016); and
  - R = 0.25 (SLS) and 1.0 (ULS)
- Groundwater level assumed at 3.0 m below ground level, based on seepage observed in test pit investigations.

The design earthquake was chosen on the basis of recurrence probability based on historical earthquakes. A 7.5 magnitude earthquake for an importance level category 2 correlates with a 25 year return period (SLS) and 500 year return period (ULS). A 50 year design life was assigned.

4.3 Shallow Bearing Capacity

Based on the results of DCP testing, we consider:

- 300 kPa ultimate bearing capacity is generally available at a depth of 1.1m bgl; and
- 200kPa ultimate bearing capacity is generally available at a level stripped of topsoil.

5 GEOTECHNICAL CONSIDERATIONS

Recommendations and opinions contained in this report are based on data from site investigations as outlined in Section 3, and our geotechnical assessment as outlined in Section 4. Inferences about the nature and continuity of subsurface geology and ground conditions are made but cannot be guaranteed.

5.1 GEOTECHNICAL SUITABILITY OF HOUSE SITES

Based on the results of these investigations we consider the site is suitable for the proposed development from a geotechnical perspective, provided:

- House sites should be situated on the main terrace for Lots 4 and 5;
  - i.e., Building footprints should not extend into the river margin, which is considered not suitable for foundations.
- Foundations for Lots 1-5 should be constructed with due consideration to the potential for liquefaction induced ground damage;
  - Particularly lateral stretch which may occur under ULS earthquake conditions;
  - In terms of the MBIE Guidelines for Christchurch (MBIE, 2015), we consider the expected liquefaction ground damage for Lots 1-5 equates to "Technical Category 2/3 Hybrid" property;
  - Requiring confirmation of appropriate foundations based on specifics of proposed developments; and
- Subsoil drainage should be installed and/or contouring should be undertaken to prevent ponding and waterlogging on Lots 1-3.

5.2 SLOPE STABILITY

Slope instability is observed in the form of soil creep and inferred slumping on over-steepened riverbank slopes;

- The river margin area (Figure 1), underlain by friable low plasticity silt, is not considered suitable for founding, due to the risk of slope instability.

5.3 FOUNDATION RECOMMENDATIONS

5.3.1 LOTS 1-5

Specific engineering design of foundations is required for Lots 1, 2, 3, 4 and 5.

The appropriate level of ground improvement and/or foundation reinforcement will depend on the scale, layout, and complexity of proposed houses;

- We consider a suitably qualified geotechnical engineer should be engaged to confirm appropriate foundation solutions at concept design stage, and in consultation with other design/engineering professionals for the project.

For small footprint lightweight timber framed structures, minimum "TC2" foundations may be deemed appropriate, likely comprising:

- Enhanced slab foundations (Options 1–4, section 5.3.1; Appendix C) in accordance with MBIE Guidelines (2012); with
  - 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil; and
  - The foundation footprint stripped of organic, loose and deleterious materials prior to construction.

For larger scale, complex and/or heavily loaded structures, further ground improvement may be deemed necessary, likely comprising:

- Excavation and replacement with a reinforced gravel raft;
  - Depth of undercut likely required between 0.8-2.0m;
  - Nominally 2-3 layers of geogrid reinforcing;
  - Backfilled and compacted under engineering control; with
- Foundation options 1-4 as specified in MBIE (Dec 2012) Technical Guidance for Christchurch, Version 3, Part A, section 5.3.1. (Appendix C).

5.3.2 LOT 7

Driven timber piles in accordance with NZS3604:2011 are appropriate for Lot 7; with

- 200 kPa ultimate bearing capacity generally available at a level stripped of topsoil.

5.4 EARTHWORKS

5.4.1 FILL

Should fill placement be required for ground improvement or to alter site levels, we recommend:

- All fills should be placed, and fill surfaces prepared in accordance with standards set out in NZS 4431:1989 "Code of Practice for Earthfill for Residential Development".
- Fills should be designed with finished overall slope angle 2H:1V and placed on natural ground stripped of organic or soft materials, and benched for stability.
- Appropriate subsurface drainage should be installed beneath all engineered fill.

5.4.2 RETAINING WALLS

Should retaining walls be required for any purpose, we recommend:

- Retaining wall design should be completed by a suitably qualified structural engineer;
- Stormwater management will be required to ensure retained soils are well drained.

All retaining walls should be backfilled with free draining materials with "Novaflow" style piping to capture and direct water away for adequate disposal.

Where fills are required to reinstate ground, backfill should be free draining and compacted under engineering supervision to nominally 98% MDD.

Appropriate parameters for the design of retaining walls should be confirmed based on soils encountered in specific locations.

5.5 ACCESS

As it relates to development of access:

- Appropriate surfacing of roadways needs to consider subgrade conditions, drainage, likely traffic loads (especially construction loads during house building), and importantly maintenance over the long term;
  - Subgrade should be stripped of all organic loose and deleterious materials;
- The carriageway should be shaped to manage surface water flows in a controlled manner, including at a minimum:
  - A well-defined "table drain" on the inside of the access-way;
  - Well defined culverts and discharge points to shed water; and
  - Adequate protection of both against erosion.

5.6 STORMWATER

Stormwater disposal should be specifically designed by professionals with competence in the field. Any comments in this report as it relates to stormwater are for guidance only.

As a minimum we recommend:

- All developments should be undertaken in a manner so as to redirect storm water from proposed building platforms and other impervious surfaces;
- Stormwater should discharge to a suitable point away from existing slopes and in a manner that reduces the risk of erosion and / or flooding.

5.7 EFFLUENT DISPOSAL

Effluent disposal fields should be specifically designed by a competent practitioner experienced in such matters; any comments in this report as it relates to effluent fields are for guidance only.

- Discharge rate should be specifically tailored to meet the requirements as they relate to the slope angle and soil conditions on site; and
- Planting between drip-lines should be undertaken with suitable species at density recommended by the effluent specialist.

5.8 FURTHER GEOTECHNICAL INPUT

We recommend a suitably qualified geotechnical professional be engaged:

- For specific design of building foundations on Lots 1, 2, 3, 4 and 5; and/or
- Should ground conditions be found to differ from those contained in this report.

6 REFERENCES

GNS Science. (2011). HAWKE'S BAY. *Institute of Geological and Nuclear Sciences, 1:250,000 Geological Map 8*. (J. Lee, K. Blankd, D. Townsend, & P. Kamp, Compilers) GNS Science.

GNS Science (2007) : *Fault Rupture Avoidance Issues at Parkhill Farmpark, Hawke's Bay*, GNS Science consultancy Report 2007/333, dated December 2007

Hawkes Bay Emergency Management Group. (2015). Online Mapping Site.

Langridge, R.M.; Ries, W.F. (2016). Active Fault Mapping and Fault Avoidance Zones for Hastings District and environs, GNS Science Consultancy Report 2015/112. 50 p.

Langridge, R.M., Ries, W.F., NJ Litchfield, N.J., Villamor, P, Van Dissen, R.J, Barrell, D.J.A, Rattenbury, M.S.,Heron, D.W, Haubrock, S, Townsend, D.B, Lee, J.M., Berryman, K.R., Nicol, A, Cox, S.C, & Stirling, M.W. (2016) *The New Zealand Active Faults Database*, New Zealand Journal of Geology and Geophysics, 59:1, p86-96, DOI: 10.1080/00288306.2015.1112818

NZS4431 (1989) *NZS4431:1989 - Code of Practice for Earthfill for Residential Development*. Standards New Zealand.

5 LIMITATIONS

- This report has been prepared for the particular purpose outlined in the project scope and no responsibility is accepted for the use of any part in other contexts or for any other purpose.
- Ground conditions assessed in this report are inferred from published sources, site inspection and the investigation described. Variations from the interpreted conditions may occur, and special conditions relating to the site may not have been revealed by this investigation, and which are therefore not taken into account. No warranty is included either expressed or implied that the actual conditions will conform to the interpretation contained in this report.
- No responsibility is accepted by Resource Development Consultants Ltd for inaccuracies in data supplied by others. Where data has been supplied by others, it has been assumed that this information is correct.
- Groundwater conditions can vary with season or due to other events. Any comments on groundwater conditions are based on observation at the time.
- This report is provided for sole use by the client and their professional advisors. No responsibility whatsoever for the contents of this report shall be accepted for any person other than the client.

7 CLOSURE

We trust this meets your current needs. Should you wish to discuss any aspect of the contents of this document please contact the undersigned on 06 877-1652.

Sincerely,

Prepared by:

EA Cairns
MSc
Engineering Geologist

Approved by:

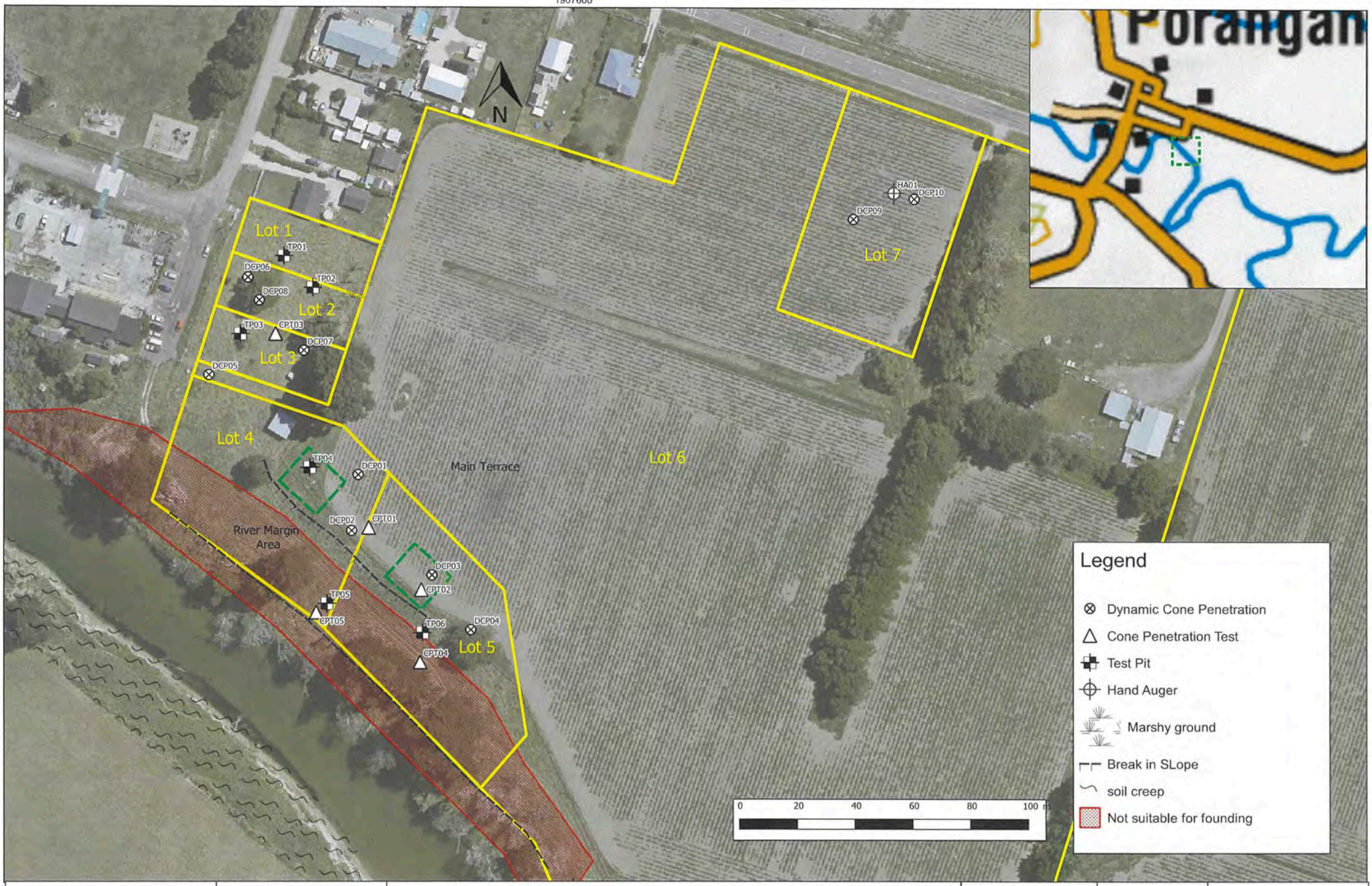
CA Wylie
MSc; MIPENZ, CPEng
Principal

Attached:

Figure 1 – Geotechnical Investigation Layout
Appendix A – Test Pit, DCP & CPT Logs
Appendix B – Liquefaction Assessment Outputs
Appendix C – Foundation Options for Technical Category 2
Important Information about your Geotechnical Report

FIGURES

1907600



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Title:	Investigation Layout	Drawn By: EC	Date 28/01/19	Drawing Size: A4
Site:	186 Beach Road, Porangahau	Approved By: CAW	Date 30/01/19	Project: 188020602
Client:	Matthew Douglas Family Trust			Figure Number: 1

APPENDIX A

TEST PIT, DCP & CPT LOGS

TEST PIT LOG

HA01

SHEET 1 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907711.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532254.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty gravelly TOPSOIL; dark brown. Moist.	M	FM				
1.0	-1.0			Clayey SILT; orange brown with grey mottle. Firm; moderate plasticity; moist. EOH: 1.10m						
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP01

SHEET 2 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907500.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532232.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	0.0		TS	SiltyTOPSOIL; brown. Moist; with rootlets and roots.						
0.5	-0.5			Clayey SILT; orange brown with grey mottle. Firm; moderate plasticity to high plasticity; moist; with rootlets; becoming clayier with depth.	M	FM				
1.0	-1.0									
1.5	-1.5									
2.0	-2.0			CLAY; orange brown with grey mottle. Soft; high plasticity; moist to wet.	M - W	S				
2.5	-2.5	▶								
3.0	-3.0			EOH: 3.00m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP02

SHEET 3 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907510.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532221.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	0.0		TS	Silty gravelly TOPSOIL; dark brown. Moist.	M					
0.5	-0.5			Clayey SILT; or4angish brown with grey mottle. Firm; moderate plasticity; moist; with rootlets.		FM				
1.0	-1.0									
1.5	-1.5									
2.0	-2.0			CLAY; orangish brown with grey mottle. Soft to firm; high plasticity; moist; trace organics (soft, wet, plastic peat lenses).		S - FM				
2.5	-2.5	▼		EOH: 2.90m						
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP03

SHEET 4 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907485.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532205.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.0	-0.5		TS	Silty TOPSOIL; dark brown. Moist.	M					
0.5	-1.0			SILT, with trace clay; brown with orange and grey mottle. Firm to stiff; moderate plasticity; moist; with roots.		FM - SF				
1.0	-1.5									
1.5	-2.0			Silty CLAY; orangish brown with grey mottle. Firm; moderate plasticity to high plasticity; moist to wet; becoming wet with possible groundwater seepage at 3.0m bgl.	M - W	FM				
2.0	-2.5									
2.5	-3.0	▼								
3.0				EOH: 3.20m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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TEST PIT LOG

TP04

SHEET 5 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907509.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532159.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered		Silty FILL; dark brown. Moist; predominantly topsoil with bricks incorporated.	M					
1.0	-1.0			Silty CLAY; orangish brown with grey mottle. Firm; moderate plasticity to high plasticity; moist; with tree roots; becoming soft at 1.5m bgl.		FM				
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0			EOH: 3.20m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁– Out flow
- ▷– In flow

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TEST PIT LOG

TP05

SHEET 6 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907515.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532112.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty TOPSOIL; brown. Dry to moist.	D - M					
1.0	-1.0			SILT; brown with slight orange mottle. Soft to firm; low plasticity; moist; with tree roots, and trace shells and gravel.	M	S - FM				
1.5	-1.5									
2.0	-2.0									
2.5	-2.5									
3.0	-3.0			EOH: 3.30m						
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁– Out flow
- –▷ In flow

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TEST PIT LOG

TP06

SHEET 7 OF 7

CLIENT:	Mathew Douglas Family Trust	PROJECTION:	NZTM2000	STARTED:	19/12/2018
PROJECT:	188020602	EASTING:	1907548.00	FINISHED:	19/12/2018
LOCATION:	186 Beach Rd, Porangahau	NORTHING:	5532102.00		
		DATUM:	-	LOGGED BY:	EC DATE: 19/02/2018
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	EC DATE: 28/01/2019
ENGINEER:	CAW	DIMENSIONS:	m x m	STATUS:	Final data
CONTRACTOR:	Ontrax Earthworks	MACHINE TYPE & MODEL:			

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	ROCK / SOIL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / DENSITY	CLASSIFICATION	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered	TS	Silty TOPSOIL; brown. Moist.	M					
1.0	-1.0			SILT; brown. Firm; low plasticity; dry to moist; silt, friable; with tree roots.	D - M	FM				
1.5	-1.5			Silty CLAY; grey and orange mottled. Stiff; moderate plasticity; moist.	M	SF				
				EOH: 1.80m						
2.0	-2.0									
2.5	-2.5									
3.0	-3.0									
3.5	-3.5									
4.0	-4.0									
4.5	-4.5									

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ◁ Out flow
- ▷ In flow

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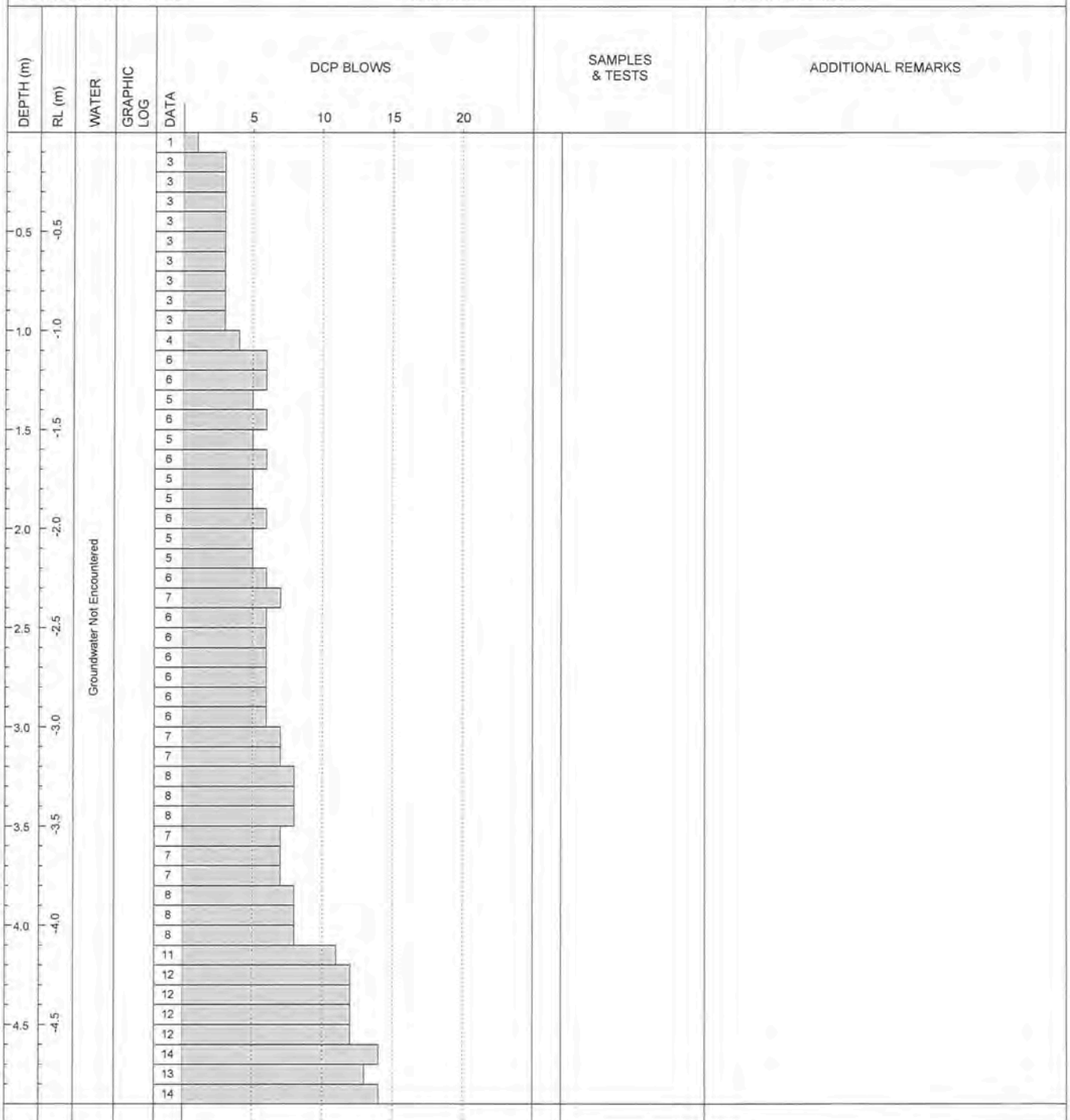
DCP LOG

DCP01

SHEET 1 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907525.73	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532156.50	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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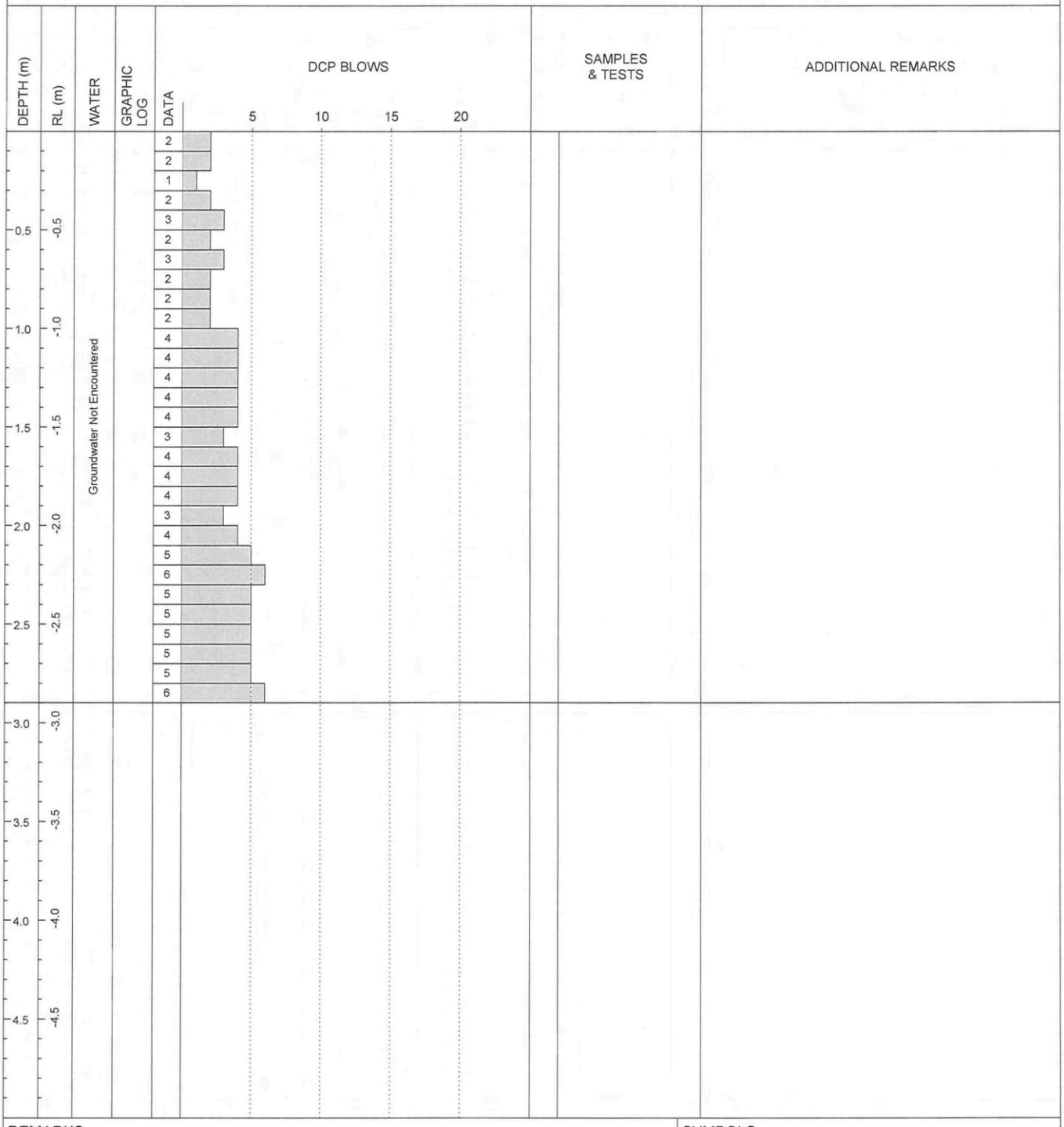
DCP LOG

