



NICKLIN CE
SURVEYING PLANNING ENGINEERING

GROWTH CELL T2
PLAN CHANGE
INFRASTRUCTURE REPORT

Sanderson Group
Kotare Properties

Frontier & Pirongia Roads
TE AWAMUTU 3876

JULY 2020
OUR REF: 4500

PREPARED BY:
NICKLIN CE
PO BOX 754
CAMBRIDGE
PH 07 827 4945



24 July 2020

Our Ref: 4500

SANDERSON GROUP LTD:

KOTARE PROPERTIES LTD:

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Land Development Consultant

Growth Cell T2 Plan Change Infrastructure Report:
Frontier and Pirongia Roads, Te Awamutu 3876

THREE WATERS, ROADING, AND UTILITY SERVICING CONCEPTS

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- Appendix A 4500 Sanderson Kotare (Frontier) Nicklin CE Development Concept Set Rev4
Appendix B Existing Underground Service Location Plans
Appendix C 3-39433.00 WSP T2 Water Supply Assessment July 2020
Appendix D Utility Service Providers Confirmation of Supply



1.0 Introduction:

Sanderson Group and Kotare Properties are applying for a plan change to zoning, from Rural to Residential, of the Waipa District Council 'T2' Growth Cell at Frontier and Pirongia Roads, Te Awamutu. This report provides an overview, at a conceptual level, of anticipated infrastructure. The purpose is to outline key infrastructure concepts regarding supply and design, and to demonstrate feasibility. The report will refer to 'T2 South' as comprising the proposed Kotare Properties Subdivision and Sanderson Group Retirement Development, and 'T2 North' comprising anticipated future development in the T2 Growth Cell to the North of the Sanderson Group Development. 'T1' will be used to refer to the 'T1 Growth Cell' currently being developed by Frontier Developments to the East of 'T2'.

Our report will be limited to the following matters:

- Wastewater Management;
- Stormwater Management;
- Water Supply;
- Roading;
- Utility Services.

2.0 Wastewater Management:

The overall wastewater strategy is similar for both T2 South and T2 North, however these are both somewhat independent systems. The concept for T2 South is a gravity reticulation network to a centralised low point, to proximity of the designed wetland, in the proposed Council reserve.

A wastewater pumping station will be constructed to Regional Infrastructure Technical Specification (RITS) standards, as required to vest in Waipa District Council. A rising main will be designed to RITS requirements to pump wastewater to the eastern boundary of T2 and all the way north to Pirongia Road. Appropriate easements will need to be registered to provide for this reticulation. The rising main would continue east along Pirongia Road to an existing Council manhole (Asset ID 20190725094422) where the 225mm $\varnothing$ existing gravity reticulation will convey wastewater to the nearby Te Awamutu Wastewater Treatment Plant. See plan sets 4500-06 and 4500-07 within Appendix A. Pump Station and Rising Main design is currently in process.

Conversations with Council Development Engineering have confirmed this approach is acceptable and that prior planning has intended for the above-mentioned existing wastewater manhole to be the receiving infrastructure for both the T1 and T2 growth cells. There is the ability for this rising main to be modified and re-directed as required for future T1 and T2 development.

The strategy for T2 North is similar, with gravity reticulation to a low point on site, and conversations with Council Development Engineering suggest that wastewater can be pumped to T1 Stage 3 as it is anticipated this will be completed prior to the development of T2 North. There are also possible routes for rising main infrastructure to run along Pirongia Road or for new infrastructure to the Te Awamutu Wastewater Treatment to be developed dependant on design. See the reporting and structure by Boffa Miskell for the proposed layout of T2 North.

As noted on plan 4500-06, infrastructure within the Te Awamutu Country Club development will be private and will connect to the public system as indicated on the Kotare Heights development plan via roads and reserves to be vested in Council.



3.0 Stormwater Management:

The overall stormwater strategy for T2 South is for reticulated infrastructure to convey stormwater to either an open swale system or a centralised wetland, for treatment prior to discharge into the downstream receiving environment. Ultimately the catchment makes its way to the Mangapiko Stream. See plan set 4500-06 within Appendix A for possible layout. A similar strategy can be achieved within T2 North. See the reporting and structure by Boffa Miskell for the proposed layout of T2 North. See the reporting and plans from Wainui Environmental for more detail regarding stormwater philosophy and design.

4.0 Water Supply:

WSP has confirmed there is adequate water supply in the Council system for both the T1 and T2 growth cells. See the Water Supply Assessment in Appendix C for further details. A meeting was held on 21st July 2020 with WSP and Council Development Engineering to discuss required infrastructure and Council Development Engineering is currently in process developing a booster pump to provide adequate pressure for anticipated T1 and T2 pressure demands upon completion.

It is anticipated that supply will be made available from an existing 375mmØ main in Frontier Road for T2 South and that future connection will be provided for T1 development at the common T1 T2 road interface. Detailed design of the water reticulation network will be undertaken in due course following further reporting from WSP and Waipa District Council.

It is anticipated that T1 roading and infrastructure as it relates and interfaces with T2 will be progressed prior to the development of T2 North. Infrastructure and design mentioned above will give due consideration to T2 North and will look to ensure appropriate supply and pressure will be available for water reticulation.

5.0 Roading:

Road infrastructure has been modelled from previous roading development within the Waipa District and modified with input from Stantec and Boffa Miskell. See plans Nicklin CE 4500-03 and 4500-08 within Appendix A for layout and road section concepts as they relate to the subdivision component of T2 South. Parking bays are proposed to be recessed and a central island is proposed for the main 20m 'Road 1'. Two roundabouts, one culdesac, and three access lots are also proposed. Roding upgrades are proposed for the north-western side of Frontier road abutting the development and speed limits are to be considered. More detailed design will be undertaken as part civil design works in due course.

T2 South provide connectivity to both Frontier Road and the T1 development, and T2 North has dual connectivity to the T1 development and connectivity to Pirongia road. Walkways and Cycleways are also proposed, linking roading and reserves and providing increased recreational connectivity. Roding infrastructure is anticipated to be of a similar nature to T2 South. See reports from Boffa Miskell and Stantec for further detail related proposed roading infrastructure, design, and layout for the T2 Growth Cell.



6.0 Utility Services:

Confirmation has been obtained from Waipa Networks, Ultrafast Fibre, and First Gas that the development of T2 South can be serviced via existing networks in respect electricity, telecommunications, and gas. Waipa Networks Ltd, Ultrafast Fibre Ltd and First Gas Ltd will be contacted in due course to undertake their infrastructure design for T2 South. Refer Appendix D for correspondence from these respective utility providers.

It is anticipated that T2 north will be able to be serviced once staged infrastructure within the T1 development is progressed to the common road interface with T2 and vested in Council. Further infrastructure could be provided from Pirongia Road.

Consideration of existing services needs to be given in the future development of T2 as follows:

- The First Gas trunk main and the Te Tahī Council water supply main will need to be located in Pirongia Road and approvals gained prior to the construction of rising main infrastructure in Pirongia road and any other civil works;
- Chorus has a telecommunications line running in proximity the common boundary between T2 South and T2 North, running West to East into the T1 development, and will need to be located and possible relocated prior to any works in this location;
- General utility infrastructure withing Frontier and Pirongia roads requires identification consideration prior to works in these locations;
- Overhead power and private water supply line servicing the existing dwelling within T2 South, and as contained within easements as shown on plan 4500-02 within Appendix 1, will need to be located and possible relocated prior to any works.

Refer Appendix B for as-built and location plans for the utility services detailed above.

7.0 Summary:

This report, in conjunction with the enclosed development concept plan set, water supply assessment, and utility services appendices, and other reporting as detailed above and enclosed within the master plan change application, outlines key infrastructure concepts regarding supply and design, and demonstrates availability of service and feasibility of infrastructure.

Should you have any queries, please do not hesitate to contact the writer.

Yours faithfully,



C P Murphy
MNZIS, BSurv.
Licensed Cadastral Surveyor
Project Management
Nicklin CE Ltd



APPENDIX A

4500 Sanderson Kotare (Frontier) Nicklin CE Development Concept Set



SANDERSON GROUP & KOTARE PROPERTIES ENGINEERING CONCEPT SET



Te Awamutu
Country Club

TE AWAMUTU COUNTRY CLUB



KOTARE HEIGHTS 10 & 52 FRONTIER ROAD, TE AWAMUTU JULY 2020

CONTENTS

SHEET 01:	TOPOGRAPHICAL SITE PLAN
SHEET 02:	EXISTING ALLOTMENTS PLAN
SHEET 03:	SUBDIVISION CONCEPT PLAN
SHEET 04:	FINAL CONTOURS EARTHWORKS PLAN
SHEET 05:	CUT FILL EARTHWORKS PLAN
SHEET 06:	COMBINED SERVICES CONCEPT PLANS
SHEET 07:	SEWER RISING MAIN CONCEPT PLANS
SHEET 08:	TYPICAL ROAD SECTIONS CONCEPT



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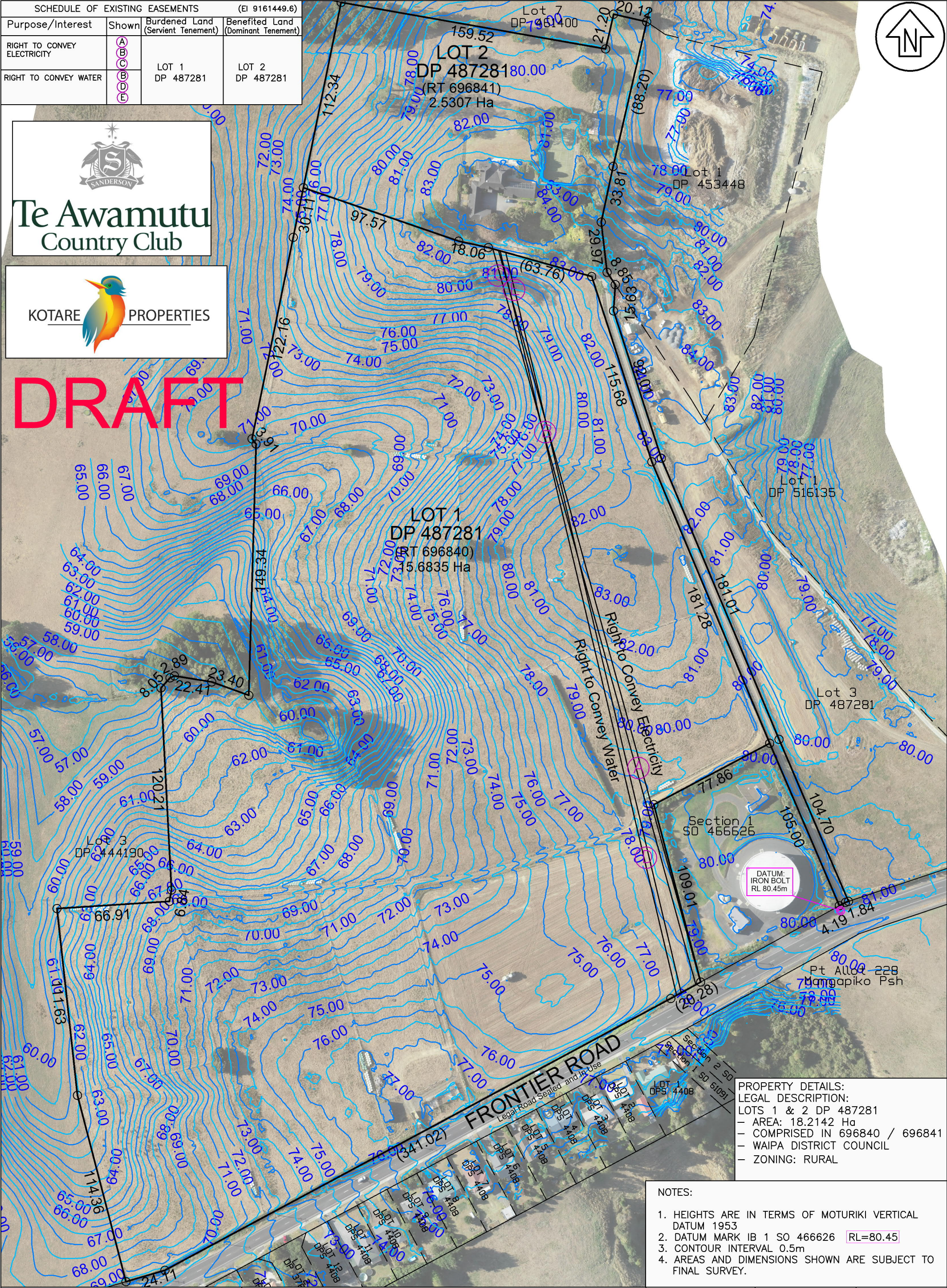


NICKLIN CE
SURVEYING PLANNING ENGINEERING

SCHEDULE OF EXISTING EASEMENTS (Ei 9161449.6)			
Purpose/Interest	Shown	Burdened Land (Servient Tenement)	Benefited Land (Dominant Tenement)
RIGHT TO CONVEY ELECTRICITY	(A) (B) (C)	LOT 1 DP 487281	LOT 2 DP 487281
RIGHT TO CONVEY WATER	(B) (D) (E)		



DRAFT



PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
- COMPRISED IN 696840 / 696841
- WAIPA DISTRICT COUNCIL
- ZONING: RURAL

- NOTES:
1. HEIGHTS ARE IN TERMS OF MOTURIKI VERTICAL DATUM 1953
 2. DATUM MARK IB 1 SO 466626 RL=80.45
 3. CONTOUR INTERVAL 0.5m
 4. AREAS AND DIMENSIONS SHOWN ARE SUBJECT TO FINAL SURVEY.

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Cambridge 3450

PROJECT TITLE **TOPOGRAPHICAL SITE PLAN**
OVER LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU
SANDERSON GROUP & KOTARE PROPERTIES

ALTERATION		JOB	SHEET
CAD CPM		4500	01
DATE 7 MAY 2020		ORIGINAL SCALE AT A3 1:2000	REV 1

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SCHEDULE OF EXISTING EASEMENTS (Ei 9161449.6)			
Purpose/Interest	Shown	Burdened Land (Servient Tenement)	Benefited Land (Dominant Tenement)
RIGHT TO CONVEY ELECTRICITY	(A) (B) (C) (D) (E)	LOT 1 DP 487281	LOT 2 DP 487281
RIGHT TO CONVEY WATER	(B) (D) (E)		



DRAFT



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- WAIPA DISTRICT COUNCIL
- ZONING: RURAL

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PROJECT TITLE

EXISTING ALLOTMENTS PLAN

OVER LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU
SANDERSON GROUP & KOTARE PROPERTIES

ALTERATION		JOB	SHEET
CAD CPM		4500	02
DATE 7 MAY 2020		ORIGINAL SCALE AT A3 1:2000	REV 1

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Te Awamutu Country Club

A 98 Villa
9.56 Hectare
Sanderson Group
Development

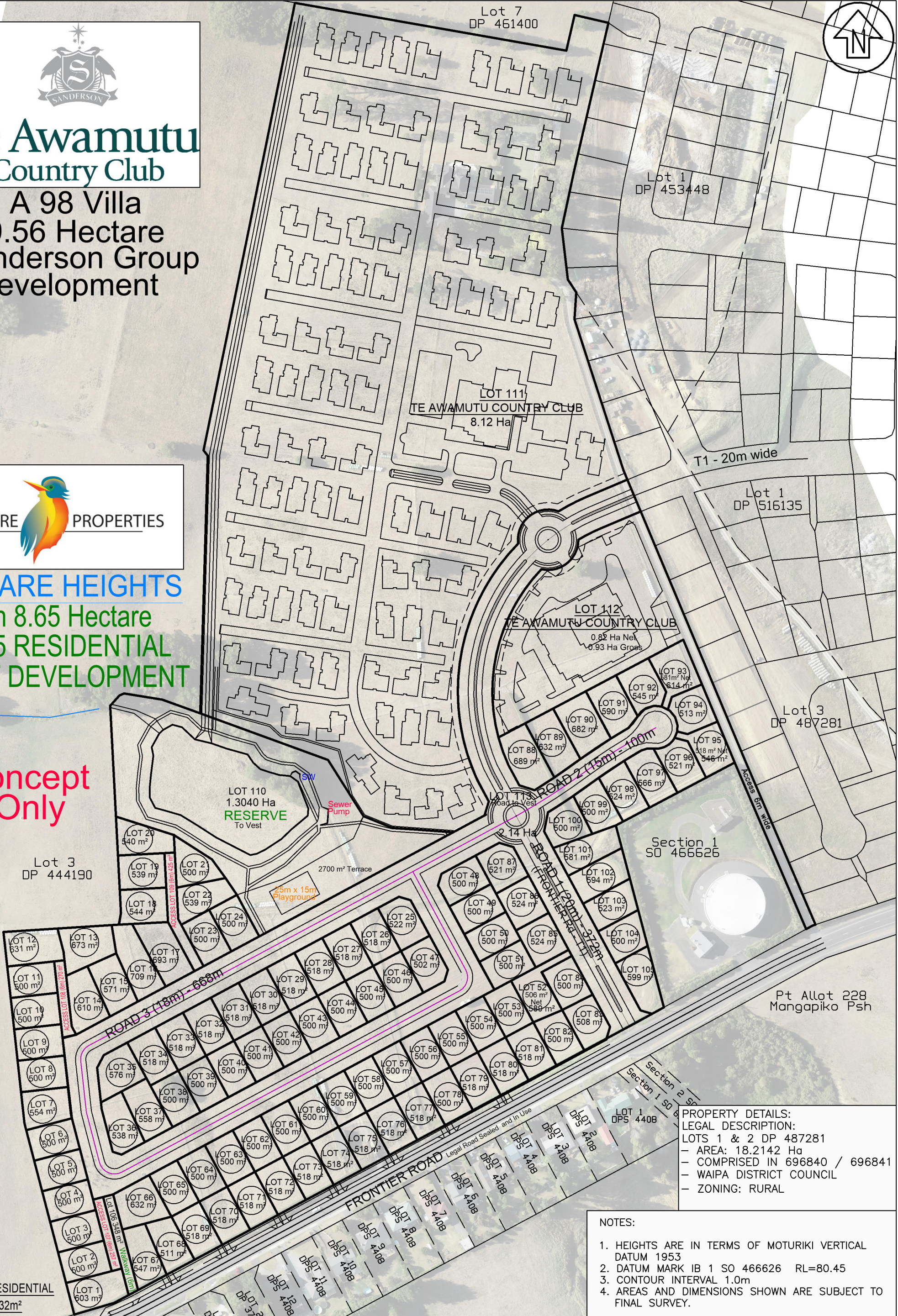


KOTARE PROPERTIES

KOTARE HEIGHTS

An 8.65 Hectare
105 RESIDENTIAL
LOT DEVELOPMENT

Concept
Only



AVERAGE RESIDENTIAL
LOT SIZE = 532m²

PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
- COMPRISED IN 696840 / 696841
- WAIPA DISTRICT COUNCIL
- ZONING: RURAL

