Birch
Planning
Surveying
Engineering
LAND DEVELOPMENT CONSULTANTS

INFRASTRUCTURE REPORT

To:

AUCKLAND COUNCIL

On behalf of:

SR AND DS SMITH

70A & 70B Lisle Farm Drive, Pukekohe

SEPTEMBER 2023

BSL REF: 4553

REVISION: F

REPORT PREPARED BY	REPORT REVIEWED BY	REPORT AUTHORISED BY
		
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APPENDICES

1 EXECUTIVE SUMMARY

The following infrastructure report is submitted in support of a request for private plan change to Auckland Council. The applicant is SR and DS Smith. The plan change seeks to rezone the land at, 70A and 70B Lisle Farm Drive, Pukekohe, from Future Urban Zone to Residential – Mixed Housing Urban Zone to enable the development of the 18.65 ha site.

This report outlines concept earthworks , the anticipated three waters (stormwater, wastewater and water supply) infrastructure and upgrades, as well as addressing roading and service utilities (power, telecom and gas supply) to support the development. A summary of the report is outlined below:

- Land Development Engineering (LDE) has provided a geotechnical assessment which is submitted with this infrastructure report as part of the plan change application. The report identified several geotechnical considerations and concluded that the site is geotechnically suitable for the extent of development enabled by the proposed plan change but further detailed investigation will be required at the further consent stage.
- Site specific sediment and erosion controls, consistent with Auckland Council Guideline Document 2016/005 (GD05), will be required to protect the surrounding environment during earthwork activities.
- The design of the roading network will be carried out in accordance with Austroads Design Manual and the Auckland Transport Design Manual (AT-TDM), with the speed environment from 30km/h to 50km/h.
- Existing ecological/wetland/bush areas will be retained.
- Stormwater treatment and hydrology mitigation and overland flow paths to mitigate the effects of the development and to protect the development from adverse stormwater effects for up to the 1% AEP storm event.
- Whilst there are some known downstream flooding concerns, urbanisation of the proposed plan change area can occur without creating any additional downstream flooding effects. This is achieved by maintaining the pre-development runoff flowrates for up to the 1% AEP storm event. Protection of the receiving stream environment is achieved through extending the SMAF Flow 1 controls and hydrological mitigation to encompass the proposed Plan Change Area. This is also outlined in more detail in the Proposed Stormwater Management Plan.
- Wastewater reticulation can be provided for the proposed plan change area, through an extension of the existing wastewater network. Pump stations and rising mains are proposed due to the topographical constraints. Further consultation and detailed design will be undertaken in conjunction with Watercare Services Limited. WaterCare have advised that offsite upgrades are required to ensure sufficient downstream capacity to accommodate the development. These include the completion of the Franklin Pump Station upgrade and proposed upgrade to Colin Lawrie Local Pump Station. Once these have been completed there will be sufficient capacity to service the proposed development.
- Water reticulation can be provided for the proposed plan change area, through an extension of the existing watermain. Watercare Services Limited has confirmed that there is sufficient capacity via the existing watermain to service the development.
- Power, Telecommunication and Gas Supply networks are present in Pukekohe area. The design details for upgrading and extensions to the existing utility networks will be confirmed and by the utility providers.

2 INTRODUCTION

The purpose of this report is to provide an assessment of the infrastructure associated with the proposed private plan change request at, 70A & 70B Lisle Farm Drive, Pukekohe, Auckland. The information provided herein relates to the earthworks, stormwater, wastewater, water supply, access, and other infrastructure services. The report is prepared in support of a plan change application. Final design plans and calculations will be provided at Resource Consent stage as required.

Table 1 Overview of Application

LEGAL DESCRIPTION	
The legal description of the land parcel is as follows:	
Appellation:	Lot 2 DP 143272 & Lot 1 DP 143272
Title Reference:	NA84D/711 & NA84D/710
Parcel Area:	18.65 Ha (more or less)
AUP(OP) Zoning:	Future Urban Zone

SITE DESCRIPTION

The site is predominantly covered in grassed pasture with an existing dwelling and shed currently on the site. The subject property is surrounded by residential properties on the western and southern sides, and adjoin properties zoned as Future Urban Zone and Mixed Rural Zone on the eastern and south eastern sides.

There is an existing ridge line across the subject site from the west to the east and the topography generally slopes down towards the three steep sided gullies. Existing ground elevations range from approximately RL 95.0m to RL 43.0m. Refer to the topography plan undertaken by Birch Land Development Consultants.

There are three existing well-established areas of indigenous vegetation which will be protected and vested in Auckland Council as Open Space Reserves. The largest of these is located at the north eastern corner zoning approximately 4.1653Ha, and other two are located along the southern boundary zoning approximately 6335m² and 3083m² respectively.

The existing properties gain access are accessed from Lisle Farm Drive, via direct road frontage and appurtenant Right of Way. There is also direct road frontage onto William Andrew Road on the northern boundary.

The southern end of the subject site is adjacent to a large residential zoned property which is currently under development. The earthwork consent reference number is BUN60406121. Careful remediation and management of this area will be required to avoid risk of instability.

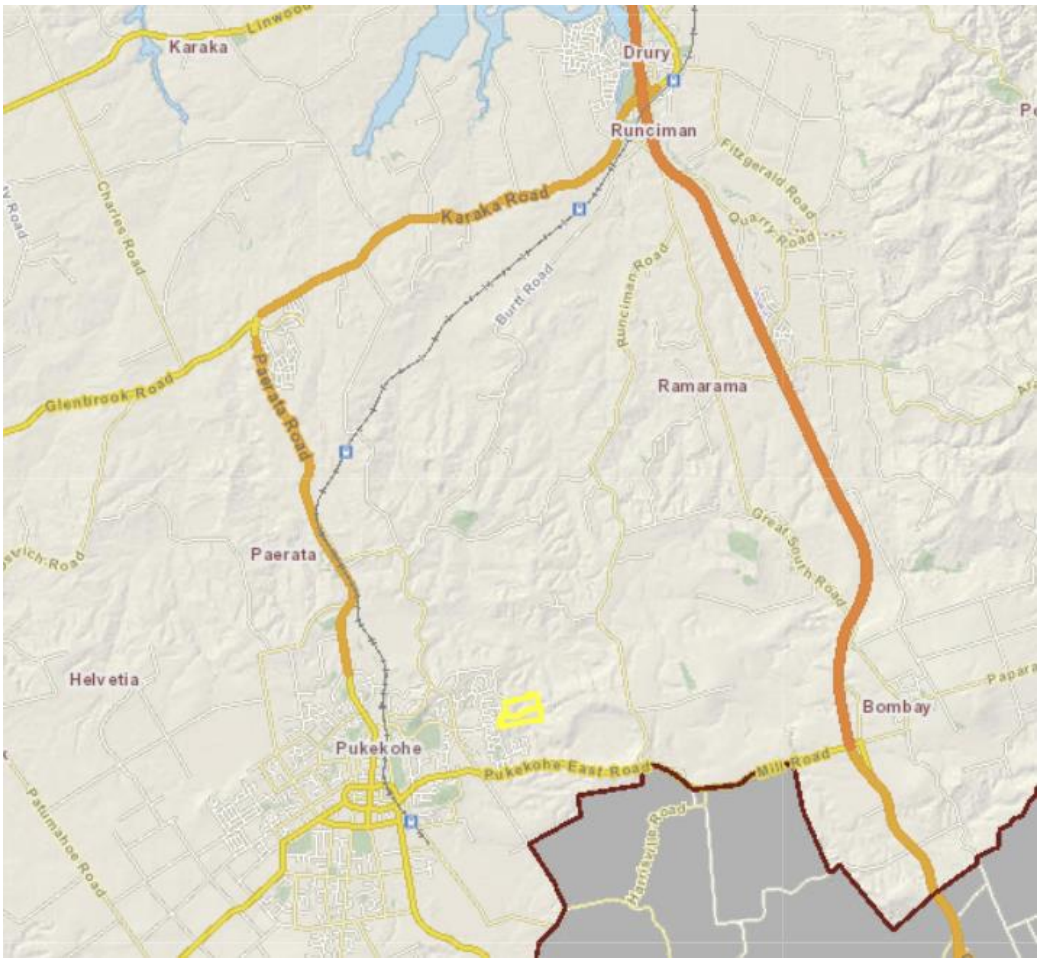


Figure 1 Site Locality Plan (Derived from Geomaps on 28/07/2023)

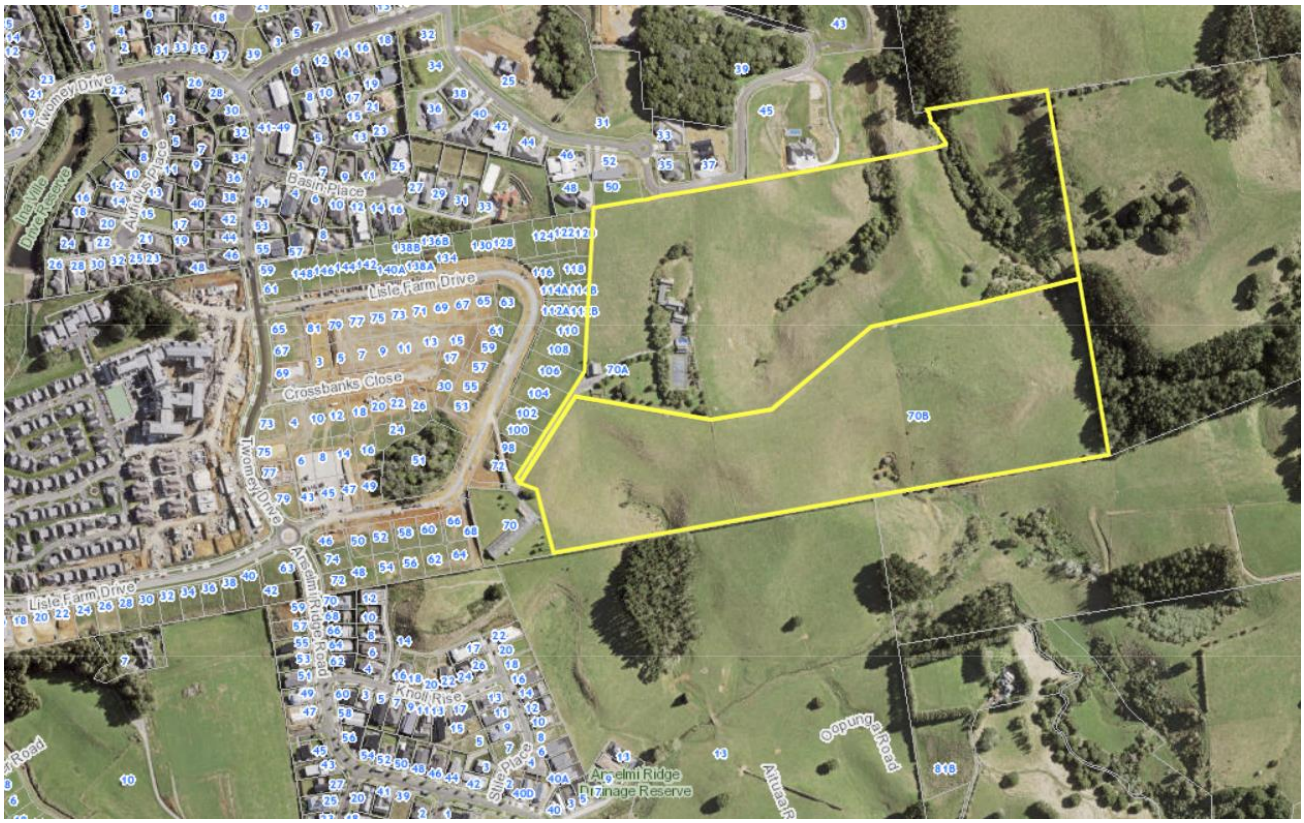


Figure 2 Private Plan Change Area (Derived from Geomaps on 28/07/2023)

3 PROPOSAL

The Private Plan Change aims to facilitate the development of the site into a urban development with approximately 192 residential sites. The concept subdivision shows a range of residential sites ranging in size from 400-600m². The proposal also seeks to protect, preserve and enhance the existing streams, wetlands and the bush & vegetation in three open space reserves. These reserves will also incorporate opportunities for recreational facilities to be established into the landscape design, offering additional amenities for residents.

A concept development master plan (refer to **Figure 3**) has been prepared by Birch Land Development Consultants and Urban Designer Ian Munro for the Private Plan Change request. Extensive efforts have been made to establish a feasible earthworks model, with the primary objective to ensure the proposed roading grades conform to Auckland Transport (AT) design requirements to inform development feasibility. The masterplan has undergone multiple revisions to optimize the layout of roads and lots, ensuring an efficient and achievable structure for future development and construction. While this layout may not be adopted by the eventual developer of the land, this represents a viable subdivision and road layout that is consistent with the intensity and character of recent development to the south and west.

Figure 3 Concept Development Master Plan

4 UTILITIES REPORT

4.1 EARTHWORKS

Earthworks will be required for the proposed development of the plan change area including removal of the existing structures and improvements, topsoil strip, bulk earthworks, and recontouring across the site. To improve contours to satisfy the preliminary design and layout requirement for the development. Bulk earthworks will be required for the construction of the proposed roading network.

A geotechnical assessment (refer to **Appendix B**) has been undertaken by Land Development & Engineering (LDE) in support of the proposed plan change development. The geotechnical assessment thoroughly investigated the site's suitability for residential development, providing a comprehensive analysis of its geology and subsurface conditions. The report highlighted various geotechnical factors that were considered during the assessment. In conclusion, the site's topography and ground conditions exhibit steep areas with evident slope instability. Additionally, there is a lesser concern regarding potential settlement in other locations. Further detailed geotechnical site investigation is required to be undertaken to identify and address any development specific geotechnical constraints which may affect the proposed development. Such investigations can include (but not limited to) hand auger boreholes, trial pits, rotary core machine boreholes, CPT or DMT soundings, and soil sampling for laboratory testing.

Proposed bulk earthworks and the associated erosion and sediment control measures will need to be undertaken in accordance with the guidelines of Auckland Council Standard GD05. And a Land Use Consent for the bulk earthwork activity will need to be obtained from Auckland Council prior to undertaking earthworks.

A concept Cut and Fill earthworks plan has been prepared to provide an overview of the likely earthwork extent and possible depths of cut and fill associated with the concept development plan (refer to **Appendix D**). Based on the size of the development, the steep contour constraints and likely volume of earthworks involved, the earthworks will need to be staged, with completed areas progressively stabilised to ensure ground stability and safety throughout the earthwork activity phase. The general principles to be implemented during the earthworks phase will be specified and designed in erosion and sediment control plans, which will be prepared for any forthcoming resource consent application.

The general principles to be used as part of the erosion and sediment control measures are likely to include the following items:

- Before commencing the bulk earthworks, it is essential to ensure that the contractors understand all the requirements outlined in the approved erosion and sediment control plan and the approved resource consent decision.
- Implement staged earthworks to allow for progressive stabilisation of the completed area.
- Divert all clean water runoff from the upstream away from the site to minimize the size of open earthwork catchments.
- Divert dirty water runoff from the earthwork disturbance areas containing sediment to the designed control measures before discharging into the downstream environment. Consider using a treatment train approach, especially in high-risk receiving environments like wetlands and streams.

- Install appropriate stabilised construction entrances within the site to prevent sediment discharge onto public roads.
- Regular inspections and maintenance are required to ensure all erosion and sediment control devices are operate functionality and in good working order, such as prior to and after any forecast extreme rain.
- Continuously review the design, catchments, and suitability of erosion and sediment control devices to accommodate changes in conditions or work program. Implement any changes, remedial works undertaken, approved by Auckland Council, as needed to ensure their effectiveness as originally intended.

Summary of conceptual bulk earthworks:

- Area of disturbed surface: 110,000 m^2 (approx.)
- Topsoil Cut: 11,000 m^3 (approx. 100mm depth of topsoil, refer to Geotechnical Report)
- Earthworks Cut Volume: 170,900 m^3 (approx.) and maximum cut depth is ≈9m.
- Earthworks Fill Volume: 125,000 m^3 (including 20% compaction factor) and maximum fill depth is ≈8.5m.
- Earthworks Balance Volume: 47,000 m^3 excess to be exported from the site
- Stripped topsoil will be re-spread upon completion of bulk earthwork

4.2 STORMWATER & FLOODING

Please refer the separate Stormwater Report and Stormwater Management Plan. A copy of the Stormwater Concept Plan and Catchment Plans for this Plan Change are attached in **Appendix E**.