DCP02

SHEET 2 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907523.52	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532137.13	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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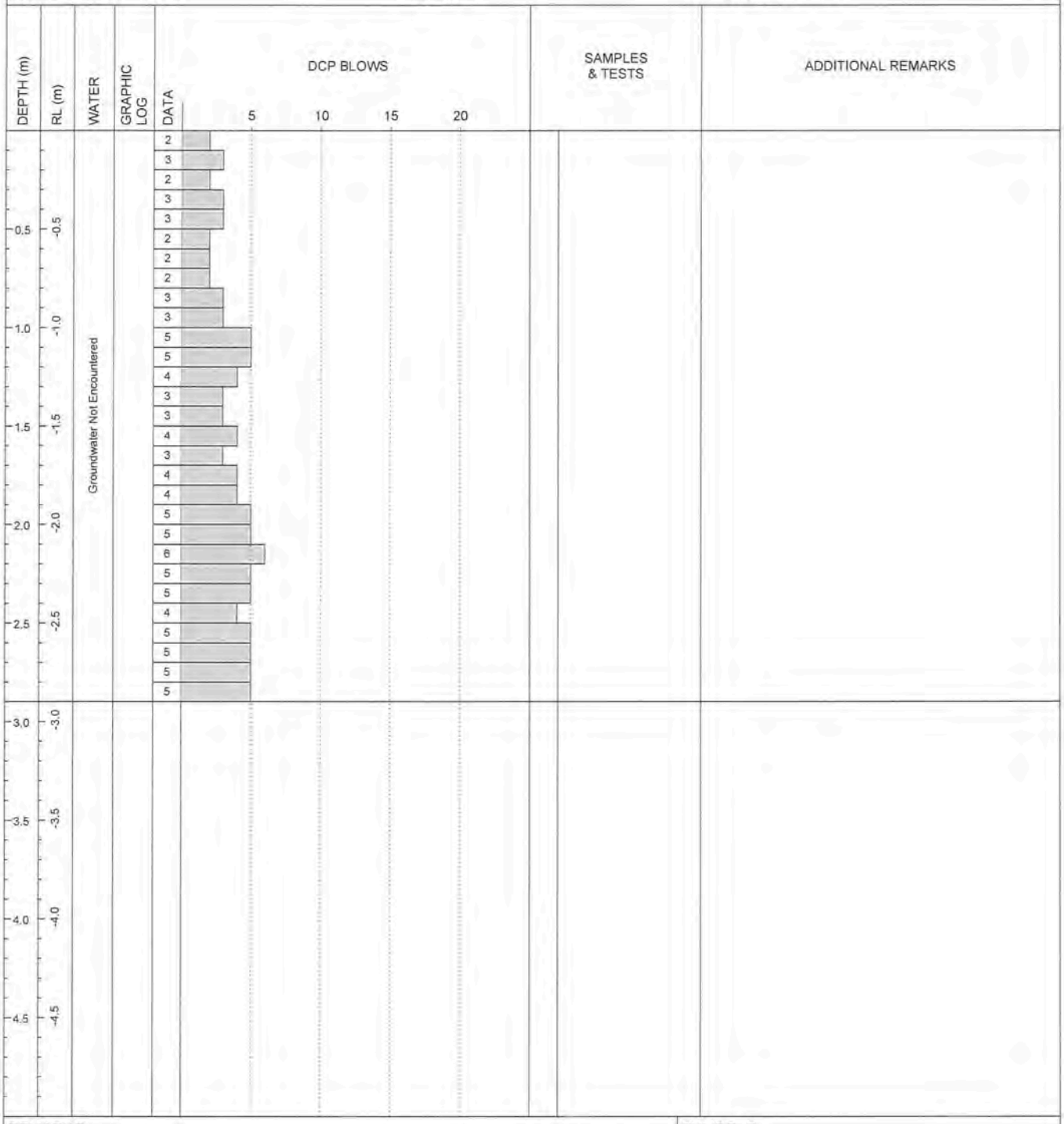
DCP LOG

DCP03

SHEET 3 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907551.27	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532121.78	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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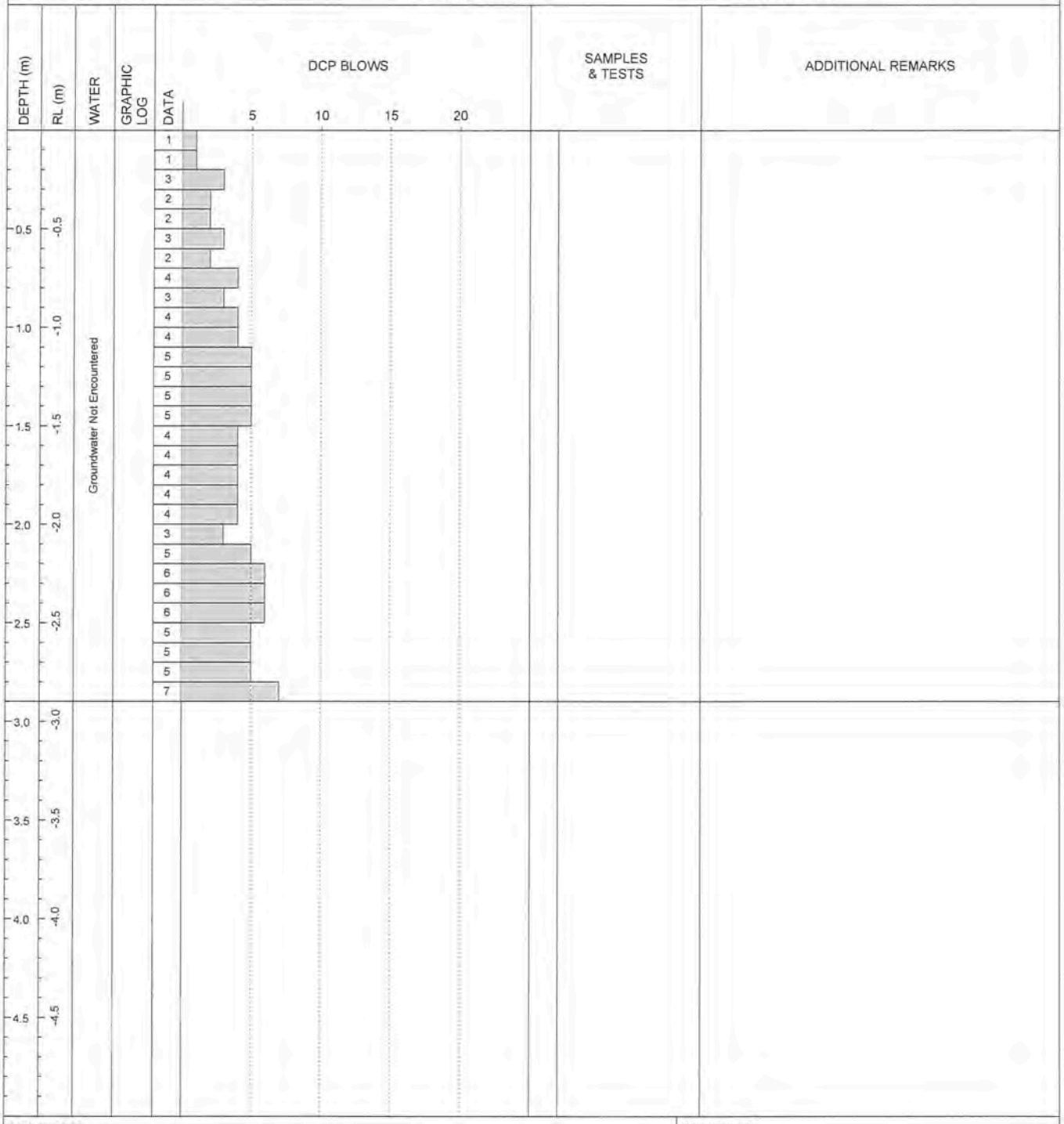
DCP LOG

DCP04

SHEET 4 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907564.70	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532103.01	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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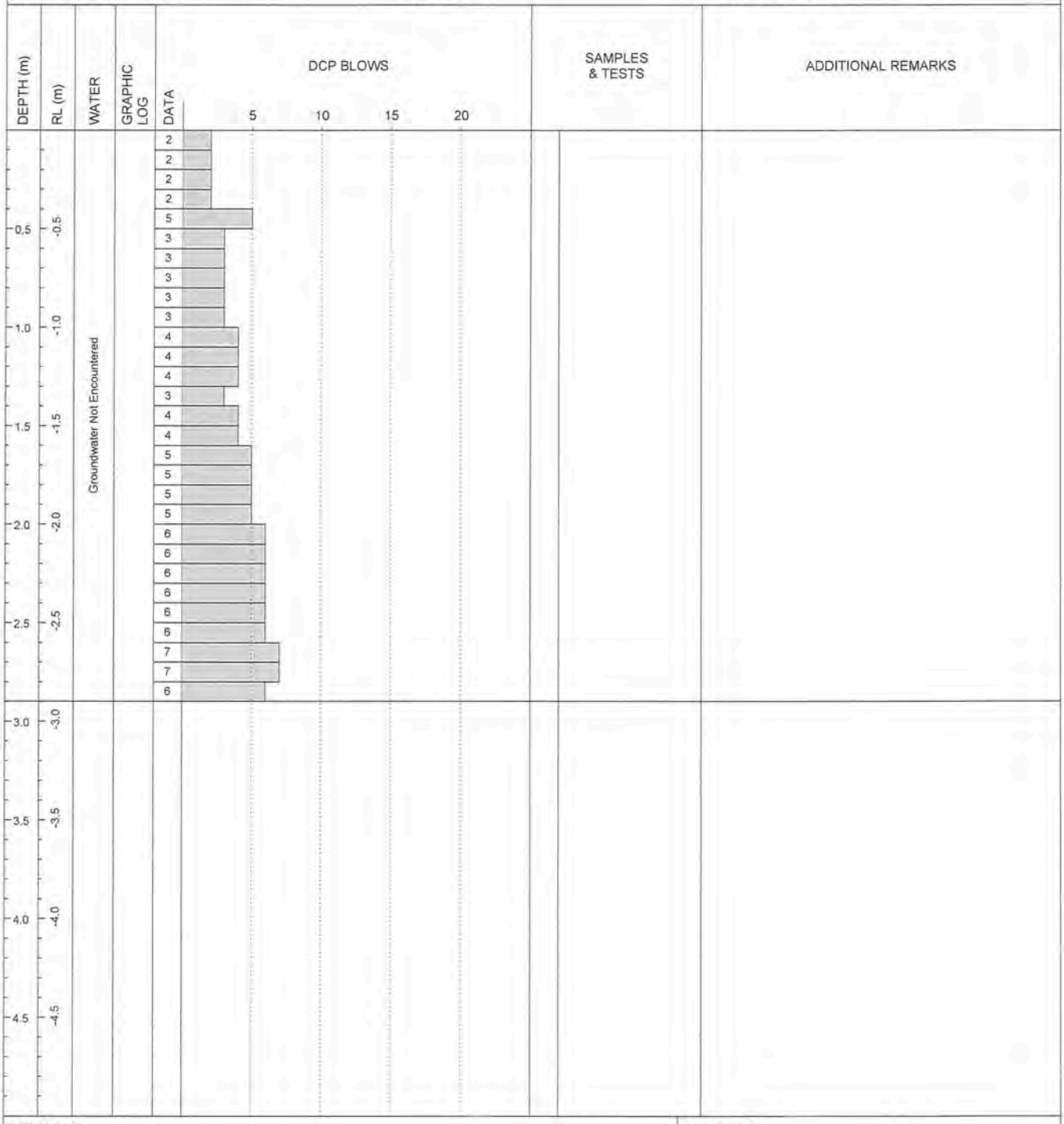
DCP LOG

DCP05

SHEET 5 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907474.15	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532190.74	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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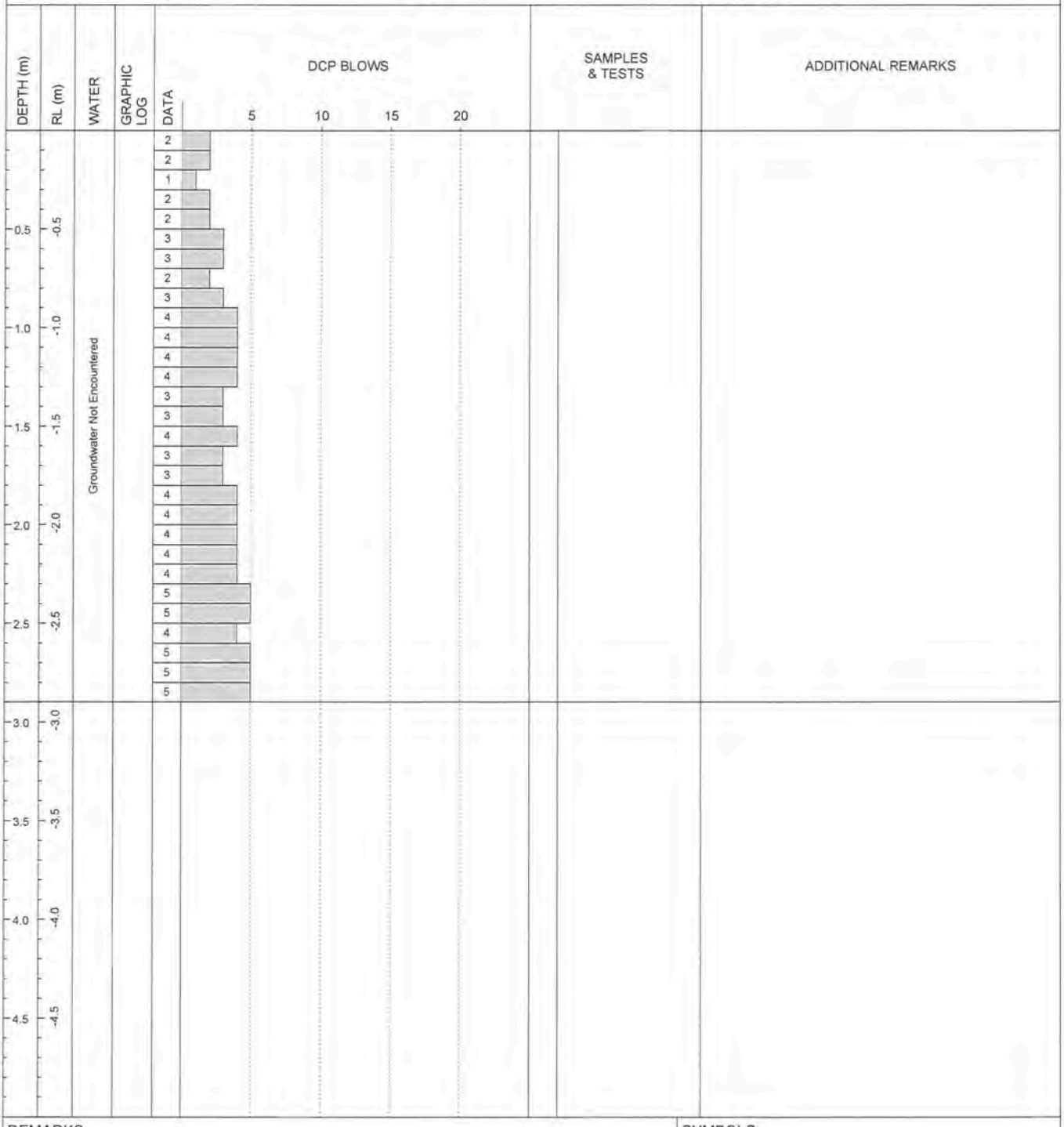
DCP LOG

DCP06

SHEET 6 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907487.59	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532224.49	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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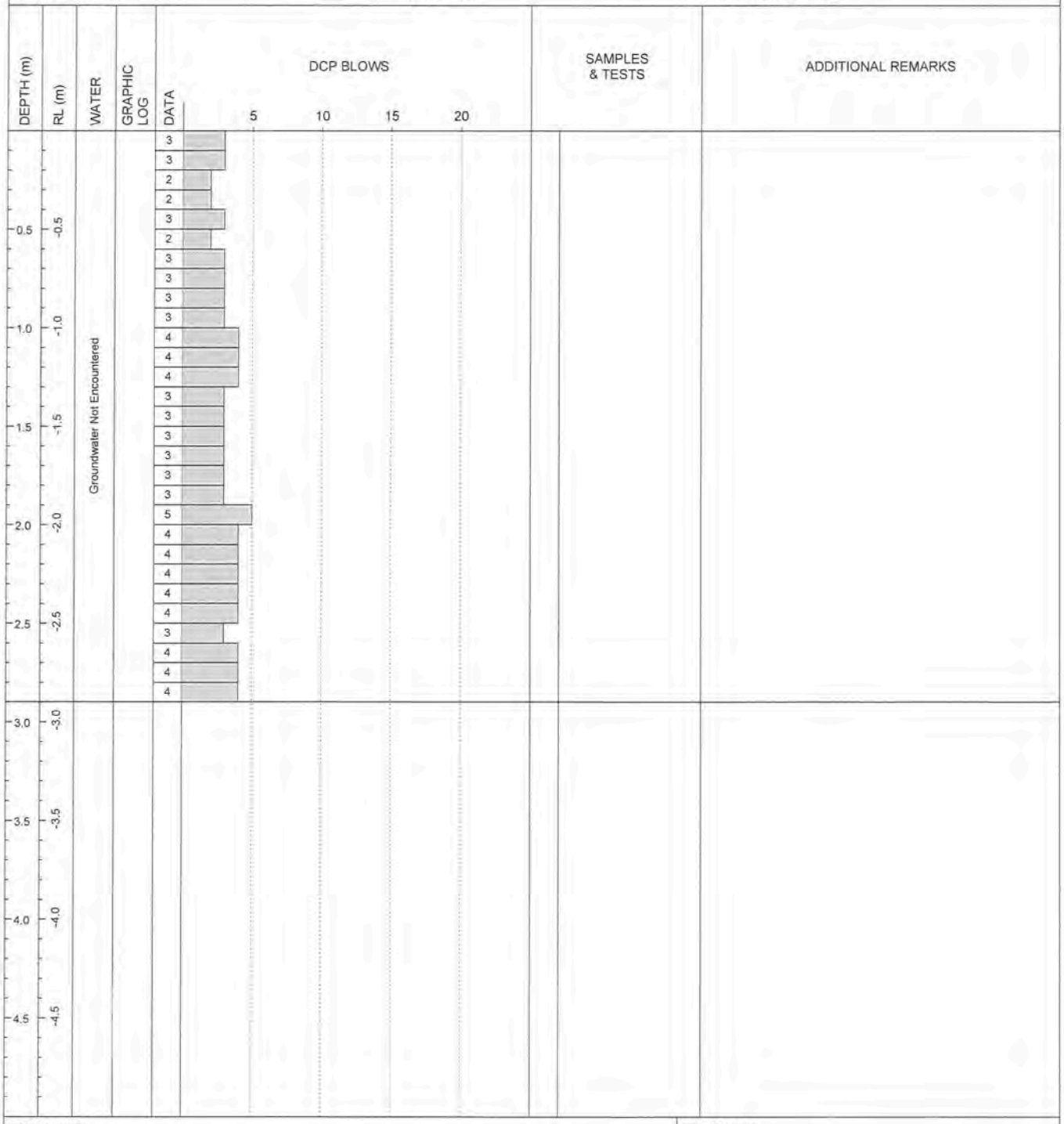
DCP LOG

