Private Plan Change Request – Hughes Developments Limited
Appendix A – Infrastructure Report

Hughes Developments Ltd

Faringdon Far West– Rolleston

Infrastructure Report

20199 R0

October 2020

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Revision History

Rev Number:	Prepared By:	Description:	Date:
Revision 0	Jamie Verstappen	For plan change submission	29/10/20

Document Control

Action:	Name:	Signed:	Date:
Prepared By	Jamie Verstappen		29/10/20
Reviewed By	Daniel Barr		29/10/20
Approved By	Andy Hall		29/10/20

Contents:

1. General

1.1 Introduction

This infrastructure report addresses the future infrastructure required to service the proposed Faringdon Far West development area. This area covers approximately 65 Ha of land and is located on the south western urban limits of Rolleston, Canterbury. The site is bounded by Dunns crossing Road to the west, Goulds Road to the south-east and rural residential development to the north. A site location plan is attached as Appendix A.

The surrounding area falls towards the south east at an approximate grade of 1 in 200. The land is currently comprised of a number of lifestyle blocks of varying sizes. A number of boundaries within the site are lined with pine tree shelter belts and the blocks are fenced into smaller paddocks. There is also a Walnut Tree orchard located within one of the land parcels. Most blocks contain a substantial home and assorted out buildings. The homes may or may not be retained in the development of the site.

Davie Lovell-Smith Ltd (DLS) have held several meetings with Strategic Planners and Infrastructure Engineers at Selwyn District Council (SDC), primarily Murray England with specific regards to servicing the proposal for water supply and sewer. It is the Applicant's intention to construct infrastructure that will meet the demands of this project and also compliment the long-term requirements of the southern end of the Rolleston Urban Area. The proposed infrastructure will be integrated into the existing networks and all efforts will be made to ensure that the installations are complimentary to the current assets.

All sites will be serviced for sewage, water supply, telecommunications and power. It is anticipated that stormwater will be discharged to ground on-site under a separate consent to be obtained from Environment Canterbury (ECan).

1.2 Legal Description

There are 5 existing land parcels within the site. The legal descriptions of these sites are; Lot 3 DP 70352, Lots 1 and 3 DP 57004 and Lots 1 and 2 DP 61278.

1.3 Soil Conditions

From the various geotechnical investigations undertaken for the development area we can deduce that the soil profile beneath the site is generally covered with 100mm-300mm of topsoil overlying silty or sandy gravels to several tens of metres depth. A thin layer of sands and silts is intermittently located between the topsoil and gravel layers. Some seams of clay and silt may be present at various depths within the deeper gravel layers. The depth to groundwater was observed to be between 5m and 10m from surface level.

The site is situated in a 'Rural and Unmapped' area as per the MBIE mapping available on the New Zealand geotechnical database. Due to the granular nature of soils beneath the site, the low ground water table and low gradients this site has been categorised as equivalent TC1 in the geotechnical reporting.

1.4 Site Contamination

Detailed site investigations into potential contamination of soil within the land parcels which make up the Far West development area have been undertaken by ENGEO. These have identified various forms of contamination which are above the limits set by the NES, namely heavy metals and asbestos.

A remediation action plan will be provided to assist in the removal of this contaminated material from the development area. All contamination from site will be removed prior to earthworks and civil construction being undertaken and a site validation report provided. The contamination removal and site validation may be undertaken in stages as the development progresses.

1.5 Development Staging

The development area will likely be constructed in stages that best meet market demand. The location and size of stages will be determined by the servicing requirements, roading access and efficiencies of construction.

2. Water Supply

The Council have a strategic plan for the delivery of water trunk mains to the south east side of Rolleston. It is contained in the SDC 5 Waters Activity Management Plan and is described as the Rolleston Master Plan 2017-2048. The plan describes a network of water trunk mains with sizes and specific timings for installation specified. This plan also includes scheduled bore upgrades to supply the trunk main network. Please refer to the attached Figure 19-5 Rolleston Master Plan in Appendix B.

The Master Plan provides a very good framework for the roll out of water supply services but the timing is no longer valid as the development of land in Rolleston has overtaken these predictions. Added to this, the construction of the Faringdon Development has provided additional up-sized mains, and the area may be better supplied than what was originally intended. The reason for this added supply is that the original intentions for the development of the town were based on a minimum housing density on 10 per hectare. In reality the density is closer to 12 houses per hectare.

Please refer to the attached Proposed Trunk Mains plan in Appendix B.

This plan shows the existing pipework, 200mm (ID) or over. It also shows the future proposed 200mm (ID) pipes into the proposed plan change areas. This plan has been forwarded to SDC Officer Murray England for assessment in the Councils overall Network Analysis Model. It is understood that that modelling is underway.

The modelling will determine the verification of the pipe sizes and will also ascertain the timing for the upgrading of bores. For the purposes of this modelling, it is predicted that these plan change areas will be completed by 2023. This is a significant departure from the current Master Plan.

These main pipes will follow main connecting traffic routes but it is worth noting that all other streets will contain water mains of 100mm or 150mm (ID) for residential and firefighting supply purposes.

The methodology for determining peak flow for the development is presented as follows:

- Area within the Block = 65.3ha
- Potential number of lots for modelling purposes = 65.3 x 12 = 784 lots
- With reference to Chart 1 in Chapter 7 of the SDC Code of Practice, the Peak design flow will be 0.13l/s/lot.
- This equates to 101.92 l/s. We add to this 25l/s for firefighting purposes.
- Assuming that a third of this flow may be going down any one trunk main, the max flow becomes 42l/s.

  Colebrook-White Equation
  Pipe diameter 200mm
  Gradient - 1 in 126
  Pipe Roughness - ks 0.06mm
  Results for Full Bore Conditions:
  Velocities 1.338 m/s
  Discharge 42.02 litres/sec

- For a 200mm (ID) pipe this equates to a unit headloss of 1 in 126m.

The development area will also be designed to comply with the New Zealand Fire Service Firefighting Water Supplies Code of Practice SNZ PAS 4509:2008. The water supply classification will be FW2(25l/s).

3. Stormwater

3.1 Design

The landform and contours throughout the completed development will be designed to ensure that secondary flow will safely conveyed through the site via the road and reserve networks. The land falls to the south east towards Goulds Road.

Primary stormwater from the site is proposed to be discharged to ground. The soakpits on individual sites will be constructed as part of the Building consent process. All proposed drainage and soakpits associated with the roads will be constructed as part of the subdivision and will be vested in SDC.

Soakpits on private residential sites will accommodate storms up to a 10% AEP 1hr event in accordance with New Zealand Building Code requirements. The soakpits in the streets will deal with the flows off the streets up to a 2% AEP critical duration event plus the runoff from the house sites once the on-site soakpits are inundated. This will be calculated as the flows generated by a 2% AEP critical duration event, less a 10% AEP 1hr event. Particular care will be made to ensure that allsumps and pipe infrastructure can accommodate these flows.

Consent or a certificate of compliance for stormwater discharge to ground from the development site will be obtained from Environment Canterbury (ECAN). All consenting from ECAN will be verified by SDC as being suitable for transfer to their ownership if required.

It is expected that all stormwater will be permitted to discharge to ground ensuring that all sump outlets are trapped as a means of separating hydrocarbons and other floatable contaminants. No

other treatments requirements are anticipated. These conditions replicate those currently in use for the balance of the Faringdon development.

Stormwater discharge during construction will comply with the Environment Canterbury (ECAN) Erosion and Sediment Control Guidelines. Erosion and Sediment Control Management Plans will be compiled for both ECAN and SDC approval. The proposed methods of stormwater treatment and disposal replicate what is currently being used in Faringdon.

3.2 Flood Analysis

It has been identified that the site is affected by flooding in both the 1 in 200 year and 1 in 500 year storm events. Water is expected to pool up to 0.5m deep in these events. It is noted that this flooding data has been compiled using the existing land contours. Flood Level Plans are attached as Appendix C.

The land contouring which will be undertaken as part of any development works will ensure all surface water drains towards the road and reserve corridors. Building platforms will be set between 200mm and 500mm above the kerb level at the lot frontage. Stormwater up to the 1 in 50 year storm will be discharged to ground within soakpits on site. Secondary flow paths will be provided along these road and reserve corridors to ensure all flow over and above the 1 in 50 year event is directed down contour and away from residential lots. As flood water flows through the site the velocity will increase due to the reduced friction associated with paved surfaces. This increase in velocity will reduce water depths and allow safe and efficient transfer of flood water through the site. The proposed roading layout will take into account locations where flood flow may enter the site. Expected flood flow levels and the calculation of minimum floor levels will be determined during detailed engineering design.

Provided correct design methodologies are followed during detailed design and construction of the development the effects of flooding from both the 1 in 200 year and 1 in 500 year storm events can be fully mitigated.

3.3 Water Races

There are 2 water races which enter the development area. One water Race enters the North side of the site at the boundary between Lot 1 DP 57004 and Lot 3 DP 70352, this water race discharges to ground shortly after entering the site. Consultation with the adjacent property owner will be undertaken to determine if this water race could be terminated within the adjacent land, otherwise a point of discharge to ground will be provided within the development site nearer to the boundary. The other water race enters the site from Goulds Road and traverses the eastern boundary of the site before discharging to ground at the boundary between Lots 1 and 3 DP 57004. This water race would be closed at Goulds Road as part of the development works. A plan showing the water race network in the vicinity of the site is attached as Appendix D.

4. Sewer

4.1 Existing Network

As part of the Eastern Selwyn Sewage Scheme, a large pump station was constructed at the corner of Selwyn Road and Springston-Rolleston Road. This pump station is known as the RADAR Pump Station.

This pump station was designed to receive the flows from the southern side of Rolleston and also flows from other communities before pumping directly to the Pines Wastewater Treatment Plant west of Rolleston.

As part of the Faringdon development, a large sewer pipe was laid from the RADAR station, south along Selwyn Road and then north into the Faringdon Development Area. This pipe along Selwyn Road is a 525mm dia uPVC pipe and has been laid at a grade of 1 in 430. By applying the Colebrook White Equation, the following data is obtained:

Pipe diameter 525mm
Gradient - 1 in 430
Pipe Roughness ks = 0.6mm

Results for Full Bore Conditions:
Velocities 1.072 m/s
Discharge 232.11 litres/sec

Part-Full Conditions:
Proportion depth = 0.92
Actual depth = 483mm
Velocity = 1.189 m/s
Discharge = 247.64 litres/sec

By relating the flow back to Equation 3 of the Wastewater Section of the SDC Code of Practice, then we can determine the number of sites that this sewer can service.

