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

Infrastructure Report
Revision 3

Hughes Developments Ltd

Halkett Road • West Melton

H19404

May 2021

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Contents:

This Design Report has been:

Prepared by:

Jamie Verstappen 17th May 2021

(Name/Sign/Date)

Reviewed by:

Andy Hall 17th May 2021

(Name/Sign/Date)

1. GENERAL

1.1. Introduction

This preliminary infrastructure report addresses the future infrastructure required to service the proposed development of approximately 20 Ha of land located at West Melton, Canterbury. The land is located on the eastern side of the West Melton Township.

It is proposed to subdivide the site at a density of 10 Lots/Ha, therefore infrastructure loadings will be based on a total of 200 new residential sites. The property is not currently connected to Selwyn District Council (SDC) drainage and water supply infrastructure.

The site is bounded by Halkett Road to the North, Gainsborough development on the west, West Coast Road (SH73) to the south and lifestyle blocks to the east. A site plan is attached as Appendix A.

Consultation has been undertaken with SDC staff in regard to the infrastructure requirements for the site. Consultation with service designers and service authorities has been undertaken to determine services requirements for the proposed development.

The proposed subdivision infrastructure construction will comply with the requirements of SDC's Code of Practice and all future consents relating to the site to ensure vesting in SDC upon completion.

The purpose of this report is to provide an assessment of the servicing of the proposed residential development with respect to road access, wastewater, water supply, stormwater, electricity and telecommunications infrastructure and to identify any issues that may prevent or substantially delay the efficient provision of this infrastructure.

1.2. Legal Description

The legal description for the site is Lot 1 DP34902 at 163 Halkett Road and Lot 2 DP 34902 at 1066 West Coast Road.

1.3. Topography

The topography of the site is relatively flat and level, with a slight fall towards the eastern side of the site. The maximum variation in ground level across the site is approximately 2.4m. There is an existing equestrian track located within the site and various rural access tracks across the land.

The existing site area is predominantly in pasture and is currently in use for rural purposes. Large mature hedges are located along the eastern and southern boundaries of the land. There is also a large amount of hedge line within the land, including along the internal boundary of the site.

Please refer to the enclosed Site Contour Plan in Appendix B of this report for existing contour levels across the site.

1.4. Soils

Two geotechnical investigations have been undertaken for the site: 163 Halkett Road in July 2017 and 1066 West Coast Road in July 2018. Both geotechnical investigations were undertaken by ENGEO and include information regarding the soil profile beneath the site, groundwater levels and the anticipated seismic performance of the site. Information was gathered from the relevant available geotechnical databases and site investigations including both hand augers and machine excavated test pits.

These geotechnical investigations conclude the soil profile beneath the site can be describes as: 0.1m to 0.4m of topsoil overlying 0.1m to 1.8m of silts and sands overlying natural medium dense to dense gravels to several tens of metres depth. Groundwater is indicated to be between 21m and 24m below ground level.

The Canterbury Earthquake Recovery Authority has categorised the site as 'N/A Rural and Unmapped however due to the ground conditions beneath the site and the relatively low groundwater depth the site is anticipated to perform as equivalent TC1. There are no know or mapped faults in the immediate area of the site.

Please see the geotechnical investigations for complete information regarding the geotechnical conditions at the site.

1.5. Site Contamination

A Preliminary Site Investigation was undertaken by ENGEO for the 163 Halkett Road property in June 2016. This investigation concludes the site has been used for agricultural grazing since before 1940 and no evidence of wider land use before this date is available. Recommendations were made to undertake asbestos surveys of the existing buildings prior to their removal. Four burn areas were encountered on site, these burn areas are to be removed and their removal is considered a permitted activity. The remainder of the site is considered highly unlikely to have been impacted by its past uses and no further investigation is required to support the proposed change of land use.

A Preliminary and Detailed Site Investigation was undertaken by ENGEO for the 1066 West Coast Road property in July 2018. This investigation identifies the site has been used for agricultural grazing from circa 1940 and residential land use with a trotting track and various stables since the 1980's. Samples were taken from imported fill material found on the site and testing has confirmed contaminants are below the site specific regional background criteria and applicable NES human health criteria. It is recommended that further asbestos surveys and testing be untaken around the existing buildings within the site prior to their refurbishment or removal.

2. EARTHWORKS

2.1. Consent Requirements

Consent will be required from SDC to undertake earthworks at the site for the purpose of residential development. Consent will also be required from Environment Canterbury to enable discharge to ground of stormwater during the construction period.

2.2. Construction

From the geotechnical investigations for the site we would expect to find interbedded variable density sands, silts and gravels underlying variable depth topsoil across the site. It is expected that all soil encountered within the site will be suitable for filling to residential development standards.

It is expected that the construction of the subdivision works will be possible in any season, however excavation over summer months in this area along with these soil conditions wind erosion may be an issue. Mitigation measures such as an onsite water cart will need to be employed to control dust.

It should also be noted that during the construction process the containment and disposal of potentially sediment laden stormwater flows would need to be carried out. To ensure this is managed appropriately an erosion and sediment control management plan must be implemented. This plan will also need to be submitted and approved by both SDC and Environment Canterbury.

It is anticipated that around 50,000 m^3 of soil will need to be cut and filled to establish building lots and roading within the site for the proposed development density. This will ensure building platforms are protected from surface water and flooding and allow adequate drainage of the development area.

All earthworks are required to be carried out in accordance with NZS4431:1989 and will involve the stripping of topsoil to stockpile, the bulk cut to fill earthworks and finally reinstatement of the topsoil and grass. We would expect that the earthworks will be a balanced cut and fill and no material will be removed from site unless it is of an unsuitable nature.

3. ROADING AND ACCESS

3.1. Existing Road Network

A new road access is proposed from Halkett Road. It is likely the section of Halkett Road fronting the site will need to be upgraded as part of any development works. This upgrade work may include any of the following; carriageway widening, the addition of kerb and channel, widening for parking and stormwater drainage works. This will be confirmed at the consenting stage. A cost share agreement may be entered into between the developer and SDC to undertake further roading upgrades in conjunction with the development works.

The current speed limit along the Halkett Road frontage is 80km/h. This speed limit is reduced to 60

km/h at the western side of the site. It is expected this speed restricted zone would be extended beyond any future development frontage.

A roading link to the site from SH 73 is also proposed to ensure adequate traffic permeability through the development. The location of this road link is shown on the ODP for the site. Consultation with NZTA has been undertaken regarding this new road connection to determine the layout and design requirements of the new intersection and the proposed road network within the development site. NZTA has indicated a left in, left out intersection at this point will be achievable following the establishment of other roading links from the development area. No direct lot access will be provided from SH 73 and it is understood the applicant will apply for noise mitigation measures for properties fronting this road. Complete details regarding NZTA consultation are included in the Novo Group Memo dated 29th March 2021, this Memo is included in the main application for the site.

A roading link to the existing Gainsborough development at the western boundary of the site is also proposed to provide for connectivity to the existing West Melton residential and commercial area. This road link will be designed and constructed in accordance with District Plan requirements and include a 2.5m shared pedestrian footpath and cycleway.

A development of this size will increase the traffic loading on Halkett Road and the surrounding road network. The intersection of Halkett Road and SH 73 has been identified as a high risk intersection and as such may require some upgrade work. As a minimum this work would likely include local carriageway widening to allow space for a right turn bay off SH 73 into Halkett Road. A merging lane for vehicles entering SH 73 from Halkett Road along with a speed restriction through the intersection may also be recommended. An independent traffic audit of this intersection will be required to determine the extent of upgrade work required for this area. SDC may also require the traffic audit to investigate other intersections in the area which may be affected.

3.2. Road Design

The internal road and carriageway widths will comply with the SDC District Plan (Township), in particular Table E13.8, all internal roading will be classified as Local Roads - Living. The pavement depths will be designed to suit the soil conditions and roads will be surfaced with asphalt. Some roading features such as thresholds, intersections and cul-de-sac heads may be surfaced with cobblestones or other suitable materials at the discretion of SDC. Footpaths and cycleway access will be provided throughout the development site as shown on the ODP. Footpath links along both Halkett Road and SH73 will also be considered following further consultation with NZTA and SDC. Direct lot access from both SH73 and Halkett Road has not been considered.

Two future road links are proposed to extend to the eastern boundary of the site which will allow for future development in this direction. These road links may be constructed as part of the development works or be held as vacant lots by the developer to be vested as road in future if the need arises.

3.3. Gradients

Due to the flat site topography, road gradients will be minimal. To ensure the roads drain adequately, kerb and channel gradients will be no shallower than 1:500 and crossfall will be provided

on all new pavements in accordance with the SDC Code of Practice. The road levels will be set to ensure all flood flows are managed and directed away from building platforms within the road corridor. Secondary flow in the event of flooding is able to be directed off site. The proposed roading layout within the development site allows for the safe conveyance of flood flows down contour and away from the development area towards the south and east.

4. STORMWATER

4.1. General

It is expected soil conditions on site will be suitable for stormwater disposal to ground. Stormwater emanating from roofs and hardstand areas on private lots will be directed to ground within the lot in accordance with the New Zealand Building Code.

All other stormwater from site will be directed to roadside kerb and channel by ground contour and collected in channel sumps. Stormwater can then be discharged to ground via council vested soakage facilities located within road berms and utility reserve areas. All flow over and above the 50 year ARI will be directed away from the development area by secondary flow channels towards the southern and eastern road connections.

Due to low contaminant levels anticipated in the stormwater runoff for the residential development and the depth to groundwater at the site no treatment requirements are expected other than submerged outlet sumps. Submerged outlet sumps will trap floatable contaminant and rubbish to prior to entering the stormwater soakage facilities. No soakage facilities will be installed within 100m of the community water supply well to be installed at the south western corner of the site to mitigate the risk of any contamination from stormwater discharge.

All stormwater infrastructure is to be constructed in accordance with the SDC Code Of Practice to enable it to be vested upon completion of the construction defects period.

4.2. Environment Canterbury Requirements

Selwyn District Council currently holds a global stormwater discharge consent for the existing West Melton residential area however as the development site is outside of the consent boundaries a new consent will be required. A stormwater discharge consent will be applied for in the developers name which will be transferred to Selwyn District Council following the nominated defects period. This consent will cover the discharge of stormwater emanating from roads, reserves and lot areas for all storm events up to and including the 50 year ARI. A compliance assessment against the consent will be required prior to the consent being transferred.