DCP07

SHEET 7 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907506.90	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532199.29	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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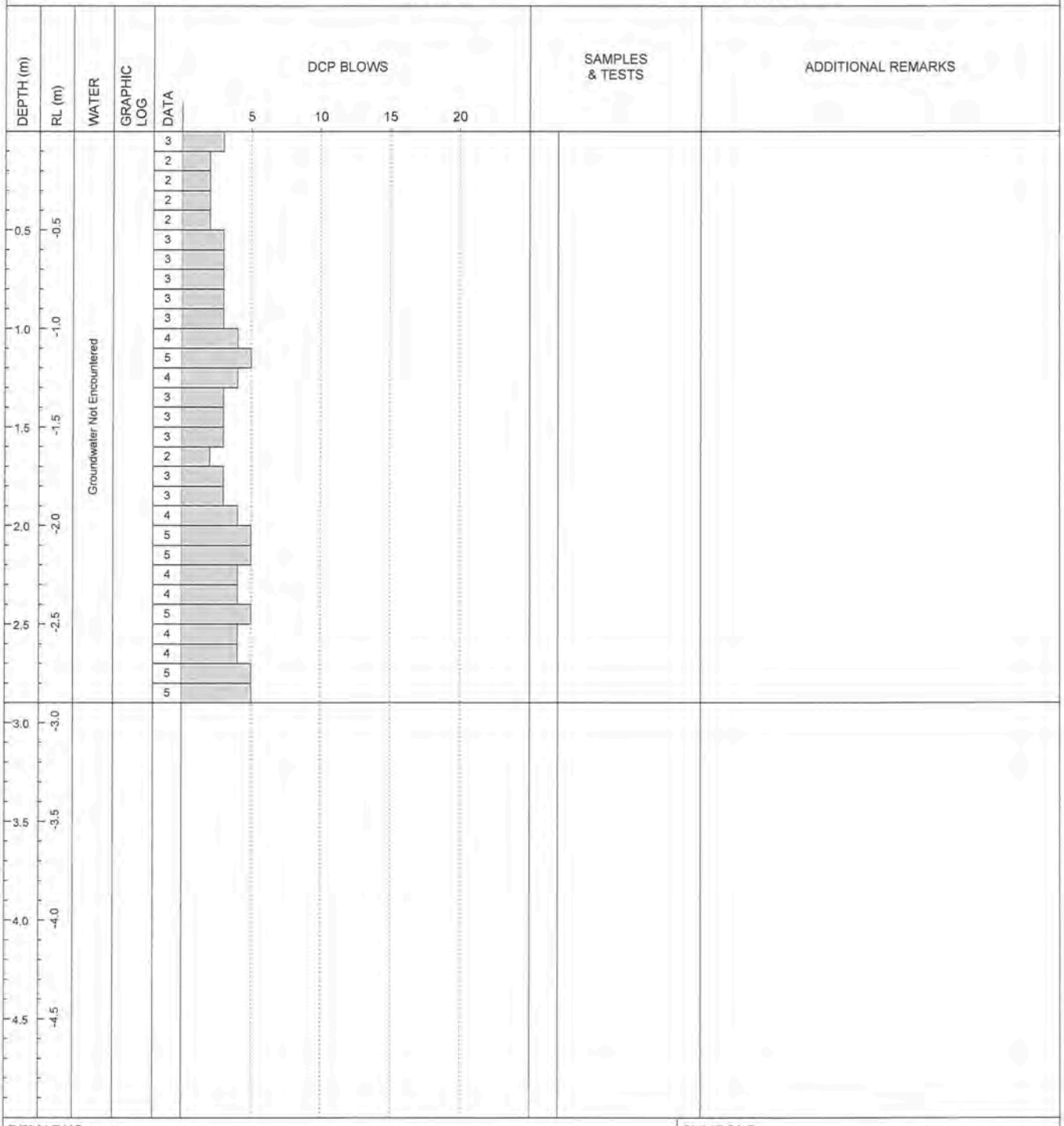
DCP LOG

DCP08

SHEET 8 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907491.53	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532216.60	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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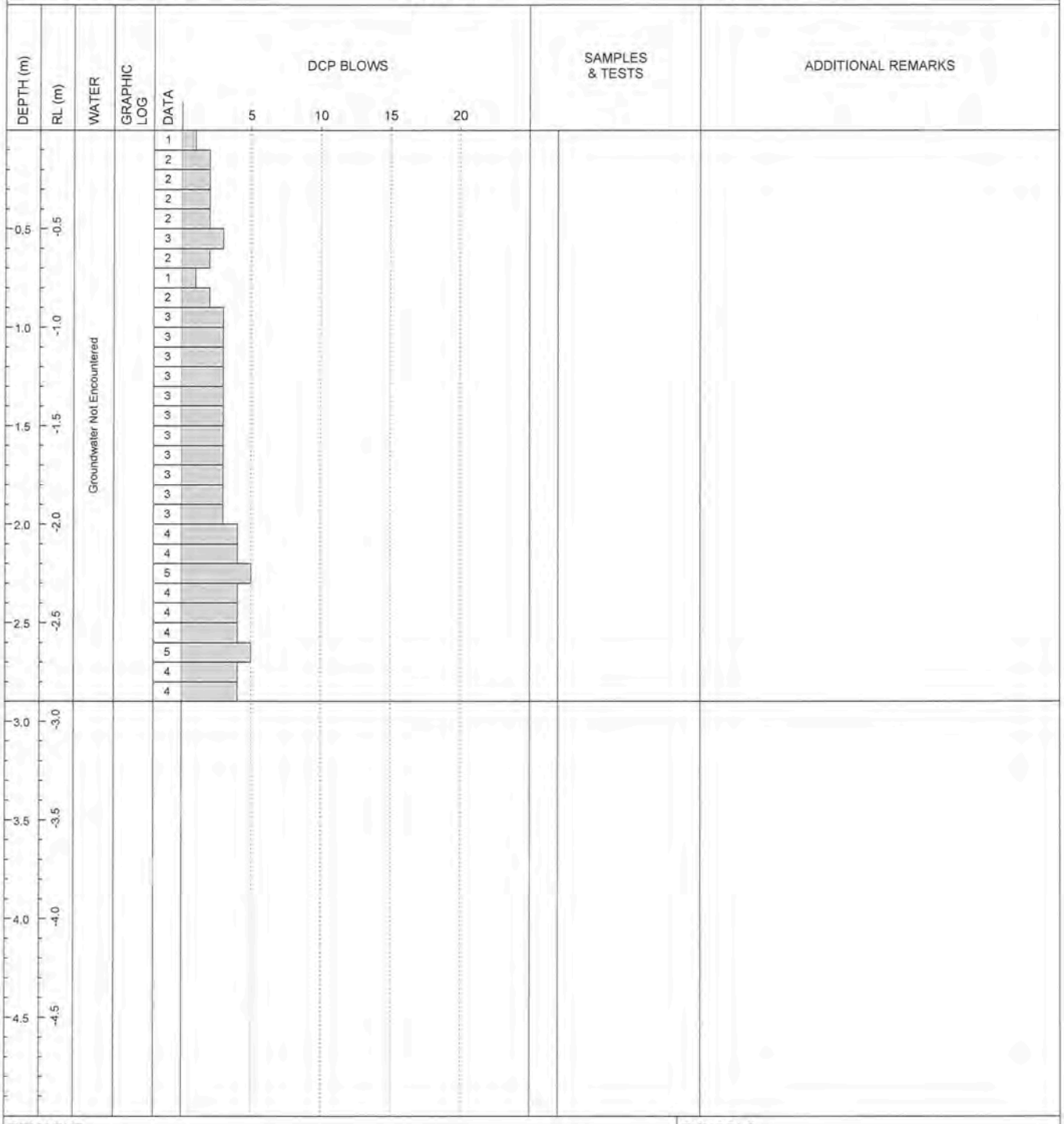
DCP LOG

DCP09

SHEET 9 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907697.00	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532245.00	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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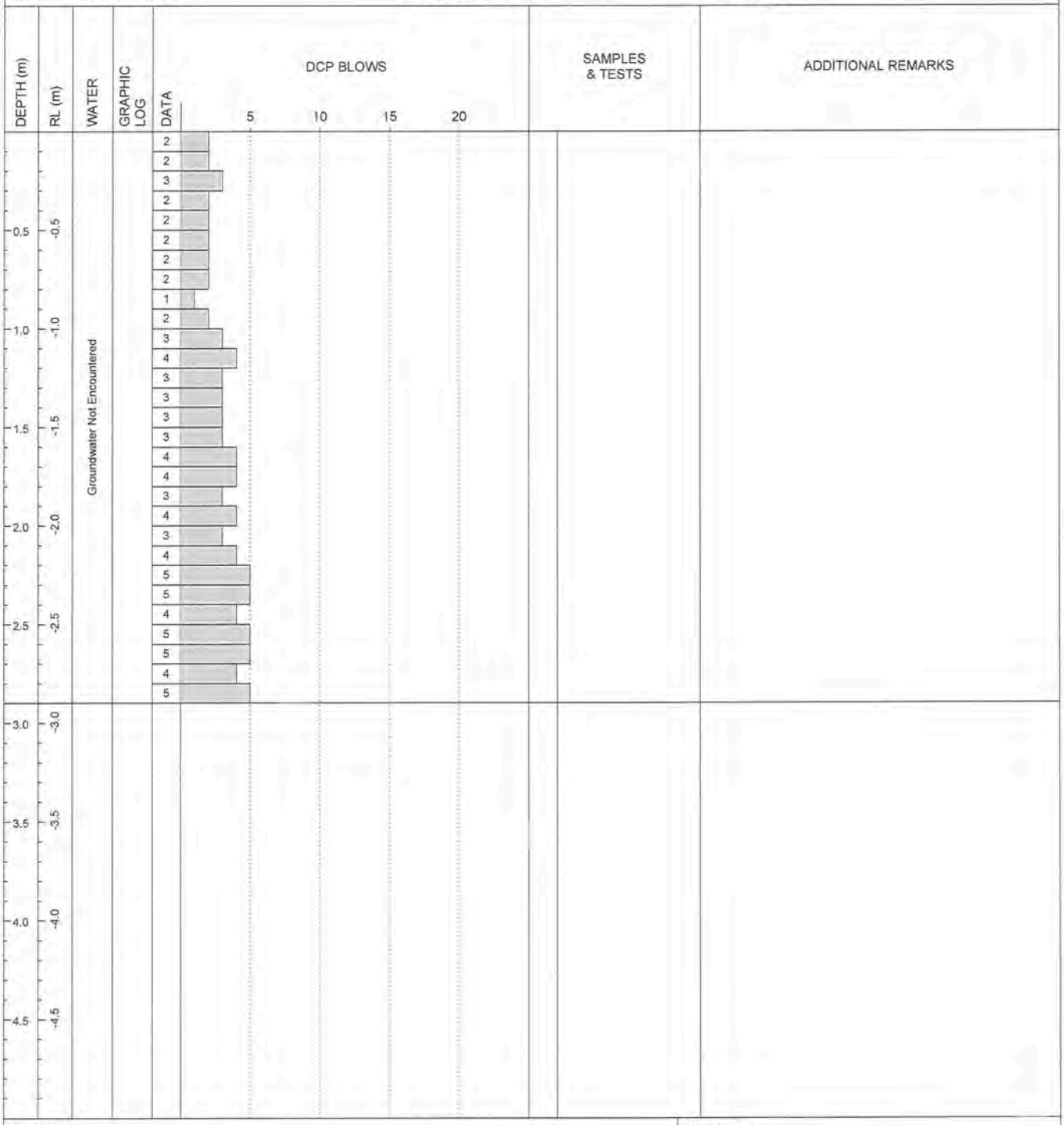
DCP LOG

DCP10

SHEET 10 OF 10

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM	LOCATION: 186 Beach Rd
PROJECT: 188020602	EASTING: 1907718.00	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532252.00	FINISHED: 19/12/2018
	DATUM: -	LOGGED BY: MD DATE: 19/12/2018
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	AZUMITH: 0° PLUNGE: 90°	STATUS: Final data
CONTRACTOR: RDCL	MACHINE:	OPERATOR: MD



REMARKS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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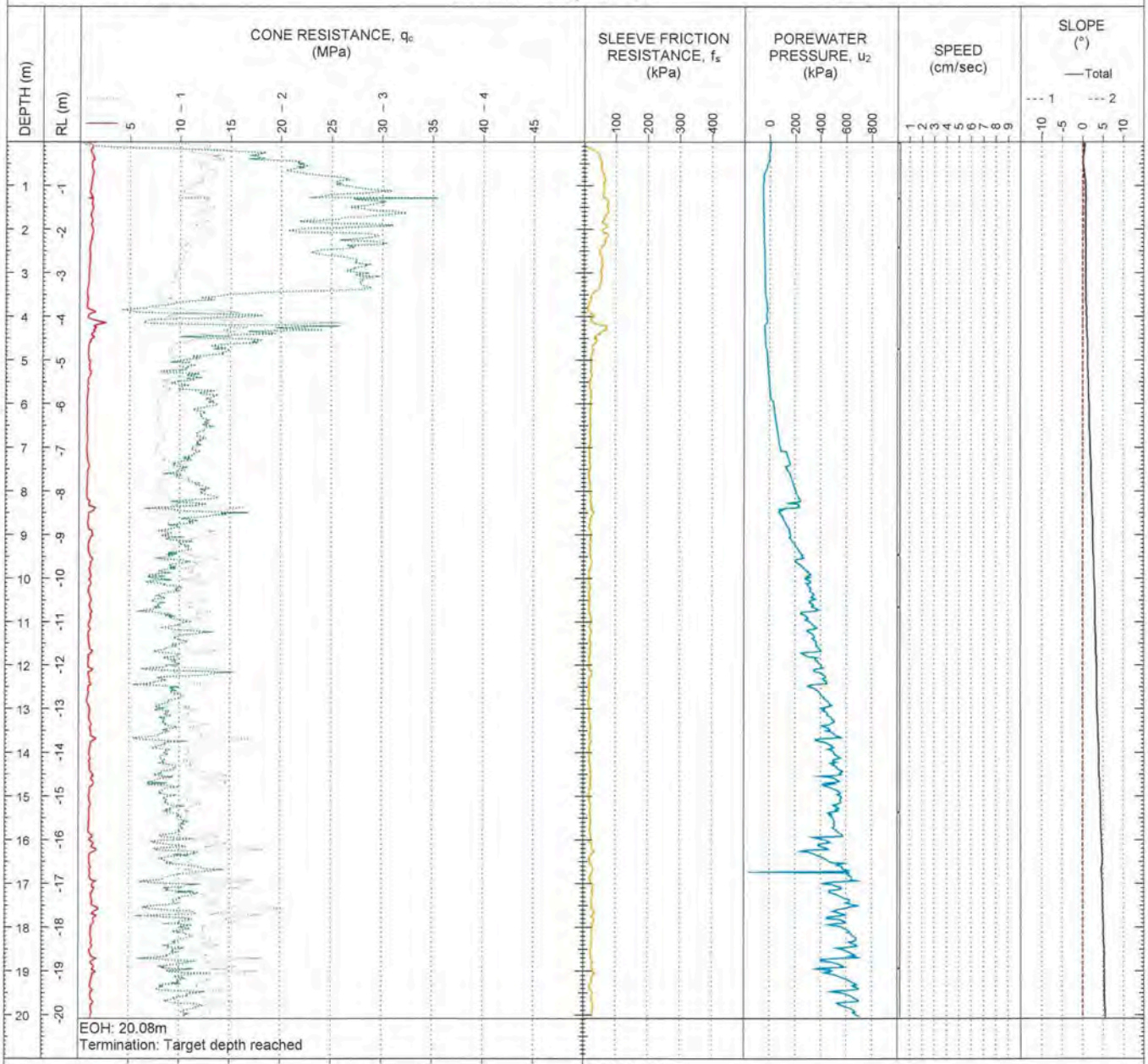
CONE PENETRATION TEST LOG

CPT01

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907529.39	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532138.19	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 4483 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6672	0.031
SLEEVE FRICTION RESISTANCE:	126.9	-0.1
POREWATER PRESSURE:	265.9	-1.3

SYMBOLS

▼ Water level

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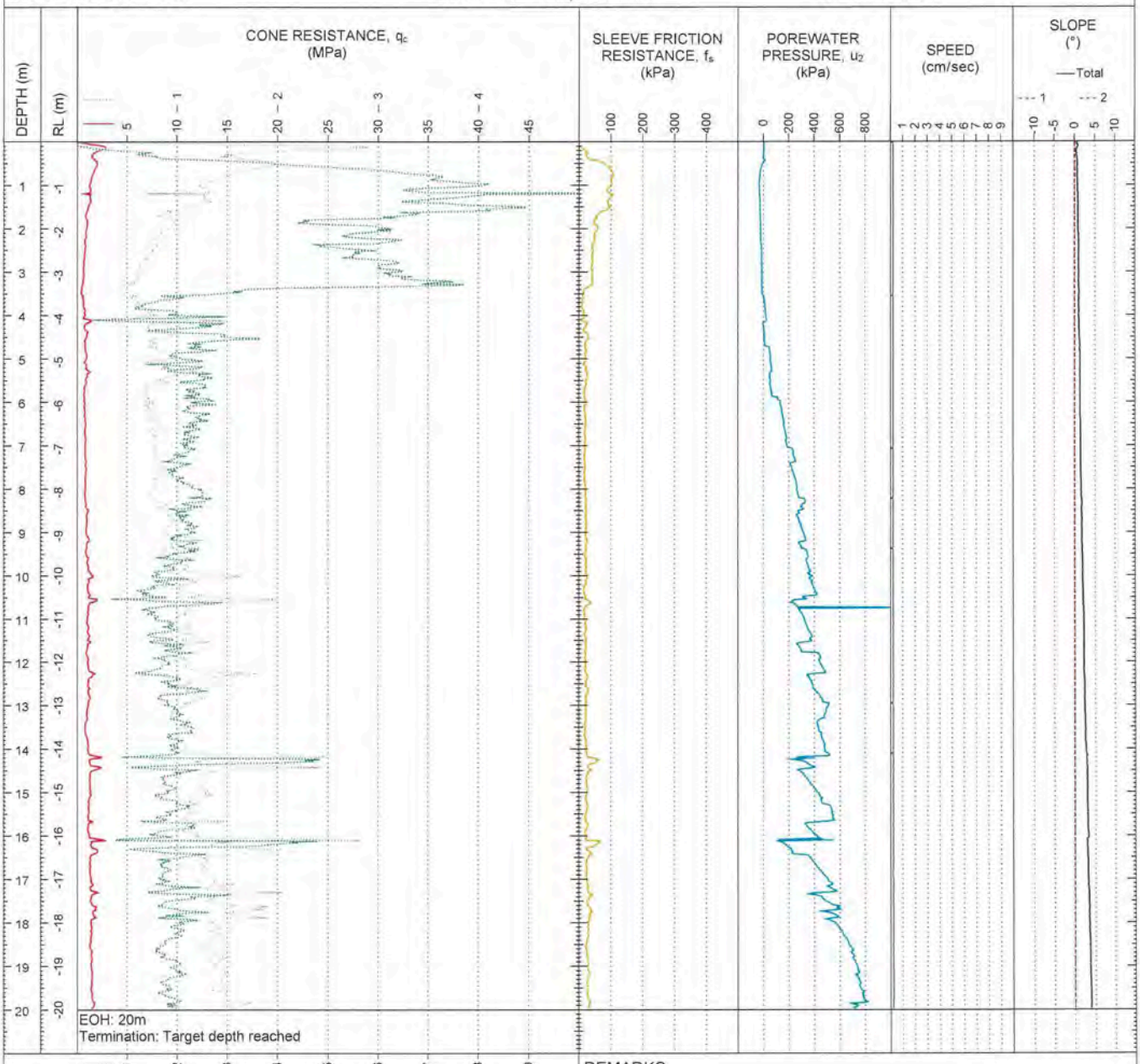
CONE PENETRATION TEST LOG

CPT02

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907547.58	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532116.76	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 5210 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE	14.1081	0.0163
SLEEVE FRICTION RESISTANCE	118.1	0.4
POREWATER PRESSURE	221.9	-0.8

SYMBOLS

▼ Water level

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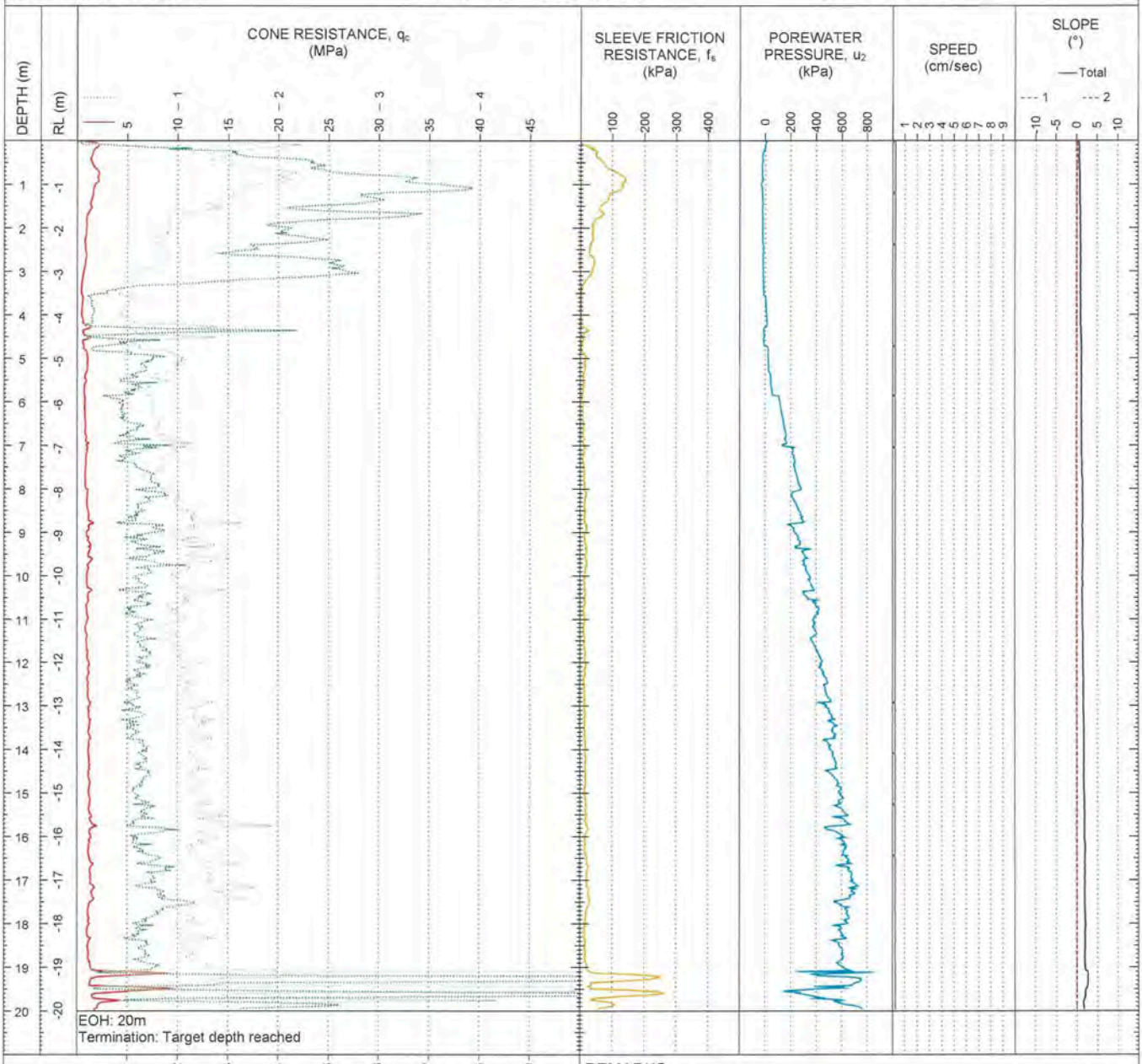
CONE PENETRATION TEST LOG

CPT03

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907497.12	STARTED: 19/12/2018
LOCATION: 186 Beach Rd	NORTHING: 5532205.02	FINISHED: 19/12/2018
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data
CONTRACTOR: RDCL	MACHINE: Geoprobe 54LT	OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 4483 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6832	-0.0042
SLEEVE FRICTION RESISTANCE:	126.5	-0.1
POREWATER PRESSURE:	265.8	-0.7

