Hughes Developments Ltd

Faringdon Oval – Rolleston

Infrastructure Report

20577 R1

February 2022

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Revision History

Rev Number:	Prepared By:	Description:	Date:
Revision 0	Jamie Verstappen	For Referral Application	22/12/21
Revision 1	Jamie Verstappen	Update following review	22/2/22

Document Control

Action:	Name:	Signed:	Date:
Prepared By	Jamie Verstappen		22-2-22
Reviewed By	Ben Fox		22-2-22
Approved By	Jamie Verstappen		22-2-22

Contents:

1. General

1.1 Introduction

This infrastructure report addresses the future infrastructure required to service the proposed Faringdon Oval development area. This area covers approximately 69.4 ha of land and is located on the south western urban limits of Rolleston, Canterbury. It is proposed to subdivide the development area into 1050 residential sections, which equates to an overall density of approximately 15 lots/ha. The site is bounded by Dunns crossing Road to the west, Goulds Road to the south-east and residential development areas 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 and Andrew Mazey with specific regards to servicing the proposal for water supply, sewer and roading. It is the Applicant's intention to construct infrastructure that will meet the demands of this project and also complement 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 6 existing land parcels within the site. The legal descriptions of these sites are; Lots 1 and 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 is estimated to be between 5m and 10m from surface level based on data from bores surrounding the site.

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 Faringdon Oval 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. Further surveys for asbestos have also been recommended if buildings are to be demolished.

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. Remedial works will be programmed to commence immediately upon ownership of the land being transferred to Hughes Developments Ltd.

1.5 Development Staging

The development area will likely be constructed in stages. 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 throughout Rolleston, including future growth areas. This plan has been compiled following network modelling considering areas of predicted urban growth to the year 2050. The plan details a network of water trunk mains with sizes to be progressively installed as the urban limits expand. This plan also shows where bores will be installed or upgraded to provide sufficient supply to the trunk main network. This plan is attached as Appendix B. The proposed Faringdon Oval site covers areas labelled on the plan as ODP Area 12 and SR 9.

The construction of the overall Faringdon Development, including the recently consented Faringdon South-West site, has provided additional up-sized mains along main internal traffic routes which has provided additional redundancy to the surrounding network. Water network modelling of the Faringdon Oval development area will be undertaken during detailed design to ensure the needs of the development and surrounding areas are met with consideration being given to the proposed development density and future land uses within the site.

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 area. This plan has been forwarded to SDC Officer Murray England who has confirmed acceptance of the proposed internal trunk main network. An additional 250mm (ID) pipe line will be included along the main east-west collector road through the development, this will ensure additional security of supply for surrounding communities by providing a large network link between the two bores nearest to the site.

These main pipes will follow main connecting traffic routes but it is worth noting that all other streets will contain water mains of 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 = 69.4ha
- Potential number of lots for modelling purposes = 1050 lots (As shown on subdivision plan)
- With reference to Chart 1 in Chapter 7 of the SDC Code of Practice, the Peak design flow will be 0.125 l/s/lot.
- This equates to 131.25 l/s.
- Assuming that a third of this flow may be going down any one trunk main, the max flow becomes 43.75 l/s.

  Colebrook-White Equation
  Pipe diameter 200mm
  Gradient - 1 in 102.5
  Pipe Roughness - ks 0.15mm
  Results for Full Bore Conditions:
  Velocities 1.393 m/s
  Discharge 43.76 litres/sec

- For a 200mm (ID) pipe this equates to a unit headloss of 1 in 102.5m which is less than the maximum allowable loss detailed in the SDC Code of Practice.

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 which requires an additional 25 l/s of flow to be available at any point within the development area. The water network model will be submitted to SDC for engineering approval as evidence that firefighting supply requirements will be met through each stage of construction.

3. Stormwater

3.1 Design

The landform and contours throughout the completed development will be designed to ensure that secondary flow will be 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. 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 to be constructed in the road corridor will deal with the flows emanating from roads for up to and including the 1 in 50 year ARI 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 1 in 50 year ARI critical duration event over the entire catchment, less a 1 in 10 year ARI 1hr event calculated using the area of contributing private lots. Particular care will be made to ensure that all sumps and pipe infrastructure can accommodate these flows.

The use of rain gardens or other treatment devices prior to discharge to both roadside and individual lot soakpits has been investigated. Rain gardens consist of infiltration media which can be planted

with a variety of plant species which assist in the removal of contaminants and sediment from stormwater. One key benefit of these devices is their relatively small footprint, allowing them to be located in narrow areas such as road berms, rather than requiring larger land allocations as would be required for first flush or infiltration basins. Proprietary treatment devices located within soakpit service manholes have also been considered. All soakpit service manholes will have the ability to be retrofit with proprietary treatment devices in future should conditions regarding stormwater treatment change. It was noted that as well as upfront capital cost, these treatment devices require regular maintenance resulting in an on-going cost centre to the end user. Considering the expected low contaminant levels of stormwater discharge from both roads and private lots, and the depth to groundwater at the site the use of these devices across the entire development is not deemed necessary. The use of rain gardens or other treatment devices within commercial areas is likely to be more viable and effective and will be explored.

Resource consent 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 following the agreed defects liability period.

It is expected that the consent granted will allow all stormwater to discharge to ground ensuring that all sump outlets are trapped as a means of separating hydrocarbons and other floatable contaminants. No other treatment requirements are anticipated. The depth of soakpits will be limited to 3m below ground level to allow the maximum amount of unsaturated depth between the point of discharge and the groundwater level while still achieving good infiltration rates. These conditions replicate those currently in use for the recent stages of the Faringdon development.

Stormwater discharge during construction will comply with the 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

Flood modelling has identified that the site in its current landform may be affected by flooding in both the 1 in 200 year and 1 in 500 year storm events. Surface water may 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 will be fully mitigated. Similar design methodologies have been applied through recent development works in Rolleston which have been shown to successfully mitigate the effects of high rainfall storm events.