4.3 WASTEWATER

4.3.1 EXISTING WASTEWATER SUPPLY NETWORK

The plan change area adjoins an existing developed residential area to the west and developed residential areas to the south. There are two existing wastewater pipes in the vicinity that can be extended into the site to provide connection for the plan change as shown on Auckland Council Geomaps. One of the existing wastewater networks is a 150mm dia. Line under Lisle Farm Road to the west of the plan change area and the other is a 150mm dia. under William Andrew Road to the north of the plan change area:

Watercare Services Limited (Watercare) has been approached to review the plan change proposal and provide comment about the wastewater connections and their response is attached in **Appendix I**. WaterCare advised that the existing local wastewater pump station within Colin Lawrie Fields, which services the catchment including the plan change area, does not have sufficient capacity to support any further development. An upgrade will be required and will need to be funded by the developer. Approximately 310m of the existing 200mm wastewater pipe which conveys wastewater into the Colin Lawrie Pump Station will need to be upgraded or duplicated.

The receiving Network Wastewater Pump Station, the Franklin Road Pump Station is also currently at capacity. Watercare advised that a new Network pump station at Isabella Drive is currently under construction and the expected completion date is mid-2025. This will provide additional and sufficient capacity within the Franklin Road Pump Station. Once the new Isabella Road Pump Station is completed and operational, the Franklin Road Pump Station will be able to support further development in Pukekohe area.

The potential local pump station and infrastructure network upgrade will be subject to detailed design at the Resource Consent/Engineering Plan Approval stage.

4.3.2 RETICULATION LAYOUT

A public wastewater reticulation network will be constructed within the site to service the plan change development. Due to the site's topography, the proposed internal reticulation will consist of both gravity and pressure systems to extend to existing public network from the adjacent connection points. The proposed wastewater network will generally follow the road alignments or run along the backyards of the proposed lots, ensuring that each lot can be connected. The proposed wastewater network design aims to minimize the number of new pump stations and rising mains, as recommended by Watercare (refer to **Appendix I**). It is expected that only one pump station will be necessary near the southeast corner of the plan change area to receive gravity sewer flows from most of the plan change area. This will pump the wastewater via rising main to a gravity point near at the top of the property, which will be confirmed during the Resource Consent stage.

The peak dry weather flow (PDWF) and peak wet weather flow (PWWF) from the proposed plan change area is calculated and shown in the table below:

Dwellings	Occupants	Flow per person	Total Flow (L/day)	Total Flow (L/s)
Average	576 Proposed	180Litre/p/day	103,680Litre/day	1.2Litre/second
PDWF	576	540Litre/p/day	311,040Litre/day	3.6Litre/second
PWWF	576	1,206Litre/p/day	694,656Litre/day	8.0Litre/second

The number of occupants is derived from WaterCare development Code of 3 persons per property. The anticipated lot yield of 192 will give 576 occupants.

4.4 WATERMAIN

4.4.1 EXISTING WATER SUPPLY NETWORK AND RETICULATION LAYOUT

There are two existing watermains that can be extended to service the proposed plan change area - refer to Auckland Council Geomaps. One of the watermains is a 150mm dia. within Lisle Farm Road to the west of the plan change area and the other is a 100mm dia. watermain within William Andrew Road to the north of the plan change area.

In order to service the plan change area, water supply reticulation within the property will be installed by any future developer with a principal watermain size of 100mm dia. (subject to detailed water demand assessment at future consent stage) along one side of the proposed roading network and 50mm dia. rider main on the opposite side of the proposed roading network, all in accordance with Watercare's Water Supply Code of Practice. To achieve a "loop" in the water supply network, the proposed water supply reticulation network is designed to link up the existing 150mm dia. watermain under Lisle Farm Road with the existing 100mm dia. watermain under William Andrew Road. The proposed reticulation network will be installed within the road berms and will include the installation of all fittings, hydrants etc. to comply with Watercare's Code of Practice.

The proposed residential lots will be created by the plan change development require fire cells designed to meet the FW2 water supply classification in accordance with PAS 4509: 2008, fire hydrant test will be carried out in the future stage if required.

4.4.2 CORRESPONDENCE WITH WATERCARE

As part of this water supply investigation, Watercare was approached for comment regarding water supply capability of the existing water supply network to service the proposed plan change development, using the master plan as an example.

The response received from Watercare, confirmed that the existing watermain network has available capacity to service the proposed 192 residential lots. There is an existing water reservoir located at the corner between Runciman Road and Rutherford Road. Watercare advised that a link to the reservoir is required to service the future urban zone to the east of the development. The extent and timing of this and access to neighbouring properties will need to be determined with WaterCare prior to development.

A copy of Watercare Correspondence Letter to review the concept master plan for the proposed plan change can be referred to **Appendix I**.

4.5 ROADING

In order to service the proposed plan change development, a new public road network will be required across the entire plan change area. The table below indicates the likely widths to be adopted for the new streets and footpaths:

	Road Reserve Width (m)	Formation Width (m)	Footpath Width (m)
Arterial Road (Future Pukekohe Ring Road)	24.0	TBC	TBC (Possible Shared Footpath & Cycleway)
Major Local Road	20.0	7.0	1.8
Minor Local Road	16.0	6.0	1.8

It is expected that the following works will be designed to support the proposed plan change development when the resource consent stages of development occur:

- The existing accessway to service the subject site from Lisle Farm Road is by way of direct frontage and an appurtenant Right of Way. This is proposed to be formed to a Local Road standard and join with Lisle Farm Road with a T-intersection. Cooperation with the owner of the Right of Way will be required to give effect to this access.
- According to Supporting Growth acting on behalf of Auckland Transport, the construction of the designated Arterial Road as an arterial Ring Road is 20 - 30 years away (refer to **Appendix H**). The current master plan is prepared based on the provided information from Supporting Growth and Auckland Transport.
- Footpaths with a minimum 1.8m width are provided in accordance with Auckland Transport TDM standards with some potential cycle paths to be designed at the future stages.
- The preliminary earthworks modelling confirms that all roads can be constructed to a gradient not exceeding 12.5%.
- The geometric design of the proposed road network will be carried out in accordance with Auckland Transport TDM and Austroads Design Manual.
- The speed environment for the new road network design is intended to be 50km/h for collector road and 30km/h for the local roads. Traffic calming devices including speed humps, speed tables, etc will be designed at Subdivision/Engineering Plan Approval to deliver the appropriate speed environment.

4.6 ELECTRIC POWER AND TELECOMMUNICATIONS

Counties Energy has confirmed that network connection points can be extended into the development to provide future connection points to the individual lots. This will require infrastructure to be installed by the developer and the extent of which will be worked out upon physical development of the property.

Furthermore, the process of connecting the lots to the electricity network will be subject to compliance with the terms and conditions outlined in the Electricity Network Provision and future subdivision consent. Capital contributions will be required to cover the costs associated with providing the network connection points. This capital contribution allows Counties Energy to make appropriate investments in its network infrastructure, ensuring the quality and security of electricity supply for both current and future consumers.

Fiber Optic telephony is available to the plan change area at Lisle Farm Road and William Andrew Road. The existing network can be extended by Chorus at subdivision stage to provide a connection to future lots. Capital contributions will be required from the developer, to be paid to Chorus, to cover the costs associated with providing the network connection points. This capital contribution allows Chorus to make appropriate investments in its network infrastructure, ensuring the quality and security of data and telephony for both current and future consumers.

5 CONCLUSIONS

This report identifies how the future urban area of 70A & 70B Lisle Farm Plan Change is to be developed, and will form the basis for the upgrading of critical service infrastructure associated with the future development of the site.

The proposed development measures are consistent with the Pukekohe-Paerata Structure Plan completed by Auckland Council and expected outcomes of key shareholders including Watercare and Auckland Transport.

From a general viewpoint, there are no issues which would stop the future development of the site for its proposed use, however, downstream network infrastructure will require upgrading to allow the full development of the site and this can be determined at future resource consenting.

Future development will incorporate a Water Sensitive Design approach focusing on reducing or eliminating stormwater runoff generation through reuse, source control, and utilising designs that mimic natural systems and processes to manage stormwater quality effects.

The stormwater management method proposed will require future development to be subject to standards to control stormwater runoff as per the SMAF-1 controls and ensure future runoff flowrates are not increased for storm events up to and including the 1% AEP rainfall event.

If further information is required, please contact Skyward Hang on 09 571 2004 or skywardh@birch.nz.

6 LIMITATIONS

This assessment contains the professional opinion of Birch Land Development Consultants relating to this development/plan change application.

Birch Land Development Consultants Staff used their professional judgement and acted in accordance with the standards of care and skill normally exercised by professional engineers providing similar services in similar circumstances. This report does not convey any explicit or implicit guarantee regarding the professional guidance it contains.

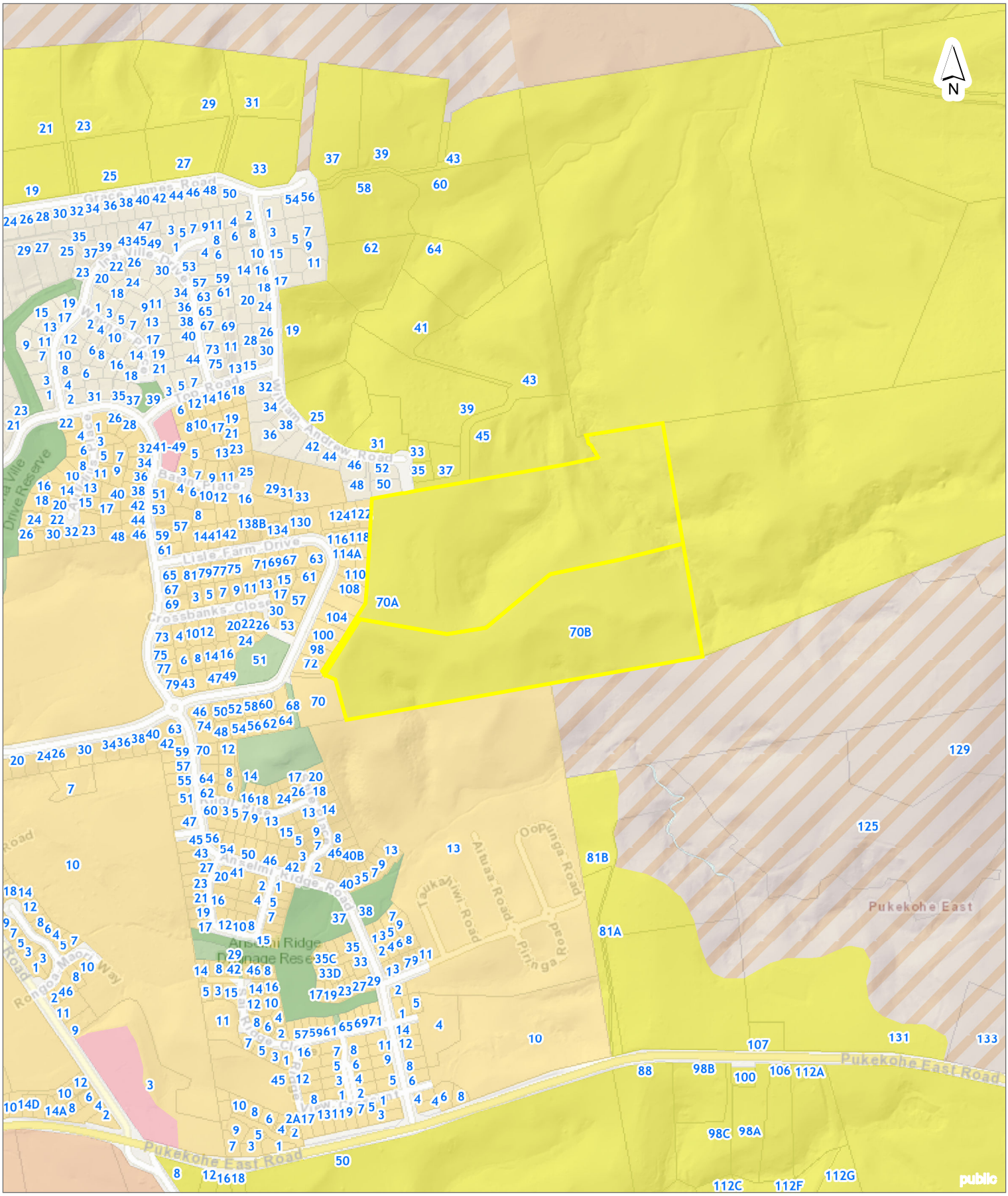
We have prepared this report in accordance with the brief provided and following our terms of engagement. The information contained in this report has been prepared by Birch Land Development Consultants for the client, Stephen & Dianne Smith, and is exclusively for its client use and reliance.

Should this report contain estimates for future works or services, physical or consulting, those estimates can only be considered current and will only reflect the extent to which the detail of the project is known to the consultant at the time given. The client is solely responsible for obtaining updated estimates from the consultants as the details of the project evolved and/or as time elapses.

The assessment will not address issues which would need to be considered for another party if that parties' particular circumstances, requirements and experience were known and, further, may make assumptions about matters of which a third party is not aware. No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of or reliance on this assessment by any third party.

The assessment is also based on information that has been provided to Birch Land Development Consultants from other sources or by other parties. The assessment has been prepared strictly on the basis that the information that has been provided is accurate, completed, and adequate. To the extent that any information is inaccurate, incomplete or inadequate, Birch Land Development Consultants takes no responsibility or liability whatsoever for any loss or damage that results from any design and assessment based on information that has been provided to Birch Land Development Consultants.

Appendix A
Auckland Unitary Plan Zoning



Lisle Farm Drive

0 40 80 120
Meters

Scale @ A4
= 1:8,000

Date Printed:
29/09/2023

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Address

Address

Zones

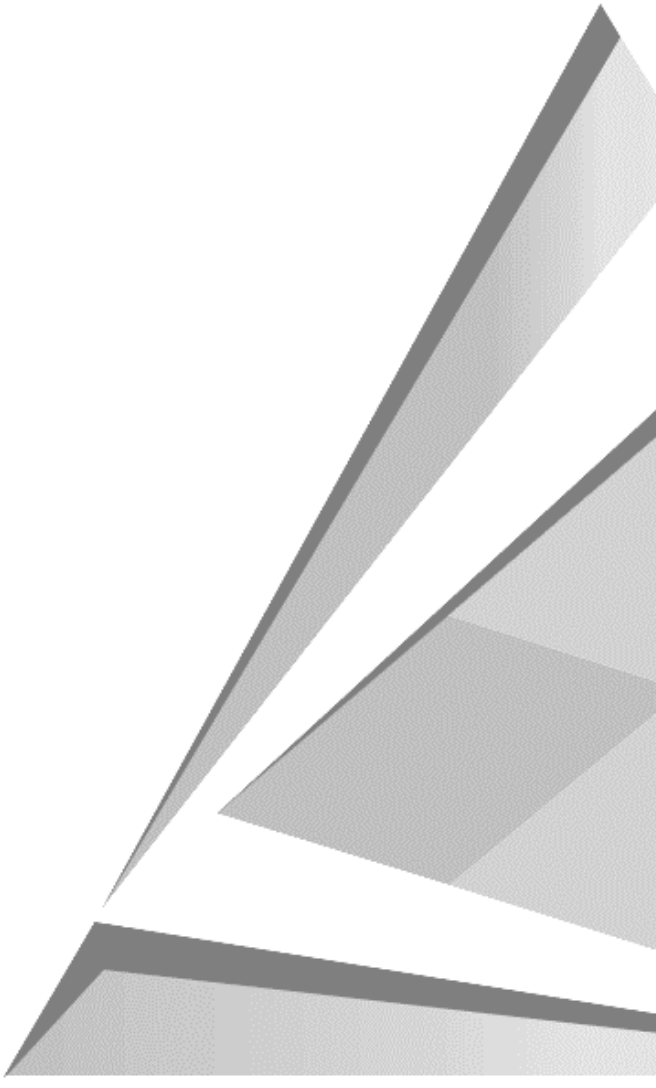
- Residential - Large Lot Zone
- Residential - Rural and Coastal Settlement Zone
- Residential - Single House Zone
- Residential - Mixed Housing Suburban Zone
- Residential - Mixed Housing Urban Zone
- Residential -Terrace Housing and Apartment Buildings Zone
- Open Space - Conservation Zone
- Open Space - Informal Recreation Zone
- Open Space - Sport and Active Recreation Zone
- Open Space - Civic Spaces Zone
- Open Space - Community Zone
- Business - City Centre Zone
- Business - Metropolitan Centre Zone
- Business - Town Centre Zone
- Business - Local Centre Zone
- Business - Neighbourhood Centre Zone
- Business - Mixed Use Zone
- Business - General Business Zone
- Business - Business Park Zone
- Business - Heavy Industry Zone
- Business - Light Industry Zone
- Future Urban Zone
- Green Infrastructure Corridor (Operative in some Special Housing Areas)
- Rural - Rural Production Zone
- Rural - Mixed Rural Zone
- Rural - Rural Coastal Zone

Legend

Date Printed:
29/09/2023

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix B
Geotechnical Report



Project Reference: 20995

26/05/2022

Stephen Smith

C/- Scott Wilkinson Planning

Attention: Mr R Scott

Dear Robert

A Proposed Private Plan Change for 70, 70A and 70B Lisle Farm Drive, Pukekohe.