- NOTES:
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PROJECT TITLE
SUBDIVISION CONCEPT PLAN
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU
SANDERSON GROUP & KOTARE PROPERTIES

ALTERATION	JOB	SHEET
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DATE 24 JULY 2020	1:2000	



Te Awamutu Country Club

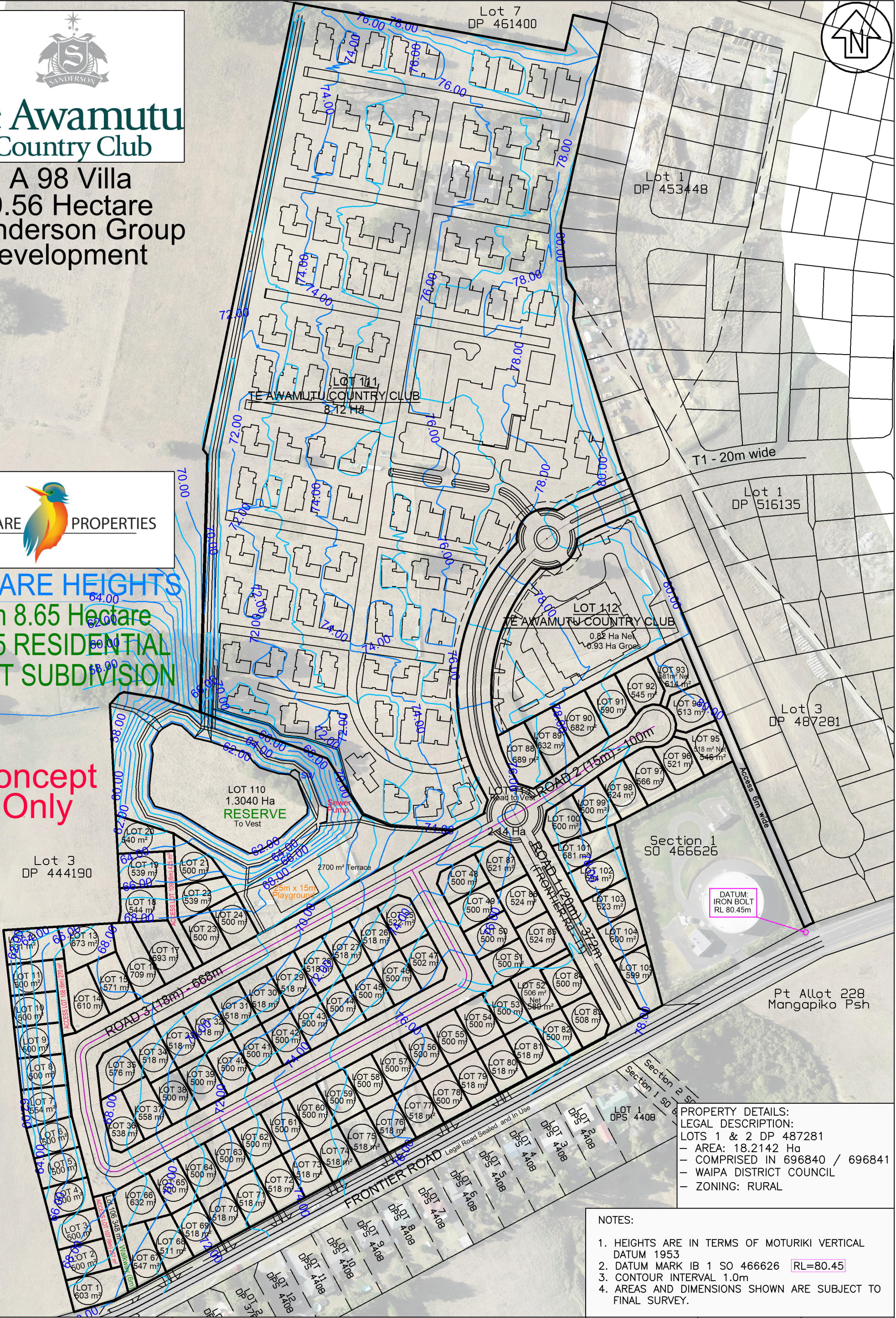
A 98 Villa
9.56 Hectare
Sanderson Group
Development



KOTARE PROPERTIES

KOTARE HEIGHTS
An 8.65 Hectare
105 RESIDENTIAL
LOT SUBDIVISION

Concept
Only



PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
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- ZONING: RURAL

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PROJECT TITLE
FINAL CONTOURS PLAN
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU
SANDERSON GROUP & KOPTARE PROPERTIES

ALTERATION	JOB	SHEET
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CAD CPM	ORIGINAL SCALE AT A3	REV 7
DATE 24 JULY 2020	1:2000	



Te Awamutu Country Club

A 98 Villa
9.56 Hectare
Sanderson Group
Development

CUT = 221,000m³ Solid
Fill = 157,000m³ Solid

x1.4

KOTARE PROPERTIES



KOTARE HEIGHTS

An 8.65 Hectare
105 RESIDENTIAL
LOT SUBDIVISION

CUT = 70,000m³ Solid
Fill = 50,000m³ Solid

x1.4

Concept
Only

Lot 3
DP 444190



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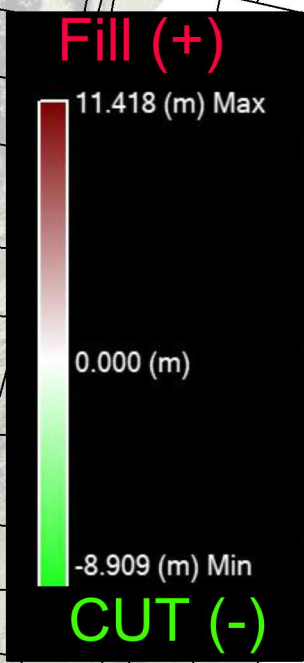
6 Wilson Street
P.O. Box 754
Cambridge 3450

PROJECT TITLE
CUT FILL CONTOURS PLAN
LOTS 1-113 BEING AN SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU
SANDERSON GROUP & KOTARE PROPERTIES

ALTERATION	JOB	SHEET
CAD CPM	4500	05
DATE	24 JULY 2020	REV 7
	ORIGINAL SCALE AT A3	1:2000

- NOTES:
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 - CONTOUR INTERVAL 1.0m
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PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
- COMPRISED IN 696840 / 696841
- WAIPA DISTRICT COUNCIL
- ZONING: RURAL



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Te Awamutu Country Club

A 98 Villa
9.56 Hectare
Sanderson Group
Development

KEY

- 74.00 Finished Contour
- SSMH_1 Wastewater / MH
- Sewer Rising Main
- SWMH_1 Stormwater / MH
- CP Catchpit
- SWWW_30 SW Wing Wall
- SW Swale



KOTARE PROPERTIES

KOTARE HEIGHTS

An 8.65 Hectare
105 RESIDENTIAL
LOT SUBDIVISION

Concept
Only

NOTES:

1. Internal Country Club Reticulation is Private Infrastructure

Lot 3
DP 444190

PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
- COMPRISED IN 696840 / 696841
- WAIPA DISTRICT COUNCIL
- ZONING: RURAL

NOTES:

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PROJECT TITLE

COMBINED SERVICE PLAN
STORMWATER AND WASTEWATER
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU

ALTERATION

CAD CPM
DATE 24 JULY 2020

JOB

4500
ORIGINAL SCALE AT A3
1:2000

SHEET

06
REV 1

Concept Only

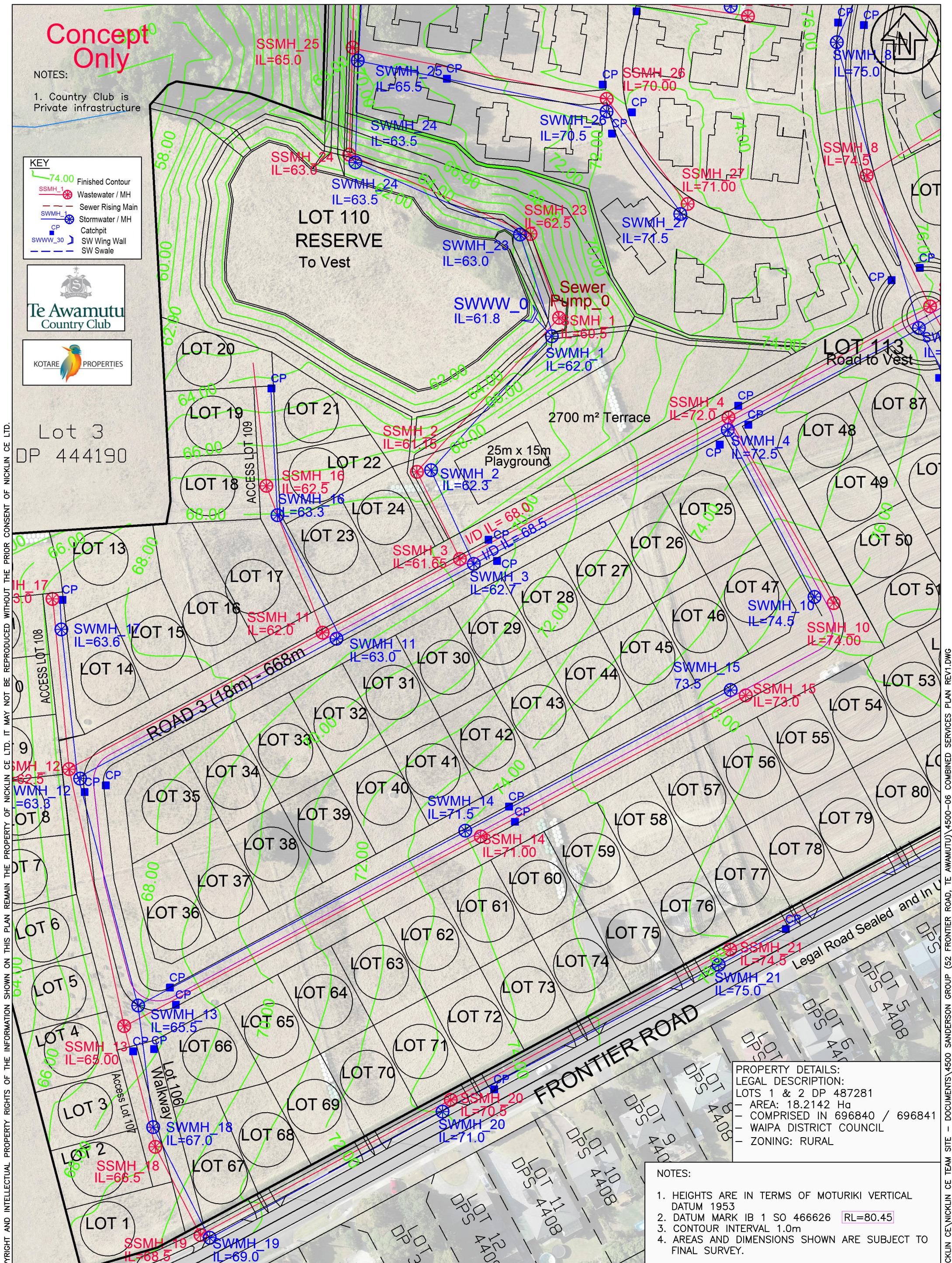
NOTES:
1. Country Club is Private infrastructure

KEY

- 74.00 Finished Contour
- SSMH_1 Wastewater / MH
- SWMH_1 Sewer Rising Main
- CP Stormwater / MH
- SWWW_30 Catchpit
- SW Wing Wall
- SW Swale



Lot 3
DP 444190



PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
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- ZONING: RURAL

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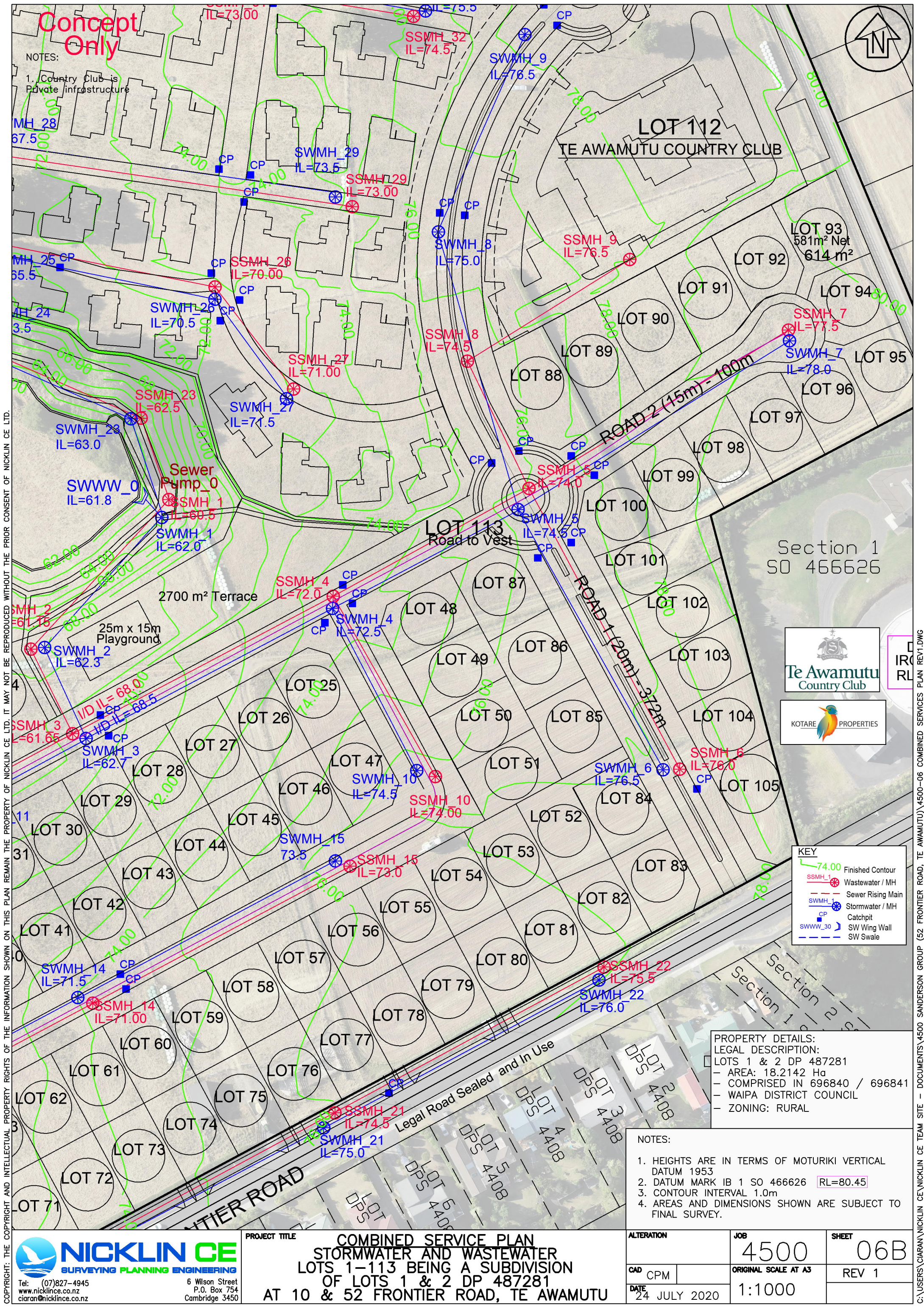
6 Wilson Street
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PROJECT TITLE
**COMBINED SERVICE PLAN
STORMWATER AND WASTEWATER
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU**

ALTERATION		JOB	SHEET
		4500	06A
CAD	CPM	ORIGINAL SCALE AT A3	
DATE	24 JULY 2020	1:1000	
		REV 1	

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NOTES:
1. Country Club is Private Infrastructure

Section 1
SO 466626



KEY

	74.00	Finished Contour
	SSMH_1	Wastewater / MH
	SSWMH_1	Sewer Rising Main
	CP	Stormwater / MH
	CP	Catchpit
	SWWW_30	SW Wing Wall
		SW Swale