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 3 DP 57004 and Lot 1 DP 26880, this water race discharges to ground shortly after entering the Faringdon Oval site (Lot 1 DP 57004). The applicants for Plan Change 76 (located to the north west of the site) are in the process of closing this water race. 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. Approval has been granted by SDC for the closure of this water race following transfer of ownership to Hughes Developments. 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 Selwyn Road 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. SDC have recently updated their sewage scheme for the area in order to free up some capacity in the Selwyn Road Pump Station in the near future. This additional capacity has been allocated to the south west Rolleston area. Updates to the scheme include diverting flow from catchments outside of Rolleston to a new pump station and the installation of a rising main which will connect the new pump station directly to the Pines Wastewater Treatment Plant. These upgrades will continue to ensure there are no concerns around the provision of sewer discharge capacity for continued urban development in the south of Rolleston.

Development of the Faringdon Oval site will be beneficial in providing continued funding through development contributions to progress planned upgrades to the Pines Wastewater Treatment Plant. This will result in the more efficient disposal of wastewater by-products and better environmental outcomes through the addition of various treatment processes not currently in use (ie primary sedimentation, anaerobic digestion). Early completion of any upgrades to the Pines Wastewater Treatment Plant will free up resources to allow council to expedite other upgrades to the existing sewer network which services existing residential areas.

As part of the original Faringdon development, a large sewer pipe was laid from the Selwyn Road Pump 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/ 3.5 = 70.75 litres/sec (Reduced peaking factor of 3.5 as agreed with SDC)
= 6,113,170 litres/day
No of lots = ASF / 220 / 2.7 = 10291 homes

A new pump station, referred to as the South-West Pump Station, is currently under construction as part of the Faringdon South-West development site which will discharge directly to this existing gravity sewer pipe. The South-West Pump Station has been designed to be constructed in two stages, with the initial stage servicing up to 400 new connections, and the second stage having the capacity to service a catchment area of approximately 222 ha. The majority of the Faringdon Oval development area is included in the catchment for this pump station, along with additional residential development areas as shown in the South West Sewer Catchment and Layout Plan attached as Appendix E. Details regarding the catchment and layout of sewer infrastructure shown on this plan are in line with the most recent sewage scheme and have been agreed with SDC.

The gravity sewer network currently being constructed through the Faringdon South-West development area has been designed to accommodate flow from upstream catchment areas. This gravity network will be extended to the boundary of the Faringdon Oval site at two locations and will be installed at a depth which will allow the site to be completely serviced by gravity. This has been verified by preliminary modelling through the proposed Faringdon Oval roading layout, the outputs of this modelling have been reviewed and accepted by SDC as part of the design acceptance for the downstream network.

4.2 Sewer Design

Referring to the sewer catchment plan, the blue catchment includes most of the proposed Faringdon Oval development area. Part of the Faringdon Oval site will gravitate to the existing sewer on East Maddisons Rd but the majority will be serviced by the South-West Pump Station which will serve the 222 ha blue catchment. The second stage of construction of the South-West pump station is expected to commence in the third quarter of 2022, with final commissioning early in 2023. The area

of the Faringdon Oval site inside the blue catchment is 68.9 ha which equates to approximately 31% 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 = 222ha

At an average density of 14 sites per hectare over the catchment that equates to 3108 lots. Considering the consented development density of the adjacent Faringdon South-West area this is considered conservative.

Average sewer flow
ASF = 3108 lots x 220 l/person/day x 2.7 people/lot

ASF = 1846 m^3/day
ASF = 21.4 l/s

Peak wet weather flow
Combined P/A and SPF ratio of 3.5 as agreed with SDC.

MF = 21.4 x 3.5
MF = 74.8 l/s = Pump rate

The flows will be pumped to the head of the 525mm diameter gravity main on Selwyn Road, approximately 940m to the east of the South-West Pump Station. A new 250mm ODPE rising main will be installed along Selwyn Road as part of the second stage of the pump station installation. The pump station will also be set up to pump directly into a rising main located within Selwyn Road directly to the Pines Wastewater Treatment Plant during emergency situations.

SDC has indicated emergency wastewater storage will be required to service the South-West Pump Station catchment which can be activated in the event of pump station failure. The target quantity of emergency storage to be provided is 8 hours of average sewage flow, this can be calculated as 616m3 based on an average flow rate of 21.4 l/s from the 221.82 Ha catchment. It has been calculated that there is 118m^3 of storage available within the upstream gravity pipe and manhole network below the overtopping level of 33.59m (pipe soffit SS.30A). The target residual volume to be provided is 498m^3.

Emergency storage is to be provided by underground fibreglass storage tanks located within the South-West Pump Station site which is currently under construction. A float switch will be provided within the wet-well at the appropriate elevation to alert SDC operations staff when the emergency storage has been activated. A 150mm vent pipe will connect all storage tanks to an odour treatment device, this vent pipe will be located at the opposite end of the tanks to the inlet pipes to ensure air flow through the entire storage system.

Sewer mains will be laid throughout the development site within the road network. The size and depth of mains will be determined based on their respective catchments. Gravity sewer pipes entering the development will be approximately 4.2m deep to ensure the entire catchment can be serviced. 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.

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 assessments of utility network requirements will proceed if the development is approved as a referred project. This will include for potential substation sites and similar large scale infrastructure items, these items will not affect the residential yield of the development.

