ENGINEERING AND INFRASTRUCTURE REPORT TO SUPPORT A RE-ZONING APPLICATION FOR A PROPOSED UNIT TITLE SUBDIVISION FOR BEACH HAVEN ROAD APARTMENTS LTD. AT 96 BEACH HAVEN ROAD/13 CRESTA AVE BEACH HAVEN

Job No: 200626/01

Issue Date: 06 November 2023

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Engineering *Ingenuity*

Document Control Record

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Client:
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96 Beach Haven Road/13 Cresta Ave

This report has been prepared solely for the benefit of the Beach Haven Road Apartments Ltd. . No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Revision	Description	Issue Date	Prepared by	Reviewed by
A	Plan Change	6/11/2023	NNN	MTW

Executive Summary

This report addresses the civil engineering aspects and requirements for the infrastructure related to the re-zoning application at a proposed unit title subdivision at 96 Beach Haven Road/13 Cresta Avenue, Beach Haven. The proposal is to remove the existing dwellings located at 96 Beach Haven Road and 13 Cresta Avenue and to construct between 75-100 new Terrace Units.

This report concludes that the development can be serviced by the existing and proposed infrastructure detailed within this report. The development will be provided with stormwater, wastewater and water supply service, and is able to be connected to the local power and telecommunications reticulation.

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1 INTRODUCTION

Airey Consultants Ltd. have been engaged by Beach Haven Road Apartments Limited to undertake an Infrastructure Assessment in support of a re-zoning application at 96 Beach Haven Road and 13 Cresta Avenue, Beach Haven.

This report addresses the civil engineering aspects and requirements for the infrastructure to adequately service the rezoned sites, pursuant to the requirements of the relevant approving authority being Auckland Council, Auckland Transport and Watercare Services Limited.
Based on the above, this report provides comment on the existing infrastructure within and adjacent to the subject sites and highlights any potential issues that may arise from re-zoning.

2 SITE DESCRIPTION

2.1 Location

The subject site comprises of the following two parcels of land totalling 7,147.00m².

96 Beach Haven Road	Lot 1 DP 157383	Area = 2,251m^2
13 Cresta Avenue	Lot 2 DP 157383	Area = 4,896m^2

Figure 1. Aerial view of Subject Site – Council Geomaps

2.2 Titles / Zoning

The sites are currently situated within the Residential – Single Housing Zone.

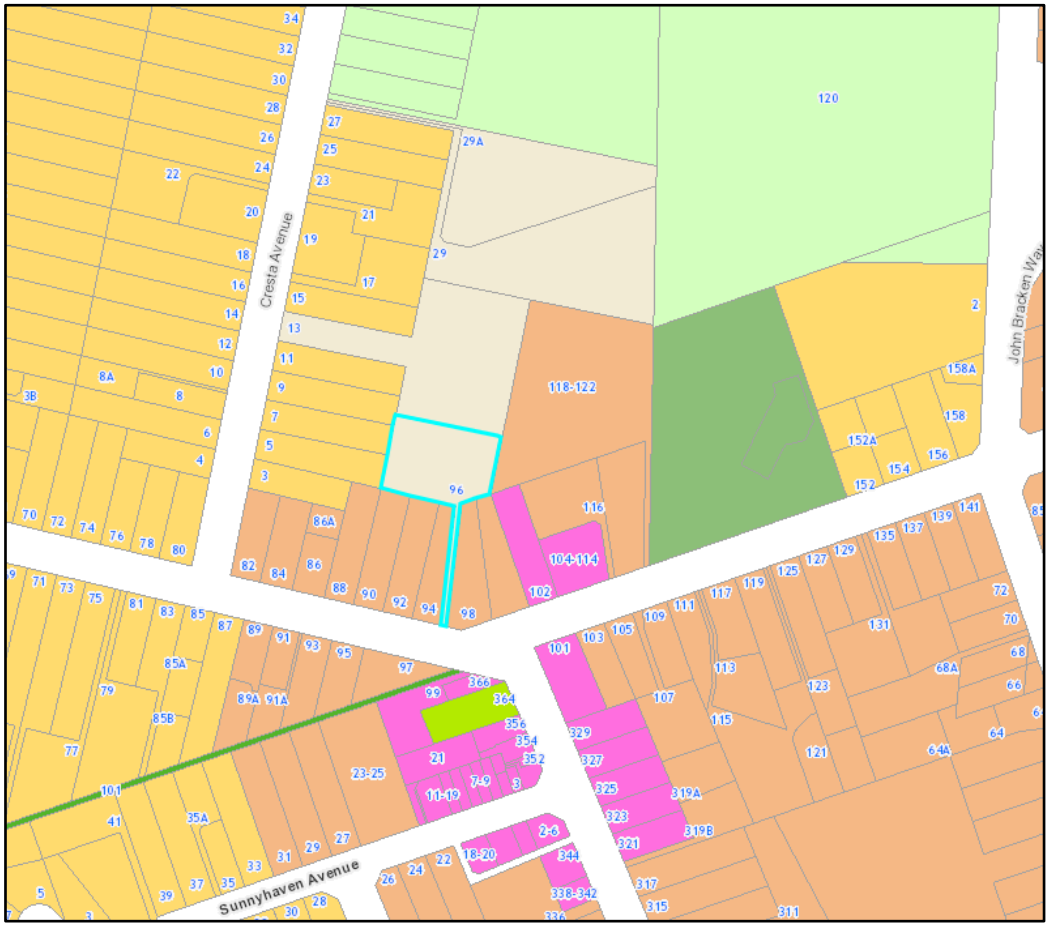

Figure 2. Auckland Unitary Plan, Operative in Part: Zoning Map

2.3 Topography

The subject site slopes in a Northerly direction towards 29 Cresta Avenue, with gradients ranging from 4% in the central portion of the site, to approximately 6% towards the Northern section of the site.

A 100-year overland Flowpath is present within the site currently flowing along a depression on the Western side of the site and thereafter existing into the property at 15 Cresta Avenue.

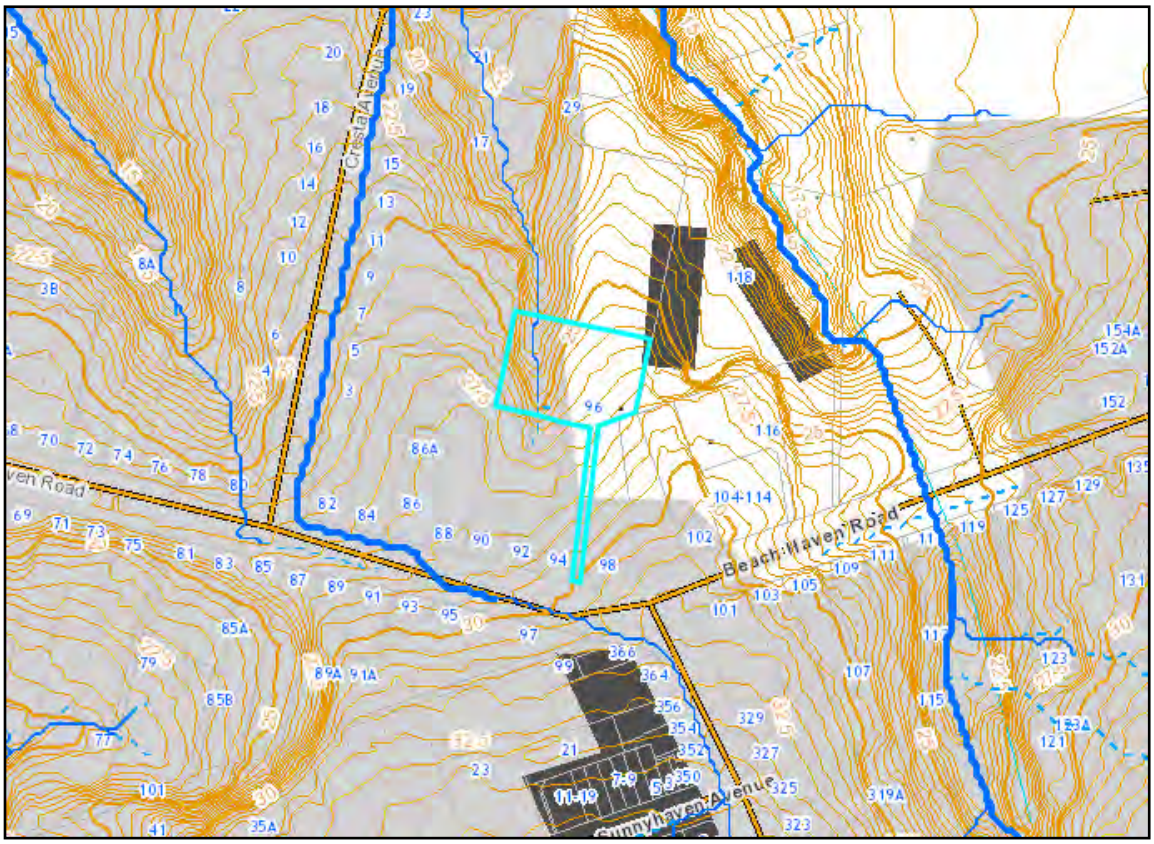

Figure 3. Site Topography and Flooding (Contours from Auckland Council and Geomaps)

2.4 Existing Site Conditions

The site is vacant and existing buildings have been removed.

3 GEOLOGY

Below is an extract from the Geotechnical Report as prepared by Lander Geotechnical, dated 2 March 2021:

A review of GNS digital Q Maps indicated that the site is located within the East Coast Bays Formation (ECBF) of the Waitemata Group flysch deposits which consist of alternation beds of sandstones and mudstones. These deposits generally weather to a dark grey, partially weathered 'transitional' soils before weathering completely to orange, light grey and brown silts, clays and sands. Please refer to Appendix D for Lander Geotechnical, Geotechnical Report, 2 March 2021.

4 CONTAMINATION

All contamination matters have been addressed as part of the approved Bulk Earthworks Consent. Refer LUC60384512-A.

5 PROPOSED DEVELOPMENT

The proposal for the sites at 96 Beach Haven Road and 13 Cresta Avenue is to remove the existing dwellings on the respective sites and based on the proposed re-zoning, a high-level bulk and location exercise has been undertaken to ensure compliance for construction of between 75-100 new two-storey units.

3.1 Access

Access to the site will be via an upgraded vehicle crossing located at the entrance to 13 Cresta Avenue. The existing vehicle crossing located at 96 Beach Haven Road will be removed and reinstated to Auckland Transport's Standards, detail VX0103.

3.2 Flooding Considerations & Overland Flow Path

3.2.1 Flood plain and Flood Sensitive Areas

The site is not situated within the 100-year flood plain.

3.2.2 Coastal Inundation

The site is not subject to coastal inundation.

3.2.3 Overland Flow Paths

Council GIS Indicates that there is an overland flow path traversing the site, along the western boundary of 96 Beach Have Road. Following a site visit and a desktop Flood Assessment it was concluded that the overland flow path will not have any detrimental effects to the proposed development.

3.3 Earthworks

3.3.1 Proposed Earthworks

An Earthworks consent has already been approved under LUC60384512-A.

3.3.2 Erosion & Sediment Control

Prior to physical works commencing, the applicant's principal contractor shall install silt and sediment control in accordance with the requirements of Auckland Council Guideline Document 2016/005 *"Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region" (Legacy ARC TP90 publication).*

3.4 Stormwater

3.4.1 Existing Stormwater

According to a topographical survey prepared by Easdale Surveyors and Auckland Council Geomaps, there is an existing 300mmØ public stormwater line traversing the boundary of 96 Beach Haven Road from a Southerly to Westerly direction. This line connects to an existing 750mmØ public stormwater line traversing the boundary of 13 Cresta Avenue.

Table of Public Stormwater Manholes and Lines traversing the Proposed Development boundary as follows:

Asset Type	Legacy Asset ID	Size
Stormwater Line	Null	300mmØ
Stormwater Manhole	Null	1050mmØ
Stormwater Line	Null	300mmØ
Stormwater Manhole	Null	1500mmØ
Stormwater Line	NSC_483772	750mmØ
Stormwater Manhole	Null	-
Stormwater Line	NSC_483770	750mmØ

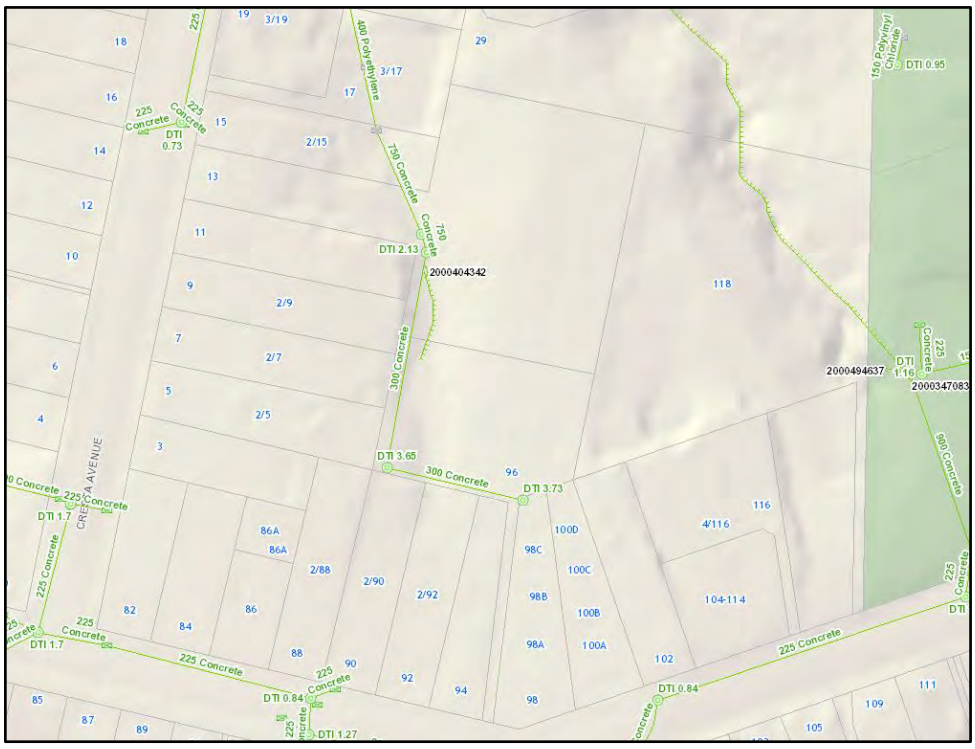

Figure 4. Existing Public Stormwater Network (Auckland Council Geomaps)

3.4.2 Assessment of Stormwater Requirements

As per the Auckland Unitary Plan, the subject site is not situated within the areas of Stormwater Management Areas, SMAF 1 or SMAF 2.

Discharge of Stormwater from the Proposed Development will not require resource consent as this is considered a permitted activity per the AUP: OP, Section E8.4.1 Item A1 – *Diversion of stormwater runoff from lawfully established impervious areas directed into an authorised stormwater network or a combined sewer network that complies with Standard E8.6.2.1.*

The proposed future development of the site will very likely increase the impervious area on site from its current situation. Per AUP: OP, Section H4.6.8 Item 1 – the maximum impervious area must not exceed 60 percent of the site area.

Stormwater Mitigation will be provided to discharge post development flows back to predevelopment flows. Our design will comply with the Auckland Unitary Plan stormwater mitigation requirements, providing detention for the 10% AEP storm event.

Detention Volume will be stored on site and gradually released over 24-hours. The purpose of the proposed stormwater mitigation system is to regulate stormwater discharge to minimise adverse effects to the existing public system.

3.5 Wastewater

3.5.1 Existing Wastewater

According to a topographical survey prepared by Easdale Surveyors and Watercare GIS maps there is an existing 150mmØ public wastewater line traversing the bottom right corner, on the Eastern section of the site at 96 Beach Haven Road.

Also indicated on Watercare GIS is the presence of an existing 150mmØ public wastewater line traversing through the centre of the site at 13 Cresta Avenue. Two 100mmØ wastewater connections are currently servicing each site.

Table of Wastewater Manholes and Lines traversing the Proposed Development boundary as follows:

Asset Type	Watercare GIS ID	Size
Wastewater Line	904512	150mmØ
Wastewater Manhole	404261	1050mmØ
Wastewater Line	938048	150mmØ
Wastewater Manhole	418424	1050mmØ
Wastewater Line	938053	150mmØ
Wastewater Line	575424	100mmØ
Wastewater Line	587346	100mmØ

Figure 5. Existing Public Wastewater Network (Watercare GIS)

5.5.2 Assessment of Wastewater Requirements

It is proposed to upgrade the existing 100mmØ Public Wastewater connection located at the North East corner of the site, to a 150mmØ connection to service the proposed development. The proposed connection will discharge into the existing 150mmØ gravity line located within the property of 29 Cresta Avenue.

Assessment of the downstream wastewater system shows the existing 150mmØ public wastewater line (*Watercare GIS ID 938053*) has sufficient capacity to cater for the proposed development. Wastewater flow calculations are based on each household consisting of three people, in which each person produces a Peak Wet Weather Flow of 1,206 litres/person/day as specified within Watercare's Code of Practice.

Further assessment was undertaken of the downstream wastewater system shows the existing 300mmØ public transmission line wastewater line (GIS *ID 909646*) has sufficient capacity to cater for the proposed development together with the contributing upstream catchment. Wastewater flow calculations are based on each household consisting of three people, in which each person produces a Peak Wet Weather Flow of 1,206 litres/person/day as specified within Watercare's Code of Practice.

The total pipe capacity was calculated at 98 l/sec whereas the design flow was calculated at 96.31 l/sec, therefore resulting in sufficient capacity within the 300mmØ Transmission Line.

Watercare has provided confirmation that the downstream transmission line does in fact have sufficient capacity to cater for the proposed development.

3.6 Water Supply

3.6.1 Existing Water Supply

According to Watercare GIS there is an existing 150mmØ water pipe *(ID 4753274)* located along the site frontage of 96 Beach Haven Road and an existing 150mmØ *(ID 4753248*) located along the site frontage of 13 Cresta Avenue. The existing dwellings at 96 Beach Haven Road and 13 Cresta Avenue are currently serviced by an existing 20mm polyethylene service connection.

3.6.2 Proposed Water Supply

Water meter banks are proposed to be installed onto the existing 150mmØ water pipe *(ID 4753274)* located on Beach Haven Road to service the development.

3.6.3 Water Supply Fire Fighting

SNZ PAS 4509:2008: NZ Fire Service Firefighting Water Supplies Code of Practice states that the firefighting requirements for residential dwellings without sprinklers is classified as FW2. The Fire Water Classification FW2 requires a flow rate of 12.5 L/s within 135m and a further 12.5 L/s within 270m of the property, using a maximum of two hydrants. There are two fire hydrants located at the site frontages of 96 Beach Haven Road and 13 Cresta Avenue, within 135m of the site *(Hydrant ID 4753247 & 1119963)*. This complies with SNZ PAS 4509:2008: NZ Fire Service Firefighting Water Supplies Code of Practice requirements.

Figure 6. Existing Water Supply Infrastructure – Watercare GIS

We are currently in consultation with Watercare to confirm the capacity of the upstream and downstream water reticulation networks.

3.7 Utilities

3.7.1 Power

There is an existing above ground power supply at the front of the site at 96 Beach Haven Road and an existing underground power supply at the site frontage of 13 Cresta Avenue, that is available to service the proposed development. The power requirement will be assessed by Vector/Northpower and upgraded accordingly within the road reserve.

3.7.2 Telecommunications

There is an existing underground telecommunications supply at the front of the site at 96 Beach Haven Road and at the site frontage of 13 Cresta Avenue, that is available to service the proposed development. The telecommunications requirement will be assessed by Chorus/Visionstream and upgraded accordingly within the road reserve.

6 SUMMARY

We have examined the infrastructure requirements for the proposed rezoning at 96 Beach Haven Road and 13 Cresta Avenue and are satisfied that redevelopment of the site can be fully serviced by the existing and proposed infrastructure.

An overland Flowpath has been identified entering and exiting the site, creating a small area of inundation. Although there is a slight change to the flood depths, the effects in the surrounding area are considered negligible.

The proposed future development of the site will very likely increase the impervious area on site compared to the existing situation, however a stormwater mitigation system will be implemented to ensure that post development flows are discharged to predeveloped conditions. An assessment of the downstream stormwater network reflects sufficient capacity to cater for the proposed development.

Wastewater capacity checks of the downstream 150mmø Public Wastewater Line and 300mmø Transmission Line show that the pipes have sufficient capacity to cater for the increased flows from the proposed development.

Mitigation of effects of construction and subsequent use are able to be practicably undertaken.

Sediment controls can be erected to mitigate the potential adverse effects of sediment laden runoff from the installation of services which will be of a small scale with rapid stabilisation for the development.

Construction of infrastructure for the development is feasible to serve the proposed development, with minimal adverse effects.

The stormwater flows from the site will be reduced with the installed mitigation measures.

Water and utility services will be provided by underground means by way of connection to the existing network.