SYMBOLS

▼ Water level

RDCL

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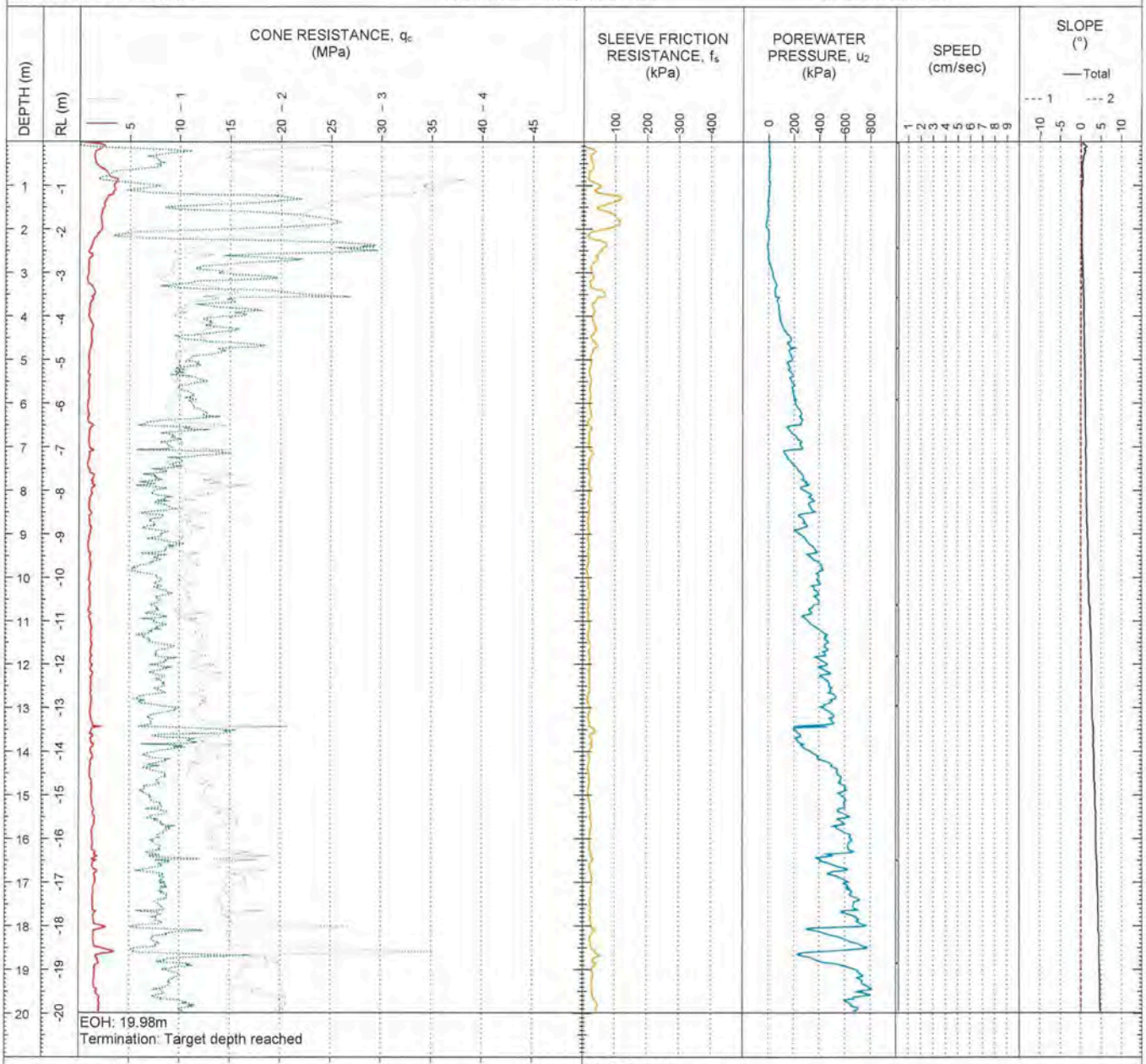
CONE PENETRATION TEST LOG

CPT04

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907547.16	STARTED: 08/01/2019
LOCATION: 186 Beach Rd	NORTHING: 5532091.75	FINISHED: 08/01/2019
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data

CONTRACTOR: RDCL MACHINE: Geoprobe 54LT OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: 5210 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	14.109	-0.0064
SLEEVE FRICTION RESISTANCE:	119.1	0.1
POREWATER PRESSURE:	223.5	0.7

SYMBOLS

▼ Water level

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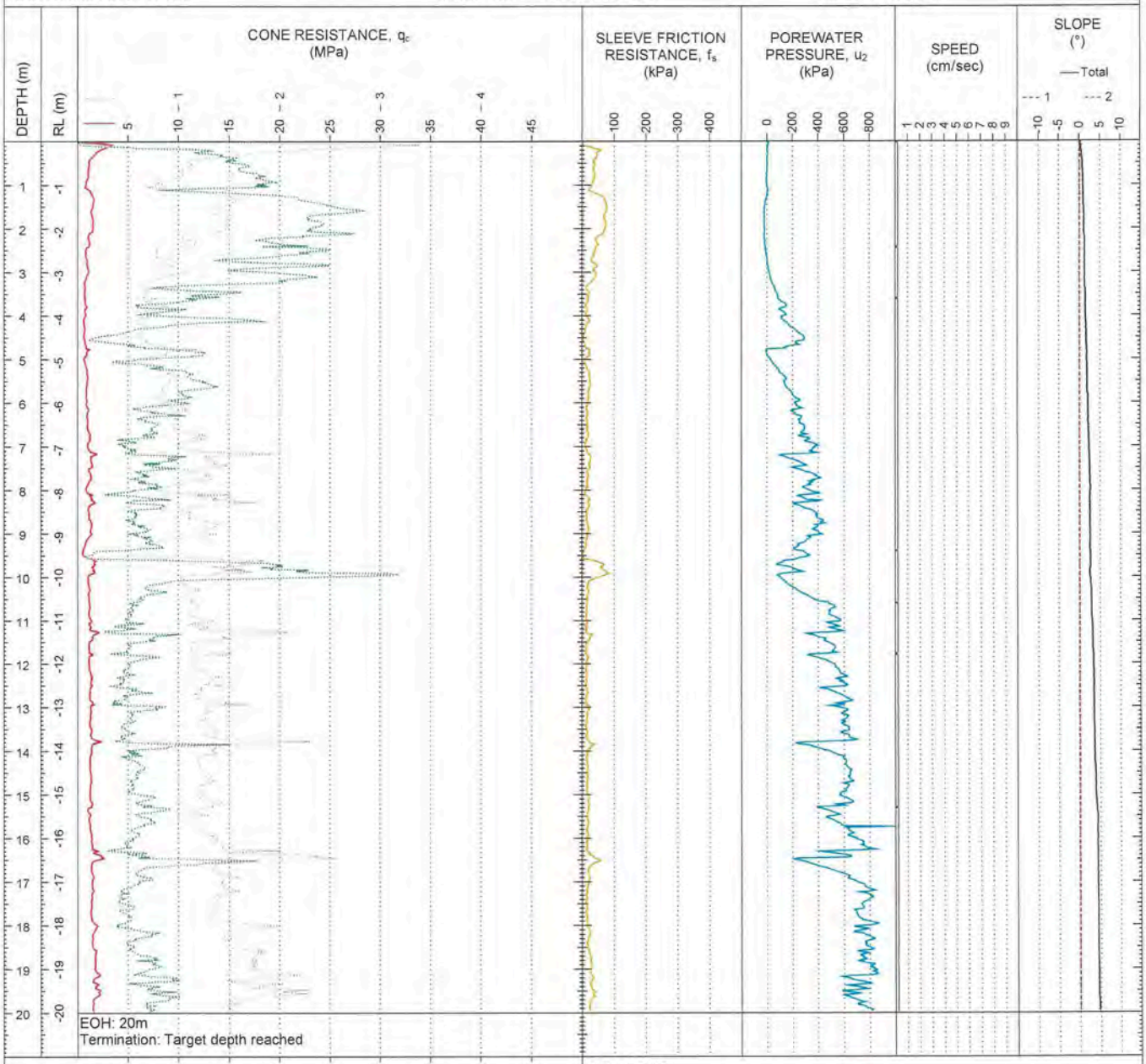
CONE PENETRATION TEST LOG

CPT05

SHEET 1 OF 1

CLIENT: Mathew Douglas Family Trust	PROJECTION: NZTM2000	LOCATION: 186 Beach Rd, Porangahau
PROJECT: 188020602	EASTING: 1907511.25	STARTED: 08/01/2019
LOCATION: 186 Beach Rd	NORTHING: 5532108.90	FINISHED: 08/01/2019
	DATUM: -	
OFFICE: RDCL - Hastings	ELEVATION: -	CHECKED BY: EC DATE: 28/01/2019
ENGINEER: CAW	SWL: 0	STATUS: Final data
CONTRACTOR: RDCL	MACHINE: Geoprobe 54LT	OPERATOR: BR



REMARKS

CONE INFORMATION

CONE ID: RDCL1 CONE TYPE: -

	INITIAL	FINAL
CONE RESISTANCE:	6.6281	0.0145
SLEEVE FRICTION RESISTANCE:	127.4	0
POREWATER PRESSURE:	266.3	0.1

SYMBOLS

▼ Water level

RDCL
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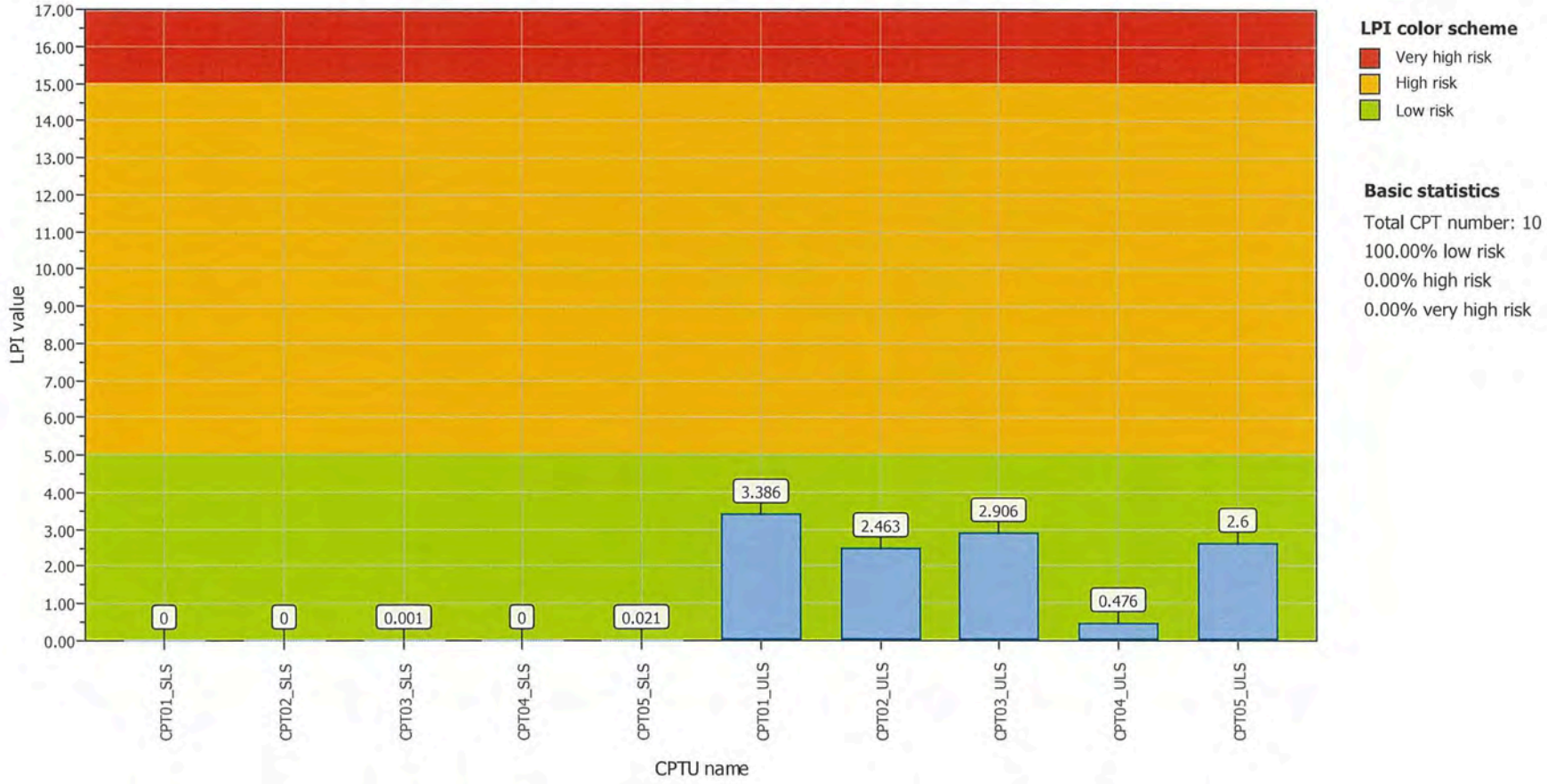
APPENDIX B

LIQUEFACTION ASSESSMENT OUTPUTS

Project title : 188020602

Location : 186 Beach Road, Porangahau

Overall Liquefaction Potential Index report



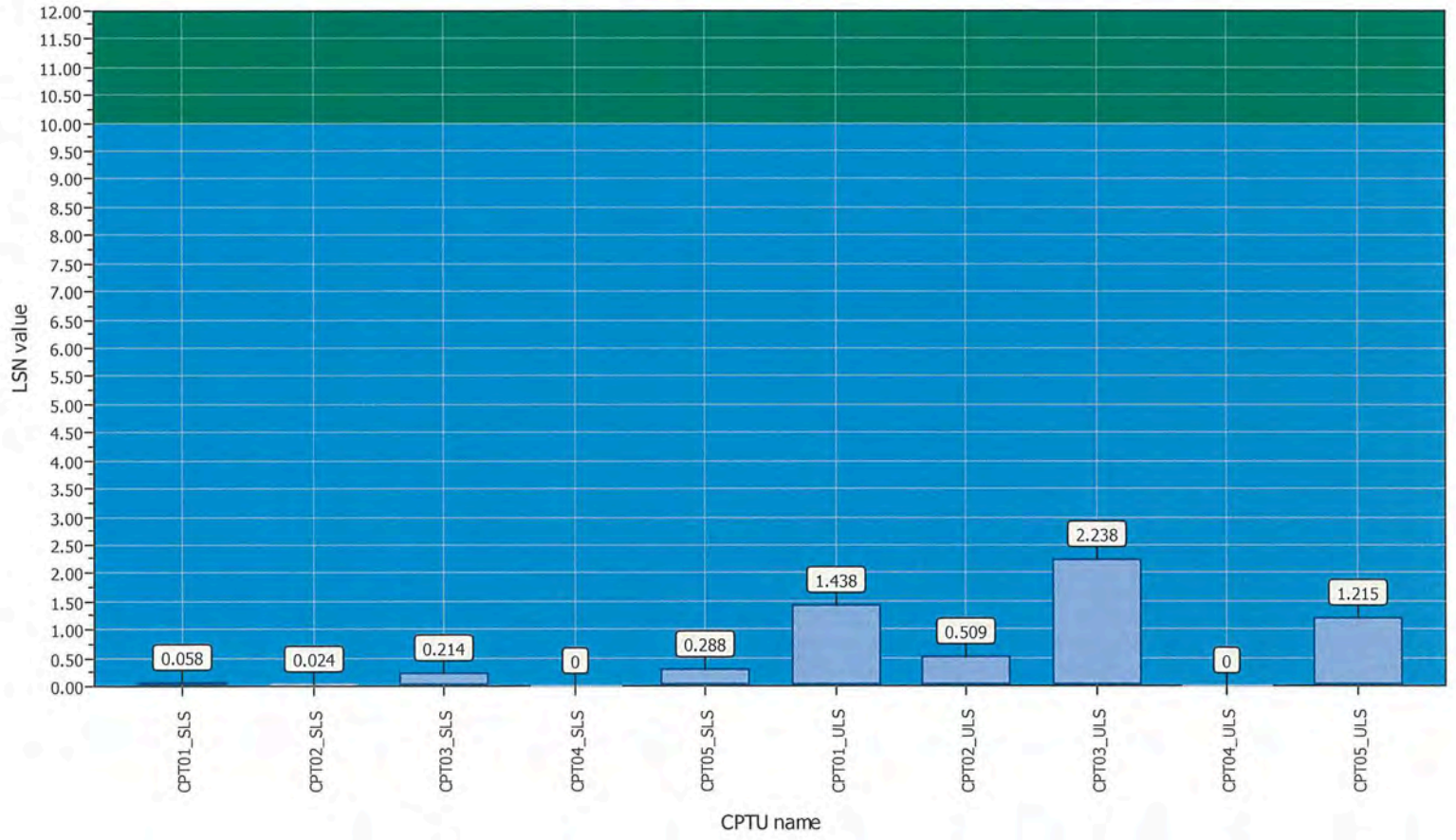
Basic statistics

Total CPT number: 10
100.00% low risk
0.00% high risk
0.00% very high risk

Project title : 188020602

Location : 186 Beach Road, Porangahau

Overall Liquefaction Severity Number report



LSN color scheme

- Severe damage
- Major expression of liquefaction
- Moderate to severe exp. of liquefaction
- Moderate expression of liquefaction
- Minor expression of liquefaction
- Little to no expression of liquefaction

