

BLUE BARN

C O N S U L T I N G E N G I N E E R S

520 GREAT SOUTH ROAD PAPAURA

Engineering Infrastructure Report

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June 27, 2019

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Prepared by:
Blue Barn Consulting Limited

Prepared for:
520 GSR Ltd

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27/06/2019

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1. INTRODUCTION

1.1 PURPOSE

Blue Barn Consulting Engineers (Blue Barn) have been engaged by 520 GSR Ltd to provide an infrastructure report for 520 Great South Road, Papakura.

This Report is based on publicly available information including: Auckland Council's GeoMaps; beforeUdig; NZ Geological Maps and consultation with Barker and Associates.

Based on the above information, the Report provides comment on the existing infrastructure within and adjacent to the site and identifies any potential issues that may need to be addressed during the further stages of investigation, design and planning of the redevelopment, specifically:

- Storm Water
- Flooding
- Wastewater
- Water Supply
- Vehicle Access, and
- Earthworks

It is noted that Tonkin & Taylor have provided a high level assessment of flood and stormwater management for the site and this report should be read in conjunction with the Tonkin & Taylor report.

1.2 SITE

Our client's site is located at 520 Great South Road, Papakura but the proposed plan change will include the adjoining properties at 522 Great South Road and at 21 Gatland Road. This subdivision is shown on the masterplan prepared by Barker and Associates included in Appendix B.

The plan change area is located in the Slippery Creek catchment and has frontage to Gatland Road to the northeast and Great South Road to the southwest. The plan change area comprises three separate titles, namely 520 Great South Road, 21 Gatland Road and 522 Great South Road.

1.3 DEVELOPMENT

The proposed development for 520 Great South Road is shown in the masterplan prepared by Barker and Associates. The development will create approximately 83 individual lots, comprising a variety of terrace, duplex, stand-alone, and zero-lot house types. The impervious cover of the site will thus increase, with greater runoff volumes and higher flows as a result.

It is expected that following the plan change, the re-zoned properties at 522 Great South Road and 21 Gatland Road will also ultimately be developed for more intensive residential purposes, creating another 30 lots. The estimated total number of new lots within the three properties is 113.

2. STORMWATER

This section should be read in conjunction with the Tonkin & Taylor Report dated 29 April 2019.

2.1 EXISTING STORMWATER

There is no public stormwater infrastructure within the properties. However, public Auckland Council piped systems run along Gatland and Great South Roads. The Gatland Road system discharges via a 450 mm diameter pipe into the open channel along the north-eastern boundary of the properties. The Great South Road system discharges via a 600mm dia pipe into a tributary of the main open channel. This channel is classified as a permanent stream by Auckland Council.

2.2 PROPOSED STORMWATER RETICULATION

It is proposed to straighten and re-align the existing open channel along the north east boundary of the site to convey the stormwater flow from the upstream catchment. This open channel will be located within the area identified on the masterplan prepared by Barker and Associates as “*Stormwater Treatment/Amenity Planting*” at the rear of the sites abutting the cemetery.

As outlined in the Tonkin & Taylor report it is proposed that stormwater mitigation to comply with the Auckland Unitary Plan (AUP) requirements will be provided for in two formats:

- On-site mitigation for each of the proposed residential lots
- Stormwater treatment mitigation by vegetated bio-retention devices for the public road network

A piped stormwater reticulation network will be constructed within the road and laneway network to convey the primary flows generated by storm events up to a 1 in 10 year ARI storm. This network will discharge into the open channel.

Runoff from flows generated by storm events greater than a 1 in 10 year ARI storm up to a 1 in 100 year ARI storm will be conveyed by overland flow within the public road corridor to discharge into the existing open channel.

2.3 EXISTING FLOODING

The Auckland Council’s GeoMaps indicates that the 100 year floodplain extends along an overland flowpath in the open channel that runs along the north eastern boundary of the 520 Great South Road property and through the 21 Gatland Road property. The proposed development will need to respect the flood storage volumes within the site to ensure that upstream properties within the catchment are not adversely affected.

3. WASTEWATER

3.1 EXISTING WASTEWATER

There is an existing 150mm diameter public wastewater line that crosses the site at 520 Great South Road that serves the adjacent residential sites to the north west. This line runs along the eastern side of Great South Road to discharge to a pump station located on the southern side of the Slippery Creek bridge adjacent to 135 Great South Road.

Preliminary catchment calculations show that the existing pipe network has the capacity to accept the flows from the proposed development *see Appendix B*.

Veolia Water have been contacted to confirm that there are no downstream constraints either in the pipe network or in the Slippery Creek wastewater pump station. Advice has been received from Veolia Water that some upgrades will be required for the pump station to cater for the increased flows generated from the additional 103 lots. This will likely include providing additional storage and upgrading the pumps to allow for a greater flow.

3.2 PROPOSED WASTEWATER

It is proposed to re-align the existing reticulation within the site to align with the proposed roading and accessway layout. New wastewater reticulation will be laid within the public road corridor to service those lots that can be serviced with a gravity connection. The lots that are at a level below the level necessary for a gravity connection to the existing network would need to gravitate to a new pump station built on the site which could then pump up and discharge to the existing network.