1 Scope

This report contains a preliminary overview of the geological setting of the setting of the above site (comprising land legally described as Lot 1 DP 169148, Lot 1 DP 143272 and Lot 2 DP 143272) to identify perceived geotechnical constraints for a proposed Private Plan Change for residential intensification of the land.

Our work involved:

- Reviewing published geological maps and available aerial photographs
- Visiting the site to inspect the landform and mapping geomorphological features.
- Drilling four hand auger boreholes to depths of up to 3.0m.

2 SITE DESCRIPTION AND DEVELOPMENT PROPOSAL

The study area includes approximately 19.2 Ha of land, generally sloping to the east and south. A ridgeline flanked by arcuate depressions, hummocky features and soil creep form the edges and heads of various incised gullies in the centre, eastern and southern portions of the site.

There are no existing council service lines shown on the Auckland Council GIS system at this site. There is one existing residential dwelling located in the north-east portion of the site, with two farm structures located across the site. The remainder of the site is grassed pasture.

Scheme Plans have not been provided at this stage; however, we understand that the client is looking at having the land currently zoned as Future Urban Zone (FUZ), rezoned to either Single House Zone (SHZ) or Mixed Housing Suburban Zone (MHS) or a combination of both.

3 GEOLOGY OVERVIEW

A review of GNS digital QMAP's indicated the site if underlain by the South Auckland Volcanic Field. The site is largely covered by ash, lapilli and lithic tuff, with basalt lava flows in the north-east portion (although these are expected to be at depth under a thick soil mantle).

4 AERIAL PHOTOGRAPH INTERPRETATION (API)

A review of historic aerial photographs indicated that the site has been in pasture with some pockets of bush since at least 2001 (earliest aerial image from Auckland GIS Maps). It is apparent that vegetation may have been planted between 2003/2004 (see insert A below) and 2010/2011 (see insert B below) in the gully to the east of the site.

Insert A (left): Aerial image from 2003/2004 showing north east portion of site. *Image retrieved from Auckland Council Geomaps on 10.03.22*

Insert B (below): Aerial image from 2010/2011 showing north east portion of site. *Image retrieved from Auckland Council Geomaps on 10.03.22*

Features indicative of slope instability are notable with the 2001 images and are consistently present through the imagery into the present day, and there are no obvious signs of active large scale land sliding over that period.

5 SUMMARY OF GROUND CONDITIONS

Four preliminary hand auger boreholes (records attached) were undertaken on the competent ridgeline, in the locations shown on Figure 1 (attached).

5.1 Topsoil

Topsoil was encountered to depths of 0.1m.

5.2 Ash Deposits

South Auckland Volcanic Field ash soils were encountered in all boreholes. These deposits generally comprised of very stiff to hard, orange, brown, yellow, grey and red clays and silts. Undrained shear strength readings ranged from 68kPa to 206+kPa, indicating stiff to hard soils, occasionally with the shear vane unable to penetrate the soil.

5.3 Groundwater

Groundwater was not encountered in any of the boreholes drilled to the depths drilled at the time of drilling.

5.4 Liquefaction

The Auckland Council Geomaps Viewer indicates that the site has 'Very Low Liquefaction Vulnerability' based on Level A Basic Assessment and Level B Calibrated Assessment.

6 GEOMORPHOLOGICAL OBSERVATIONS

In conjunction with the API, a walkover of the site was undertaken on the 16 February 2022 to observe and map geomorphology (Refer Figure 02) and assess any perceived constraints to the proposed development.

Our findings are summarised as follows:

6.1 Overview

The broad main dividing ridgeline runs generally south-east to east through the site. This is generally comprised of relatively flat land and is considered to be geotechnically competent. Four large instability features are inferred on the northern and southern flanks of the ridge, with several minor circular (arcuate) failures observed on the banks of the many tributary gullies associated with these slips. Each of these larger features extend from just below the ridgeline (i.e. the heads of the tributary gullies) to the main watercourse below and comprise a large portion of the site.

6.2 North-Eastern Portion of the Site

The north-eastern portion of the site, located east of the ridgeline and comprises elevated steep slopes (generally greater that 1(v) in 4(h), with evidence of larger scale land movement (deeper seated) east of the ridgeline and gully flanks.

Within the south-western portion of this area, a large arcuate (relict) landslide is present with soil creep (gradual, shallow seated movements of the steeper slopes. Soil creep is a function of expansive soil movements caused by shrink-swell between seasons and gravity, exacerbated by the movement of livestock (commonly referred to as ‘sheep tracks’).

Within the north-eastern portion of this area, a large arcuate landslide is present, with a large associated debris flow. A large debris lobe was identified here.

Landform within the southern portion of this area is hummocky, likely caused by historic land movements, and/or groundwater springs / overland flow erosion. Reeds identified near the southern most slip indicative of a high groundwater and subsequently an active slip area.

These features will present constraints to development and are outlined further in Section 7 below.

Photo 1: Typical steep hillside with soil creep with gully.

Photo 2a &b: Typical large scale slope instability features with reeds indicative of high groundwater.

Photo 3a & 3b: Typical soil creep on steeper portions and inferred instability (leaning trees) on hummocky ground.

6.3 Southern Portion of the Site

The southern portion of the site comprises elevated steep slopes (steeper than 1(v) in 4(h), south of the ridgeline, with large scale land movement near the ridgeline and gully flanks, becoming steeper towards the base of the gully.

A large arcuate slip (likely to be relict) is located in the south-western portion of the site, with minor circular failures below. Soil creep is more prevalent on the western portion of the slip and becomes more widespread as the terrain becomes steeper.A larger active slip is located east of the slip discussed above, with soil creep below. Minor slips are located downslope with steepening of the topography. An area of reed growth was identified towards the low-lying south portion of this area, indicating possible high groundwater.

Photo 4: Typical steep slope with arcuate slip beneath ridgeline.


Photo 5a & b: Typical of soil creep and gully with large scale slope instability.

6.4 Central Portion of the Site

The central portion of the site comprises elevated steep slopes (approximately 1(v) in 3(v), with large scale land movement near the ridgeline and gully flanks.

A large active arcuate slip is located west of the gully, beneath the existing residential dwelling. Soil creep is noted across the slopes, additionally numerous smaller active and relic slips downslope of the large arcuate slip and an associated debris flow.Three drainage pipes associated with the existing dwelling were observed upslope of crest of the slip, creating associated overland flow paths scouring the area directly below. Reeds were observed at the base of the slope near the tributary gully indicating high groundwater.

Photo 6: Arcuate slip located west of the gully, below the ridgeline.


Photo 7a & b: Typical soil creep and shallow instability on steeper portion of the site.

7 GEOTECHNICAL ENGINEERING CONSIDERATIONS

7.1 General

Based on our site observations and as depicted on the attached Geomorphic Hazard Map (see Figure 03). The main geotechnical constraints to the development on this site relates to slope instability. We have used a 'traffic light' system to show identified areas of inferred low (Area A; green) and medium (Area B; yellow) geotechnical risk of slope instability, with the remainder of the site (Area C; red) being classified as containing ground that is inherently steep, and/ or already contains geomorphic signs of slope instability, and/ or is in close proximity to such ground. Further details are given on Figure 03, which is summarised as follows:

- Area A (Low Risk): Suitable for build NZS3604-type structures with little to no geotechnical inputs required on account of slope instability; slope gradients flatter than 1(v) in 4(h) and no obvious geomorphic signs of slope instability.
- Area B (Medium Risk): Generally containing slope gradients steeper than 1(v) in 4(h) and/ or close proximity to steeper slopes and/or geomorphic instability features and/ or displays evidence of soil creep; requires geotechnical site investigations and analyses on account of slope stability.
- Area C (High Risk): Considered too steep and/or contains obvious signs of larger scale slope instability that would likely preclude economical residential development.

8 TYPICAL GEOTECHNICAL ENGINEERING

8.1 Foundations for Buildings

Where inorganic and competent (firm to stiff) natural ground is present, bearing capacity is expected to be in accordance with the limitations imposed by NZS3604 (i.e. 300 kPa geotechnical ultimate). This assumes portions of the land will be modified during subdivision development to ease slope gradients to less than 1(v) in 4(h), thereby

minimising the propensity for soil creep, etc. It also assumes development upon (or near) land displaying geomorphic signs of slope instability will be geotechnically investigated and remediated where required to deal with on-going slope stability risks.

- The soils are likely to fall within AS2870 Class H1 (high) to Class M (medium) expansive site class, and this is subject to laboratory testing of soil samples collected during later more intensive investigations for the Resource Consent phase(s). Foundation design for end users will need to mitigate adverse effects from expansive soils.

8.2 Ground Stability

Significant portions of the site are steeply incised by gully features or steep sided ridgelines which display signs of shallow seated soil creep, slumping and large scale instability, and some places are low lying and associated with watercourses, which will contain soft and saturated sedimentary infill. Outside of such areas the land is defined by a broad competent ridgeline and this shows no obvious geomorphic signs of ground instability.

- Consideration to development setbacks from incised gully flanks and areas displaying signs of slope instability will need to be assessed during detailed geotechnical site investigations of the land for Resource Consent.
- Areas that may be at risk from falling debris from any steep slopes above will need to be identified and risks to development below such areas established.
- Low lying area and/ or areas containing soft sedimentary infill generally comprise gully inverts and should be avoided to reduce ground stability risks from consolidation settlement or potential liquefaction. However, it is envisaged such areas will not be developed upon and will be preserved for ecological and stormwater management aspects.
- Where adequate setbacks cannot be achieved to mitigate slope instability risks, engineering intervention such as bulk earthworks (e.g. shear keys or buttress fills, and/ or remediation of slip areas), counterfort drains, palisade pile walls (i.e. in-ground retaining) can be designed and employed to mitigate slope instability. In soft ground areas, drainage and/ or ground improvements techniques (such as removing soft soils and reinstatement with stronger materials, drainage and pre-loading, etc). Refer attached Figure 4 for illustration of these concepts.
- Figure 5 attached shows a concept arrange where some of the measures described above (i.e, buttress fills, shear keys, underfill and counterfort drains) can be formed in the heads of incised gully features, sympathetically to the ecological features (identified in the Wildlands Limited report), to improve global stability and effectively arrest long term retrogressive movements of the gully head. Such measures will improve global stability of development above, and minimise the long term potential for sedimentation of the downstream receiving environment from the ongoing retrogressive erosion that would otherwise occur if the buttress fills were not constructed.
- In any event, engineering measures will be dependent on the findings of a detailed geotechnical site investigation that is commensurate with the subdivision scheme and earthworks proposals, and therefore subject to detailed design.

8.3 Earthworks and Infrastructure

The natural deposits encountered across the site (saturated gully sedimentary infill aside) are typically expected to have relatively high strength and have good engineering characteristics for foundations and earthwork handling, as has been experienced during the development of various Pukekohe subdivisions nearby.

- The materials can be sensitive to disturbance during earthworks and repetitive trafficking from heavy machinery, and this is particularly relevant where works are in gully bases or near such areas (i.e. where the water table is expected to be relatively high, and sedimentary infill soils may prevail – however as mentioned in section 8.2 above, it is unlikely that earthworks will extend into such areas). Careful site management, subsoil drainage and drainage blankets / underfill drains have been effective in dealing with these issues at the nearby Pokeno subdivisions under construction (or recently completed). If there are deeper cuts, it is likely to require conditioning prior to placement as filling, since insitu moisture contents will likely be higher than those required for optimum compaction.
- Deep trenches are prone to collapse especially where ground water conditions change rapidly, and the materials are less cohesive, but this risk can be minimised by appropriate shoring or battering as required by legislation and safe construction practices.
- It is anticipated that “shallow” cuts for bulk earthworks required to facilitate future residential intensification of the land would not encounter rock, but “deep” cuts might and should therefore be specifically investigated as part of a Resource Consent application.
- Road subgrades are prone to degradation once exposed to the elements, but is normally dealt with by engineering design (e.g. subgrade improvement via undercutting and replacement, or lime stabilising, construction sequencing to reduce subgrade exposure time, etc.).
- High allophane content is associated with the surficial ash derived soils and appropriate earthworks methodologies specific to subsequent subdivisional plans should be recommended to mitigate any problems associated with the placement and compaction of these soils.
- Underfill drainage is usually adopted to control natural groundwater seepages in the various drainage features that may be modified during development. They generally pose no constraints to end use if they are buried deep within engineered fills, or if this is not possible they can be aligned to site boundaries to avoid future building platforms.
- If slip areas are to be remediated during the subdivision, then they may contain weak ground at residual strength and special measures are normally required to minimise localised short term instability during construction (e.g. benching out to reduce destabilising loads and/ or special geotechnical drainage to relieve insitu porewater pressures).

9 FURTHER WORK

This report is intended to provide an initial geotechnical overview to advance a submission of the Proposed Private Plan Change, by highlighting perceived geotechnical constraints. In due course earthworks and construction plans will be developed, if the project progresses to Resource Consent application stage.

Once the ground model is proven commensurate with a development / earthworks scheme, engineering solution concepts for prevailing instability areas can be established. As already mentioned in section 8.2, a range of geotechnical solutions (dependant on ground proving results) to treat perceived slope stability constraints are depicted on Figure 04 and a concept design illustrating buttress fills / shear key / drainage solutions at the gully heads is also given on Figure 5 (both attached).

10 CONCLUSIONS

In summary, the site comprises topography and ground conditions that is steep in places and shows evidence of slope instability and of lesser concern is likely prone to settlement in other places such as the low lying areas and inverts of watercourses.

Provided there is consideration to prevailing or perceived geotechnical issues during detailed site investigations for Resource Consent, then the study area as defined herein is considered suitable for residential intensification.

11 RECOMMENDATIONS

The assessments presented in this report are based on a desktop review and preliminary visual inspections, plus a limited number of shallow borehole tests on the prevailing landform.

It is recommended that:

- To support future development (i.e. Resource Consent / Subdivision design), further physical geotechnical site investigations that are commensurate with subdivision and earthworks scheme(s) should be undertaken to substantiate ground conditions and address any geotechnical constraints. Such investigations are expected to comprise (but are not limited to) detailed geomorphic mapping, hand auger boreholes, trial pits, rotary cored machine boreholes, CPT or DMT soundings, and soil sampling for laboratory testing.
- Appropriate laboratory soil testing is undertaken to characterise engineering and earthworks handling properties.. In addition, effective stress tri-axial testing may be warranted to support design assumptions for slope stability analyses and/ or any engineering remediation design that may result.

12 LIMITATIONS

This letter has been prepared exclusively for Stephen Smith with respect to the brief given to us. Information, opinions, and recommendations contained in it cannot be used for any other purpose or by any other entity without our review and written consent. LDE Ltd accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report by any third party.

This report was prepared in general accordance with current standards, codes, and practice at the time of this report. These may be subject to change.

This report should be read in its entirety to understand the context of the opinions and recommendations given.