Basic statistics

Total CPT number: 10

100.00% little liquefaction

0.00% minnor liquefaction

0.00% moderate liquefaction

0.00% moderate to major liquefaction

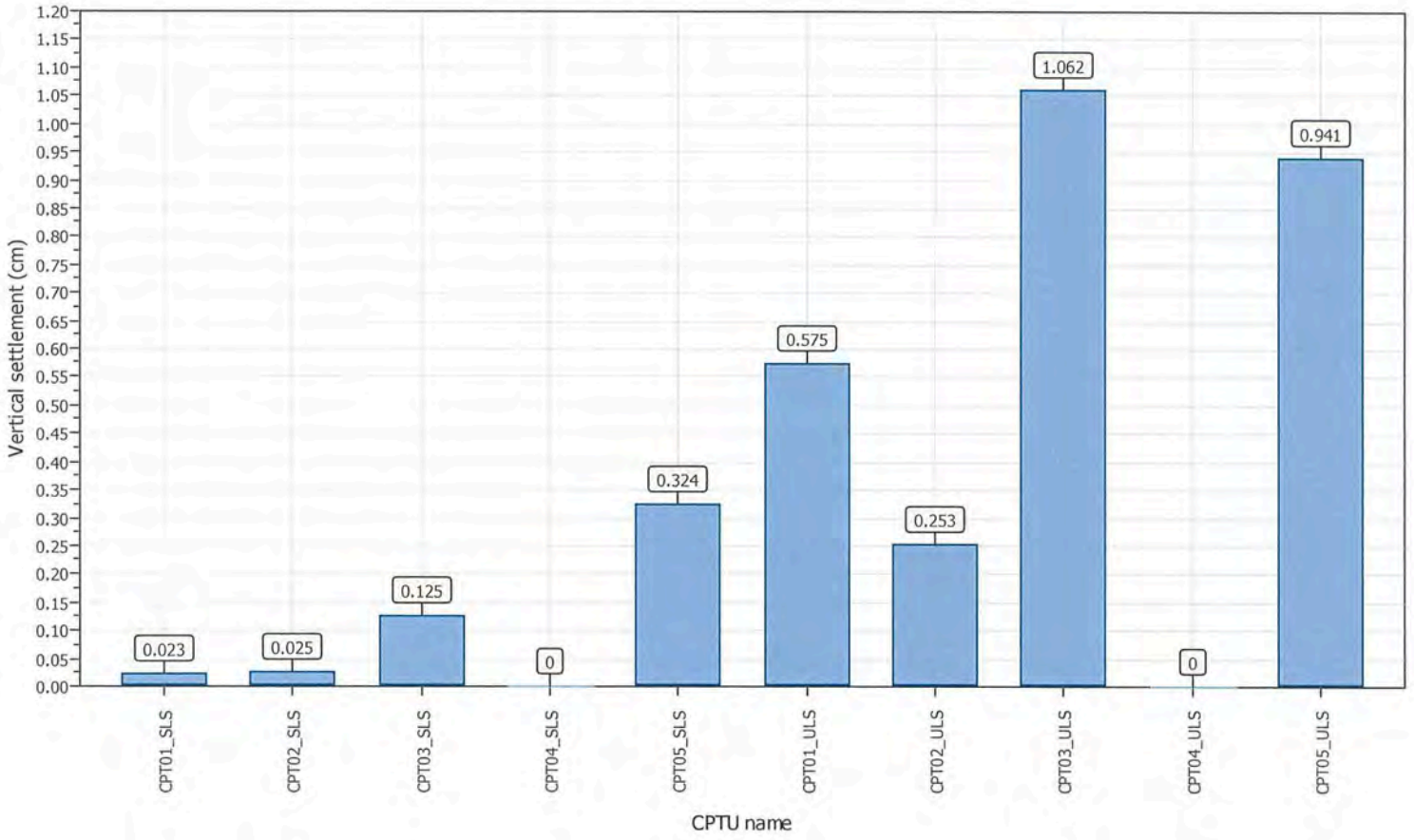
0.00% major liquefaction

0.00% severe liquefaction

Project title : 188020602

Location : 186 Beach Road, Porangahau

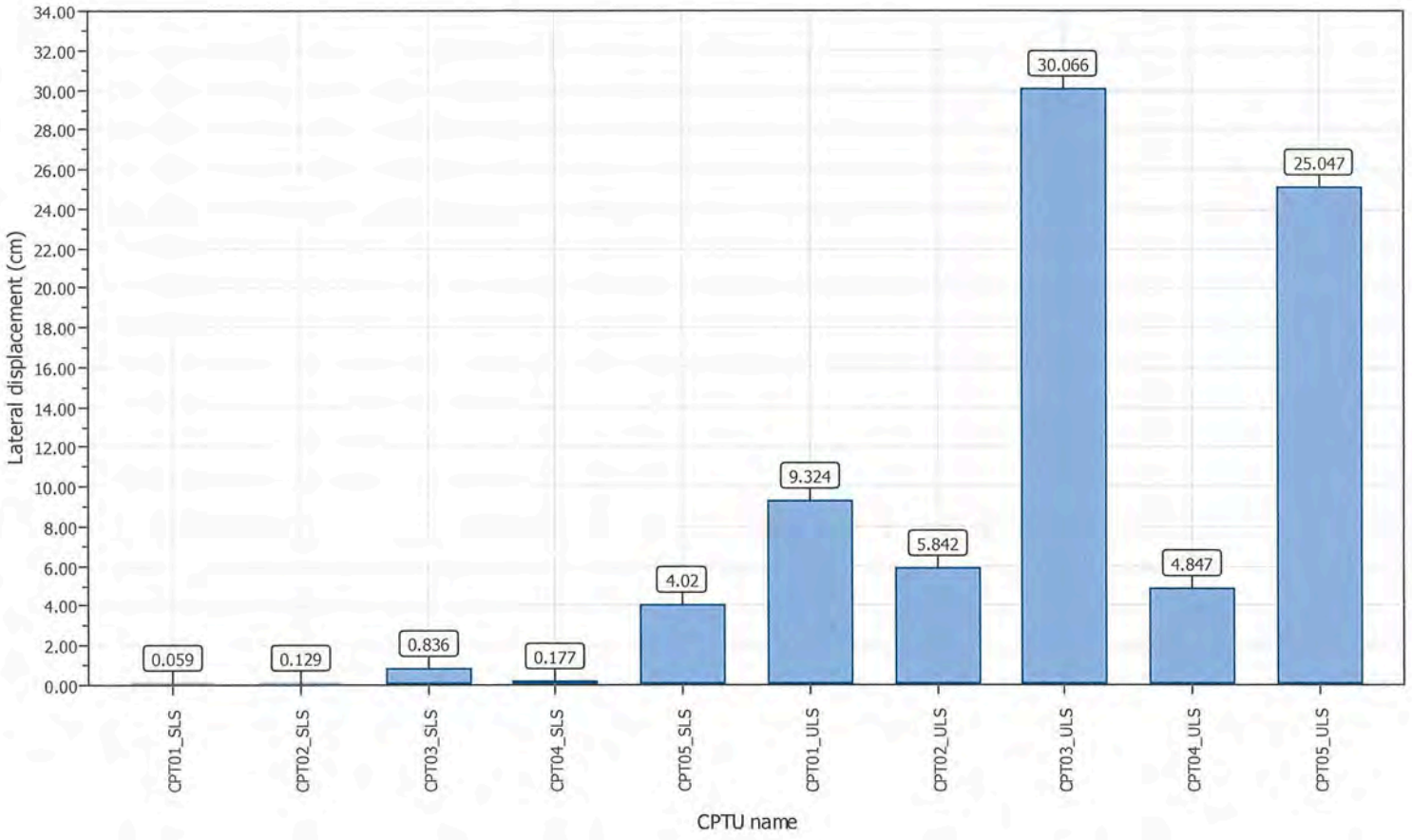
Overall vertical settlements report



Project title : 188020602

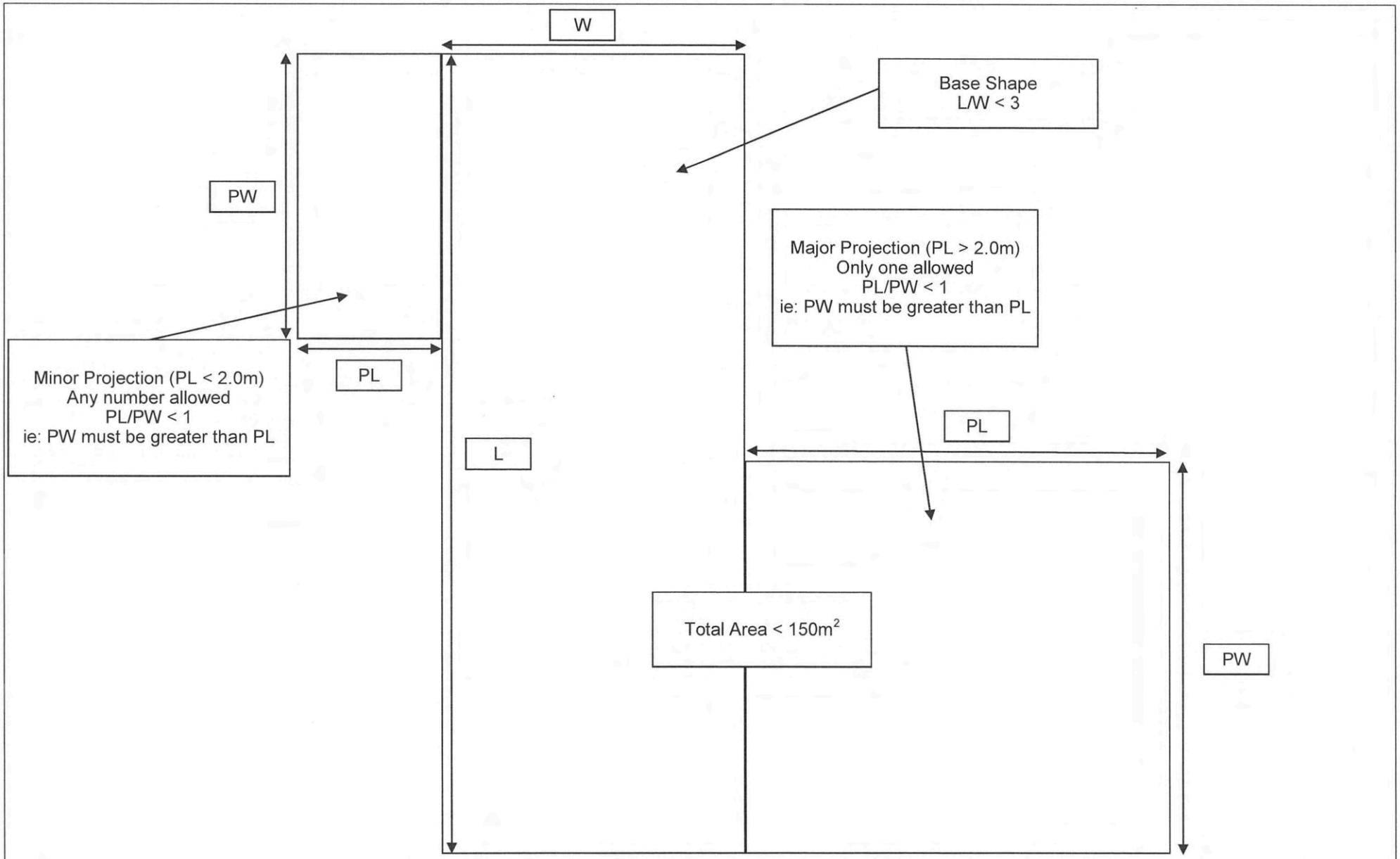
Location : 186 Beach Road, Porangahau

Overall lateral displacements report



APPENDIX C

FOUNDATION OPTIONS FOR TECHNICAL CATEGORY 2



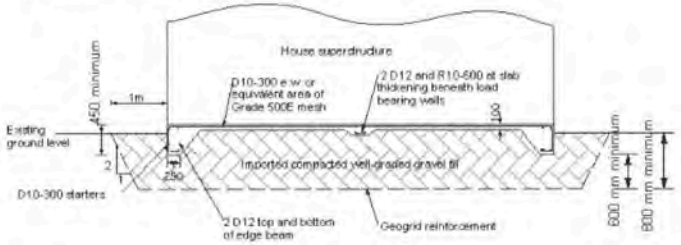
RDCL	TITLE	Foundation Layout Restrictions	PROJECT	184660602			
	PROJECT	Tuki Tuki Road Subdivision	DRAWN BY	JJN	DATE	07/06/18	PAGE
	CLIENT	Judith & Richard Holland	CHECKED BY	CAW	DATE	08/06/18	1

Option 1 – Excavation and replacement of the upper layers of soil with compacted, well-graded gravels and construction of a reinforced NZS 3604 slab foundation.

The ground immediately beneath the compacted gravel fill must have a minimum geotechnical ultimate bearing capacity of 200 kPa, or the slab should be subject to specific engineering design (see section 3.4.1).

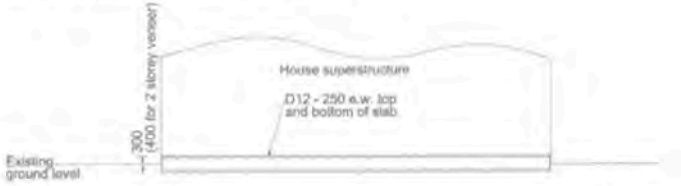
External service lines will need to be beyond the outer extent of the gravel raft and/or have flexible connections (refer to section 5.6).

Figure 5.5: Enhanced foundation slab – Option 1



Option 2 – Construct a thick slab foundation over the existing soil.

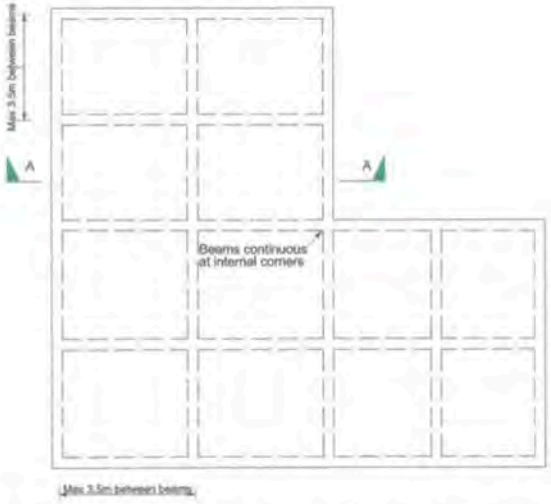
Figure 5.6: Enhanced foundation slab – Option 2



Note: NZS ground clearances adjacent to house foundation must be complied with. DPC omitted for clarity.

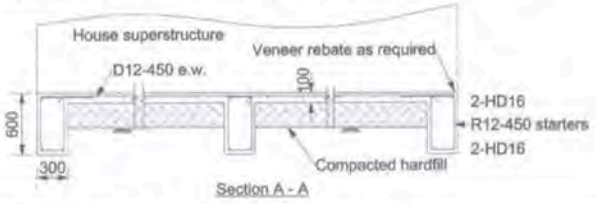
Option 3 – Construct a generic beam grid and slab foundation.

Figure 5.7: Enhanced foundation slab – Option 3 plan



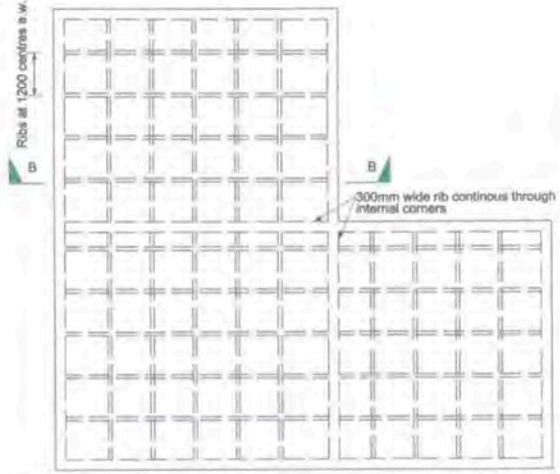
Note: Reinforcing details are not sufficient for two-storey heavy-weight cladding (brick veneer) with a heavy roof but can be used for a two-storey heavy-weight cladding with a light weight roof.

Figure 5.8: Enhanced foundation slab – Option 3 cross-section



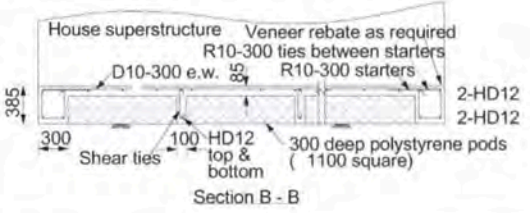
Option 4 – Construct a waffle slab over the existing soil.

Figure 5.10: Enhanced foundation slab – Option 4 plan



Note: Reinforcing details are not sufficient for two-storey heavy-weight cladding (brick veneer) with either a heavy or light roof.

Figure 5.11: Enhanced foundation slab – Option 4 cross-section



Images sourced from MBIE Guidelines (2017)

RDCL

TITLE	Enhanced Foundation Slab Options	PROJECT	184660602			
PROJECT	Tuki Tuki Road Subdivision	DRAWN BY	EC	DATE	26/10/18	PAGE
CLIENT	Judith & Richard Holland	CHECKED BY	CAW	DATE	26/10/18	2

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

BUILDING PERMIT FILE

Permit No.
Building : L 072831
Plumbing &

Owner's Name L. E. CARR

Date 24-9-79 Receipt No. 1066F.

Building Permit Fee	$ 57.—
Plumbing and Drainage Fee	$ 11.—
Building Research Fee	$ 13.—

DUPLICATE

BUILDING PERMIT

Refer to cover for general instructions regarding completion of this form.

I 076831

1. LOCATION AND OWNERSHIP

Local Authority: Date: 24/ 9 / 79

Number on Valuation Roll: 10940/377 Receipt No. 1066F

Lot: D.P.: Section: 215 Block: XII

Site of Building: S.D.

Street:

Township or Rural District:

Riding: Porangahau

OFFICE USE ONLY

Received from Homabre Ltd.

for Building Permit Fee, etc. $ 57.00

Building Research Levy $ 13.00

the sum of (Total) $ 70.00

Authorised Officer N. C. Argyle

24/ 9 /1979

Owner—Name: L. R. Carr

Full Address: P.O. Box 53, Porangahau

Builder—Name: Homabre Ltd.

Full Address: P.O. Box 520, Waipukurau

2. NATURE OF PERMIT (Tick box)

New building including separate buildings added to existing complex ☐ Repairs, alterations or extensions to an existing building. ☐ Conversion ☐ Demolition ☐

3. VALUE AND AREA OF BUILDING

		If valued at more than $20,000 state:		Total floor area (sq. metres)
Est. value of building work	$ 12,000.—	Est. commencement date	Mth. 19	33 m²
Est. value of plumbing and drainage if not included in permit.	$ 400.—	Est. completion date	Mth. 19	
		Building registration No.		

4. DESCRIPTION OF BUILDING OR STRUCTURE AND MAIN PURPOSE FOR WHICH IT WILL BE USED:

Addition Dwelling

5. PREDOMINANT ACTIVITY OF OWNER (See Cover Instructions):

Special Conditions: (In addition to those listed on the Reverse)

Permission is hereby granted you to carry out the works as proposed in accordance with the drawings and other documents submitted; such work to be subject at any time during progress to inspection, and to be carried out in strict conformity with the requirements of the council bylaws, and subject to the builder taking full responsibility for any damage done to any works such as telephone cables, power cables, water mains, sewers, pipes, footpaths, roads, or other services.

Stats.—B.C./MP/01 N. C. Argyle Issuing Officer. 24/ 9 /79

90872/7/77

I076831

24/9/79 ASSESSMENT No.

WAIPUKURAU DISTRICT COUNCIL RECEIVED 19 SEP 1979 FILE ENGINEERS OFFICE

WAIPUKURAU DISTRICT COUNCIL

APPLICATION FOR (PLUMBING AND DRAINAGE PERMIT
(BUILDING PERMIT

I hereby apply for permission to erect EXTANTION FOR KITCHEN' BATHROOM AND LAUNDRY. DESCRIPTION OF WORK (e.g. Dwelling, Alterations and additions to buildings, garage etc).

PROPOSED USE OR OCCUPANCY OF BUILDING: Dwelling.

FLOOR AREA: 33 SQR METERS.

THE FOLLOWING MUST BE PROVIDED AND ARE OBTAINABLE FROM RATE ASSESSMENT:

LOT: VALUATION No. 10990/377.

D.P.: RIDING:

SECTION: 215 AREA OF PROPERTY 971 Sq M.

BLOCK: XII

S.D.

LEGAL OWNER OF PROPERTY: NAME: L. E. CARR.

POSTAL ADDRESS: P.O. Box 53. PORANGAHAU.

DE
ADE
SEA I
SEA II
W SUPT
ES
PO
INSPECTOR
STOREMAN
FILE

ADDRESS OF PROPOSED WORK: ABERCROMBIE ST. PORANGAHAU.

NAME AND ADDDRESS OF BUILDER HOMEDEC LTD. P.O. Box 520. WAIPUKURAU.

NAME AND ADDRESS OF PLUMBER/DRAINLAYER: B. TURFREY. Cook ST. WAIPUKURAU.

REGISTRATION No.

ESTIMATED VALUE OF BUILDING: (RESALE VALUE)		$ ~~~~ 12,000	FEE $ ~~40.00~~ 57.00
ESTIMATED VALUE OF PLUMBING & DRAINAGE:		$ 400.00	FEE $ 4.00. 11.00
SEWER CONNECTION			FEE $
WATER CONNECTION			FEE $
BUILDING RESEARCH LEVY			FEE $ 13.00
SERVICES INDEMNITY FEE			FEE $
VEHICLE CROSSING	(Existing/~~Required~~)		FEE $
STORMWATER CROSSING	(Existing/~~Required~~)		FEE $

Please find herewith Permit Fee $ 81.00

NAME AND ADDDRESS OF APPLICANT D. CORP 14 TUTANEKAI ST. WAIPUKURAU.

SIGNATURE OF APPLICANT [signature]

PLAN OF ALLOTMENT

Showing all existing buildings and drainage, and position of proposed buildings, sanitary fittings, gully traps, inspection pipes and ventilators, sumps, sewers, septic tanks, stormwater drains, if any, in relation to all boundaries.

New Sewage Drains: Red
Stormwater: Dotted Black

Old Drains: Black
Boundary Lines to be shown thus:—.—.—.—

Scale: 1:200

IMPORTANT

THE FOLLOWING MUST ACCOMPANY THIS SITE PLAN:—

Ground Plan of Proposed Building.
Foundation Plan
Cross Section, from Footing Upwards
Elevation of One End and One Side
Specifications

FOR OFFICE USE: Date Received:

Receipt No.:

Building Permit No.: Fee

Date Issued:

P. and D. Permit No.: Fee

Date Issued:

Building Research Levy Paid:

DISTRICT ENGINEER'S COMMENTS:

Structurally OK

HEALTH AND BUILDING INSPECTOR'S COMMENTS:

WAIPUKURAU DISTRICT COUNCIL

1066 F Waipukurau, 17.9.79

Received from Homedec Development.

the sum of Eighty One dollars only

in payment of Building Permit $ 81:00

L.E. Lake Porangahau

F. P. SPINLEY, County Clerk, per L.M. Fisher

SERVICES INDEMNITY FEE:

I certify that has completed a building in Street.

I recommend/do not recommend that the indemnity sum of $ be refunded.

Date of Inspection: District Engineer:

Comments:

Application for Work to be Carried Out

NAME Lot

HOUSE No. D.P.

STREET

Description of Work Required	(tick)	PAID
Sewer Connection	☐	
Water Connection	☐	
Vehicle Crossing	☐	
Stormwater Crossing	☐	
Other (Specify)		

BUILDING INSPECTOR: Date:

BUILDING PERMIT FEES

Estimated value of work excluding any amount upon which drainage and plumbing fees are payable.

FIRST SCHEDULE

Estimated Value of Work			Fees
Not exceeding	$20		.50
$21 and not exceeding		$200	$1.00
$201 and not exceeding		$400	$2.00
$401 and not exceeding		$600	$3.00
$601 and not exceeding		$800	$4.00
$801 and not exceeding		$1000	$5.00
$1001 and not exceeding		$1200	$6.00
$1201 and not exceeding		$1400	$7.00
$1401 and not exceeding		$1600	$8.00
$1601 and not exceeding		$1800	$9.00
$1801 and not exceeding		$2000	$10.00
$2001 and not exceeding		$2500	$12.00
$2501 and not exceeding		$3000	$14.00
$3001 and not exceeding		$3500	$16.00
$3501 and not exceeding		$4000	$18.00
$4001 and not exceeding		$5000	$21.00
$5001 and not exceeding		$6000	$24.00
$6001 and not exceeding		$7000	$27.00
$7001 and not exceeding		$8000	$30.00
$8001 and not exceeding		$9000	$33.00
$9001 and not exceeding		$10000	$36.00
$10001 and not exceeding		$12000	$40.00
$12001 and not exceeding		$14000	$44.00
$14001 and not exceeding		$16000	$48.00
$16001 and not exceeding		$18000	$52.00
$18001 and not exceeding		$20000	$56.00
$20001 and not exceeding		$25000	$64.00
$25001 and not exceeding		$30000	$72.00
$30001 and not exceeding		$35000	$80.00
$35001 and not exceeding		$40000	$88.00
$40001 and not exceeding		$50000	$98.00

For Fees over $50,000 refer to Council's By-Laws.

In any dispute the Engineer shall determine the value of the work in accordance with clause 2.13.2 of Council's Building By-Laws.

The above scale of fees shall also apply to the issue of a chimney permit or permission to erect an advertising hoarding or a sky-sign and to any other work requiring a permit under this chapter of this by-law (N.Z.S.S. 1900: Chapter 2: 1964) whether the permit is issued in the form of a building permit or otherwise.

PLUMBING AND DRAINAGE FEES

SECOND SCHEDULE

Not exceeding	$10		.10
$11 not exceeding		$20	.25
$21 not exceeding		$100	.50
$101 not exceeding		$200	$2.00
$201 not exceeding		$300	$3.00
$301 not exceeding		$400	$4.00

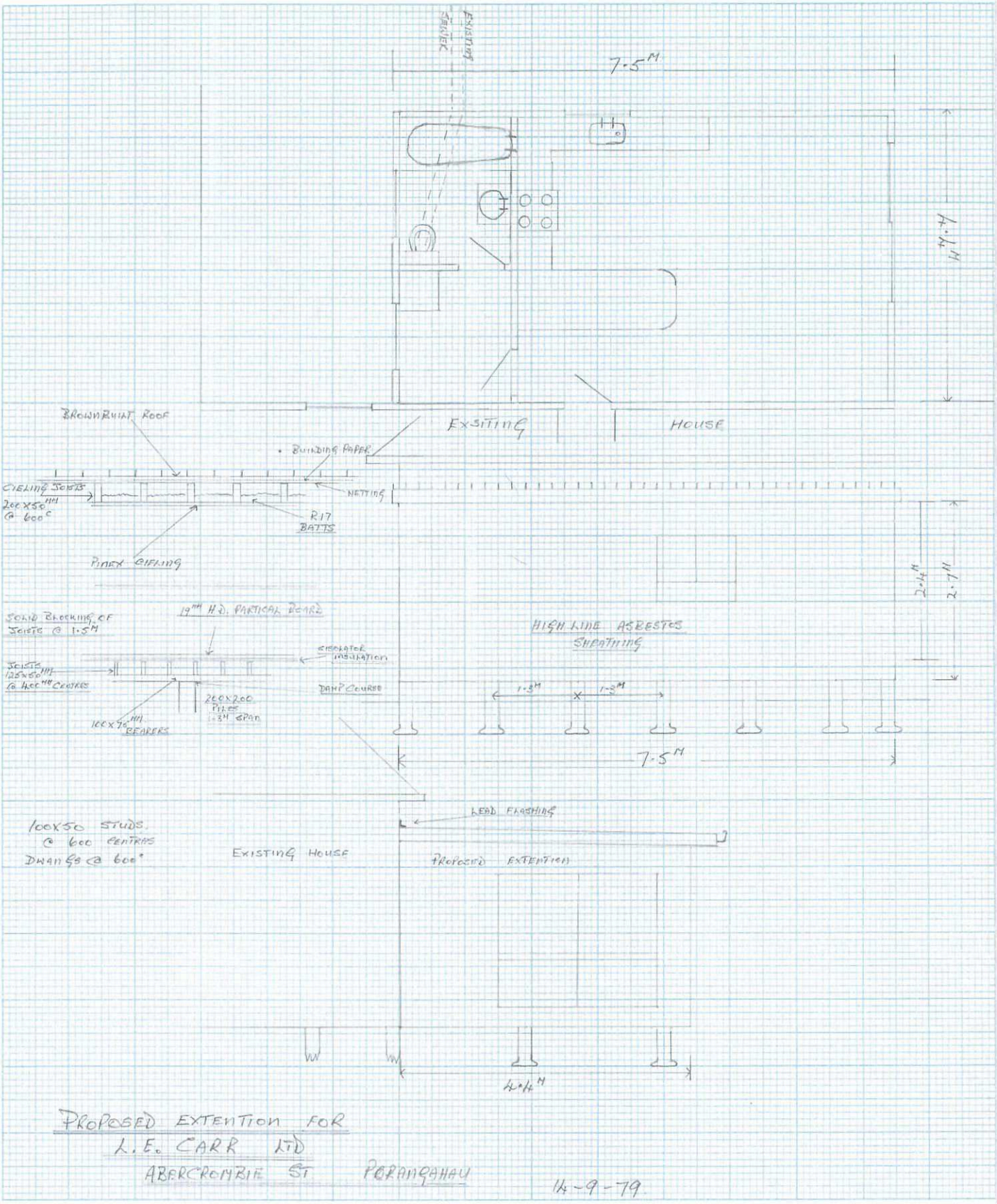
Over $400 = $4.00 plus $1.00 for every $200 or part thereof.