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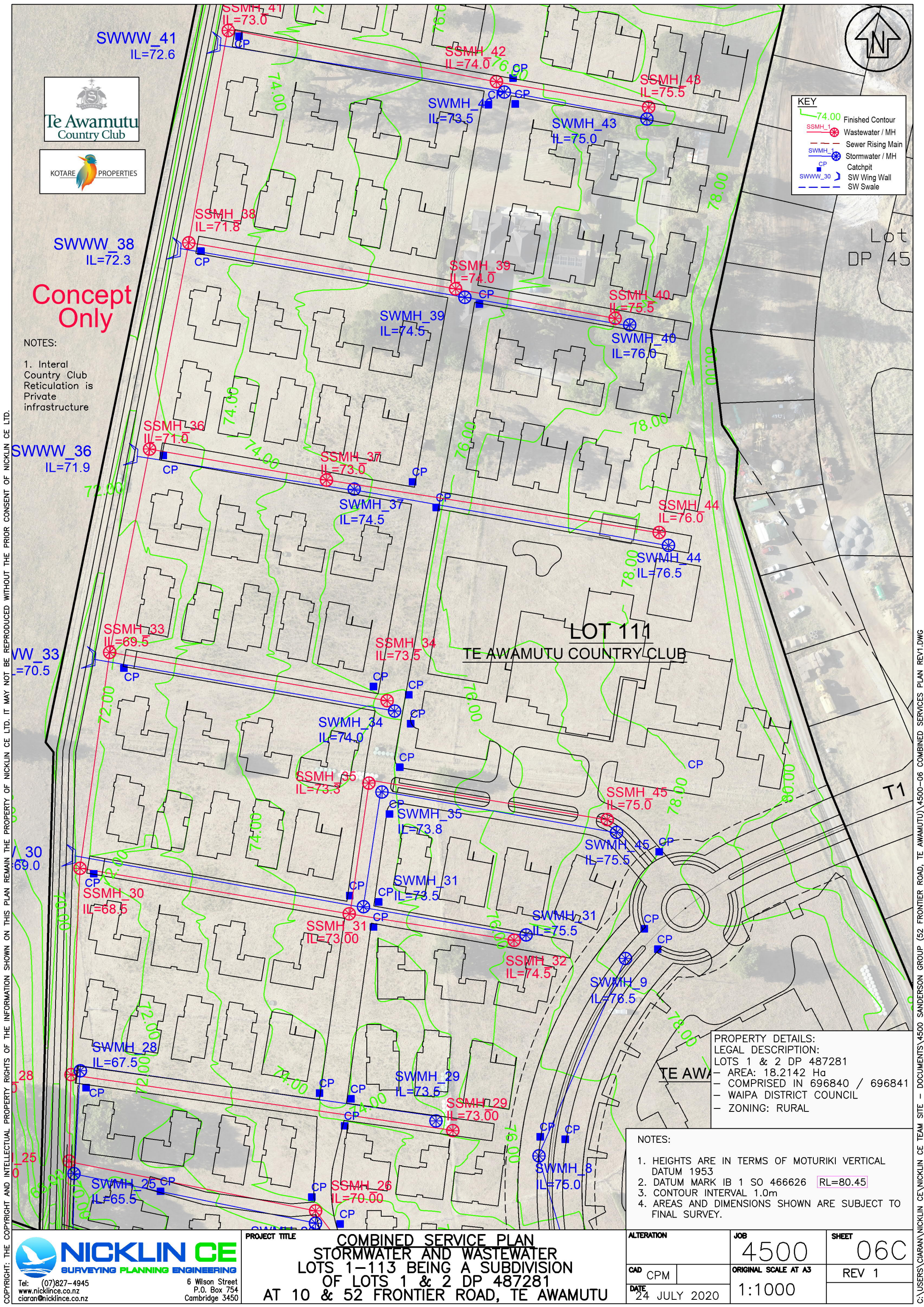
6 Wilson Street
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PROJECT TITLE
**COMBINED SERVICE PLAN
STORMWATER AND WASTEWATER
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU**

ALTERATION		JOB	SHEET
		4500	06B
CAD	CPM	ORIGINAL SCALE AT A3	
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KEY

- 74.00 Finished Contour
- SSMH 1 Wastewater / MH
- SWMH 1 Stormwater / MH
- CP Catchpit
- SWWW 30 SW Wing Wall
- SW Swale

Concept Only

NOTES:
1. Internal Country Club Reticulation is Private infrastructure

PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
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- ZONING: RURAL

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ALTERATION		JOB	SHEET
CAD CPM		4500	06C
DATE		ORIGINAL SCALE AT A3	REV 1
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KEY

 74.00 Finished Contour
 SSMH_1  Sewer Manhole
 Sewer Rising Main
 70 Finished Spot Height
 Ch 627 Chainage

Concept Only

PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
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- ZONING: RURAL

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6 Wilson Street
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PROJECT TITLE DEVELOPMENT ENGINEERING
WASTEWATER RISING MAIN PLAN
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU

	ALTERATION
--	-------------------

CAD	CPM
DATE	24 JULY 2020

	JOB
--	------------

4500
ORIGINAL SCALE AT A3
1:2000

SHEET

07A

REV 1



Te Awamutu
Country Club

Lot 1
DP 327266

KOTARE PROPERTIES



KEY

- 74.00 Finished Contour
- SSMH_1 Sewer Manhole
- Sewer Rising Main
- 70 Finished Spot Height
- Ch 627 Chainage

Concept
Only

PROPERTY DETAILS:
LEGAL DESCRIPTION:
LOTS 1 & 2 DP 487281
- AREA: 18.2142 Ha
- COMPRISED IN 696840 / 696841
- WAIPA DISTRICT COUNCIL
- ZONING: RURAL

NOTES:

- HEIGHTS ARE IN TERMS OF MOTURIKI VERTICAL DATUM 1953
- DATUM MARK IB 1 SO 466626 RL=80.45
- CONTOUR INTERVAL 2.0m
- AREAS AND DIMENSIONS SHOWN ARE SUBJECT TO FINAL SURVEY.



Tel: (07)827-4945
www.nicklince.co.nz
claran@nicklince.co.nz

6 Wilson Street
P.O. Box 754
Cambridge 3450

PROJECT TITLE

DEVELOPMENT ENGINEERING
WASTEWATER RISING MAIN PLAN
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU

ALTERATION

CAD CPM

DATE 24 JULY 2020

JOB

4500

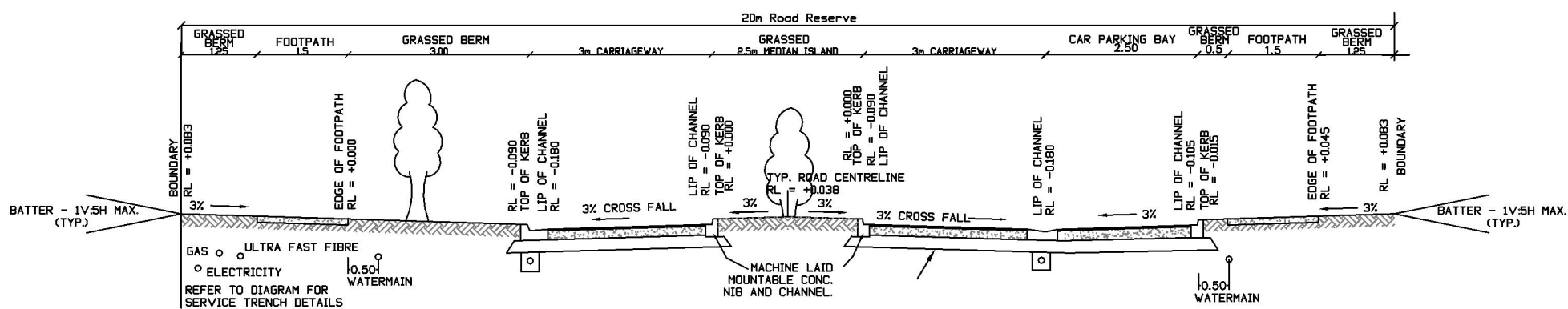
ORIGINAL SCALE AT A3

1:2000

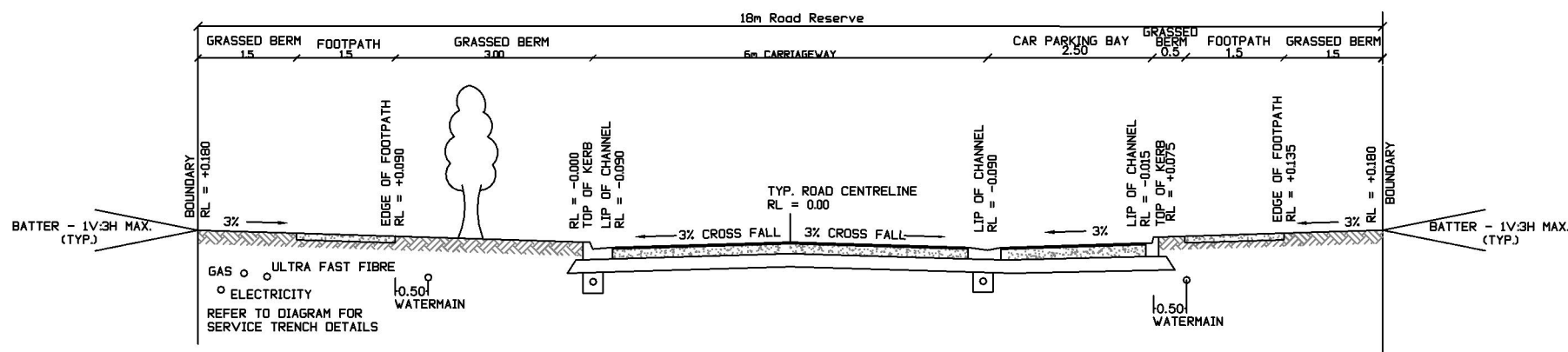
SHEET

07B

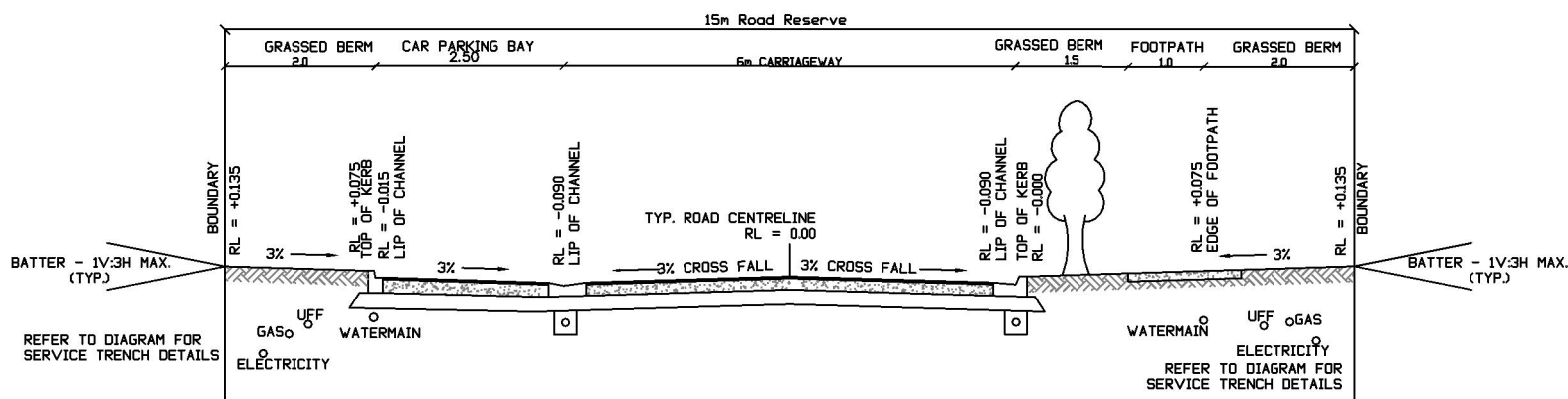
REV 1



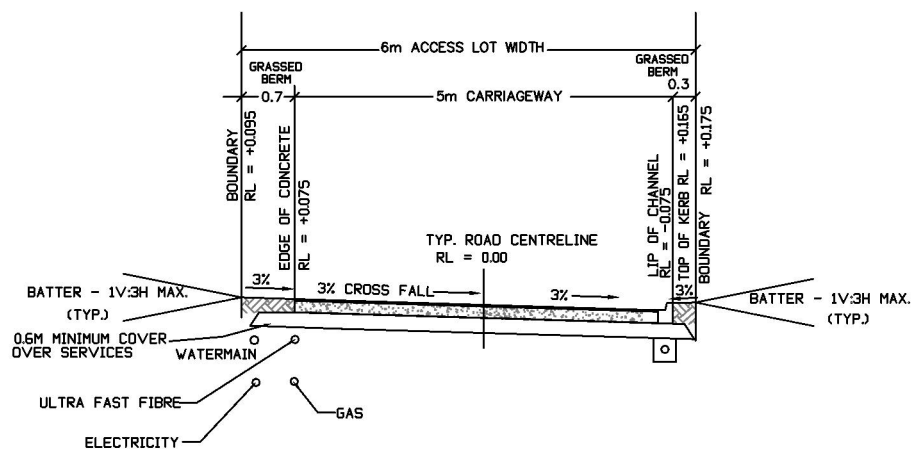
TYPICAL CROSS-SECTION A – A' DOUBLE CAR PARKING BAY (20m Road Reserve)



TYPICAL CROSS-SECTION B – B' DOUBLE CAR PARKING BAY (18m Road Reserve)



TYPICAL CROSS-SECTION C – C' SINGLE CAR PARKING BAY (15m Road Reserve – 6m Carriageway)



TYPICAL CROSS-SECTION D – D' 6.0M WIDTH
ACCESS LOT 109

REFER TO PLAN 4500-03 FOR
ROAD LAYOUT

NOTES:

1. AREAS AND DIMENSIONS SHOWN ARE SUBJECT TO FINAL SURVEY.

ALTERATION	JOB	SHEET
	4500	08
CAD	ORIGINAL SCALE AT A3	REV
CPM	1:100	0
DATE		
24 JULY 2020		



Te Awamutu
Country Club



Concept Only



Tel: (07)827-4945
www.nicklince.co.nz
6 Wilson Street
P.O. Box 754
Cambridge 3450

PROJECT TITLE
**DEVELOPMENT ENGINEERING
TYPICAL ROAD SECTIONS
LOTS 1-113 BEING A SUBDIVISION
OF LOTS 1 & 2 DP 487281
AT 10 & 52 FRONTIER ROAD, TE AWAMUTU**

APPENDIX B

Existing Underground Service Location Plans



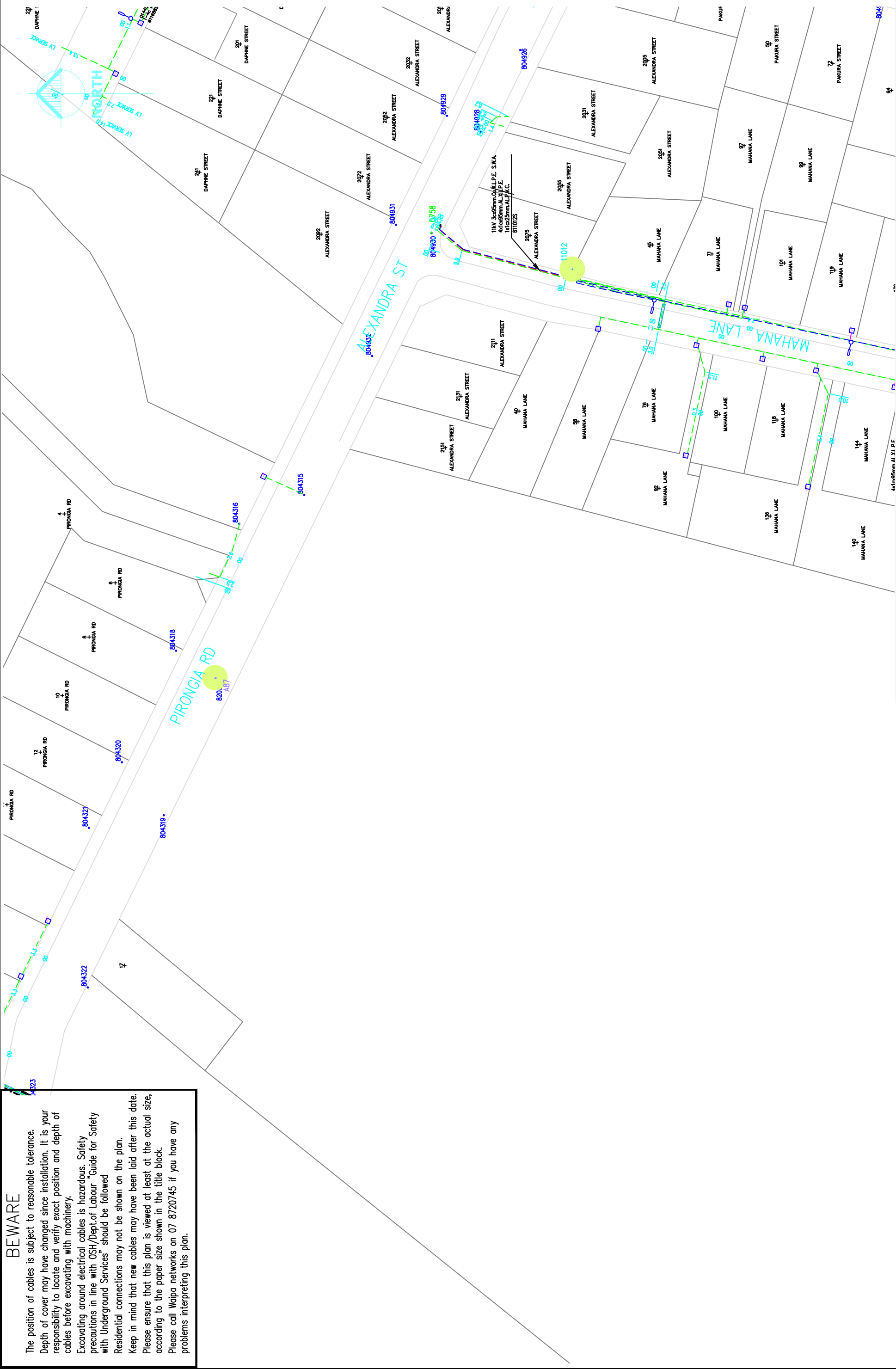
BEWARE

The position of cables is subject to reasonable tolerance. Depth of cover may have changed since installation. It is your responsibility to locate and verify exact position and depth of cables before excavating with machinery.