For and on Behalf of Land Development and Engineering Ltd

Report prepared by:

Marina Burton
Engineering Geologist

Report reviewed by:

S. G Lander
Principal Geotechnical Engineer
CMEngNZ, CPEng, IntPE(NZ)

Attachments

Hand Auger Borehole Records

Figure 01: Site Investigation Plan

Figure 02: Geomorphic Map

Figure 03: Geomorphic Hazard Map

Figure 04: Geotechnical Engineering Concepts

Figure 05: Concept Design – Buttress Fill / Shear Key

Client : STEPHEN SMITH

Project Location : 70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE

Job Number: 20995

Auger Borehole No. HA 01

Sheet 1 of 4

Vane Head:	Logged By:	Processor :	Date:
2784	MB / JL	MB	16.02.22

Borehole Location: mN | mE | Ground R.L.

Description: Refer to site plan

SOIL DESCRIPTION

Depth (m)	Legend	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
	TOPSOIL				
	clayey SILT with trace fine sand, yellow/brown. Very stiff, dry to moist, low plasticity, moderately sensitive [ASH]				
0.5	becoming orange streaked yellow/brown, with trace limonite		124/60	2.1	
1.0	silty CLAY, brown/orange and light grey mottled. Stiff, moist, medium to high plasticity, insensitive		68/37	1.8	
	clayey SILT, red streaked orange and light grey mottled. Very stiff, moist, low plasticity, moderately sensitive				
1.5	becoming light brown becoming wet, medium plasticity		171/59	2.9	
2.0	becoming orange/brown, low plasticity		108/43	2.5	
2.5	becoming red and grey streaked orange/brown		140/50	2.8	
3.0	at 3.0m, becoming hard EOB at 3.0m. Target depth.		206+		
3.5					
4.0					
4.5					
5.0					
5.5					
6.0					

LDE LAND DEVELOPMENT & ENGINEERING

Comments:
Groundwater not encountered.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: SL

Topsoil	Sand	Sandstone	Plutonic
Fill	Gravel	Siltstone	No Core
Clay	Organic	Limestone	
Silt	Pumice	Volcanic	

Client : STEPHEN SMITH

Project Location : 70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE

Job Number: 20995

Auger Borehole No. HA 02

Sheet 2 of 4

Vane Head:	Logged By:	Processor :	Date:
2784	MB / JL	MB	16.02.22

Borehole Location: mN | mE | Ground R.L.

Description: Refer to site plan

SOIL DESCRIPTION

Depth (m)	Soil Description	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
	TOPSOIL				
	clayey SILT, orange/brown. Very stiff to hard, dry to moist, low plasticity [ASH]				
	becoming hard				
0.5			UTP		
	becoming very stiff, moist, with trace fine sand				
	becoming red streaked orange/brown, hard				
1.0			206+		
	becoming red/orange				
	becoming very stiff, insensitive				
1.5	becoming wet		131/85	1.5	
2.0			119/62	1.9	
	becoming moderately sensitive				
2.5			148/66	2.2	
3.0	EOB at 3.0m. Target depth.				
3.5					
4.0					
4.5					
5.0					
5.5					
6.0					

LDE LAND DEVELOPMENT & ENGINEERING

Comments:
Groundwater not encountered.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: SL

Topsoil	Sand	Sandstone	Plutonic		
Fill	Gravel	Siltstone	No Core		
Clay	Organic	Limestone			
Silt	Pumice	Volcanic			

Client : STEPHEN SMITH

Project Location : 70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE

Job Number: 20995

Auger Borehole No. HA 03

Sheet 3 of 4

Vane Head:	Logged By:	Processor :	Date:
2784	MB / JL	MB	16.02.22

Borehole Location: mN | mE | Ground R.L.

Description: Refer to site plan

SOIL DESCRIPTION	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL					
clayey SILT with trace fine sand, yellow/brown. Hard, dry to moist, low plasticity, with trace rootlets to 0.4m [ASH]					
becoming orange mottled light brown					
becoming brown/orange, moist, low to medium plasticity	0.5		206+		
becoming light yellow streaked brown/red	1.0		UTP		
becoming black and light grey streaked brown/red					
becoming very stiff, moderately sensitive	1.5		152/74	2.1	
becoming wet					
becoming stiff, insensitive	2.0		80/43	1.9	
becoming moderately sensitive	2.5		80/38	2.1	
at 3.0m, becoming insensitive					
EOB at 3.0m. Target depth.	3.0		71/40	1.8	
	3.5				
	4.0				
	4.5				
	5.0				
	5.5				
	6.0				

LDE LAND DEVELOPMENT & ENGINEERING

Comments:
Groundwater not encountered.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: SL

Topsoil	Sand	Sandstone	Plutonic		
Fill	Gravel	Siltstone	No Core		
Clay	Organic	Limestone			
Silt	Pumice	Volcanic			

Client : STEPHEN SMITH

Project Location : 70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE

Job Number: 20995

Auger Borehole No. HA 04

Sheet 4 of 4

Vane Head:	Logged By:	Processor :	Date:
2784	MB / JL	MB	16.02.22

Borehole Location: mN | mE | Ground R.L.

Description: Refer to site plan

SOIL DESCRIPTION

Depth (m)	Soil Description	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
	TOPSOIL				
	clayey SILT, yellow/brown. Very stiff to hard, moist to dry, low plasticity [ASH]				
0.5	becoming hard		206+		
	becoming yellow mottled orange/brown, moist				
1.0	becoming red mottled orange/brown		206+		
1.5			UTP		
	becoming red				
2.0	becoming yellow streaked red		UTP		
2.5			UTP		
3.0	EOB at 3.0m. Target depth.		UTP		
3.5					
4.0					
4.5					
5.0					
5.5					
6.0					

LDE LAND DEVELOPMENT & ENGINEERING

Comments:
Groundwater not encountered.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: SL

Topsoil	Sand	Sandstone	Plutonic		
Fill	Gravel	Siltstone	No Core		
Clay	Organic	Limestone			
Silt	Pumice	Volcanic			

Legend and/or Notes:

3m Hand Auger Borehole

BASEMAP FROM AUCKLAND COUNCIL GIS. RETRIEVED ON 02.03.22.

revision	description	drawn	approved	date

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Horizontal Scale (metres)
0 30.0 60.0 90.0 120.0
Vertical Scale (metres)

drawn	MB
approved	SL
date	02/03/22
scale	1:2500
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

client: **STEPHEN SMITH**

project: **70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE**

title: **SITE INVESTIGATION PLAN**

project no: **20995** figure no: **01**

Template revision: 1:2000 (10/12/14)

Legend and/or Notes:

- Scarp
- Active Scarp
- Bench
- Soil Creep
- Hummocky Ground
- Reeds

BASEMAP FROM AUCKLAND COUNCIL GIS. RETRIEVED ON 02.03.22.

revision	description	drawn	approved	date

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Horizontal Scale (metres)
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Vertical Scale (metres)

drawn	MB
approved	SL
date	02/03/22
scale	1:2500
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

client: **STEPHEN SMITH**

project: **70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE**

title: **GEOMORPHIC MAP**

project no: **20995** figure no: **02**

Template revision: 1:2000 (10/12/14)

Legend and/or Notes:

Area A:
Definition: Ground generally having slope gradients flatter than 1(v) in 4(h) and without obvious signs of slope instability or inferred moeified ground.
Implication: Minimal further geotechnical engineering works anticiptaed to form suitable building platforms for NZGS3604 type development.

Area B:
Definition: Ground generally having slope gradients greater than 1(v) in 4(h) but flatter than 1(v) in 2(h) and/or ground with inferred shallow or small scale slope instability and/or ground immediately upslope of inferred slope stability, and/or containing inferred ground modified features such as overland flow paths.
Implication: Further geotechnical investigation required to confirm likely extends of modified ground and/or prevailing slope stability conditions. Geotechnical engineering works anticipated to form suitable building platforms for NZGS3604 type development may include geotechnical (counterfort drainage) and/or palisade walls etc. which are subject to specific geotechnical investigation and design.

Area C:
Definition: Ground generally having slope gradients greater than 1(v) in 2(h) and/or inferred deep seated slope instability features.
Implication: Significant further geotechnical investigation required to confirm prevailing slope stability conditions. Geotechnical engineering works anticiptaed to form suitable building platforms for NZGS3604 type development will likely be substantial and extensive, and may include shear keys, bulk earthworks, and geotechnical drainage and will be subject to specific geotechnical investigation and design.

Note: All zoning subject to reevaluation based on further geotechnical investigation and assessment.

Geomorphology:

- Scarp
- Soil Creep
- Active Scarp
- Hummocky Ground
- Bench
- Reeds

BASEMAP FROM AUCKLAND COUNCIL GIS. RETRIEVED ON 02.03.22.

revision	description	drawn	approved	date

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Horizontal Scale (metres)
0 30.0 60.0 90.0 120.0
Vertical Scale (metres)

drawn	MB
approved	SL
date	02/03/22
scale	1:2500
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

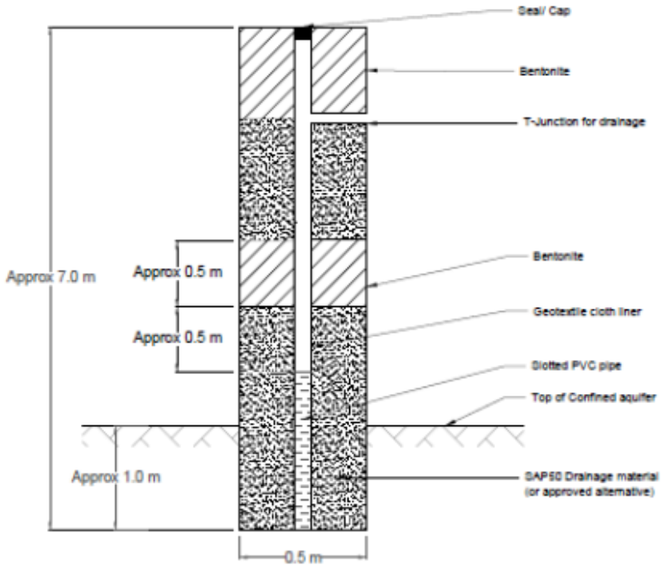
client: **STEPHEN SMITH**

project: **70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE**

title: **GEOMORPHIC HAZARD MAP**

project no: **20995** figure no: **03**

Template revision: 1:2000 (10/12/14)



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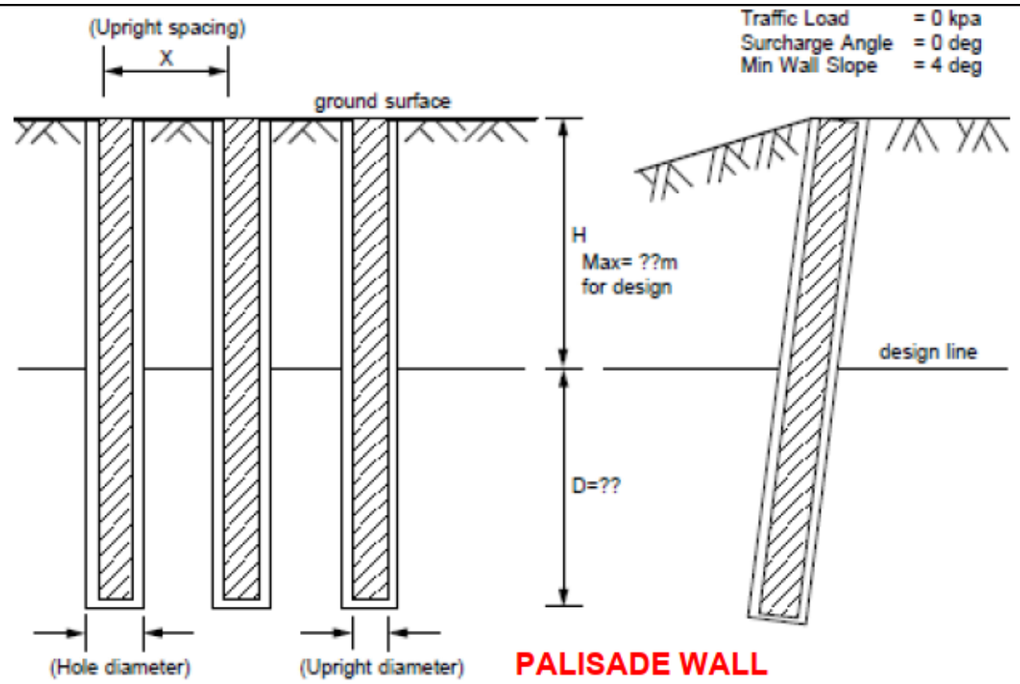
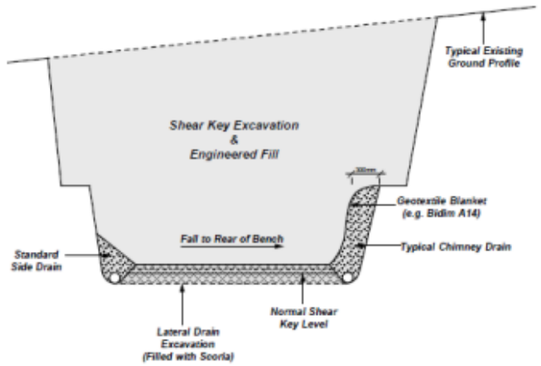


PALISADE WALL



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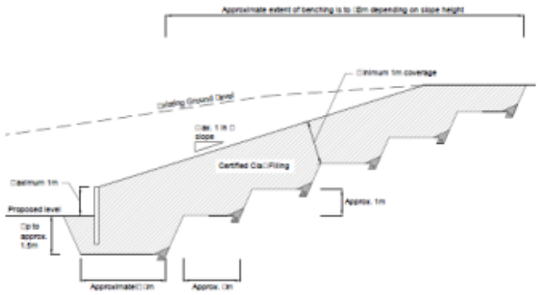

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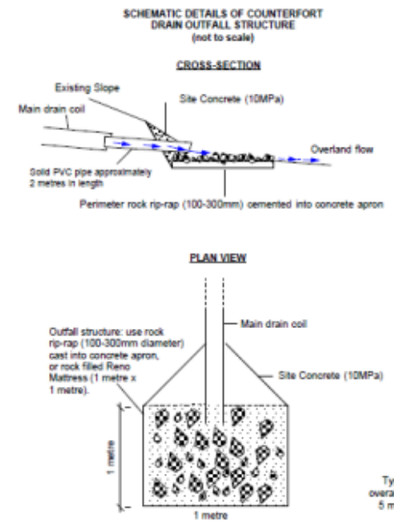
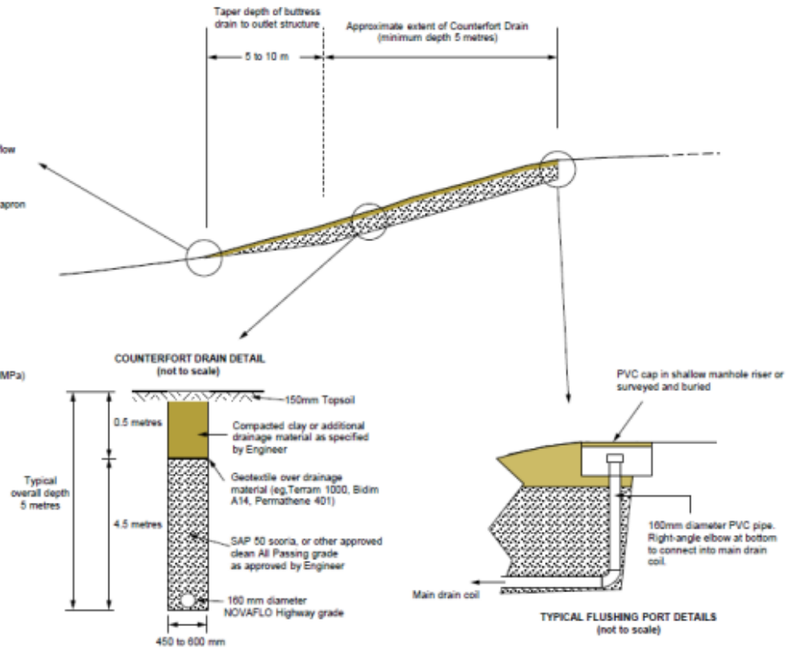




COUNTERFORT DRAIN

revision	description	drawn	approved	date

FOR DISCUSSION

drawn	MB
approved	SL
date	10/03/22
scale	NTS
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