Consent for the discharge of construction stormwater will also be sought from ECan to be used throughout the construction period. Construction stormwater will be captured on site and conveyed to temporary soakpits located in accordance with the ESCMP and ECan erosion and sediment control guidelines prior to discharge to ground.

It is noted that there are several domestic supply wells located in the rural land to the east of the site in the direction of groundwater flow. Well depths range from 36m to 78m within 300m of the site. Both operational phase and construction phase stormwater are expected to have no adverse effects on these supply wells.

4.3. Flood Flows

Selwyn District Council has with the help of Environment Canterbury identified land across the Selwyn District which may be susceptible to flooding. The proposed development site has been shown to be affected by flooding in both the 1 in 200 year and 1 in 500 year storm events.

An assessment of the existing flood flow channels within and surrounding the site has been undertaken by Davie Lovell-Smith Ltd to determine any works to mitigate these potential flood flows. Three flow channels were identified within the site and all are able to be fully mitigated by filling of lots and providing for secondary flow channels through road corridors and reserves. Secondary flow channels for flow over and above the 1 in 50 year event will need to be considered in the development of the future subdivision layout.

5. WASTEWATER

5.1. Existing Wastewater System

An existing sewer pumping station is located at the south western corner of the site on Rossington Drive. This pumping station serves all existing residential areas in West Melton township. Initial consultation with SDC has indicated there is additional capacity available in the local sewerage system and rising main; however some changes will be required to ensure adequate downstream system capacity is available.

The current rising main conveying flow from the pump station is sized 225mm and has a pressure rating of PN10. SDC has indicated that the pressure rating of the pipe is the limiting factor for sewer flow from the pump station. Upgrading the capacity of the wastewater pumps to a maximum of 70m pressure may be considered to ensure additional future flows can be accommodated. The rising main links the West Melton pump station to the Rolleston gravity wastewater network approximately 9km away.

We have been informed that the flow rate available through the rising main at maximum operating pressure is 44l/s. This equates to a catchment loading of 1276 households using the SDC Code of Practice flow calculation method.

There is currently 921 consented connections within this pump station catchment, therefore an additional 355 connections can be accommodated by the current pumping arrangement. We understand that 84 additional sites are being sought at Wilfield development which leaves capacity for 271 future residential lots. The maximum sewerage flow for a development size of 200 lots is expected to be 6.875 l/s, or approximately 15.7% of the total available pump station flow.

SDC has also indicated that additional emergency wastewater storage may be required within the Rossington Drive pump station catchment as a result of further development. The volume of additional storage required will be determined at detailed design stage. It is likely the combination of pipework, structures, lift station and/or residential pump reservoirs installed in the new development will account for a large proportion of the required storage.

A 225mm uPVC gravity sewer connection has been provided to the site area approximately mid-way along the western boundary for future connection. This pipe is located in an easement through Lot 109 DP 402313. It is anticipated a proportion of the wastewater from the development site will discharge into this pipe system.

5.2. Wastewater Design

Due to the flat contour of the site only a proportion of the development area will be able to drain via gravity to the existing network. Initial estimates are that approximately 50% of the site will be able to drain into the existing network via gravity; this area is located along the western boundary of the site. This will mean some form of wastewater pumping arrangement will need to be installed to enable the entire development site to be serviced. The two options we will consider during detailed design are a low pressure sewer system to property boundaries and an additional pumping station to vest in SDC.

Initial indications from Council are that the use of a low pressure sewer network to service the balance of lots that cannot use a gravity pipe system will be allowable. This low pressure sewer system would rely on small pump units at each property boundary that would pump to a common PE rising main located in the road berm that discharges to the gravity pipes. The cost of operations and maintenance of the pump units would be the responsibility of the home owner. The cost of operations and maintenance of the pressure pipe located in the road reserve would be the responsibility of council. The majority of the construction cost in this solution is in the installation of boundary pumping kits.

Alternatively a sewer pumping station will be required within the site to convey wastewater to the existing Rossington Drive pump station at the south western corner of the site. This will allow the eastern side of the site to be serviced via gravity sewer mains located in the road carriageways and laterals to within the property boundaries. It is expected the largest sewer main pipe required will be 150mm uPVC and all laterals to residential lots will be 100mm uPVC. This new pump station and gravity sewer network will be required to be built to SDC standards in order to be vested in Council upon completion.

5.3. Wastewater Rising Main Outfall

SDC has indicated that the existing gravity system which the West Melton rising main discharges to is nearing capacity. This outfall is located at Walkers Road on the north western side of Rolleston. Currently all sewerage pumped into this gravity pipeline flows to a pump station at Burnham School Road. Upgrade works of this gravity pipeline or an alternative point of discharge will need to be considered some time in future if flows into the system are increased. It is noted that proposed further development of Rolleston Prison will also increase flow through this system. Two alternative

discharge options are currently being considered by SDC.

An alternative outfall into the gravity sewer system located at Hoskyns Road is being considered by SDC. This outfall location would be near the Maddisons Road intersection. SDC has indicated the gravity sewer system from here has adequate capacity to accommodate additional flow produced by future West Melton development; however this discharges to a pump station located at Jones road which is nearing capacity. This option would require the installation of approximately 1850m of new 225mm diameter sewer rising main along Hoskyns Road to connect with the existing rising main at West Melton Road.

SDC have indicated an extension to the existing sewer rising main which will convey sewage directly to the Pines treatment plan is also an option. This will require an additional 5750m of 225mm sewer rising main to be installed south along Walkers Road and beneath the railway and SH1. This option is favourable as it frees up capacity within the Jones Road pump station and existing gravity network.

Each of the above options will likely require pump upgrades within the Rossington Drive pump station due to the increase in rising main length. SDC have indicated a portion of the costs associated with the above upgrade work will be recovered by development contributions split between all new lots within the West Melton sewer catchment. These costs will be determined when the district plan is reviewed.

6. WATER SUPPLY

6.1. Existing Water Supply Network

SDC has existing water supply reticulation in the area, supplied by several groundwater extraction wells. The Council well nearest to the site is located in the Gainsborough reserve located on Rossington Drive. This well is currently connected to a reservoir consisting of 10 above ground water tanks located at the south western boundary of the site on land currently owned by Hughes Developments Ltd. The current flow reliably available from the Rossington Drive well is 9 l/s. SDC has indicated that the current local water pressures are at, or above the council suggested pressure range.

Council water supply is not currently provided to either of the lots within the proposed development area. One well is currently active within the site for domestic and stock water supply, this well is labelled M35/1013 and details have been provided in Appendix C. It is expected this well will be abandoned during development works.

6.2. Proposed Water Supply Network

The estimated water supply loading of the proposed development is 800 m^3/ day, this is based on a conservative average household usage of 4000 l/ day. This daily flow volume equates to 9.3 l/s, however during peak times this flow rate will be significantly higher.

It is understood that the proposed development will require more water than is currently available

within the existing community water supply scheme. This can be managed by increasing the capacity of the existing reservoir facility. SDC has indicated they would like to remove the current multiple tank storage arrangement and replace this with a single steel tank reservoir with at least 400 m^3 of storage. Additional land for this new reservoir would be required and SDC has indicated there would be funding available for the purchase of land for this purpose. The most logical position for this reservoir facility would be adjacent to the current location of the tanks, within the proposed development area. The proposed utility lot to be provided for this purpose is shown on the OPD.

In addition to the provision of a new reservoir facility SDC has indicated a new bore will be required to service the development site and support the surrounding water supply network. This bore is proposed to be located adjacent to the new reservoir facility within the utility lot. A groundwater protection zone of 100m radius from the bore will be provided. Stormwater emanating from new roads within this zone will be conveyed via roadside channels and a stormwater pipe network to discharge to ground outside of the groundwater protection zone.

In addition, SDC has recently been undertaken work to connect the Edendale and West Melton water networks. The Edendale well is capable of supplying approximately 35 l/s, with a local loading of approximately 10 l/s. This surplus capacity will be transferred to the West Melton water network through a recently installed pipe connection between Edendale and West Melton which will add further reliability to the water supply network.

Water within the development will be supplied by a reticulated pipe system located within the road berms. This would be linked at all available locations into the existing system surrounding the proposed development area. Metered water connections will be required to each property boundary as per council standards. It is expected all water infrastructure will be vested in SDC upon completion of construction.

The water supply system will be designed to meet the flow and pressure required by the New Zealand Fire Service Code of Practice. Hydrants will also be placed in accordance and water modelling will be undertaken during detailed design phase to ensure these requirements are met.

7. ELECTRICITY AND STREETLIGHTING

The site is currently serviced by an overhead power connection to a pole located in the 163 Halkett Road property. This line will be removed during the development works.

Preliminary consultation with Design Net (power design engineer) has indicated all proposed sites can be serviced for power to the industry standards. The infrastructure will be laid underground in the roading reserve. It is estimated 4 or 5 new kiosks will be required for the proposed development density. Connection to the HV network is available at Halkett Road. All lots within the development will require a power supply connection at the lot boundary.

All power reticulation installed within the site will be taken over by Orion upon completion. A rebate will be given to the developer upon completion to cover a proportion of the installation costs. This

value is to be determined through an agreement prior to installation.

Streetlighting will need to be installed to SDC standards as part of the proposed development works. Streetlighting would be serviced by the local LV power supply installed by the developer and be vested in council upon commencement of construction. All streetlighting will be located in the vested road reserve.

Correspondence with Design Net and existing power supply plans can be found in Appendix E.

8. TELECOMMUNICATIONS

The site is currently serviced by Chorus via their standard rural supply.

Enquiries have been made to Chorus in regards to the proposed development. Chorus have confirmed they are able to supply fibre reticulation to the development from Halkett Road. Connection is also available from the southern side of the site over West Coast Road, however Chorus has indicated this will be at some additional cost.

The cost for Chorus to provide fibre telecommunications is estimated to be $1,600 per connection. The proposal letter from Chorus in regards to the proposed development site is attached as Appendix F.

9. CONCLUSION

Our investigations and consultation with SDC and service designers have led us to an agreed understanding that the land described in this report is able to be fully serviced with the infrastructure required for a residential development of the proposed 10 lot/Ha density.

There are no foreseeable difficulties around undertaking earthworks for the purpose of residential development and ground conditions are anticipated to be favourable for future use as residential land.

Initial indications are that the surrounding road network is able to generally support the increased traffic loading associated with the proposed development. The main road connection to the site is likely to be from Halkett Road. Consultation has been undertaken with NZTA to determine the requirements around a road connection to SH73. A secondary roading link will be provided at the western boundary of the site to the existing residential area.