MF =247.64 litres/sec
ASF = MF/ 2.5 / 2 = 49.53 litres/sec
= 4,279,392 litres/day
No of lots = ASF / 220 / 2.7 = 7204 homes

If we make an assumption that there are on average, a density of twelve homes per hectare over the catchment then the pipe should be able to service 600ha.

Please refer to the attached plan of the Wastewater Catchments in Appendix D. The overall shaded area (red, blue and green) is the catchment entering the 525mm sewer. This overall catchment area amounts to approximately 411ha. From this we can establish that the 525mm sewer can adequately service the entire catchment.

A wastewater capacity assessment of the RADAR pump station and Selwyn Road gravity main was undertaken by OPUS in January 2020. This assessment also concludes that the Selwyn Road gravity sewer has capacity to service the proposed catchments as shown on the catchment plan. However, the current pump capacity in the RADAR pump station will need to be increased to accommodate the fully developed catchment area. It is also noted that flows from the land to be rezoned has been loaded into the model as constant peak design values which has provided a conservative representation of volume and flow.

4.2 Sewer Design

Referring to the sewer catchment plan, the blue catchment includes most of the proposed Far West development area. Part of the Far West site will gravitate to the existing sewer on East Maddisons Rd but the majority will need to be serviced by a new pump station which will serve the 130 Ha blue catchment. The area of the Far West site inside the blue catchment is 64.8 ha which equates to approximately half of the pump station catchment.

The sewer demand for the proposal has been calculated using SDC Code of Practice. Please refer to the calculation below for the peak domestic demands.

Blue Catchment area = 130ha

At 12 sites per hectare that equates to 1560 lots

Faringdon is currently developing at about this density but it is conservative.

Average sewer flow
ASF = 1560 lots x 220 l/person/day x 2.7 people/lot

ASF = 927 m^3/day
ASF = 10.73 l/s

Peak wet weather flow
P/A ratio = 2.5 Part 6: Wastewater drainage SDC Code of Practice

SPF = 2 Part 6: Wastewater drainage SDC Code of Practice

MF = P/A ratio x SPF x ASF

MF = 2 x 2.5 x 10.72
MF = 53.65 l/s = Pump rate

The flows will most likely need to be pumped to the head of the 525mm diameter gravity main on Selwyn Road, approximately 880m to the east. An early estimate of the pipe size would be a 250mm PE PN12.5 with a head loss of around 1m per 80m length. An alternative solution of pumping directly into the large pressure main from RADAR pump station to the pines treatment plant is also being looked into by council.

The pump station would be located on Selwyn Road approximately 420m southwest of the intersection with East Maddisons Rd. This is the general location of where Selwyn Road will intersect with a major local road entering into the catchment area.

The sewer main route from the pump station to service the Far West area would be located along primary and collector road links which will be constructed as part of the Faringdon South-West development area. Indicative alignments for these routes are shown on the sewer catchment plan in Appendix D.

The required pump station depth will be calculated once the roading link locations are confirmed. It has been noted that the depth of the pump station can be reduced through the use of shallower than usual gradients of the downstream sewer mains where flow velocities will allow, this can be confirmed during detailed engineering design. The pump station will be constructed as part of the Faringdon South-West development which will likely commence in 2021.

The pump station will be designed with a suitable amount of storage for emergency situations. This volume can be derived from calculating 8hrs of mean flow. That is 8hrs at 10.48l/s. This amounts to 302m³. Part of this can be stored in the upstream pipe system and in the pump chamber, but this is still a very large volume to cater for. To that end we would like council to consider a lesser period of storage, perhaps 6 hours or 225m³.

Sewer mains will be laid throughout the development site within the road network. The size of mains will be determined based on their respective catchments. All lots will be serviced with a 100mm PVC lateral at least 1m inside the net area of the lot. Cover will be maintained on all sewer pipelines installed to ensure the entire proposed catchment area can be serviced.

All works will be to Council Standards unless otherwise agreed with council wastewater engineers. All public sewer pipes over private land or reserves will be covered by appropriate easements in favour of SDC. The pump station will be located on its own utility lot to be vested in SDC.

5. Power / Telecommunications / Street Lights

Power and telecommunications will be provided to all sites to utility company and industry standards. All cables will be placed underground and all kiosks will be constructed on separate individual lots. The kiosk sites will be forwarded to Council for approval following the power design.

Street lights will be provided to the roading and reserves to SDC standards. The applicant will provide a street light style consistent with the style used previously in Faringdon.

Full appraisals will proceed once the Plan Change has been obtained. This will include for potential substation sites and similar large scale infrastructure items.

6. Roading

The proposed Far West development area will incorporate a number of collector roads in line with the CRETS network. These include an extension of Shillingford Boulevard between East Maddisons and Dunns Crossing Roads and the extension of Northmoor Boulevard to connect to the future Shillingford Boulevard. The locations and alignments of these roads are largely dictated by the adjacent Faringdon and Faringdon South development areas. These roads are shown as primary routes in the figure shown below and will be continued through the Far West development area as

dual carriageway roads. Specific intersection design will be required for the intersections of these primary routes with Goulds Road, these will be covered during the consent and detailed design phases.

The Far West development area will also incorporate a number of secondary roads and cycle links as shown in the figure below. The roading and cycle links will extend to site boundaries where shown to provide the required level of traffic permeability within the development. Off road cycle links are also proposed to link the road network with the central reserve area.

Faringdon Far-West Roading ODP

The cross sections of new roads will be a continuation of what will be constructed in the adjacent stages of Faringdon with legal widths varying from 17m to 24m and formed widths between 6m and

8m. All cycleways will be 2.5m wide and footpaths 1.5m wide as per code of practice requirements. Indicative roading cross sections are attached as Appendix F.

Water, power and telecommunications services will be located in the road berms. The width of berms will be determined to allow the installation of these services along with street trees and street lighting.

The existing roads which front the development area will be upgraded to residential standards. These upgrades may include carriageway widening, installation of kerb and channel, footpaths, grassed berms, street trees and street lighting. The upgrades will be to the development frontage only however SDC will be given the opportunity to undertake additional road upgrades as part of the overall development work.

7. Earthworks and Clearing

A key intention of the development of Faringdon is to create simple building sites with as little earthworks as possible.

Earthworks will be carried out on the site to ensure that all future house sites will drain towards the street at a minimum grade of 1/500. Subject to design the house sites will be elevated above the street to facilitate drainage. The minimum elevation from the street boundary to the building site will be 100mm and may be as high as 500mm.

The area is not prone to flooding as the soils generally allow very good soakage, however, the design of the site levels will take into consideration flood levels in the streets and all building platforms will be above potential secondary flows associated with extreme storm events.

The total estimated cut to fill volume in the Far West development area may exceed 150,000m^3.The significant areas of cut are in the roadways where the depth to the subgrade may be as much as half a metre or more below existing ground level. Trenching for drainage will likely be up to 2.5m below ground level.

All topsoil on site will be stripped, stockpiled and replaced on the land immediately following bulk earthworks. All disturbed topsoil will be re-sown with Council specification grass seed mixes. A balance of cut and fill will be maintained where possible and removal of material from site will be kept to a minimum. Some topsoil may be removed from site due to contamination.

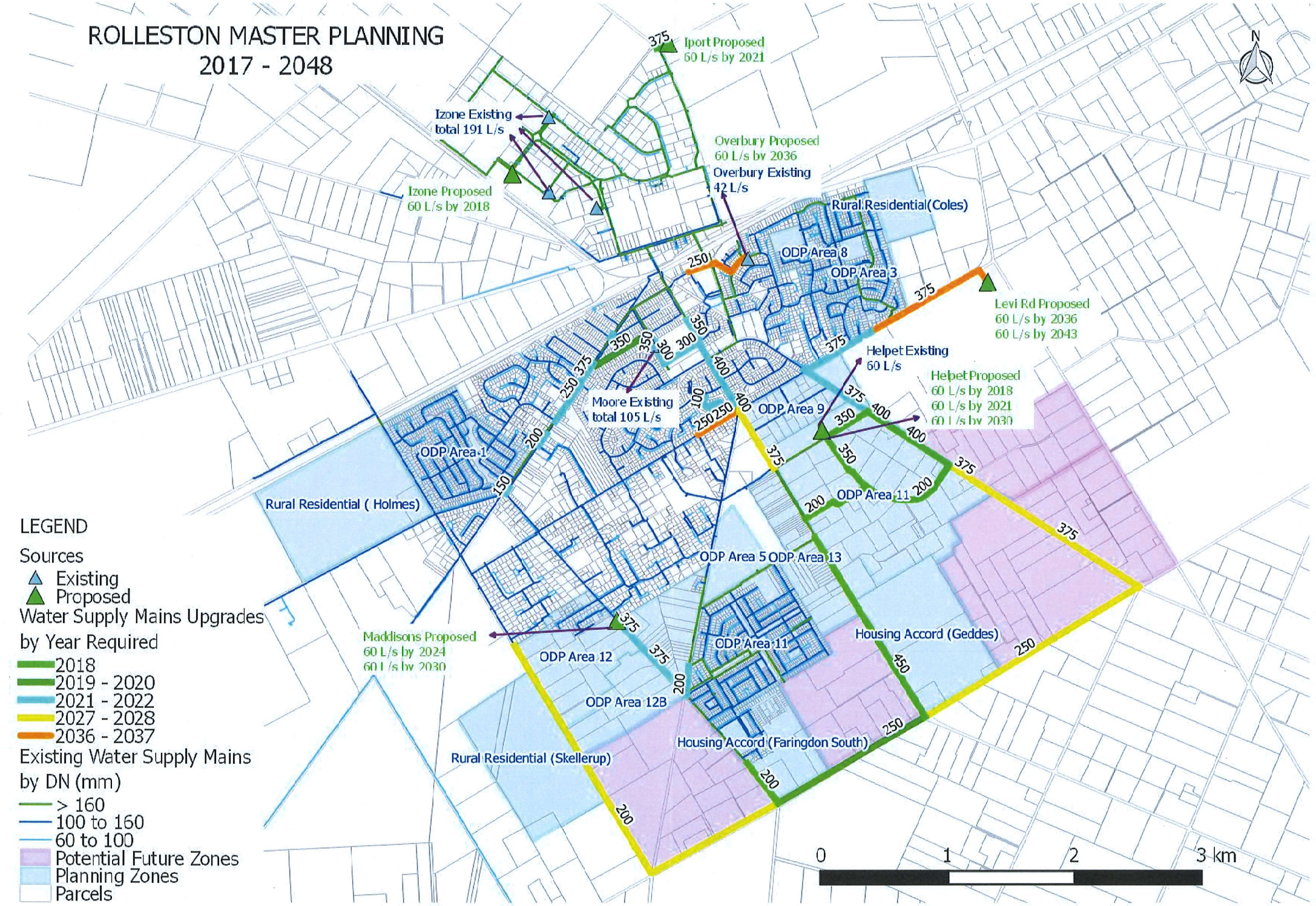
Sediment off the site will be controlled as per Council requirements. The basis of the sediment control will be the Environment Canterbury Guidelines and the discharge during construction will be undertaken either under Council's global discharge consent or in accordance with Environment Canterbury rules. All dust created on the site will be controlled by water cart or other such Council approved methods.