6. Roading

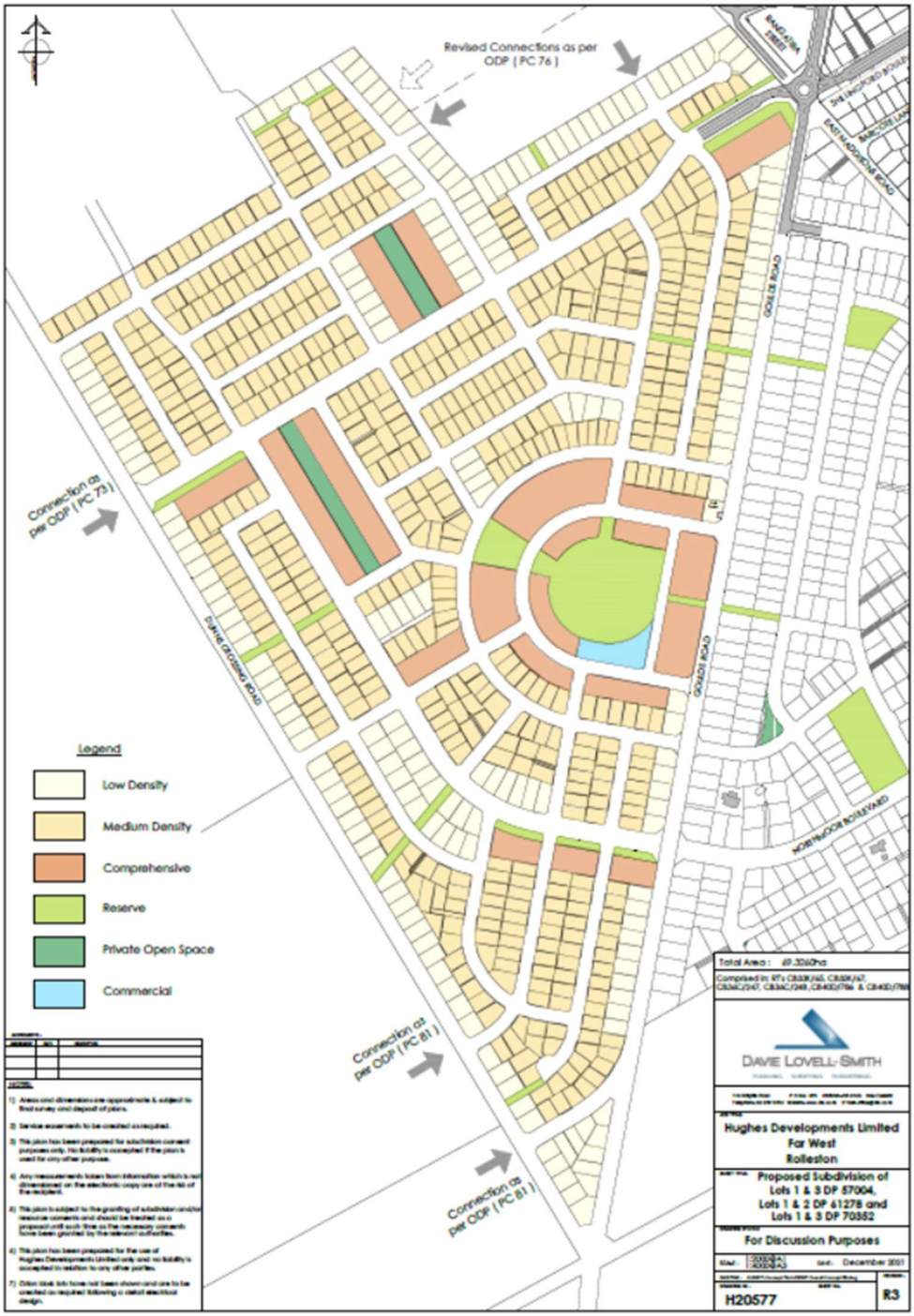
The Faringdon Oval development area will incorporate a number of collector roads in line with the CRETS network. These include an extension of Shillingford Boulevard between East Maddisons and Dunns Crossing Roads and the extension of the collector road which traverses the Faringdon South-West development site to connect to the future Shillingford Boulevard. The locations and alignments of these roads are largely dictated by the adjacent Faringdon development areas. These roads are shown as primary routes in the figure shown below and will be continued through the Faringdon Oval 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 Faringdon Oval 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. Consideration has been given to the development layouts of adjacent land to the north, in particular the roading links to the site boundaries.

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 15m to 24m and formed widths between 7m and 12m. 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.



Faringdon Oval Roading Concept Plan

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 detailed 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 Faringdon Oval development area may exceed 150,000m³.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 4.2m below ground level.

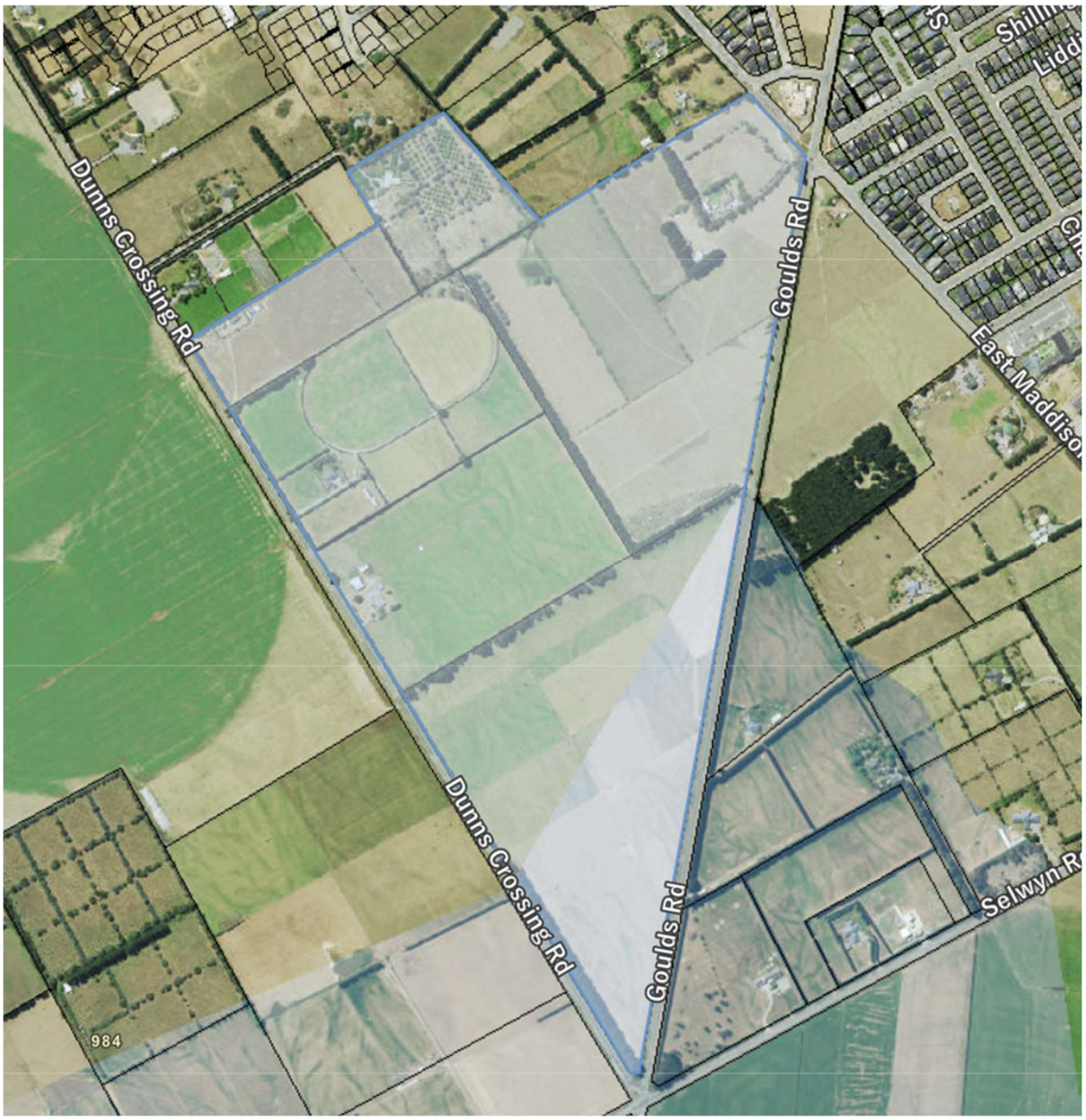
All topsoil on site will be stripped, stockpiled and replaced on the land immediately following bulk earthworks. All disturbed topsoil will be re-sown with Council specification grass seed mixes. A balance of cut and fill will be maintained where possible and removal of material from site will be kept 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 ECan Guidelines and the discharge during construction will be undertaken either under Council's global discharge consent or in accordance with ECan rules. All dust created on the site will be controlled by water cart or other such Council approved methods.