Unfortunately, there is no alternative to providing a new pump station to service those lots that are at a level below the existing wastewater reticulation, unless Veolia Water is prepared to accept an LPS system which would involve individual private pumps on each lot. Veolia Water have indicated that they are not prepared to accept such a system.

4. WATER SUPPLY

4.1 EXISTING WATER SUPPLY

An existing 150mm diameter watermain is located on the eastern side of Great South Road. There is another 150mm diameter watermain located on the western side of Great South Road. There is an existing 100mm diameter watermain located on the southern side of Gatland Road. Fire hydrants are located in Great South Road and in Gatland Road in close proximity to the subject sites.

4.2 PROPOSED POTABLE WATER SUPPLY

An extension to the existing public water supply network will be required to serve the development. New 100 diameter PE water supply mains and 63mm diameter rider mains will be installed as part of the development to serve each new lot. It is proposed that a 100mm dia watermain be laid along the alignment of the paper road adjacent to the cemetery to provide a link to the Gatland Road 100mm diameter watermain.

Veolia Water have previously advised that there are no restrictions or limitations with the existing water supply network to supply water to the development.

4.3 PROPOSED WATER SUPPLY FIRE FIGHTING

All the new buildings in the development will be residential dwellings and as such the development is classified as FW2 within the New Zealand Fire Service Firefighting Water Supplies Code of Practice Table 1. The firefighting requirements for FW2 developments consist of one fire hydrant within 135m of every dwelling and an additional hydrant within 270m of every dwelling.

There are existing hydrants located on the water mains outside the property in Great South Road and Gatland Road. The water supply network will be extended into the site and hydrants will be installed to meet the requirements of the FW2 fire classification.

5. UTILITIES

5.1 POWER AND TELECOMMUNICATIONS

Power and Telecommunications service are able to be supplied to the development by connecting to the existing infrastructure located along Great South Road.

There is an overhead power supply on the eastern side of Great South Road and an underground supply on the western side. It is proposed to upgrade and underground the power reticulation along the Great South Road frontage of the site.

Telecommunications is by underground supply along Great South Road and Gatland Road *see Chorus plans included within Appendix D.*

Both power and telecommunication services can be readily extended through the site to service all the proposed lots.

5.2 GAS

First Gas have confirmed that there is no piped gas reticulation in the area *see Appendix D.*

6. ROADING AND ACCESS

Access to the development will be from a new public road formed off Great South Road near the mid-point of the frontage. This new road will be constructed through the site utilising the alignment of the paper road adjacent to the cemetery to create a link through to Gatland Road.

Each of the two proposed public roads will be classified as Local Roads as described in Auckland Transport's Code of Practice.

7. EARTHWORKS

7.1 PROPOSED EARTHWORKS

The sites are zoned Future Urban Zone under the AUP.

It is proposed that earthworks will be undertaken as a cut to fill operation within the site with a cut/fill balance likely to be achieved. The site will be formed to accommodate the roading network and the proposed lots as shown on the masterplan prepared by Barker and Associates. These works will be completed prior to the civil works commencing, and if for any reason there are delays in starting the civil works, the site will be stabilised with hay mulch.

7.2 EROSION AND SEDIMENT CONTROL

Erosion and Sediment Control measures will be adopted in accordance with Auckland Council Guideline document 2016/05 - *“Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region”* to minimise adverse effects during the construction period.

8. SUMMARY

Following our preliminary infrastructure study, the proposal to construct a 83 Lot development at 520 Great South Road together with a further 30 lots on 522 Great South Road & 21 Gatland Road, is considered feasible from an engineering perspective through the provision of stormwater, wastewater, utilities, water supply and access in accordance with relevant Auckland Unitary Plan requirements, Engineering Standards and Construction Good Practice.

Mitigation of the effects of earthworks and civil construction are able to be practically undertaken. Erosion and sediment control measures in accordance with GD-05 will be implemented to mitigate the effects of sediment laden run off from earthworks.

The existing stormwater reticulation in Gatland Road discharges into the open channel along the north-eastern boundary of the properties. It is proposed to re-align this existing open channel within the stormwater treatment/amenity planting zone to convey the stormwater flow from the upstream catchment through to the main Slippery Creek stormwater system. All stormwater runoff from the proposed subdivision will be directed to this open channel. Stormwater treatment will be provided at source for all roadways and heavily trafficked areas in accordance with the provisions of the AUP.

There is a 100 year floodplain that exists over the low lying portion of the site following the alignment of the existing open channel. The flood storage volume will be maintained when the channel is realigned.

The existing wastewater reticulation runs south-east down Great South Road towards an existing Watercare pump station. It is proposed to re-align the existing reticulation within the site to align with the proposed roading layout. The public gravity network will be extended to serve the remainder of the development which is able to be serviced by gravity means. The balance of the site that cannot be serviced by gravity means will be serviced by a low-pressure wastewater system with individual private pumps on each lot.