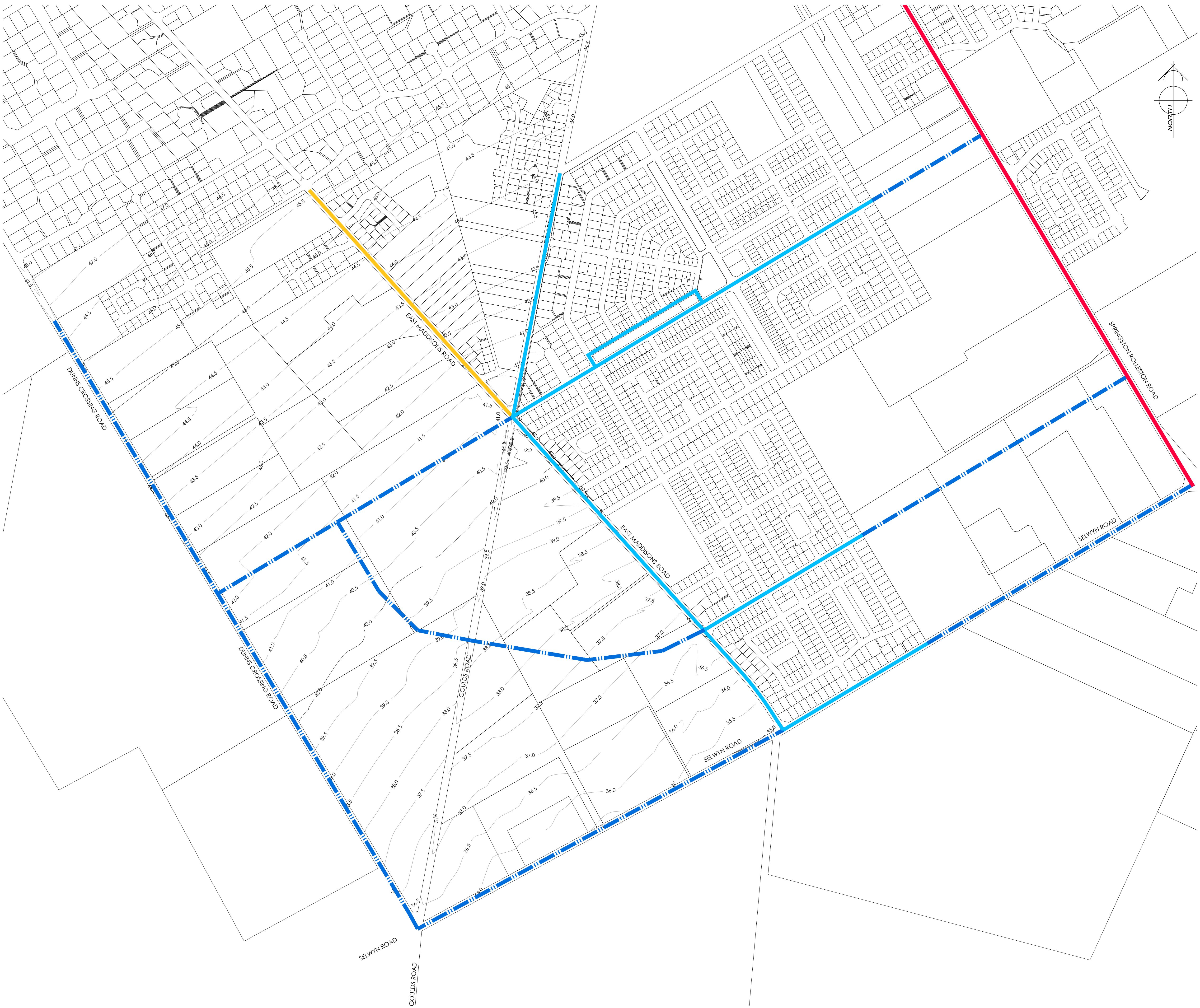
All bulk filling within residential sites will be undertaken in accordance with NZS 4431:1989. All fill testing will be carried out by an independent laboratory.

Jamie Verstappen
Chartered Professional Engineer
Davie Lovell-Smith Ltd

Appendix A- Location Plan

Appendix B – Water Supply Plans


ROLLESTON MASTER PLANNING
2017 - 2048
Iport Proposed
60 L/s by 2021
Izone Existing
total 191 L/s
Izone Proposed
60 L/s by 2018
Overbury Proposed
60 L/s by 2036
Overbury Existing
42 L/s
Rural Residential(Coles)
ODP Area 8
ODP Area 3
Levi Rd Proposed
60 L/s by 2036
60 L/s by 2043
Helpet Existing
60 L/s
Helpet Proposed
60 L/s by 2018
60 L/s by 2021
60 L/s by 2030
Moore Existing
total 105 L/s
ODP Area 9
ODP Area 1
Rural Residential (Holmes)
ODP Area 11
ODP Area 5
ODP Area 13
Maddisons Proposed
60 L/s by 2024
60 L/s by 2030
ODP Area 12
ODP Area 11
Housing Accord (Geddes)
ODP Area 12B
Housing Accord (Faringdon South)
Rural Residential (Skellerup)
LEGEND
Sources
Existing
Proposed
Water Supply Mains Upgrades
by Year Required
2018
2019 - 2020
2021 - 2022
2027 - 2028
2036 - 2037
Existing Water Supply Mains
by DN (mm)
> 160
100 to 160
60 to 100
Potential Future Zones
Planning Zones
Parcels
N
0
1
2
3 km