Excavating around electrical cables is hazardous. Safety precautions in line with OSH/Dept.of Labour "Guide for Safety with Underground Services" should be followed

Residential connections may not be shown on the plan. Keep in mind that new cables may have been laid after this date. Please ensure that this plan is viewed at least at the actual size, according to the paper size shown in the title block.

Please call Waipa networks on 07 8720745 if you have any problems interpreting this plan.



 WAIPA NETWORKS	WAIPA NETWORKS		240 Harrison Dve, PO Box 505, TE AWAMUTU Ph. (07) 872 0745 Fax (07) 870 2401		SCALE	NTS
	TITLE		TE AWAMUTU: Pirongia Road Te Awamutu Sequence Number: 7968905 Underground Reticulation			
				DRAWN	Planning	
				DATE	3/6/20	
				A3	SHT. 3 of 11	

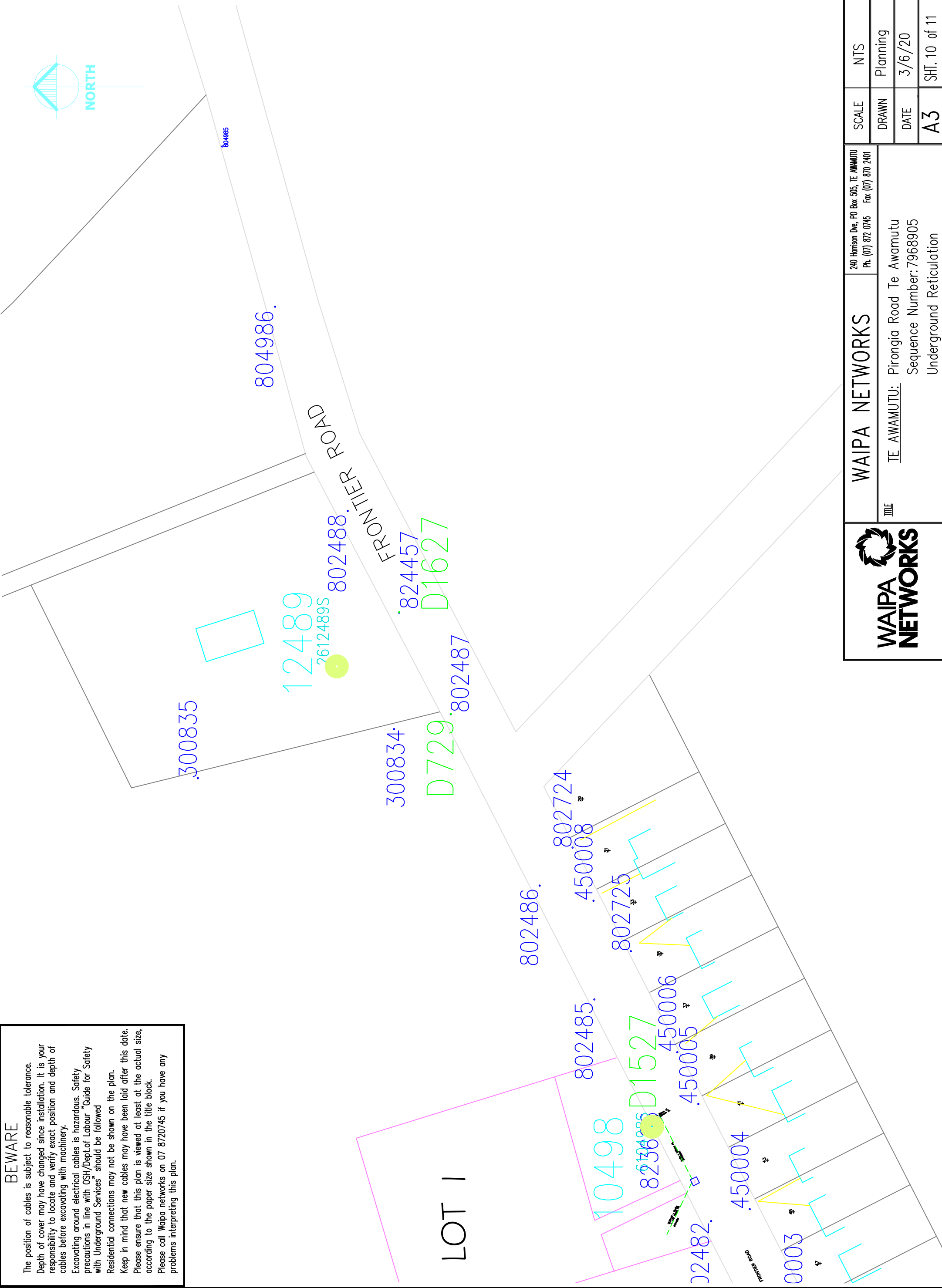
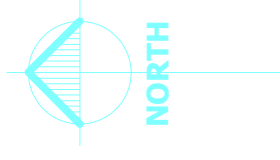
BEWARE

The position of cables is subject to reasonable tolerance. Depth of cover may have changed since installation. It is your responsibility to locate and verify exact position and depth of cables before excavating with machinery.

Excavating around electrical cables is hazardous. Safety precautions in line with OSH/Dept.of Labour "Guide for Safety with Underground Services" should be followed

Residential connections may not be shown on the plan. Keep in mind that new cables may have been laid after this date. Please ensure that this plan is viewed at least at the actual size, according to the paper size shown in the title block.

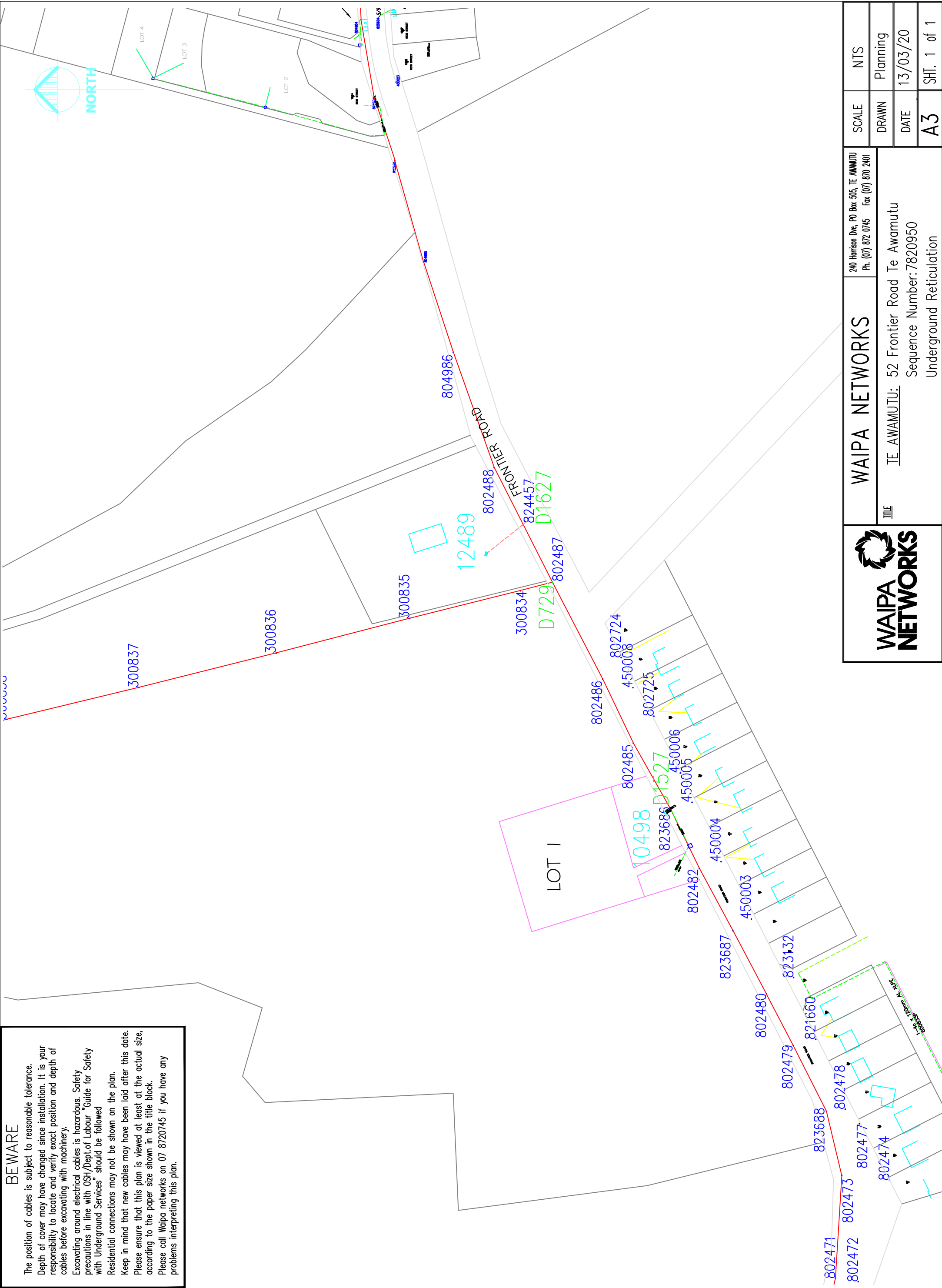
Please call Waipa networks on 07 8720745 if you have any problems interpreting this plan.

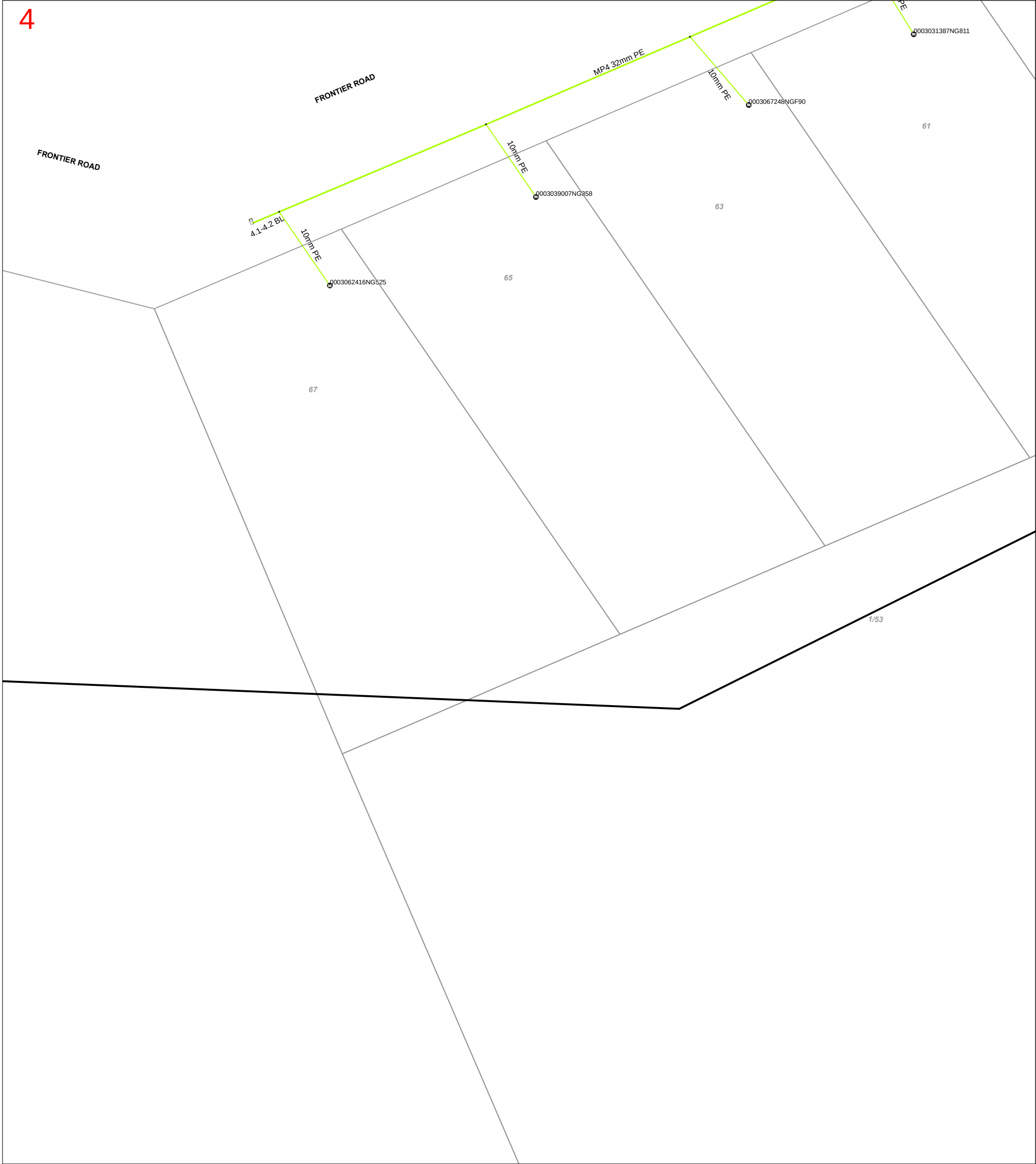


 WAIPA NETWORKS	WAIPA NETWORKS <u>TE AWAMUTU:</u> Pirongia Road Te Awamutu Sequence Number: 7968905 Underground Reticulation	240 Harrison Dve, PO Box 505, TE AWAMUTU Ph. (07) 872 0745 Fax (07) 870 2401	
		SCALE	NTS
		DRAWN	Planning
		DATE	3/6/20
		A3	SHT. 10 of 11

BEWARE

The position of cables is subject to reasonable tolerance.
Depth of cover may have changed since installation. It is your responsibility to locate and verify exact position and depth of cables before excavating with machinery.
Excavating around electrical cables is hazardous. Safety precautions in line with OSH/Dept.of Labour "Guide for Safety with Underground Services" should be followed
Residential connections may not be shown on the plan.
Keep in mind that new cables may have been laid after this date.
Please ensure that this plan is viewed at least at the actual size, according to the paper size shown in the title block.
Please call Waipa networks on 07 8720745 if you have any problems interpreting this plan.