Report prepared by

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Reviewed and approved by

Mike Williams
Director
CPEng(NZ), CMEngNZ, IntPE(NZ), BE(Civil)
Airey Consultants Ltd

Appendix A

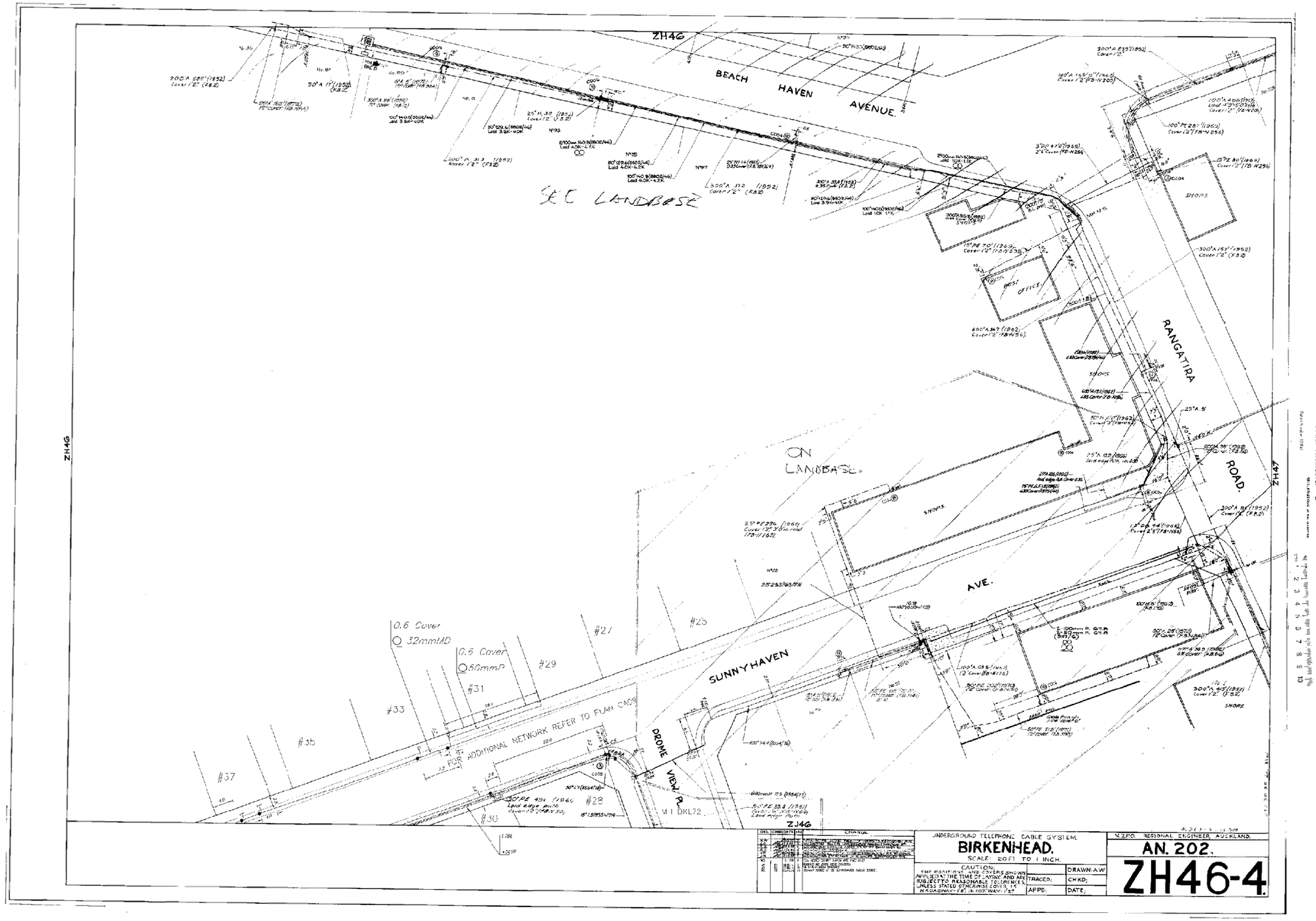
Utility Service Plans

CHORUS

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	ZH46-4
Plan ID	98654
Version	GL
Current at	22/01/2021



ZH46/4
Re-Order Filemaster "P"

CHORUS

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Plan Name	CA01
Plan ID	273714
Version	HZ
Current at	22/01/2021

DEL	CHKD	DATE	ISS	CHANGE
WDI	VS	24.06.19	33	HANDHOLE, 5mmMD ADDED # 30 BEACH HAVEN ROAD (VS159641)
WDI	VS	31.10.19	34	DUCT TEE AND 50mmP ADDED # 97 BEACH HAVEN RD (VS174663)
JDR	UCG	05.11.19	35	F-BOG146 & F-BOG147 ADDED 13 SUNNYHAVEN AVE (281465)
WDI	VS	13.12.19	36	50mmP ADDED # 86 BEACH HAVEN RD (VS179589)
WDI	VS	18.05.20	37	REFERENCE TEXT ADDED #2/35 BEACH HAVEN ROAD (VS187432)
ICT	IK	04.05.11	7	100mmP ADDED RANGATIRA RD (VS5091)
IEL	VS	08.08.14	8	CABINET, ABFATS, RIBBONET AND JOINTS ADDED (VS27374)
IEL	VS	11.08.14	9	ABFATS, RIBBONET AND JOINTS ADDED (VS43245)
IEL	VS	25.08.14	10	QA UPDATIONS ARE ADDED (VS27374)
IEL	VS	27.08.14	11	QA UPDATIONS ARE ADDED (VS43245)
IEL	VS	27.08.14	12	QA UPDATIONS ARE ADDED (VS27374)
IEL	VS	23.03.15	13	1/5mmMD,POLE,PEDESTAL AND FAT NAME ADDED AT 23 CRESTA AVE (VS63277)
IEL	VS	18.05.15	14	FAT NAMES UPDATED (VS27374)
IEL	VS	08.09.15	15	MANHOLES,FAT NAME,32mmMD,12mmMD ADDED AT BEACH HAVEN RD (VS68955)
POP	VS	14.03.16	16	DROP JOINT ADDED AT 65 BEACH HAVEN RD (VS79174)
IEL	VS	05.07.16	17	PEDESTAL AND FATNAME ADDED AT 48 CRESTA AVE (VS80910)
PB	VS	22.12.16	18	50mmP DUCT, JNT & MH.KRK120 ADDED AT 40 CRESTA AVE (VS94163)
TUM	VS	06.01.17	19	MH.KMU235 & 20mmP ADDED 40 CRESTA AVENUE (VS94729)
IEL	VS	10.10.17	20	POLES,PEDESTAL,32mmP,FAT NAME ADDED #75B BEACH HAVEN RD (VS101851)
IEL	VS	12.12.17	21	50mmP,5mmMD,MANHOLE ADDED AT 98 BEACH HAVEN RD(VS99749)
IEL	VS	14.12.17	22	QA UPDATES ARE ADDED (VS99749)
IEL	VS	06.04.18	23	AFFP, JOINTS AND REFERENCE TEXT ARE ADDED (VS64493)
IEL	VS	12.04.18	24	QA UPDATES ARE ADDED (VS64493)
IEL	VS	09.08.18	25	REFERENCE TEXT ADDED #36A RAMBLER CRES (VS145907)
IEL	VS	10.09.18	26	5mmMD ADDED # 2/61 BEACH HAVEN RD(VS144323)
WDI	VS	26.10.18	27	REFERENCE TEXT ADDED AT 2-41 GAZELLE AVE (VS147775)
IEL	VS	05.11.18	28	REFERENCE TEXT ADDED #2/17 GAZELLE AVE(VS145907)
IEL	VS	30.11.18	29	LATERAL ADDED AT 4 CRESTA AVENUE (VS156533)
IEL	VS	22.01.19	30	REFERENCE TEXT ADDED #20 GAZELLE AVE (VS159647)
IEL	VS	09.02.19	31	REFERENCE TEXT ADDED #14A BEACH HAVEN RD(VS148252)
WDI	VS	28.03.19	32	REFERENCE TEXT ADDED # 50A Rambler Crescent (VS150148)

BIRKDALE

UNDERGROUND TELEPHONE CABLE SYSTEM

CAUTION

POSITIONAL MEASUREMENTS ARE SUBJECT TO REASONABLE TOLERANCE. COVER AT INSTALLATION WAS : ROADWAY 0.50m FOOTWAY 0.35m. UNLESS SHOWN OTHERWISE
NOTE: COVER MAY HAVE CHANGED AND MUST BE CHECKED ON SITE.

ORIGINAL SCALE: 1:2000 A1

TELECOM CORPORATION OF NEW ZEALAND LTD.

NZMG REF:

R11-2

TCNZ SHT. No.

CA01

BS77	CA77	CE77
BS01		CE01
	CA05	CE05

CHORUS

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N

Plan Name	CE01
Plan ID	273716
Version	IS
Current at	22/01/2021

DEL	CHKD	DATE	ISS	CHANGE
IEL	VS	17.01.19	33	REFERENCE TEXT ADDED #93 LANCASTER RD(VS146620)
IEL	VS	18.03.19	34	REFERENCE TEXT ADDED AT ODONN AVENUE(VS161064)
JDR	UCG	26.04.19	35	F-BHD802 ADDED 104 BEACH HAVEN RD (1048087)
WDI	VS	30.04.19	36	JOINT,HANDHOLE,1/20mmP AND 1/50mmP ADDED AT 2 FRIZELL ST (VS166087)
WDI	VS	01.08.19	37	JOINT,100mmP AND 50mmP ADDED #187-191 BEACH HAVEN RD(VS168581)
WDI	VS	05.08.19	38	HH and LATERAL ADDED #171 BEACH HAVEN RD(VS173643)
WDI	VS	05.08.19	39	LATERAL ADDED 215 BEACH HAVEN RD(VS171582)
WDI	VS	06.05.20	40	REFERENCE TEXT ADDED #8A CROCOMBE CRES (VS187707)
WDI	VS	04.06.20	41	REFERENCE TEXT ADDED #64 TRAMWAY ROAD (VS188492)
WDI	VS	22.07.20	42	F-BYP688 ADDED #122 LANCASTER ROAD (VS192171)
WDI	VS	11.08.20	43	100mmP ADDED AT 196 BEACH HAVEN RD (VS184301)
WDI	VS	27.08.20	44	2/5mmMD ADDED #11 HELLYERS STREET (VS193906)
WDI	VS	08.10.20	45	F-BYQ095 ADDED (VS193787)
WDI	VS	08.12.20	46	REFERENCE TEXT ADDED #25 RANCH AVENUE (VS197276)
IEL	VS	13.02.15	16	RIBBONET,ABFFP AND JOINTS ADDED (VS36139)

DEL	CHKD	DATE	ISS	CHANGE
IEL	VS	30.09.15	17	5mmMD,POLE,PEDESTAL,FAT NAME AND BDD PIT ADDED AT 223 BEACH HAVEN RD (VS72733)
IEL	VS	23.06.17	18	JOINTS ,DUCT TEES AND REFERENCE TEXT ARE ADDED(VS64496)
IEL	VS	06.11.17	19	QA UPDATES ARE ADDED (VS64496)
POP	VS	22.11.17	20	HANDHOLE ADDED AT 157 BEACH HAVEN RD (VS126890)
IEL	VS	05.12.17	21	PEDESTAL,FAT NAME ADDED #20 HELLYERS ST (VS119533)
NY	VS	19.03.18	22	GOLD NETWORK AREA ADDED O'DONN AVE (VS131293)
IEL	VS	06.04.18	23	5mmMD ADDED #17 HELLYERS ST (VS133302)
IEL	VS	21.05.18	24	REFERENCE TEXT ADDED #22A ODONN AVE (VS135823)
IEL	VS	21.05.18	25	REFERENCE TEXT ADDED #61 PARAGON AVE (VS132603)
IEL	VS	06.06.18	26	5mmMD ADDED #50 RANCH AVE (VS137024)
BC	UCG	20.06.18	27	50mmP FROM MH69 TO 20mmP TO F-BCH957 ADDED #2 SUNNYHAVEN AVE (1010521)
BC	UCG	03.09.18	28	5mmMD FROM EX DROP-OFF TO F-BCI896 ADDED #248 BEACH HAVEN RD (1019653)
JDR	UCG	07.09.18	29	5 x OFDC's (A4) ADDED 2 JOHN BRACKEN WAY (1002398)
IEL	VS	24.09.18	30	REFERENCE TEXT ADDED AT 2 PACKHAM PL(VS146165)
IEL	VS	27.09.18	31	REFERENCE TEXT ADDED AT 2 MELBA STREET (VS149373)
WDI	VS	30.10.18	32	LATERAL ADDED AT 10 HELLYERS ST (SO7446155)

BIRKDALE

UNDERGROUND TELEPHONE CABLE SYSTEM

CAUTION

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ORIGINAL SCALE: 1:2000 A1

TELECOM CORPORATION OF NEW ZEALAND LTD.

NZMG REF: R11-2

TCNZ SHT. No. CE01

Enquiry Confirmation Sheet

Job No 1771322

Phone: 0800248344
www.beforeudig.co.nz

Caller Details

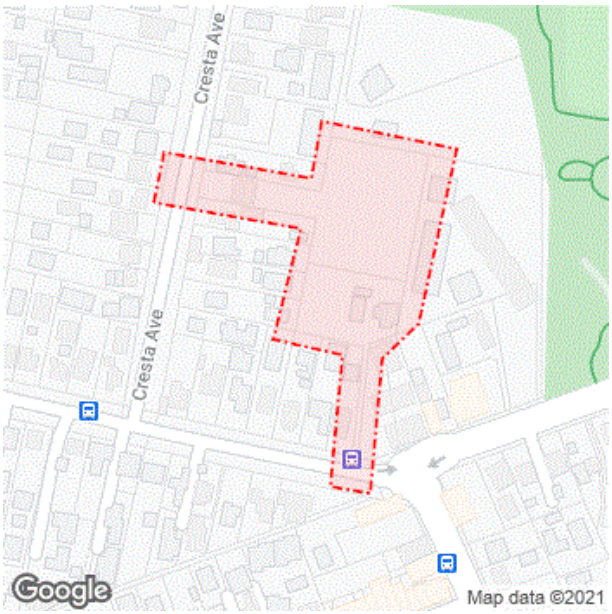
Contact: Mr Bjorn Steiner
Company: Airey Consultants Limited
Address: Level 1, Fountain Lane North, Botany Town Ce
East Tamaki Auckland 2013

Caller Id: 122448
Mobile: 098861152
Email: bjorns@aireys.co.nz

Phone: 095346523
Fax: Not Supplied

Dig Site and Enquiry Details

WARNING: The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables.
The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.



User Reference: 200626/1
Working on Behalf of:
Private
Enquiry Date: 22/01/2021
Start Date: 01/04/2021
End Date: 01/04/2022
Address:
96 Beach Haven Road
Beach Haven Auckland 0626
For Planning: Yes
Onsite Activity: Major Earthworks Cutting/Filling
Plans Requested Yes
Workplace Location: Both
Location in Road: CarriageWay,Footpath,Berm
Locate Requested: No
Preferred Locate Date: Not Supplied

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Notes/Description of Works:
Proposed Development at 13 Cresta Ave and 96 Beach Haven Road.

Your Responsibilities and Duty of Care

- If plans are **not** received within **2 working days**, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using the beforeUdig service, you agree to our privacy policy and the terms and conditions set out at **www.beforeudig.co.nz**
- **For more information about the beforeUdig service, visit www.beforeudig.co.nz**

Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days.
Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the beforeUdig service, this confirmation will not provide details of those asset owners so it is **your responsibility** to identify and contact directly any asset owners not listed here. Known Non-Member Utilities are listed on the beforeUdig website under the 'Utilities & Members' Tab.
Any asset owner name listed below with the status 'Not Notified' is an associate member of beforeUdig which only notifies you of their presence and you will need to contact them directly.

Where an Asset Locate has been requested, Utilities will endeavour to respond to your Preferred Locate Date, where possible. Asset owners highlighted by asterisks ** **Do Not** supply plans and/or information regarding the existence of underground assets on private property. # Asset owners highlighted with a hash request you reference their attachment for further instructions on how to obtain plans.

Seq. No.	Authority Name	Phone	Status
9050567	Chorus **	0800822003	Notification Sent
9050571	LINZ	044983835	Notification Sent
9050569	Vector - Electricity**	093083860	Notification Sent
9050570	Vector - Gas Distribution	093083860	Notification Sent
9050568	Watercare **	094422222	Notification Sent

END OF UTILITIES LIST

CABLE COLOUR CODE

CABLES IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

JOINTS & SEALING ENDS
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT
- IN PROGRESS
- ON HOLD
- PLANNED

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Title:

Request Title:

Company Name:	
Usage:	Request ID: 9050569
Request for:	No associated viewport
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 1 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

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W No associated viewport E
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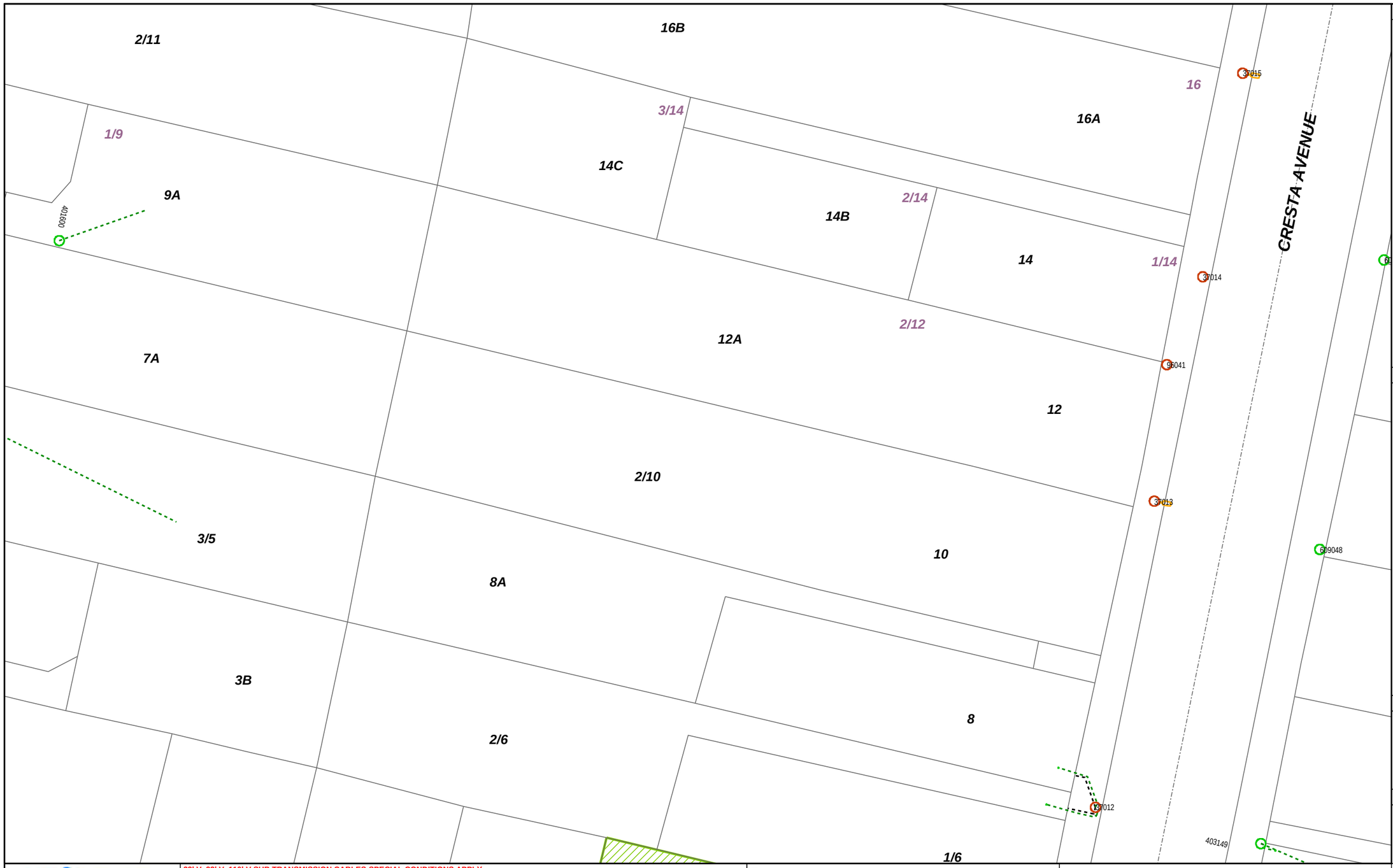

CABLE COLOUR CODE

CABLES IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

JOINTS & SEALING ENDS
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT
- IN PROGRESS
- ON HOLD
- PLANNED

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Title:

Request Title:	
Company Name:	
Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 2 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

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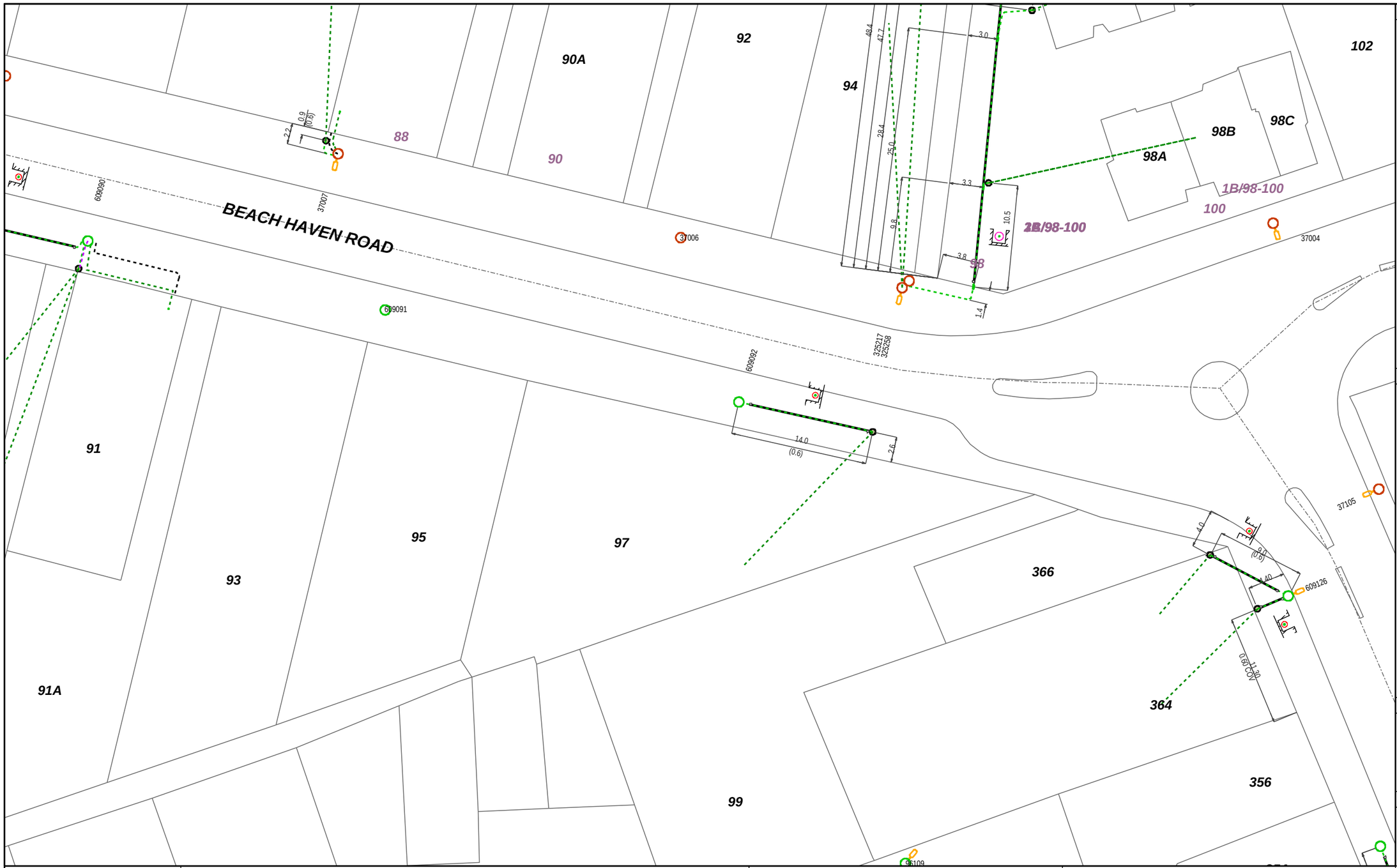