Legend

- Existing 200mmØ
- Existing 300mmØ
- Existing 450mmØ
- Proposed 200mmØ

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

South West Water Supply Rolleston

Proposed Trunk Mains

For Discussion

1:5000@A1
1:10000@A3

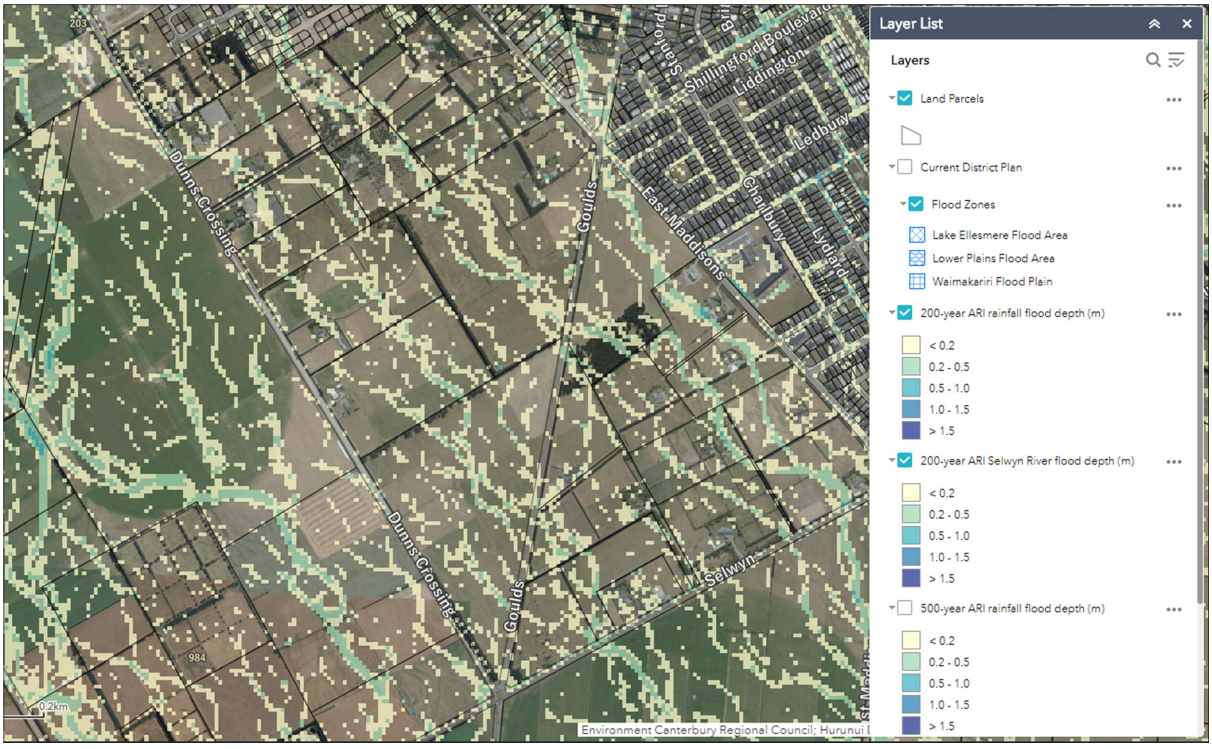
October 2019

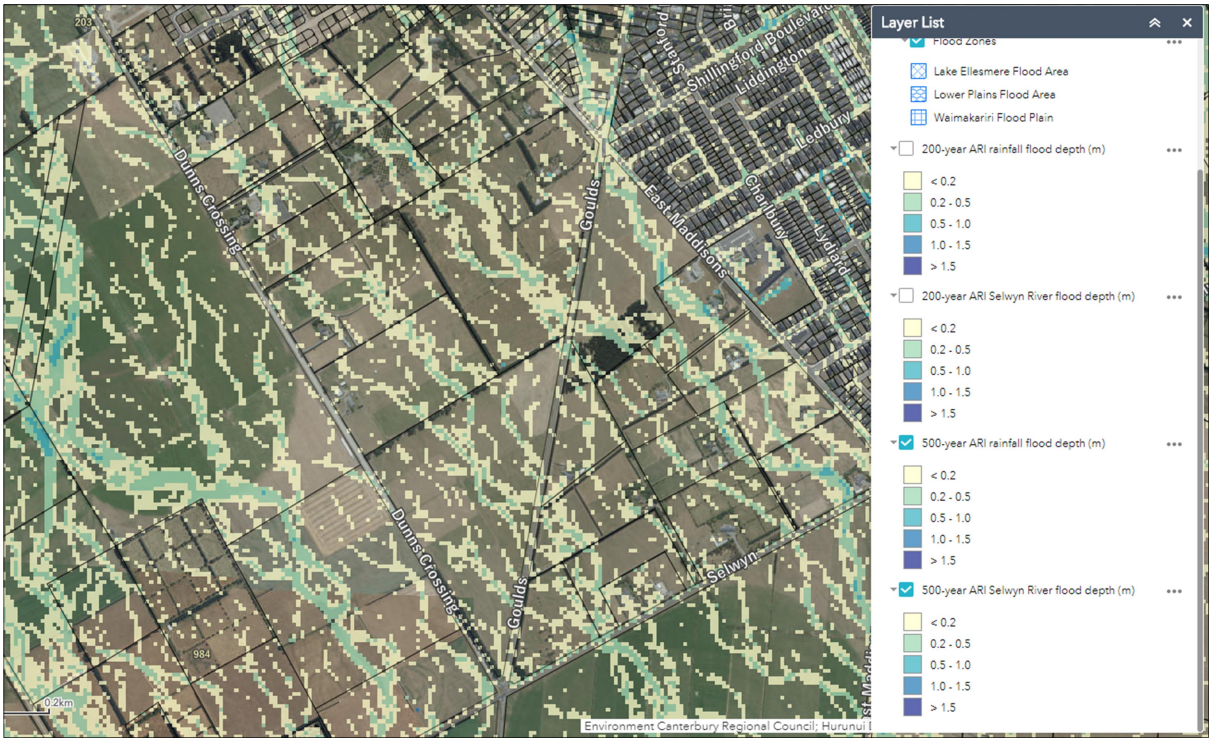
J:\18727\ENG Concepts\Water Supply Trunkmains.dwg

GC

P18727 **E06.0** **R0**

Appendix C – Flood Level Plans





Appendix D – Water Race Map and Existing Bore Data

Canterbury Maps

N

0 0.1 0.2 0.3 0.4 Kilometres

Scale: 1:5,000 @A3

Map Created by Canterbury Maps on 22/10/2020 at 7:54 AM

Canterbury Maps

Information has been derived from various organisations, including Environment Canterbury and the Canterbury Maps partners. Boundary information is derived under licence from LINZ Digital Cadastral Database (Crown Copyright Reserved). Environment Canterbury and the Canterbury Maps partners do not give and expressly disclaim any warranty as to the accuracy or completeness of the information or its fitness for any purpose.

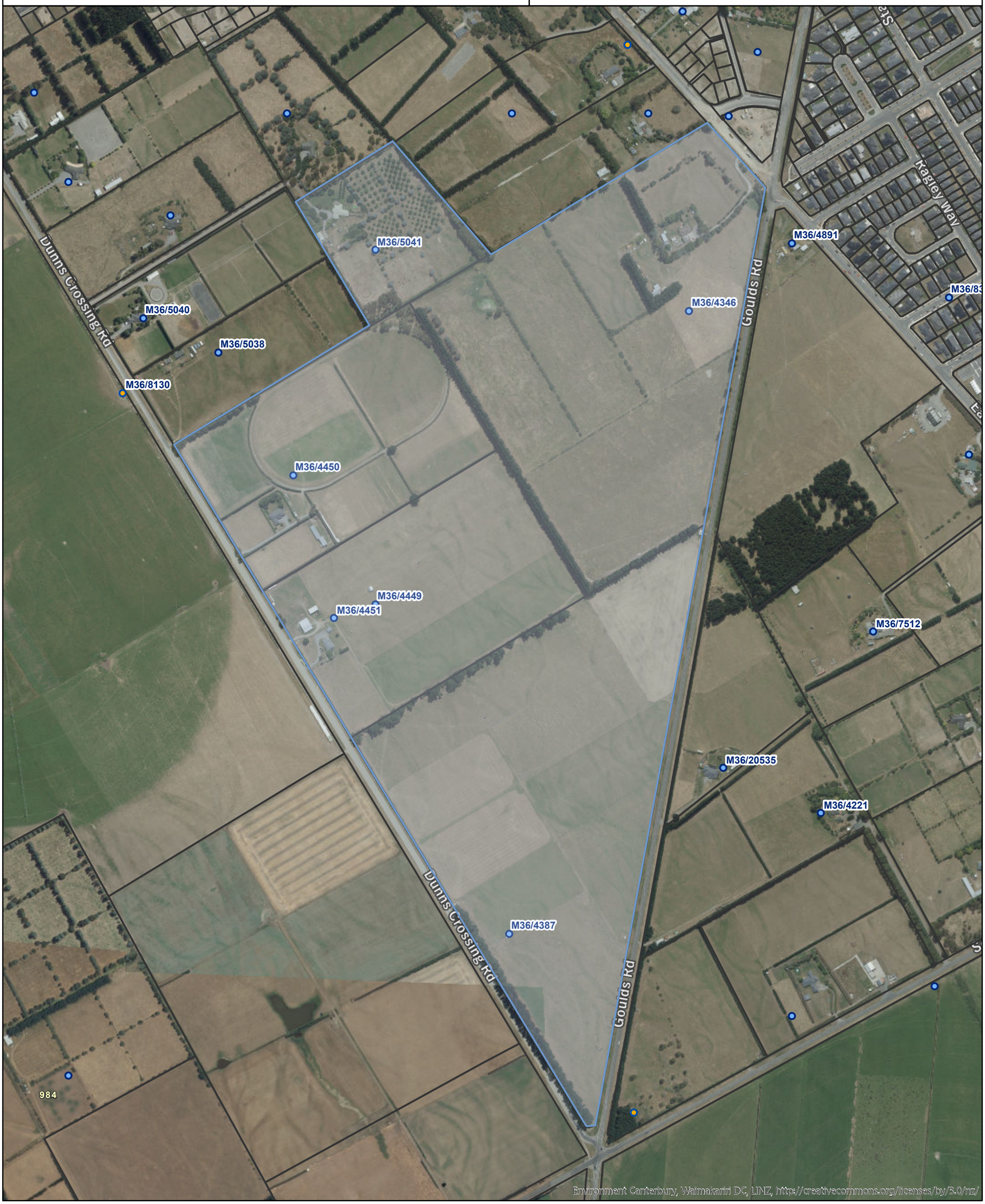
Information from this map may not be used for the purposes of any legal disputes. The user should independently verify the accuracy of any information before taking any action in reliance upon it.

N

0 0.1 0.2 0.3 0.4 Kilometres

Scale: 1:5,000 @A3

Map Created by Canterbury Maps on 22/10/2020 at 7:56 AM



Bore or Well No	M36/5041
Well Name	DUNNS CROSSING ROAD
Owner	KAJENS TRADING DEVELOPMENT LTD

Well Number	M36/5041	**File Number**	CO6C/10302
Owner	KAJENS TRADING DEVELOPMENT LTD	**Well Status**	Active (exist, present)
Street/Road	DUNNS CROSSING ROAD	**NZTM Grid Reference**	BX23:49507-69990
Locality	ROLLESTON	**NZTM X and Y**	1549507 - 5169990
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	32.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	6.80m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	40.47m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	10	**Calc Min 80%**	9.73m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	01 Feb 1997	**Max Tested Yield**	5 l/s
Driller	Dynes Road Drilling	**Drawdown at Max Tested Yield**	13 m
Drilling Method	Cable Tool	**Specific Capacity**	0.40 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	30	32				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Feb 1997	1	5.1	67.31074	12.8	2