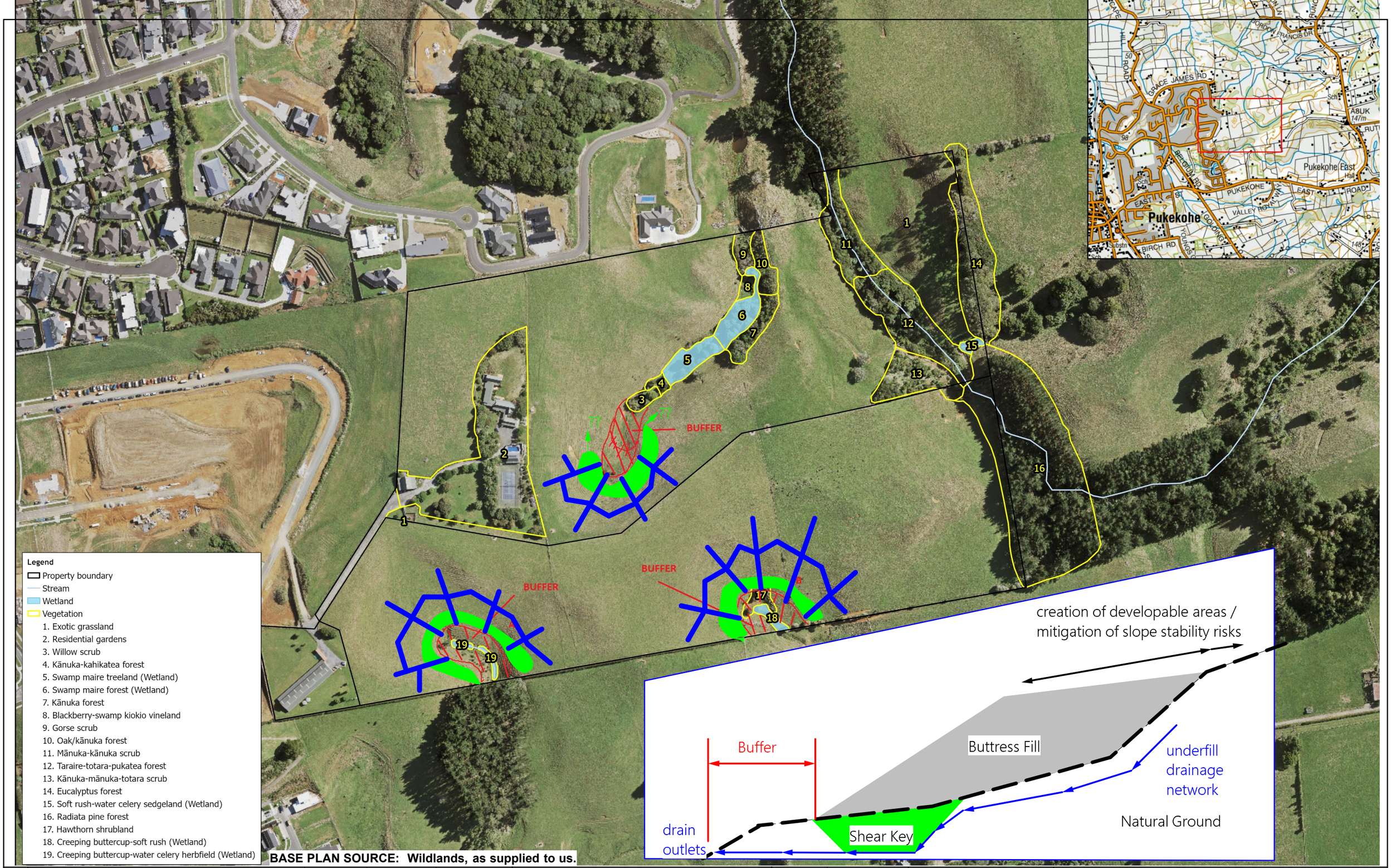
client: **STEPHEN SMITH**

project: **70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE**

title: **GEOTECHNICAL ENGINEERING CONCEPTS**

project no: **20995** figure no: **04**

Template revision: 1:2000 (10/12/14)



BASE PLAN SOURCE: Wildlands, as supplied to us.

revision	description	drawn	approved	date

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Horizontal Scale (metres)
0 45.0 90.0 135.0 180.0
Vertical Scale (metres)

drawn	SL
approved	SL
date	13/04/22
scale	1:3000
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

client: **STEPHEN SMITH**

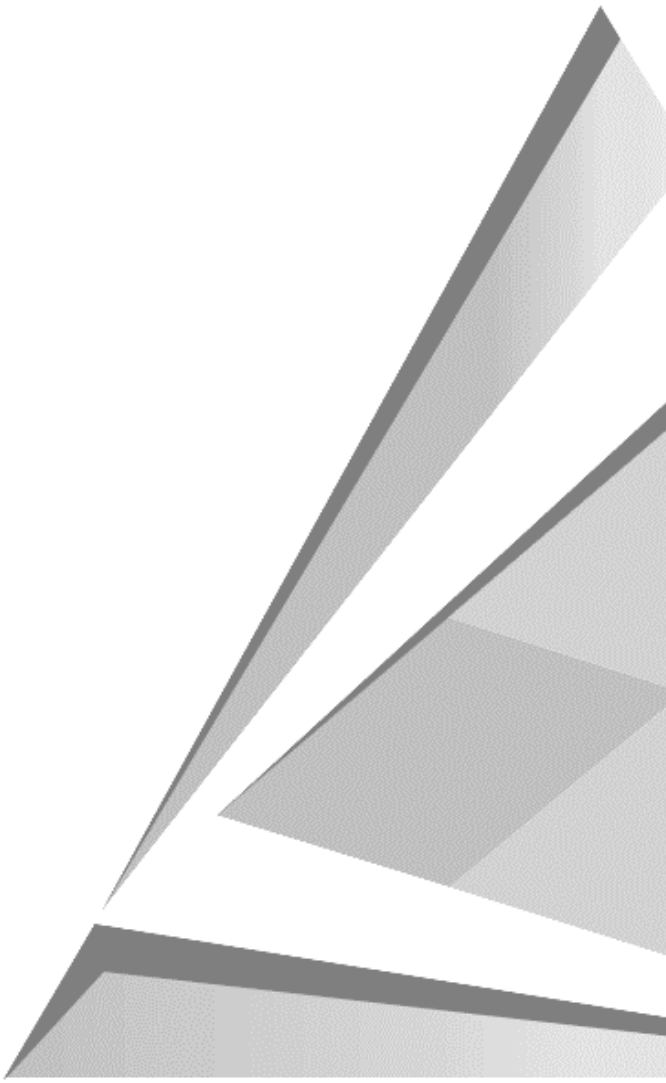
project: **70, 70A & 70B LISLE FARM DRIVE, PUKEKOHE**

title: **CONCEPT DESIGN - BUTTRESS FILL / SHEAR KEY**

project no: **20995** figure no: **5**

Template revision: 1:2000 (10/12/14)

Appendix C
Concept Development Master Plan



I/We confirm that this proposal has been examined by me/us and agree to the use and reproduction of this plan for the purpose of obtaining a resource consent

.....
Applicants Approval

Approved for submission by: .....
Birch Surveyors Ltd

KEY

- Proposed Lot Boundaries
- Road Boundaries
- Abuttal Boundaries
- Major Contours (5m)
- Minor Contours (1m)
- Proposed Open Space Reserve to protect wetland & streams (Designation to be agreed)
- Proposed Walking & Cycle Track (2m width)
- Existing Bush and Wetland
- Tree
- Existing Stream
- Indicative Draft Designation Boundary
- Road Corridor
- Bridge

NOTES:

1) Areas and measurements are approximate only and subject to final survey
2) Roads shown are legal
3) Datum is arbitrary and subject to final survey
4) This document shall be used only for the purpose for which it is supplied. No reproduction, copying, reuse, sale, hire, loan or gift of this document directly or indirectly is permitted without the prior written consent of Birch Surveyors Ltd
5) This document is subject to copyright

Total number of proposed private lots = 192
Total number of public open air reserves = 3
Combined total lots = 195

original size A3

Birch Planning Surveying Engineering
LAND DEVELOPMENT CONSULTANTS
2A Wesley Street
Pukekohe 2120
PO Box 475
Pukekohe 2340
Ph: 09 237 1111
pukekohe@birch.nz
www.birch.nz

Telarc Registered Quality ISO 9001

LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	AUCKLAND UNITARY PLAN
ZONING	FUTURE URBAN ZONE
ACTIVITY	-
COMPRISED IN	NA84D/710, NA84D/711 , NA103A/604
TOTAL AREA	10.130 ha, 8.517 ha, 0.5378 ha
REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

79 LISLE FARM DRIVE
PUKEKOHE

Surveyed T.RHODES	Date 14/03/2019	Project No. 4553
Designed SWB	Date 10/2022	Scale Hz: 1:2000 @ A3
Drawn T.RHODES	Date 09/2023	
Approved SWB	Date 09/2023	

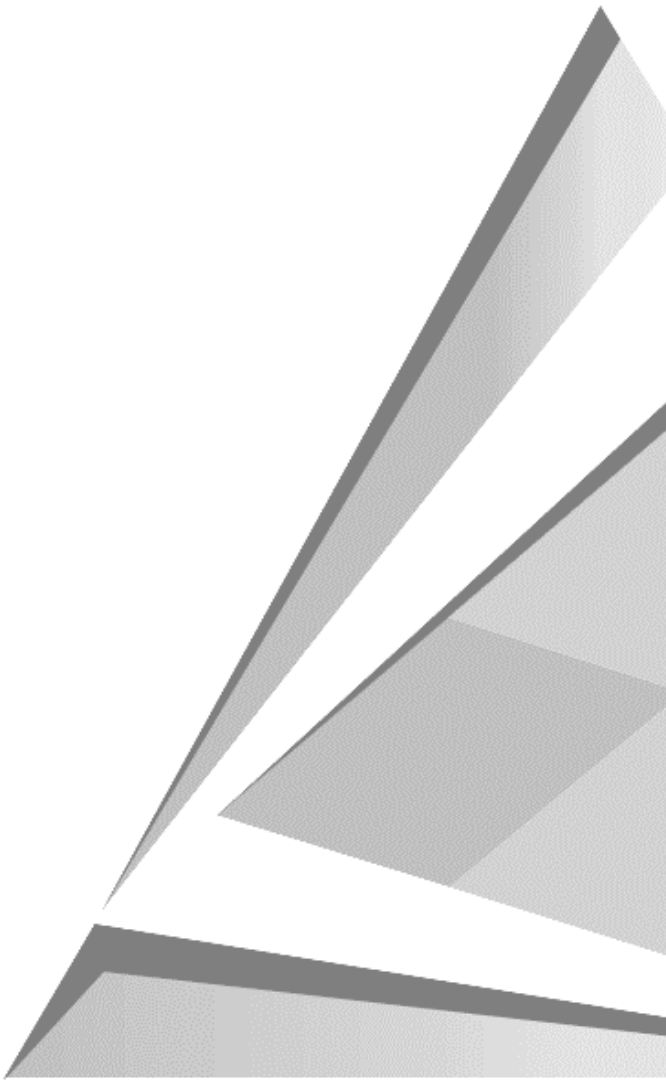
REV.	BY	DATE	COMMENT
E	TR	08/23	LOTS & OPEN SPACE
F	TR	09/23	LOTS
G	TR	09/23	LOTS & OPEN SPACE
H	TR	09/23	LOTS

TITLE

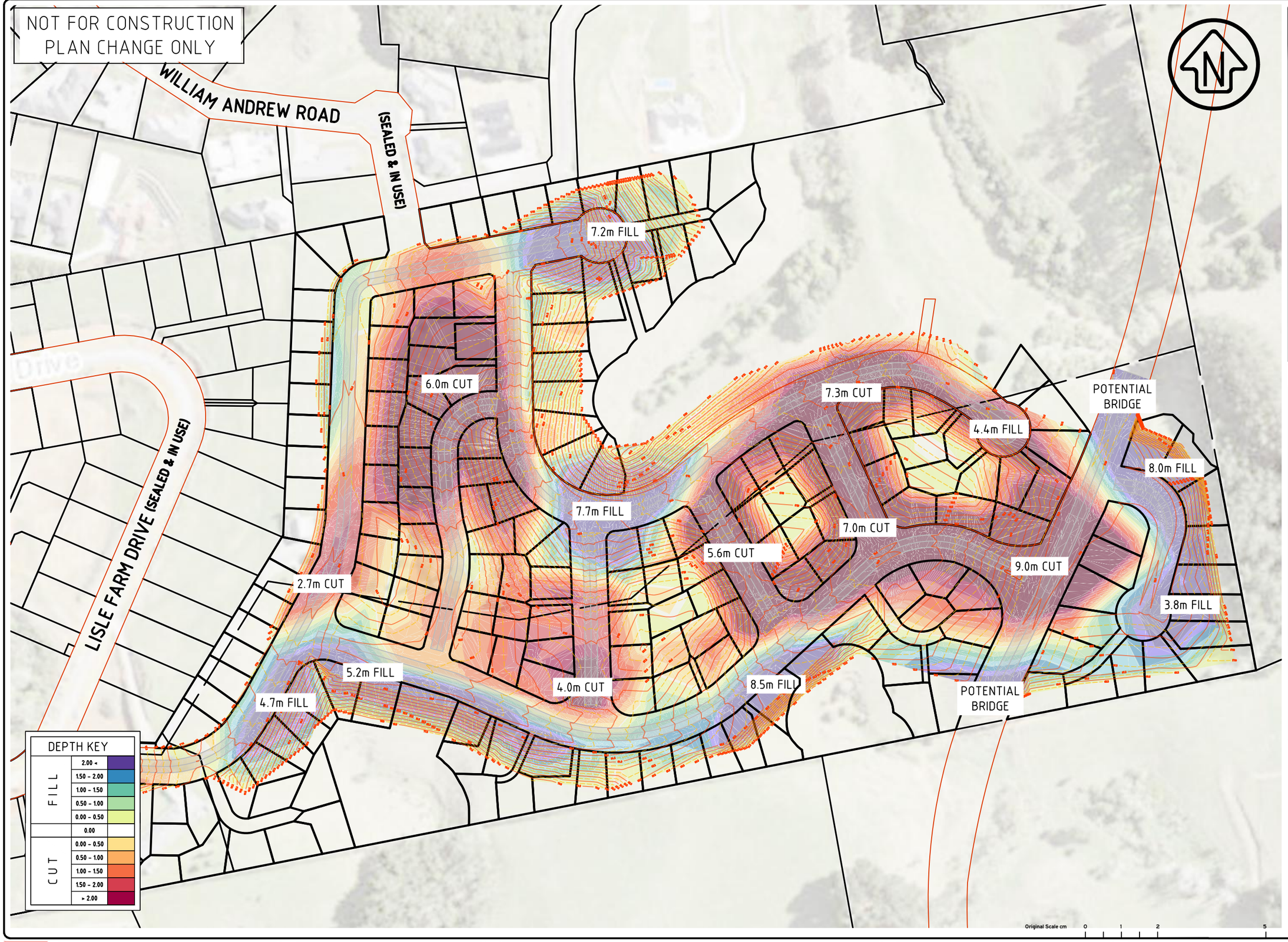
CONCEPT PLAN OF LOTS 1 & 2 DP 143272 & LOT 1 DP 169148

Drawing Name	F:\..\CAD\CP 4553 H.dwg /	SUBJECT TO FINAL SURVEY	Rev. H

Appendix D
Concept Earthworks Plan



NOT FOR CONSTRUCTION
PLAN CHANGE ONLY



DEPTH KEY

FILL	2.00 <	
	1.50 – 2.00	
	1.00 – 1.50	
	0.50 – 1.00	
	0.00 – 0.50	
	0.00	
CUT	0.00 – 0.50	
	0.50 – 1.00	
	1.00 – 1.50	
	1.50 – 2.00	
	> 2.00	

KEY

- Proposed Lot Boundaries
- Abuttal Boundaries
- Edge of Kerb
- Design Major Contour (1.0m) — 20.00
- Design Minor Contour (0.2m)
- Proposed Dwelling
- Extent of Earthwork
- Prop. Retaining Wall (H) — 600mm

CUT/FILL SUMMARY (Approximately)

EARTHWORK DISTURBANCE AREA = 110,000m^2

TOTAL CUT VOLUME = 16,500m^3 (To be exported from the site)

CUT VOLUME FOR TOPSOIL = 16,500m^3 (150mm)

CUT VOLUME (excl. Topsoil) = 170,900m^3

FILL VOLUME = 125,000m^3 (20% RATIO)

MAXIMUM CUT DEPTH: 9,000mm

MAXIMUM FILL DEPTH: 8,500mm

NOTES

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6) It is the contractors responsibility to arrange to have all fill areas inspected by the geotechnical engineer prior to placing fill and further inspections as required by the geotechnical engineer for the purpose of carrying out compaction testing.