Stormwater from roads will be disposed of directly to ground via a piped network and soakage devices which will be vested in SDC. ECan consent will be sought for the discharge to ground of both construction and operational phase stormwater. The operational phase consent will be transferred to SDC following the nominated defects period and a final compliance assessment.

Sewage generated by the proposed development will discharge to the Rossington Drive sewer pump station by both gravity and pressure pipe lines located within future roads. Upgrades to the sewer system downstream of this pump station will be required to service this development, these include sewer pump upgrades and an alternative outfall point within Rolleston to be determined by SDC. Additional sewage storage may also be required on site.

The existing water network within West Melton has the ability to service the proposed development due to recent upgrades undertaken by SDC. Water reticulation within the site will be connected to the surrounding network at all available locations. A new reservoir and supply bore will be installed as part of the development works, this infrastructure will be located adjacent to the current council storage facility located at the south western corner of the site within the area allocated as a utility lot. The proposed supply bore and reservoir will provide additional resilience to the local water supply network in terms of supply volume and pressure.

Power and Fibre telecommunications are able to be provided to the site in the usual manner.

Further design and consultation with the local authority and service providers will be required to confirm the details around the required infrastructure, and the costs associated with installing this infrastructure. This can be undertaken during then consenting and engineering design phase of the project.

APPENDIX A

Site Location Plan

NORTH

AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

SEE O:\STD_DWG\Eng Notes\Standard Notes.dwg - Shortcut FOR RELEVANT NOTES.

NOTES :

1) ALL WORKS IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7 CURRENT ISSUE.

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

3) ELECTRICITY & TELECOM SERVICES NOT SHOWN. REFER TO ELECTRICAL & COMMUNICATION PLANS FOR DUCT LOCATIONS.

4) TRENCHING AND INSTALLATION OF POWER AND TELECOM SERVICES TO BE PROVIDED IN ACCORDANCE WITH SERVICE PROVIDERS PLANS AND SPECIFICATIONS.

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

6) CONTROL OF SW, SEDIMENT AND DUST ON SITE IS THE RESPONSIBILITY OF THE CONTRACTOR

7) ALL ROW AND DRIVEWAYS ARE TO HAVE 50mm DUCTS INSTALLED FOR COMMUNICATIONS AND POWER SUPPLY.

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

	NAME	SIGNED	DATE
DESIGNED BY			
CHECKED BY			

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:

Hughes Developments Ltd

SHEET TITLE:

Site Plan

DRAWING STATUS

For Information

SCALE : 1:2000@A1
1:4000@A3

DATE : July 2018

CAD FILE : J:\19404\Preliminary Investigation\Site Plan.dwg

DRAWN : GAC

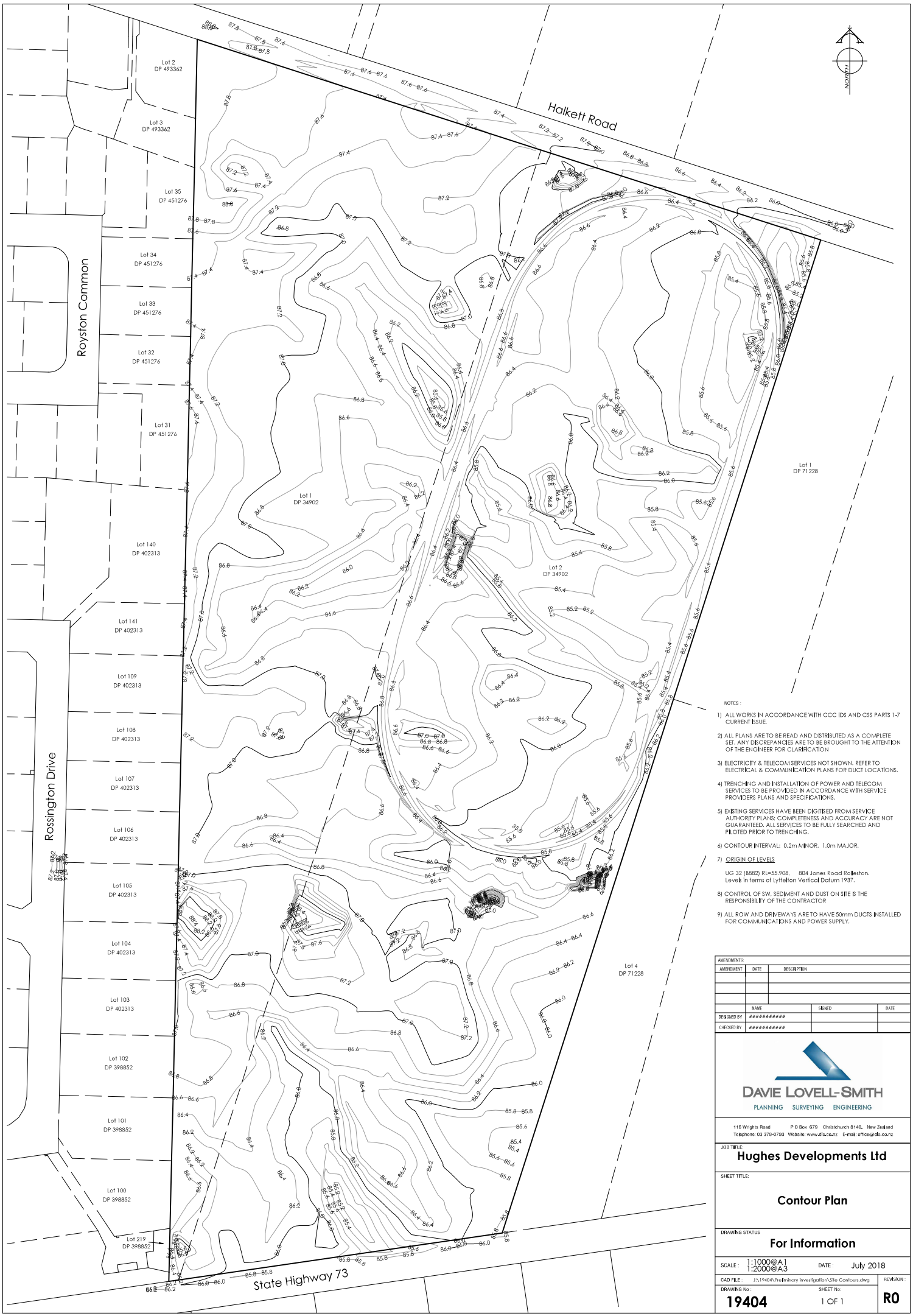
DRAWING No : **19404**

SHEET No:

REVISION : **R0**

APPENDIX B

Site Contours



NOTES :

1) ALL WORKS IN ACCORDANCE WITH CCC IDS AND CSS PARTS 1-7 CURRENT ISSUE.

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

3) ELECTRICITY & TELECOM SERVICES NOT SHOWN. REFER TO ELECTRICAL & COMMUNICATION PLANS FOR DUCT LOCATIONS.

4) TRENCHING AND INSTALLATION OF POWER AND TELECOM SERVICES TO BE PROVIDED IN ACCORDANCE WITH SERVICE PROVIDERS PLANS AND SPECIFICATIONS.

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

6) CONTOUR INTERVAL: 0.2m MINOR. 1.0m MAJOR.

7) ORIGIN OF LEVELS

UG 32 (8882) RL=55.908. 804 Jones Road Rolleston. Levels in terms of Lyttelton Vertical Datum 1937.

8) CONTROL OF SW, SEDIMENT AND DUST ON SITE IS THE RESPONSIBILITY OF THE CONTRACTOR

9) ALL ROW AND DRIVEWAYS ARE TO HAVE 50mm DUCTS INSTALLED FOR COMMUNICATIONS AND POWER SUPPLY.

AMENDMENTS:		
AMENDMENT	DATE	DESCRIPTION

	NAME	SIGNED	DATE
DESIGNED BY	##########		
CHECKED BY	##########		

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:
Hughes Developments Ltd

SHEET TITLE:
Contour Plan

DRAWING STATUS
For Information

SCALE : 1:1000@A1 1:2000@A3 DATE : July 2018

CAD FILE : J:\19404\Preliminary Investigation\Site Contours.dwg REVISION :

DRAWING No : **19404** SHEET No: 1 OF 1 **R0**

APPENDIX C

ECAN Bore Data

canterbury maps

Canterbury Maps

N

0 0.045 0.09 0.135 0.18 Kilometres

Scale: 1:3,000 @A3

Map Created by Environment Canterbury on 7/5/2018 at 10:05:58 AM

Bore or Well No	M35/10751
Well Name	Weedons Ross Road
Owner	Selwyn District Council

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M35/10751	**File Number**	CO6C/23232
Owner	Selwyn District Council	**Well Status**	Active (exist, present)
Street/Road	Weedons Ross Road	**NZTM Grid Reference**	BX23:49567-81486
Locality	West Melton	**NZTM X and Y**	1549567 - 5181486
Location Description		**Location Accuracy**	< 50m
CWMS Zone	Selwyn - Waihora	**Use**	Public Water Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	78.00m	**Water Level Count**	1
Diameter	300mm	**Initial Water Level**	24.00m below MP
Measuring Point Description		**Highest Water Level**	24.00m below MP
Measuring Point Elevation	89.17m above MSL (Lyttelton 1937)	**Lowest Water Level**	24.00m below MP
Elevation Accuracy	< 5 m	**First reading**	07 Sep 2007
Ground Level	0.00m above MP	**Last reading**	07 Sep 2007
Strata Layers	7	**Calc Min 95%**	
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	3
Drill Date	07 Sep 2007	**Max Tested Yield**	22 l/s
Driller	East Coast Drilling	**Drawdown at Max Tested Yield**	27 m
Drilling Method	Rotary Rig	**Specific Capacity**	1.10 l/s/m
Casing Material	STEEL	**Last Updated**	02 Apr 2015
Pump Type		**Last Field Check**	07 Sep 2007
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	74	77				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
07 Sep 2007	1	12	158.3782	10.9	0.05
07 Sep 2007	2	18	237.5673	25	0.05
07 Sep 2007	3	21.5	283.760956	26.6	0.166666672