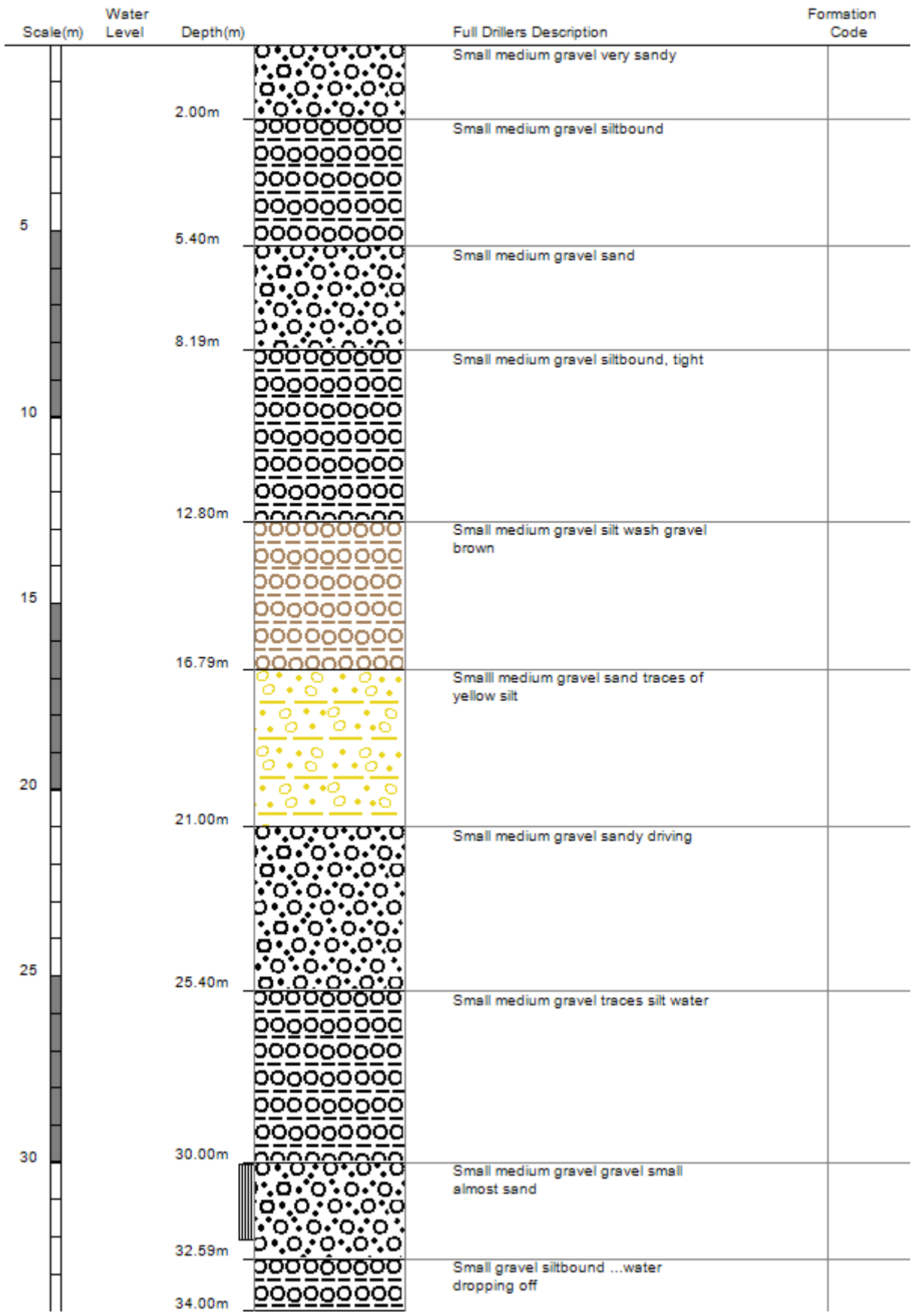
No comments for this well

Bore Log

Borelog for well M36/5041

Grid Reference (NZTM): 1549508 mE, 5169991 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 40.5 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 34.0 m Drill Date: 01-Feb-1997

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Bore or Well No	M36/4451
Well Name	DUNNS CROSSING RD
Owner	TYACK GJ & FR

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/4451	**File Number**	
Owner	TYACK GJ & FR	**Well Status**	Active (exist, present)
Street/Road	DUNNS CROSSING RD	**NZTM Grid Reference**	BX23:49448-69450
Locality	ROLLESTON	**NZTM X and Y**	1549448 - 5169450
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth		**Water Level Count**	0
Diameter		**Initial Water Level**	
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	38.92m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	0	**Calc Min 80%**	
Aquifer Name		**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	0
Drill Date		**Max Tested Yield**	
Driller	not known	**Drawdown at Max Tested Yield**	
Drilling Method	Unknown	**Specific Capacity**	
Casing Material		**Last Updated**	18 Oct 2006
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		

No screen data for this well

No step tests for this well

No comments for this well

Bore or Well No	M36/4450
Well Name	DUNNS CROSSING RD
Owner	Mr & Mrs L K & J C Blackmore

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/4450	**File Number**	CO6C/02046
Owner	Mr & Mrs L K & J C Blackmore	**Well Status**	Active (exist, present)
Street/Road	DUNNS CROSSING RD	**NZTM Grid Reference**	BX23:49388-69660
Locality	ROLLESTON	**NZTM X and Y**	1549388 - 5169660
Location Description	DP61278 LOT 2	**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	25.20m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	39.62m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	8	**Calc Min 80%**	9.43m below MP (Estimated)
Aquifer Name	Riccarton Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	09 Apr 1992	**Max Tested Yield**	6 l/s
Driller	Dynes Road Drilling	**Drawdown at Max Tested Yield**	6 m
Drilling Method	Cable Tool	**Specific Capacity**	1.00 l/s/m
Casing Material		**Last Updated**	08 Nov 2013
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	23.2	25.2				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
09 Apr 1992	1	6.1	80.50892	6.1	0

No comments for this well

Bore Log

Borelog for well M36/4450

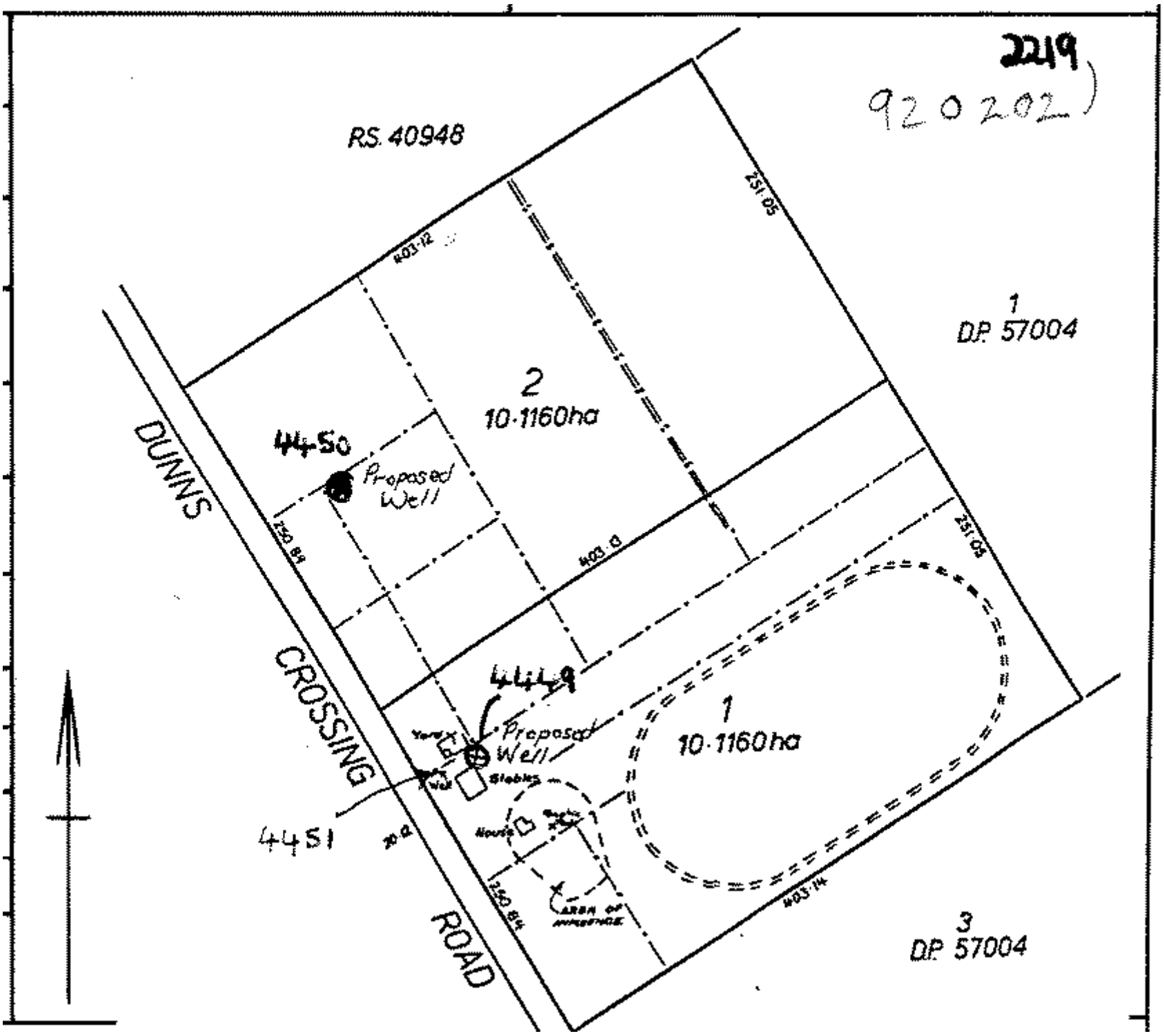
Grid Reference (NZTM): 1549388 mE, 5169661 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 39.6 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 26.5 m Drill Date: 09-Apr-1992

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Bore or Well No	M36/4449
Well Name	DUNNS CROSSING RD
Owner	TYACK GJ & FR

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/4449	**File Number**	CO6C/02046
Owner	TYACK GJ & FR	**Well Status**	Not Used
Street/Road	DUNNS CROSSING RD	**NZTM Grid Reference**	BX23:49508-69470
Locality	ROLLESTON	**NZTM X and Y**	1549508 - 5169470
Location Description	LOT 1	**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Irrigation,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	24.20m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	38.81m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	9	**Calc Min 80%**	9.27m below MP (Estimated)
Aquifer Name	Riccarton Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	09 Jun 1992	**Max Tested Yield**	6 l/s
Driller	Dynes Road Drilling	**Drawdown at Max Tested Yield**	5 m
Drilling Method	Cable Tool	**Specific Capacity**	1.36 l/s/m
Casing Material		**Last Updated**	08 Nov 2013
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		



Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	22.2	24.2				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
09 Jun 1992	1	6.1	80.50892	4.5	0