7) All setout of the works is the responsibility of the contractor.

8) Hardfill backfill to be placed under all driveways and accessways at the direction of the engineer.

9) Topsoil in Berms is to rotary hoed topsoil from site or as otherwise approved material, 150mm thick and free of stones, debris etc.

10) Telecom, Power and Water Services are

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Ph: 09 237 1111
pukekohe@bslnz.com
www.birchsurveyors.co.nz

LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	AUCKLAND UNITARY PLAN
ZONING	FUTURE URBAN ZONE
ACTIVITY	-
COMPRISED IN	NA84D/710, NA84D/711 , NA103A/604
TOTAL AREA	10.130 ha, 8.517 ha, 0.5378 ha
REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

70/70A/70B LISLE FARM DRIVE
PUKEKOHE

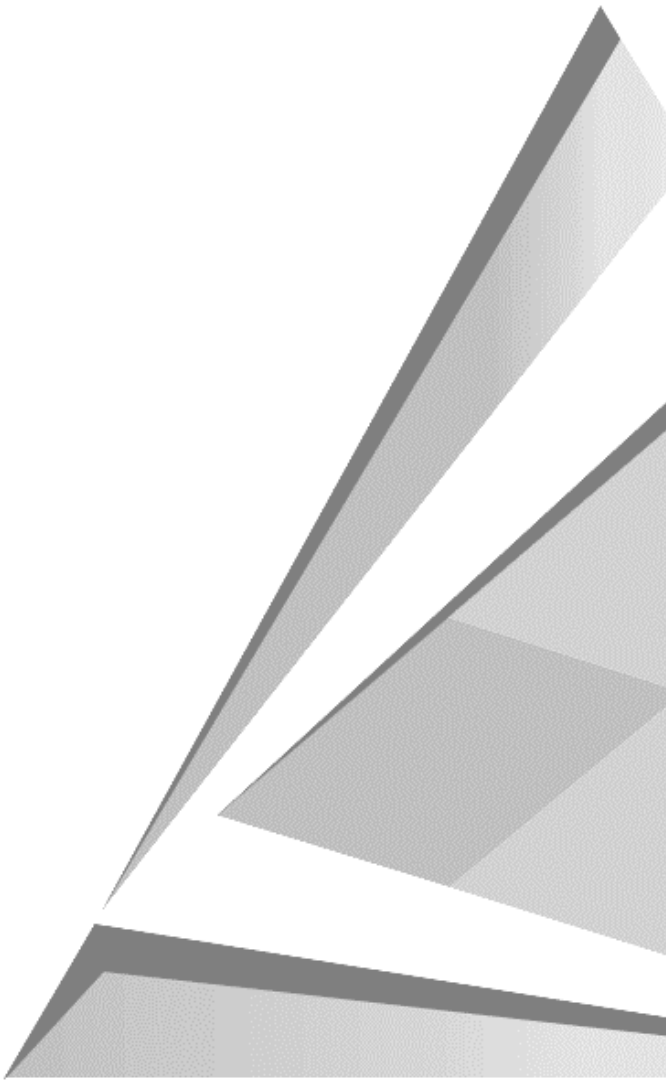
Surveyed BSL	Date 04/19	Project No. 5324	
Designed S.HANG	Date 06/23	Scale Hz: 1:2000 @ A3	
Drawn S.HANG	Date 06/23	REV. A	BY SH	DATE 06/23	COMMENT INITIAL ISSUE
Approved K.BOSGRA	Date		

TITLE

EARTHWORK DRAFT CONCEPT PLAN OF
LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /EW (2)	SUBJECT TO FINAL SURVEY	Rev. A

Appendix E
Stormwater Servicing Plan



Stephen Smith
70A & 70B Lisle Farm Drive, Pukekohe

BSL Ref: 4553

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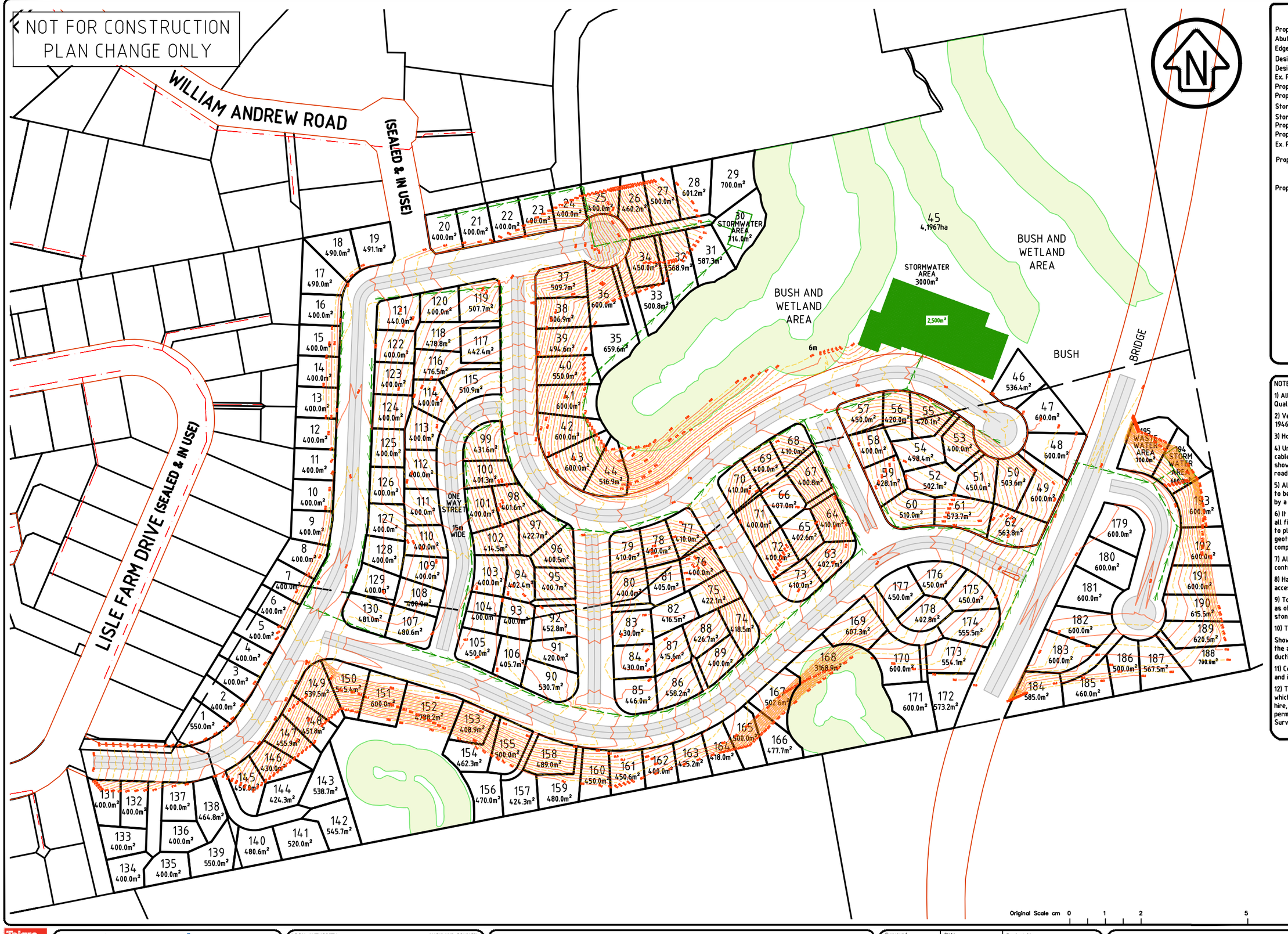
PLAN CHANGE ONLY



KEY

- Proposed Lot Boundaries
- Abuttal Boundaries
- Edge of Kerb
- Design Major Contour (1.0m) — 20.00
- Design Minor Contour (0.2m)
- Ex. Public Stormwater Line
- Prop. Public Stormwater Line
- Prop. Private Stormwater Line
- Stormwater Manhole — Ex. / Prop.
- Stormwater Cesspit — Ex. / Prop.
- Prop. Public Wastewater Line
- Prop. Private Wastewater Line
- Ex. Public Wastewater Line
- Proposed Dwelling
- Prop. Driveway

NOTES

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LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	AUCKLAND UNITARY PLAN
ZONING	FUTURE URBAN ZONE
ACTIVITY	-
COMPRISED IN	NA84D/710, NA84D/711 , NA103A/604
TOTAL AREA	10.130 ha, 8.517 ha, 0.5378 ha
REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

70/70A/70B LISLE FARM DRIVE
PUKEKOHE

Surveyed BSL	Date 04/19	Project No. 5324
Designed S.HANG	Date 06/23	Scale Hz: 1:250 @ A3
Drawn S.HANG	Date 06/23	
Approved K.BOSGRA	Date 06/23	

REV.	BY	DATE	COMMENT
A	SH	06/23	INITIAL ISSUE

TITLE

STORMWATER ENGINEERING PLAN FOR LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /SW	SUBJECT TO FINAL SURVEY	Rev.	A

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PLAN CHANGE ONLY

WILLIAM ANDREW ROAD (SEALED & IN USE)

LISLE FARM DRIVE (SEALED & IN USE)

Pre-SC A 9,633m²

Pre-SC B 36,308m²

Pre-SC C 13,425m²

Pre-SC D 21,005m²

Pre-SC E 21,812m²

Pre-SC F 9,090m²

Pre-SC G 15,740m²

Pre-SC H 12,464m²

ONE WAY STREET 15m WIDE

BUSH AND WETLAND AREA

STORMWATER AREA 3000m²

BUSH

BRIDGE

6m

45 4.1967ha

30 STORMWATER AREA 714.0m²

195 WASTE WATER AREA 700.0m²

194 STORM WATER AREA 600.0m²

KEY

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- Natural Minor Contour (0.2m)
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- Stormwater Manhole Ex. Prop.
- Stormwater Cesspit Ex. Prop.
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- Proposed Dwelling
- Prop. Driveway

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LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	AUCKLAND UNITARY PLAN
ZONING	FUTURE URBAN ZONE
ACTIVITY	-
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REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

70/70A/70B LISLE FARM DRIVE
PUKEKOHE

Surveyed BSL	Date 04/19	Project No. 5324
Designed S.HANG	Date 06/23	Scale Hz: 1:250 @ A3
Drawn S.HANG	Date 06/23	
Approved K.BOSGRA	Date 06/23	

REV.	BY	DATE	COMMENT
A	SH	06/23	INITIAL ISSUE

TITLE

PRE-DEVELOPMENT STORMWATER CATCHMENT PLAN FOR LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /Pre Catchment	SUBJECT TO FINAL SURVEY	Rev.	A

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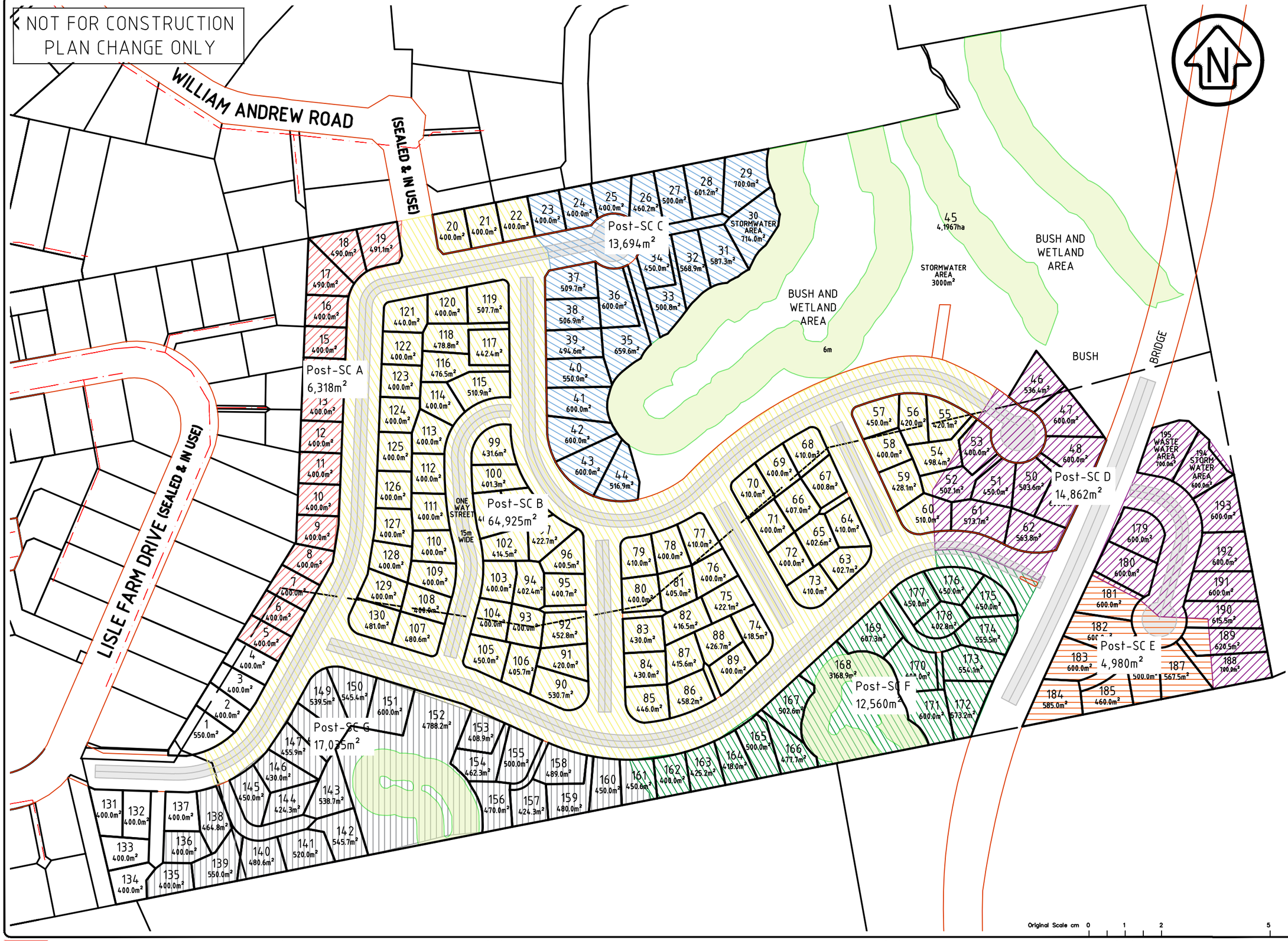
PLAN CHANGE ONLY



KEY

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- Abuttal Boundaries
- Edge of Kerb
- Ex. Public Stormwater Line
- Prop. Public Stormwater Line
- Prop. Private Stormwater Line
- Stormwater Manhole Ex. Prop.
- Stormwater Cesspit Ex. Prop.
- Prop. Public Wastewater Line
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- Ex. Public Wastewater Line
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- Prop. Driveway

NOTES

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LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	AUCKLAND UNITARY PLAN
ZONING	FUTURE URBAN ZONE
ACTIVITY	-
COMPRISED IN	NA84D/710, NA84D/711 , NA103A/604
TOTAL AREA	10.130 ha, 8.517 ha, 0.5378 ha
REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