Comments

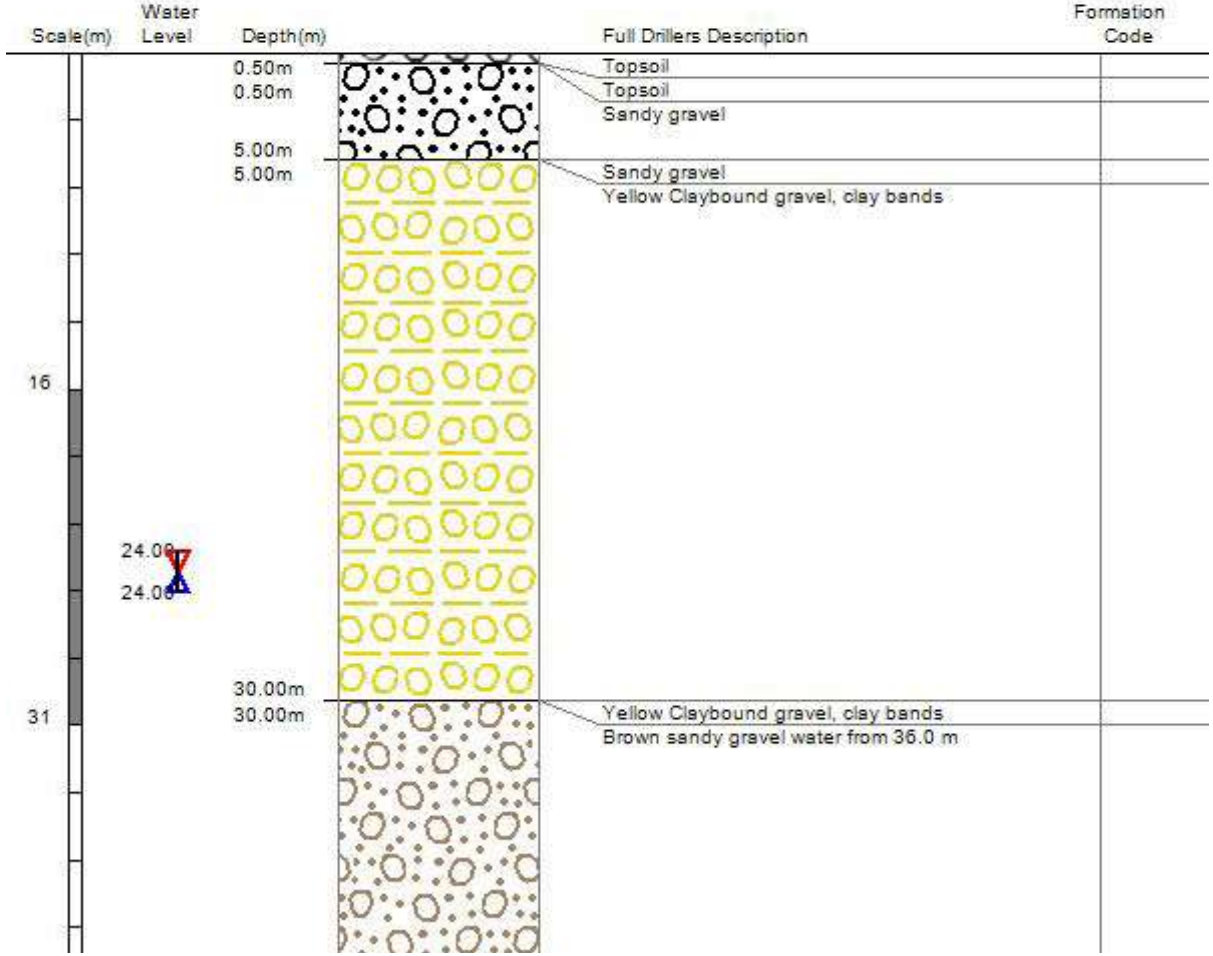
Comment Date	Comment
27 Apr 2010	Set status to active, this is a community supply for SDC. Added well name, added to community water supply database

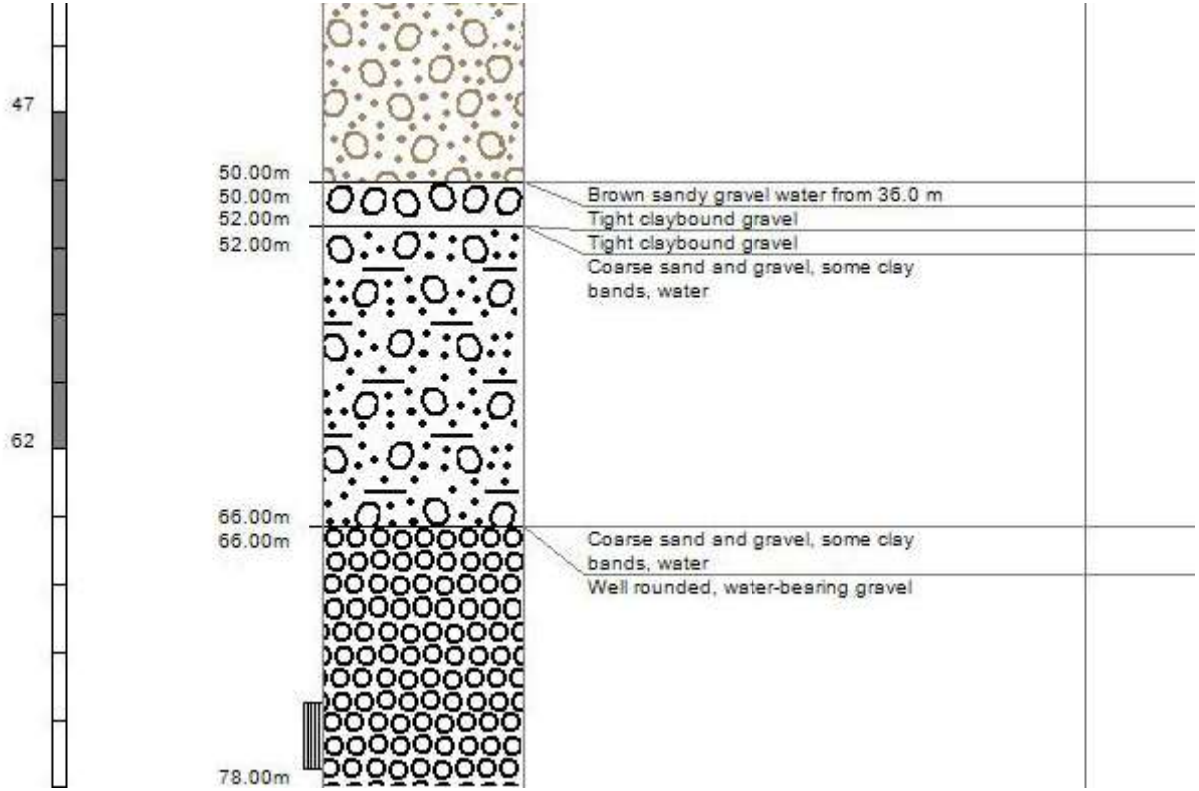
Bore Log

Borelog for well M35/10751

Grid Reference (NZTM): 1549567 mE, 5181487 mN
Location Accuracy: < 50m
Ground Level Altitude: 89.2 m +MSD Accuracy: < 0.5 m
Driller: East Coast Drilling
Drill Method: Rotary Rig
Borelog Depth: 78.0 m Drill Date: 07-Sep-2007

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha




47
62
50.00m
50.00m
52.00m
52.00m
66.00m
66.00m
78.00m
Brown sandy gravel water from 36.0 m
Tight claybound gravel
Tight claybound gravel
Coarse sand and gravel, some clay bands, water
Coarse sand and gravel, some clay bands, water
Well rounded, water-bearing gravel

Bore or Well No	M35/9443
Well Name	HALKETT ROAD
Owner	MR & MRS P & J ROWLANDS

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M35/9443	**File Number**	CO6C/19967
Owner	MR & MRS P & J ROWLANDS	**Well Status**	Active (exist, present)
Street/Road	HALKETT ROAD	**NZTM Grid Reference**	BX23:50107-81376
Locality	WEST MELTON	**NZTM X and Y**	1550107 - 5181376
Location Description		**Location Accuracy**	10 - 50m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	36.00m	**Water Level Count**	0
Diameter	150mm	**Initial Water Level**	22.19m below MP
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	86.06m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	10	**Calc Min 95%**	23.70m below MP
Aquifer Name		**Aquifer Tests**	0
Aquifer Type		**Yield Drawdown Tests**	1
Drill Date	16 Sep 2003	**Max Tested Yield**	5 l/s
Driller	Clemence Drilling Contractors	**Drawdown at Max Tested Yield**	23 m
Drilling Method	Rotary Rig	**Specific Capacity**	0.20 l/s/m
Casing Material	Steel	**Last Updated**	08 Nov 2013
Pump Type		**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	33.4	35.9				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
16 Sep 2003	1	4.5	59.3918266	22.9	2.5

Comments

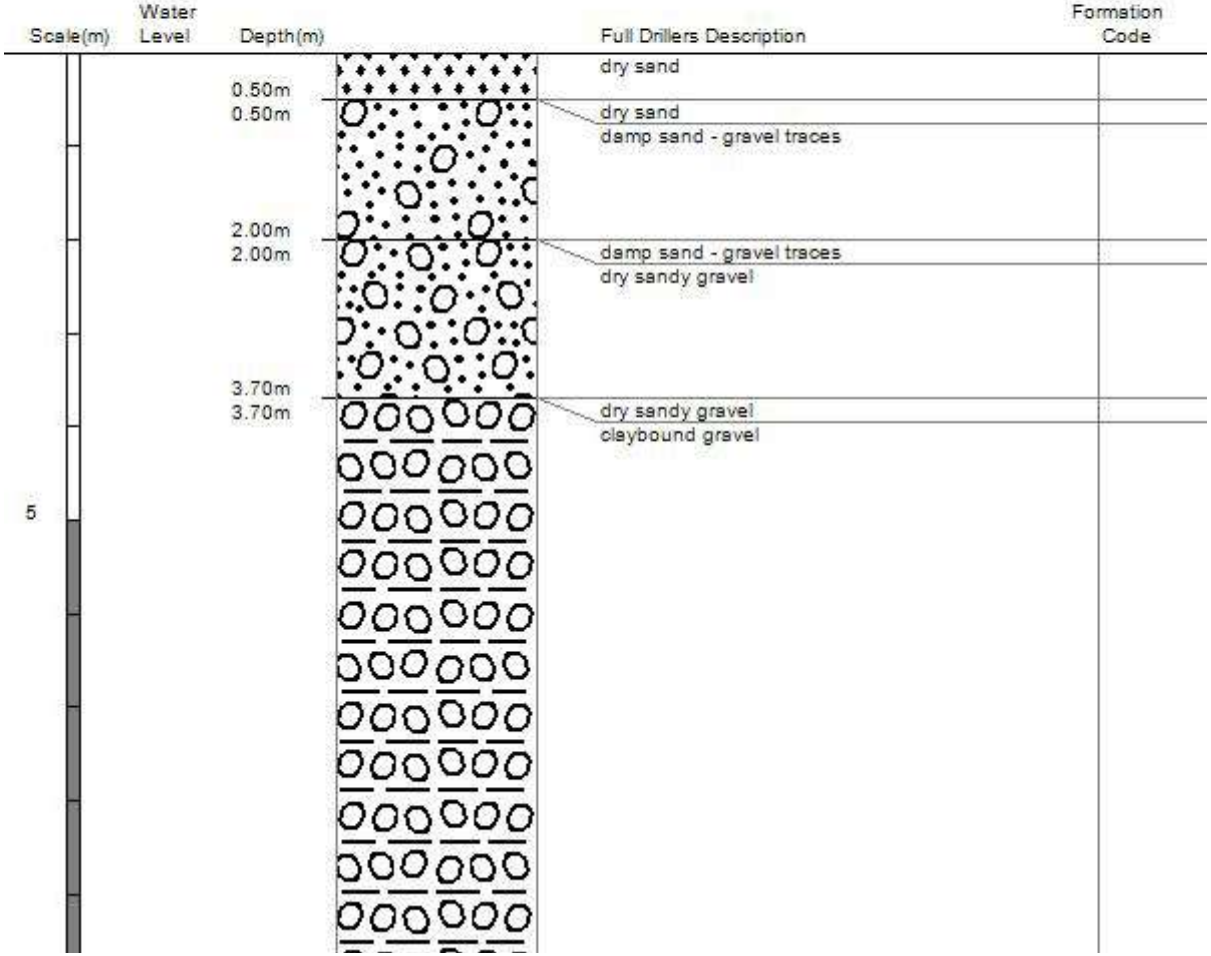
Comment Date	Comment
11 Jun 2003	Alternative site requested M35:6011-4301
12 Sep 2003	Site confirmed from M35:6015-4315.