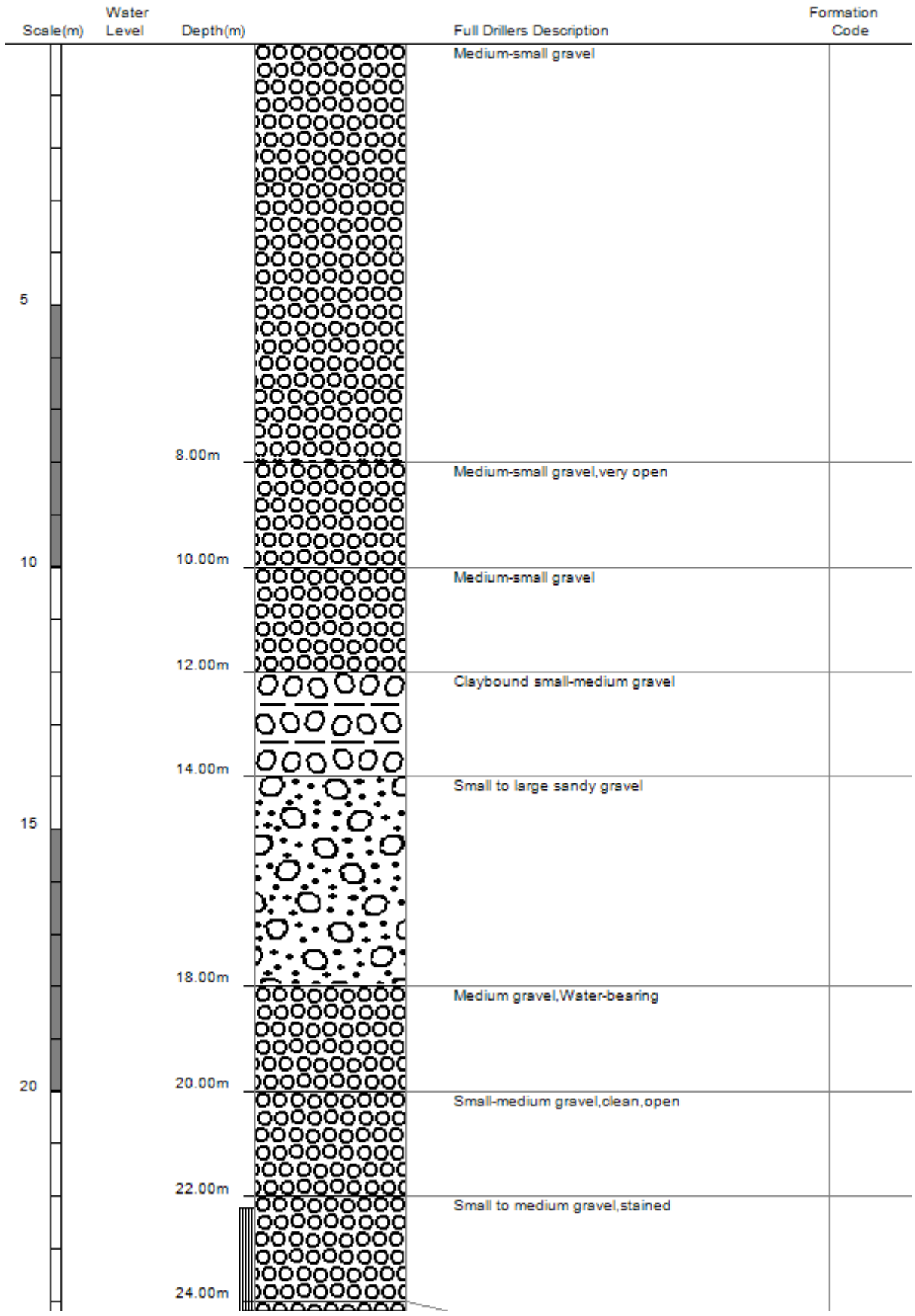
No comments for this well

Bore Log

Borelog for well M36/4449

Grid Reference (NZTM): 1549508 mE, 5169471 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 38.8 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 24.2 m Drill Date: 09-Jun-1992

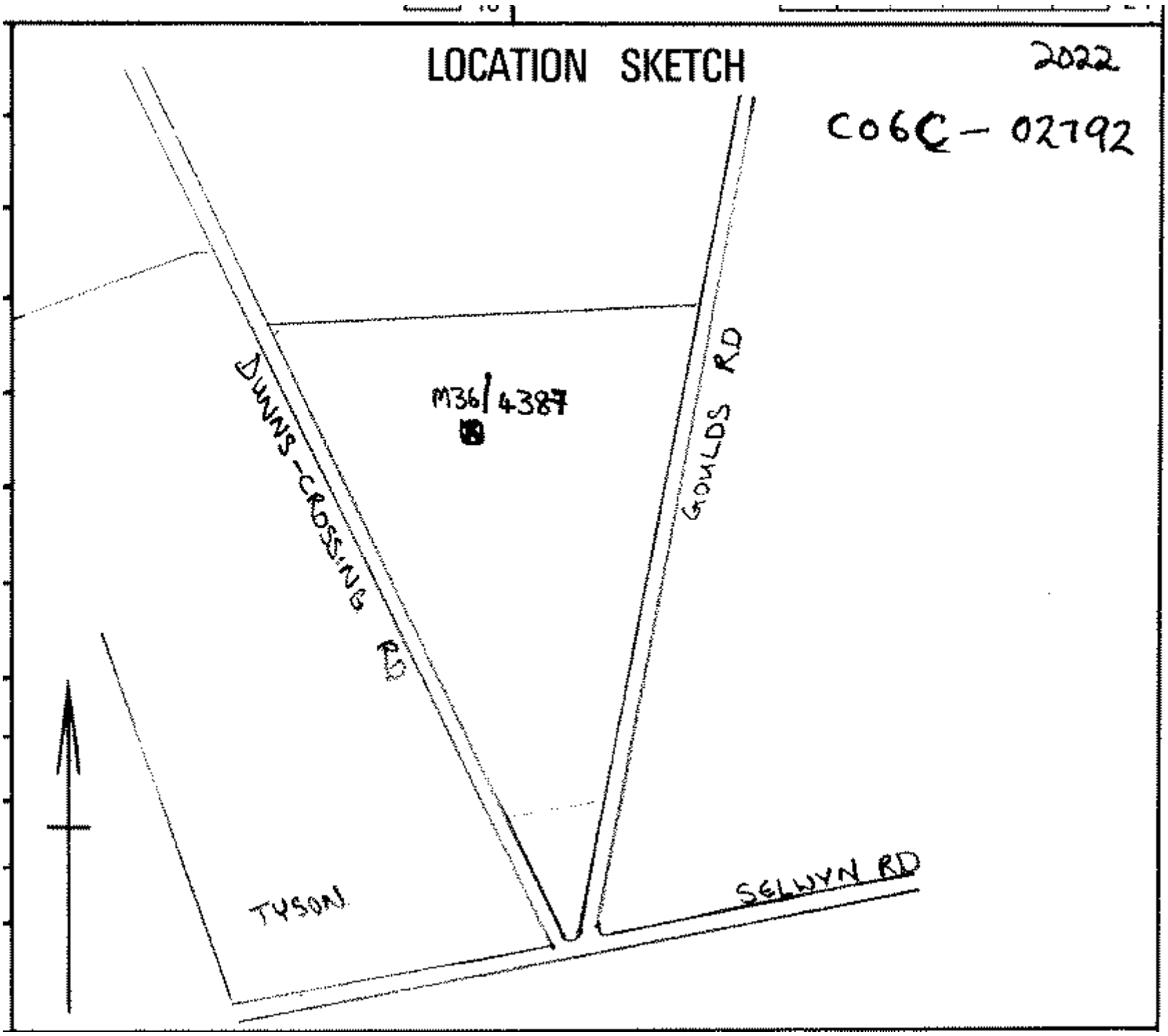
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Bore or Well No	M36/4387
Well Name	DUNNS CROSSING RD
Owner	Mr & Mrs I G & D C Robertson

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/4387	**File Number**	CO6C/02792
Owner	Mr & Mrs I G & D C Robertson	**Well Status**	Active (exist, present)
Street/Road	DUNNS CROSSING RD	**NZTM Grid Reference**	BX23:49703-68988
Locality	ROLLESTON	**NZTM X and Y**	1549703 - 5168988
Location Description		**Location Accuracy**	2 - 15m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	35.60m	**Water Level Count**	0
Diameter	200mm	**Initial Water Level**	5.65m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	36.46m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	5	**Calc Min 80%**	8.87m below MP (Estimated)
Aquifer Name		**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	2
Drill Date	11 Oct 1991	**Max Tested Yield**	18 l/s
Driller	McMillan Drilling Ltd	**Drawdown at Max Tested Yield**	10 m
Drilling Method	Rotary/Percussion	**Specific Capacity**	1.64 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Unknown	**Last Field Check**	
Water Use Data	Yes		



Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	32.6	35.6				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
11 Oct 1991	1	15.9	209.85112	9.7	2

Comments

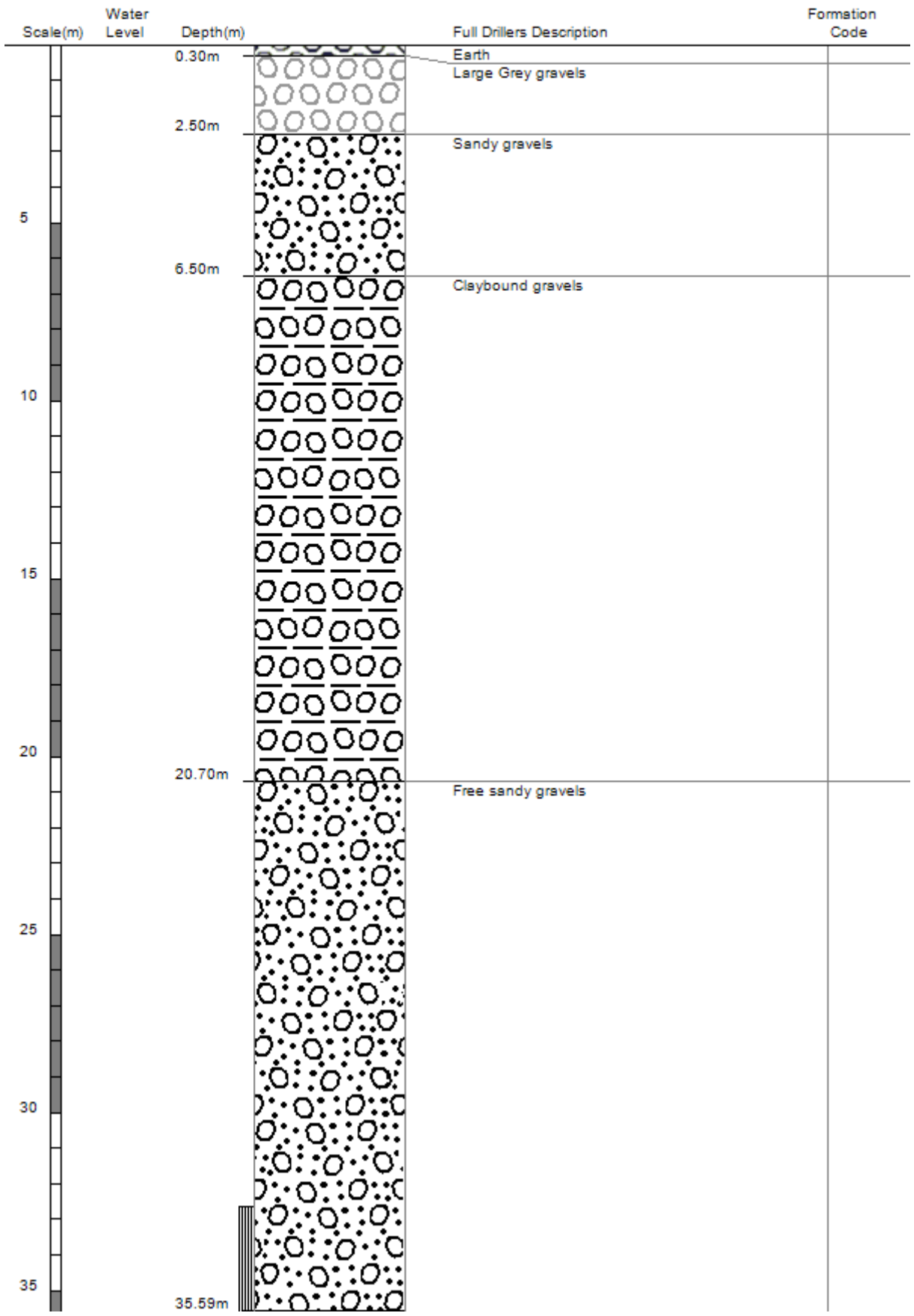
Comment Date	Comment
22 Feb 2006	Gridref changed from: M36:5975-3065. No access to depth etc. Located in the middle of the paddock.