CABLE COLOUR CODE

CABLES IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
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JOINTS & SEALING ENDS
- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT
- IN PROGRESS
- ON HOLD
- PLANNED

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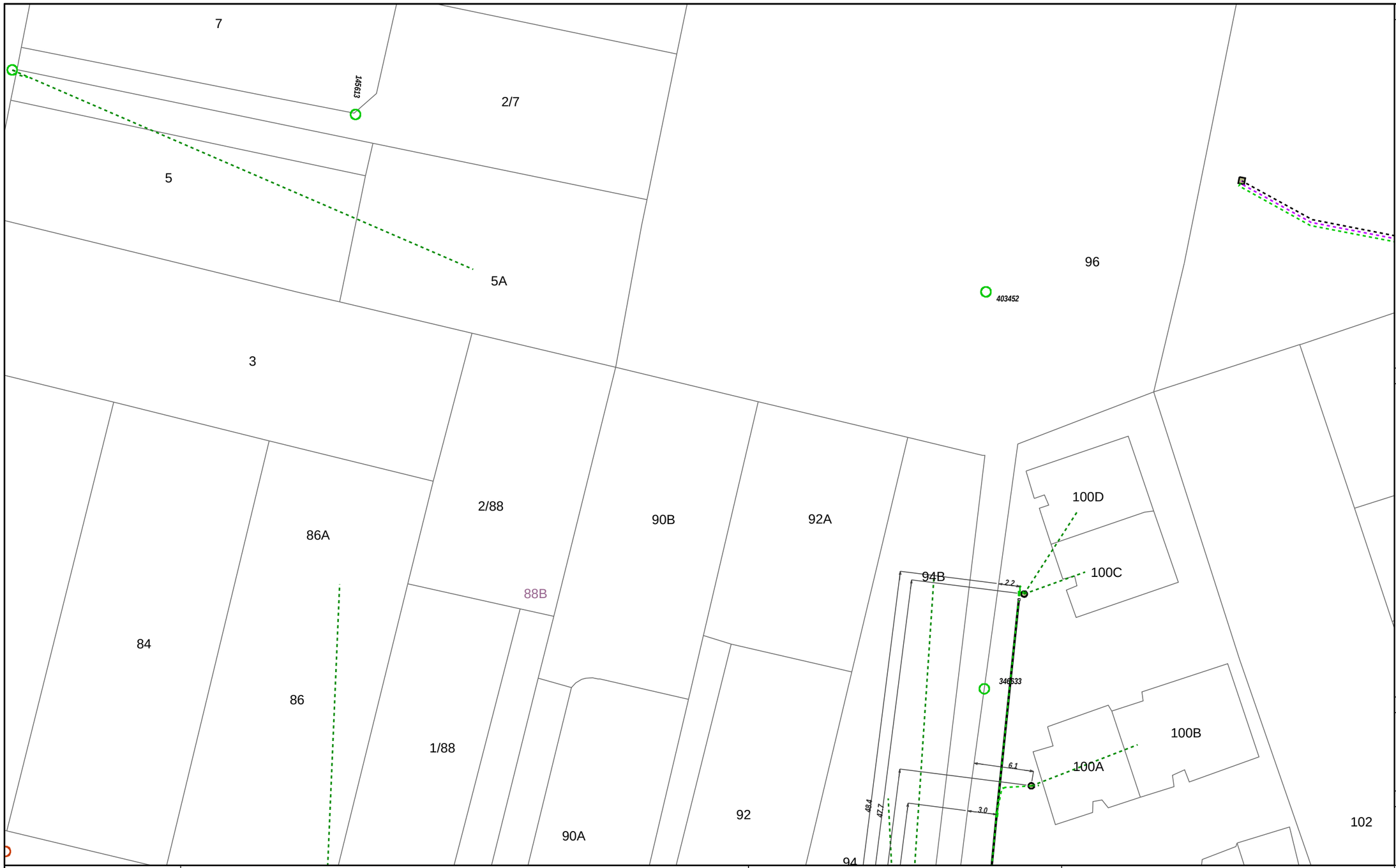
Title:

Request Title:	
Company Name:	
Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 3 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

N W E S



CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

JOINTS & SEALING ENDS

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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Request Title:	
Company Name:	
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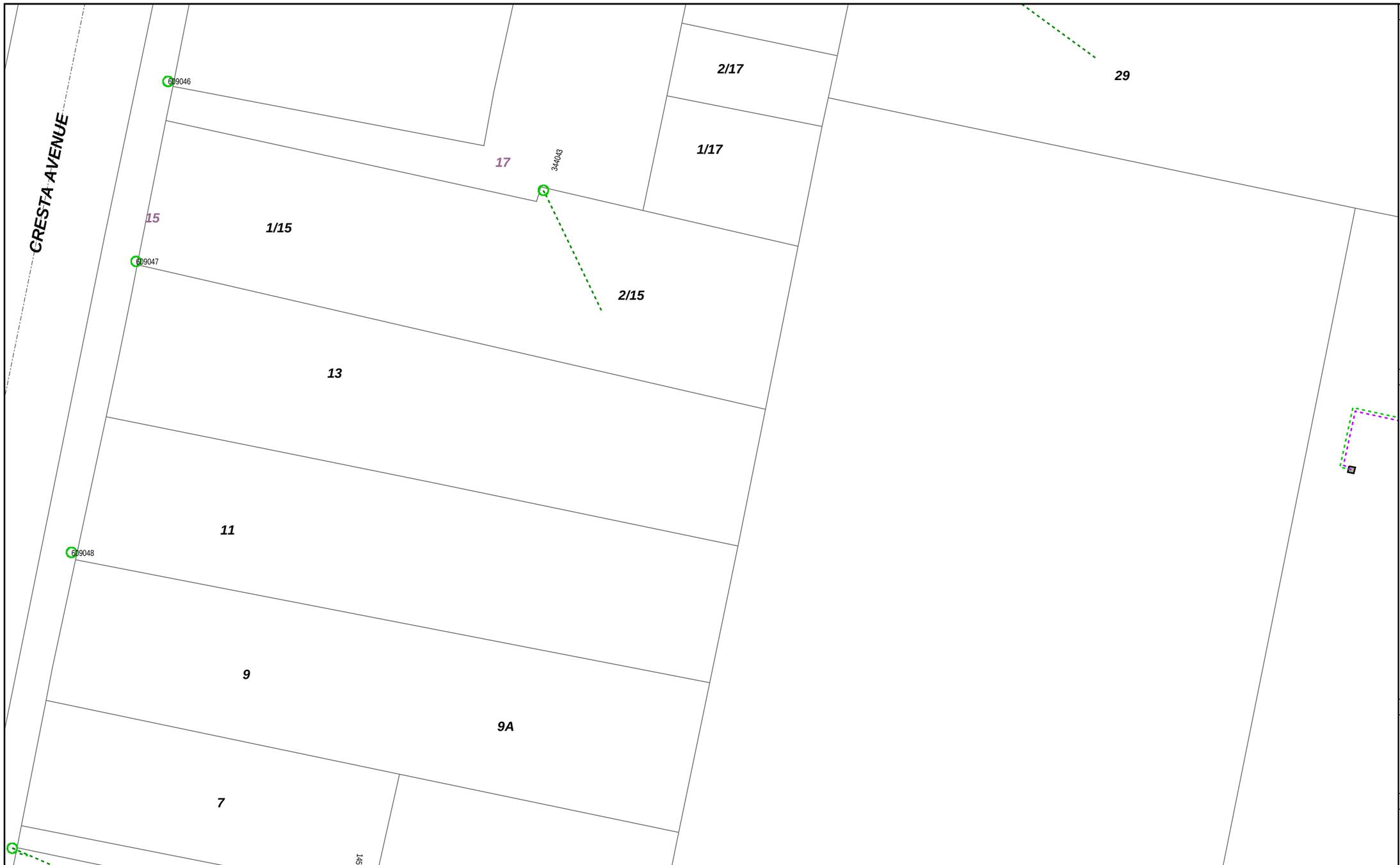
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 4 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

N W E S



CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE

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- 22,000 volt
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- 400 volt
- Streetlight
- Pilot / Fibre Optic

JOINTS & SEALING ENDS

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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Title:

Request Title:	
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Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 5 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

N
W E
S

CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
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SYMBOL LEGEND

- TUNNEL
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- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION

POLES

- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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Request Title:	
Company Name:	
Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 6 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

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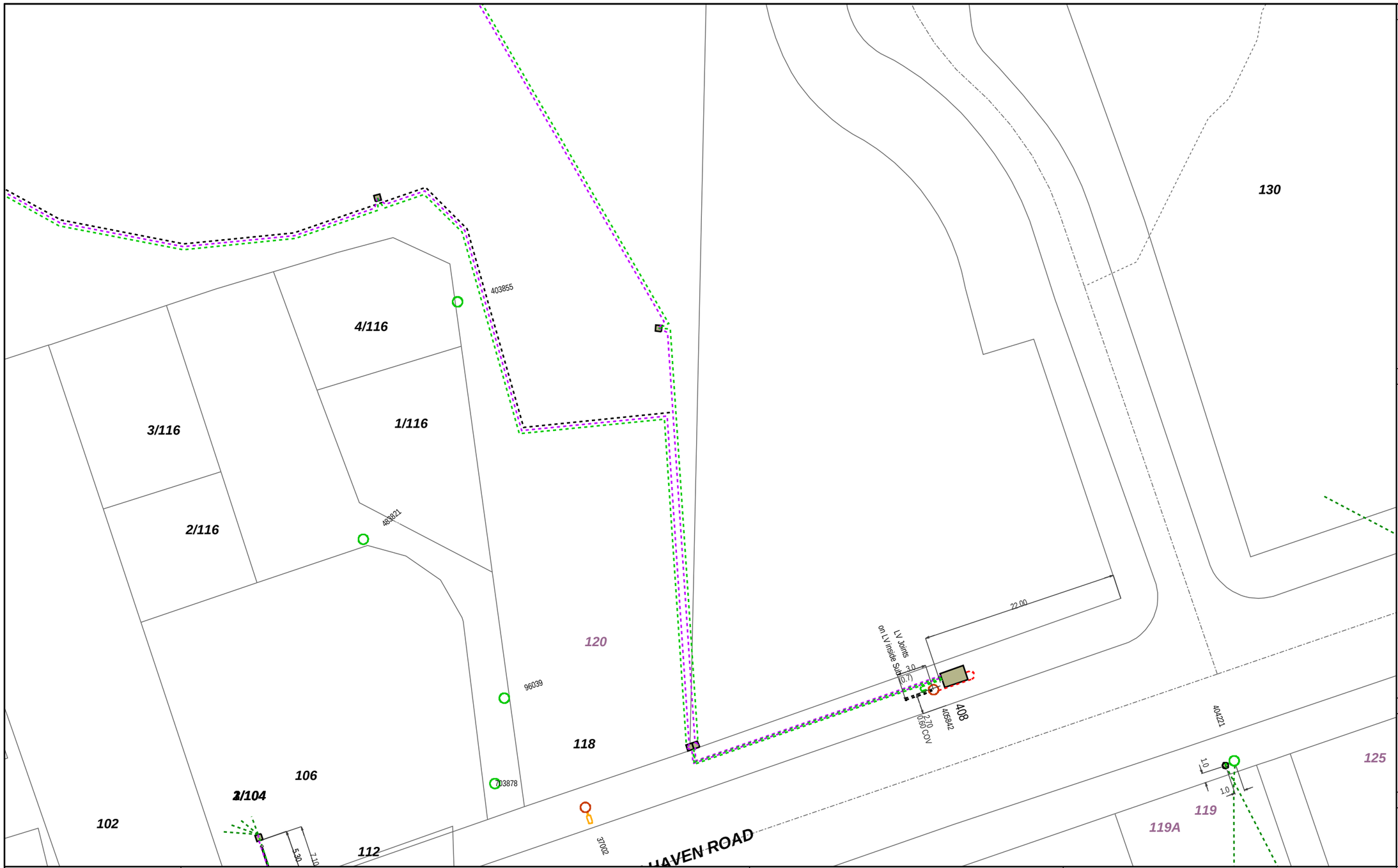

CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
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- 400 volt
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JOINTS & SEALING ENDS

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
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- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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Request Title:	
Company Name:	
Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 7 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

N
W E
S

CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE

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SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
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- DISTRIBUTION SUBSTATION
- POLES
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- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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Company Name:	
Usage:	Request ID: 9050569
Request for:	Scale: 1:400
Customer Contact:	Printed by: swadmin
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 8 of 9

A3 ELECTRICITY OBSTRUCTION PLAN

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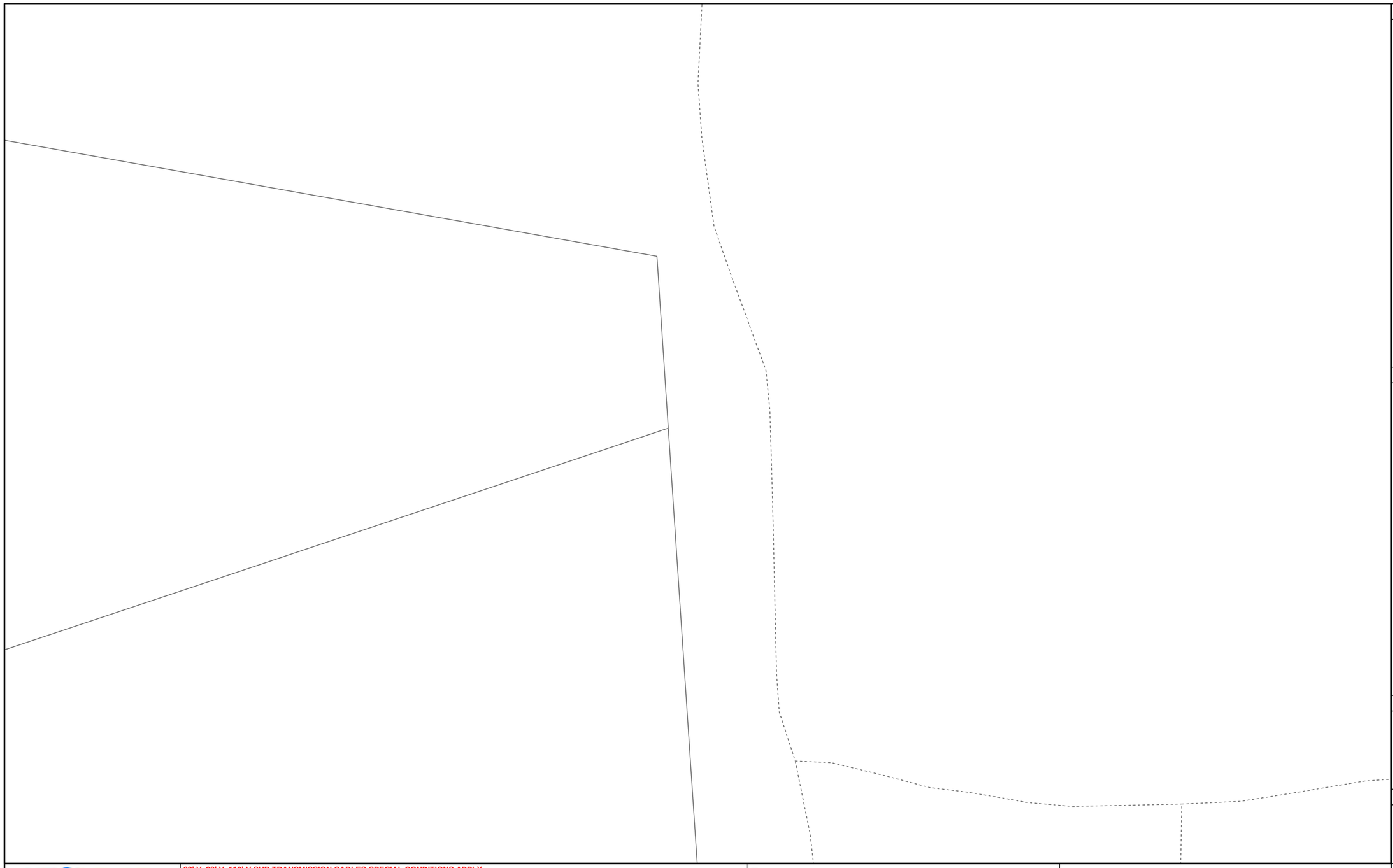

CABLE COLOUR CODE

CABLES IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

CABLES NOT IN USE

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic

JOINTS & SEALING ENDS

- 110,000 - 22,000 volt subtransmission
- 22,000 volt
- 11,000 - 6,600 volt
- 400 volt
- Streetlight
- Pilot / Fibre Optic
- NOT IN USE

SYMBOL LEGEND

- TUNNEL
- DUCT BANK
- FIBRE OPTIC DUCT
- TRENCH
- PILLAR
- PIT
- DISTRIBUTION SUBSTATION
- POLES
- LAMP
- CESSPIT
- MANHOLE
- FIRE HYDRANT
- DRAIN
- FIBRE OPTIC PIT
- EARTHWIRE & RODS

DUCT CROSS SECTIONS mm

25 50 80 100 150 200 250 300

WORK MANAGEMENT

- IN PROGRESS
- ON HOLD
- PLANNED

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A3 ELECTRICITY OBSTRUCTION PLAN

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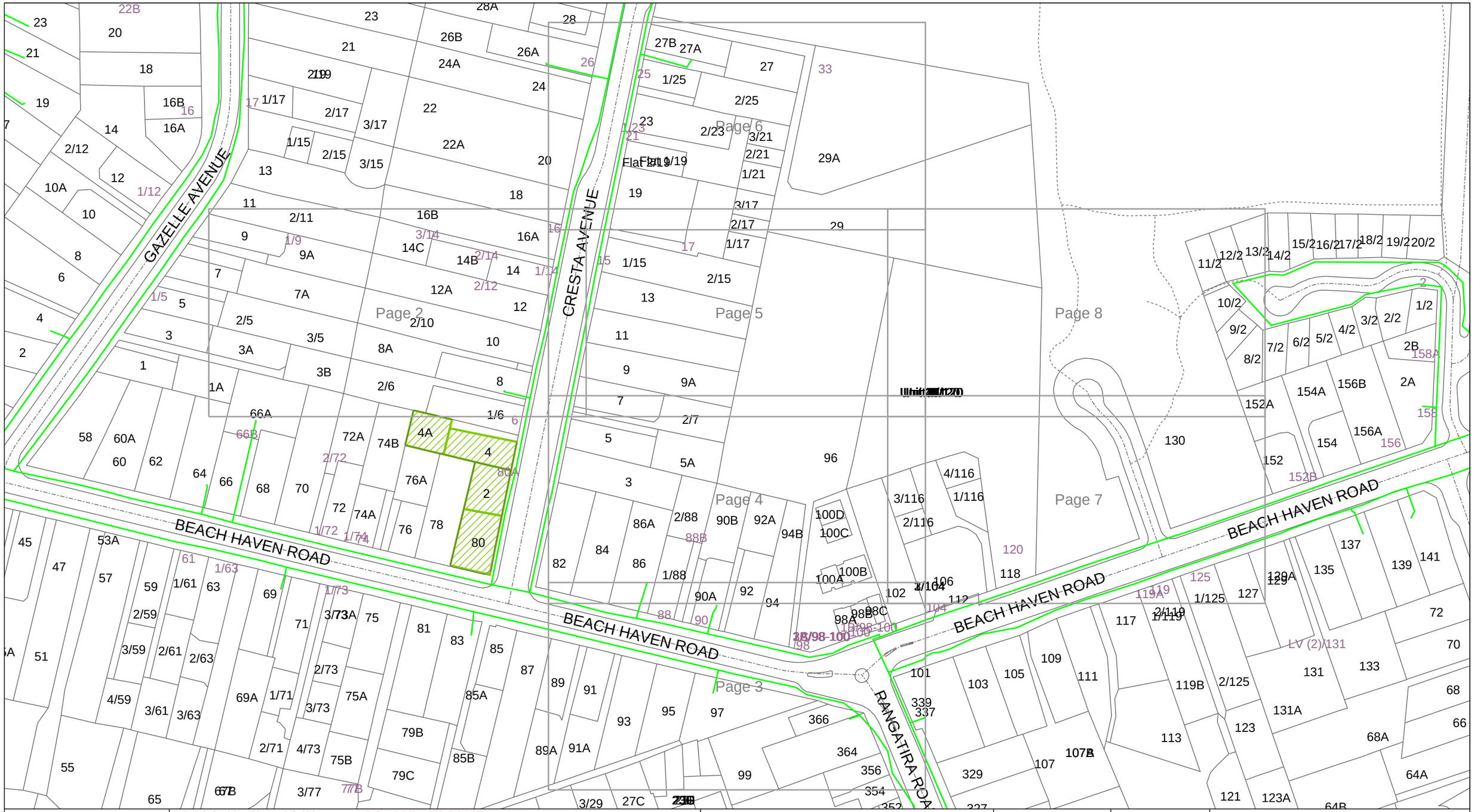

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Customer Contact:	Printed by:
Phone:	Date printed: 22. January 2021
Client Reference:	Page: 1 of 8

PIPE COLOUR BY PRESSURE

- LP Pipe
- LPG Pipe
- MP1 Pipe
- MP2 Pipe
- MP4 Pipe
- MP7 Pipe
- IP10 Pipe
- IP20 Pipe
- HP Pipe
- 0 kPa

WARNING! Live service within this property.