Existing public water reticulation networks are located in Great South Road and Gatland Road. These will be extended to provide a potable water supply to the subject sites and to provide a fire-fighting supply to NZ Fire Service requirements.

Power and Telecommunications service are able to be supplied to the development by connecting to the existing infrastructure located along Great South Road.

9. LIMITATIONS

1. Except where required by law, the findings presented as part of this report are for the sole use of our client, as noted above. The findings are not intended for use by other parties and may not contain sufficient information for the purposes of other parties or other uses. No third party (excluding the local authority) may use or rely upon this report unless authorised by Blue Barn in writing.
2. This Report has been prepared solely for 520 GSR Ltd to support a private plan change and should not be relied upon in any other context or for any other purpose.
3. Blue Barn will not be held liable to any Third Parties.

APPENDIX A – MASTER PLAN

(Refer Barker and Associates- Master Plan Dated 6 June 2019)



Legend

- Detached/ Zero-lot Dwelling
- Duplex
- Terrace
- Stormwater Treatment/ Open Space
- Rear Access Lane
- Street

APPENDIX B – WASTEWATER CAPACITY ANALYSIS

01910-520 Great South Road Papakura
 520 GSR Limited
 WW Pipe flows

Blue Barn Consulting Ltd
 Updated By: JC Date: 11/06/2019
 Checked By: RC Date: 11/06/2019



Post-Development

Design Assumptions

Residential EP = 3.0 people/dwelling
 ADWF = 180 l/person/day
 PDWF = 3.0
 PWWF = 6.7
 k_s = 0.6 mm

WW Line	Pipe ID SSMH	Pipe Catchment					PDWF Flow in pipe (l/s)	PWWF Flow in pipe (l/s)	Pipe diameter (mm)	Gradient (%)	Full pipe velocity (m/s)	Full Pipe Capacity (l/s)	Part flow capacity %	PDWF Velocity (m/s)*	Pipe reserve capacity (l/s)	Notes
		Dwellings	EP	ADWF (l/s)	PDWF (l/s)	PWWF (l/s)										
A		261	783	1.631	4.894	10.929	4.894	10.929	150	0.94%	0.97	17	28%	0.73	6	

Post Development

Total dwellings are 158+83 (on 520 GSR)+19 (on 21 Gatland)+11 (on 522 GSR)ie 261

Limiting section of existing 150mm dia wastewater line is the line across the Great South Road Bridge over Slippery Creek

Upstream manhole IL is 5.70m

Downstream manhole IL is 5.36m

Length 36.1m

Grade is 0.94%

Full pipe capacity is 17 l/s

01910-520 Great South Road Papakura
 520 GSR Limited
 WW Pipe flows

Blue Barn Consulting Ltd
 Updated By: JC Date: 11/06/2019
 Checked By: RC Date: 11/06/2019



Pre-Development

Design Assumptions

Residential EP = 3.0 people/dwelling
 ADWF = 225 l/person/day
 PDWF = 3.0
 PWWF = 1500.0 l/day/person
 k_s = 0.6 mm

WW Line	Pipe ID SSMH	Pipe Catchment					PDWF Flow in pipe (l/s)	PWWF Flow in pipe (l/s)	Pipe diameter (mm)	Gradient (%)	Full pipe velocity (m/s)	Full Pipe Capacity (l/s)	Part flow capacity %	PDWF Velocity (m/s)*	Pipe reserve capacity (l/s)	Notes
		Dwellings	EP	ADWF (l/s)	PDWF (l/s)	PWWF (l/s)										
A		158	474	1.234	3.703	8.229	3.703	8.229	150	0.94%	0.97	17	22%	0.62	9	

Pre development

Total dwellings are 111+25+2+20 ie 158

Limiting section of existing 150mm dia wastewater line is the line across the Great South Road Bridge over Slippery Creek