Bore Log

Borelog for well M36/4387

Grid Reference (NZTM): 1549704 mE, 5168988 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 36.5 m +MSD Accuracy: < 2.5 m
Driller: McMillan Drilling Ltd
Drill Method: Rotary/Percussion
Borelog Depth: 35.6 m Drill Date: 11-Oct-1991

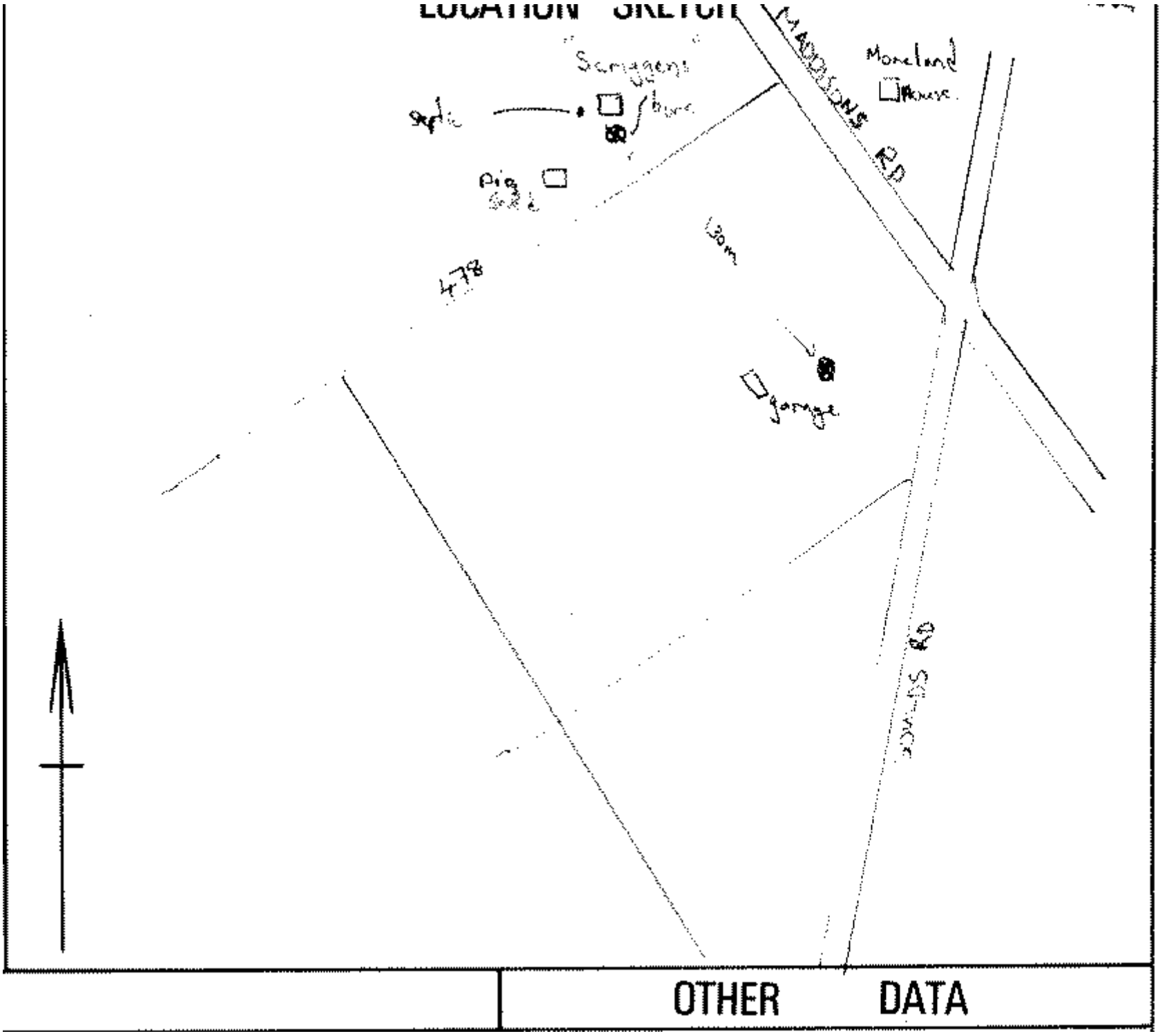
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Bore or Well No	M36/4346
Well Name	CNR MADDISONS & GOULDS RDS
Owner	MAIN M.R.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M36/4346	**File Number**	
Owner	MAIN M.R.	**Well Status**	Active (exist, present)
Street/Road	CNR MADDISONS & GOULDS RDS	**NZTM Grid Reference**	BX23:49967-69900
Locality	ROLLESTON	**NZTM X and Y**	1549967 - 5169900
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	26.80m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	39.12m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 2.5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	15	**Calc Min 80%**	9.71m below MP (Estimated)
Aquifer Name	Riccarton Gravel	**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	1
Drill Date	01 Apr 1991	**Max Tested Yield**	6 l/s
Driller	Dynes Road Drilling	**Drawdown at Max Tested Yield**	5 m
Drilling Method	Cable Tool	**Specific Capacity**	1.33 l/s/m
Casing Material	STEEL	**Last Updated**	08 Nov 2013
Pump Type	Unknown	**Last Field Check**	
Water Use Data	No		



Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	24.8	26.8				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
01 Apr 1991	1	6.1	80.50892	4.57	4

No comments for this well

Bore Log

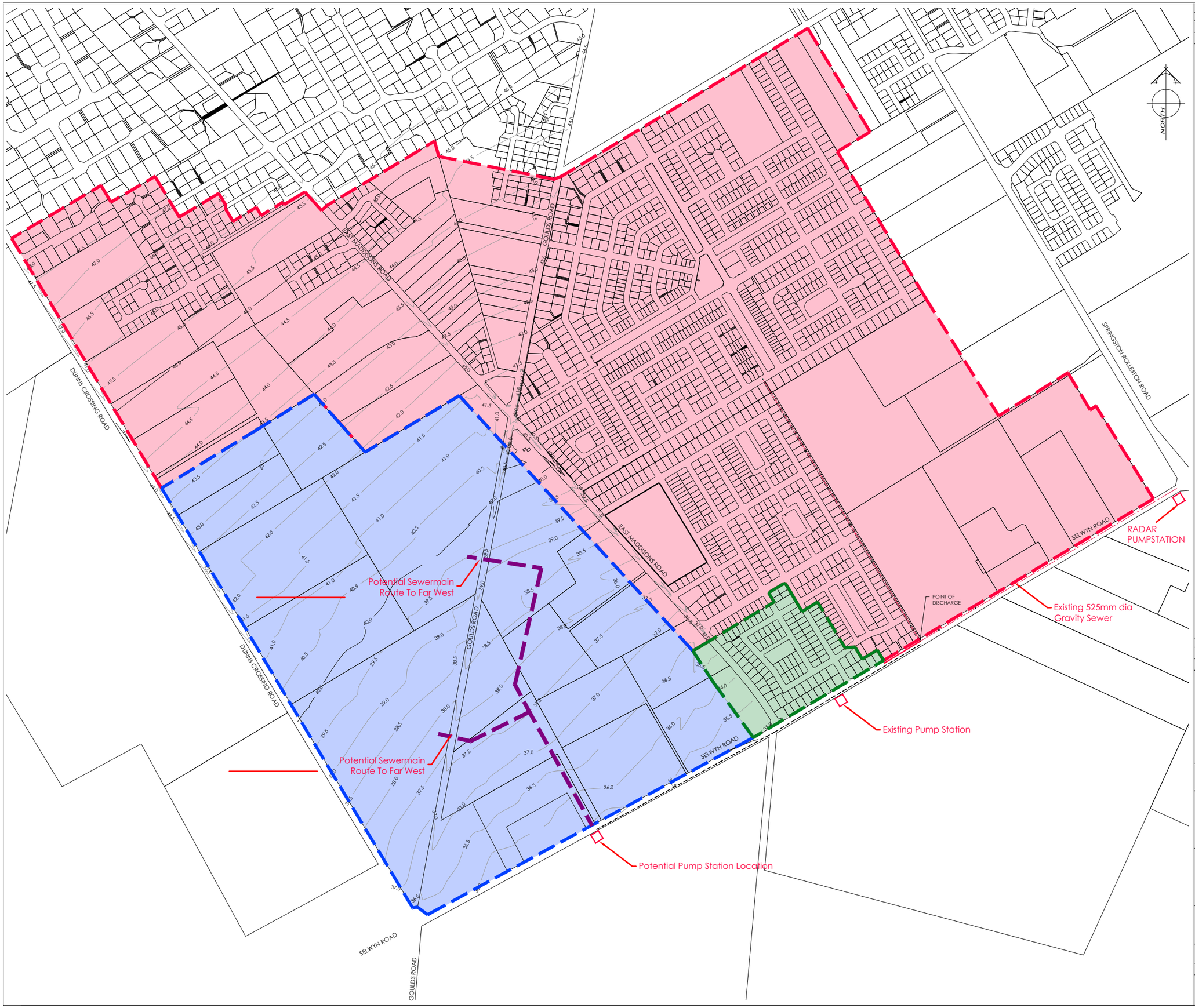
Borelog for well M36/4346

Grid Reference (NZTM): 1549968 mE, 5169901 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 39.1 m +MSD Accuracy: < 2.5 m
Driller: Dynes Road Drilling
Drill Method: Cable Tool
Borelog Depth: 28.5 m Drill Date: 01-Apr-1991