Request ID: 7884251		PIPE COLOUR BY PRESSURE HP > 2000 kPa IP20 1000-2000 kPa IP10 700-1000 kPa MP7 420-700 kPa MP4 210-420 kPa MP2 110-210 kPa MP1 7-110 kPa LP 0-7 kPa 0 kPa Pipe Casing	Information Uncertainty Active Project Proposed Project	WARNING: TRANSMISSION PIPELINES Indication only additional data is required Prior to commencing work please contact First Gas on 0800 800 393, or email locations@firstgas.co.nz for FREE on site locations and permits. A minimum of two working days notice is required.	IKL Inside Kerb Line BL Boundary Line FL Fence Line OKL Outside Kerb Line	
Work Location: 52 Frontier Road Te Awamutu						
Intended Work: Hand Digging						
Company Name: Nicklin CE						
Contact: Mr Ciaran Murphy						
Original Scale: A3 – 1:300	Date: 29/04/2020	OTHER GAS FEATURES All dimensioning are in metres unless otherwise stated. Gate Station District PRS Service PRS Meter Valve Open Valve Closed Reducer Shortstopp R CP Rectifier CP Test Point CP Anode Rectifier Cable Squeeze Off End Cap Coupling Tee				
DISCLAIMER: Whilst care has been taken in the preparation of this plan, First Gas Limited and its subsidiaries do not accept any liability for its accuracy and completeness and do not make any representation or warranty, express or implied, in relation to the same. These drawings are not to scale and may not show customer connections or obsolete lines. Works may have occurred in the vicinity which may not be represented in this plan at the date of issue. The information contained in this plan is supplied for reference purposes only; actual dimensions and locations on site may differ from those indicated. Without limiting the foregoing, where plans are more than 28 days old they should not be used; a new plan should be requested from First Gas.						
First Gas reminds you of your responsibilities under the Health and Safety at Work Act 2015, whereby you must establish the location of underground services before commencing excavation.						
If you hit any gas pipeline call the Fire Service first on 111						
Emergency Contact Numbers: Transmission Pipelines: 0800 734 567 Distribution Pipelines: 0800 802 332						

5

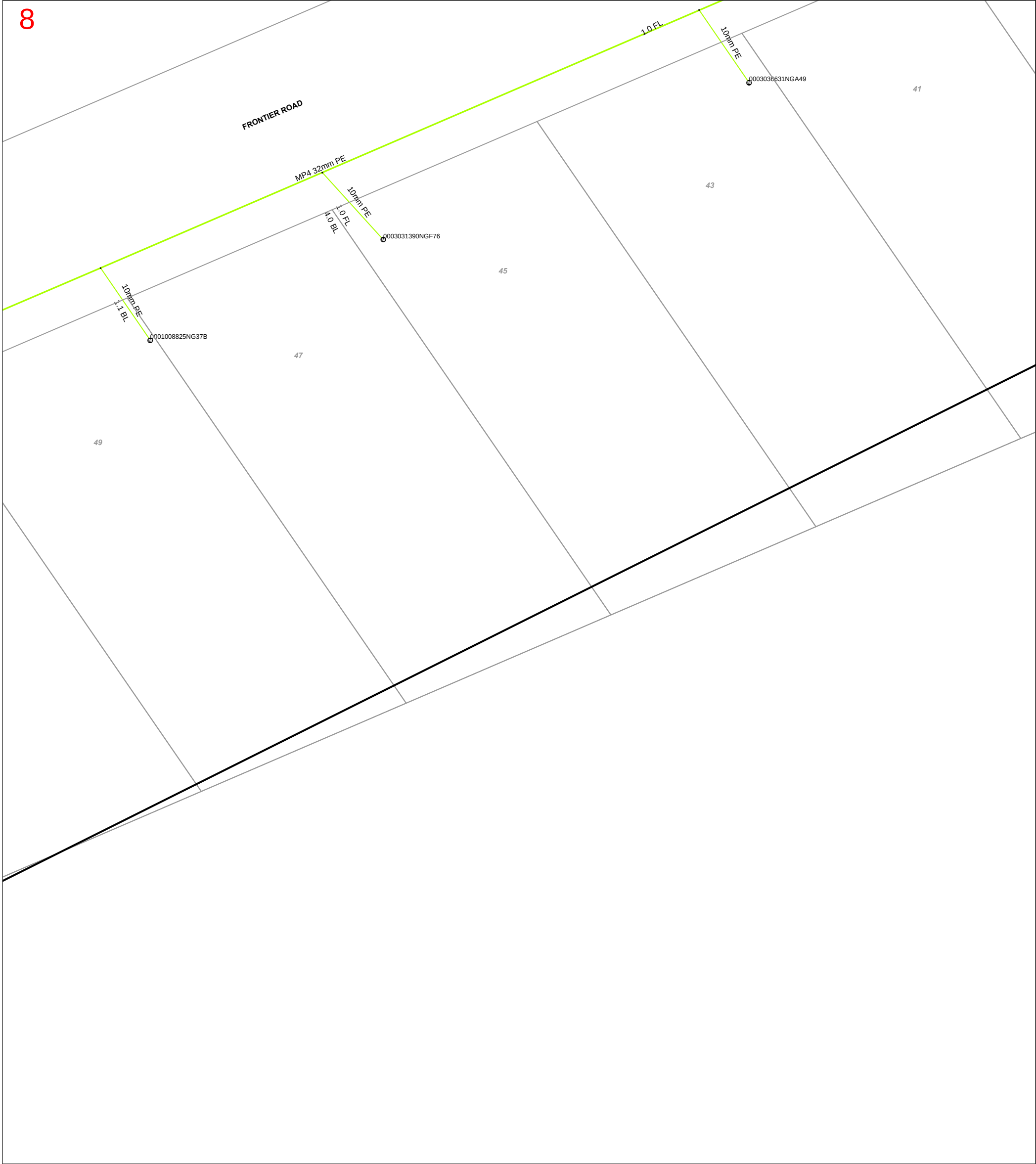


Request ID: 7884251		PIPE COLOUR BY PRESSURE HP > 2000 kPa IP20 1000-2000 kPa IP10 700-1000 kPa MP7 420-700 kPa MP4 210-420 kPa MP2 110-210 kPa MP1 7-110 kPa LP 0-7 kPa 0 kPa Pipe Casing	Information Uncertainty Active Project Proposed Project	WARNING: TRANSMISSION PIPELINES Indication only additional data is required Prior to commencing work please contact First Gas on 0800 800 393, or email locations@firstgas.co.nz for FREE on site locations and permits. A minimum of two working days notice is required.	IKL Inside Kerb Line BL Boundary Line FL Fence Line OKL Outside Kerb Line	
Work Location: 52 Frontier Road Te Awamutu						
Intended Work: Hand Digging						
Company Name: Nicklin CE						
Contact: Mr Ciaran Murphy						
Original Scale: A3 – 1:300	Date: 29/04/2020	OTHER GAS FEATURES All dimensioning are in metres unless otherwise stated. Gate Station District PRS Service PRS Meter Valve Open Valve Closed Reducer Shortstopp CP Rectifier CP Test Point CP Anode Rectifier Cable Squeeze Off End Cap Coupling Tee	WARNING: Special conditions apply for strategic gas pipelines. (HP, IP20, IP10, MP7) A close approach consent is required for any excavation within 2 meters of this pipeline. A MINIMUM of 3 working days’ notice is required when applying for a close approach consent.			
DISCLAIMER: Whilst care has been taken in the preparation of this plan, First Gas Limited and its subsidiaries do not accept any liability for its accuracy and completeness and do not make any representation or warranty, express or implied, in relation to the same. These drawings are not to scale and may not show customer connections or obsolete lines. Works may have occurred in the vicinity which may not be represented in this plan at the date of issue. The information contained in this plan is supplied for reference purposes only; actual dimensions and locations on site may differ from those indicated. Without limiting the foregoing, where plans are more than 28 days old they should not be used; a new plan should be requested from First Gas.						
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If you hit any gas pipeline call the Fire Service first on 111						
Emergency Contact Numbers: Transmission Pipelines: 0800 734 567 Distribution Pipelines: 0800 802 332						



Detailed Map

Sequence No: 7884251
52 Frontier Road Te Awamutu



Request ID: 7884251

Work Location: 52 Frontier Road Te Awamutu

Intended Work: Hand Digging

Company Name: Nicklin CE

Contact: Mr Ciaran Murphy

Original Scale: A3 – 1:300

Date: 29/04/2020

PIPE COLOUR BY PRESSURE

HP > 2000 kPa

IP20 1000-2000 kPa

IP10 700-1000 kPa

MP7 420-700 kPa

MP4 210-420 kPa

MP2 110-210 kPa

MP1 7-110 kPa

LP 0-7 kPa

0 kPa

Pipe Casing

Information Uncertainty

Active Project

Proposed Project

WARNING: TRANSMISSION PIPELINES

Indication only additional data is required

Prior to commencing work please contact First Gas on 0800 800 393, or email locations@firstgas.co.nz for FREE on site locations and permits. A minimum of two working days notice is required.

IKL Inside Kerb Line

BL Boundary Line

FL Fence Line

OKL Outside Kerb Line

Other Gas Features

Gate Station

District PRS

Service PRS

Meter

Valve Open

Valve Closed

Reducer

Shortstopp

CP Rectifier

CP Test Point

CP Anode

Rectifier Cable

Squeeze Off

End Cap

Coupling

Tee

WARNING: Special conditions apply for strategic gas pipelines.

(HP, IP20, IP10, MP7)

A close approach consent is required for any excavation within 2 meters of this pipeline. A MINIMUM of 3 working days' notice is required when applying for a close approach consent.

DISCLAIMER: Whilst care has been taken in the preparation of this plan, First Gas Limited and its subsidiaries do not accept any liability for its accuracy and completeness and do not make any representation or warranty, express or implied, in relation to the same. These drawings are not to scale and may not show customer connections or obsolete lines. Works may have occurred in the vicinity which may not be represented in this plan at the date of issue. The information contained in this plan is supplied for reference purposes only; actual dimensions and locations on site may differ from those indicated. Without limiting the foregoing, where plans are more than 28 days old they should not be used; a new plan should be requested from First Gas.

First Gas reminds you of your responsibilities under the Health and Safety at Work Act 2015, whereby you must establish the location of underground services before commencing excavation.

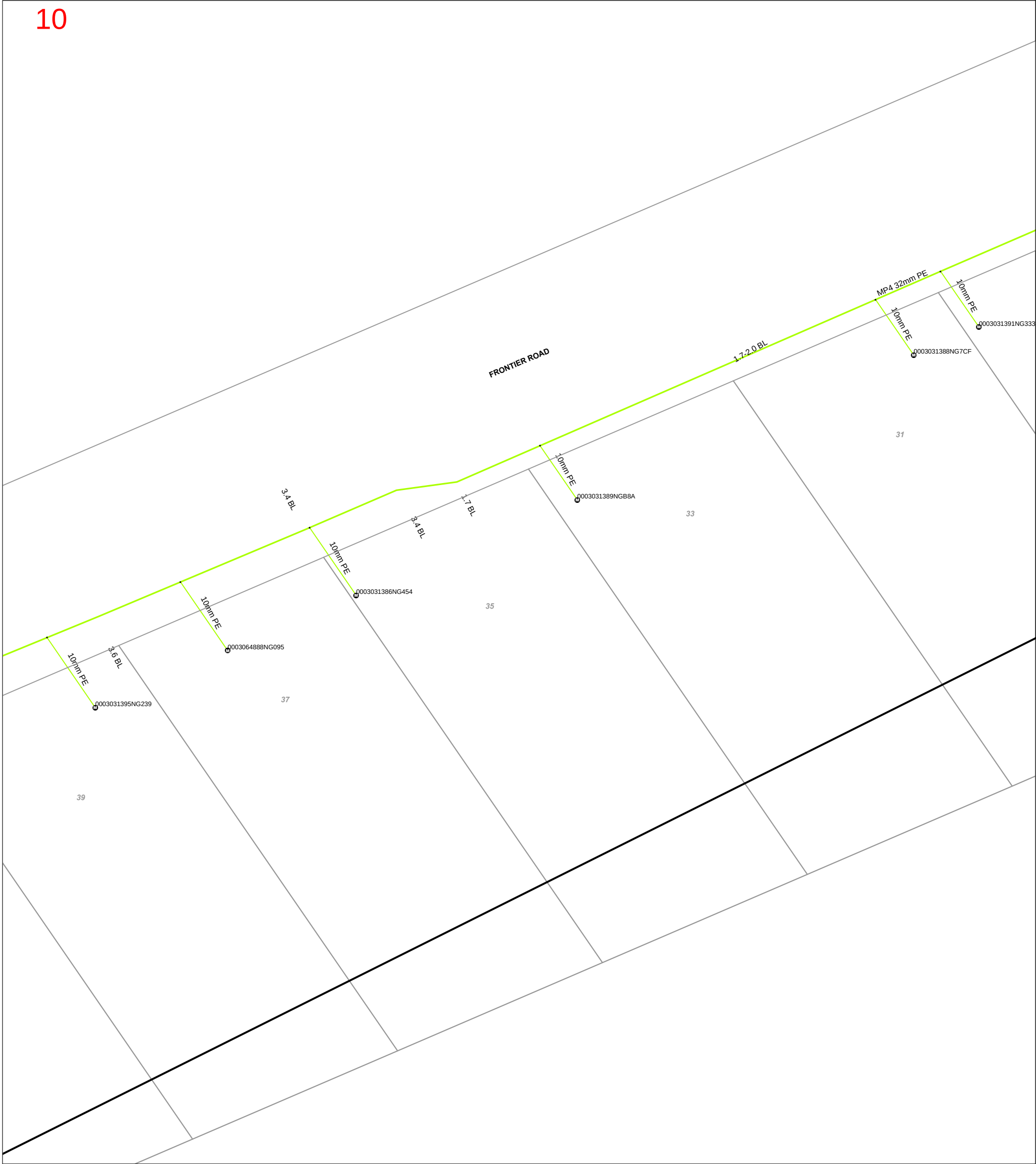
If you hit any gas pipeline call the Fire Service first on 111

Emergency Contact Numbers: Transmission Pipelines: 0800 734 567 Distribution Pipelines: 0800 802 332

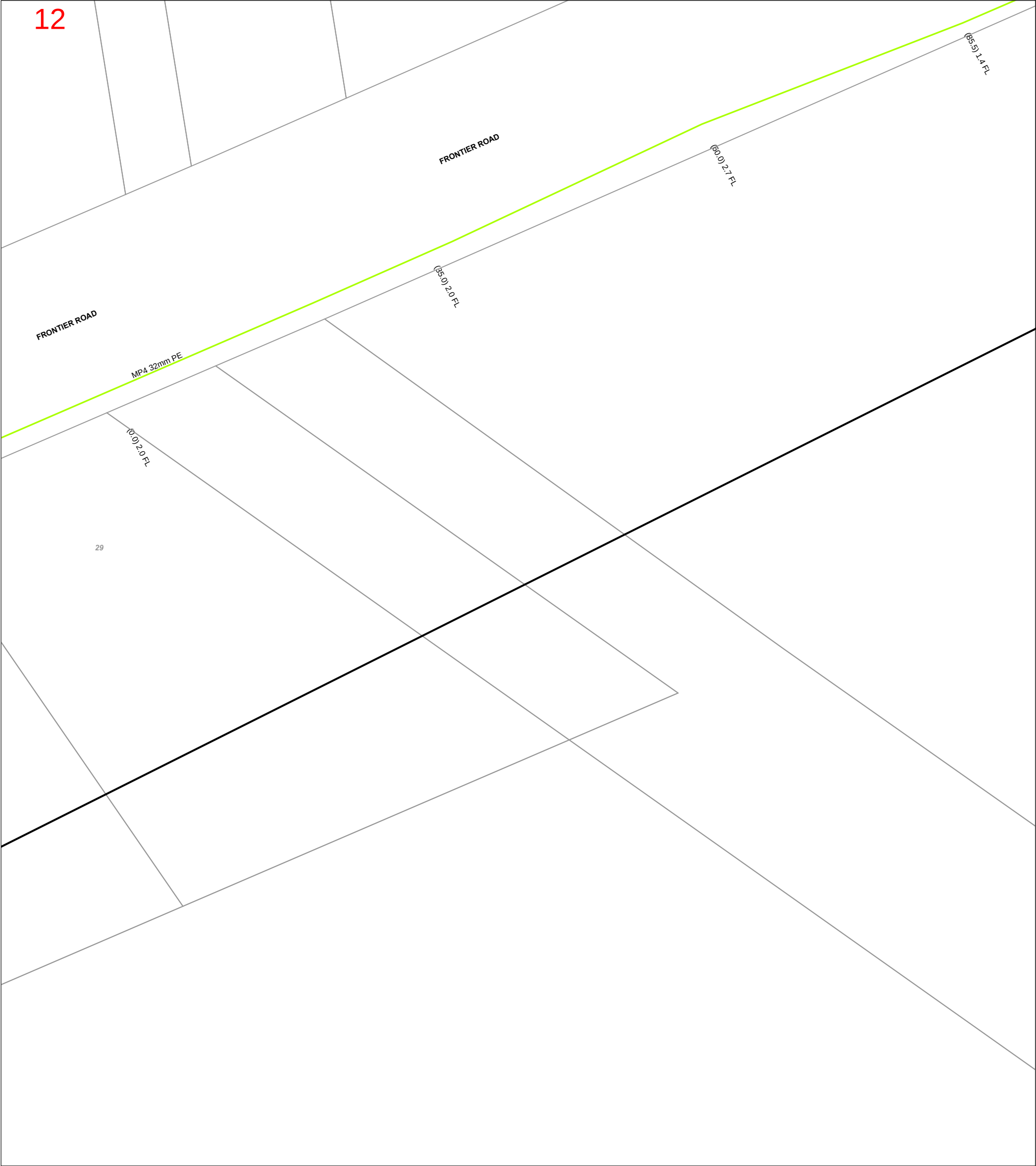
Powered by mipela

First Gas Limited. This plan is the property of First Gas Limited. All rights reserved. The contents of this document may not be reproduced either in whole or in part by any means whatsoever without the prior written consent of First Gas Limited.