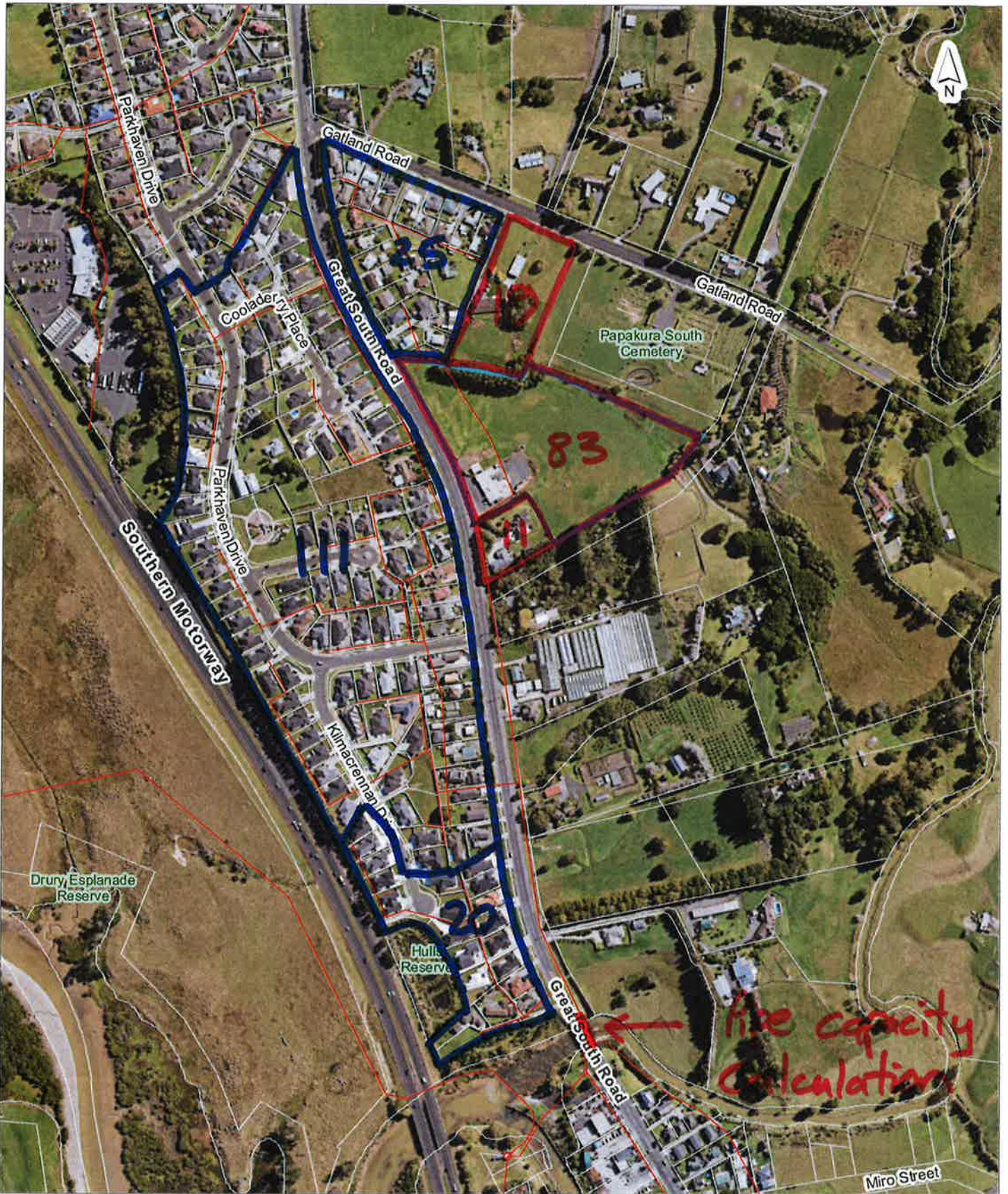
Upstream manhole IL is 5.70m

Downstream manhole IL is 5.36m

Length 36.1m

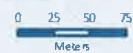
Grade is 0.94%

Full pipe capacity is 17 l/s



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520 GSR Ltd



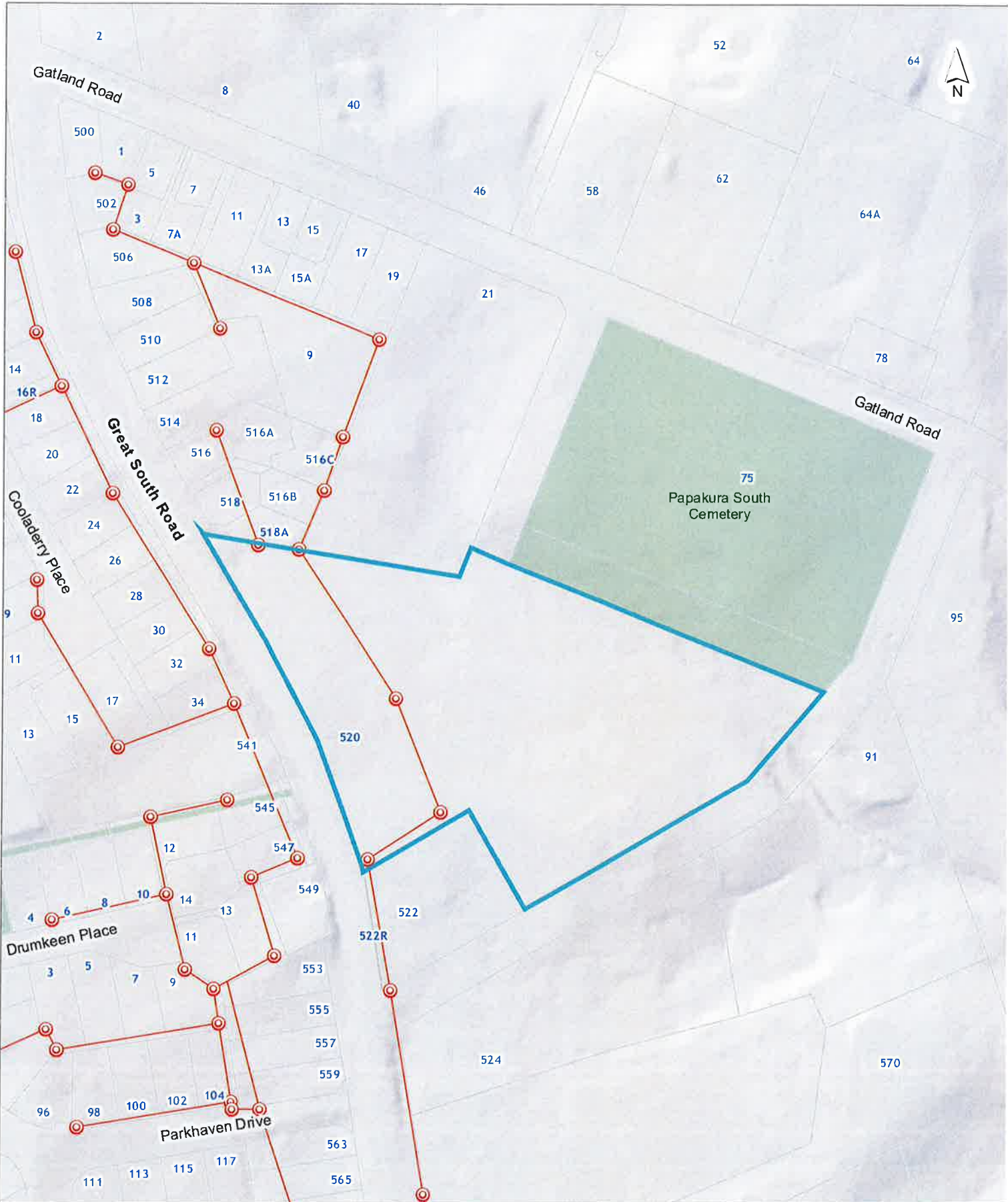
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Date Printed:
 11/06/2019