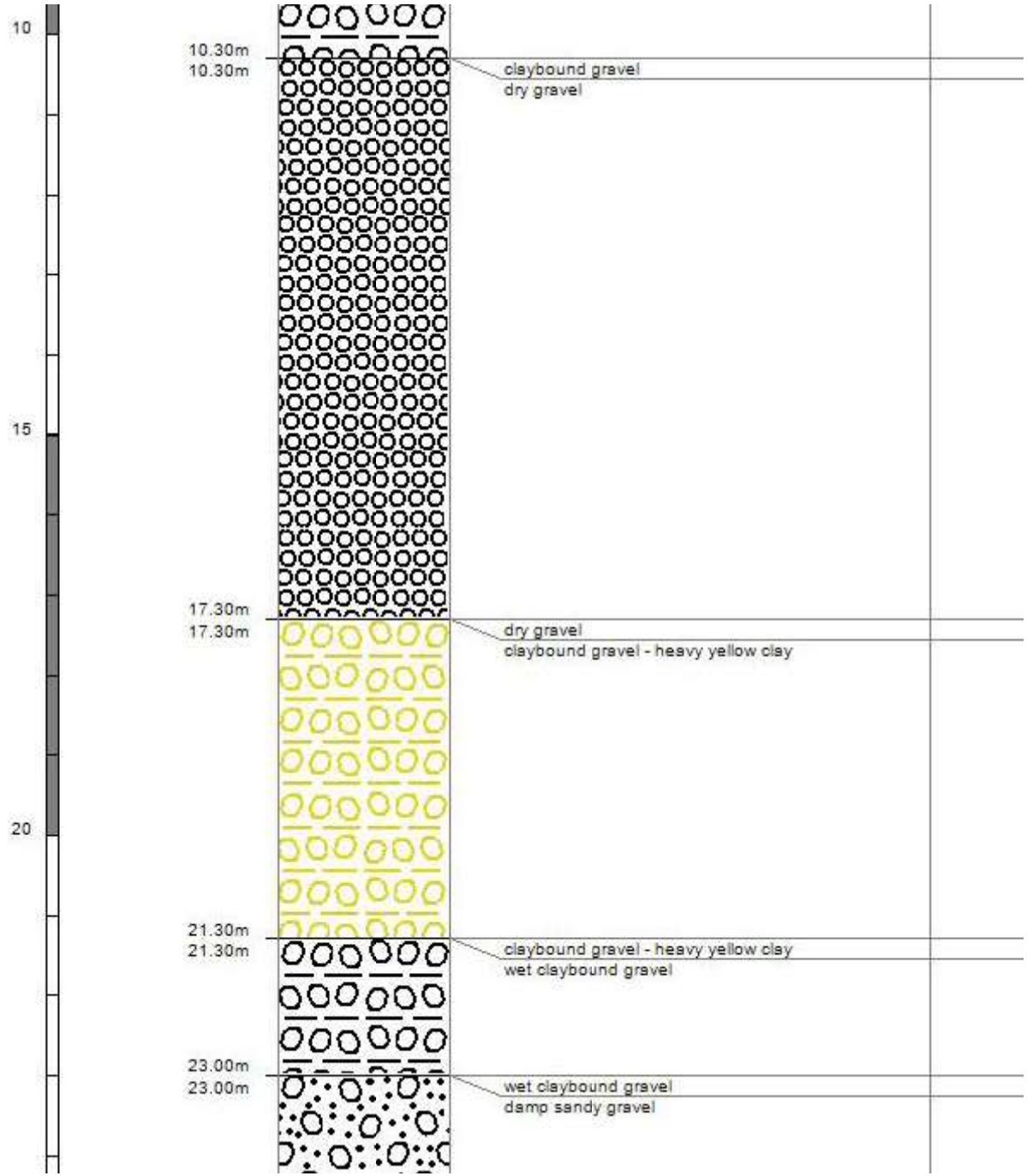
Bore Log

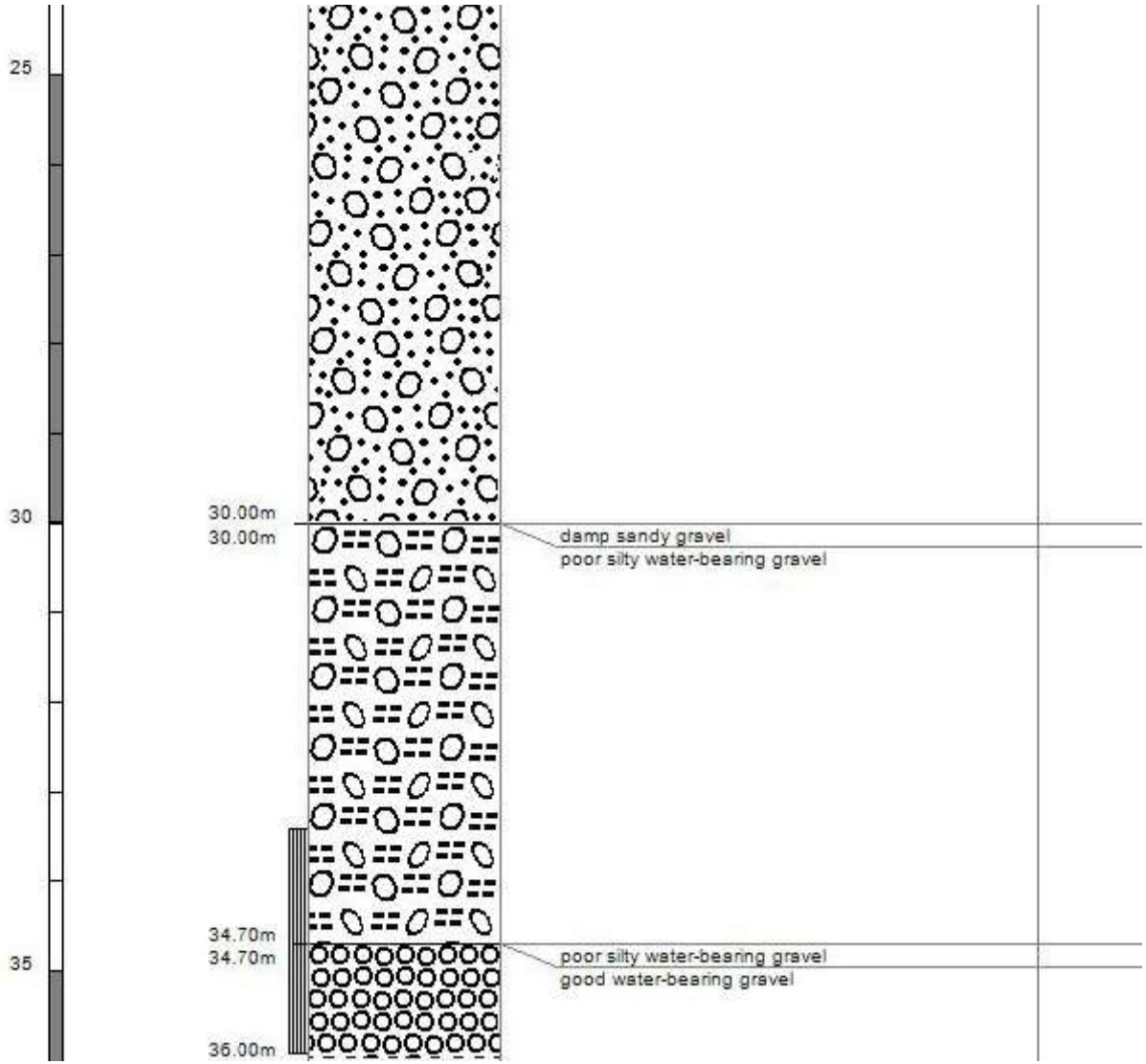
Borelog for well M35/9443

Grid Reference (NZTM): 1550107 mE, 5181377 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: 86.1 m +MSD Accuracy: < 0.5 m
Driller: Clemence Drilling Contractors
Drill Method: Rotary Rig
Borelog Depth: 36.0 m Drill Date: 16-Sep-2003