WARNING! Indication only additional data is required

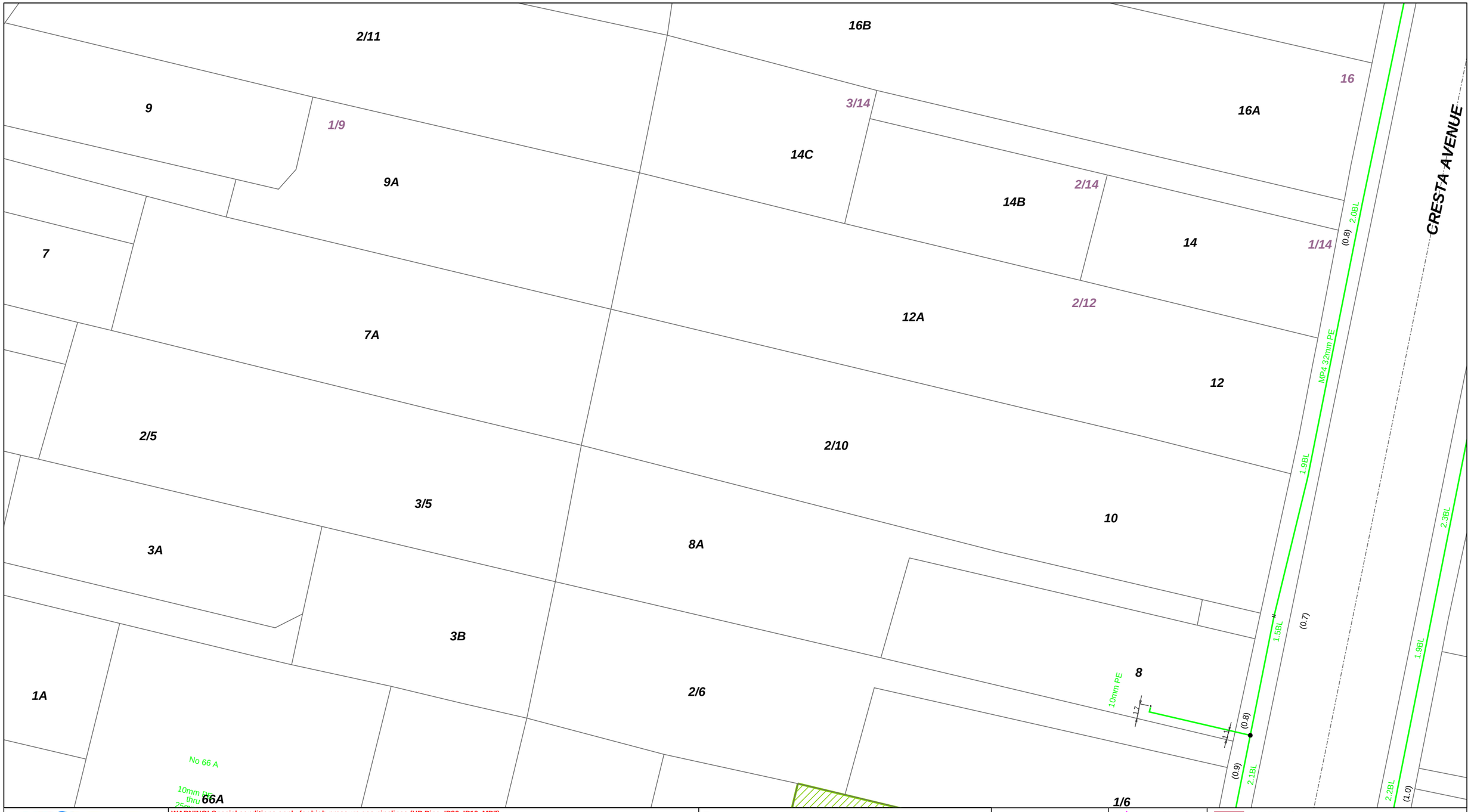
Transmission Pipeline (ex - NGC)
Please contact Vector - New Plymouth on 0800 734 567 for On-Site Location and Work Permits. A minimum of 48 hours notice is required.

WORK MANAGEMENT

- In Progress
- On Hold
- Planned

OTHER GAS FEATURES

- Fibre Optic
- Closed Valve
- Gate
- Riser
- Open Valve
- PRS
- Service Regulator
- Reducer



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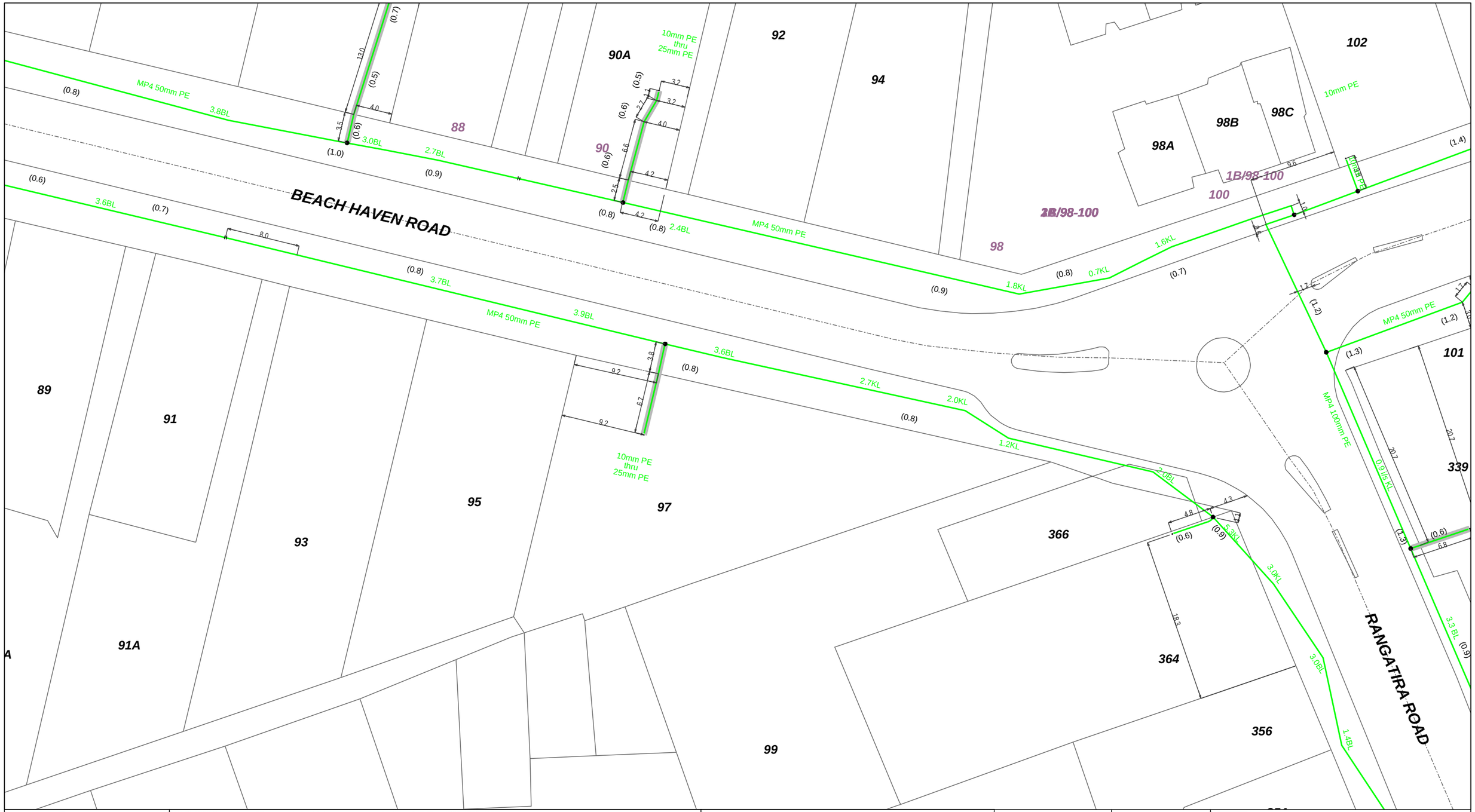

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PIPE COLOUR BY PRESSURE

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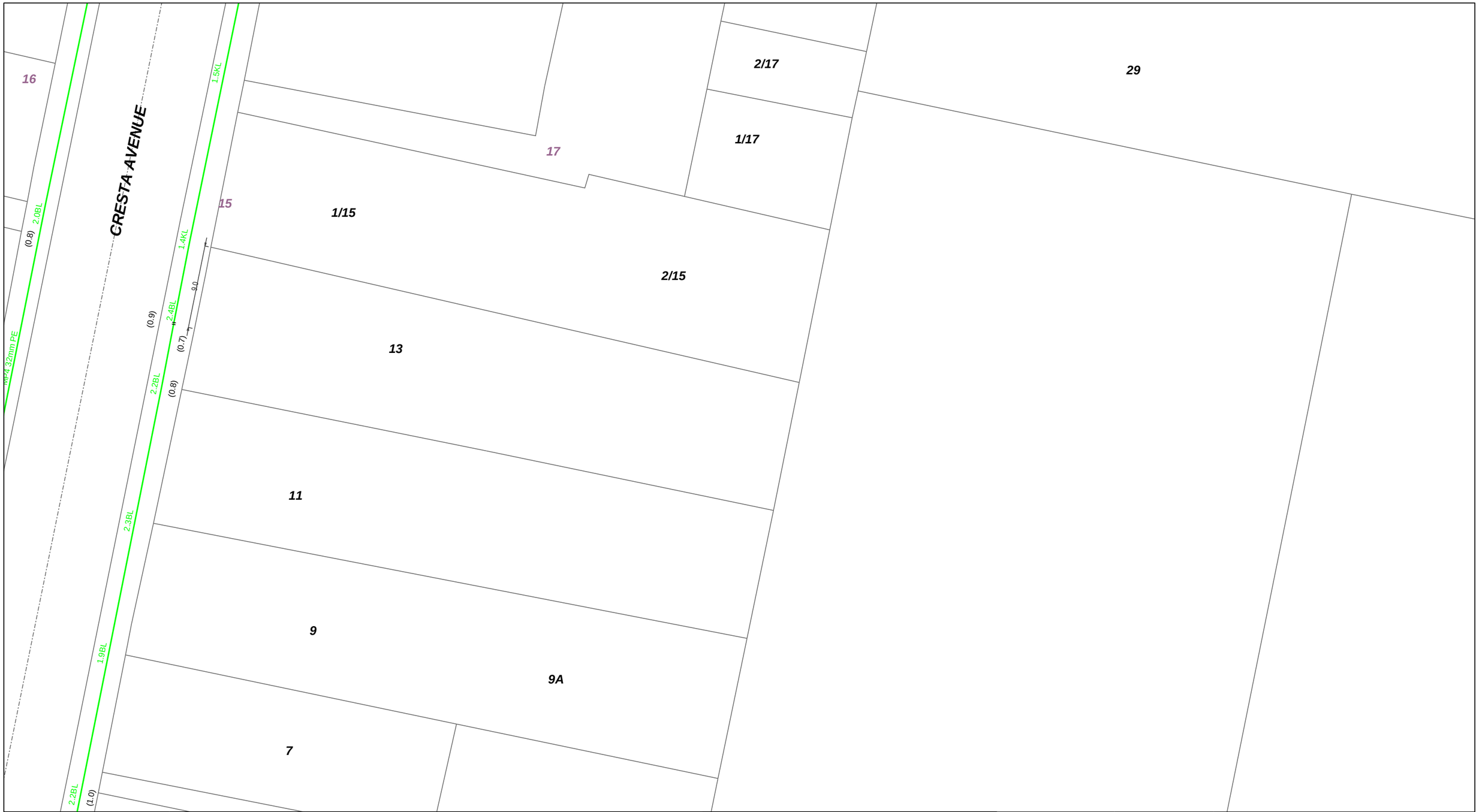

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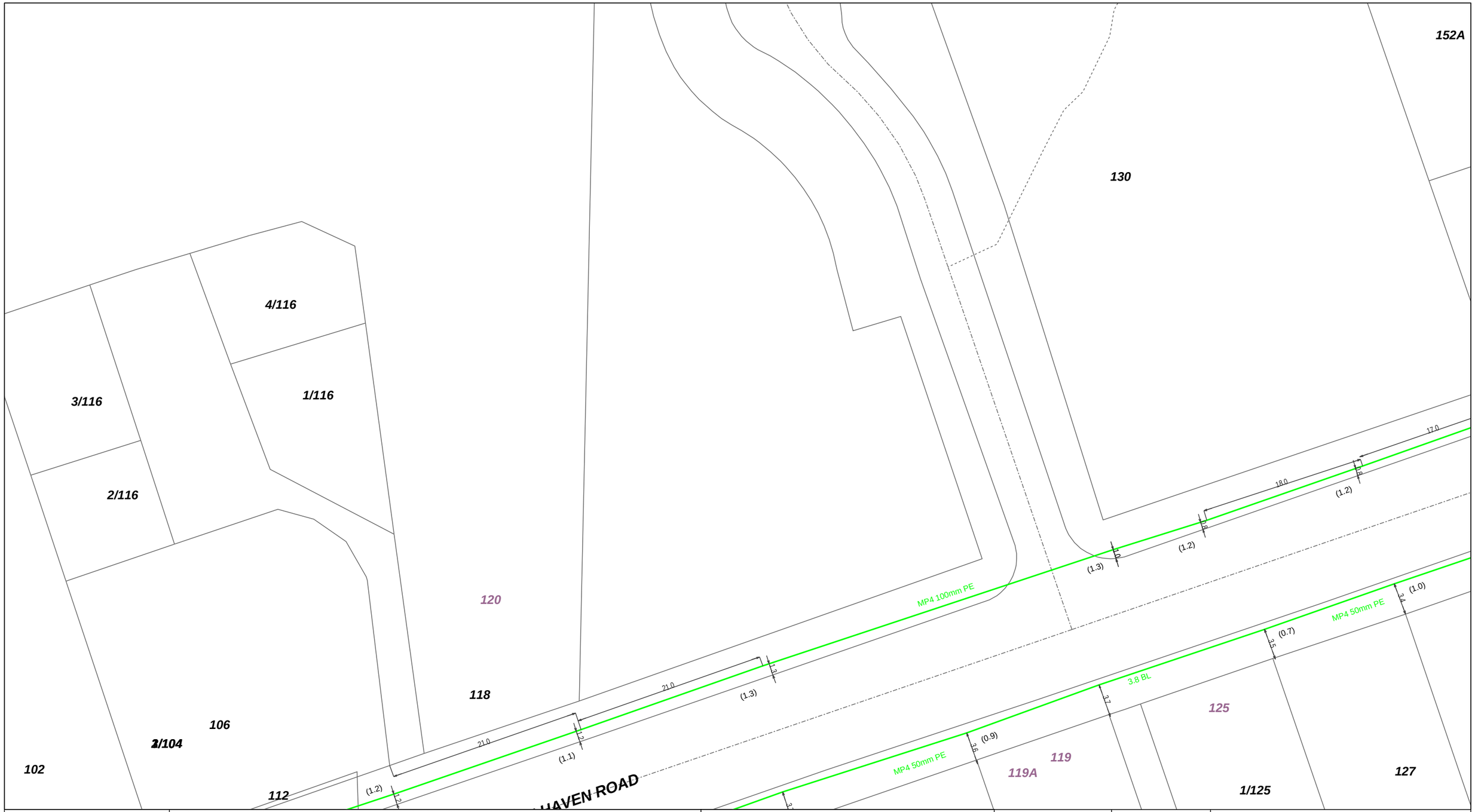

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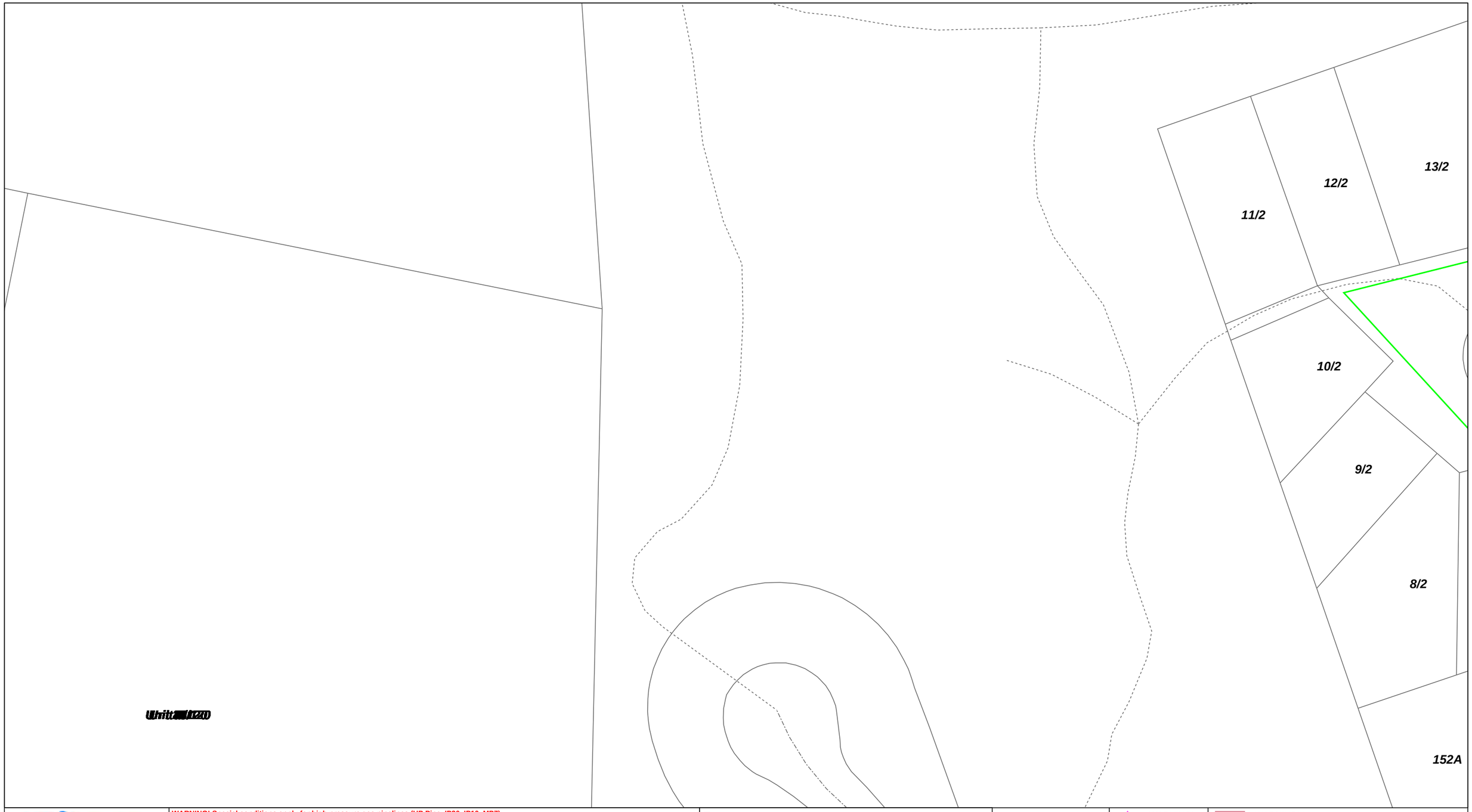

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Watercare
An Auckland Council Organisation

Watercare Services Limited

73 Remuera Road, Newmarket
Auckland 1023 New Zealand

Private Bag 92521 Wellesley Street,
Auckland 1141

Telephone +64 9 539 7300

Facsimile +64 9 539 7334

www.watercare.co.nz

BeforeUdig Enquiry – Services Impacted

Name: Mr Bjorn Steiner

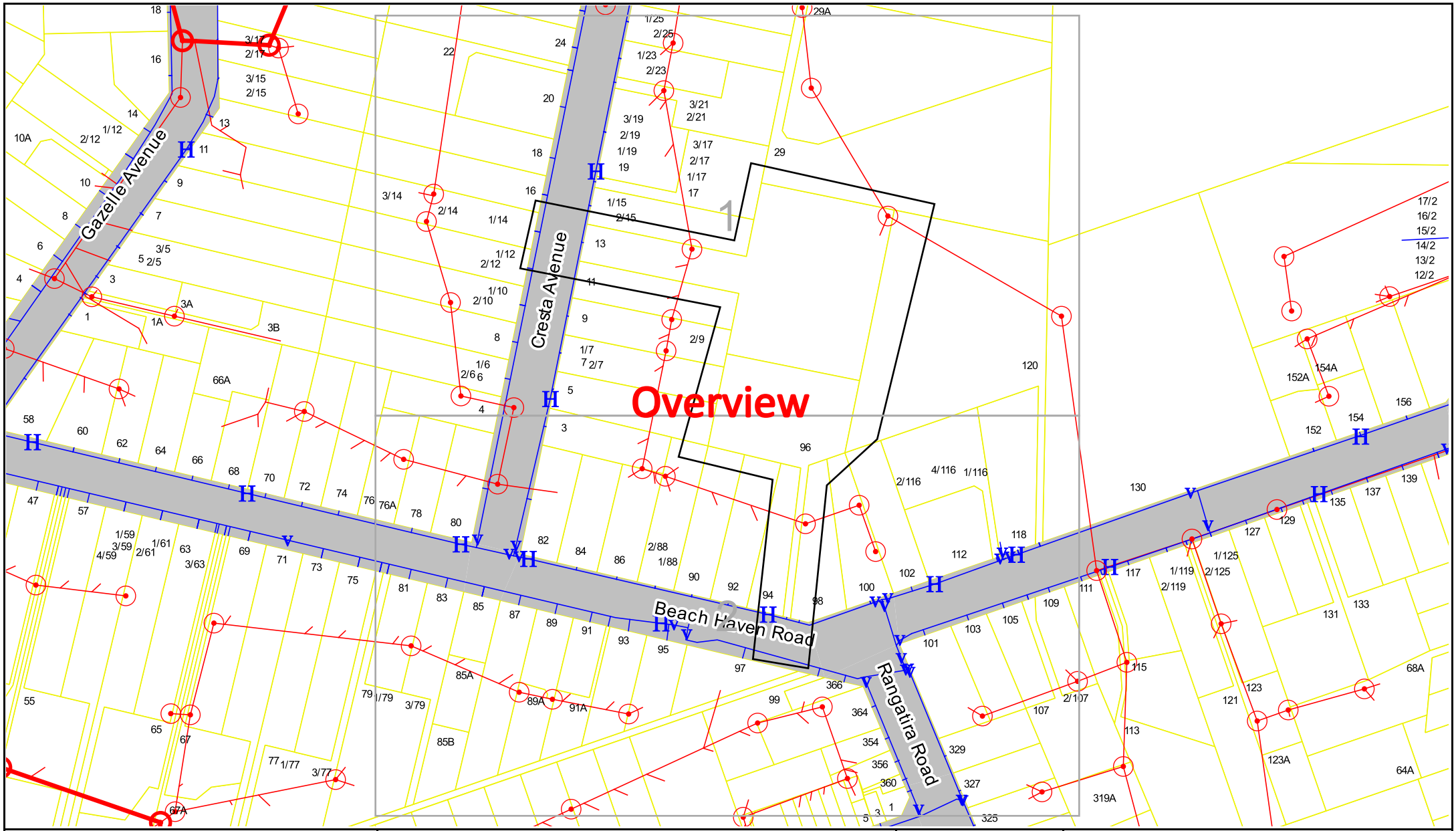
Site Location: 96 Beach Haven Road, Beach Haven, Auckland 0626

Sequence Number: 9050568

Date: 22/01/2021

Thank you for your enquiry to provide water and wastewater service plans. The information below is to assist you with your works:

- The attached plans are illustrative only and must be verified before carrying out any work. Whilst due care has been taken in their preparation, Watercare Services Limited ("Watercare") does not accept any liability whatsoever for their accuracy or completeness.
- Only water and wastewater assets are indicated on the plans. Service lines to a property may not be shown on these plans.
- Measurements and depths may vary from those shown on the plan. A physical check including potholing should be undertaken to verify the exact location, depth and other details.
- The attached plan is valid for two months from the date of issue; assets are replaced and renewed so the location of the asset may have changed. It is essential that any plan used is current at the time of excavation. Where plans are more than two months old they should not be used; a new plan must be requested from Watercare.
- If the scope of work changes another enquiry should be made to ensure you have up to date plans.
- Written approval will be required from Watercare if the proposed works are within 10 metres of a critical water or wastewater asset or any pipe 300mm diameter or greater.
- The person undertaking the work is responsible for ensuring the Watercare assets are protected from damage.
- If any Watercare assets are damaged please immediately call Watercare's emergency response number (09) 422 2222 so that further damage is minimised. Note that Watercare will recover the cost to repair any damage together with administrative and supervision charges.
- No one may work on or interfere with a Watercare asset unless they are an approved Watercare contractor engaged by Watercare.
- Watercare reminds you of regulations and guidelines that specify safe working practices and the penalties for carrying out unauthorised work. These include:
  - Health and Safety in Employment Act 1992 and its amendments.
  - Local Government Act 2002 and 2009.
  - The Utilities Access Act 2010 and its related Code of Practice.
  - Department of Labour "*Guide for Safety with Underground Services".*
- If you require assistance or have any further queries you can either email **worksover@water.co.nz** or phone **(09) 442 2222.**



Watercare
An Auckland Council Organisation

Sequence Number: 9050568

Address: 96 Beach Haven Road
Beach Haven, Auckland, 0626

Waste Water
Water
Electrical/Cathodic Protection
Waste Water Proposed
Water Proposed

V Valve
H Hydrant
M Water Meter
Manhole

Scale: 1:2050

N

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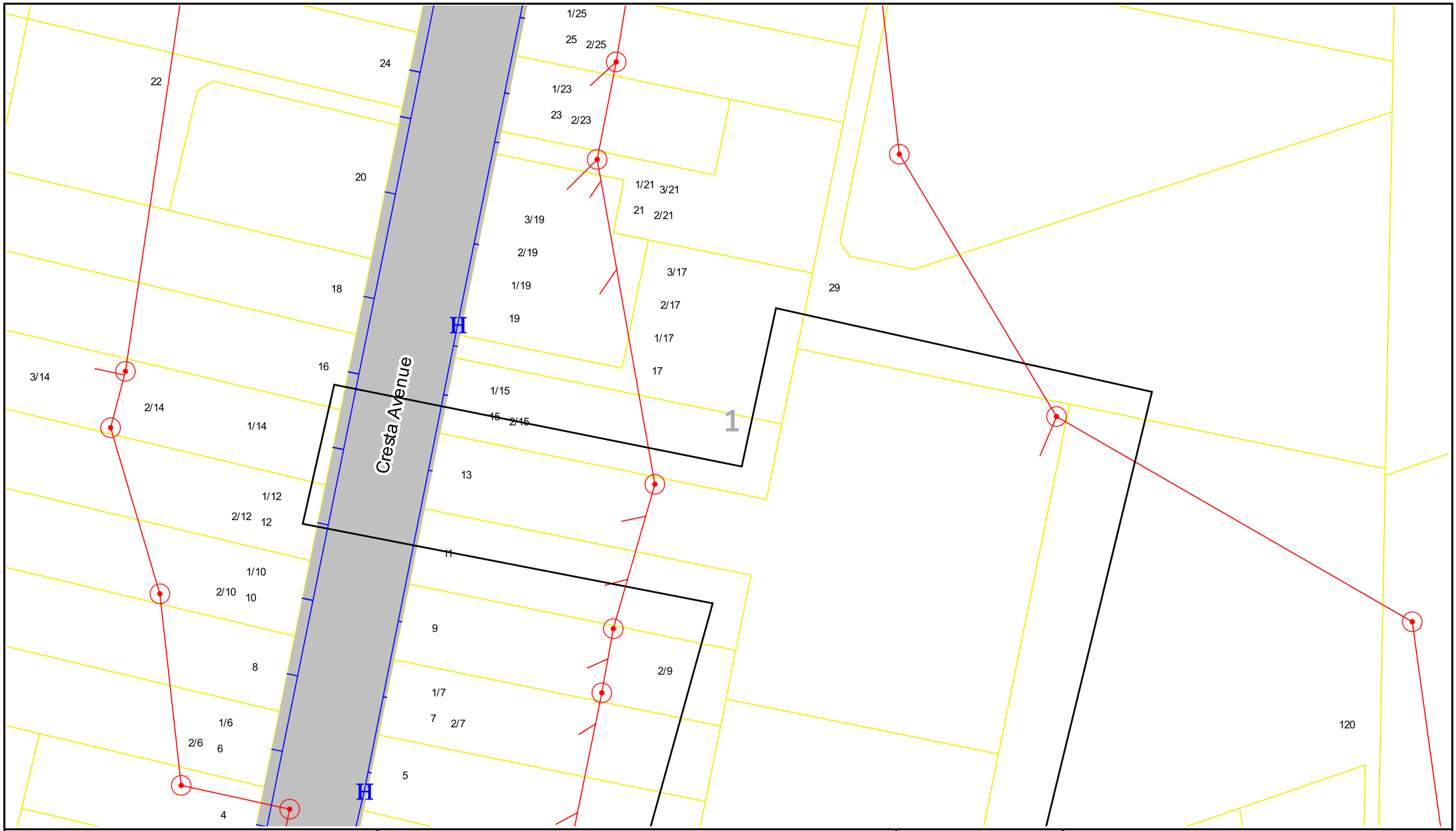
OVERVIEW NOT TO SCALE.



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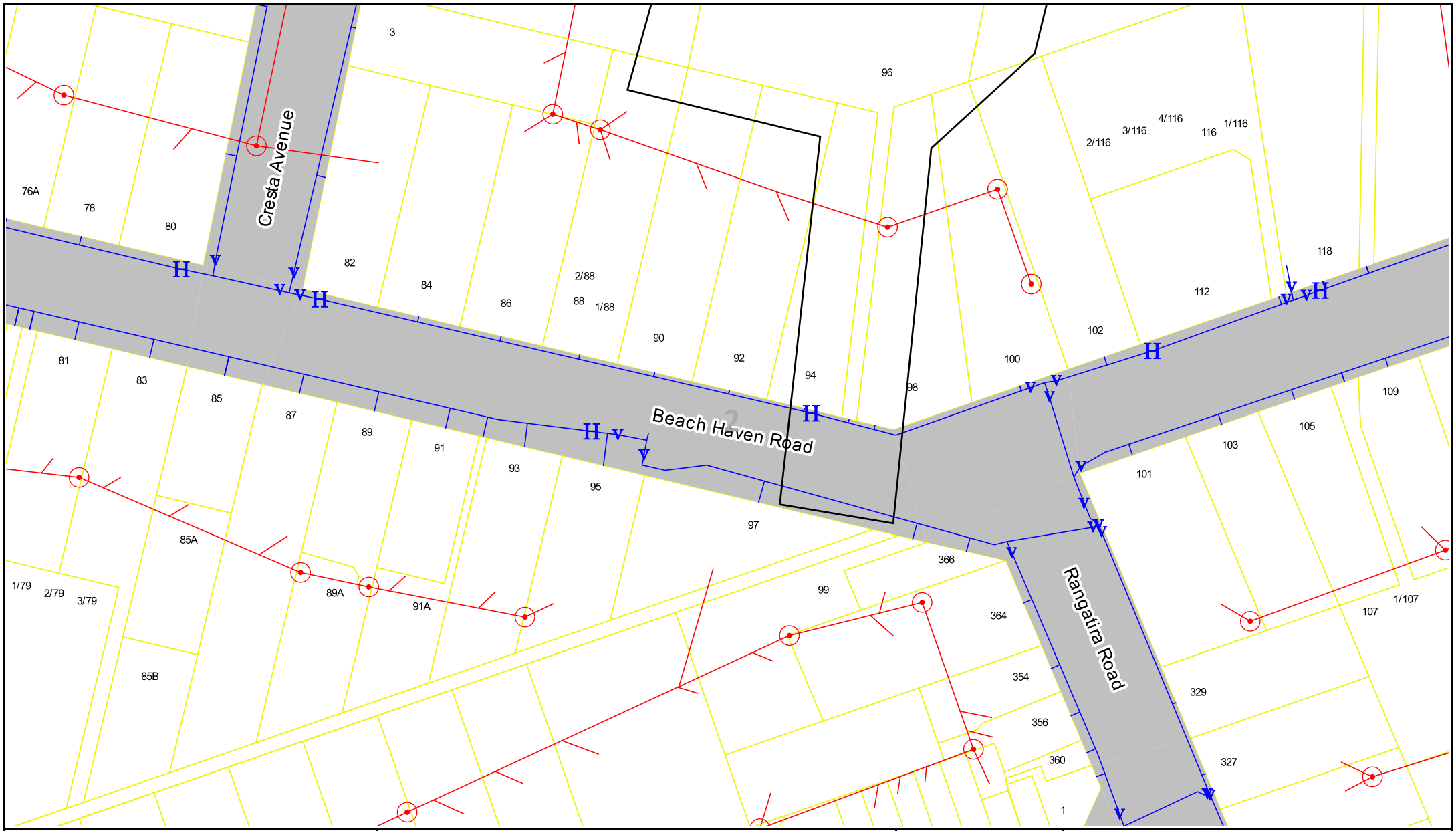
OVERVIEW NOT TO SCALE.



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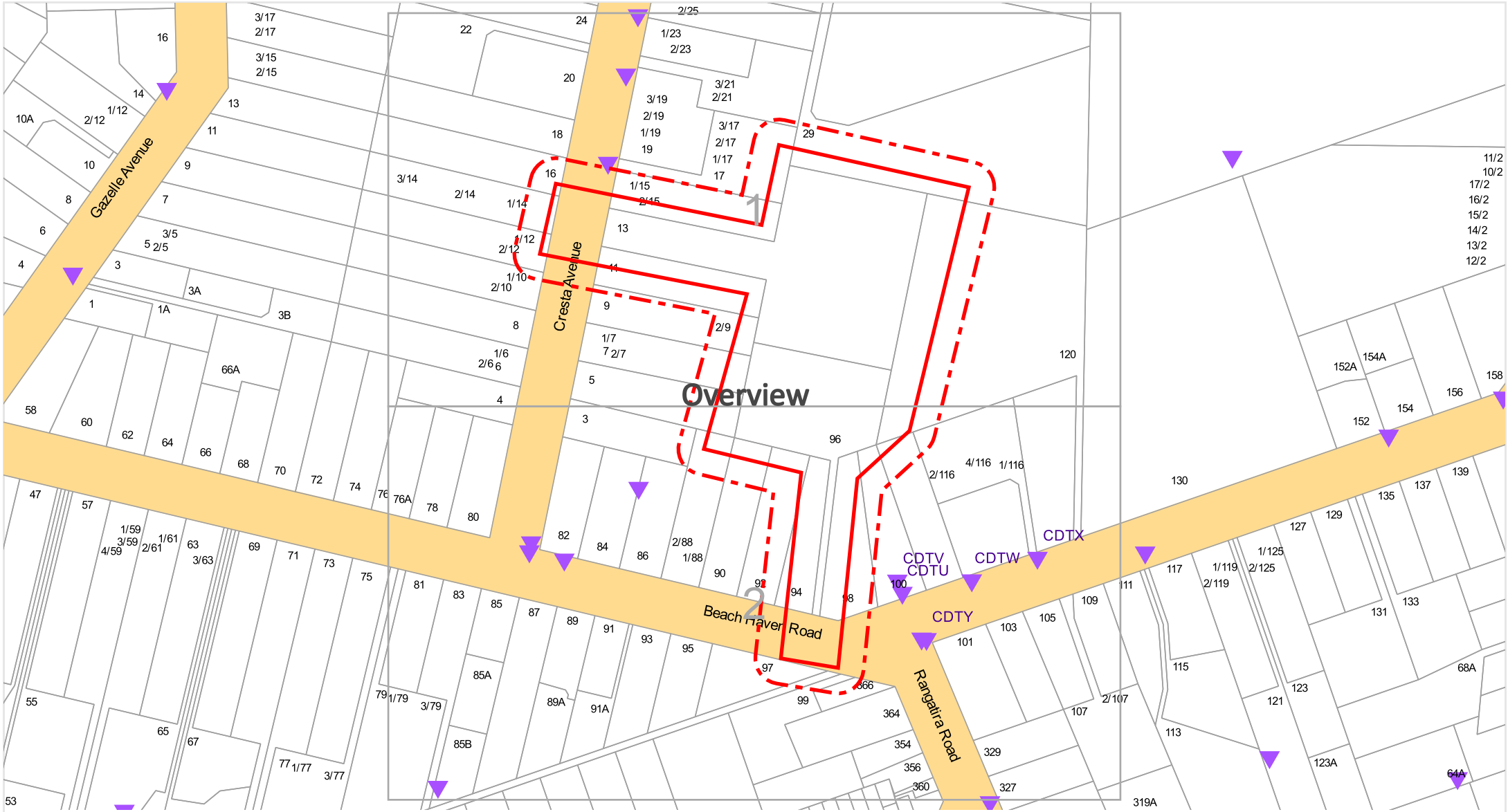
OVERVIEW NOT TO SCALE.

Land Information New Zealand
Toitū te whenua

Sequence No: 9050571
Job No: 1771322
Location: 96 Beach Haven Road, Beach Haven, Auckland 0626

beforeudig.co.nz



Scale: 1:2050

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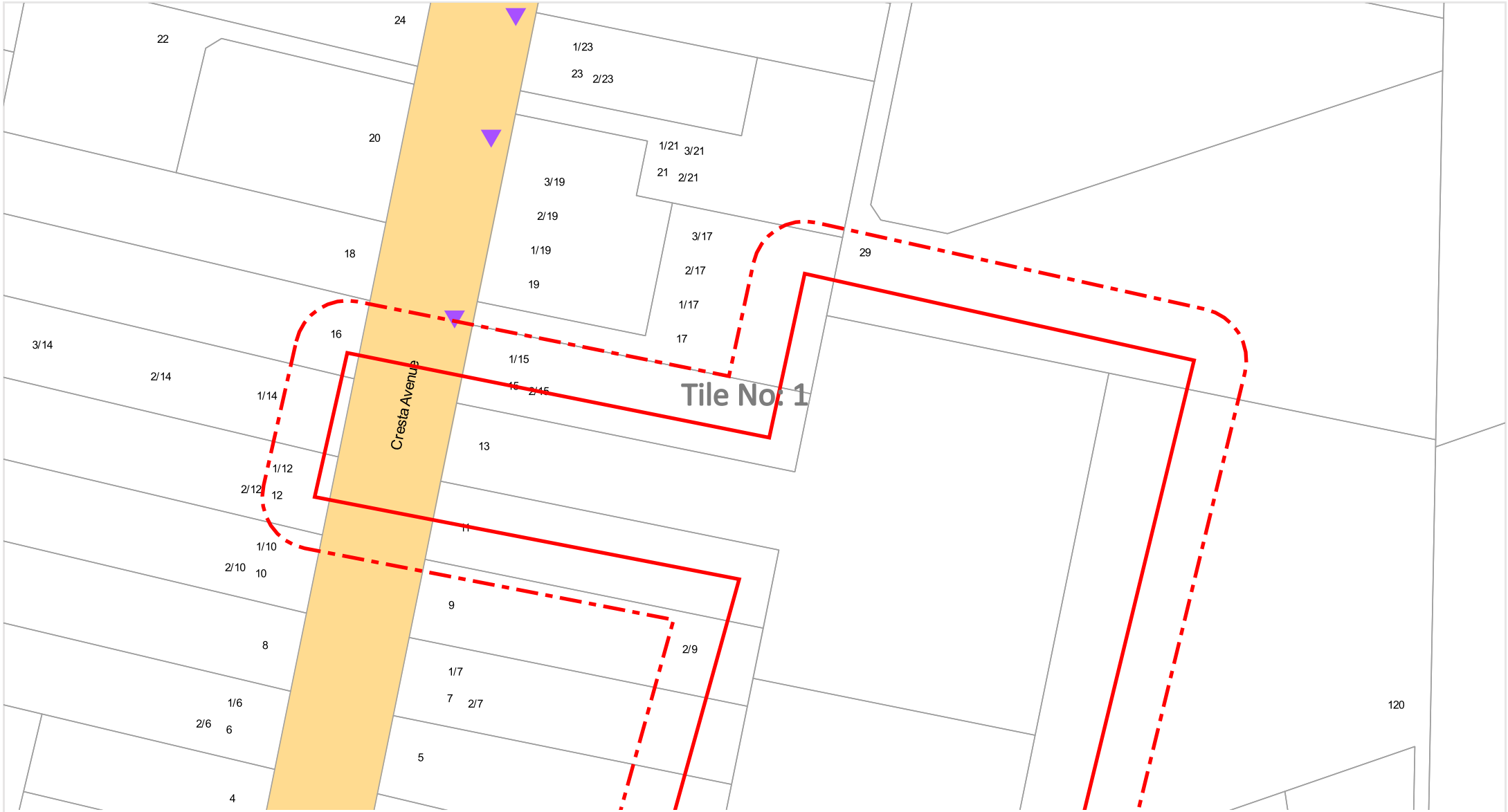
If any survey marks (inverted purple triangles) appear on this image and are at risk from your works please fill in the response form. If no marks are shown or affected, no further action is required.

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither LINZ or PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms. Sourced from the LINZ Data Service https://data.linz.govt.nz/layer/50839 Crown Copyright Reserved.

Land Information New Zealand
Toitū te whenua

Sequence No: 9050571
Job No: 1771322
Location: 96 Beach Haven Road, Beach Haven, Auckland 0626

beforeudig.co.nz



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Land Information New Zealand
Toitū te whenua

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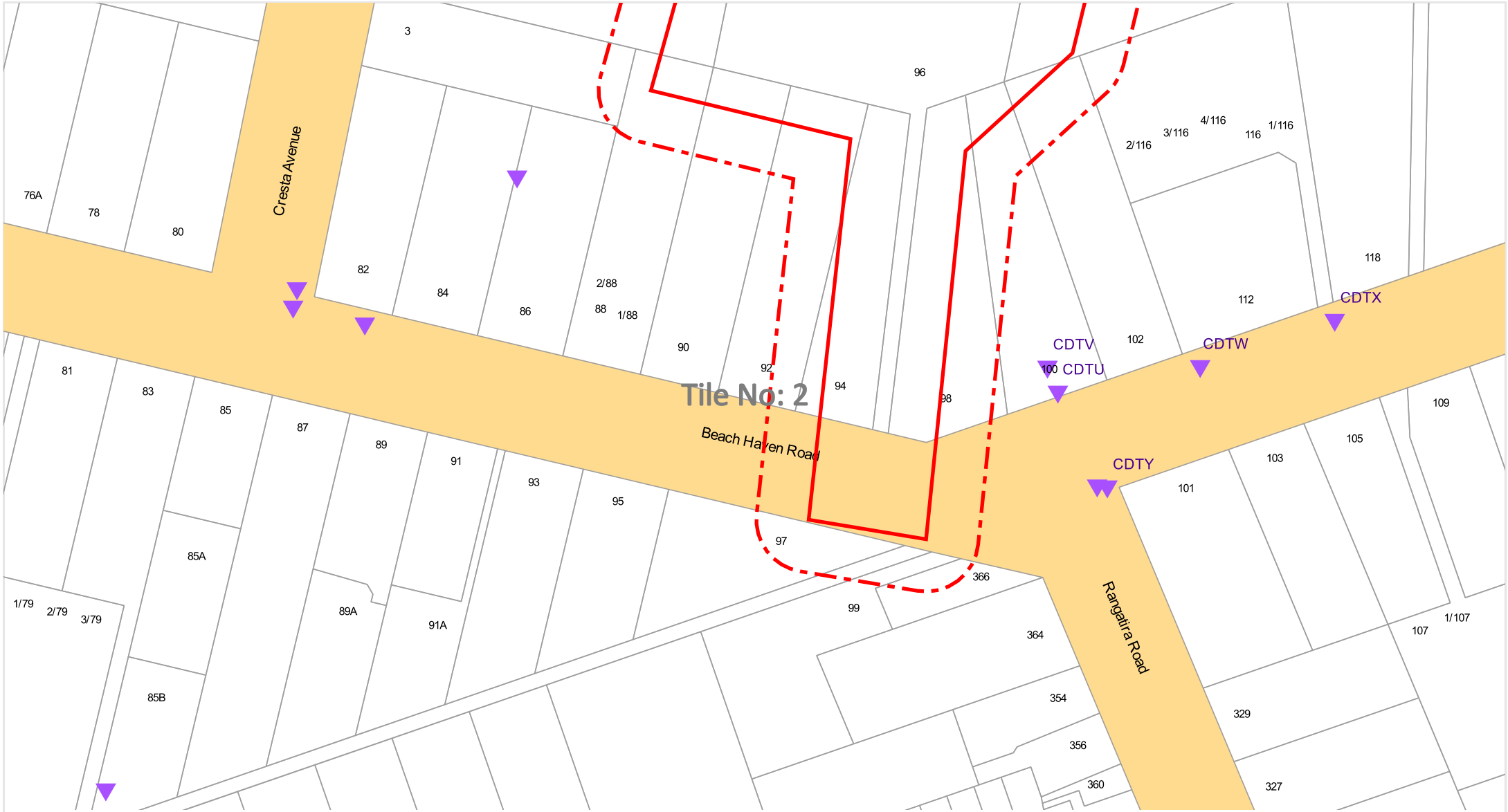

Scale: 1:1000

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Response Cover Letter

Land Information New Zealand (LINZ)

PO Box 5501

Wellington 6145

www.linz.govt.nz

Date: 22/01/2021

To:
Mr Bjorn Steiner
Airey Consultants Limited
Level 1, Fountain Lane North, Botany Town Centre 588 Chapel Road
East Tamaki Not Supplied 2013

Your request has been successfully processed. Please review the attached Plan for survey markers in and around your enquiry location, and complete the attached Form within two clear business days of this response, if your work will impact these marks:

Sequence No: 9050571

Job No: 1771322

Location: 96 Beach Haven Road
Beach Haven Auckland 0626

If you require further information, please contact LINZ on 0800 665 463 or beforeudig@linz.govt.nz

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Important Notice: This enquiry response, including any associated documentation, has been assessed and compiled from the information detailed within the beforeUdig enquiry outlined above. Please ensure that the beforeUdig enquiry details and this response accurately reflect your proposed works.

This response is intended for use only by the addressee. If you have received the enquiry response in error, please let us know by telephone and delete all copies; you are advised that copying, distributing, disclosing or otherwise acting in reliance on the response is expressly prohibited.