Auckland Council
Te Kaitiaki o Te Matua Kaitiaki

APPENDIX C – AUCKLAND COUNCIL GIS PLANS

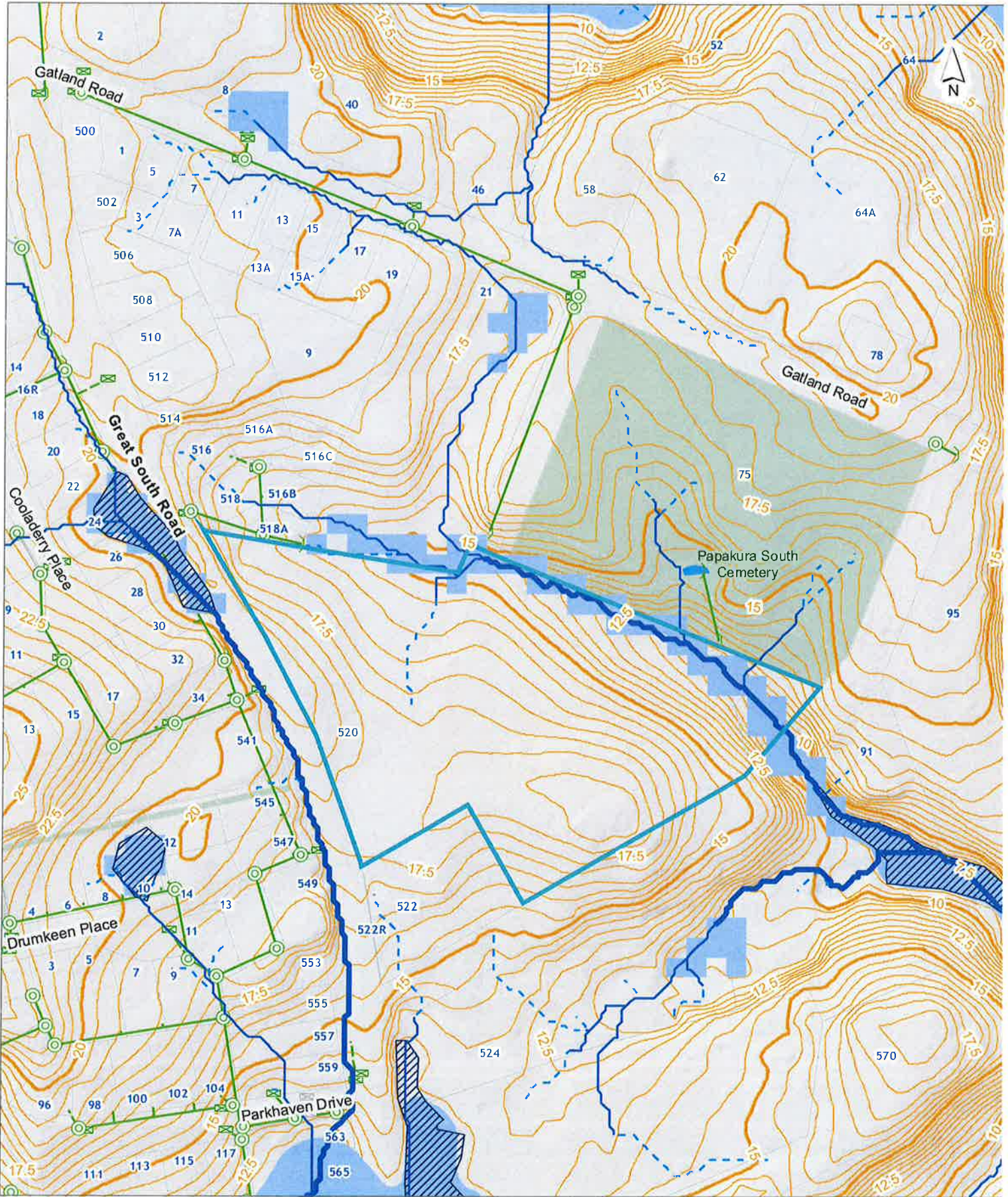


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Existing Wastewater

0 10 20 30
 Metres
 Scale @ A4
 = 1:2,500
 Date Printed:
 11/06/2019