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



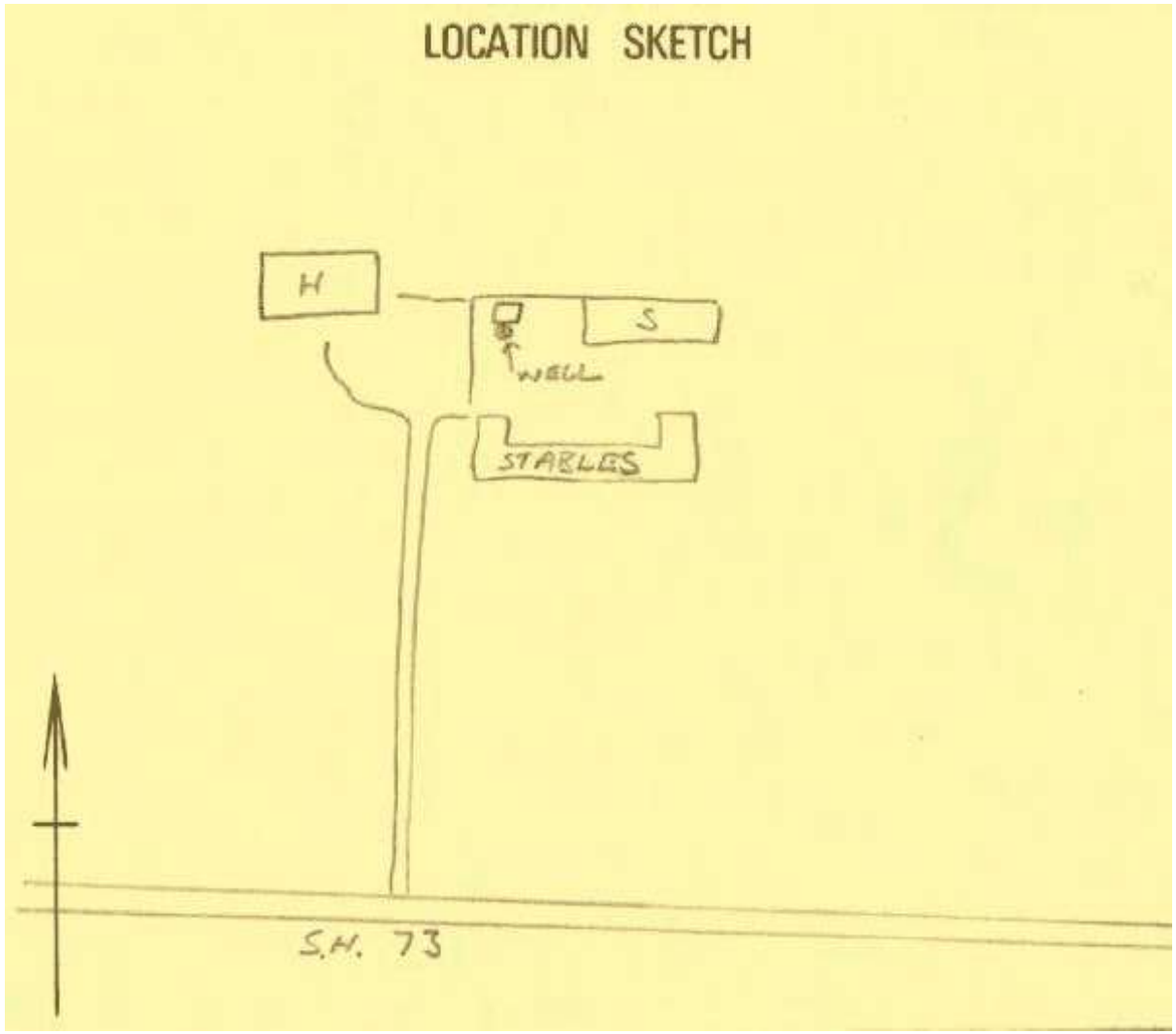

10
15
20
10.30m
10.30m
claybound gravel
dry gravel
17.30m
17.30m
dry gravel
claybound gravel - heavy yellow clay
21.30m
21.30m
claybound gravel - heavy yellow clay
wet claybound gravel
23.00m
23.00m
wet claybound gravel
damp sandy gravel


25
30
35
30.00m
30.00m
34.70m
34.70m
36.00m
damp sandy gravel
poor silty water-bearing gravel
poor silty water-bearing gravel
good water-bearing gravel

Bore or Well No	M35/1013
Well Name	S.H.73
Owner	DUNN, A.R.& J.R.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Well Number	M35/1013	**File Number**	
Owner	DUNN, A.R.& J.R.	**Well Status**	Active (exist, present)
Street/Road	S.H.73	**NZTM Grid Reference**	BX23:49837-81236
Locality	WEST MELTON	**NZTM X and Y**	1549837 - 5181236
Location Description		**Location Accuracy**	50 - 300m
CWMS Zone	Selwyn - Waihora	**Use**	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	**Water Level Monitoring**	--
Depth	28.00m	**Water Level Count**	0
Diameter		**Initial Water Level**	
Measuring Point Description		**Highest Water Level**	
Measuring Point Elevation	87.29m above MSL (Lyttelton 1937)	**Lowest Water Level**	
Elevation Accuracy	< 5 m	**First reading**	
Ground Level	0.00m above MP	**Last reading**	
Strata Layers	0	**Calc Min 95%**	23.60m below MP
Aquifer Name		**Aquifer Tests**	0
Aquifer Type	Unknown	**Yield Drawdown Tests**	0
Drill Date	01 Jul 1977	**Max Tested Yield**	
Driller	McMillan Drilling Ltd	**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

Comments

Comment Date	Comment
29 Apr 2002	NCCB 3101/S83A 414 Ref. Level MP is an approximation. Well not measurable.
18 Jan 2008	Gridref changed from: M35:598-428

APPENDIX D

Flood Assessment

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

Davie, Lovell-Smith Ltd
116 Wrights Road, Addington
PO Box 679, Christchurch 8140
New Zealand
Telephone (03) 379-0793,
E-mail: office@dls.co.nz

2nd May 2020

Selwyn District Council
Benjamin.Rhodes@selwyn.govt.nz

Attn: Mr Ben Rhodes

RE: Future Development Area, Halkett Road, West Melton – Flood Assessment

Dear Ben

As part of the identification of future development areas in West Melton, Council require us to assess the effects of flooding on potential sites and how it may be mitigated. In this case we are investigating a site owned by Hughes Developments on the existing Urban Edge between Halkett Road and State Highway 73.

Selwyn District Council has with the help of Environment Canterbury (ECan) identified land across the Selwyn District which may be susceptible to flooding. Please refer to the two attached plans of the proposed development area. These two plans depict the modelled flood effects on the development site. Please note that all flows up to a 1 in 50 year event will be disposed of on site by infiltration to ground.

Plan A describes the channelization and water depth for a 1 in 200 year critical storm event.
Plan B describes the channelization and water depth for a 1 in 500 year critical storm event.

These clearly show channelized flow through and around the site. To better locate these channels, please refer to the attached plan of the site with overlaid LIDAR contours. The key flow channels have been superimposed over the LIDAR and they fall into distinct contour channels.

From this investigation there appear to be four main flow routes and these are described on the plan as Flows A – D. What is also apparent is that the site is quite flat but generally slopes towards the southeast at a gradient of

Flow A crosses Halkett Road and just touches the north-eastern corner of the site. This corner will be filled to ensure that flood flows remain in the roadway and continue past the site to the adjacent rural land.

Flow B enters the site in the north-eastern corner and flows south to a point half way along the eastern boundary. It is proposed that a road entry will be located at the point on Halkett Road where the flow enters the property and a road connection will also be located at the point where it exists. The flows derived from the channels within the site will be relocated to the proposed road network with gradients towards the outlet point.

Flow C is derived from drainage from within the site and discharges onto State Highway 73. The flows within the site will once again be contained within a future road network and will be directed to this existing discharge point via either a reserve link or a Road Link. Please note that there is an existing entry into the site at or close to this location.

DAVIE LOVELL-SMITH

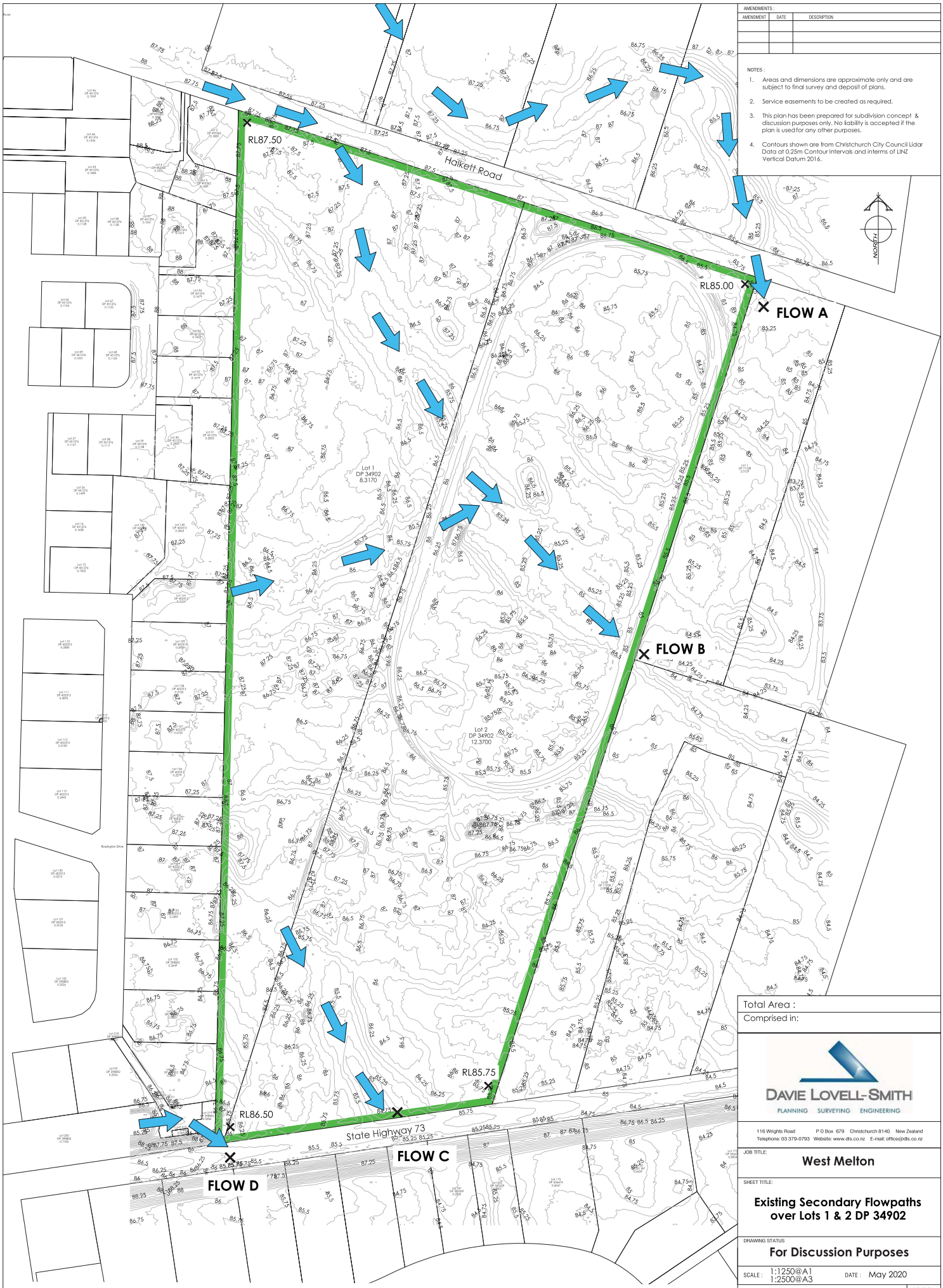
Flow D is the overflow from the basin associated with the Gainsborough subdivision. It enters onto State Highway 73 at the southwestern corner of the site. As with Flow A, the new sites will be filled to ensure that flood flows do not enter into the site.