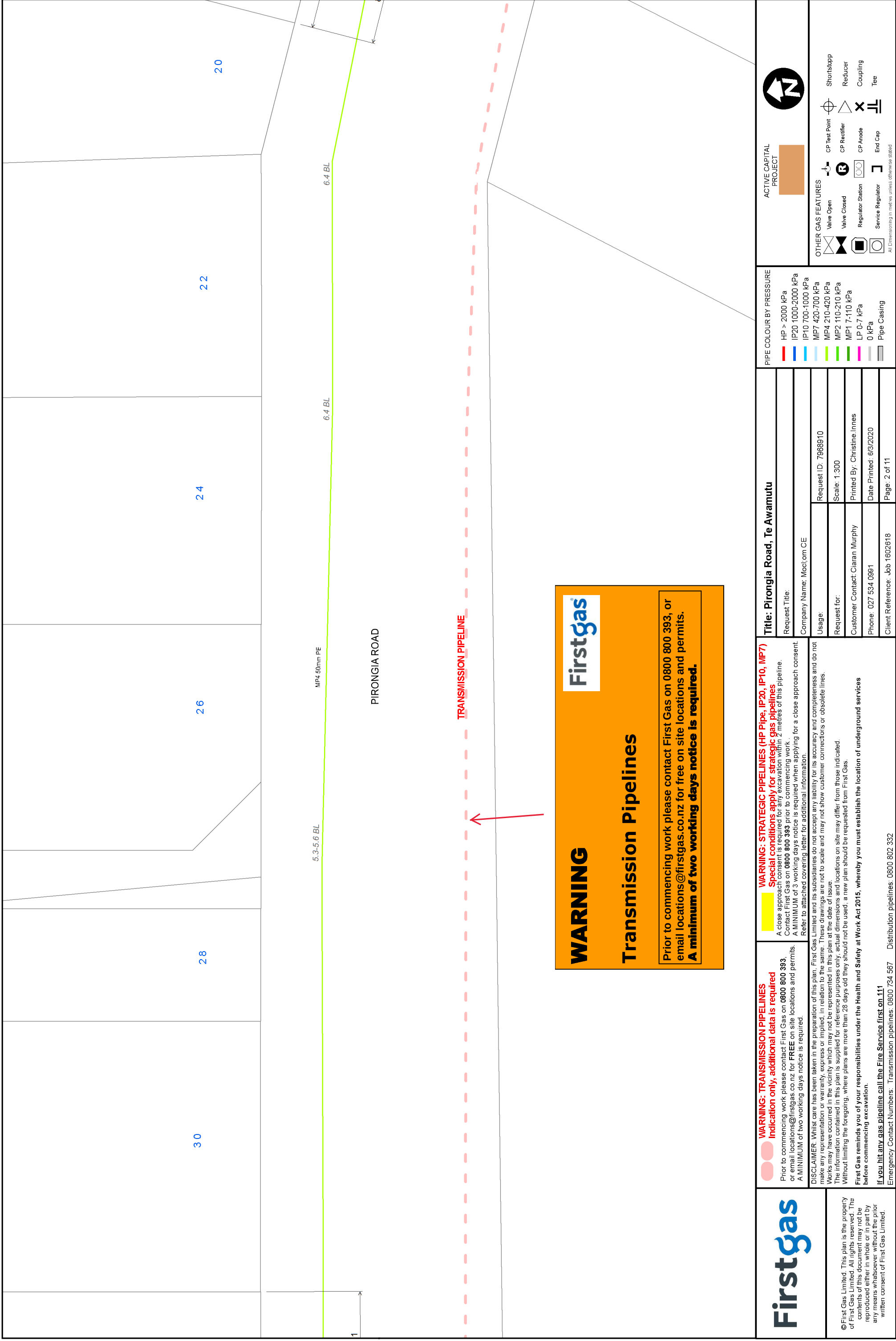
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Request ID: 7884251		PIPE COLOUR BY PRESSURE HP > 2000 kPa IP20 1000-2000 kPa IP10 700-1000 kPa MP7 420-700 kPa MP4 210-420 kPa MP2 110-210 kPa MP1 7-110 kPa LP 0-7 kPa 0 kPa Pipe Casing	Information Uncertainty Active Project Proposed Project WARNING: TRANSMISSION PIPELINES Indication only additional data is required Prior to commencing work please contact First Gas on 0800 800 393, or email locations@firstgas.co.nz for FREE on site locations and permits. A minimum of two working days notice is required.	IKL Inside Kerb Line BL Boundary Line FL Fence Line OKL Outside Kerb Line
Work Location: 52 Frontier Road Te Awamutu			OTHER GAS FEATURES All dimensioning are in metres unless otherwise stated. Gate Station District PRS Service PRS Meter Valve Open Valve Closed Reducer Shortstopp CP Rectifier CP Test Point CP Anode Rectifier Cable Squeeze Off End Cap Coupling Tee	
Intended Work: Hand Digging				
Company Name: Nicklin CE				
Contact: Mr Ciaran Murphy				
Original Scale: A3 – 1:300	Date: 29/04/2020	WARNING: Special conditions apply for strategic gas pipelines. (HP, IP20, IP10, MP7) A close approach consent is required for any excavation within 2 meters of this pipeline. A MINIMUM of 3 working days' notice is required when applying for a close approach consent.		
DISCLAIMER: Whilst care has been taken in the preparation of this plan, First Gas Limited and its subsidiaries do not accept any liability for its accuracy and completeness and do not make any representation or warranty, express or implied, in relation to the same. These drawings are not to scale and may not show customer connections or obsolete lines. Works may have occurred in the vicinity which may not be represented in this plan at the date of issue. The information contained in this plan is supplied for reference purposes only; actual dimensions and locations on site may differ from those indicated. Without limiting the foregoing, where plans are more than 28 days old they should not be used; a new plan should be requested from First Gas. First Gas reminds you of your responsibilities under the Health and Safety at Work Act 2015, whereby you must establish the location of underground services before commencing excavation. If you hit any gas pipeline call the Fire Service first on 111 Emergency Contact Numbers: Transmission Pipelines: 0800 734 567 Distribution Pipelines: 0800 802 332				



Request ID: 7884251		PIPE COLOUR BY PRESSURE HP > 2000 kPa IP20 1000-2000 kPa IP10 700-1000 kPa MP7 420-700 kPa MP4 210-420 kPa MP2 110-210 kPa MP1 7-110 kPa LP 0-7 kPa 0 kPa Pipe Casing	Information Uncertainty Active Project Proposed Project	WARNING: TRANSMISSION PIPELINES Indication only additional data is required Prior to commencing work please contact First Gas on 0800 800 393, or email locations@firstgas.co.nz for FREE on site locations and permits. A minimum of two working days notice is required.	IKL Inside Kerb Line BL Boundary Line FL Fence Line OKL Outside Kerb Line	
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If you hit any gas pipeline call the Fire Service first on 111						
Emergency Contact Numbers: Transmission Pipelines: 0800 734 567 Distribution Pipelines: 0800 802 332						



Asbuilt District Wide Mains Replacement

Pirongia Road
Te Awamutu

Contract No. 27-17-26

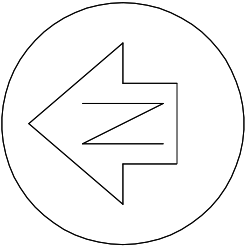
Installer: Allens United Drainage and Earthworks Ltd

ALIGN SURVEYORS

REGISTERED SURVEYORS

43 Malcolm Street, Hamilton
Ph 8566652

Office@alignsurveyors.co.nz



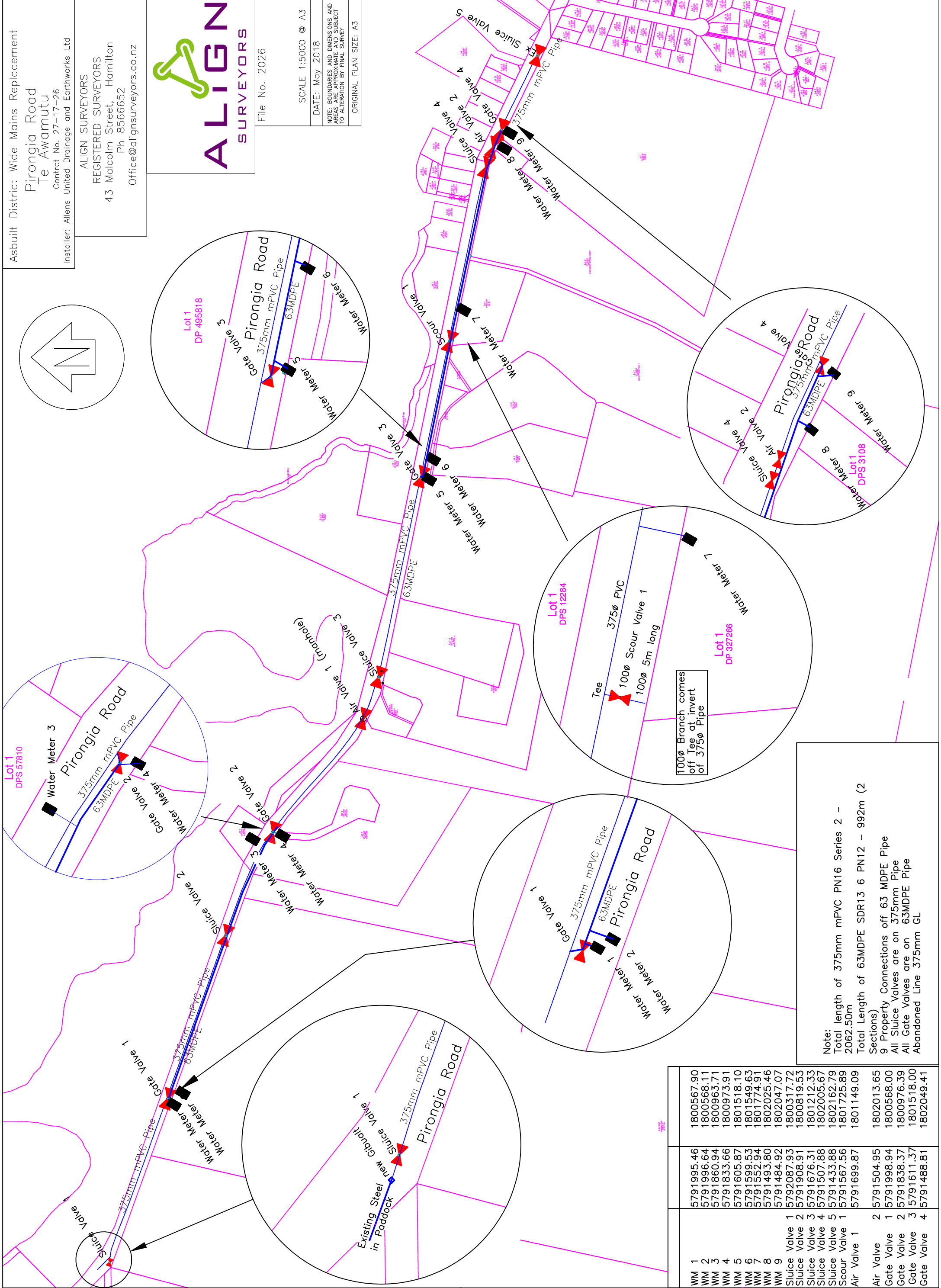
File No. 2026

SCALE 1:5000 @ A3

DATE: May 2018

NOTE: BOUNDARIES AND DIMENSIONS AND AREAS ARE APPROXIMATE AND SUBJECT TO ALTERATION BY FINAL SURVEY

ORIGINAL PLAN SIZE: A3

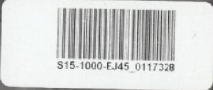


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WM 2	5791996.64	1800568.11
WM 3	5791860.94	1800963.71
WM 4	5791833.66	1800973.91
WM 5	5791605.87	1801518.10
WM 6	5791599.53	1801549.63
WM 7	5791552.94	1801774.91
WM 8	5791493.80	1802025.46
WM 9	5791484.92	1802047.07
Sluice Valve 1	5792087.93	1800317.72
Sluice Valve 2	5791908.91	1800819.53
Sluice Valve 3	5791676.31	1801212.33
Sluice Valve 4	5791507.88	1802005.67
Sluice Valve 5	5791433.88	1802162.79
Scour Valve 1	5791567.56	1801725.89
Air Valve 1	5791699.87	1801149.09
Air Valve 2	5791504.95	1802013.65
Gate Valve 1	5791998.94	1800568.00
Gate Valve 2	5791838.37	1800976.39
Gate Valve 3	5791611.37	1801518.00
Gate Valve 4	5791488.81	1802049.41

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

Plan Name	EJ45
Plan ID	117328
Version	GA
Current at	02/06/2020

DEL	CHKD	DATE	ISS	CHANGE	DEL	CHKD	DATE	ISS	CHANGE	DRAWN : D.W.B.A	TE AWAMUTU 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 1:1000	TELECOM CORPORATION OF NEW ZEALAND LIMITED DISTRICT TELECOM MANAGER HAMILTON	TCNZ DRG No : HN 1077	TCNZ SHT No : EJ 45
DA		47.5.86	2	TAW-PIR PCM & SUBS ADDED						CHKD : A		NZMG REF : S15-1000 / 45.23		
No.		30.1.91	3	REVIS 10000 DATA 11/1/18						APPD :				
										DATE : 47.5.86		A1		



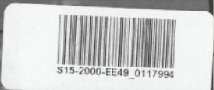
EE	
45	EJ 45
	EL 45



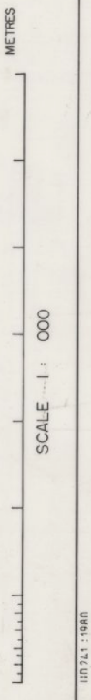
WARNING: Buried services are widespread and it should be assumed that they are present until it is proven otherwise.
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For assistance contact Chorus Network Protection on 0800 822 003 or if you suspect damage has occurred contact 0800 463 896 opt 2

Plan Name	EE49
Plan ID	117994
Version	GD
Current at	02/06/2020

DEL	CHKD	DATE	ISS	CHANGE	DEL	CHKD	DATE	ISS	CHANGE	DRAWN: ADW.	TE AWAMUTU	TELECOM	TCNZ DRG No	TCNZ SHT No:
ADW		18.8.06	1	PLA EE49/AI ADDED UGL TS9045 (88272 90306)							UNDERGROUND TELEPHONE CABLE SYSTEM	CORPORATION OF NEW ZEALAND LTD. DISTRICT MANAGER HAMILTON	HN 1077	EE 49
										CHKD :	CAUTION			
										APPD :	POSITIONAL MEASUREMENTS ARE SUBJECT TO REASONABLE TOLERANCE. COVER AT INSTALLATION WAS: ROADWAY 0.50m FOOTWAY 0.35m. UNLESS SHOWN OTHERWISE NOTE: EDGER MAY HAVE CHANGED AND MUST BE CHECKED ON SITE.		NZMG REF:	
										DATE : 24-1-92	ORIGINAL SCALE 1:2000	A1	215-2000/22.13	

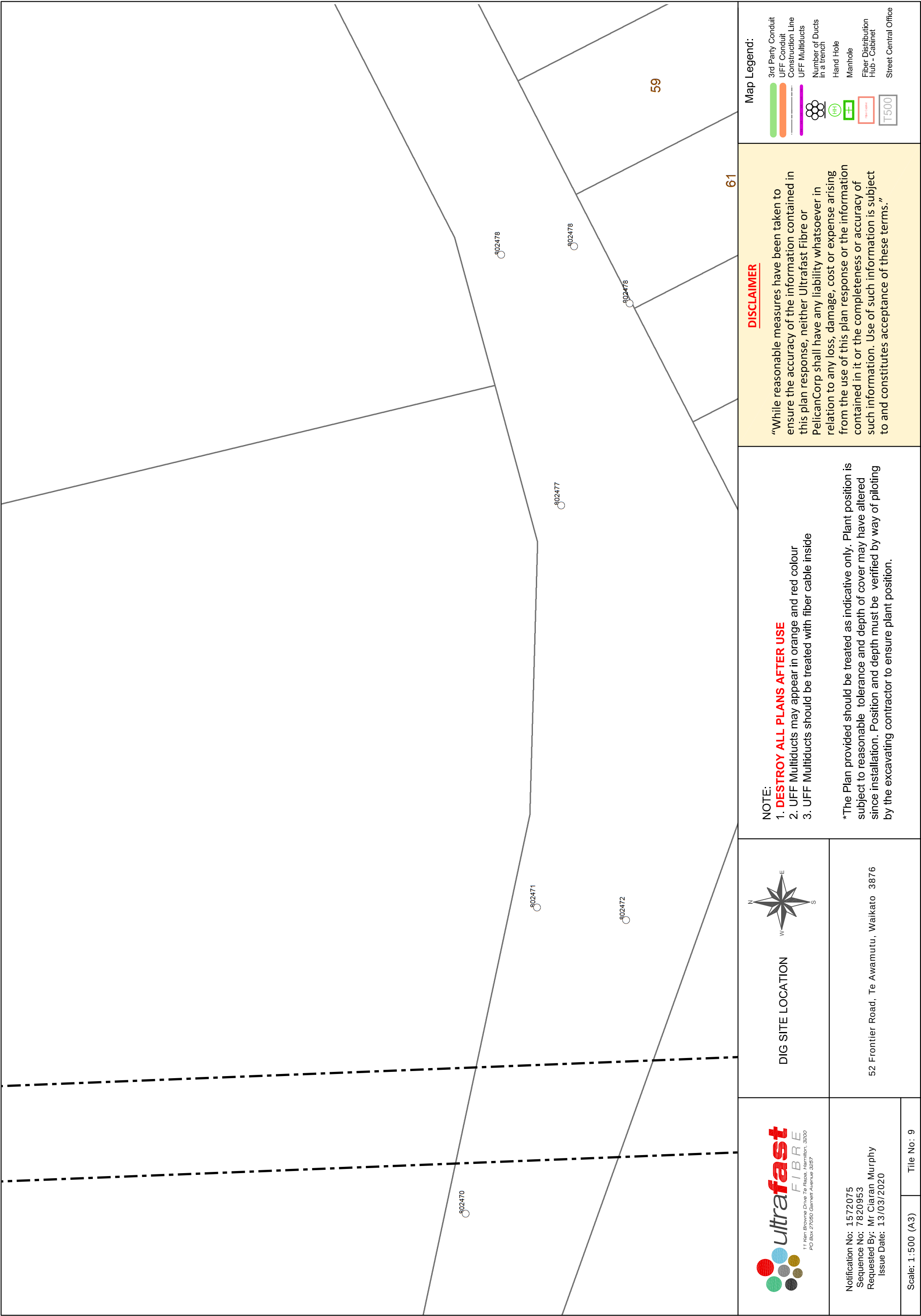


EA 49	EE 49	F19
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DEL	CHKD	DATE	ISS	CHANGE	DEL	CHKD	DATE	ISS	CHANGE	DRAWN :	D.W.B.A	TE AWAMUTU UNDERGROUND TELEPHONE CABLE SYSTEM		TELECOM CORPORATION OF NEW ZEALAND LIMITED	TCNZ DRG No :	TCNZ SHT No :
DA												CAUTION POSITIONAL MEASUREMENTS ARE 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.		DISTRICT TELECOM MANAGER HAMILTON	HN 1077	EE 45
16									CHKD :							
19									APPD :							
23									DATE :	14.8.5.88						
25																
26																
27																
28																
29																
30																
31																
32																
33																
34																





APPENDIX C

3-39433.00 WSP T2 Water Supply Assessment July 2020





Memorandum

To	Ciaran Murphy, Nathan Sanderson
Copy	Rebecca Francis, Dan Johnson
From	Daniel Edwards
Office	Christchurch
Date	10/07/2020
File	3-39433.00
Subject	T2 Water Supply Development Enquiry

Disclaimer

This report ('**Report**') has been prepared by WSP exclusively for Sanderson Group ('**Client**') in relation to the T2 Water Supply Development Enquiry ('**Purpose**') and in accordance with the Short Form Agreement with Sanderson Group dated 26 May 2020. The findings in this Report are based on and are subject to the assumptions specified in the Report, communication with Waipa District Council on 16 June 2020 and the Offer of Service dated 26 May 2020. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('**Client Data**') provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

1 Introduction

Sanderson Group engaged WSP to investigate the impact of developing the T2 growth cell on the western edge of Te Awamutu. This memorandum assesses Stage 1 of T2. Stage 1 involves the southern portion of the T2 growth cell. This development shares its Eastern boundary with the T1 growth cell, where construction has begun.