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Existing Stormwater

0 10 20 30
 Meters

Scale @ A4
 = 1:2,500

Date Printed:
 11/06/2019



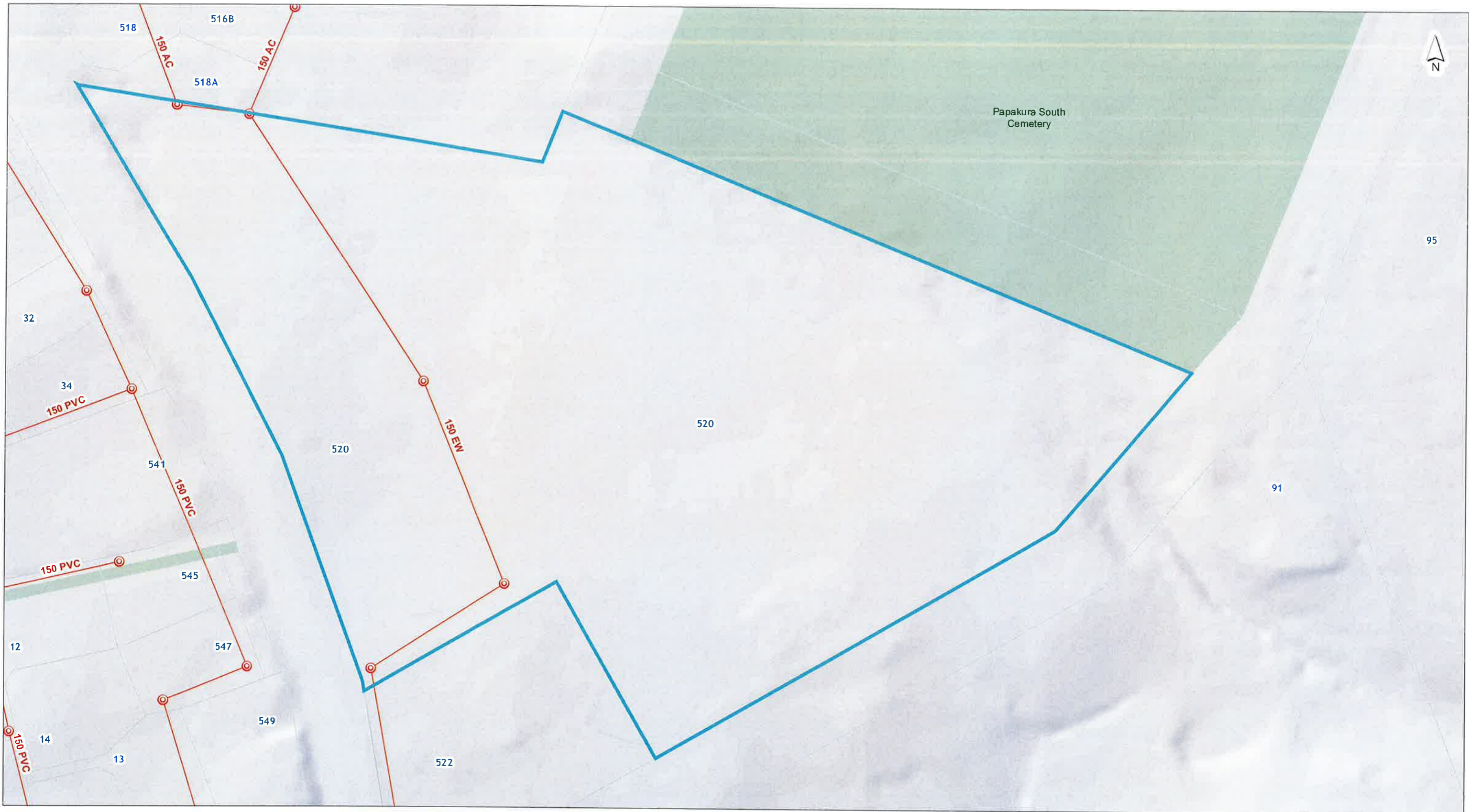


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Height datum: Auckland 1946.