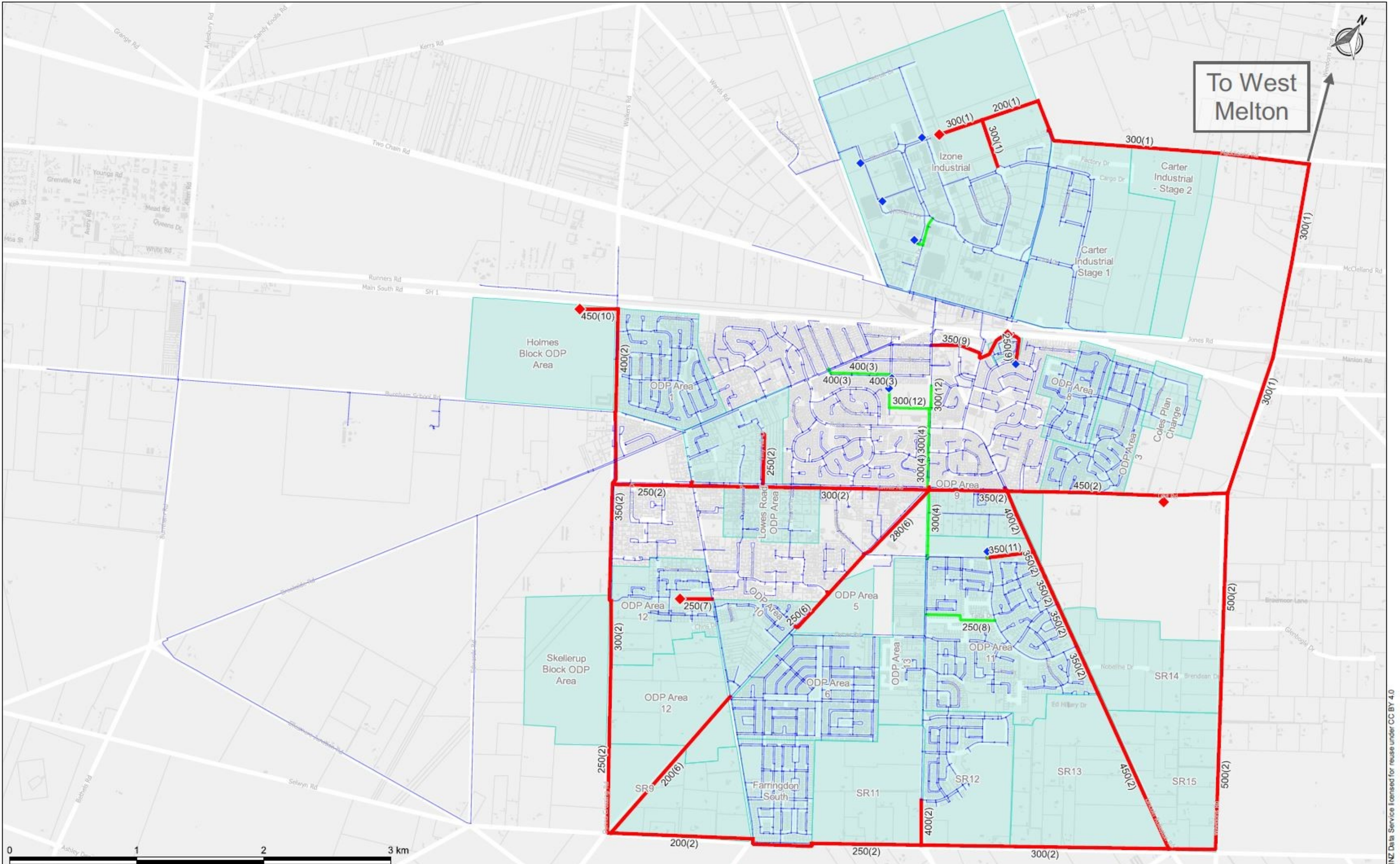
All bulk filling within residential sites will be undertaken in accordance with NZS 4431:1989. All fill testing will be carried out by an independent laboratory.