By adhering to this ass3ssment, the effects of significant flood events will be fully mitigated. The actual final floor levels in relation to these events will be determined as part of the Detailed Design and subdivision process.

Should you have any queries, please do not hesitate to call.

Kind Regards

Andy Hall
Director
CPEng



AMENDMENTS :

AMENDMENT	DATE	DESCRIPTION

NOTES :

1. Areas and dimensions are approximate only and are subject to final survey and deposit of plans.
2. Service easements to be created as required.
3. This plan has been prepared for subdivision concept & discussion purposes only. No liability is accepted if the plan is used for any other purposes.
4. Contours shown are from Christchurch City Council Lidar Data at 0.25m Contour Intervals and interms of LINZ Vertical Datum 2016.

Total Area :

Comprised in:

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:

West Melton

SHEET TITLE:

Existing Secondary Flowpaths over Lots 1 & 2 DP 34902

DRAWING STATUS

For Discussion Purposes

SCALE : 1:1250@A1
1:2500@A3

DATE : May 2020

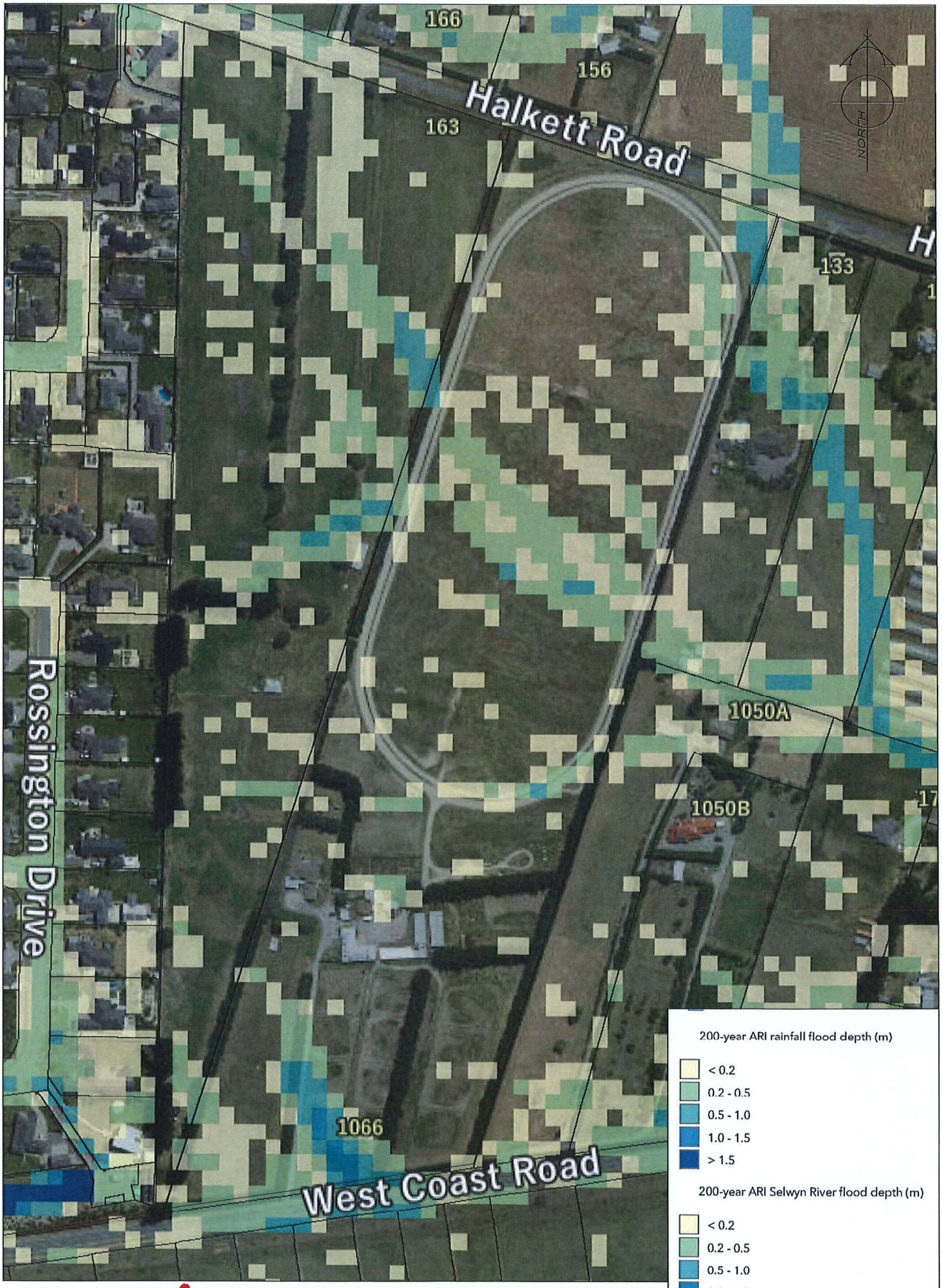
CAD FILE : J:\19404\Flooding\E19404 West Melton Lidar.dwg

REVISION :