Existing Water Supply

0 10 20 30
Meters
Scale @ A3
= 1:1,000
Date Printed:
11/06/2019





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Height datum: Auckland 1946.

Existing Wastewater




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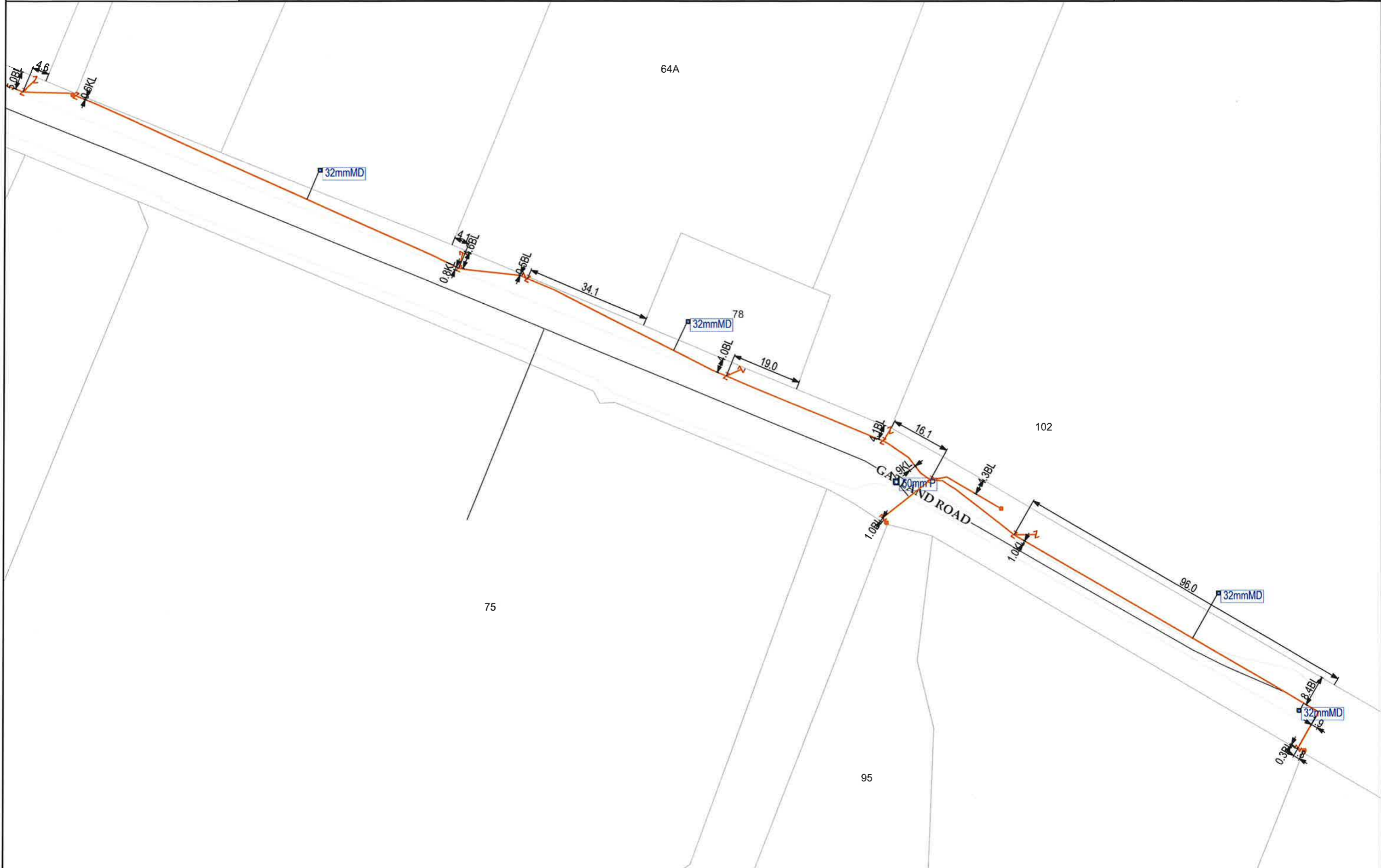
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APPENDIX D – BEFORE-U-DIG PLANS