While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither LINZ or PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

CHORUS

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	22/01/2021

Toitu te whenua
Land Information
New Zealand

Name:

Contact:

Please list affected survey markers and press "Submit"

*Nil responses not required**

Example:
C7UO, C57U, A3YT

Submit

If you are unable to submit this form via email please phone 04 498 3835

Watercare
An Auckland Council Organisation

Watercare Services Limited

73 Remuera Road, Newmarket
Auckland 1023 New Zealand

Private Bag 92521 Wellesley Street,
Auckland 1141

Telephone +64 9 539 7300

Facsimile +64 9 539 7334

www.watercare.co.nz

WATER AND WASTEWATER PLANS - TERMS OF USE

The information is supplied to you on the following terms and conditions:

- The attached plan/s are provided for reference purposes only and while due care has been taken in their preparation, Watercare Services Limited ("Watercare") does not accept any liability whatsoever for their accuracy or completeness and does not make any representation or warranty, express or implied in relation to the same.

- The plan/s show the location of Watercare's underground and above ground assets only. Separate enquiries should be made to other utilities for the location of their services. It is your responsibility to confirm the actual location of all existing utilities assets, above and below ground prior to commencement of any works.

- Where a 'plan for design purposes only' has been issued another plan must be requested by you through www.beforeudig.co.nz within 14 days of any excavation. Allow 10 working days for processing where a locate and standover will be required; these are required for all critical Watercare assets.

- Watercare is continually altering and expanding its network; the attached information may become out of date. The attached plan is valid only at the date of issue; other assets may have been installed since. It is essential that any plan used is current at the time of excavation. Where plans are more than two months old they must not be used; a new plan must be requested from Watercare.

- Watercare can provide a free mark out service for your worksite when critical assets are present. Asset location markings are only valid for seven days after which time remarking is required at the applicants cost. Where CCTV is used to determine the location and depth of the wastewater assets it will be at the applicants cost. All requests for mark outs require at least two working days' notice. Please note that if the mark out is expected to take longer than one day we will require more than two working days' notice.

- Measurements and depths may vary from those shown on the plan. A physical check of the items on the plan should be undertaken to verify their exact location and other details. All equipment is shown diagrammatically only. In order to avoid interpretation difficulties, use only the original (coloured) plans in A3 format.

- Service lines to a property may or may not be shown. Where customer service connections are shown, these indicate the position where the connection crosses the front boundary only.

- Transmission water and wastewater mains as well as their related assets are critical to the security of water and wastewater services throughout the Auckland region. Damage to these can be extremely hazardous and costly to repair. These assets are not easily repaired and therefore anyone proposing to work within 10 metres of these assets requires Watercare consent. The consent will include the standover procedures and relevant contact details for the mark out.

- Watercare reminds you of your responsibilities under the Health and Safety in Employment Act 1992. You must establish the location of underground services before commencing any excavation. If you fail to do so, you will be held liable for any loss or damage that you may cause.

Under no circumstances are you permitted to carry out work on Watercare assets unless you have consent and are an approved Watercare contractor carrying out work on behalf of Watercare.

Your Legal Requirements

The Department of Labour has set down minimum safe work practices for carrying out any work near underground assets. You are encouraged to view their 'Guide for Safety with Underground Services'. It can be viewed at their website and downloaded for free.

There are also further government laws and regulations that specify safe working practices and the penalties for carrying out unauthorised work. These include:

- Health and Safety in Employment Act 1992 and its amendments
- Local Government Act 2002
- Local Government (Auckland Council) Act 2009
- The Utilities Access Act 2010

Important Contact Numbers

For obstruction plans of the water and wastewater networks contact BeforeUDig on 0800 248 344

Watercare
An Auckland Council Organisation

If there is a leak or a strike on a Watercare asset immediately call us on (09) 442 2222

Watercare
An Auckland Council Organisation

Works Over approval

Apply for approval to start working over or near our assets on public and private property.

Please complete and return this form to
Post: Watercare, Private Bag 94010, Auckland 2241
Email: worksover@water.co.nz
Phone: (09) 442 2222 Website: www.watercare.co.nz

Important information

Before you fill in this application, please visit Watercare GIS viewer, where you can find out which assets are on your planned work site. This may include pipe size, type of network, the process for wastewater pipes, etc.

You need to complete this form for any works within 10 meters of a Watercare critical asset (i.e. transmission mains, rising mains of any size, or local mains 300 mm diameter or greater) and within 2 meters of non-critical Watercare assets..

Important: Do not CCTV transmission mains, and rising mains.

Charges apply for processing this application and full payment must be received before any approval is granted. Please refer to our charges.

To apply for works over approval, please fill out this form, attach all the required documents, and email to worksover@water.co.nz.

☐ Pipes on public property

Apply for approval to start working over or near our critical and noncritical pipes of any size on public property

Checklist

Yes, I have attached (please tick):

- ☐ Pdf copy of Watercare GIS Map showing the area of works
- ☐ If available, your beforeUdig sequence number: _____
- ☐ A plan showing the proposed works in relation to our water and wastewater pipes
- ☐ A cross-section drawing showing vertical and horizontal clearances from all water and wastewater pipes and manholes

☐ Pipes on private property

I confirm that the pipes I am working near ☐ are 300mm or more in diameter ☐ are less than 300mm in diameter ☐ Rising mains *(Do NOT CCTV rising mains)*

Network Group *(Please refer to Watercare GIS viewer to confirm the Network group of the pipe)*

☐ Transmission *(Do NOT CCTV transmission mains)* ☐ Local

Checklist

Yes, I have attached (please tick):

- ☐ A foundation plan showing the proposed development in relation to our water and wastewater pipes
- ☐ A cross section drawing showing vertical and horizontal clearances and the 45° line of influence taken from a point 500mm below the invert level of the affected pipe
- ☐ The correct legal address of the site, which complies with Auckland Council's numbering standards
- ☐ A cross-section drawing showing vertical and horizontal clearances from all water and wastewater pipes and manholes

continued ›››

☐ If required, a pre-construction CCTV inspection video and log sheets **less than 6 months old** showing the condition of the public local network wastewater pipes.
Please do not CCTV transmission mains and rising mains.

Clearance distances: ☐ I have checked the clearance requirements.

1. Applicant's details

Consultant ☐ Contractor ☐ owner ☐ other – please specify ☐

First name Last name

Company (if applicable)

Postal address:

Street number Street name or PO Box

Suburb Postcode

Email

Phone ( ) Mobile

2. Property owner's details (if different from applicant's)

First name Last name

Company (if applicable)

Postal address:

Street number Street name or PO Box

Suburb Postcode

Email

Phone ( ) Mobile

3. Client's details (if different from above)

First name Last name

Company (if applicable)

Postal address:

Street number Street name or PO Box

continued ›››

Suburb | Postcode

Email

Phone ( ) | Mobile

4. Billing details

Details of the person paying the fees for this application (if different from above). See www.watercare.co.nz for fee details.

First name | Last name

Company (if applicable)

Postal address:

Street number | Street name or PO Box

Suburb | Postcode

Email

Phone ( ) | Mobile

Please send my bills by ☐ Email ☐ Post

5. Property address (for works on private property)

Legal site address: *(must comply with Auckland Council numbering standards)*

Street number | Street name

Suburb | Postcode

Does the property have an individual title? ☐ Yes ☐ No

Lot number | Deposited plan (DP) number | Certificate of Title (CT) number

If this property does not have a lot number and a DP number, please contact us on (09) 442 2222.

6. Site address or location (for works on public property)

continued ›››

7. Work details

Investigation ☐ Works over ☐ other – please specify ☐

Construction start date: DD / MM / YYYY Construction end date: DD / MM / YYYY

Briefly describe the work you plan to do, and the type of pipes you will be working near e.g. water, wastewater or both:

Method (e.g. trenching, thrusting):

Plant used (e.g. 20T digger):

Dimensions of work (including depth):

8. Declaration

I declare that the information given on this application is true and correct. I agree to pay all applicable charges for the services indicated.

Name

Signature

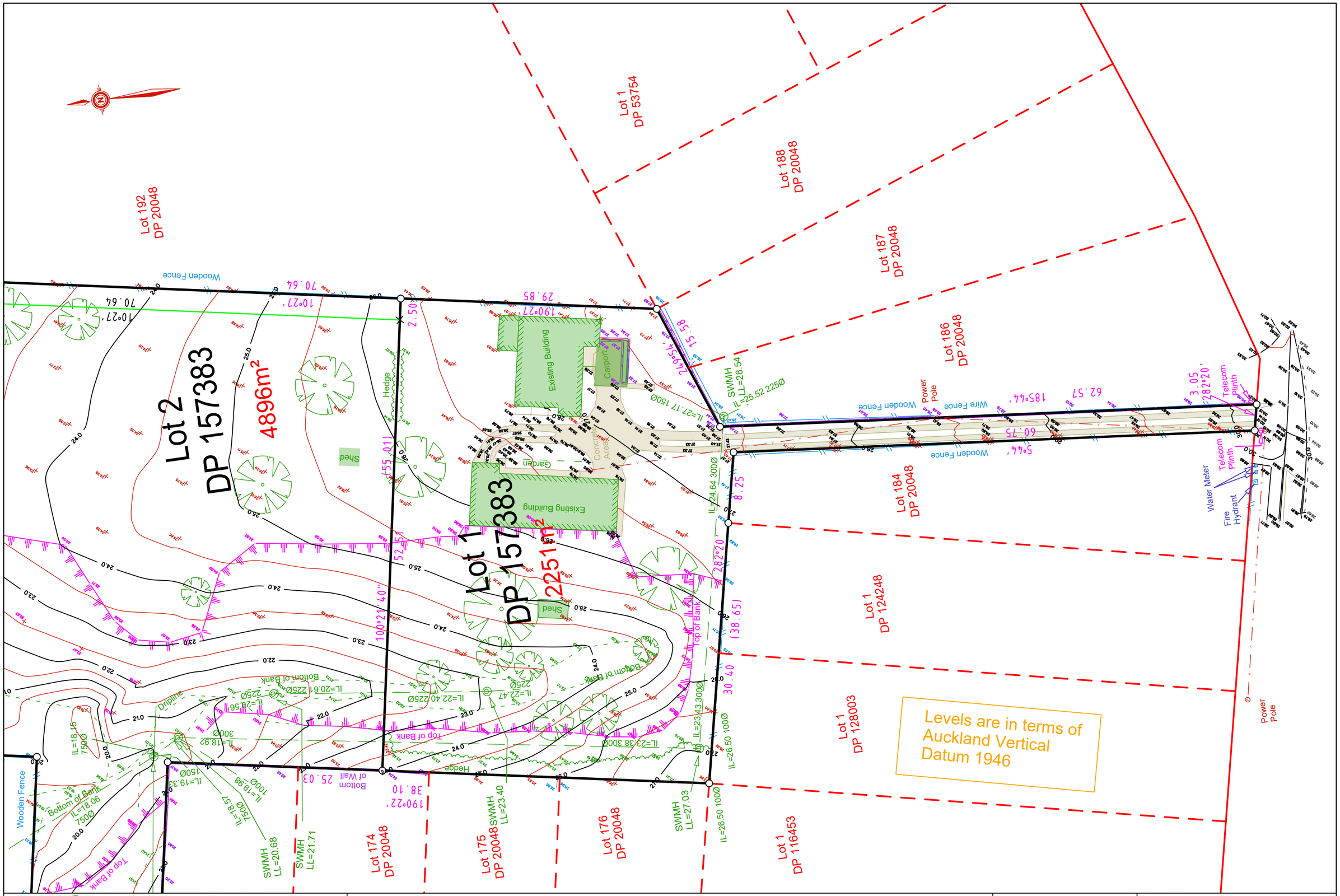
Date DD / MM / YYYY

Privacy

We may use this information to process your application, update our records or help improve our services. We will not disclose it unless required by law. You have the right to access your information, and you can ask us to correct any errors.

Appendix B

Topographical Survey Plans



EASDALE SURVEYORS LTD
39 Meadowland Drive, Howick p: 09 5348452 e: surveyors@easdales.co.nz

Job Title

Topographical Survey
For
Da-Silva Builders
13 Cresta Ave & 96 Beach Haven Rd
Lot 1 and Lot 2 DP 157383

Design	N/A
Survey	ZN&JS
Drawn	ZN
Checked	ML
Date	February 2021
Scale	1: 400 (A3)

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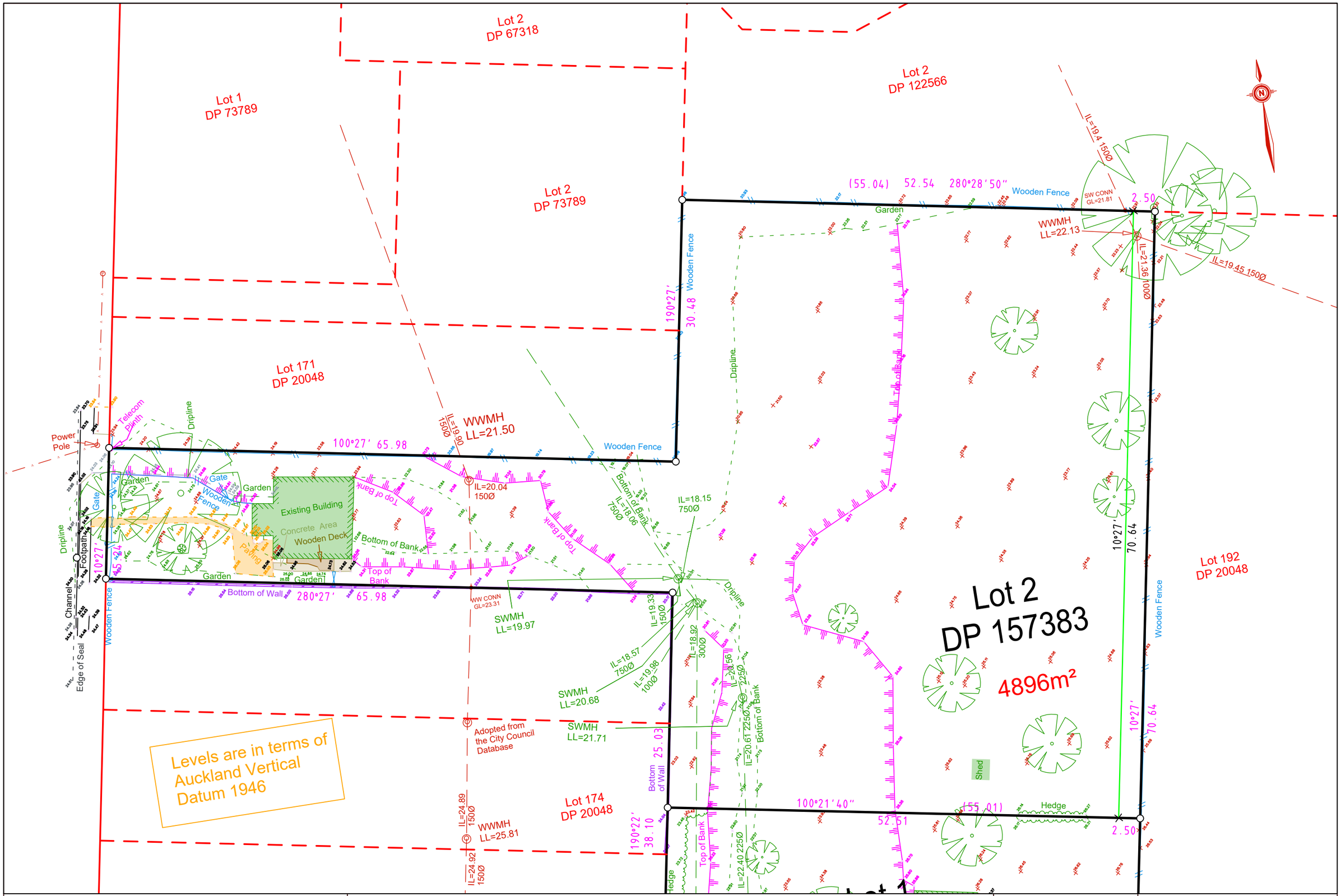
Drawing Title:
Site Plan Sheet 1
Surveyed on 03/02/2021

File No.	Rev.	Dwg No.
14424	N/A	



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Design	N/A
Survey	ZN&JS
Drawn	ZN
Checked	ML
Date	February 2021
Scale	1: 400 (A3)

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Drawing Title:
Site Plan Sheet 2
Surveyed on 03/02/2021

File No.	Rev.	Dwg No.
14424	N/A	

Appendix C

Rezoning Plans

REZONING PROPOSAL

96 Beach Haven Road & 13 Cresta Road
Beach Haven

NOVEMBER 2020

B&A
Urban & Environmental

Prepared by: Nick Mitchell
Reviewed: Rachel Morgan
B&A Job Ref: 18230

WIDER CONTEXT

B&A
Urban & Environmental

LOCAL CONTEXT

B&A
Urban & Environmental

SURROUNDING AREA

B&A
Urban & Environmental

Site entry to Beach Haven Road

Looking east along Beach Haven Road from site entry - towards Local Centre

Looking west down Beach Haven Road from site entry - towards Ferry.
Note: Bus stops in each direction outside of site

Looking east along Beach Haven Road from corner of Cresta Avenue

PUBLIC TRANSPORT

B&A
Urban & Environmental

FERRY TIMETABLE

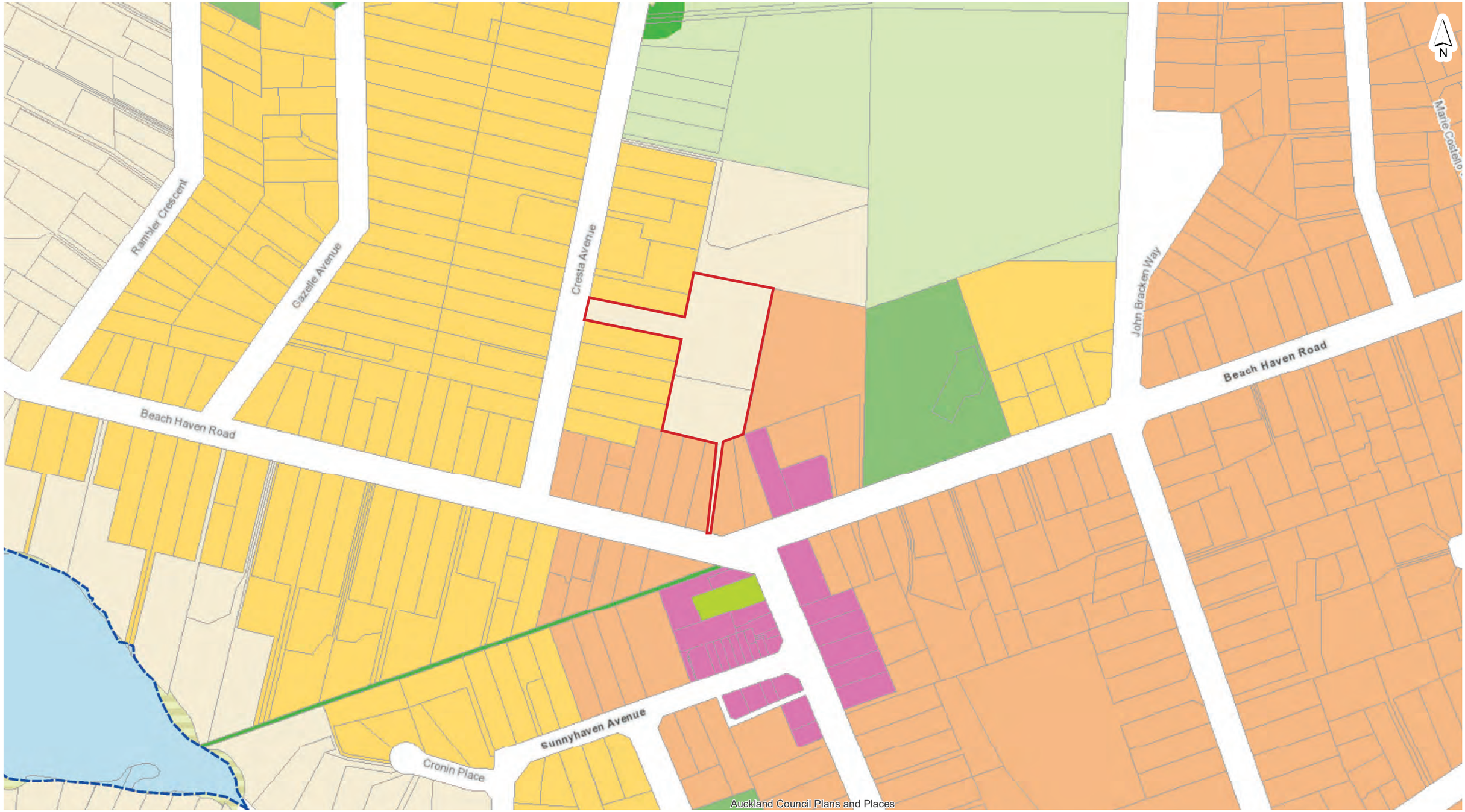
TO: AUCKLAND CITY	TO: BEACH HAVEN
MON - FRI	MON - FRI
6:25 AM	7:05 AM
7:40 AM	8:25 AM
9:00 AM	2:40 PM
3:15 PM	3:55 PM
4:30 PM	5:10 PM
5:45 PM	6:25 PM
7:00 PM	7:40 PM

SUBJECT SITE

B&A
Urban & Environmental

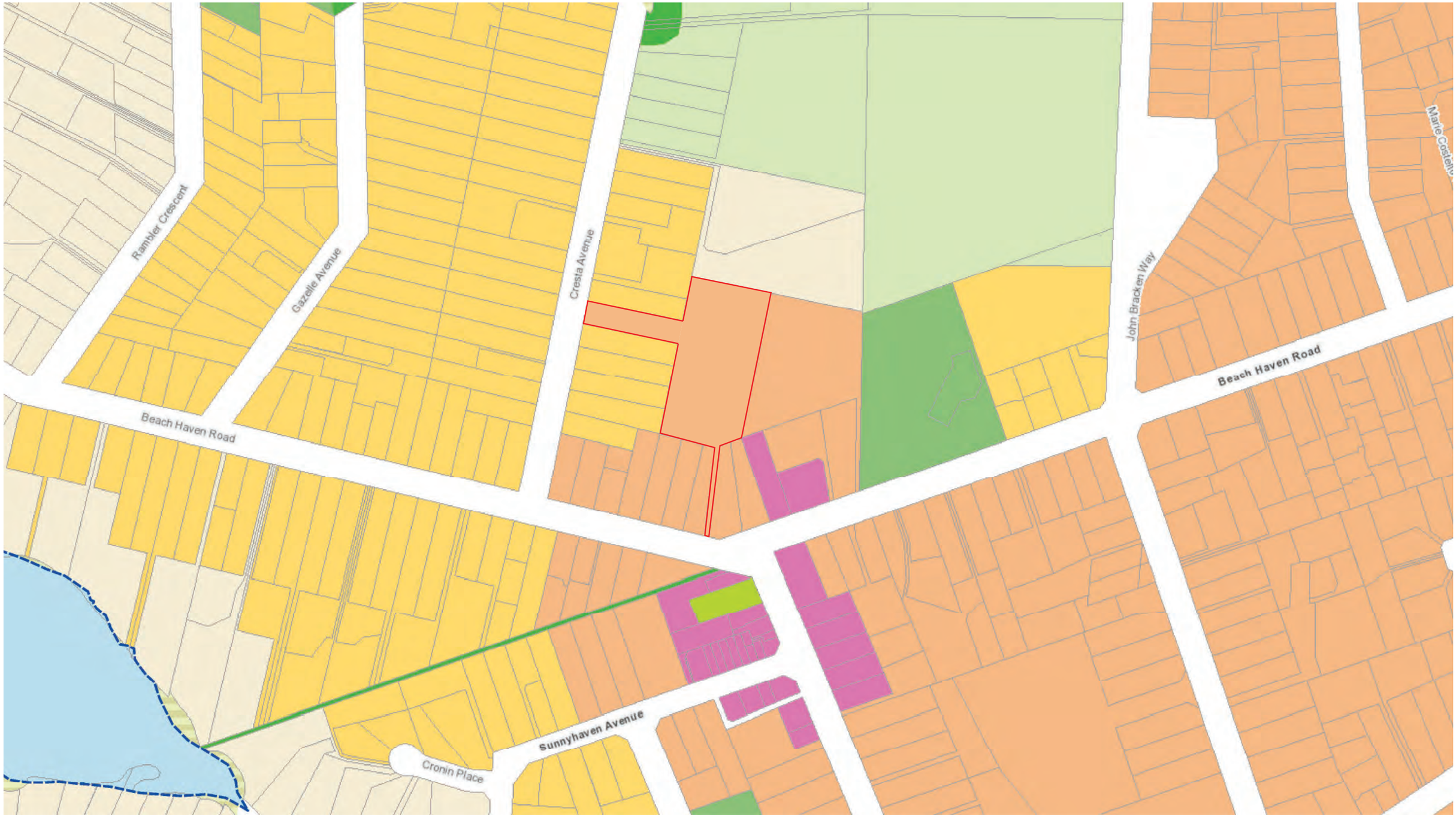
CURRENT ZONING

B&A
Urban & Environmental



PROPOSED ZONING

B&A
Urban & Environmental



B&A

Urban & Environmental

Appendix D

Lander Geotechnical – Geotechnical Report

14 April 2021 Ref No: J01675 (Rev1)

Bentley Studios Limited

Attention: Mr L Da-Silva

Dear Leon

RE: Geotechnical Investigation Report for Private Plan Change at 96 Beach Haven Road & 13 Cresta Avenue, Beach Haven

1 PROJECT BRIEF

This report has been prepared for Bentley Studios Limited in support of an application to the Auckland Council for a Private Plan Change (PPC).