Jamie Verstappen
Chartered Professional Engineer
Davie Lovell-Smith Ltd

Appendix A- Location Plan



Appendix B – Water Supply Plans



LEGEND

Growth Projections
- 2050+

WS Mains - DN(Scheme#)
- New
- Upsized
- Existing

Sources
- New / Upgrades
- Existing

CLIENT: Selwyn District Council

wsp
Christchurch Water
+64 3 363 5400
PO Box 1482
Christchurch 8140
New Zealand

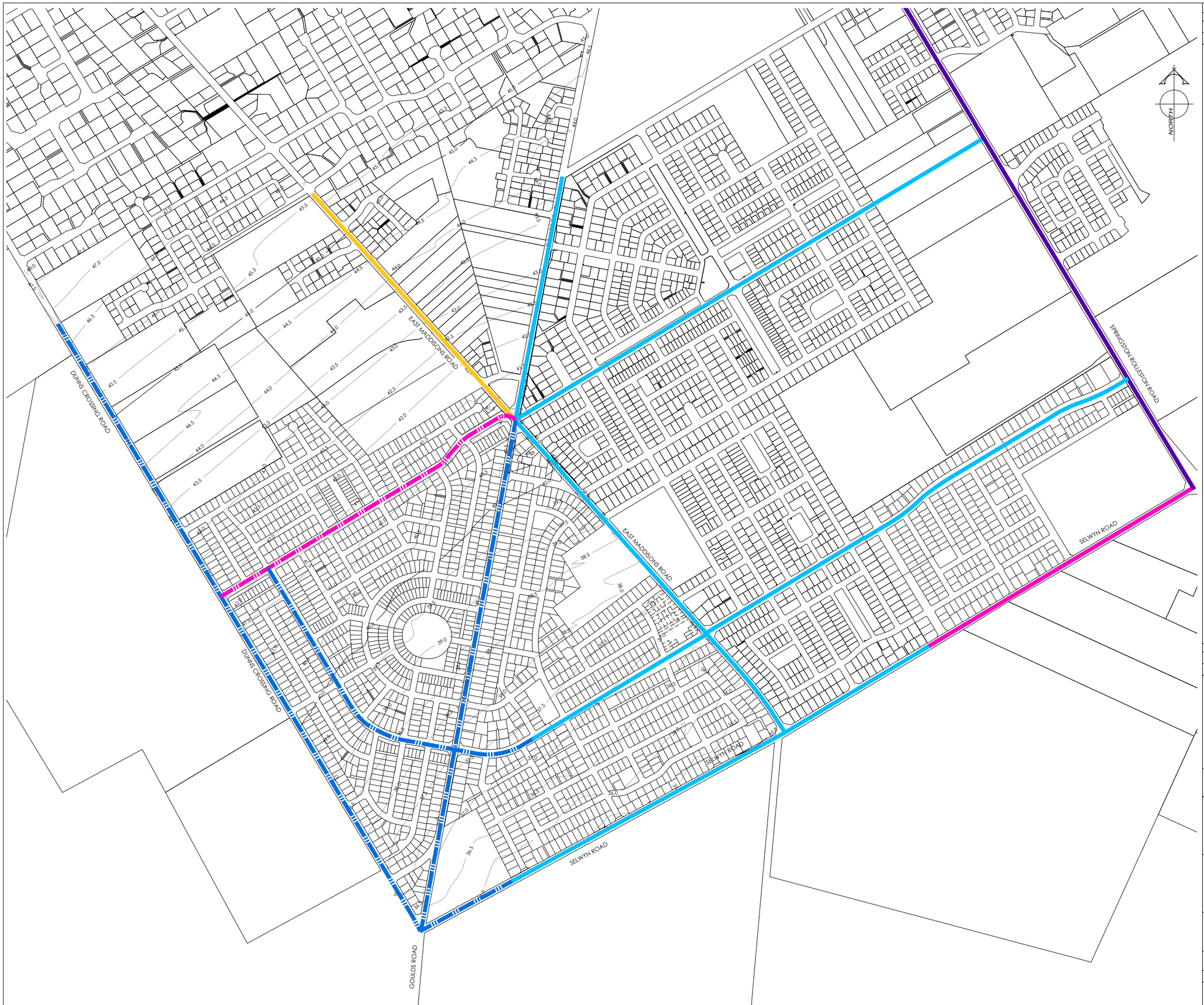
DRAWN	APPROVED
SJD	DJ
SHEET NUMBER	SCALE
1 of 1	1:27,665

PROJECT: Selwyn District Council
Water Supply Master Planning 2020 - 2050

SHEET: Rolleston Master Planning & Water Supply Upgrades

PROJECT NUMBER	REVISION DATE	REVISION
3-C1831.07 / 00150	01/04/2021	R1

Original Sheet Size: A3 [W = 420, H = 297] Plot Date: 2021-04-01 12:48:24 by Dellis, Simon (chsxd1) File Ref: \\corp.pbwan.net\ANZ\ProjectsNZ\3c\3-C1831.07 Update Selwyn Water Master Planning to 2\Home\500 Work in Progress\503 Reporting Outputs\SDC Growth Reporting Rolleston Only 2021-03-31.qgz



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION
R1	17/01/22	WATER LAYOUT AMENDED

NOTES :

Legend

- Proposed 250mmØ
- Existing 250mmØ
- Proposed 200mmØ
- Existing 200mmØ
- Existing 375mmØ
- Existing 450mmØ

	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 Water Supply Rolleston

SHEET TITLE:

Proposed Trunk Mains

DRAWING STATUS

For Information

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

DATE : January 2021

CAD FILE : J:\20557\Drawings\H20557 Water Supply Trunkmains_R1.dwg

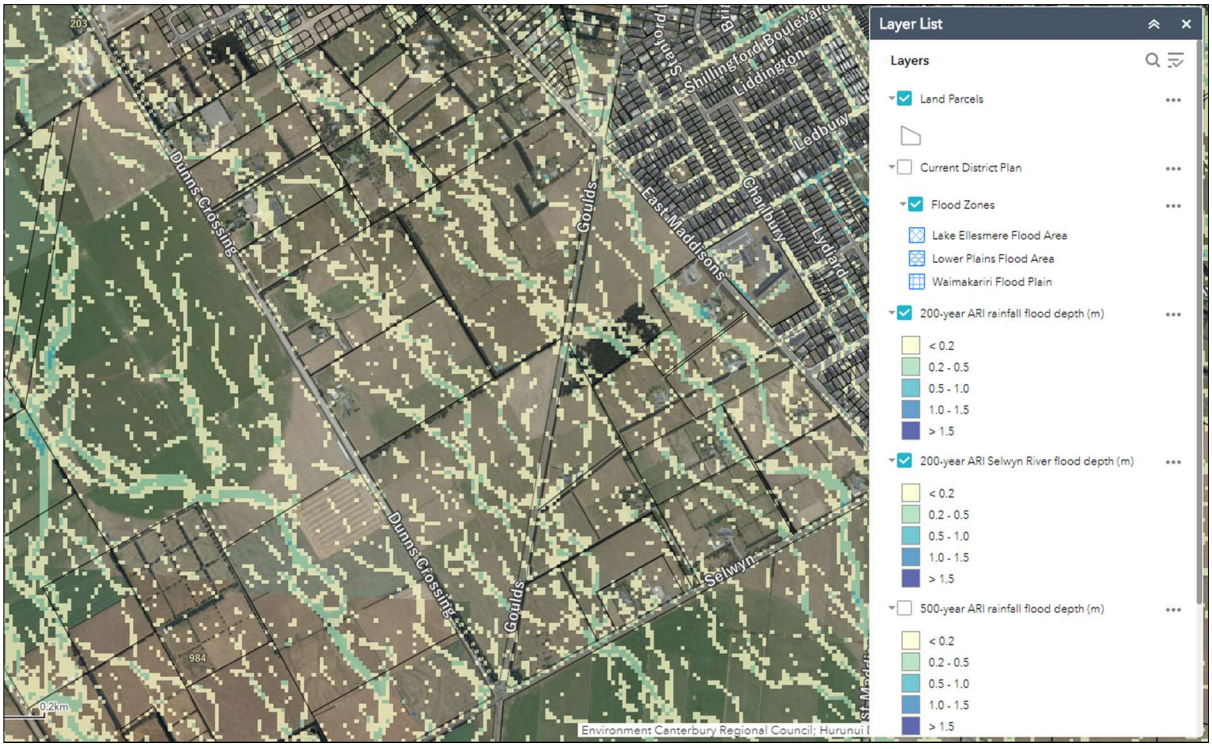
DRAWN : GC

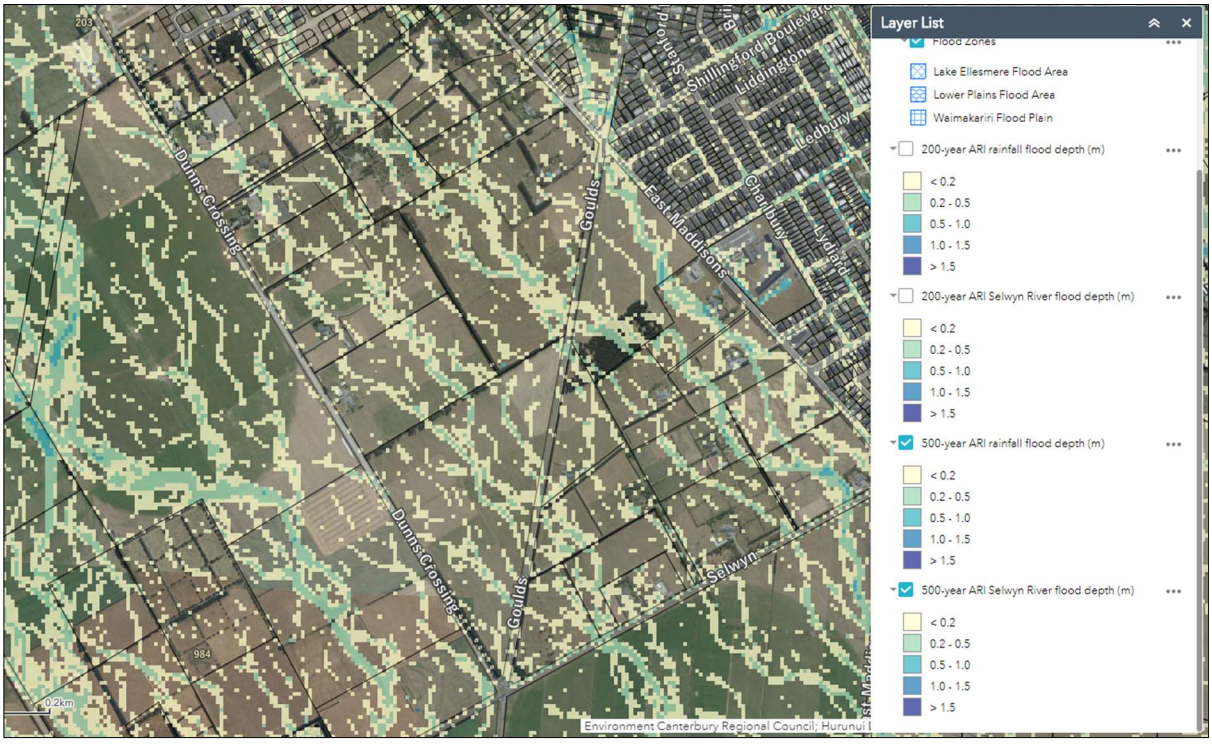
DRAWING No : **H20557**

SHEET No: **E06.0**

REVISION : **R1**

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.