In this investigation WSP assessed the following:

- The impact of the proposed development demand only on the wider Te Awamutu Water Supply network Level of Service (LOS)
- The impact of the proposed development and T1 development combined on the wider Te Awamutu Water Supply network Level of Service (LOS)
- Whether FW2 fire flow can be provided in the proposed development.
- Whether required LOS can be provided to the proposed development in normal conditions and in the event of a water main failure on Frontier Road.
- Investigated different connection points for the proposed development.

The base water model used was the Waipa District Council Water Model which was built and calibrated in 2019. It was updated in April 2020 to incorporate new developments.

2 Methodology

2.1 Proposed Development Layout and Demand

The proposed development is between Pirongia Road and Frontier Road, on the western edge of the Te Awamutu urban area.

There are two possible connection points for the development to the existing / proposed network:

- Frontier Road
- Two interconnecting roads between the T1 and T2 growth cells.

The T1 growth cell is being developed and will include a trunk main from Pirongia Road to Frontier Road. Long-term, the T2 development will also include a trunk main from Pirongia to Frontier Road, but not in stage 1.

WSP have investigated three options to service stage 1 of the T2 development:

- The demand from stage 1, T2 is supplied from the water network at one location on Frontier Road (standard operation)
- The demand from stage 1, T2 and all the T1 demand is supplied from the water network at one location on Frontier Road (standard operation)
- The demand for stage 1, T2 and all the T1 demand is supplied from the connection point to T1 on Pirongia Road (emergency operation if there is a pipe failure on Frontier Road).

The two connection options are shown in Figure 1 below.

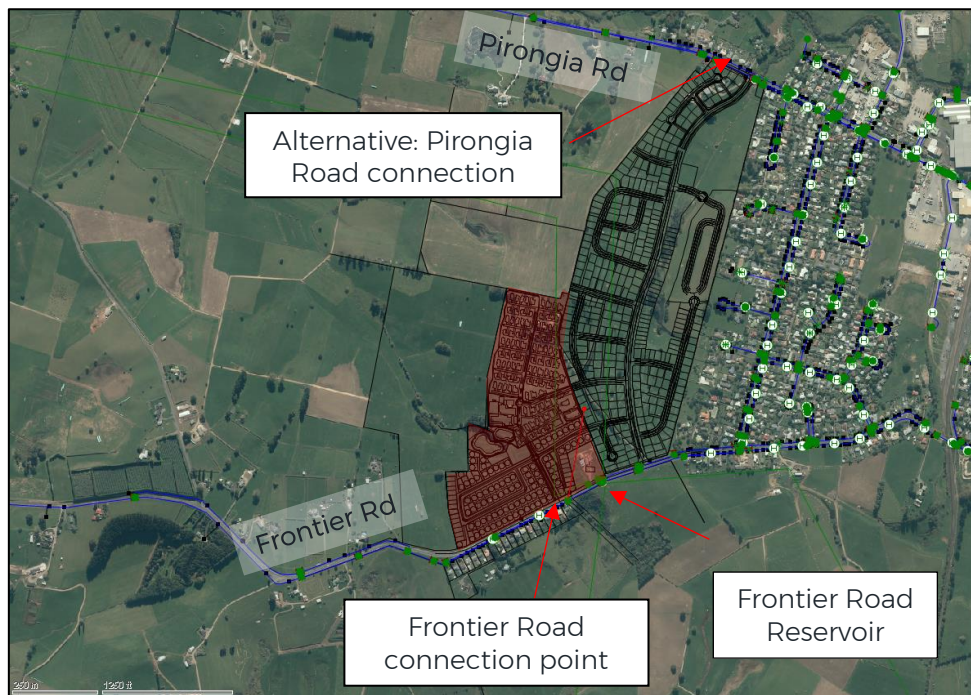


Figure 1. Development Location and Proposed Water Supply Connection Points

The assumed demand has been taken from the Masterplan Ultimate Growth System Performance Assessment for Water Supply. Demand was 266L/person/day, and leakage was 72L/person/day. The assumed population of the Stage 1, T2 Development was 450 as stated in the email from Ciaran Murphy to WSP on 28/5/2020.

WSP have assumed the population for growth area T1 based on ultimate development of 444 households and 2.5 people per household, as outlined in Appendix S17 of the 2019 Waipa Growth Management Structure Plans and Concept Plans. See the modelled demand in Table 1.

Table 1. Modelled demand at T1 and T2, stage 1 developments

Area	Population	Demand (L/person/day)	Demand (m ³ /day)	Leakage (L/person/day)	Leakage (m ³ /day)
T2 Development, Stage 1	450	266	119.7	72	32.4
T1 Development	1,154	266	307.0	72	83.1

The demand profile for the new development demand was a standard domestic demand profile (see Figure 2 below). The daily peak factor was 2.41.

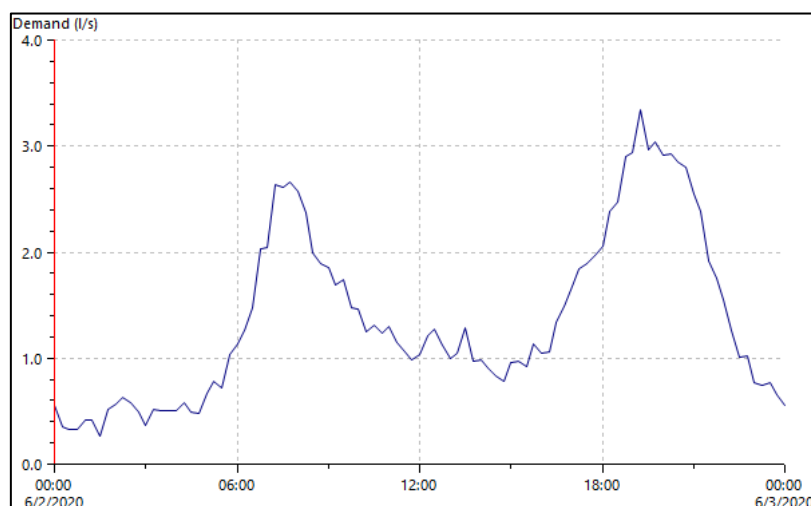


Figure 2. Demand Profile for T1 and T2 developments

2.2 Assessment on Te Awamutu Water Network

The following assessment was carried out to determine the effect of T2 stage 1 development alone, and the effect of T2, stage 1 development and T1 development combined on:

- The network pressure in the wider network
- The Frontier Road Reservoir level
- The trunk main capacity from Te Tahi, as the existing DN375 steel main currently experiences high headlosses.

2.3 High Point

A node was represented in the model at the highest elevation customer in the proposed development (see Figure 3 below). This high point was at 81m AD. This high point was used as the worst-case for the investigations.

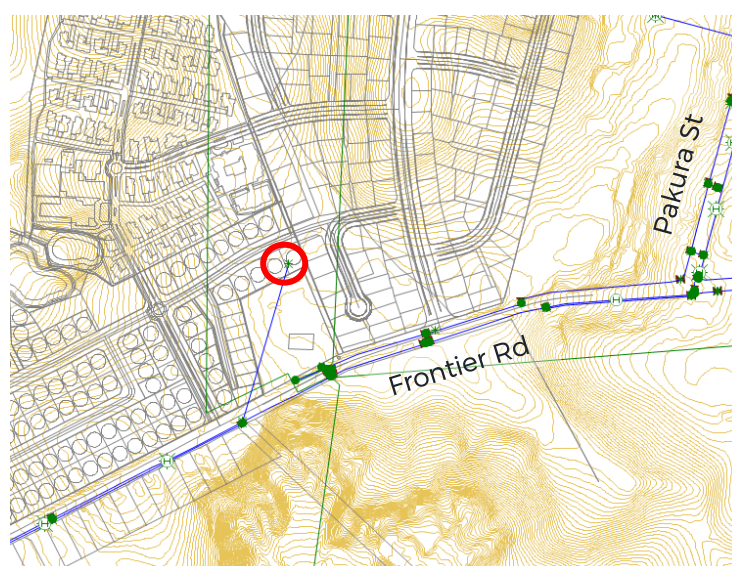


Figure 3. The Highest Point within Stage 1, T2 Growth Cell.

2.4 FW2 Fire Flow

The development is required to achieve FW2 fire flow as outlined in SNZ PAS 4509:2008 - *New Zealand Fire Service Firefighting Water Supplies Code of Practice*. FW2 flow is 25L/s for 30 minutes, which was modelled at a time which coincides with 60% of peak demand. The pressure provided under FW2 flow conditions at the high-point of the proposed development was modelled. This was assessed only from the Frontier Road connection.

The FW2 Fire Flow was assessed with the demand from T2, stage 1 and T1 combined.

No allowance for fire sprinkler or FW3 demand has been considered in this assessment.

2.5 Level of Service

It was determined whether the current water supply network can provide adequate pressure for LOS. This assessment was done in two scenarios:

- Normal flow conditions, where the demand from the proposed development and T1 development is connected to the Frontier Road main.
- Worst-case scenario where the Frontier Road main failed. Demand from T1 and T2 was connected to the Pirongia Road main. It was also determined whether the Pirongia Road main has capacity for the combined demand from T1 and T2 developments.

Alternative connections were investigated to determine whether they were more suitable.

2.6 Limitations

This model did not review the proposed internal network with the development site.

The assessment considers the current operation from Te Tahi and does not allow for the change to consent conditions in 2030, where the main supply will be from Parallel Road Water Treatment Plant via Taylors Hill Reservoirs. It also does not account for any proposed changes to the network as part of Waipa District Council's Master Planning.

3 Assessment

3.1 Effect on Te Awamutu Water Network

3.1.1 Pressure in Wider Network

The proposed development has no significant effect on the pressure in the wider Te Awamutu network (see Figure 4 below).

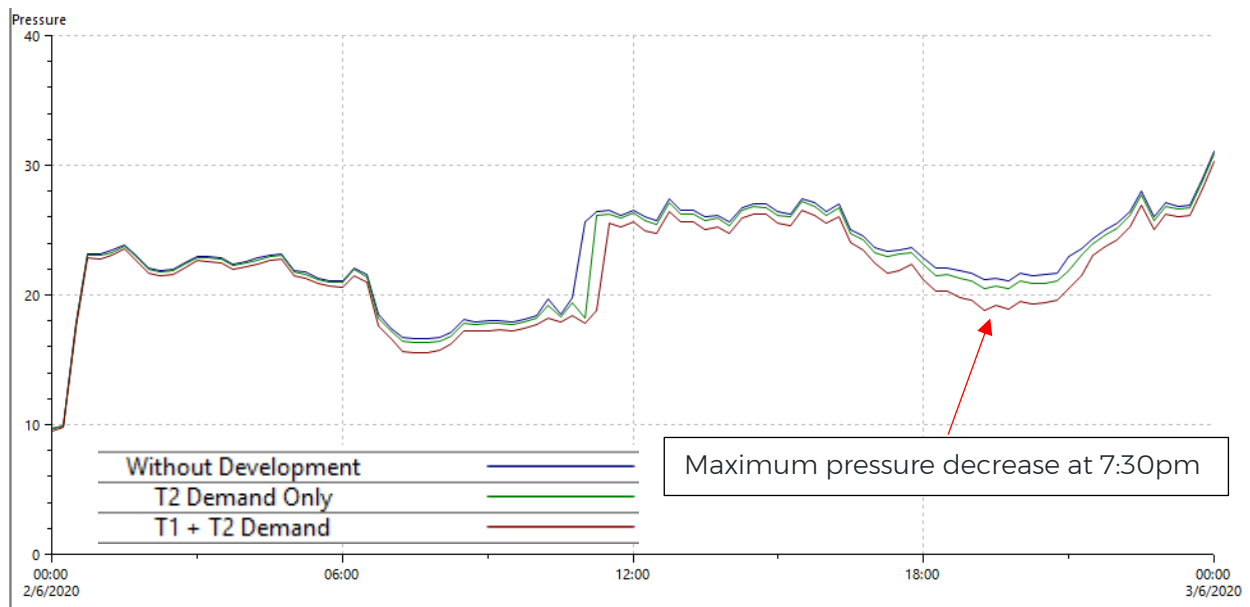


Figure 4. Pressure at the connection point of proposed development on the Frontier Road main

Figure 4 shows that the pressure in the wider Te Awamutu network is not adversely affected by the proposed development. The demand from the proposed development decreases the pressure in the Frontier Road main by a maximum of 0.6m.

Figure 4 also shows that the demand from T2 and T1 combined decrease the pressure in the Frontier Road main by a maximum of 2.2m.

3.1.2 Frontier Road Reservoir

T2 development and T1 development combined have no significant effect on Frontier Road Reservoir water levels under normal demand conditions, FW2 fire flow, and in the worst-case scenario where the water main on Frontier Road has failed.

3.1.3 Te Tahi Supply Loading

It is known to WSP that the DN375 steel pipe from the Te Tahi reservoirs is currently at capacity. (see Figure 5 below).

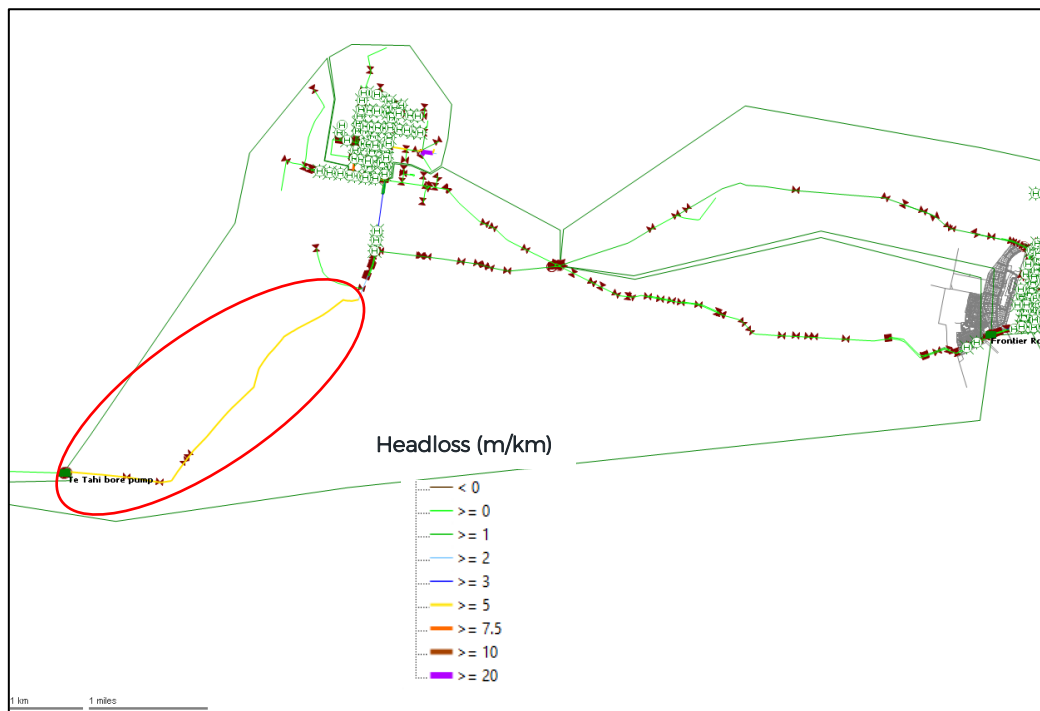


Figure 5. Headloss per km in Te Awamutu - Pirongia network without proposed development.

The circled area in Figure 5 shows that the maximum headloss in the DN375 steel trunk main is above 5m/km without the proposed development. Figure 6 below shows the impact of the proposed development (T2) alone, and the impact of T1 + T2 developments combined, on this pipe.