70/70A/70B LISLE FARM DRIVE
PUKEKOHE

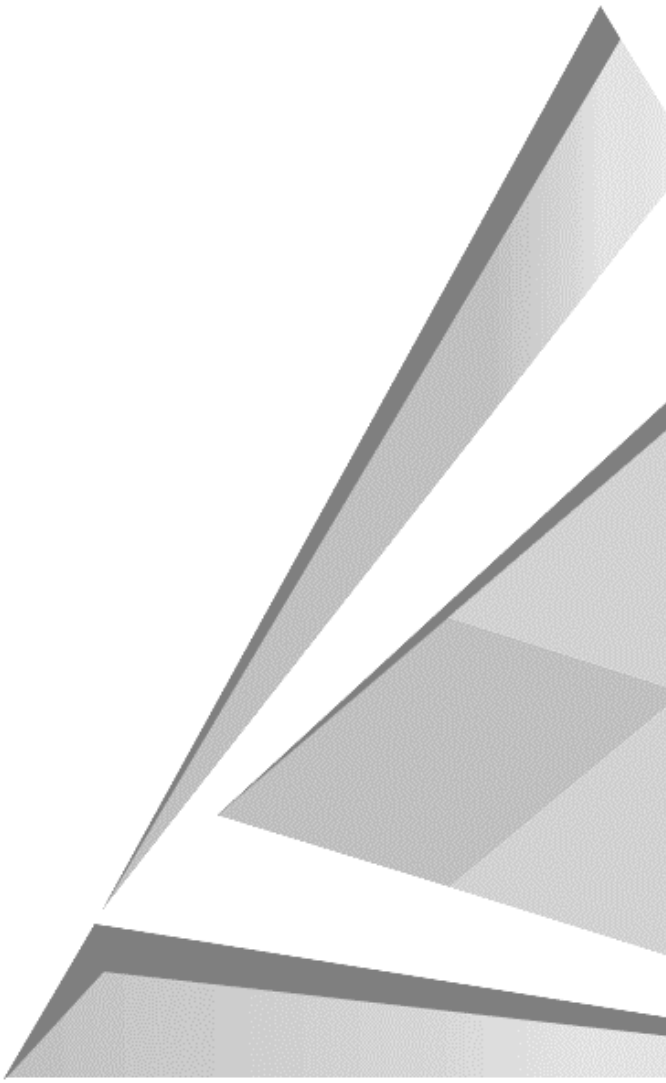
Surveyed BSL	Date 04/19	Project No. 5324	
Designed S.HANG	Date 06/23	Scale Hz: 1:250 @ A3	
Drawn S.HANG	Date 06/23	REV. A	BY SH
Approved K.BOSGRA	Date 06/23	DATE 06/23	COMMENT INITIAL ISSUE

TITLE

POST-DEVELOPMENT STORMWATER CATCHMENT PLAN FOR LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /Post Catchment	SUBJECT TO FINAL SURVEY	Rev. A

Appendix F
Wastewater and Water Servicing Plan



Stephen Smith
70A & 70B Lisle Farm Drive, Pukekohe

BSL Ref: 4553

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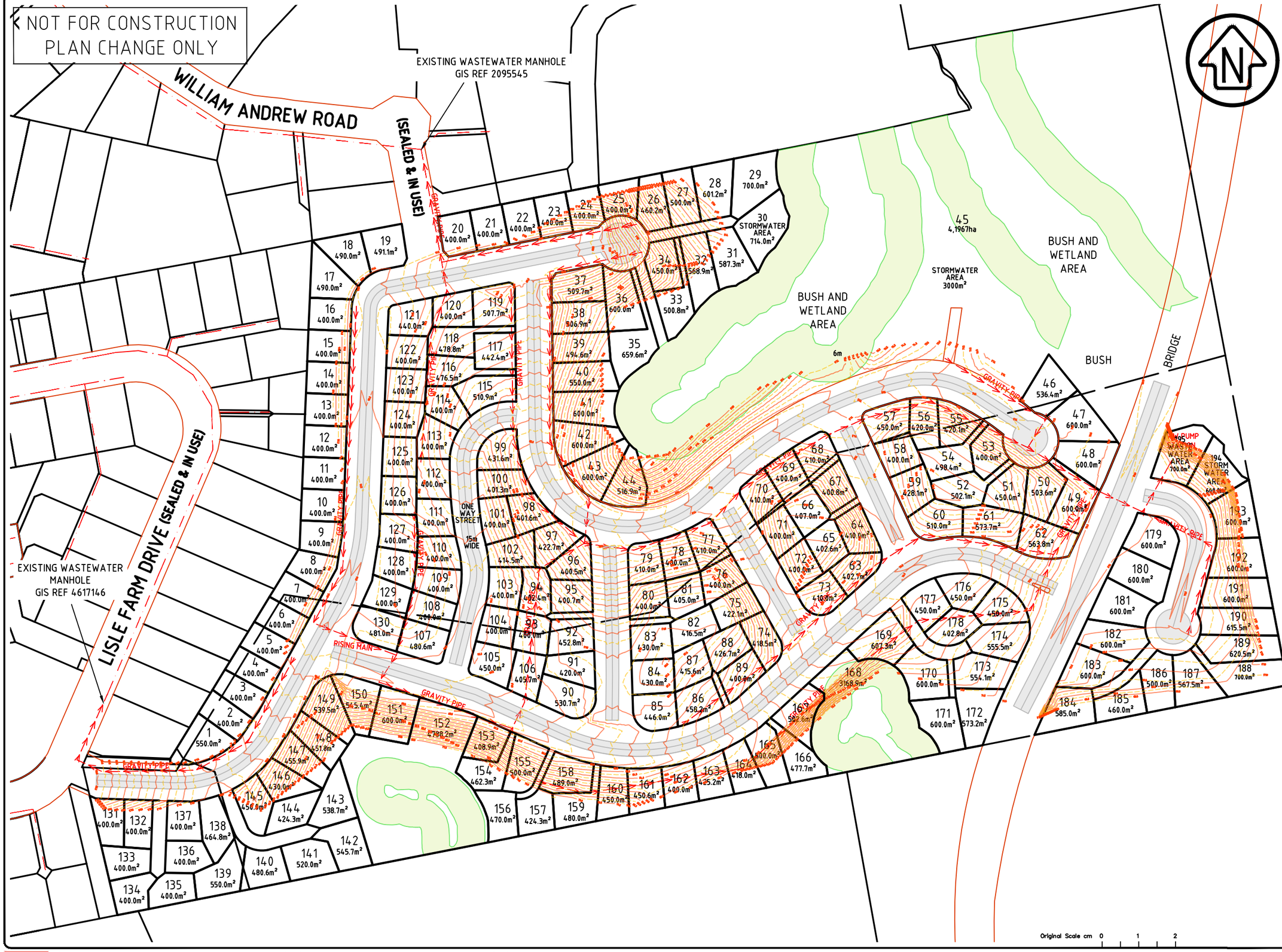
PLAN CHANGE ONLY



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PROJECT NAME

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70/70A/70B LISLE FARM DRIVE
PUKEKOHE

Surveyed BSL	Date	04/19
Designed S.HANG	Date	06/23
Drawn S.HANG	Date	06/23
Approved K.BOSGRA	Date	06/23

Project No. 4553

Scale Hz: 1:250 @ A3

REV.	BY	DATE	COMMENT
A	SH	06/23	INITIAL ISSUE

TITLE

WASTEWATER ENGINEERING PLAN FOR LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /WW	SUBJECT TO FINAL SURVEY	Rev.	A

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PLAN CHANGE ONLY

WILLIAM ANDREW ROAD (SEALED & IN USE)

LISLE FARM DRIVE (SEALED & IN USE)

ONE WAY STREET

15m WIDE

BUSH AND WETLAND AREA

STORMWATER AREA 3000m²

STORMWATER AREA 714.0m²

BUSH

BRIDGE

WASTE WATER AREA 700.0m²

STORM WATER AREA 600.0m²

6m

KEY

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REGISTERED OWNERS	STEPHEN SMITH DIANNE SMITH

PROJECT NAME

SMITH

70/70A/70B LISLE FARM DRIVE
PUKEKOHE

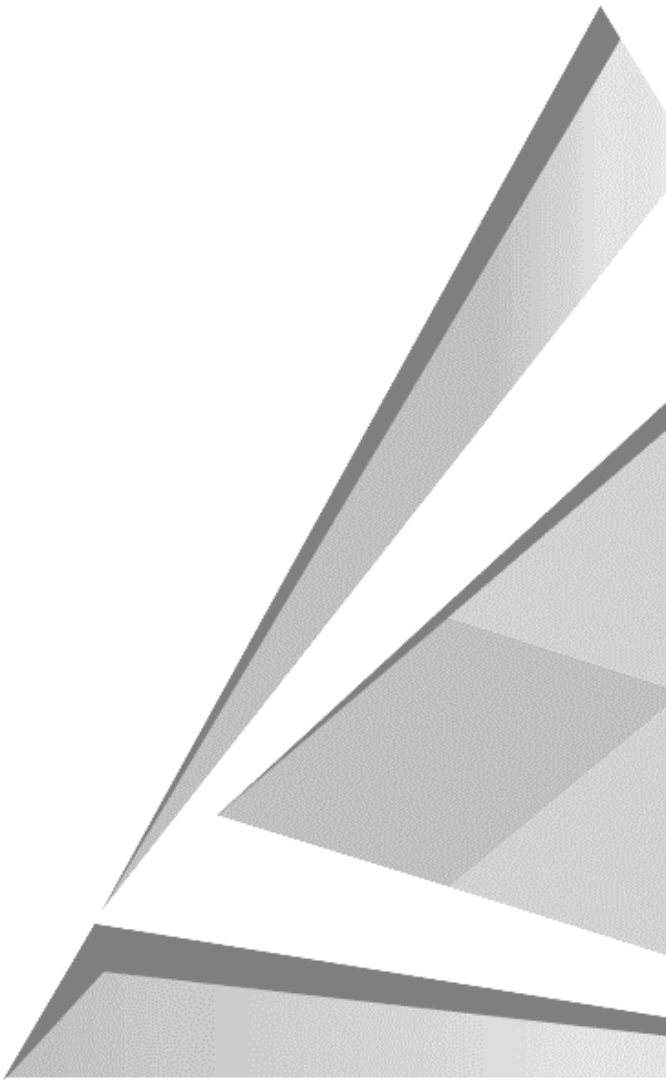
Surveyed BSL	Date 04/19	Project No. 4553	
Designed S.HANG	Date 06/23	Scale Hz: 1:250 @ A3	
Drawn S.HANG	Date 06/23	REV. A	BY SH	DATE 06/23	COMMENT INITIAL ISSUE
Approved K.BOSGRA	Date 06/23		

TITLE

WATER SUPPLY ENGINEERING PLAN FOR LOT 1 DP 143272, LOT 2 DP 143272, LOT 1 DP 169148

Drawing Name	EP 4553 PPC Rev WIP.dwg /WS	SUBJECT TO FINAL SURVEY	Rev. A

Appendix G
Counties Energy Letter



3/08/2023

Stephen Smith
C/O Birch Land Development Consultants
Po Box 475
Pukekohe
Auckland 2340

By Email skywardH@birch.nz

Dear Skyward,

INITIAL ASSESSMENT for Stephen Smith (Customer)
Proposed 187 Residential Lot Subdivision (Proposed Project)
70 Lisle Farm Drive, Pukekohe (Location)
J21986 (Our Reference Number)

Thank you for your enquiry regarding providing a network connection point for the proposed 187 residential lot subdivision at 70 Lisle Farm Drive, Pukekohe

- Lots: 187
- 70 Lisle Farm Drive, Pukekohe
- Provide single-phase 63A domestic point of connection.

We confirm that network connection points can be made available within the road reserve to serve this request; however, further technical assessment (including the number of connections) will be necessary to determine the extent and nature of the work required to do this. In addition, the connection of the lots to the electricity network will be further subject to compliance with the terms and conditions of the Electricity Network Provision and payment of a capital contribution towards the provision of the network connection points. This allows Counties Energy to appropriately invest in its network to ensure quality and security of supply for existing and future consumers.

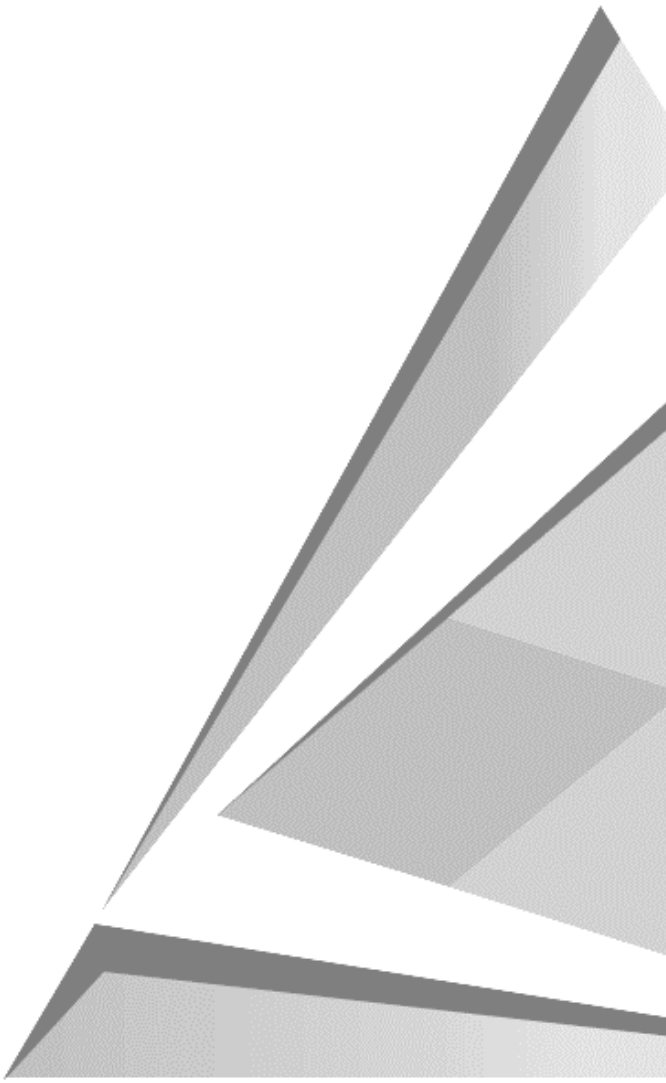
Yours faithfully,

Holly Benadie

HBenadie

Customer Projects Co Ordinator
Customer.projects@countiesenergy.co.nz

Appendix H
Supporting Growth Letter



Te Tupu Ngātahi
Supporting Growth
PO Box 105218
Auckland 1143

15 May 2023

SR Smith & DS Smith
PO Box 585
Pukekohe 2340

Kia ora

Property Address: 70A Lisle Farm Drive;70B Lisle Farm Drive
Record of Title number: NA84D/710;NA84D/711
SG Reference Number: 511178;511192

Pukekohe, Paerata, and south Drury future transport connections - Important information relating to your property.

We are writing to update you on essential transport infrastructure that is being planned in the next 20 to 30 years and what this may mean for you and your property.

Last year, we shared with the community the options we are looking at for a future transport network in Pukekohe, Paerata and south Drury. Since the conclusion of public feedback in late December 2022, we have continued to work on environmental and technical assessments to confirm those transport options. To find out more please visit our website https://findoutmore-supportinggrowth.nz/pukekohe

We can now share more detailed information with you about how our proposed routes could impact your property and the Notice of Requirement process to route protect certain areas of land for that purpose.

Enclosed with this letter is a plan showing a draft designation boundary and the extent of the potential impact on your property.

The proposed route and extent to which your property could be impacted may still change as further investigations and refinements are undertaken, including consultation with landowners, such as yourselves.

Once this work is completed, we will finalise the route for the project and seek the approvals required under the Resource Management Act 1991. At this stage, Waka Kotahi and Auckland Transport expect to lodge Notices of Requirement in late 2023.

We would like to talk with you about what the Notice of Requirement process means, answer any questions, and understand what support you may need before the process gets underway.

Please contact us to book a time to meet from 24 May to 16 June. We are available to meet with you over the phone, via an online meeting, or in person at Franklin: The Centre in Pukekohe or at our office in Auckland CBD if that works better for you.

What is a Notice of Requirement?

We are going through a Notice of Requirement process to officially designate and protect the land needed for future transport projects. This is a statutory process, similar to applying for resource consent under the Resource Management Act 1991.

You can read more about what a Notice of Requirement is at our website:

https://www.supportinggrowth.govt.nz/property-owner-information/notice-of-requirement-process/

Once the designation is in place, property owners, with some limitations, can continue to use, own, or sell their designated land until it is needed for construction.