1.1 I have undertaken a review of the private plan change, on behalf of Auckland Council in relation to the geotechnical effects.

I hold a NZCE (Civil) and BE (Civil; Hons 1st class, 1st division) and am a Chartered Professional Engineer. My work experience includes significant land subdivisions across South Auckland over the past 20 years on steep and/or compressible ground. I hold the position of Managing Director and Principal Geotechnical Engineer at Lander Geotechnical Consultants Limited based in Manukau.

1.2 In writing this report, the following documents have been reviewed:

- Geotechnical Due Diligence Desktop Study, CMW Geosciences Ltd, Ref No. AKL2020-0310AA Rev.0, dated 30 November 2020.

2 SCOPE AND OBJECTIVES

The scope of this report encompasses the geotechnical suitability and stability of the land associated with the PPC;

- Geotechnical setting and ground conditions for the site, including assessment of natural features and geohazards that may affect future residential development upon the land.
- Geotechnical guidance for future earthworks based on ground conditions likely to be encountered during site stripping and bulk cut operations.
- Broad stability of the site to safely support typical residential structures for likely end use.
- Available historical aerial photographs to infer fills and/or land modification that may have occurred within the watercourse near the north-eastern corner of the site.
- Shallow surface investigations have only been completed within the site boundaries and it is unknown as the characteristics of the soils encountered within the existing watercourse near the north-eastern corner of the site.

- Review groundwater depths and complete a 14 day assessment for reference to the Auckland Unitary Plan (AUP) permanent drawdown effects assessment (E7.) to be completed at a later stage (e.g. during a subdivision Resource Consent stage) if required, once the nature of development concepts (e.g. building and earthworks) are known.

3 SITE DESCRIPTION AND DEVELOPMENT PROPOSALS

Number 96 Beach Haven Road, Beach Haven is legally described as Lot 1 DP 157383, with an area of 2251m^2. Along the northern boundary of this site sits 13 Cresta Avenue with the legal description of Lot 2 DP 157383 comprising an area of 4896m^2. Land gradients across the site are generally flat around 1(v) in 6(h), but steepen to 1(v) in 4(h) towards the gully located along the western boundary of the site which appears to contains the overland flow path from south to north.

There are currently two dwellings located on each site with two separate garage structures located at 96 Beach Haven Road. A stormwater line runs along the western and southern boundary of 96 beach Haven Road as well as a sewer line that cuts through 13 Cresta Avenue.

We understand that the site is proposed for a zone change for the development of future residential housing which will likely require minor earthworks i.e. cuts and fills to develop the proposed housing foundation platforms

4 FIELDWORK AND FINDINGS

4.1 Fieldwork Programme

Our fieldwork was conducted on 4 February 2021 which involved drilling of 16 hand auger boreholes with target depths of between 3.0m and 5.0m in the positions indicated on the appended site plan (refer Figure 1). Three piezometer standpipes were also installed in HA05, HA11 and HA16.

Results of all in-situ tests, detailed descriptions and depths of strata encountered during drilling of the boreholes are appended.

4.2 Geology

A review of GNS digital QMaps indicates that the site is located within the East Coast Bays Formation (ECBF) of the Waitemata Group flysch deposits which consist of alternating beds of sandstones and mudstones. These deposits generally weather to a dark grey, partially weathered ‘transitional’ soils before weathering completely to orange, light grey and brown silts, clays and sands

4.3 Findings

4.3.1 Topsoil

Topsoil was encountered in each of the hand auger boreholes to a depth of between 100m to 800mm (the latter isolated to HA15) but averaged around 300mm.

4.3.2 Residual East Coast Bays Formation

Residual East Coast Bays Formation (ECBF) soils were noted in each hand auger borehole underlying surficial topsoil and alluvial deposits. These deposits consisted of grey, black, orange and

brown clays and silts. Undrained shear strength readings were generally greater than 75 kPa (Stiff) and up to more than 216 kPa (Hard).

4.3.3 Transitional East Coast Bays Formation

The transitional ECBF was encountered within HA12 underlying the residual ECBF at a depth of 3.85m. These soils were described grey silty Clay and undrained shear strengths within this formation were hard as the shear vane was unable to penetrate the soil.

4.3.4 Groundwater

Groundwater was encountered in HA09 and HA15 at depths of 4.0m and 3.0m respectively. Piezometers standpipes were installed in hand auger boreholes, HA05, HA11 and HA16. Results are tabulated below in table 1.

It is worth noting HA05 was tampered with after its installation and was found partially removed from the ground only allowing a monitoring depth of 3.5m BEGL before an obstruction was met. Additionally during the final round of groundwater monitoring HA16 recorded elevated levels of groundwater compared to the other piezometers, this outlying data point has been determined to have been caused due to excess runoff from a period of heaving rainfall just prior to its measurement and is deemed inaccurate (i.e. higher than the actual groundwater level).

Table 1: Groundwater Levels Following Drilling

Borehole	**Groundwater Depth Encountered During Drilling** (m BEGL)	**Standing Groundwater Depth** (m BEGL)			
		4 February 2021 (Completion of drilling)	**9 February 2021** (5 Days)	**12 February 2021** (15 Days)	**19 February 2021** (22 Days)
HA05	N/A	N/A	N/A	N/A	N/A
HA11	N/A	N/A	4.05	3.85	3.85
HA16	N/A	N/A	4.10	3.70	1.70

5 LABORATORY RESULTS

Atterberg limit soils testing of material from HA11 at a depth of 0.5-1.0m returned the following index properties to aid in the determination of an expansive site class for this site.

- Liquid Limit: 103
- Plastic Limit: 40
- Linear Shrinkage: 22%
- Moisture Content 31.4%

6 PROJECT EVALUATIONS AND RECOMMENDATIONS

Based on our site observations and field investigations we are of the opinion the site contains no insurmountable geotechnical hazards that would prevent future residential intensification.

Specific comments and recommendations follow:

6.1 Foundations for Buildings

6.1.1 Bearing Capacity and Settlement Potential

A geotechnical ultimate bearing capacity of 300 kPa should generally be available for all shallow and pad foundations constructed on engineer certified filling and on the natural ground. Anticipated differential settlements are assessed to be within the required building code limits.

Please note, following earthworks, if existing fill is found to underlay any future building platforms then it will need to be undercut and replaced with engineer certified fill (i.e. compacted GAP65 hardfill), subject to engineering direction from the observing geo-professional.

6.1.2 Expansive Site Class

Based on the Atterberg Limit laboratory testing, refer Section 6, visual-tactile assessment of the soils and knowledge of the area, the preliminary assessed expansive site class for this site is H(High); as defined in MBIE Acceptable Solutions and Verification Methods for NZ Building Code Clause B1 Structures, effective 28 November 2019) with characteristic ground movement (Y_s) of up to 78mm.

This site class should be re-assessed during the detailed design (i.e. at Building Consent stage) via Shrink-Swell testing as outlined in MBIE (extract attached)

6.2 Pavement Subgrade

Given the generally very stiff surficial subsoils present across the site, we consider that a design CBR value of 4% maybe adopted for the natural soils if this is a design requirement for driveways. As CBR values are affected by moisture content and trafficking, we recommend that subgrades are only trimmed to final level immediately prior to placing base course and that a programme of Scala Penetrometer testing be carried out during construction to confirm the design value.

6.3 Preliminary Earthworks Comments

Generally speaking, following the removal/ demolition of the existing dwellings and structures located on site, all debris and excavation which is surplus to requirements should be removed from site, in addition if any existing deep topsoil and pre-existing non engineered fill deposits were encountered on site will require undercutting and replacement with engineered fill if located beneath the proposed building platforms, at the discretion of the observing geo-professional.

All vegetation should be removed, and topsoil stripped well clear of the proposed works and stockpiled clear of the building platform also.

This should be re-addressed at a later phase (e.g. a Resource Consent Application).

7 FURTHER WORK

Further geotechnical assessments should be undertaken to support any subsequent Resource Consent or Building Consent applications commensurate with the nature of future development proposals.

8 LIMITATIONS

This report has been prepared solely for the use of our client, Bentley Studios Limited, their professional advisers and the relevant Territorial Authorities in relation to the specific project described herein. No liability is accepted in respect of its use for any other purpose or by any other person or entity. All future owners of this property should seek professional geotechnical advice to satisfy themselves as to its ongoing suitability for their intended use.

The opinions, recommendations and comments given in this report result from the application of normal methods of site investigation. As factual evidence has been obtained solely from boreholes which by their nature only provide information about a relatively small volume of subsoils, there may be special conditions pertaining to this site which have not been disclosed by the investigation and which have not been taken into account in the report.

If variations in the subsoils occur from those described or assumed to exist, then the matter should be referred back to us immediately.

For and on behalf of Lander Geotechnical Consultants Limited

S.G. Lander

Principal Geotechnical Engineer
CMEngNZ, CPEng

Attachments:

Figure 01: Site Investigation Plan
Hand Auger Boreholes Records
Laboratory Results
MBIE Acceptable Solutions and Verifications Methods for NZ Building Code Clause B1 Structure (extract)

Legend and/or Notes:

- 5m Hand Auger Borehole
- 3m Hand Auger Borehole
- 5m Hand Auger Borehole with Piezometer

BASEMAP: AUCKLAND COUNCIL GEOMAPS DATABASE [RETRIEVED 12.02.21]

revision	description	drawn	approved	date

0 10.0 20.0 30.0
Horizontal Scale (metres)
0 10.0 20.0 30.0
Vertical Scale (metres)

drawn	PL
approved	RP
date	12.02.21
scale	1:500
original size	A3

LANDER geotechnical

client: BENTLEY STUDIO LIMITED

project: 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

title: SITE INVESTIGATION PLAN

project no: J01675 figure no: 01

Template revision: 1:500 (10/12/14)

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA01

Sheet 1 of 16

Vane Head:	Logged By:	Processor :	Date:
1900	RG	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Legend	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL						
slightly clayey SILT, light grey mottled orange/brown. Very stiff, moist, low plasticity [RESIDUAL EAST COAST BAYS FORMATION]						
		0.5		193+		
with trace fine sand						
		1.0		193+		
becoming hard		1.5		UTP		
		2.0		UTP		
becoming very stiff, moderately sensitive		2.5		157/72	2.2	
		3.0		141/50	2.8	
EOB at 3.0m. Target Depth.						
		3.5				
		4.0				
		4.5				
		5.0				
		5.5				
		6.0				

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA02

Sheet 2 of 16

Vane Head:	Logged By:	Processor :	Date:
1750	NM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Description	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
TOPSOIL			
silty CLAY, black, light orange/brown and red mottled brown. Hard, dry to moist, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]			
	0.5	216+	
becoming black and light orange/brown mottled brown			
	1.0	216+	
becoming orange/brown streaked grey, moist			
	1.5	216+	
becoming very stiff, insensitive	2.0	151/114	1.3
becoming orange streaked light grey, high plasticity			
becoming slightly pumiceous silty CLAY, orange and light grey/white streaked light grey, with trace fine sand	2.5	194/108	1.8
EOB at 3.0m. Target Depth.	3.0	148/117	1.3
	3.5		
	4.0		
	4.5		
	5.0		
	5.5		
	6.0		

Legend: Standing Water Level: Sample and Laboratory / Other Test Details

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA03

Sheet 3 of 16

Vane Head:	Logged By:	Processor :	Date:
2153	JM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Description	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL				
silty CLAY, orange mottled light grey. Hard, moist, medium to high plasticity [RESIDUAL EAST COAST BAYS FORMATION]	0.5	216+		
with trace fine sand	1.0	216+		
with trace limonite to 1.2m				
becoming medium plasticity, with minor fine sand	1.5	216+		
becoming high plasticity, with trace fine sand	2.0	216+		
becoming very stiff, insensitive	2.5	120/77	1.6	
with trace rootlets				
becoming hard, moist to wet	3.0	216+		
slightly clayey fine to medium SAND, orange mottled light grey. Hard, wet, low to no plasticity at 3.3m, becoming light grey				
becoming grey	3.5	UTP		Scala Penetrometer Test (blows/100mm)
EOB at 3.9m. Too hard to auger further. Scala penetrometer test commenced to 4.9m.		UTP		
	4.0			6
				11
				12
				12
				10
	4.5			10
				10
				10
				11
				10
	5.0			
	5.5			
	6.0			

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA04

Sheet 4 of 16

Vane Head:	Logged By:	Processor :	Date:
1750	NM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
TOPSOIL			
clayey SILT, grey mottled orange/brown. Hard, dry to moist, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]			
becoming grey streaked orange/brown	0.5	216+	
becoming orange streaked grey			
becoming moist, insensitive	1.0	201/114	1.8
	1.5	216+	
becoming medium plasticity			
becoming very stiff, moderately sensitive	2.0	194/74	2.6
becoming grey streaked orange/brown, low plasticity, with trace sand			
becoming hard	2.5	216+	
becoming brown/orange streaked grey			
	3.0	216+	
	3.5	216+	
	4.0	216+	
	4.5	216+	
EOB at 5.0m. Target Depth.	5.0	216+	
	5.5		
	6.0		

Legend: Standing Water Level; Sample and Laboratory / Other Test Details

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA05

Vane Head:	Logged By:	Processor :	Date:
1900	RG	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
0.5	193+	
1.0	193+	
1.5	152/66	2.3
2.0	160/52	3.1
2.5	171/83	2.1
3.0	193+	
3.5	193+	
4.0	182/58	3.1
4.5	UTP	
5.0	UTP	
5.5		
6.0		

TOPSOIL

clayey SILT, orange mottled light grey. Very stiff, moist, low plasticity [RESIDUAL EAST COAST BAYS FORMATION]

becoming medium plasticity

becoming low plasticity, with trace fine sand

becoming moderately sensitive

fine sandy SILT with minor clay, orange mottled light grey. Loose, moist, low to no plasticity, with trace limonite

becoming moderately sensitive

becoming medium dense

slightly clayey SILT with trace fine sand, light grey mottled orange. Hard, wet, low plasticity, with trace limonite

EOB at 5.0m. Target Depth.

Standing Water Level

Sample and Laboratory / Other Test Details

Piezometer Details:

0.0m-0.5m - Bentonite Seal

0.5m-5.0m - Screened with Filter Sock

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA06

Sheet 6 of 16

Vane Head:	Logged By:	Processor :	Date:
307	RZ	RZ	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Description	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
TOPSOIL			
silty CLAY, orange mottled light brown. Very stiff, moist, medium plasticity, moderately sensitive [RESIDUAL EAST COAST BAYS FORMATION]			
	0.5	173/78	2.2
becoming orange mottled light grey			
becoming high plasticity, insensitive	1.0	153/101	1.5
	1.5	121/72	1.8
becoming hard	2.0	201+	
clayey SILT, orange mottled light grey. Hard, moist, low to medium plasticity			
	2.5	201+	
	3.0	201+	
EOB at 3.0m. Target Depth.			
	3.5		
	4.0		
	4.5		
	5.0		
	5.5		
	6.0		

Legend: Standing Water Level: Sample and Laboratory / Other Test Details

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client :	BENTLEY STUDIOS LIMITED	**Auger Borehole No.**	HA07
Project Location :	96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN	Sheet	7 of 16
Job Number:	J01675	Vane Head: 307 / Logged By: RZ / Processor : RZ	Date: 04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Legend	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL						
EOB at 0.3m. Too hard to auger further. Scala penetrometer test commenced and found effective refusal (ER) at 0.4m.		0.5				3 20+ (ER) Scala Penetrometer Test (blows/100mm)
		1.0				
		1.5				
		2.0				
		2.5				
		3.0				
		3.5				
		4.0				
		4.5				
		5.0				
		5.5				
		6.0				

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA08

Sheet 8 of 16

Vane Head:	Logged By:	Processor :	Date:
1750	NM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Legend	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL						
silty CLAY, light brown. Hard, dry to moist, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]		0.5		216+		
becoming grey and orange/brown mottled light brown, moist						
becoming grey streaked orange/brown						
becoming insensitive		1.0		201/111	1.8	
becoming very stiff becoming orange/brown streaked grey		1.5		182/105	1.7	
		2.0		139/108	1.3	
		2.5		139/102	1.4	
		3.0		170/120	1.4	
becoming high plasticity		3.5		127/99	1.3	
		4.0		167/130	1.3	
becoming hard		4.5		216+		
EOB at 5.0m. Target Depth.		5.0		201/139	1.4	
		5.5				
		6.0				

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA09

Sheet 9 of 16

Vane Head:	Logged By:	Processor :	Date:
2153	JM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Legend	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL						
silty CLAY, orange mottled light grey. Hard, moist, high plasticity [RESIDUAL EAST COAST BAYS FORMATION]						
		0.5		216+		
becoming moderately sensitive		1.0		213/58	3.7	
with trace fine sand						
becoming very stiff, insensitive		1.5		173/89	1.9	
		2.0		164/99	1.7	
becoming medium to high plasticity, with minor fine sand						
becoming moist to wet		2.5		130/83	1.6	
becoming moderately sensitive		3.0		178/85	2.1	
becoming wet, with some fine sand						
		3.5		160/67	2.4	
clayey fine to medium SAND, orange mottled light grey. Very stiff, wet, low plasticity						
becoming grey, saturated, with minor woody inclusions with moderately thin bed of wood		4.0	▽	178/45	4.0	
becoming grey/brown, without woody inclusions		4.5		159/51	3.1	
EOB at 5.0m. Target Depth.		5.0		190/49	3.9	
		5.5				
		6.0				

LANDER geotechnical

Comments:
Groundwater encountered at 4.0m.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA10

Vane Head:	Logged By:	Processor :	Date:
307	RZ	RZ	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
TOPSOIL			
silty CLAY, orange/brown and light grey mottled light orange. Hard, dry, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]			
	0.5	UTP	
becoming moist			
becoming orange mottled light grey	1.0	201+	
becoming very stiff, insensitive	1.5	170/124	1.4
	2.0	173/132	1.3
becoming high plasticity	2.5	147/109	1.3
	3.0	112/72	1.6
becoming stiff	3.5	92/72	1.3
becoming very stiff becoming medium plasticity, with some fine sand	4.0	118/78	1.5
with minor fine sand becoming hard	4.5	201+	
EOB at 5.0m. Target Depth.	5.0	201+	
	5.5		
	6.0		

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

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

Borehole Diameter: 50mm

Checked: JM

LANDER geotechnical

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA11

Sheet 11 of 16

Vane Head:	Logged By:	Processor :	Date:
1900	RG	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
			TOPSOIL
			clayey SILT, light grey mottled orange/brown. Very stiff, moist, low to medium plasticity, moderately sensitive [RESIDUAL EAST COAST BAYS FORMATION]
0.5	152/44	3.5	Piezometer Details: 0.0m-0.5m - Bentonite Seal; 0.5m-5.0m - Screened with Filter Sock; Sample 1 Disturbed 0.5-1.0m
			becoming orange streaked light grey
1.0	155/55	2.8	
			becoming insensitive
1.5	149/97	1.5	
2.0	138/91	1.5	
			silty CLAY, orange streaked grey. Very stiff, moist, high plasticity, insensitive, with trace limonite
2.5	108/72	1.5	
3.0	105/72	1.5	
3.5	105/69	1.5	Standing Groundwater Level as on 12.02.21 and 19.02.21 (3.85m)
			becoming stiff
4.0	72/41	1.8	Standing Groundwater Level as on 09.02.21 (4.05m)
			becoming very stiff
4.5	127/77	1.6	
			at 5.0m, becoming moderately sensitive
5.0	110/52	2.1	EOB at 5.0m. Target Depth.
5.5			
6.0			