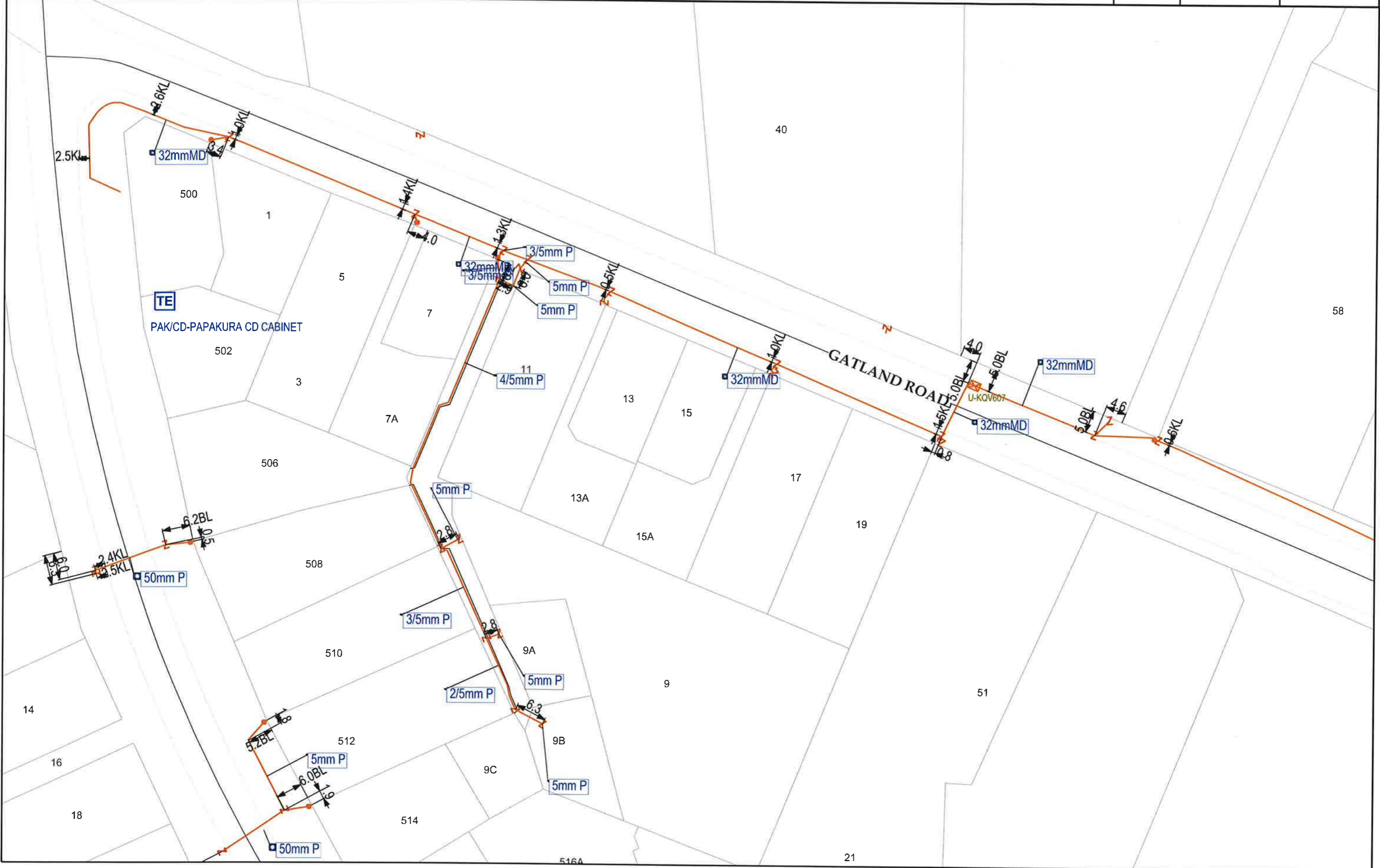
WARNING: Buried services are widespread and it should be assumed that they are present until it is proven otherwise.
 Cables should be expected to be found at ANY depth.
 In most instances Chorus plans do NOT show house service feeds on private property.
 Refer to cover letter provided with your request for additional information - use all plans provided in conjunction with each other
 You are responsible for interpreting the information provided and should refer to Worksafe.govt.nz for the 'Guide for safety with underground services'
 For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

 N	Plan Name	Gold
	Plan ID	
	Version	
	Current at	24/05/2019



WARNING: Buried services are widespread and it should be assumed that they are present until it is proven otherwise.
 Cables should be expected to be found at ANY depth.
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 For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

 N	Plan Name	Gold
	Plan ID	
	Version	
	Current at	24/05/2019





42 Connett Road West
Private Bag 2020
New Plymouth 4342
Phone 0800 800 393
locations@firstgas.co.nz

GAS PIPELINE LOCATION RESPONSE

121409

There are NO Gas Transmission pipelines present at below location.

Company: Blue Barn Consulting Ltd
Contact Name: Christopher Harre
Phone: 09 839 7009 **Mobile:** 021 848 748
Postal Address: 4 Henderson Valley Road Henderson Auckland 0612

Intended Work: Digging
Date Response Sent: 24/05/2019
From: Bronwyn Ward - Pipeline Safety Coordinator

<u>Location</u>			
Address:	Suburb:	Town:	B4UDIG No:
520 Great South Road ONLY	Rosehill	Auckland	7159861

WARNING: It is your responsibility to check for all other underground services laid, owned or operated by other utility companies in this area.

The Health and Safety at Work Act 2015 requires people to identify all hazards within their worksite. Anyone who damages a gas pipeline as a result of unsafe work practices may be found in breach of the act and liable to prosecution.