BUILDING RESEARCH LEVY

This levy is made in accordance with the Building Research Levy Act 1969 and the fees payable are assessed on the **TOTAL COST OF THE BUILDING** (Estimated Value of Building and Plumbing and Drainage) See Cashier for amount of Levy.

STORMWATER DRAINAGE:

Stormwater Drainage System to be installed to comply with Plumbing and Drainage Regulations and District Council's Standard Specifications.

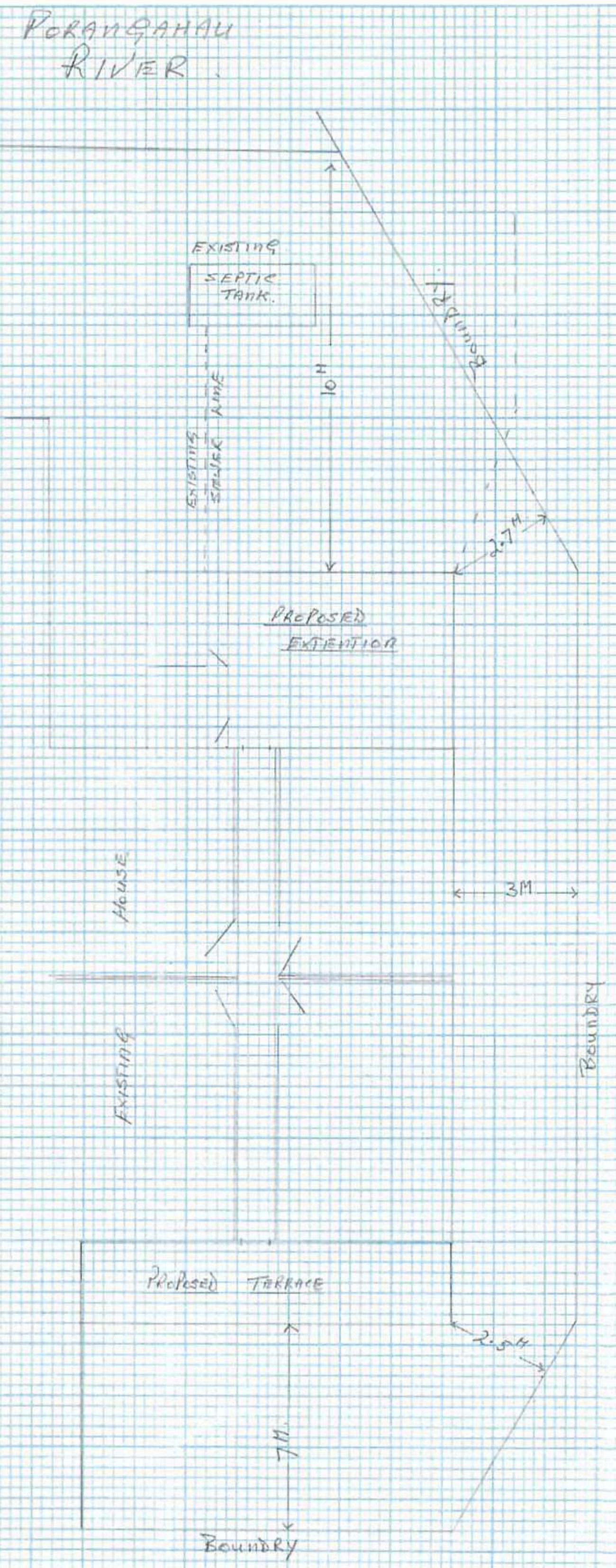


PROPOSED EXTENTION FOR
L.E. CARR LTD
ABERCROMBIE ST PORANGAHAU

14-9-79

SITE PLAN
L.E CARR LTD
ABERCROMBIE STREET
PORANGAHAU

PT SECTION 215
BLOCK XII



BUILDING PERMIT FILE

Permit No.
Building : L 072831
Plumbing or.

Owner's Name L. E. CARR

Date 24-9-79 Receipt No. 1066F.

Building Permit Fee	$ 57.—
Plumbing and Drainage Fee	$ 11.—
Building Research Fee	$ 13.—

ASSESSMENT No.....

WAIPUKURAU DISTRICT COUNCIL

WAIPUKURAU DISTRICT COUNCIL RECEIVED 22 JAN 1985 ENGINEERS OFFICE

APPLICATION FOR PLUMBING AND DRAINAGE PERMIT
BUILDING PERMIT

I hereby apply permission to erect STORE ROOMS .....

..... DESCRIPTION OF WORK (e.g. Dwelling, Alterations and additions to buildings, garage etc).

PROPOSED USE OR OCCUPANCY OF BUILDING:.....

FLOOR AREA..56 SQUARE METRES.....

THE FOLLOWING MUST BE PROVIDED AND ARE OBTAINABLE FROM RATE ASSESSMENT:

LOT: 173 174 ..... S.D. .....

D.P.: ..... VALUATION No. 10940 36700

SECTION: ..... RIDING: .....

BLOCK: ..... AREA OF PROPERTY .....

LEGAL OWNER OF PROPERTY: NAME: J & AM HUTCHISON

POSTAL ADDRESS: BOX 21 PORANGAHAU

ADDRESS OF PROPOSED WORK: AS ABOVE

NAME AND ADDRESS OF BUILDER: AS ABOVE

NAME AND ADDRESS OF PLUMBER/DRAINLAYER: .....

REGISTRATION No. .....

ESTIMATED VALUE OF BUILDING: (RESALE VALUE)		$ 5,600	FEE $ 38.00
ESTIMATED VALUE OF PLUMBING & DRAINAGE:		$.....	FEE $.....
SEWER CONNECTION			FEE $.....
WATER CONNECTION			FEE $.....
BUILDING RESEARCH LEVY			FEE $.....
SERVICES INDEMNITY FEE			FEE $.....
VEHICLE CROSSING	(Existing/Required)		FEE $.....
STORMWATER CROSSING	(Existing/Required)		FEE $.....

Please find herewith Permit Fee $.....

NAME AND ADDRESS OF APPLICANT .....

SIGNATURE OF APPLICANT .....

109400 367 - 00.

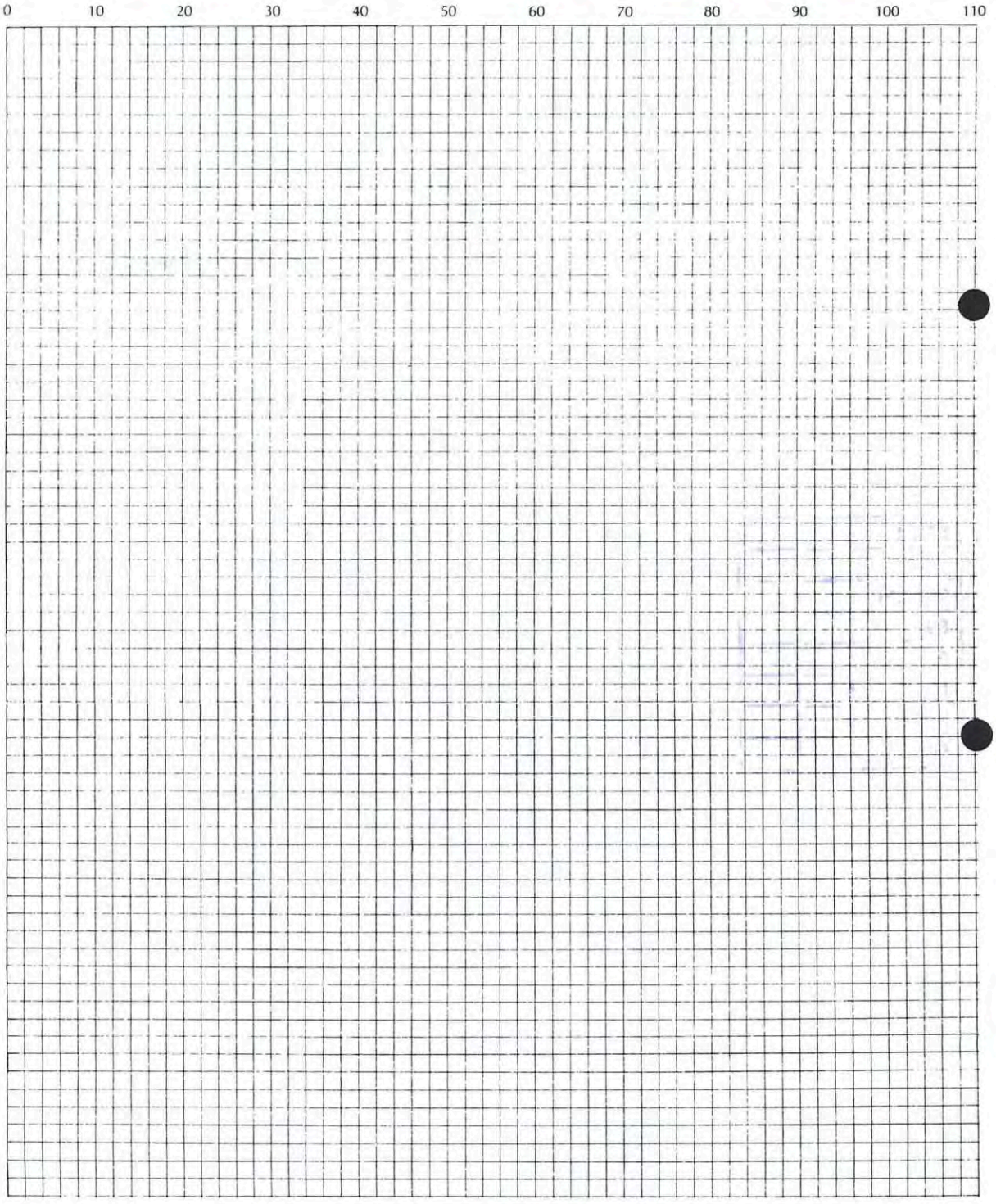
PLAN OF ALLOTMENT

Showing all existing buildings and drainage, and position of proposed buildings, sanitary fittings, gully traps, inspection pipes and ventilators, sumps, sewers, septic tanks, stormwater drains, if any, in relation to all boundaries.

New Sewage Drains: Red
Stormwater: Dotted Black

Old Drains: Black
Boundary Lines to be shown thus—.—.—.—

Scale: 1:200



IMPORTANT

THE FOLLOWING MUST ACCOMPANY THIS SITE PLAN:—

Ground Plan of Proposed Building.
Foundation Plan
Cross Section, from Footing Upwards
Elevation of One End and One Side
Specifications

ILDING PERMIT AUTHORITY

(Office Copy)

Stats. No. B 106557

No. _____

Receipt No. 93319

Date Permit Issued 25/1/85

OWNER

Name J. & A.M. HUTCHESON,

Mailing Address P.O. BOX 21,
PORANGAHAU.

BUILDER

Name AS OWNER

Mailing Address _____

PROPERTY ON WHICH BUILDING IS TO BE ERECTED/DEMOLISHED

SITE

Street No. _____

Street Name FRANKLIN ST.

Town/District PORANGAHAU

Riding "

LEGAL DESCRIPTION

Valuation Roll No. 1094 00367 00.

Lot 173, 174. D.P. _____

Section _____ Block _____

Survey District _____

DESCRIPTION OF PROPOSED WORK AND MAIN PURPOSE OF USE

GARAGE.

FLOOR AREA

Whole Sq. Metres 56.

DWELLING UNITS

Number Erected _____

ESTIMATED VALUES $

Building	5,600 -
Plumbing	
Drainage	
TOTAL	5,600

NATURE OF PERMIT (TICK BOX)

- ☐ NEW BUILDING – include dwelling added, exclude domestic garages
- ☐ FOUNDATIONS ONLY
- ☐ ALTERED, REPAIRED, EXTENDED – include conversions and resited buildings
- ☐ NEW CONSTRUCTION OTHER THAN BUILDINGS – include demolitions
- ☑ DOMESTIC GARAGES AND DOMESTIC OUTBUILDINGS

FEES APPLICABLE

Building Permit	$	Water Connection	$
Street Damage Deposit	$	Vehicle Crossing Levy	$
Building Research Levy	$	M.S. Plumbing	$
Plumbing	$		$
Drainage	$		$
Sewer Connection	$	TOTAL:	$

Receipt No. 93319.

Date of Payment 18/1/85

Authorised Officer N.G. Argyle.

Special Conditions: (In addition to those noted on reverse):

SITING — TO BE AT LEAST 2.5 METERS FROM SIDE BOUNDARY.

NOTICE TO APPLICANT

PERMISSION IS HEREBY GRANTED YOU to carry out the works as proposed in accordance with the drawings and other documents submitted, and with any conditions defined; such work to be subject to inspection at any time during progress and to be carried out in strict conformity with the requirements of the Council By-Laws

IMPORTANT — YOU ARE FULLY RESPONSIBLE for any damage done to any works such as telephone cables, water mains, gas mains, sewers, pipes, footpaths, roads or other services.

BC/MP/01A

FOR OFFICE USE: Date Received: .....

Receipt No.: .....

Building Permit No.: B/06550 ..... Fee .....

Date Issued: 26/1/85

P. and D. Permit No.: ..... Fee .....

Date Issued: .....

Building Research Levy Paid: .....

DISTRICT ENGINEER'S COMMENTS: .....

Side yard as discussed

18.01.85 043314M CHQ. $*******38.00 A

OFFICIAL RECEIPT

Receipt invalid without Cash Register Imprint

WAIPUKURAU DISTRICT COUNCIL

RECEIVED FROM: J R Hutcheson

PARTICULARS AS UNDER: Building Permit

TOWN .....

HEALTH AND BUILDING INSPECTOR'S COMMENTS: .....

OTHER COMMENTS: .....

BUILDING PERMIT FEES

Estimated value of work excluding any amount upon which drainage and plumbing fees are payable.

FIRST SCHEDULE

		Estimated Value of Work	Fees
Up to	$1000		$11.00
Over	$1000 and not exceeding	$2000.....	$22.00
Over	$2000 and not exceeding	$2500.....	$25.00
Over	$2500 and not exceeding	$3000.....	$27.00
Over	$3000 and not exceeding	$3500.....	$29.00
Over	$3500 and not exceeding	$4000.....	$31.00
Over	$4000 and not exceeding	$5000.....	$35.00
Over	$5000 and not exceeding	$6000.....	$38.00
Over	$6000 and not exceeding	$7000.....	$41.00
Over	$7000 and not exceeding	$8000.....	$44.00
Over	$8000 and not exceeding	$9000.....	$48.00
Over	$9000 and not exceeding	$10000.....	$51.00
Over	$10000 and not exceeding	$12000.....	$57.00
Over	$12000 and not exceeding	$14000.....	$63.00
Over	$14000 and not exceeding	$16000.....	$70.00
Over	$16000 and not exceeding	$18000.....	$76.00
Over	$18000 and not exceeding	$20000.....	$83.00
Over	$20000 and not exceeding	$25000.....	$99.00
Over	$25000 and not exceeding	$30000.....	$116.00
Over	$30000 and not exceeding	$35000.....	$132.00
Over	$35000 and not exceeding	$40000.....	$149.00
Over	$40000 and not exceeding	$50000.....	$171.00
Over	$50000 and not exceeding	$60000.....	$193.00
Over	$60000 and not exceeding	$70000.....	$215.00
Over	$70000 and not exceeding	$80000.....	$237.00
Over	$80000 and not exceeding	$90000.....	$259.00
Over	$90000 and not exceeding	$100000.....	$281.00
Over	$100000 and not exceeding	$120000.....	$303.00
Over	$120000 and not exceeding	$140000.....	$325.00
Over	$140000 and not exceeding	$160000.....	$347.00
Over	$160000 and not exceeding	$180000.....	$369.00
Over	$180000 and not exceeding	$200000.....	$391.00
Over	$200000 and not exceeding	$240000.....	$435.00
Over	$240000 and not exceeding	$280000.....	$479.00

For every $40,000 or part thereof in excess of $280,000 an additional fee of $22.00.

In any dispute the Engineer shall determine the value of the work in accordance with clause 2.13.2 of Council's Building By-Laws.

The above scale of fees shall also apply to the issue of a chimney permit or permission to erect an advertising hoarding or a sky-sign and to any other work requiring a permit under this chapter of this by-law (N.Z.S.S. 1900: Chapter 2: 1964) whether the permit is issued in the form of a building permit or otherwise.

SECOND SCHEDULE

For inspection required in the case of proposed structural alterations before drawings and other documents are submitted for approval.
For inspection of old timber before re-using in a new building.
For inspection that may be necessary with any building or work in respect of which no fee has otherwise been paid. $20.00
For searching drawings and other documents after completion of work. $5.00

DRAINAGE AND PLUMBING FEES

Up to $100.00 (Plumbing only).....$4.00
Up to $100.00 (Drainage only).....$6.00
$101—$500.....$11.00
$501—$1000.....$22.00
Over $1000.....$22.00
Plus $1.00 every $100.00 or part thereof.

MINIMUM DRAINAGE CHARGE.....$6.00

BUILDING RESEARCH LEVY

This levy is made in accordance with the Building Research Levy Act 1969 and the fees payable are assessed on the

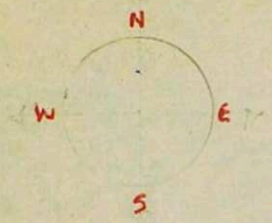
TOTAL COST OF THE BUILDING. (Estimated Value of Building and Plumbing and Drainage) See Cashier for amount of Levy.

STORMWATER DRAINAGE:

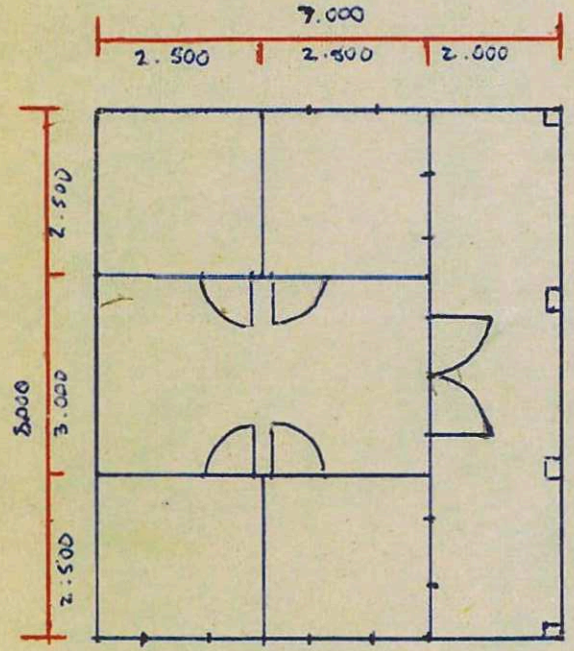
Stormwater Drainage System to be installed to comply with Plumbing and Drainage Regulations and District Council's Standard Specifications.

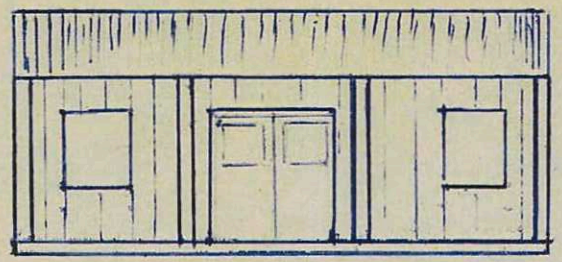
J. R. HUTCHESON & CO.,
P.O. BOX 21,
PORANGAHAU.