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA12

Vane Head:	Logged By:	Processor :	Date:
2153	JM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL			
silty CLAY with trace fine sand, orange mottled light grey. Very stiff, moist, medium to high plasticity, sensitive [RESIDUAL EAST COAST BAYS FORMATION]			
0.5	167/24	7.0	
becoming moderately sensitive becoming high plasticity, without fine sand			
1.0	191/55	3.5	
1.5	157/80	2.0	
becoming insensitive			
2.0	160/111	1.4	
2.5	141/93	1.5	
3.0	179/105	1.7	
becoming moist to wet			
becoming stiff, moderately sensitive			
3.5	96/43	2.2	Scala Penetrometer Test (Blows/100mm)
silty CLAY with trace fine sand, grey. Hard, moist to wet, medium to high plasticity at 3.8m, becoming dark grey/blue	UTP		4
EOB at 3.85m. Too Hard to Auger Further. Scala penetrometer test commenced and found effective refusal (ER) at 4.1m.			12
4.0			20+ (ER)
4.5			
5.0			
5.5			
6.0			

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA13

Vane Head:	Logged By:	Processor :	Date:
307	RZ	RZ	04.02.21

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					
silty CLAY, orange, brown and light grey mottled. Hard, dry, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]	0.5		UTP		
becoming moist					
becoming orange mottled light grey	1.0		201+		
	1.5		201+		
	2.0		201+		
with trace fine sand					
becoming very stiff, moderately sensitive	2.5		184/89	2.1	
becoming stiff, high plasticity, insensitive, without fine sand	3.0		95/58	1.6	
becoming light brown, with some woody inclusions					
becoming orange mottled light grey/white, without woody inclusions					
becoming very stiff	3.5		130/112	1.2	
becoming light grey					
becoming orange mottled light grey	4.0		132/75	1.8	
	4.5		158/109	1.4	
EOB at 5.0m. Target Depth.	5.0		176/115	1.5	
	5.5				
	6.0				

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA14

Sheet 14 of 16

Vane Head:	Logged By:	Processor :	Date:
1750	NM	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION	Legend	Depth (m)	Standing Water Level	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL						
clayey SILT, light brown. Hard, dry to moist, low to no plasticity [RESIDUAL EAST COAST BAYS FORMATION] becoming red and light grey mottled light brown		0.5		216+		
becoming red mottled light brown						
becoming medium plasticity		1.0		188/108	1.7	
silty CLAY, grey streaked orange/brown. Very stiff, moist, medium to high plasticity, insensitive		1.5		177/68	1.7	
becoming orange/brown streaked grey		2.0		154/139	1.1	
becoming red and orange/brown streaked grey		2.5		170/120	1.4	
becoming orange/brown streaked grey						
becoming high plasticity		3.0		167/127	1.3	
		3.5		182/139	1.3	
		4.0		145/120	1.2	
		4.5		142/139	1.0	
EOB at 5.0m. Target Depth.		5.0		139/108	1.3	
		5.5				
		6.0				

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA15

Vane Head:	Logged By:	Processor :	Date:
307	RZ	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Description	Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity
TOPSOIL			
	0.5	132/106	1.2
silty CLAY, orange and brown mottled. Hard, moist, medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]	1.0	201+	
becoming orange and light grey motted, with trace fine sand			
becoming very stiff, insensitive	1.5	115/81	1.4
becoming moderately sensitive	2.0	124/55	2.3
becoming high plasticity, without sand			
becoming insensitive	2.5	104/72	1.4
becoming stiff, saturated	3.0	86/52	1.7
becoming hard, grey	3.5	201+	
becoming very stiff, insensitive	4.0	118/63	1.9
becoming orange mottled grey			
becoming hard	4.5	201+	
	5.0	201+	
EOB at 5.0m. Target Depth.			
	5.5		
	6.0		

Standing Water Level: ▽

Sample and Laboratory / Other Test Details

LANDER geotechnical

Comments:
Groundwater encountered at 3.0m.
UTP = unable to penetrate.
EOB = end of borehole.

Borehole Diameter: 50mm

Checked: JM

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

Client : BENTLEY STUDIOS LIMITED

Project Location : 96 BEACH HAVEN ROAD & 13 CRESTA AVENUE BEACH HAVEN

Job Number: J01675

Auger Borehole No. HA16

Vane Head:	Logged By:	Processor :	Date:
1900	RG	PL	04.02.21

Borehole Location:	mN	mE	Ground R.L.
	Description:	Refer to site plan	

SOIL DESCRIPTION

Depth (m)	Vane Shear(kPa) peak / residual	Soil Sensitivity	Sample and Laboratory / Other Test Details
TOPSOIL			Piezometer Details: 0.0m-0.5m - Bentonite Seal; 0.5m-5.0m - Screened with Filter Sock
clayey SILT, orange streaked grey. Very stiff, moist, low to medium plasticity [RESIDUAL EAST COAST BAYS FORMATION]			
0.5	193+		
becoming medium plasticity			
1.0	193+		
1.5	193+		Standing Groundwater Level as on 19.02.21 (1.70m)
with trace coarse sand sized white pumiceous inclusions			
silty CLAY, orange streaked grey. Very stiff, moist, medium to high plasticity, insensitive			
2.0	144/86	1.7	
with black organic streaks, with trace fine sand			
clayey SILT, orange mottled light grey. Very stiff, moist, medium plasticity, moderately sensitive, with trace limonite			
2.5	127/50	2.5	
becoming stiff, insensitive			
3.0	97/52	1.9	
silty CLAY, orange streaked light grey. Stiff, moist, medium plasticity, insensitive, with trace limonite			
3.5	86/52	1.7	Standing Groundwater Level as on 12.02.21 (3.70m)
becoming moderately sensitive			
4.0	75/36	2.1	Standing Groundwater Level as on 09.02.21 (4.10m)
becoming insensitive			
4.5	97/64	1.5	
becoming grey			
5.0	75/41	1.8	
EOB at 5.0m. Target Depth.			
5.5			
6.0			

LANDER geotechnical

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

Borehole Diameter: 50mm

Checked: JM

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

GEOTECHNICS

Our Ref: 1009521.1123.0.0/Rep1
Customer Ref: J01675
19 February 2021

Lander Geotechnical Consultants Limited
Level 3, 3 Osterley way
Manukau
Auckland 2104

Attention: Rosie Garrill

Dear Rosie

96 Beach Haven & 13 Cresta Avenue Beach Haven

Laboratory Test Report

Samples from the above mentioned site have been tested as received according to your instructions and the results are included in this report. Results apply only to the sample(s) tested.

Descriptions are enclosed for your information, but are not covered under the IANZ endorsement of this report.

This report has been prepared for the benefit of Lander Geotechnical Consultants Limited , with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This report may be reproduced only in full.

Samples not destroyed during testing will be retained for one month from the date of this report before being discarded. If we can be of any further assistance, feel free to get in touch. Contact details are provided at the bottom of this page.

GEOTECHNICS LTD

Report prepared by:

.....
Tylah Wardrope
Laboratory Technician

Authorised for Geotechnics by:

.....
Paul Burton
Project Director

Report checked by:

.....
Ryan Milligan
Project Manager
Approved Signatory
19-Feb-21
t:\geotechnicsgroup\projects\1009521\1009521.1123\workingmaterial\20210219.96 beach haven & 13 cresta avenue beach haven .tywa.docx

ACCREDITED IANZ TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

GEOTECHNICS
15C Amber Crescent
Judea
Tauranga 3110
New Zealand
p +64 7 571 0280

Geotechnics Project Number	1009521.1123.0.0
QESTLab Work Order ID	W21TG-0027
Customer Project ID	J01675

Determination of Liquid & Plastic Limit, Plasticity Index - NZS 4402: 1986 Tests 2.2 (4 Point), 2.3 & 2.4

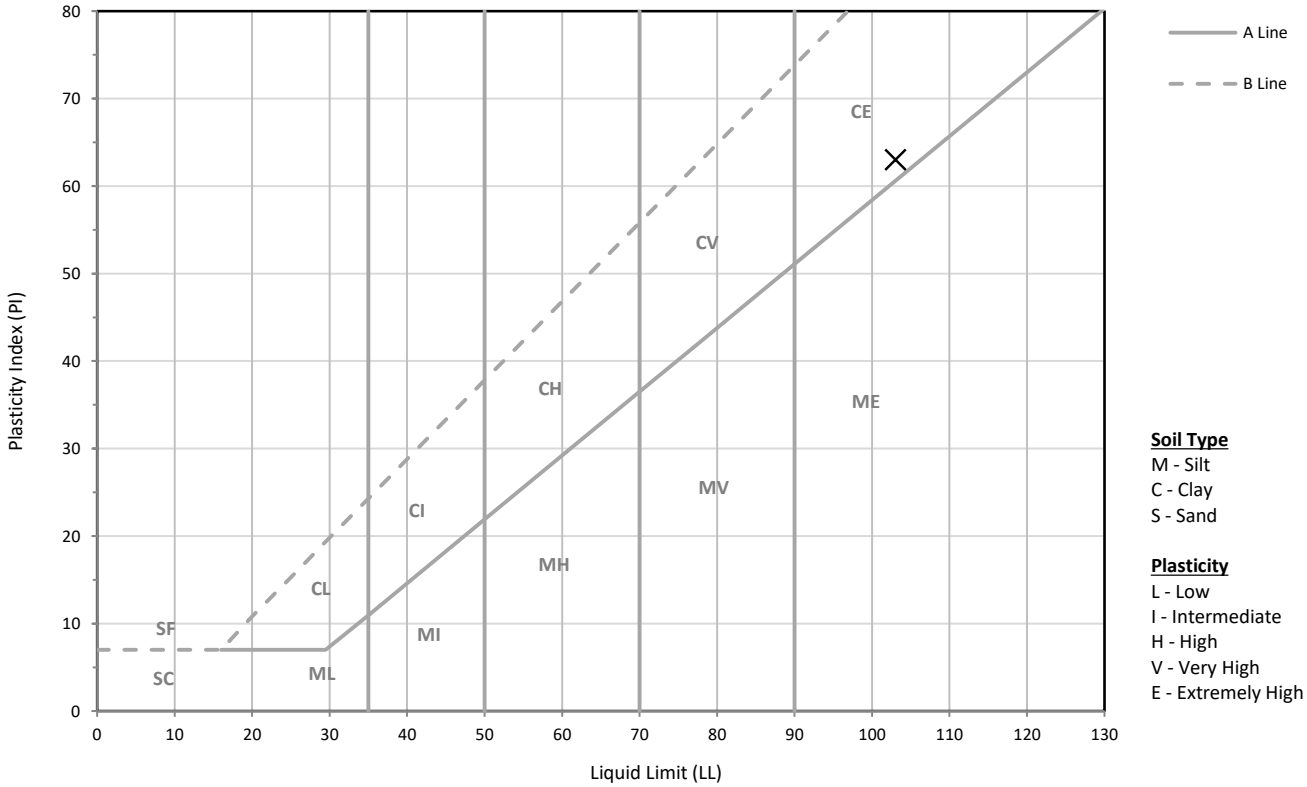
TEST DETAILS

LOCATION	**Description**	96 Beach Haven & 13 Cresta Avenue Beach Haven		
	Data	N/A		
SAMPLE	**Geotechnics ID**	S21TG000063		
	Reference	HA11	**Top Depth**	0.5m
	Sampled By	Others, Tested As Received	**Bottom Depth**	1.0m
	Description	Silty CLAY, with trace rootlets; light brown mixed orange brown. Dry to moist, extremely high plasticity.		
SPECIMEN	**Reference**	N/A	**Depth**	N/A
	Description	N/A		

TEST RESULTS

Liquid Limit	**103**
Plastic Limit	**40**
Plasticity Index	**63**

Plasticity Chart - BS 5930:1999



TEST REMARKS

• The material used for testing was natural, fraction passing a 425um sieve. • This test result is IANZ accredited.•Date tested 18/02/2021

Approved Signatory	Ryan Milligan
Date	19/02/2021

GEOTECHNICS

15C Amber Crescent
Judea
Tauranga 3110
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p +64 7 571 0280

Geotechnics Project Number	1009521.1123.0.0
QESTLab Work Order ID	W21TG-0027
Customer Project ID	J01675

Determination of the Linear Shrinkage - NZS 4402:1986 Test 2.6

TEST DETAILS

LOCATION	**Description**	96 Beach Haven & 13 Cresta Avenue Beach Haven		
	Data	N/A		
SAMPLE	**Geotechnics ID**	S21TG000063		
	Reference	HA11	**Top Depth**	0.5m
	Sampled By	Others, Tested As Received	**Bottom Depth**	1.0m
	Description	Silty CLAY, with trace rootlets; light brown mixed orange brown. Dry to moist, extremely high plasticity.		
SPECIMEN	**Reference**		**Depth**	
	Description			

Linear Shrinkage **22%**

TEST REMARKS

• This test result is IANZ accredited.•Date tested 17/02/2021

Approved Signatory	Ryan Milligan
Date	19/02/2021

Tauranga
15C Amber Crescent
Judea
Tauranga 3110
New Zealand

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Report No: MAT:S21TG000063
Issue No: 1

Material Test Report

Customer: Lander Geotechnical
Address: Level 3, 3 Osterley Way
Manukau, 2104
Project: 96 Beach Haven & 13 Cresta Avenue Beach Haven
Project No.: 1009521.1123.0.0
Customer Reference No.: J01675
Report Authorised By : Ryan Milligan

Approved By:
Ryan Milligan
(Development Manager)
Date of Issue: 19/02/2021

Please reproduce this report in full when transmitting to others or including in internal reports.

Sample Details

Location	96 Beach Haven & 13 Cresta Avenue Beach Haven
Geotechnics ID	S21TG000063
Sample Reference	HA11
Sample Description	Silty CLAY, with trace rootlets; light brown mixed orange brown. Dry to moist, extremely high plasticity.
Sample Depth	0.5m
Bottom Depth	1.0m

Test Results

Description	Method	Result	Limits
Moisture Content [NZS 4402:1986 Test 2.1]			
Moisture Content (%)		31.4	
Date Tested		15/02/2021	

Comments

This test result is IANZ accredited.

If samples have been taken, and were not destroyed during testing, they will be retained for one month from the date of this report before being discarded.

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3.2 Slab-on-ground in expansive soils

3.2.1 NZS 3604 Clause 1.1.2 Buildings covered by this Standard

Amend 1.1.2(a) to read:

"Buildings founded on good ground or on expansive soils where the requirements of 1.1.5 are met"

3.2.2 NZS 3604 New Clause

Add new: "**Clause 1.1.5 Buildings on expansive soils**

Buildings on expansive soils shall be supported on slab-on-ground foundations complying with 7.5.13 and in addition to 1.1.2 shall be limited as follows:

(a) single storey, stand-alone household unit, and

(b) maximum length or width of floor of 24.0 m including any attached garage, and

(c) simple plan shapes such as rectangular, L, T or boomerang, and

(d) concrete slab-on-ground with a minimum thickness of 100 mm and a minimum concrete compressive strength of 20 MPa, and

(e) simple roof forms, incorporating hips, valleys, gables or mono pitches, and

(f) maximum overall height of 7.0 m to roof apex from lowest cleared ground level, and

(g) maximum roof height of 3.0 m, and

(h) roof slope between 10° and 35° from the horizontal, and

(i) maximum span of roof truss 12.0 m, and

(j) external walls maximum of 2.4 m height studs, other than gable end walls and walls to mono-pitched roofs, which shall not exceed 4.0 m.

COMMENT:

Floor plans

Where floor plans incorporate re-entrant corners then continuity of the exterior ground beam shall be maintained by continuing it as an internal beam, with the exterior beam details continued for a length of at least 1.0 m into the internal beam. This is only applicable where internal beams are specified in Tables 7.4A and 7.4B. This is aimed to bring the solution in NZS 3604 in line with Clause 5.3.8 of AS 2870:2011.

Amend 19
Nov 2019

Ground movement

Provision for the additional ground movement effects from trees near to foundations in expansive soils should be considered. Trees remove moisture from the soil for a radius equal to the height of the tree. This causes expansive soils to shrink to varying degrees, and when near houses leads to differential settlement occurring under foundations. Movement of the foundations may lead to cracks in the building and door jamming.

Where existing trees (including trees that have been recently removed) are located closer to the foundations than 1.5 times the mature height of a tree, then additional geotechnical advice should be obtained. Planting of new trees should be avoided near foundations of new buildings or neighbouring buildings on sites with expansive soils.

3.2.3 NZS 3604 Clause 7.5.1

Add the following paragraph at the end of Clause 7.5.1:

"Slabs on expansive soils for buildings meeting the requirements of 1.1.5 shall, in addition to meeting the requirements of 7.5.1 to 7.5.12, meet the requirements of 7.5.13. Where there is conflict the requirements of 7.5.13 shall apply."

3.2.4 NZS 3604 New clause, tables and figures

Add new: **Clause 7.5.13 Slab-on-ground in expansive soils**

7.5.13.1 Identification of expansive soils

7.5.13.1.1 Should reasonable enquiry as outlined in 3.1.3 show any signs of expansive soils, the expansive soil class, as defined in AS 2870, shall be established by one or all of:

(a) enquiry to the local territorial authority, and/or

(b) reference to the certificate of suitability issued in terms of NZS 4431, and/or

(c) a soil test undertaken by a suitably qualified soils engineer.

7.5.13.1.2 Expansive soil class shall be defined as:

(a) Slightly 'S', having an I_{SS} range of 0–1.9%, and a 500 year design characteristic surface movement return (y_S) of 22 mm, or

(b) Moderately 'M', having an I_{SS} range of 2.0–3.7% and a 500 year design characteristic surface movement return (y_S) of 44 mm, or

Amend 19
Nov 2019

(c) Highly 'H', having an I_{SS} range of 3.8–6.5%and a 500 year design characteristic surface movement return (y_S) of 78 mm, or

(d) Extremely 'E', having an I_{SS} range of 6.6–7.5% and a 500 year design characteristic surface movement return (y_S) of 90 mm.

7.5.13.2 Maximum aspect ratio of concrete slabs

The aspect ratio of the concrete slabs or bays of concrete slabs, such as in the case of L, T or boomerang concrete slab shapes, shall not exceed 5 to 1 (length to width).

7.5.13.3 Foundation details

7.5.13.3.1 For the identified expansive soil class the foundation details, external and internal thickenings shall be as follows.

(a) For light wall claddings refer to Table 7.4A and Figure 7.22.

(b) For medium wall or heavy wall claddings refer to Table 7.4B and Figure 7.23.

7.5.13.3.2 Situations where no internal thickenings shall be required are limited to a rectangular slab with long side not exceeding 17.0 m. Where this limit is exceeded, add additional internal thickenings across the slab with the same cross section dimensions and reinforcing as the external footing, so that the centre to centre spacing of thickenings is always less than 17.0 m.

COMMENT:

Design constraints:

a) The characteristic surface movements and the corresponding expansivity classifications have been calculated based on design for ultimate limit state (ULS) conditions for a 1 in 1000 year "extreme" drought event, and the serviceability limit state (SLS) conditions for a 1 in 500 year drought event.

b) Maximum soil movements are calculated to be based on a 500 year return period for SLS, and a 1000 year return period for ULS*;

(*NB: *This differed from the recommendations contained within BRANZ Study Report 120A (BSR120A) which used a 300 year return period for the design level drought conditions)*

Amend 19 Nov 2019

c) Climate parameters adopted from BSR120A of Δu = 1.2 pF, Hs = 1.5 m, and a crack depth of 0.5 Hs

d) The I_{SS} (soil stability index) ranges attributed to the expansivity classifications as defined in 3.2.4 above have been calculated using the parameters presented in BSR120A and Equation 2.3.1 of AS 2870:2011.

e) Sites subject to parameters that differ from those mentioned above, in particular sites where the crack depth is less than 0.75 m, such as cut natural ground or clay backfill, require specific engineering assessment to confirm their appropriate site classification.

f) The effects of nearby trees (whether existing, recently removed, or future planting) are not considered in these solutions. It is recommended that specific geotechnical engineering advice is obtained where a tree is within a lateral distance of 1.5 times its mature height of the foundations.

Maintenance of foundations in expansive soils

Normal maintenance is that work generally recognised as necessary to achieve the expected performance over time of the foundation located on expansive soils. Unless otherwise specified by the designer and noted on the drawings, basic normal maintenance tasks should ensure that:

a) the drainage and wetting of the site is controlled so that extremes of wetting and drying of the soils are prevented, and

b) the position and operation of gardens adjacent to the dwelling are controlled, and the planting of trees near to foundations is suitably restricted, and

c) any leaks which develop in plumbing, storm water or sanitary sewage systems are repaired promptly.

Amend 19 Nov 2019

Table 7.4A **Reinforced concrete foundations in expansive soils for light wall claddings**
Clause 7.5.13 and Figure 7.22

Expansive soil class	Slightly 'S'	Moderately 'M'	Highly 'H'	Extremely 'E'
Soil embedment (De)	375 mm	525 mm	575 mm	625 mm
Top steel (A_S top)	2/D 16	2/ D16	2/ D16	2/ D16
Bottom steel (A_S bottom)	1/ D16	1/ D25	1/ D20	1/ D25
Stirrups	R6/ 125 crs.	R6/ 125 crs.	R6/ 300 crs.	R6/ 300 crs.
Maximum spacing of internal thickenings	no internal thickening	no internal thickening	2.5 m crs.	2.5 m crs.
Depth of thickening (D1)	–	–	400 mm	450 mm
Base width (B1)	–	–	300 mm	350 mm
Top steel (A_S top)	–	–	2/ D20	2/ D20
Bottom steel (A_S bottom)	–	–	2/ D16	2/ D20
Stirrups	–	–	R6/ 150 crs.	R6/ 150 crs.

Table 7.4B **Reinforced concrete foundations in expansive soils for medium wall and heavy wall claddings**
Clause 7.5.13 and Figure 7.23

Expansive soil class	Slightly 'S'	Moderately 'M'	Highly 'H'	Extremely 'E'
Soil embedment (De)	500 mm	550 mm	775 mm	800 mm
Top steel (A_S top)	2/ D16	2/ D20	2/ D20	3/ D20
Bottom steel (A_S bottom)	2/ D16	2/ D16	2/ D20	2/ D20
Stirrups	R6/ 125 crs.	R6/ 250 crs.	R6/ 300 crs.	R6/ 300 crs.
Maximum spacing of internal thickenings	–	2.5 m crs.	2.5 m crs.	2.5 m crs.
Depth of thickening (D1)	–	350 mm	450 mm	500 mm
Base width (B1)	–	300 mm	300 mm	350 mm
Top steel (A_S top)	–	2/ D16	3/ D20	3/ D20
Bottom steel (A_S bottom)	–	2/ D16	2/ D16	2/ D20
Stirrups	–	R6/ 125 crs.	R6/ 150 crs.	R6/ 150 crs.

Amend 19
Nov 2019