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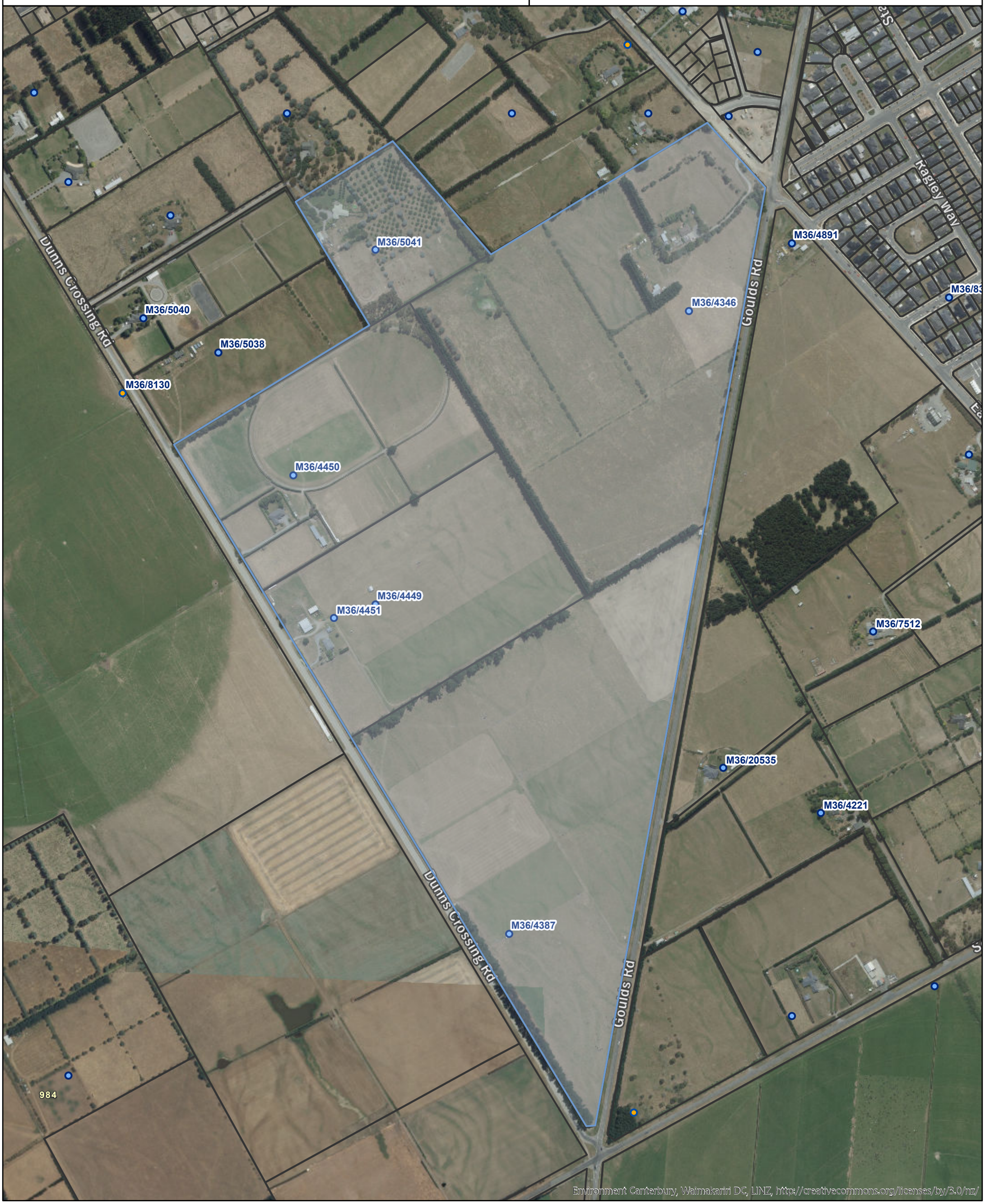
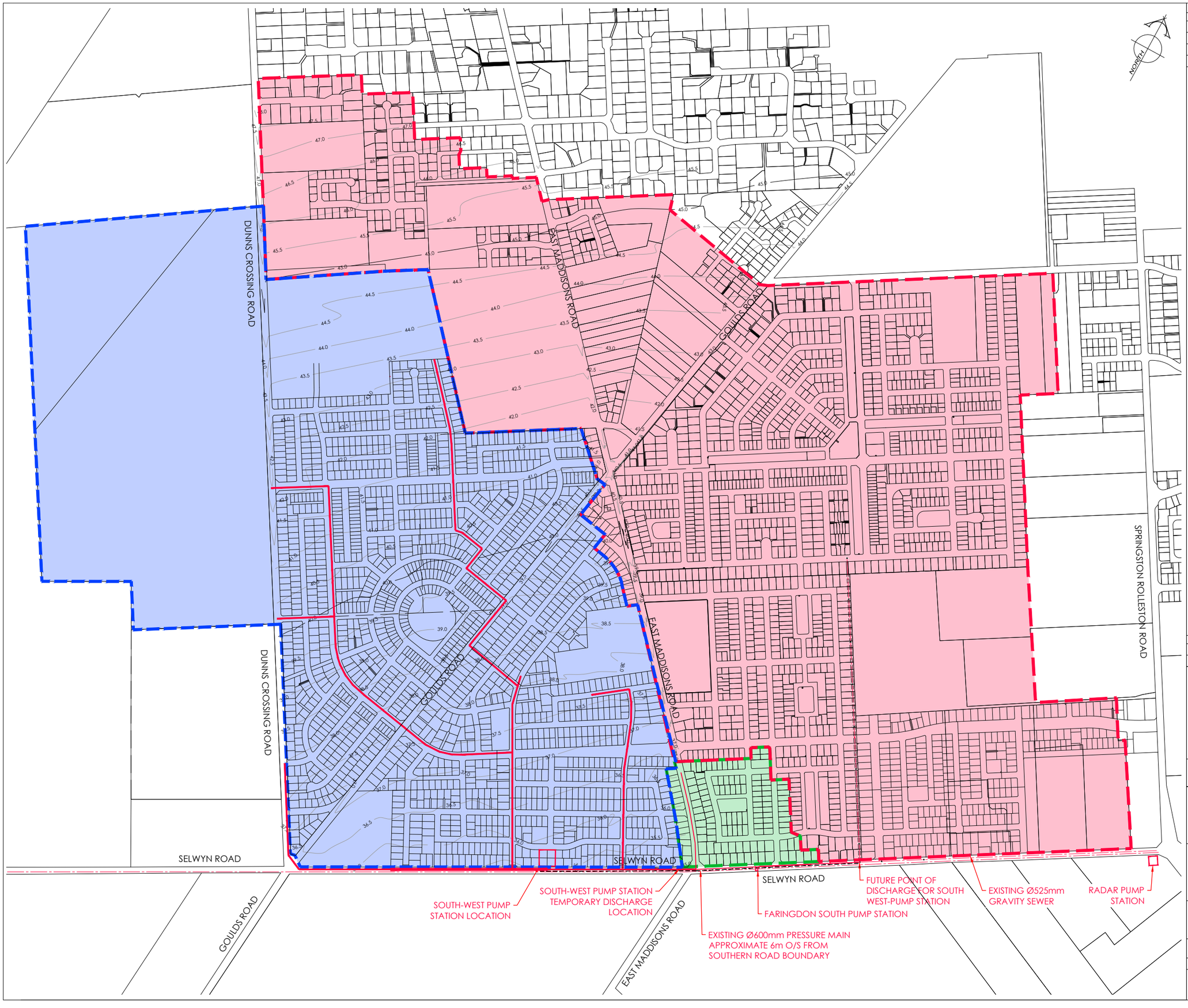


Appendix E – Sewer Catchment Plan



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION
R2	30.04.21	LAYOUT & SEWER PUMP STATION LOCATIONS UPDATED
R3	18.05.21	LAYOUT UPDATED
R4	20.08.21	LAYOUT UPDATED
R5	22.02.22	THE OVAL BOUNDARIES & SEWER LAYOUT UPDATED

NOTES :