DRAWING No : **E19404**

SHEET No: 1 OF 1

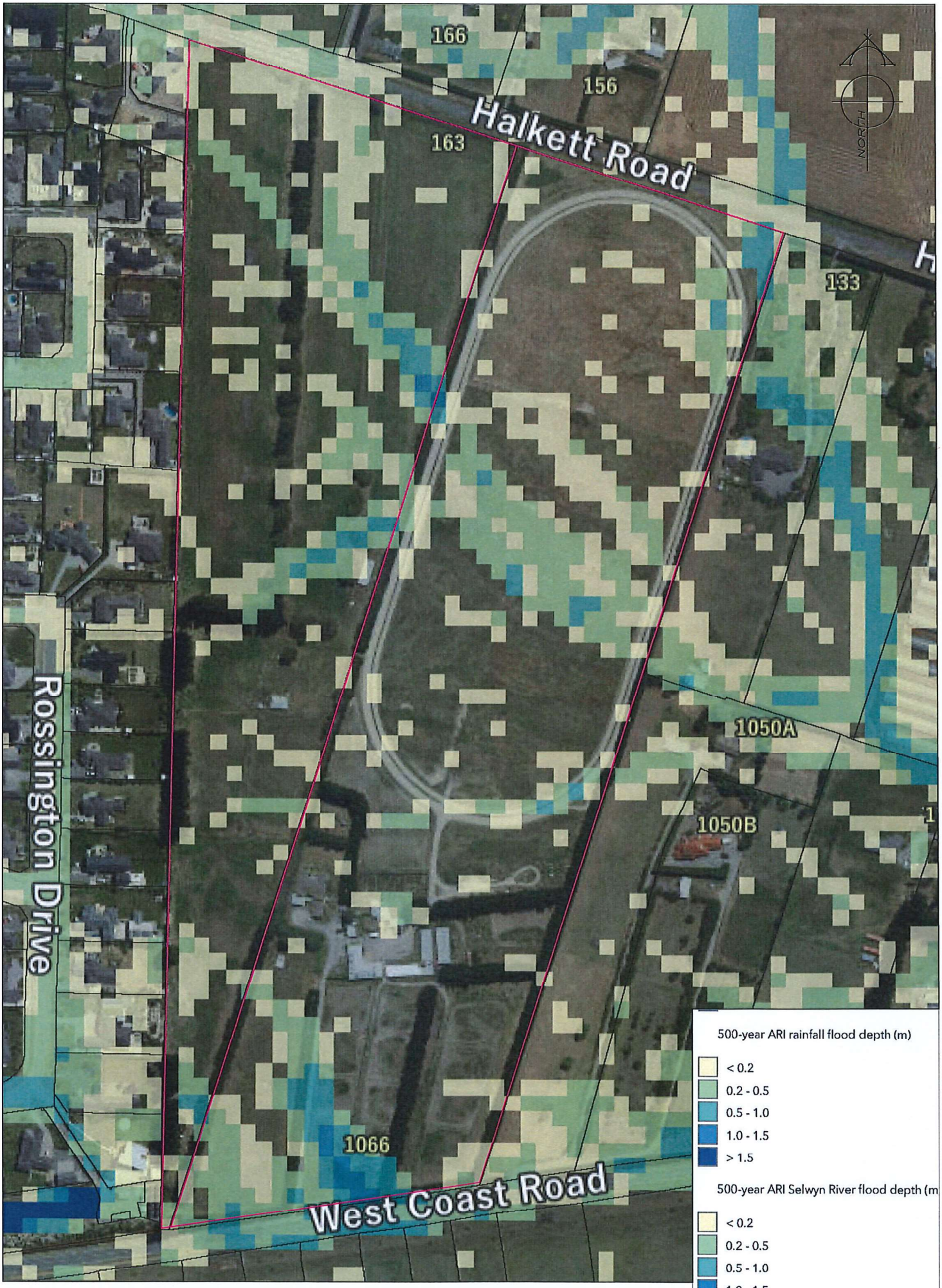
R0



Plan A

1 in 200 year Flood Event
Scale 1:3000@A4

J:\18727\West Melton\H18727 West Melton Lidar.dwg



Plan B

1 in 500 year Flood Event
Scale 1:3000@A4

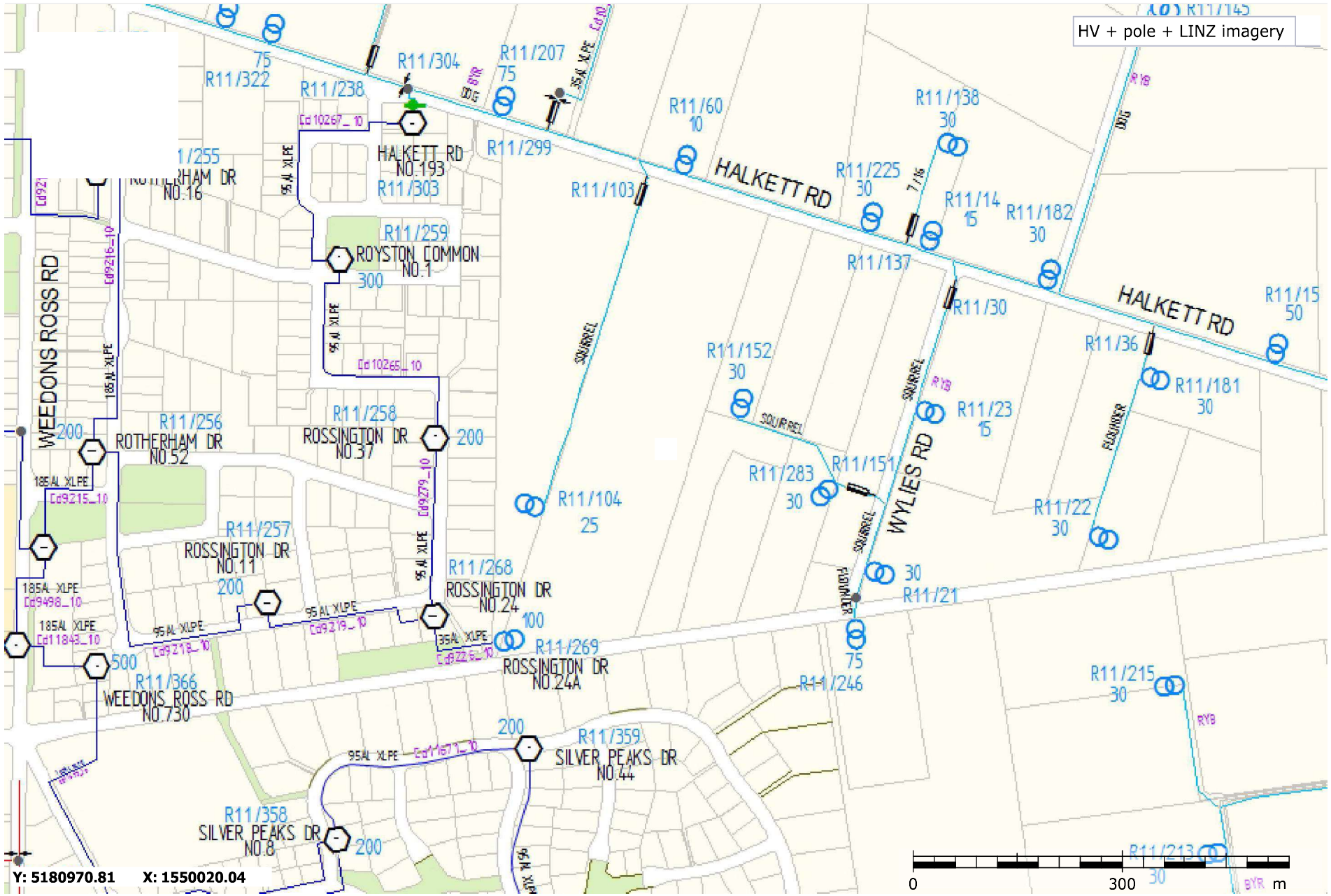
J:\18727\West Melton\H18727 West Melton Lidar.dwg

APPENDIX E

Power Supply Plan and Correspondence

1: 7200

1066 West Coast Road West Melton



Jamie Verstappen

From: David Wear <davidwear@xtra.co.nz>
Sent: Monday, 25 June 2018 3:53 p.m.
To: Jamie Verstappen
Subject: Fw: 1066 West Coast Road Inquiry
Attachments: West Coast Rd 1066 ex HV supply.pdf

Hi Jamie
Should not be a problem.
200 lots=1MVA of load 4-5 kiosks on new roads (standard res. size lots similar to adj Rossington Dr Rotheram Dr they did).

The HV conductors(DOG large CSA) are on the north side of Halkett Rd so HV cable network, in & out would be required from these to kiosks.

If you need formal confirmation (later on), Orion will provide this.

The Farm presently has an OH HV line to a 25kVA pole sub (to be removed).

Regards Dave Wear
Design-Net Ltd
Ph3799937

From: Jamie Verstappen
Sent: Monday, June 25, 2018 3:23 PM
To: davidwear@xtra.co.nz
Subject: FW: 1066 West Coast Road Inquiry

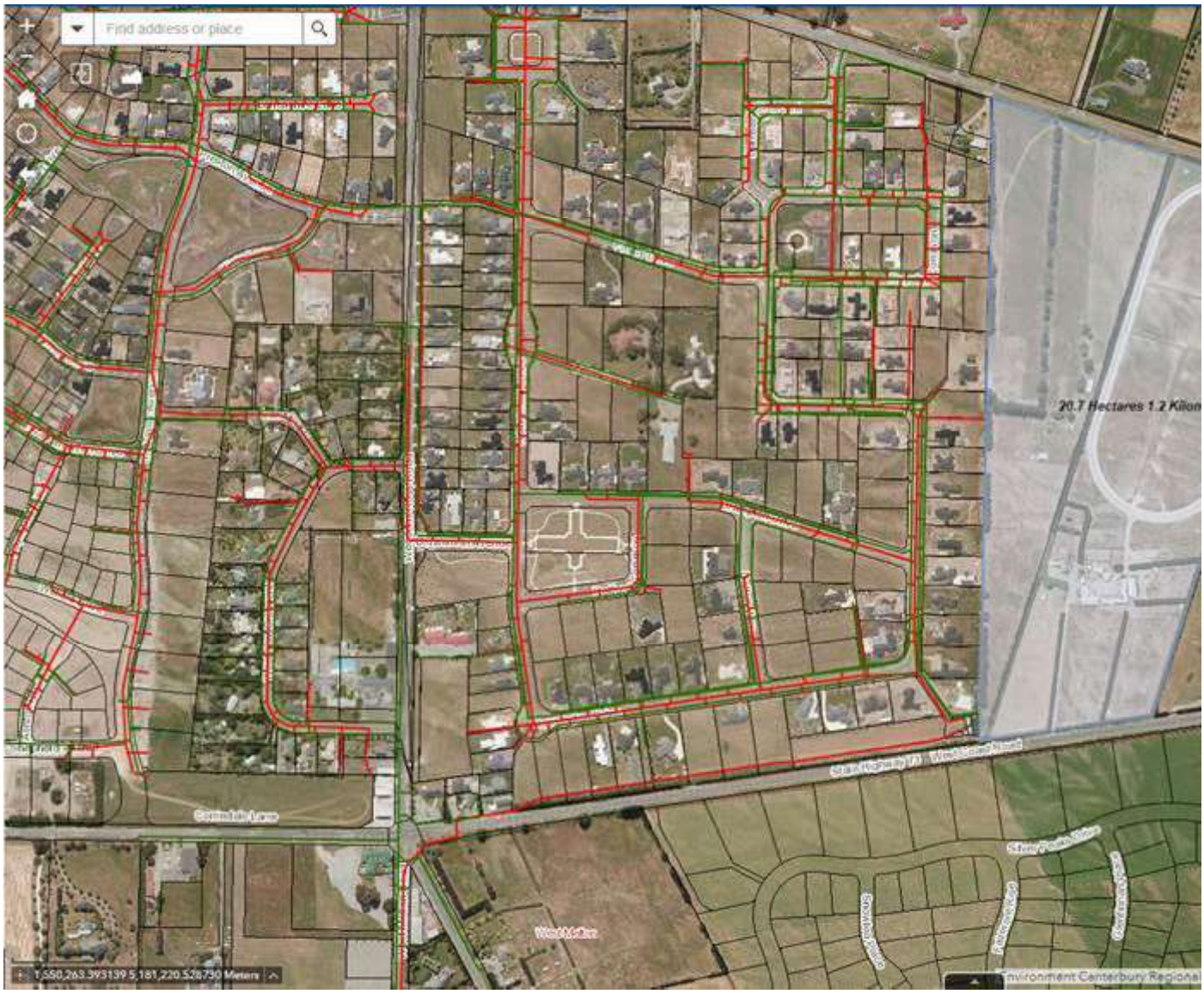
Hi Dave

Hughes are looking at the block of land below for development.

Can you have a quick look into the local power supply and provide comment on the installation/upgrade work required for a development density of 10 lots/ha (200 Lots total).

No layout available yet.

Regards
Jamie



Jamie Verstappen | Civil Engineer

Davie Lovell-Smith Ltd
Planning Surveying Engineering
PO Box 679 | Christchurch | Phone (03) 379 0793 | www.dls.co.nz

APPENDIX F

Chorus Telecommunications Supply Proposal

Chorus Network Services
PO Box 9405
Waikato Mail Centre
Hamilton 3200
Telephone: 0800 782 386
Email: tsg@chorus.co.nz

Sub Div Ref: ROL47118
Your Ref:

29 June 2018

Davie Lovell-Smith

Attention: **Jamie Verstappen**
Dear Sir / Madam

SUBDIVISION RETICULATION – ROL: 1066 West Coast Road, West Melton. 200 Lot Subdivision - SIMPLE ESTIMATE

Thank you for your enquiry regarding the above subdivision.

Chorus is pleased to advise that, as at the date of this letter, we would be able to provide ABF telephone reticulation for this subdivision. In order to complete this reticulation, we require a contribution from you to Chorus' total costs of reticulating the subdivision. Chorus' costs include the cost of network design, supply of telecommunications specific materials and supervising installation. At the date of this letter, our estimate of the contribution we would require from you is $368,000.00 (including GST).

We note that (i) the contribution required from you towards reticulation of the subdivision, and (ii) our ability to connect the subdivision to the Chorus network, may (in each case) change over time depending on the availability of Chorus network in the relevant area and other matters.

If you decide that you wish to undertake reticulation of this subdivision, you will need to contact Chorus (see the contact details for Chorus Network Services above). We would recommend that you contact us at least 3 months prior to the commencement of construction at the subdivision. At that stage, we will provide you with the following:

- confirmation of the amount of the contribution required from you, which may change from the estimate as set out above;

- a copy of the Contract for the Supply and Installation of Telecommunications Infrastructure, which will govern our relationship with you in relation to reticulation of this subdivision; and

- a number of other documents which have important information regarding reticulation of the subdivision, including - for example - Chorus' standard subdivision lay specification.

Yours faithfully

Jono Tutty
Network Services Coordinator