These projects are not currently funded, so we are not seeking to purchase the land until funding becomes available, which may be in 20 to 30 years.

What happens next?

We expect to lodge the Notice of Requirement with Auckland Council by late 2023.

Auckland Council will then formally notify property owners, who can submit to support or oppose the designation and take part in a hearing, if they choose, as part of the decision-making process.

You can find information for property owners and an explanation of the route protection and Notice of Requirement processes on our website at: supportinggrowth.govt.nz/property-owner-information.

We know many of you may have been dealing with some uncertainty during our planning for future transport projects to support planned growth in your area. We hope this letter provides more clarity on the process ahead, how you may be impacted, and what actions you can take.

Please take the opportunity to meet with the Te Tupu Ngātahi team leading this project to talk about the Notice of Requirement process and ask questions about what this means for you.

Next steps – book in a time to talk to us

To book an online or in-person meeting:

- Scan the QR code or visit https://calendly.com/d/ykz-cw4-tpk
- Email us: info@supportinggrowth.nz
- Freephone 0800 GROW AKL (0800 4769 255)

Ngā mihi nui

Deepak Rama
Principal Transport Planner
Transport Services – System Design
Waka Kotahi NZ Transport Agency

Alastair Lovell
Auckland Transport Owner Interface Manager
Auckland Transport

TE TUPU NGĀTAHI
SUPPORTING GROWTH

Translation Support
Tautoko Takatau
翻译支持
번역 지원

Lagolago Faaliliu
Tokoni ki he Liliu Leá
ਅਨੁਵਾਦ ਸਹਾਇਤਾ
ترجمہ سپورٹ

If you would like this letter translated, or for a translator to support you during a meeting, please contact info@supportinggrowth.nz or call us on 0800 Grow Akl (0800 4769 255) and we can help arrange this.

Te reo Māori
Mēnā, e hiahia ana koe he reta Reo Māori, he kaiwhakamāori rānei hei tautoko i a koe i roto i te hui. Tuku īmera mai ki info@supportinggrowth.nz
He karere rānei ki te nama 0800 Grow Akl (0800 4769 255) ā, kātahi mātou ka āwhina ki te whakarite.

中文
如果您希望翻译这封信，或希望翻译人员在会议期间为您提供支持，请联系 info@supportinggrowth.nz或致电 0800 Grow Akl (0800 4769 255) 我们可以帮助安。

한국어
이 편지의 번역을 원하시거나 회의 중에 번역가의 도움을 받으려면 info@supportinggrowth.nz 로 연락하거나 0800 Grow Akl (0800 4769 255) 로 전화해 주시면 준비를 도와드릴 수 있습니다.

Gagana fa'a Sāmoa
Afai e mana'omia se fesoasoani i le fa'aliliuina o lenei tusi i le tatou gagana Samoa, ae fa'apea fo'i e mana'omia se tagata e fa'aliliuina o le gagana Samoa i le gagana Peretania i le taimi o le fonotaga, fa'amolemole fa'afeso'ota'i le info@supportinggrowth.nz, pe vala'au mai i le 0800 GrowAkl (0800 4769 255) ona e mafaiona matou fesoasoani i lenei mataupu matagofie.

Lea faka-Tonga
Kapau 'oku ke fie ma'u ke liliu 'a e tohi ni, pe ko ha tokotaha liliu lea ke poupou'i koe lolotonga ha fakataha, kataki 'o fetu'utaki ki he info@supportinggrowth.nz pe telefoni mai kiate kimautolu 'i he 0800 tupu Akl (0800 4769 255) pea 'e lava ke mau tokoni 'i hono fokotu'utu'u 'eni.

ਪੰਜਾਬੀ
ਜੇਕਰ ਤੁਸੀਂ ਇਸ ਚਿੱਠੀ ਦਾ ਅਨੁਵਾਦ ਕਰਨਾ ਚਾਹੁੰਦੇ ਹੋ, ਜਾਂ ਇੱਕ ਅਨੁਵਾਦਕ ਲਈ ਇੱਕ ਮੀਟਿੰਗ ਦੌਰਾਨ ਤੁਹਾਡੀ ਮਦਦ ਕਰਨ ਲਈ, ਕਿਰਪਾ ਕਰਕੇ info@supportinggrowth.nz ' ਤੇ ਸੰਪਰਕ ਕਰੋ ਜਾਂ ਸਾਨੂੰ 0800 Grow Akl (0800 4769 255) 'ਤੇ ਕਾਲ ਕਰੋ ਅਤੇ ਅਸੀਂ ਇਸਦਾ ਪ੍ਰਬੰਧ ਕਰਨ ਵਿੱਚ ਮਦਦ ਕਰ ਸਕਦੇ ਹਾਂ।

اردو

اگر آپ چاہتے ہیں کہ اس خط کا ترجمہ ہو، یا کسی مترجم کے لیے ملاقات کے دوران آپ کی مدد کرے، تو براہ کرم info@supportinggrowth.nz پر رابطہ کریں یا ہمیں 0800 Grow Akl (0800 4769 255) پر کال کریں اور ہم اس کا بندوبست کرنے میں مدد کر سکتے ہیں۔

DRAFT

William Andrew Rd

Lisle Farm Dr

Lot 1 DP 143272

Lot 1 DP 143272

0 45 90 180 m

Aerial imagery supplied by Nearmap Australia Pty Ltd
Road names LINZ and ESRI Community Maps

Path: P:\381\38109341TG\01 Map\06 ArcGIS Pro\04 South\SGA_Pro_S_Pukekohe_PropertyPlans.aprx Name: SGA-EN-PUK-004-NoR 4

LEGEND

- Your Property
- Indicative area of your property within draft designation boundary
- Earthworks
- Verge
- Bridge
- Retaining Wall
- Road Corridor
- Footpath
- Cycleway
- Verge Material/Median
- Stormwater Wetland/ Attenuation Device
- Proposed Design

Owner ID:511178
Title No: NA84D/710
70A Lisle Farm Drive

Pukekohe North East Arterial (NoR 4)

Date : 11/05/2023

NOTES
1. Property Boundary data derived from Land Information New Zealand
2. This map shows the area of land that may be affected by the route
3. This plan may not include all the land in your ownership over a wider area
4. Blue hatched area for the proposed designation may also include areas to enable temporary construction works to take place

This map contains data derived in part or wholly from sources other than those party to the Supporting Growth Alliance, and therefore, no representations or warranties are made by those party to the Supporting Growth Alliance as to the accuracy or completeness of this information.

Map intended for distribution as a PDF document. Scale may be incorrect when printed.

The recipient receives this information in confidence and in good faith to assist with discussions with the members of the Te Tupu Ngātahi Supporting Growth team. In receiving this information, the recipient acknowledges that this information is in draft form and may be subject to further amendments including (but not limited to) prior to the lodgment of the notice/s of requirement for the Level crossing removals and replacement projects, and as part of any subsequent detailed design process. The recipient further acknowledges that Te Tupu Ngātahi has no obligation to provide any such amendments or updates to the recipient as part of this process or otherwise.

WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

DRAFT

William Andrew Rd

Lisle Farm Dr

Knoll Rise

Stile Pl

Bale Way

Lot 2 DP 143272

Lot 2 DP 143272

0 50 100 200 m

Aerial imagery supplied by Nearmap Australia Pty Ltd
Road names LINZ and ESRI Community Maps

Path: P:\38138109341TGI\01 Map\06 ArcGIS Pro\04 South\SGA_Pro_S_Pukekohe_PropertyPlans.aprx Name: SGA-EN-PUK-004-NoR 4

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- Stormwater Wetland/ Attenuation Device
- Proposed Design

Owner ID:511192
Title No: NA84D/711
70B Lisle Farm Drive

Pukekohe North East Arterial (NoR 4)

Date : 11/05/2023

NOTES
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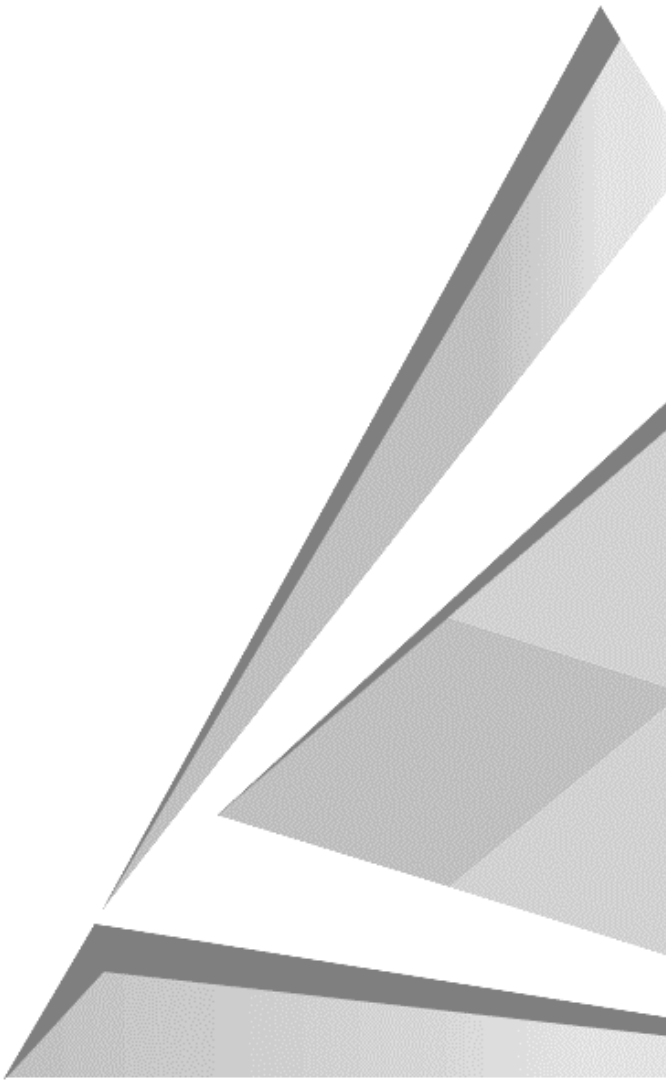
WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

Appendix I
Watercare Correspondence Letter



Kelly Bosgra

From: KSwanepoel (Kerryn) <Kerryn.Swanepoel@water.co.nz>
Sent: Friday, 14 April 2023 3:46 pm
To: Susan Andrews; Stephen; Sir William Birch; Robert Scott; CChau (Chhan) 2; SMudliar (Suresh); SCarthelis (Supun)
Cc: Sir William Birch; Skyward Hang; Kelly Bosgra
Subject: RE: 70A and 70B Lisle Farm Dr

Hi Robert,

As per Sir Bill's request in our last meeting, please see the below notes for consideration ahead of your plan change submission.

Wastewater

Network proposal within the development

- We prefer as few pumpstations and rising mains as possible, if there is a way to consolidate the flow please consider it.
- Please demonstrate if a consideration has been taken into if one rising main can be pumped into the other to minimise lengths and number of rising mains
- It's difficult to identify where the southern rising main pumps to, clarity on this would help us to understand which manhole you propose to connect to and if there is further advice required on that portion of the network.

Supporting infrastructure

- In our meeting, it was identified that two local pumpstations were impacted by the development proposal. On review it was noted that only the Colin Laurie 2 pump station (Located at the junction of Reynolds Rd and The Glade North) support the development.
- The development proposal will trigger the upgrade of this pump station and, as it is local network infrastructure, will need to be funded by the developer. The development also impacts the approximately 310m of the 200mm wastewater gravity network ahead of the pumpstation. This wastewater network is local and will need to be upgraded to support the development.
- From Colin Laurie 2 pump station, the flow is sent to Franklin Road Pumpstation which is currently at capacity. Watercare is constructing Isabella Road Pumpstation, due for completion mid-2025, which is designed to relieve Franklin Road Pumpstation. Once complete, Franklin Road Pump station will be able to support further development in Pukekohe area, however ahead of this work the network is unable accept any further development.

Water

Local Supporting Infrastructure

- The proposed development will fall within the Cape Hill Boosted Zone. Presently there is available capacity to service the proposed 184 DUEs being considered. The zoning does have a capacity limit and as a result, anything beyond this would need to consider connection to an alternative water network zone.

- A large local watermain will be required in the future to service part of your site and the future urban zone to the east of the development. At a high level, we would prefer for this to be located within the designation of the arterial road proposed in the structure plan. However, should there be uncertainty with this, we would need to consider space for this to traverse through part of the development. The watermain would

likely approximately 400mm in diameter and connect from the proposed Pukekohe East BSP (Pukekohe East Road) through the development to the Runciman Reservoir (Runciman Road).

Please let me know if you have any questions on the above information.

Kind Regards | Ngā mihi,

Kerryn Swanepoel (she/her) Why share pronouns? | Major Development Programme Lead

Watercare Services Limited
DDI: +64 0220501176
Postal address: Private Bag 92 521, Wellesley Street, Auckland 1141, New Zealand
Physical address: 73 Remuera Road, Remuera, Auckland 1050, New Zealand
Website: www.watercare.co.nz

Watercare
An Auckland Council Organisation

In the Office = ✓ Working from home = WFH

Mon	Tue	Wed	Thu	Fri
WFH	✓	✓	WFH	✓

Kelly Bosgra

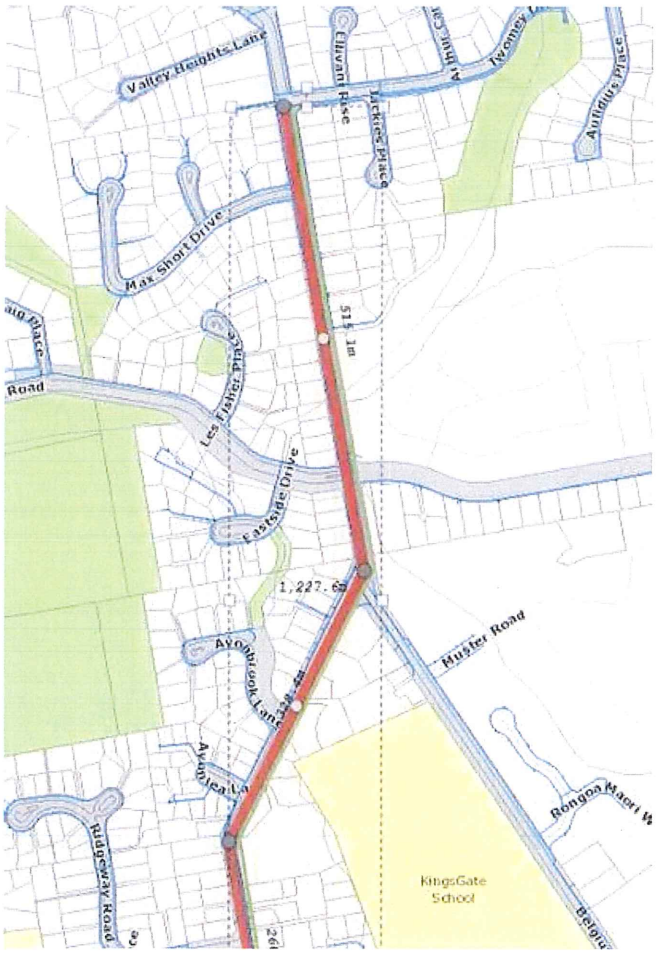
From: KSwanepoel (Kerryn) <Kerryn.Swanepoel@water.co.nz>
Sent: Monday, 17 April 2023 1:18 pm
To: Susan Andrews; Stephen; Sir William Birch; Robert Scott; CChau (Chhan) 2; SMudliar (Suresh); SCarthelis (Supun)
Cc: Sir William Birch; Skyward Hang; Kelly Bosgra
Subject: RE: 70A and 70B Lisle Farm Dr

Hi All,

Following this email, my water planner has advised me that we have missed a point.

Please note that under local water upgrades, we require an additional point to be added.

- The existing boosted zone demonstrates issues with suction side on the booster pump station when testing the development growth proposal. As a result, the existing 200mm watermain from East Street, and up along Valley Road to Twomey Drive needs to be upgraded. The new proposed pipe would need to be approximately 355mm OD (subject to further investigation), approximately 1.2km in length.



Please let us know if you have any questions.

Kind Regards | Ngā mihi,

Kerryn Swanepoel (she/her) Why share pronouns? | Major Development Programme Lead

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