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
			Not logged	RI
		4.00m		
5			Large to medium gravel, small amount of silt	RI
		6.00m		
			Silt	RI
		8.00m		
			Gravel and silt	RI
10				
		11.50m		
			Very tight clay, small shingle	RI
		14.00m		
			Tight clay and shingle	RI
15				
		16.00m		
			Tight clay, small gravel	RI
		18.00m		
		18.50m	Clay and gravel, not as tight	RI
		19.00m	Gravel, some water	RI
			Tight clay gravel	RI
20				
		21.00m		
			Tight clay and small to medium gravel, some amount of water	RI
		22.00m		
			Open medium gravel	RI
		24.00m		
			Small to medium gravel	RI
25				
		26.00m		
			Small gravel	RI
		28.00m		
		28.50m	Grey silt with wood	BR

Appendix E – Sewer Catchment Plan



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

TOTAL CATCHMENT AREA:

GRAVITY CATCHMENT AREA = 269.68ha

PUMPED CATCHMENT AREA = 130.40ha

LIFT STATION 1 CATCHMENT AREA = 11.02ha

SERVICES

EX.SS — STD. MH

FUTURE PRESSURE SS

FUTURE GRAVITY SS — STD. MH

	NAME	SIGNED	DATE
DESIGNED BY	JAMIE VERSTAPPEN		
CHECKED BY	ANDY HALL		

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

South West Sewer Rolleston

SHEET TITLE:

Catchment and Layout Plan

DRAWING STATUS

For Discussion

SCALE : 1:5000@A1 1:10000@A3

DATE : October 2019

CAD FILE : J:\20199\Eng\Drawings\South West Sewer Catchment_22-10-20.dwg

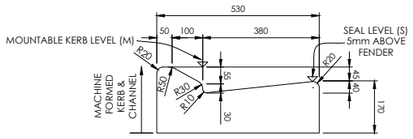
DRAWN : GC

DRAWING No : **P18727**

SHEET No: **E06.0**

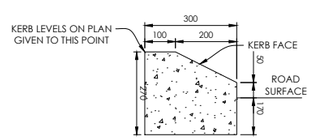
REVISION : **R0**

Appendix F – Typical Road Cross Sections



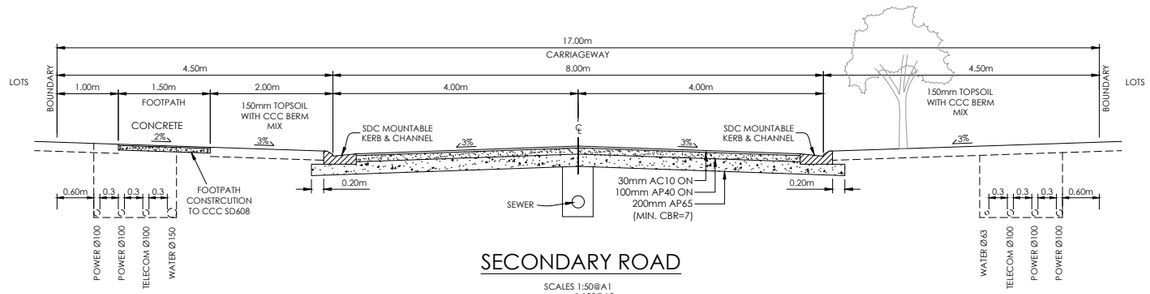
SDC MOUNTABLE KERB & CHANNEL

SCALE 1:10@A1
1:20@A3



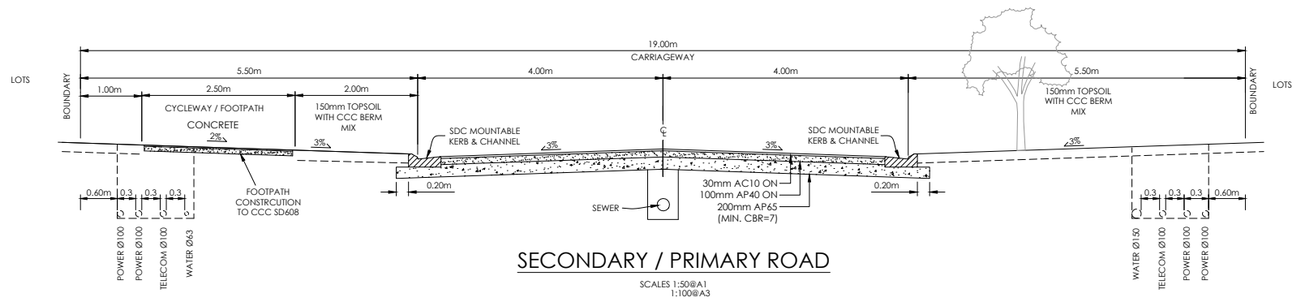
IN SITU MOUNTABLE MEDIAN KERB TO CCC SD603

SCALES 1:10@A1
1:20@A3



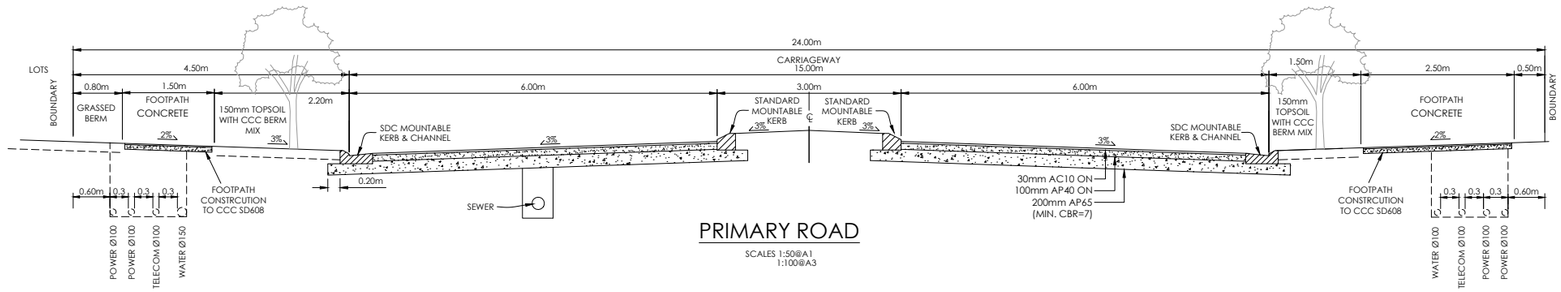
SECONDARY ROAD

SCALES 1:50@A1
1:100@A3



SECONDARY / PRIMARY ROAD

SCALES 1:50@A1
1:100@A3



PRIMARY ROAD

SCALES 1:50@A1
1:100@A3

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1) ALL WORKS IN ACCORDANCE WITH SDC CODE OF PRACTICE PARTS 1-11 STANDARDS, IF STANDARDS ARE UNSPECIFIED REFER TO CCC CSS PARTS 1-7.

2) ORIGIN OF LEVELS
LEVELS ARE IN TERMS OF MEAN SEA LEVEL (LYTTELTON VERTICAL DATUM 1937) PRIOR TO CANTERBURY EARTHQUAKES OF 2010 AND 2011.

3) METAL DEPTHS TO BE CONFIRMED OR INCREASED BY ENGINEER FOLLOWING CHECKING OF SUBGRADE CBR STRENGTH ONCE EXCAVATED.

4) ELECTRICITY & TELECOM SERVICES NOT SHOWN. REFER TO ELECTRICAL / TELECOM STREETLIGHT RETICULATION PLANS FOR RELEVANT DETAILS.

5) EXISTING SERVICES HAVE BEEN DIGITISED FROM SERVICE AUTHORITY PLANS; COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. ALL SERVICES TO BE FULLY SEARCHED & PILOTED PRIOR TO TRENCHING.

6) CARRIAGEWAY & FOOTPATH ACCEPTANCE TESTING IN ACCORDANCE WITH SDC CODE OF PRACTICE PART 8, CCC CSS PART 6 & CCC IDS.

7) FOOTPATH BASECOURSE TESTING - MINIMUM CLEGG HAMMER VALUE OF 25 REQUIRED FOR FOOTPATHS & RESIDENTIAL CROSSINGS. 35 FOR COMMERCIAL CROSSINGS.

8) KERB & CHANNEL BASECOURSE TESTING - MINIMUM DRY DENSITY OF 2100kg/m³ WITH 75% EQUAL OR EXCEEDING 2150kg/m³.

9) ROAD BASECOURSE TESTING - MAXIMUM BENKELMAN BEAM DEFLECTION OF 2.0m WITH 95% OF RESULTS BELOW 1.6mm & RIGHT OF WAY 2.5m WITH 95% OF RESULT BELOW 2.0mm.

10) ALL KERB & FLAT CHANNELS TO BE TO SDC CoP; RD2.0

11) ALL AC FOOTPATHS TO CCC CSS SD607; SD608 CONCRETE.

12) DRAWINGS TO BE DISTRIBUTED AND READ AS A COMPLETE SET. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION

HUGHES
DEVELOPMENTS

	NAME	SIGNED	DATE
DESIGNED BY	JAMIE VERSTAPPEN		
CHECKED BY	ANDY HALL		

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

Faringdon
Far West
Rolleston

SHEET TITLE:

Roading Sections

DRAWING STATUS

For Discussion

SCALE : As Shown DATE : October 2020

CAD FILE : J:\20199\Eng\Drawings\P20199 CROSS SECTIONS.dwg DRAWN : GC

DRAWING No : **P.20199** SHEET No: **E03.2** REVISION : **R0**