PROPOSED BUILDING

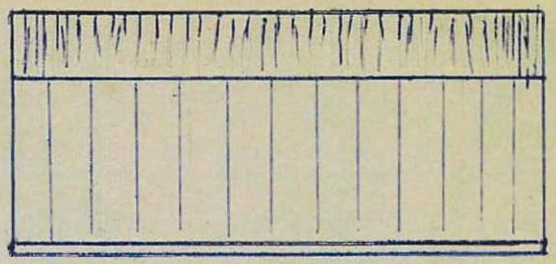


Floor Plan

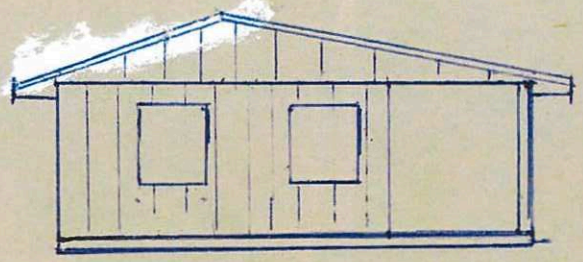




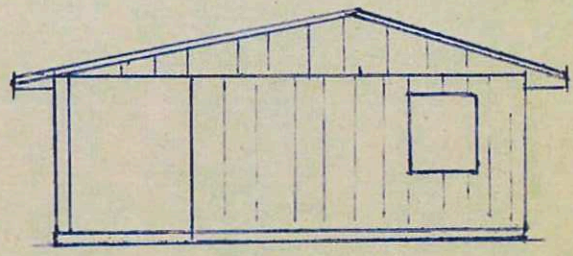
EAST ELEV



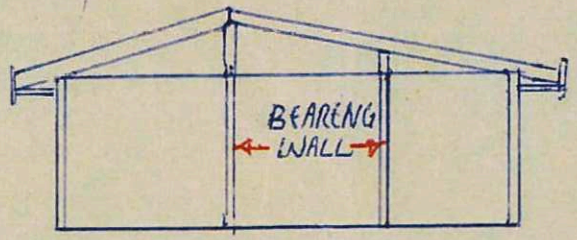
WEST ELEV

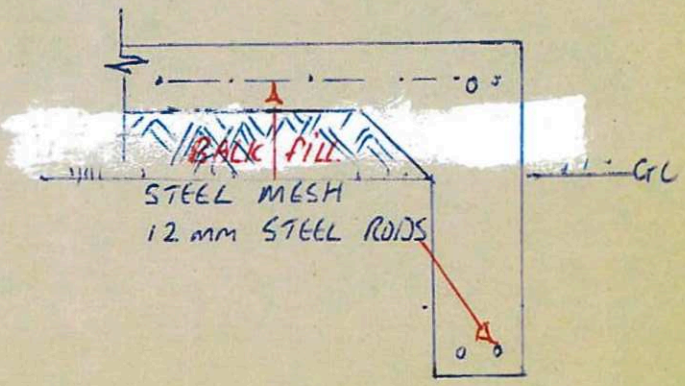


SOUTH ELEV



NORTH ELEV



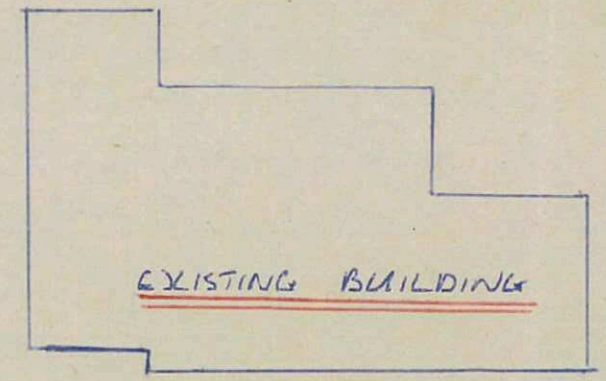


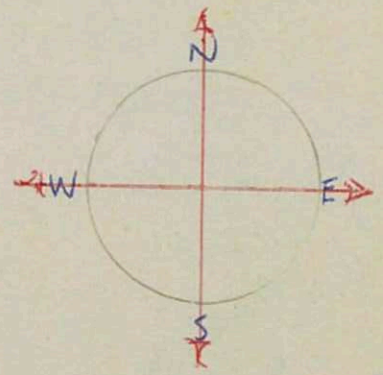
WINDOWS

ALL WINDOWS 1.000 x 1.200
DOUBLE DOOR 1.800
SINGLE DOORS .800
ALL WALLS 100 x 50
RAFTER 100 x 50
POST 200 x 200

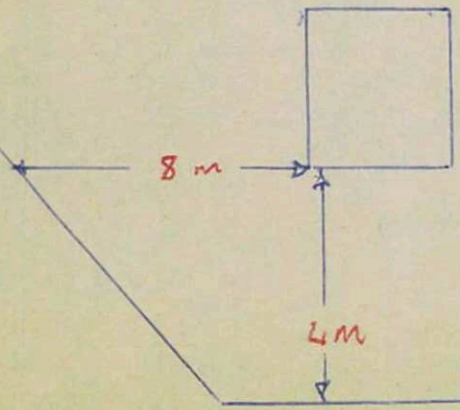
FRANKLIN STREET

NOT TO SCALE





J. R. HUTCHESON
P.O. BOX 21
PORANGAHAU
PHONE 55-166 W



DUPLICATE

BUILDING PERMIT

Refer to cover for general instructions regarding completion of this form.

I 076831

1. LOCATION AND OWNERSHIP

Local Authority: ______ Date: 24/ 9 / 79.

Number on Valuation Roll: 10990/377 Receipt No. 1066F.

Lot: ______ D.P.: ______ Section: 215 Block: XII

Site of Building: S.D. ______

Street: ______

Township or Rural District: ______

Riding: Porangahau.

OFFICE USE ONLY

Received from Homadore Ltd.

for Building Permit Fee, etc. $ 57.00

Building Research Levy $ 13.00

the sum of (Total) $ 70.00

Authorised Officer

N. le Quayle

24/ 9 /1979

Owner–Name: L. R. Carr

Full Address: P.O. Box 53, Porangahau

Builder–Name: Homadore Ltd

Full Address: P.O. Box 520, Waipukurau.

2. NATURE OF PERMIT (Tick box)

New building including separate buildings added to existing complex	☐	Repairs, alterations or extensions to an existing building.	☐	Conversion	☐	Demolition	☐

3. VALUE AND AREA OF BUILDING

		If valued at more than $20,000 state:		Total floor area (sq. metres)
Est. value of building work	$ 12,000.—	Est. commencement date	Mth. 19	33m²
Est. value of plumbing and drainage if not included in permit.	$ 400.—	Est. completion date	Mth. 19	
		Building registration No.		

4. DESCRIPTION OF BUILDING OR STRUCTURE AND MAIN PURPOSE FOR WHICH IT WILL BE USED:

Addition Dwelling

5. PREDOMINANT ACTIVITY OF OWNER (See Cover Instructions):

Special Conditions: (In addition to those listed on the Reverse)

Permission is hereby granted you to carry out the works as proposed in accordance with the drawings and other documents submitted; such work to be subject at any time during progress to inspection, and to be carried out in strict conformity with the requirements of the council bylaws, and subject to the builder taking full responsibility for any damage done to any works such as telephone cables, power cables, water mains, sewers, pipes, footpaths, roads, or other services.

Stats.–B.C./MP/01 N. le Quayle

Issuing Officer. 24/ 9 /79.

90872/7/77

I076831

~~Paid~~ Found 24/9/79 ASSESSMENT No.

WAIPUKURAU DISTRICT COUNCIL

WAIPUKURAU DISTRICT COUNCIL RECEIVED 19 SEP 1979 FILE ENGINEERS OFFICE

APPLICATION FOR (PLUMBING AND DRAINAGE PERMIT
(BUILDING PERMIT

I hereby apply for permission to erect EXTENTION FOR KITCHEN/BATHROOM AND LAUNDRY. DESCRIPTION OF WORK (e.g. Dwelling, Alterations and additions to buildings, garage etc).

PROPOSED USE OR OCCUPANCY OF BUILDING: DWELLING.

FLOOR AREA: 33 SQR METERS.

THE FOLLOWING MUST BE PROVIDED AND ARE OBTAINABLE FROM RATE ASSESSMENT:

LOT:

D.P.:

SECTION: 215

BLOCK: XII

S.D.

VALUATION No. 10940/377.

RIDING:

AREA OF PROPERTY 971 SQ M.

LEGAL OWNER OF PROPERTY: NAME: L. F. CARR.

POSTAL ADDRESS: P.O. BOX 53. PORANGAHAU.

ADDRESS OF PROPOSED WORK: ABERCROMBIE ST. PORANGAHAU.

NAME AND ADDDRESS OF BUILDER HOMEDIEC LTD. P.O. BOX 320. WAIPUKURAU.

NAME AND ADDRESS OF PLUMBER/DRAINLAYER: B. TURFREY. Cook ST. WAIPUKURAU.

REGISTRATION No.

DE	✓
ADE	
SEA I	
SEA II	
W SUPT	
ES	
PO	
INSPECTOR	
STOREMAN	
FILE	✓

ESTIMATED VALUE OF BUILDING: (RESALE VALUE)	$ ~~24,000~~ 12,000	FEE $ ~~40.00~~ 57.00
ESTIMATED VALUE OF PLUMBING & DRAINAGE:	$ 400.00	FEE $ 4.00 + 11.00
SEWER CONNECTION		FEE $
WATER CONNECTION		FEE $
BUILDING RESEARCH LEVY		FEE $ 13.00
SERVICES INDEMNITY FEE		FEE $
VEHICLE CROSSING	(Existing/~~Required~~)	FEE $
STORMWATER CROSSING	(Existing/~~Required~~)	FEE $

Please find herewith Permit Fee $ 81.00

NAME AND ADDDRESS OF APPLICANT D. CORP 14 TUTANEKAI ST. WAIPUKURAU.

SIGNATURE OF APPLICANT

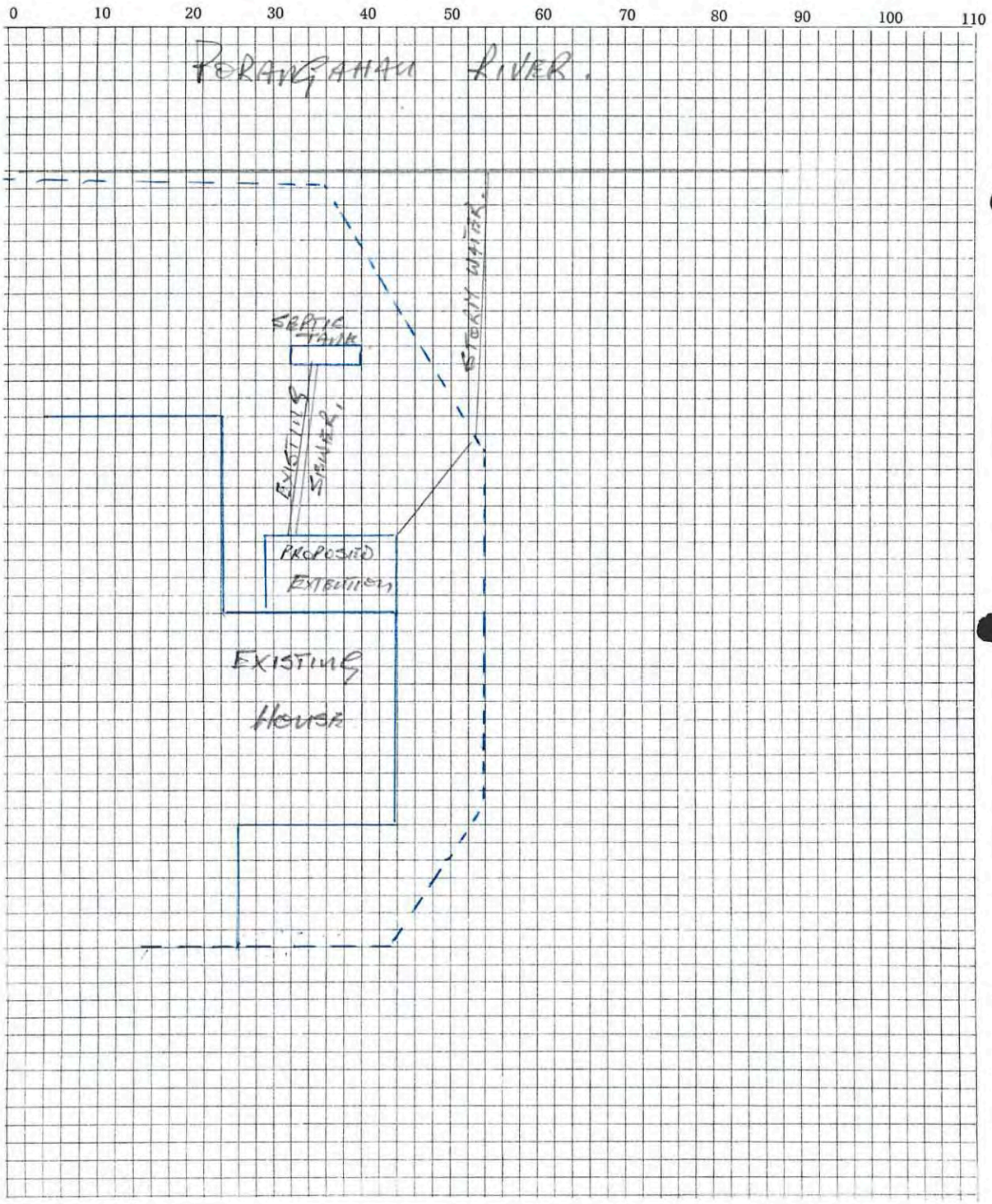
PLAN OF ALLOTMENT

Showing all existing buildings and drainage, and position of proposed buildings, sanitary fittings, gully traps, inspection pipes and ventilators, sumps, sewers, septic tanks, stormwater drains, if any, in relation to all boundaries.

New Sewage Drains: Red
Stormwater: Dotted Black

Old Drains: Black
Boundary Lines to be shown thus:—.—.—.—

Scale: 1:200



IMPORTANT

THE FOLLOWING MUST ACCOMPANY THIS SITE PLAN:—

Ground Plan of Proposed Building.
Foundation Plan
Cross Section, from Footing Upwards
Elevation of One End and One Side
Specifications

FOR OFFICE USE: Date Received:

Receipt No.:

Building Permit No.: Fee

Date Issued:

P. and D. Permit No.: Fee

Date Issued:

Building Research Levy Paid:

DISTRICT ENGINEER'S COMMENTS:

Structurally OK

8

HEALTH AND BUILDING INSPECTOR'S COMMENTS:

WAIPUKURAU DISTRICT COUNCIL

1066 F Waipukurau, 17.9.79

Received from Homedec Developments

the sum of Eighty One dollars only

in payment of Building Permits $ 81:00

L.E. Lake Porangahau

F. P. SPINLEY, County Clerk, per L.M. Fisher

SERVICES INDEMNITY FEE:

I certify that .... has completed a building .... in .... Street.

I recommend/do not recommend that the indemnity sum of $ .... be refunded.

Date of Inspection: .... District Engineer:

Comments:

Application for Work to be Carried Out

NAME .... Lot

HOUSE No. .... D.P.

STREET

Description of Work Required	(tick)	PAID
Sewer Connection	☐	
Water Connection	☐	
Vehicle Crossing	☐	
Stormwater Crossing	☐	
Other (Specify)		

BUILDING INSPECTOR: .... Date:

BUILDING PERMIT FEES

Estimated value of work excluding any amount upon which drainage and plumbing fees are payable.

FIRST SCHEDULE

Estimated Value of Work			Fees
Not exceeding	$20		.50
$21 and not exceeding		$200	$1.00
$201 and not exceeding		$400	$2.00
$401 and not exceeding		$600	$3.00
$601 and not exceeding		$800	$4.00
$801 and not exceeding		$1000	$5.00
$1001 and not exceeding		$1200	$6.00
$1201 and not exceeding		$1400	$7.00
$1401 and not exceeding		$1600	$8.00
$1601 and not exceeding		$1800	$9.00
$1801 and not exceeding		$2000	$10.00
$2001 and not exceeding		$2500	$12.00
$2501 and not exceeding		$3000	$14.00
$3001 and not exceeding		$3500	$16.00
$3501 and not exceeding		$4000	$18.00
$4001 and not exceeding		$5000	$21.00
$5001 and not exceeding		$6000	$24.00
$6001 and not exceeding		$7000	$27.00
$7001 and not exceeding		$8000	$30.00
$8001 and not exceeding		$9000	$33.00
$9001 and not exceeding		$10000	$36.00
$10001 and not exceeding		$12000	$40.00
$12001 and not exceeding		$14000	$44.00
$14001 and not exceeding		$16000	$48.00
$16001 and not exceeding		$18000	$52.00
$18001 and not exceeding		$20000	$56.00
$20001 and not exceeding		$25000	$64.00
$25001 and not exceeding		$30000	$72.00
$30001 and not exceeding		$35000	$80.00
$35001 and not exceeding		$40000	$88.00
$40001 and not exceeding		$50000	$98.00

For Fees over $50,000 refer to Council's By-Laws.

In any dispute the Engineer shall determine the value of the work in accordance with clause 2.13.2 of Council's Building By-Laws.

The above scale of fees shall also apply to the issue of a chimney permit or permission to erect an advertising hoarding or a sky-sign and to any other work requiring a permit under this chapter of this by-law (N.Z.S.S. 1900: Chapter 2: 1964) whether the permit is issued in the form of a building permit or otherwise.

PLUMBING AND DRAINAGE FEES

SECOND SCHEDULE

Not exceeding	$10		.10
$11 not exceeding		$20	.25
$21 not exceeding		$100	.50
$101 not exceeding		$200	$2.00
$201 not exceeding		$300	$3.00
$301 not exceeding		$400	$4.00

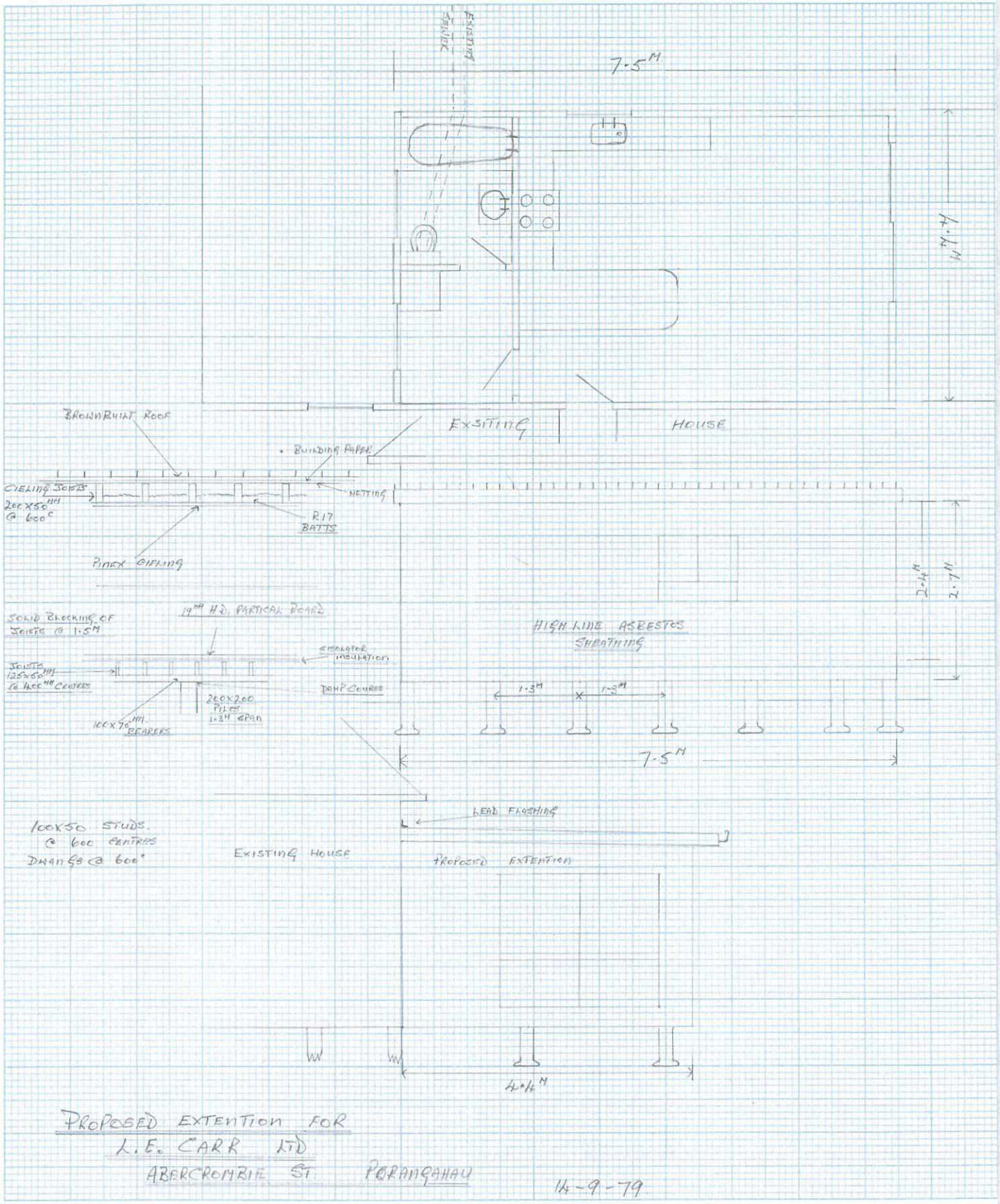
Over $400 = $4.00 plus $1.00 for every $200 or part thereof.

BUILDING RESEARCH LEVY

This levy is made in accordance with the Building Research Levy Act 1969 and the fees payable are assessed on the **TOTAL COST OF THE BUILDING** (Estimated Value of Building and Plumbing and Drainage) See Cashier for amount of Levy.

STORMWATER DRAINAGE:

Stormwater Drainage System to be installed to comply with Plumbing and Drainage Regulations and District Council's Standard Specifications.



PROPOSED EXTENTION FOR
L.E. CARR LTD
ABERCROMBIE ST PORANGAHAU

14-9-79

PORANGAHAU RIVER.

SITE PLAN

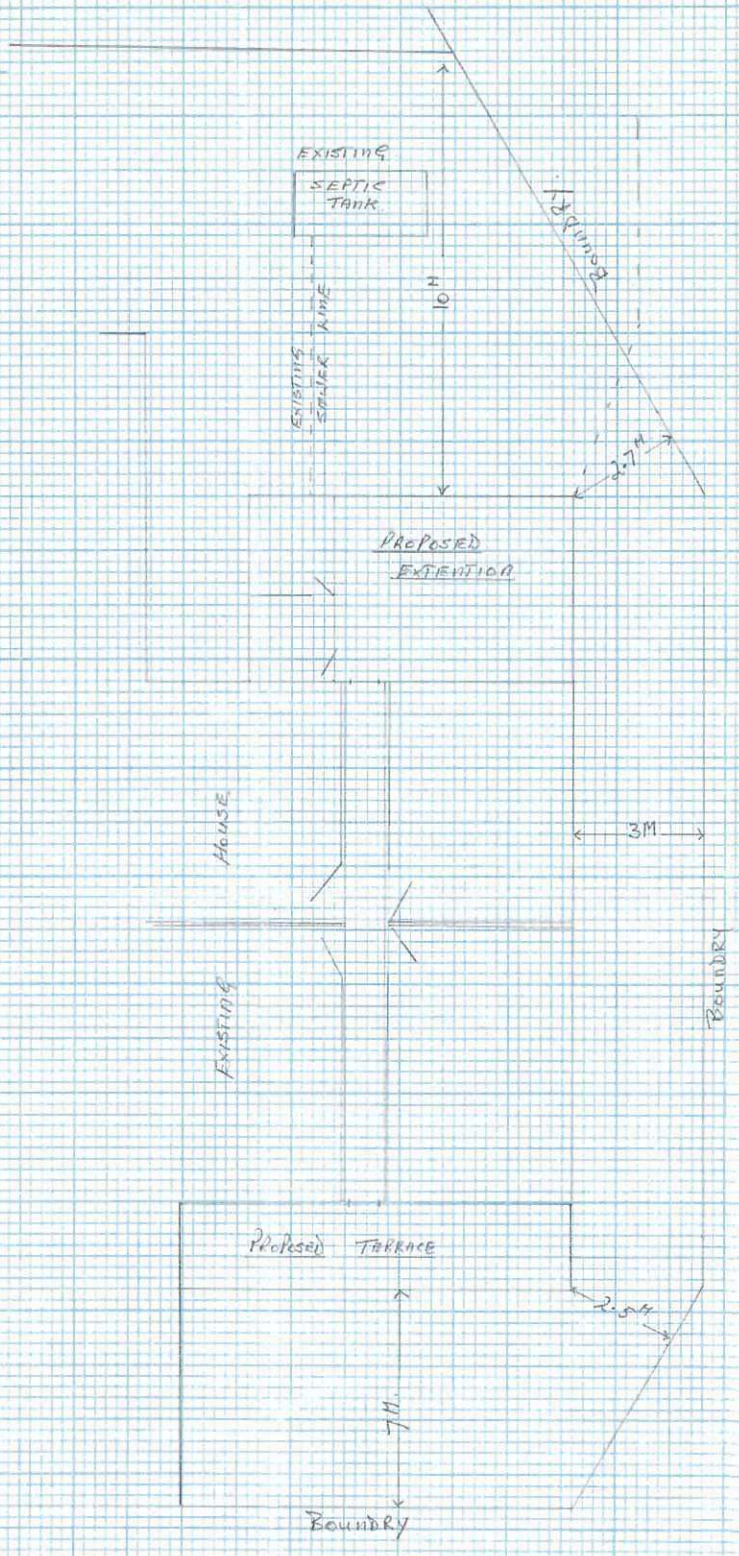
L.E CARR LTD

ABERCROMBIE STREET

PORANGAHAU

PT SECTION 215

BLOCK XII



ASSESSMENT No. ....