TOTAL CATCHMENT AREA:

GRAVITY CATCHMENT AREA = 254.58ha

PUMPED CATCHMENT AREA = 221.82ha

LIFT STATION 1 CATCHMENT AREA = 10.00ha

SERVICES

EXISTING SEWER — STD. MH

FUTURE PRESSURE SS

FUTURE GRAVITY SS — STD. MH

CRITICAL SEWER MAINS

	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

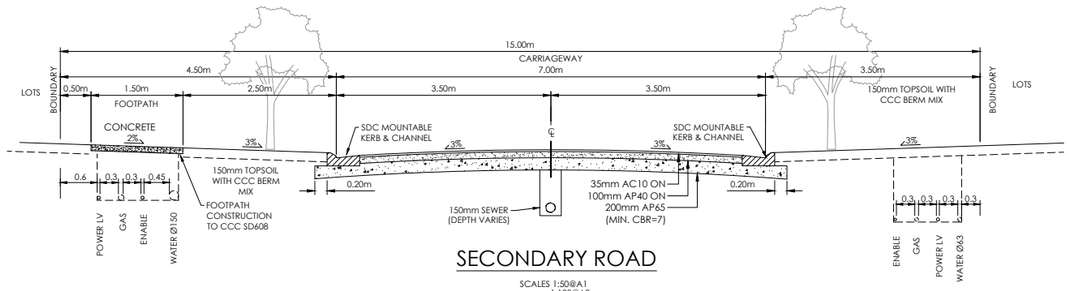
For Information

SCALE : 1:5000@A1 1:10000@A3 DATE : February 2022

CAD FILE : J:\20256\ENG\Drawings\E20256_South West Sewer Catchment_R5.dwg DRAWN : DG

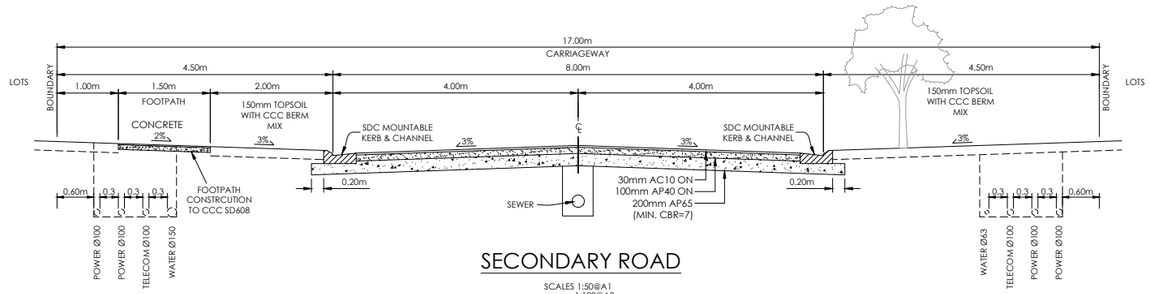
DRAWING No : **E.20256** SHEET No: **CP01.0** REVISION : **R5**

Appendix F – Typical Road Cross Sections



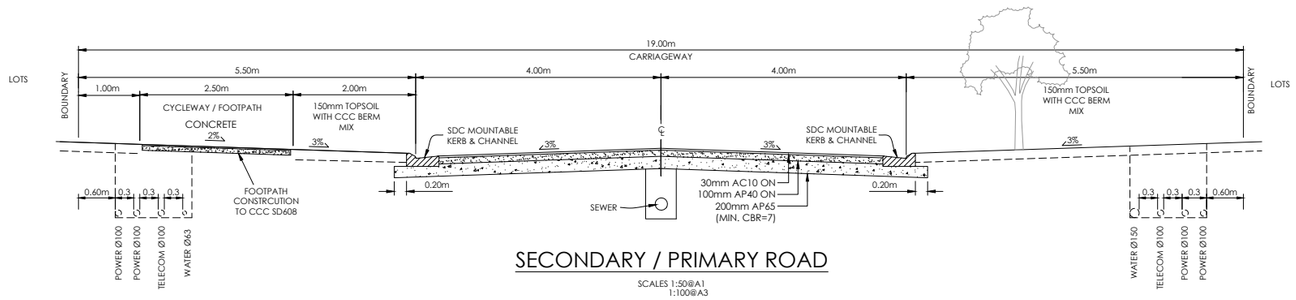
SECONDARY ROAD

SCALES 1:50@A1
1:100@A3



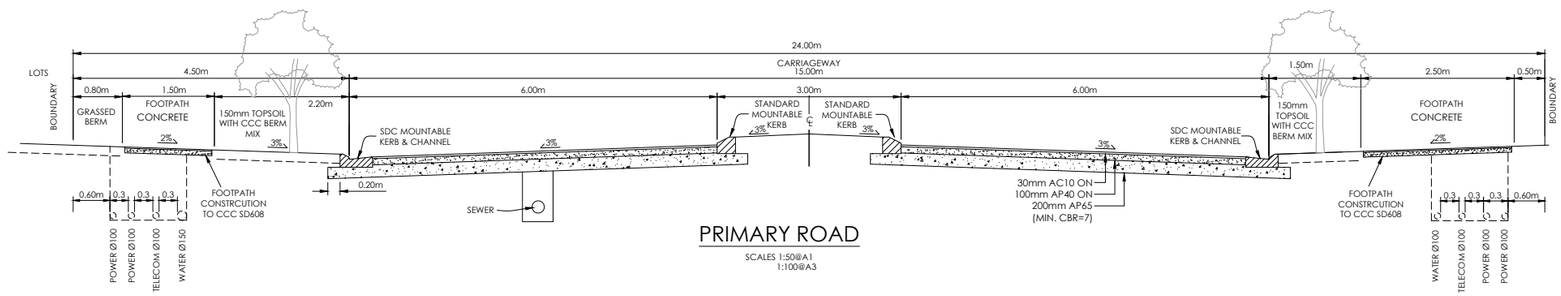
SECONDARY ROAD

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; FD2.0

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 Oval Rolleston

SHEET TITLE:

Roading Sections

DRAWING STATUS

For Consent

SCALE : As Shown DATE : December 2021

CAD FILE : J:\20577\Concept Plan\H20577 Oval Cross sections Concept.dwg DRAWN : GC

DRAWING No : **P.20577** SHEET No: **E03.0** REVISION : **R0**