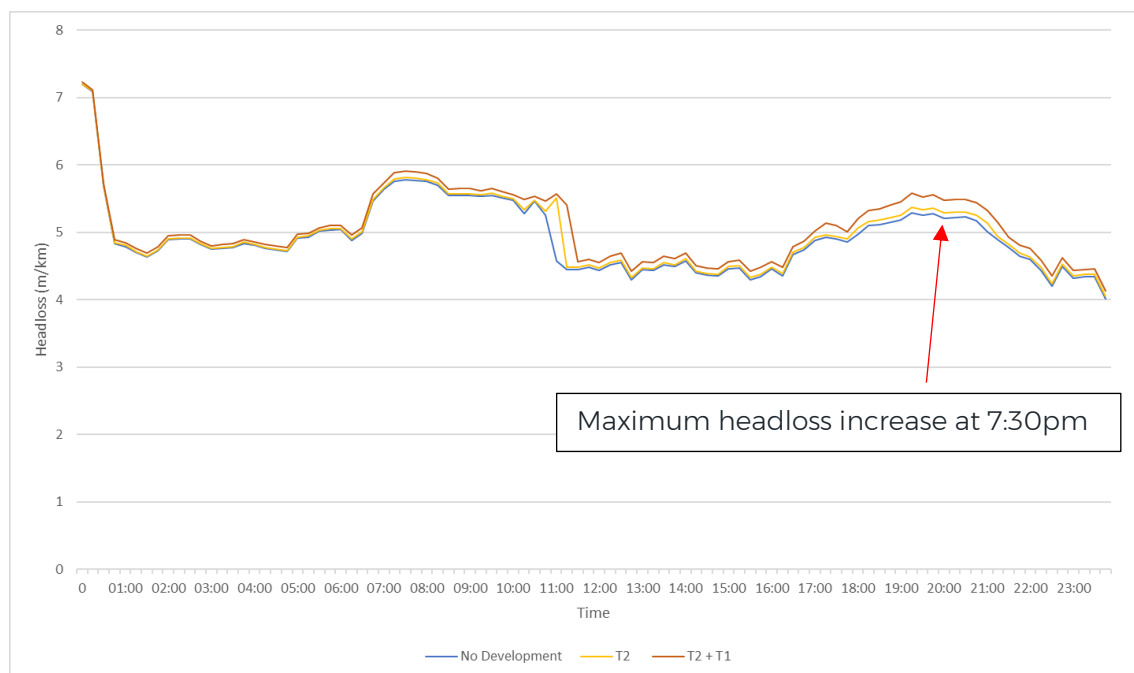


Figure 6. Headloss per km in the DN375 steel trunk main from Te Tahi reservoirs with and without the proposed development demand.

The proposed development does not affect this pipe, as the headloss only increase by a maximum of 0.1m/km.

T2 and T1 developments combined do not affect this pipe significantly, as the headloss only increases by a maximum of 0.3m/km.

Figure 6 shows that the pipe headloss is in excess of 5m/km across the entire peak day.

3.2 FW2 Fire Flow



Figure 7. Pressure at high-point within proposed development under FW2 fire flow.

The minimum pressure during FW2 flow conditions is 14.3m at the high point in the proposed development which is higher than the required 10m (see Figure 7). This means that the network can provide FW2 fire flow throughout the entire proposed development, this accounts for the demands from both T1 and T2 developments.

3.3 Level of Service

3.3.1 Normal Conditions

Figure 8 below represents the pressure at the highest point within the proposed development under normal conditions where the water is supplied through the Frontier Road main.

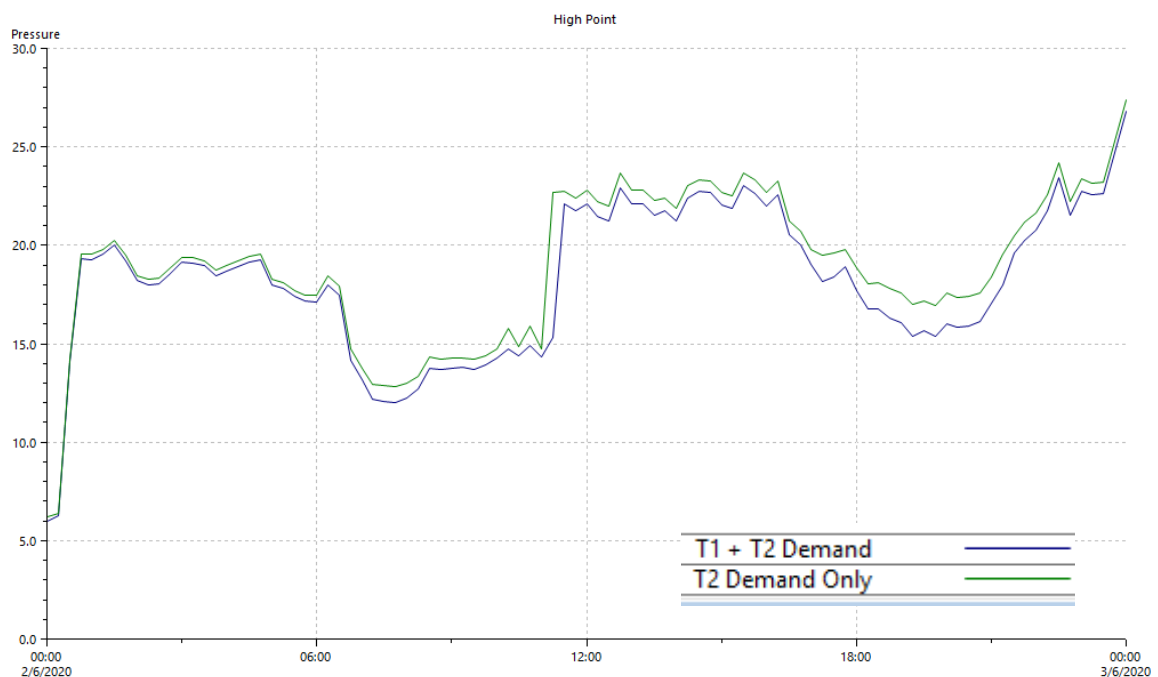


Figure 8. Pressure at the high point of the proposed development under demand from T2 only and demand from T2 and T1 combined.

Figure 8 shows that the pressure at the high point in the proposed development is lower than the required LOS pressure of 20m for most of the day, under both demand from T2 only and the demand from T1 and T2 combined.

3.3.2 Worst Case – Failed Frontier Road Main

The effect on the pressure in the T2 growth cell was analysed under the worst-case scenario of the failure of the Frontier Road main. The demand from the T2 Growth cell and the demand from the T1 Growth cell were allocated to the Pirongia Road main as described in section 2.1. The effect on the pressure in the proposed development are in Figure 9 below.

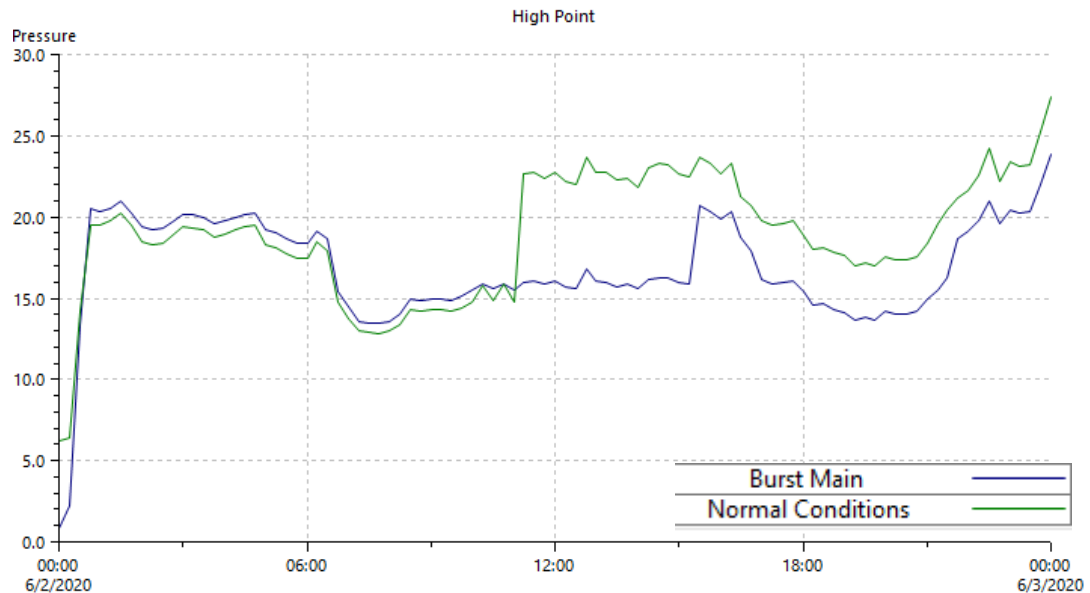


Figure 9. Pressure provided at the worst-case customer in the proposed development

Figure 9 shows that in the event of the Frontier Road main failing, the worst-case customers can still be supplied with the minimum 10m head to ensure continuous water supply.

See Figure 10 below which shows the effect of the trunk main on Frontier Road failing on the flow in the Pirongia Road main.

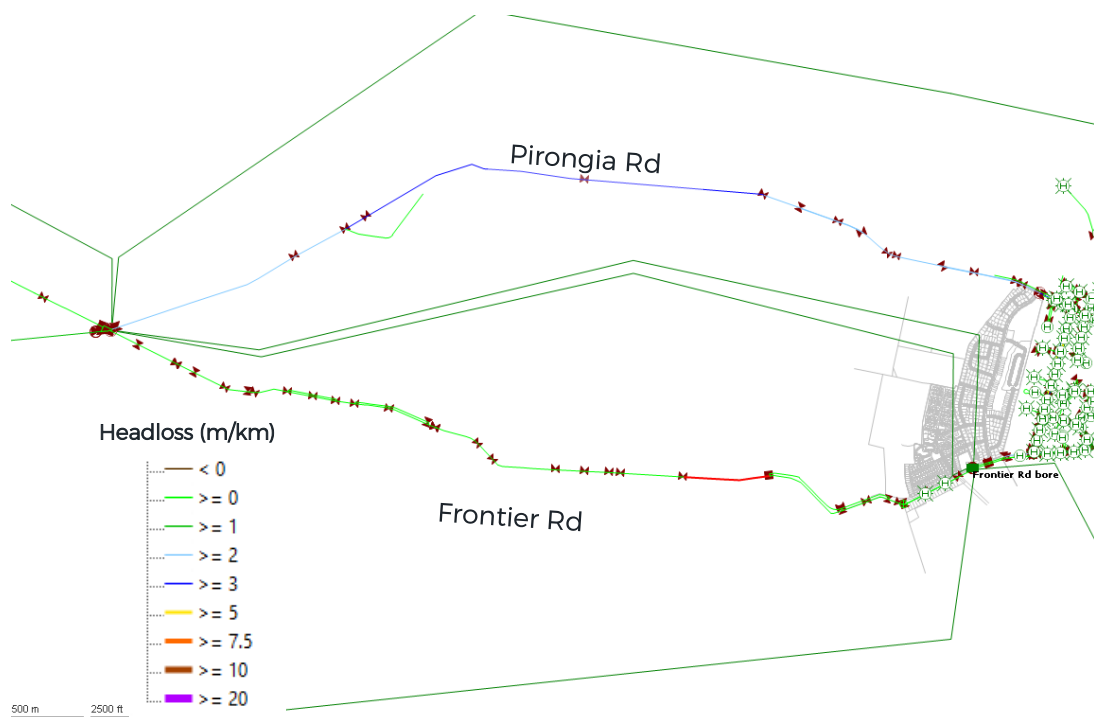


Figure 10. The headloss along Pirongia Road trunk main during failure of the trunk main on Frontier Road.

The headloss along the trunk main on Pirongia Road was low, showing that the trunk main on Pirongia Road has sufficient capacity to deliver the required flow should the trunk main on Frontier Road fail.

3.4 Alternative Connections

Two potential alternative connections were investigated, however neither were suitable:

- Connecting downstream of the booster pump which is directly downstream of the Frontier Road reservoir. However, WSP understands that this pump operates infrequently, and only during the daytime, meaning that connecting downstream of this pump would not provide the required LOS in the proposed development. There are no other connection points which would improve the LOS pressure.
- Connecting to the Pirongia Road main. This does not increase the pressure at the high-point.

4 Conclusions and Recommendations

4.1 Effect on Te Awamutu Water Network

- The proposed development alone does not adversely affect the wider Te Awamutu Water network.
- Furthermore, the proposed development and T1 development combined do not adversely affect the wider Te Awamutu Water network.

4.2 Level of Service

- The required pressure of 20m for LOS cannot be provided by the current network at the highest point within the proposed development. There are no alternative connections which would improve the pressure within the proposed development, without a local booster supplied within the development. A localised booster pump is required at the high area in the south of the proposed development to meet the LoS. This option requires further investigation.
- The T1 development will experience similar pressure issues to the T2 development. It is recommended that the two adjacent developments should consider installing a combined booster pump which will provide the required pressure to both T1 and T2 developments.
- The ground level in most of the proposed development is 5m or more below the high point used in this investigation. This means that the required pressure could be provided under the current network conditions in all areas except those in the high ground in the south of the proposed development.

4.3 FW2 Fire Flow

- FW2 fire flow can be provided throughout the proposed residential development (retirement villas) when supplied from the Frontier Road main.
- FW3 (50L/s) flows were not assessed. It is highly unlikely that FW3 flow can be achieved. Consideration should be given to this requirement for any specific fire sprinkler requirements for the Country Club and any other proposed non-residential facilities.
- This study has considered just the existing Te Awamutu distribution mains network and not the localised pipework within the development. The internal development pipework will need to be designed accordingly to accommodate peak day / hour demand.

4.4 Future Changes to Network

- This assessment only considers the current operation where Te Awamutu is supplied from Te Tahi. It does not allow for the change to consent conditions in 2030, where the main supply will be from Parallel Road Water Treatment Plant via Taylors Hill Reservoirs. Furthermore, the Waipa District Council Master Planning states that the Te Tahi main will be renewed with an equivalent DN375 pipe. It is expected that these changes will improve the LOS within the proposed development, although further investigations are required to confirm.

APPENDIX D

Utility Service Providers Confirmation of Supply



21 July 2020



N Sanderson
Sanderson Group Ltd
PO Box 15803
TAURANGA 3144

Email: nathan@sandersongroup.co.nz

Dear Nathan

Re: Te Awamutu Country Club Frontier Road Te Awamutu
Our Ref: 17291

Waipa Networks Ltd confirms that our distribution network has the capacity to supply the above retirement village development.

The full design and Capital Contribution costs incurred for the reticulation of the development along with any electricity easements that are required will be the responsibility of the developer and these will be forwarded once the design is completed.

Yours faithfully

A handwritten signature in black ink, appearing to read 'W. Gray', with a large, stylized flourish at the end.

Bill Gray
CUSTOMER CONNECTIONS SUPERVISOR

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WAIPA NETWORKS LTD
240 Harrison Drive
PO Box 505
Te Awamutu, 3840

TE AWAMUTU
Telephone: 07 872 0745
Facsimile: 07 870 2401

CAMBRIDGE
Telephone: 07 827 4014
Facsimile: 07 827 6487



16 July 2020

Te Awamutu Country Club
c/- Nathan Sanderson
Sanderson Group
nathan@sandersongroup.co.nz

Dear Nathan

Te Awamutu Country Club proposed development, Te Awamutu

I refer to your email of Wednesday 16 July regarding the availability of natural gas to supply the proposed retirement village and subdivision on Frontier Road.

First Gas can confirm that the existing network can supply the required load. We look forward to providing a design for the subdivision in due course.

If you have any questions, please contact me on (04) 979 5367 or via email Paul.Bird@firstgas.co.nz.

Kind regards



Paul Bird
Firstgas Distribution

Ref: Te Awamutu Country Club
ID: MDU-HN-20026



Date: 16th July 2020

0800 342 735
info@ultrafast.co.nz

ultrafastfibre.co.nz

CONDITIONAL ACCEPTANCE BY ULTRAFast FIBRE LIMITED AS TELECOMMUNICATIONS OPERATOR

Subdivision: Te Awamutu Country Club and residential lots

1. Ultrafast Fibre Limited (UFF) confirms that a UFF telecommunications connection will be made available for each site in the development, **providing the developer was to sign an UFF Installation Agreement**. Upon approval of this agreement, UFF will undertake to become the telecommunications operator of the telecommunications reticulation in the proposed public roads for Te Awamutu Country Club (the "**Subdivision**"), to provide network connections to all lots and apartments, in the Subdivision (the "**Reticulation**").
2. The Reticulation will be installed in accordance with:
 - (a) the requirements and standards set by the Waipa District Council and advised to UFF via the Council's website; and
 - (b) the requirements of the Telecommunications Act 2001 and all other applicable laws, regulations and codes (as amended).
3. The Reticulation will be installed by Broadspectrum Limited to UFF's satisfaction.
4. UFF will be the owner, operator and maintainer of the Reticulation.
5. One or more retail service providers will be available to supply telecommunications services over the completed Reticulation when service is available, provided that UFF shall not be responsible if the retail service provider's offer to supply such telecommunications services or the number of such providers varies from time to time.

SIGNED for and on behalf of
ULTRAFast FIBRE LIMITED by:

Signature: *MGleeson*

Name: Mark Gleeson

Date: 16th July 2020