WAIPUKURAU DISTRICT COUNCIL

WAIPUKURAU DISTRICT COUNCIL RECEIVED 22 JAN 1985 ENGINEERS OFFICE

APPLICATION FOR PLUMBING AND DRAINAGE PERMIT / BUILDING PERMIT

I hereby apply permission to erect ... STORE ROOMS ...

... DESCRIPTION OF WORK (e.g. Dwelling, Alterations and additions to buildings, garage etc).

PROPOSED USE OR OCCUPANCY OF BUILDING: ...

FLOOR AREA ... 56 square METRES ...

THE FOLLOWING MUST BE PROVIDED AND ARE OBTAINABLE FROM RATE ASSESSMENT:

LOT: 173 174	S.D.
D.P.:	VALUATION No. 10940 36700
SECTION:	RIDING:
BLOCK:	AREA OF PROPERTY

LEGAL OWNER OF PROPERTY: NAME: J & AM HUTCHESON

POSTAL ADDRESS: BOX 21 PORANGAHAU

ADDRESS OF PROPOSED WORK: AS ABOVE

NAME AND ADDRESS OF BUILDER: AS ABOVE

NAME AND ADDRESS OF PLUMBER/DRAINLAYER: ...

REGISTRATION No. ...

ESTIMATED VALUE OF BUILDING: (RESALE VALUE)		$ 5,600	FEE $ 38.00
ESTIMATED VALUE OF PLUMBING & DRAINAGE:		$	FEE $
SEWER CONNECTION			FEE $
WATER CONNECTION			FEE $
BUILDING RESEARCH LEVY			FEE $
SERVICES INDEMNITY FEE			FEE $
VEHICLE CROSSING	(Existing/Required)		FEE $
STORMWATER CROSSING	(Existing/Required)		FEE $

Please find herewith Permit Fee $ ...

NAME AND ADDRESS OF APPLICANT ...

SIGNATURE OF APPLICANT ... [signature]

10940 367 - 00.

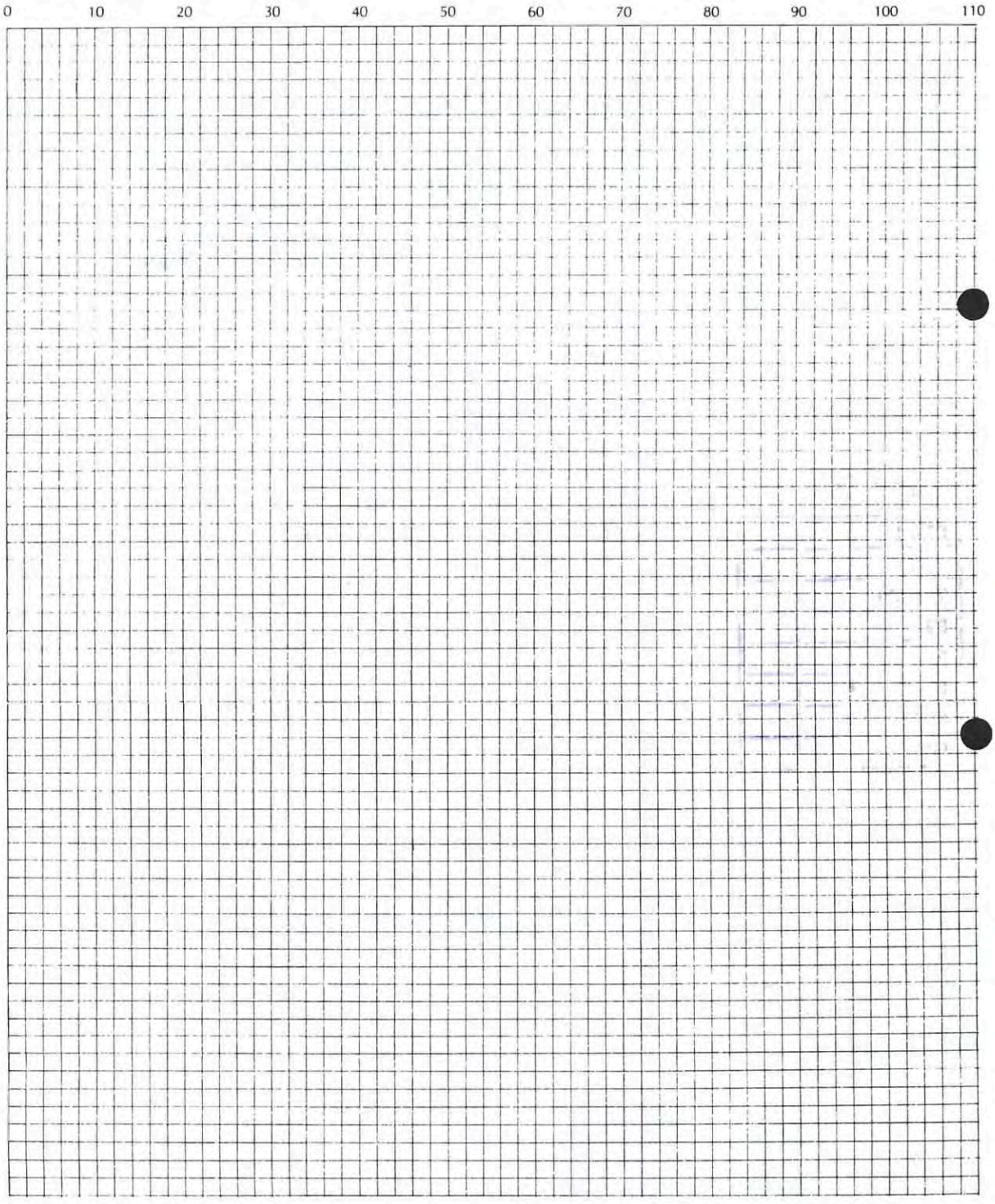
PLAN OF ALLOTMENT

Showing all existing buildings and drainage, and position of proposed buildings, sanitary fittings, gully traps, inspection pipes and ventilators, sumps, sewers, septic tanks, stormwater drains, if any, in relation to all boundaries.

New Sewage Drains: Red
Stormwater: Dotted Black

Old Drains: Black
Boundary Lines to be shown thus—.—.—.—

Scale: 1:200



IMPORTANT

THE FOLLOWING MUST ACCOMPANY THIS SITE PLAN:—

Ground Plan of Proposed Building.
Foundation Plan
Cross Section, from Footing Upwards
Elevation of One End and One Side
Specifications

ILDING PERMIT AUTHORITY

(Office Copy)

Stats. No. B 106557

No. _____

Receipt No. 93319

Date Permit Issued 25/1/85

OWNER

Name J. & A.M. HUTCHESON,

Mailing Address P.O. BOX 21,
PORANGAHAU.

BUILDER

Name AS OWNER

Mailing Address _____

PROPERTY ON WHICH BUILDING IS TO BE ERECTED/DEMOLISHED

SITE

Street No. _____

Street Name FRANKLIN ST.

Town/District PORANGAHAU

Riding "

LEGAL DESCRIPTION

Valuation Roll No. 1094 00367 00.

Lot 173, 174. D.P. _____

Section _____ Block _____

Survey District _____

DESCRIPTION OF PROPOSED WORK AND MAIN PURPOSE OF USE

GARAGE.

FLOOR AREA

Whole Sq. Metres 56.

DWELLING UNITS

Number Erected _____

ESTIMATED VALUES $

Building	5,600 -
Plumbing	
Drainage	
TOTAL	5,600

NATURE OF PERMIT (TICK BOX)

- ☐ NEW BUILDING – include dwelling added, exclude domestic garages
- ☐ FOUNDATIONS ONLY
- ☐ ALTERED, REPAIRED, EXTENDED – include conversions and resited buildings
- ☐ NEW CONSTRUCTION OTHER THAN BUILDINGS – include demolitions
- ☑ DOMESTIC GARAGES AND DOMESTIC OUTBUILDINGS

FEES APPLICABLE

Building Permit	$	Water Connection	$
Street Damage Deposit	$	Vehicle Crossing Levy	$
Building Research Levy	$	M.S. Plumbing	$
Plumbing	$		$
Drainage	$		$
Sewer Connection	$	TOTAL:	$

Receipt No. 93314.

Date of Payment 18/1/85

Authorised Officer N.G. Argyle

Special Conditions: (In addition to those noted on reverse):

SITING — TO BE AT LEAST 2.5 METERS FROM SIDE BOUNDARY.

NOTICE TO APPLICANT

PERMISSION IS HEREBY GRANTED YOU to carry out the works as proposed in accordance with the drawings and other documents submitted, and with any conditions defined; such work to be subject to inspection at any time during progress and to be carried out in strict conformity with the requirements of the Council By-Laws

IMPORTANT — YOU ARE FULLY RESPONSIBLE for any damage done to any works such as telephone cables, water mains, gas mains, sewers, pipes, footpaths, roads or other services.

BC/MP/01A

FOR OFFICE USE: Date Received: .....

Receipt No.: .....

Building Permit No.: B/06550 ..... Fee .....

Date Issued: 26/1/85

P. and D. Permit No.: ..... Fee .....

Date Issued: .....

Building Research Levy Paid: .....

DISTRICT ENGINEER'S COMMENTS: .....

side yard as discussed

18.01.85 043314M CHQ. $*******38.00 A

OFFICIAL RECEIPT

Receipt invalid without Cash Register Imprint

WAIPUKURAU DISTRICT COUNCIL

RECEIVED FROM: J R Hutcheson

PARTICULARS AS UNDER: Building Permit

TOWN .....

HEALTH AND BUILDING INSPECTOR'S COMMENTS: .....

OTHER COMMENTS: .....

BUILDING PERMIT FEES

Estimated value of work excluding any amount upon which drainage and plumbing fees are payable.

FIRST SCHEDULE

		Estimated Value of Work	Fees
Up to	$1000		$11.00
Over	$1000 and not exceeding	$2000.....	$22.00
Over	$2000 and not exceeding	$2500.....	$25.00
Over	$2500 and not exceeding	$3000.....	$27.00
Over	$3000 and not exceeding	$3500.....	$29.00
Over	$3500 and not exceeding	$4000.....	$31.00
Over	$4000 and not exceeding	$5000.....	$35.00
Over	$5000 and not exceeding	$6000.....	$38.00
Over	$6000 and not exceeding	$7000.....	$41.00
Over	$7000 and not exceeding	$8000.....	$44.00
Over	$8000 and not exceeding	$9000.....	$48.00
Over	$9000 and not exceeding	$10000.....	$51.00
Over	$10000 and not exceeding	$12000.....	$57.00
Over	$12000 and not exceeding	$14000.....	$63.00
Over	$14000 and not exceeding	$16000.....	$70.00
Over	$16000 and not exceeding	$18000.....	$76.00
Over	$18000 and not exceeding	$20000.....	$83.00
Over	$20000 and not exceeding	$25000.....	$99.00
Over	$25000 and not exceeding	$30000.....	$116.00
Over	$30000 and not exceeding	$35000.....	$132.00
Over	$35000 and not exceeding	$40000.....	$149.00
Over	$40000 and not exceeding	$50000.....	$171.00
Over	$50000 and not exceeding	$60000.....	$193.00
Over	$60000 and not exceeding	$70000.....	$215.00
Over	$70000 and not exceeding	$80000.....	$237.00
Over	$80000 and not exceeding	$90000.....	$259.00
Over	$90000 and not exceeding	$100000.....	$281.00
Over	$100000 and not exceeding	$120000.....	$303.00
Over	$120000 and not exceeding	$140000.....	$325.00
Over	$140000 and not exceeding	$160000.....	$347.00
Over	$160000 and not exceeding	$180000.....	$369.00
Over	$180000 and not exceeding	$200000.....	$391.00
Over	$200000 and not exceeding	$240000.....	$435.00
Over	$240000 and not exceeding	$280000.....	$479.00

For every $40,000 or part thereof in excess of $280,000 an additional fee of $22.00.

In any dispute the Engineer shall determine the value of the work in accordance with clause 2.13.2 of Council's Building By-Laws.

The above scale of fees shall also apply to the issue of a chimney permit or permission to erect an advertising hoarding or a sky-sign and to any other work requiring a permit under this chapter of this by-law (N.Z.S.S. 1900: Chapter 2: 1964) whether the permit is issued in the form of a building permit or otherwise.

SECOND SCHEDULE

For inspection required in the case of proposed structural alterations before drawings and other documents are submitted for approval.
For inspection of old timber before re-using in a new building.
For inspection that may be necessary with any building or work in respect of which no fee has otherwise been paid. $20.00
For searching drawings and other documents after completion of work. $5.00

DRAINAGE AND PLUMBING FEES

Up to $100.00 (Plumbing only).....$4.00
Up to $100.00 (Drainage only).....$6.00
$101—$500 .....$11.00
$501—$1000.....$22.00
Over $1000.....$22.00
Plus $1.00 every $100.00 or part thereof.

MINIMUM DRAINAGE CHARGE.....$6.00

BUILDING RESEARCH LEVY

This levy is made in accordance with the Building Research Levy Act 1969 and the fees payable are assessed on the

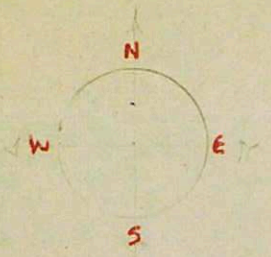
TOTAL COST OF THE BUILDING. (Estimated Value of Building and Plumbing and Drainage) See Cashier for amount of Levy.

STORMWATER DRAINAGE:

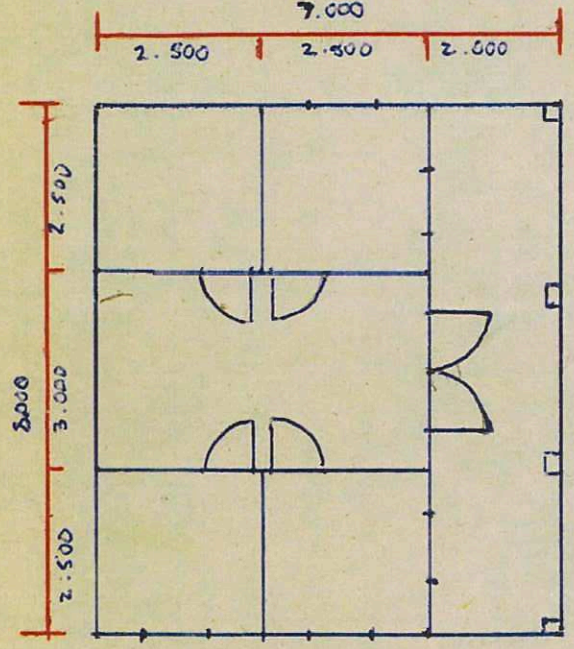
Stormwater Drainage System to be installed to comply with Plumbing and Drainage Regulations and District Council's Standard Specifications.

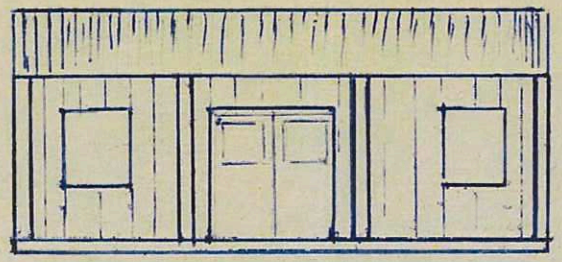
J. R. HUTCHESON & CO.,
P.O. BOX 21,
PORANGAHAU.

PROPOSED BUILDING

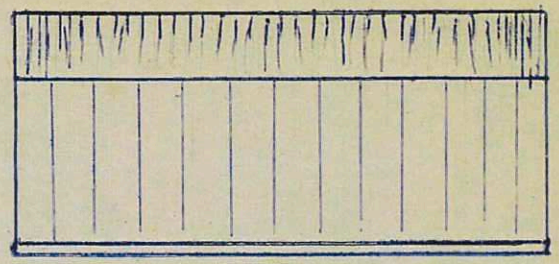


Floor Plan

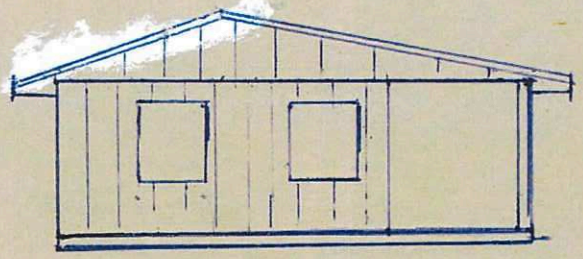




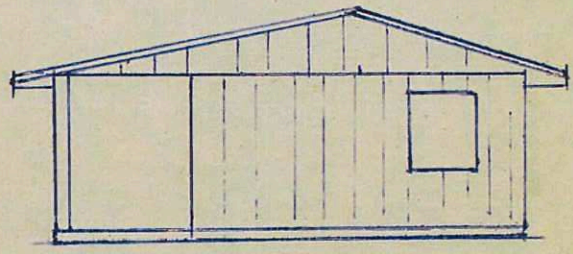
EAST ELEV



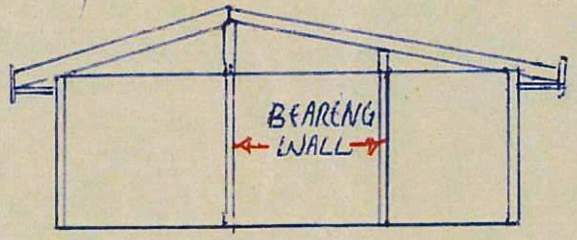
WEST ELEV

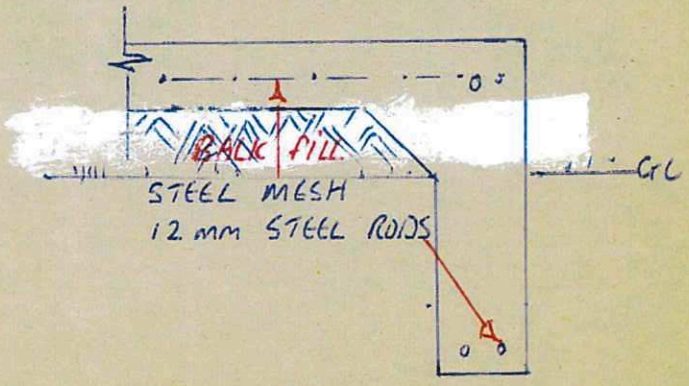


SOUTH ELEV



NORTH ELEV



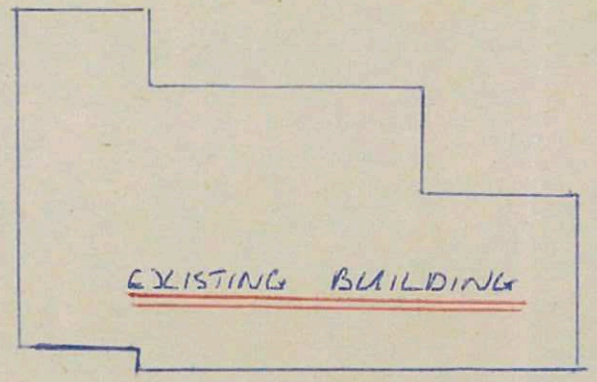


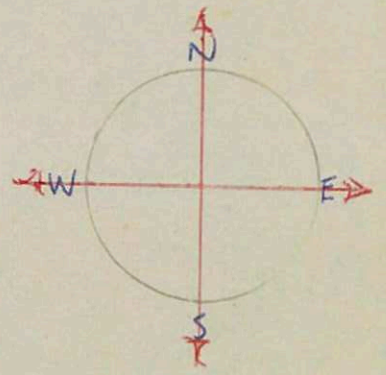
WINDOWS

ALL WINDOWS 1.000 x 1.200
DOUBLE DOOR 1.800
SINGLE DOORS .800
ALL WALLS 100 x 50
RAFTER 100 x 50
POST 200 x 200

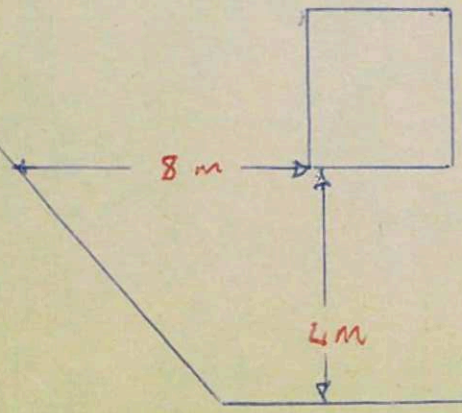
FRANKLIN STREET

NOT TO SCALE





J. R. HUTCHESON
P.O. BOX 21
PORANGAHAU
PHONE 55-166 W



File No: 1094037800

Hazards and Contamination

Hazard Register

New Site ☑ Amendment to existing site ☐ (Circle choice)

Street No:		Street: Keppel Street			
Town:	Waipukurau	Waipawa	Otane	Takapau	Porangahau
	Te Paerahi	Kairakau	Rural		
Owner: CHBDC				Valuation No: 1094038300	
Legal desription: Sec 7 BLK XII Porangahau SD					
Building consent no:					
Resource consent no:					

Site Information:

☐ **Contamination:**

Asbestos	Bio-waste	Chemical waste	Dosing Strip
Offal	Petroleum products	Sewage holding tanks	
Effluent ponds	Timber chemicals		Sheep dip

☐ **Fill:**

Rubbish fill	Mixed concrete fill	Sawdust	Engineered fill

☐ **Flooding:**

Ponding	Flowing water	General flooding	HBRC flood zone

☐ **Industries:**

Bulk storage tanks	Car wreckers	Dry cleaners	Garages
Shop/paint/workshop	Taxidermy	Service station	

☑ **Types of landfill:**

Closed landfill	Current land fill	Private dump site	Transfer station

☐ **Quarry:**

Old gravel pit	Current gravel pit	General quarry

☐ **Unstable ground:**

Slip	Benonite

☐ **Data verified by:** _____

☑ **Data unverified**

Notes:

Data collected by: JO Date: 16/12/08