INFRASTRUCTURE REPORT

605-627 EAST MADDISONS ROAD - ROLLESTON

DATE
08/12/20

CLIENT
DUNWEAVIN 2020 LIMITED

SURVUS CONSULTANTS
surveying engineering property development

Document Control

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A	07/12/20	FOR INFORMATION	CWH	JLC	CWH

Contents

1. Executive Summary

Dunweavin 2020 Limited have instructed Survus Consultants to complete an infrastructure report of 605-627 East Maddisons Road (the “subject site”) located on the south west side of Rolleston. This report assesses the feasibility of providing the engineering services to develop this land as a residential subdivision in accordance with all relevant Council and industry standards and guidelines.

The site is gently sloping from north west to south east at a grade of approx. 1:200 (0.5%). Soils consist of topsoil overlying silty gravels. Groundwater levels (as interpolated from well cards) typically vary between 6.0m to 10m BGL.

Access to the proposed subdivision would be from two main points. The existing Lennon Drive would be extended through the site from the north and extended through to the southern boundary of the subject site. A new roading link is proposed from East Maddisons Road, which would extend through to the western boundary of the subject site.

Stormwater servicing is proposed to be a network which discharges to ground via rapid soakage trenched/soakpits.

Wastewater servicing will be provided by way of a gravity reticulation system that drains to an existing sewer main that is located on East Maddisons Road.

Water Supply is readily available and able to connect onto. There is an existing 375mm water main located in East Maddisons Road. Modelling will confirm there is an adequate water supply to service the development with potable water and to satisfy fire-fighting requirements.

Given the information available and the investigations conducted to date we recommend that the development land can be effectively serviced to the requirements of SDC and other national standards.

2. Introduction

2.1 Scope

Survus Consultants has been commissioned by Dunweavin 2020 Limited to complete an Infrastructure report to support a private plan change and district plan submission for the subject site in Rolleston. The report will cover the following components:

- Bulk Earthworks
- Roading/Transportation
- Stormwater drainage
- Wastewater reticulation
- Water reticulation
- Power, Telecommunications and Streetlighting.

2.2 Site Background

The site is located on the western side of Rolleston, fronting East Maddisons Road. The site backs onto the "Olivefields" Development to the north. There are currently 3 underlying title involved, as follows;

Address	Name of Lot/Appellation	Area (ha)	Record of Title (RT)
605 East Maddisons Road	Lot 1 DP 26880	4.047	CB33A/761
617 East Maddisons Road	Lot 3 DP 74311	4.065	CB42D/967
627 East Maddisons Road	Lot 2 DP 74311	4.857	CB42D/966
	Total	**12.969ha**	

The development is a proposed subdivision that will ultimately provide facilities for up 155 lots.

There are no other resource consents in with SDC or any other consenting authority at this stage for this property.

3. Bulk Earthworks

3.1 Bulk Earthworks Design

The topography of the existing site is generally sloping from north west to south east, with a height difference of approximately 2.2 metres between the two points. Currently the majority of the site comprises agricultural fields and pasture. There are three existing houses on the subject site, as the site is currently made up of 3 individual titles. Please find attached existing site contour plan in **Appendix A**.

Bulk earthwork design would be dictated by the need to have a 1:500 (absolute minimum) grade from the top of kerb to the rear of the sections fronting the road.

The design philosophy for the setting of earthwork levels will be determined by the following criteria:

1. Road gradients not to exceed 1 in 20, not to be less than 1:450 where possible
2. Cut/fill balance where applicable

Overland flow paths for the subdivision are to follow the roading and stormwater layout, with the overall site overland flows not being substantially different to the current situation.

There is an existing water race, which is currently flowing through the site from a north to south direction. We are aware that the neighbouring plan change (PC70) has proposed to underground the water race at the boundary, meaning that there would be no further use of the water race once it leaves the subject site. It is therefore proposed that the water race would be terminated at the northern extremity of the site where it enters the property.

Existing levels will need to be met along shared external boundaries where applicable.

3.2 Proposed Earthworks Design Methodology

There will be the need to complete a cut/fill balance across the site, to avoid carting material off-site. This means that engineered fill may be utilised in certain areas to reapportion dugout materials from roading areas.

If there is any filling exceeding 300mm it will be engineered fill and testing requirements will be met as per NZS4431:1989.

It is envisaged that material won from site, will be sufficient to use as structural engineered fill.

4. Roading/Transportation

4.1 Proposed Road Network

4.1.1 Layout

The proposed roading layout can be seen on the ODP plan attached as **Appendix B.**

There are two proposed main connections onto the subject property.

The first connection enters the site from Lennon Drive to the north. This has been extended through to the southern boundary of the subject site and is intended to link up with the adjacent Plan Change PC70 boundary to the south. It is noted that this existing road is 15.0m legal width.

The second proposed connection enters the site from East Maddisons Road and once again links through to the boundary of PC70. There is no roading link shown on PC70 in this location, but it is believed that it would be beneficial.

4.1.2 Roading Typology

All main legal road corridors will be 13m-20m in legal width. Rights of way will be between 4.5m and 6.5m, dependant on the number of users and length of ROW.

The following design parameters for the development have been selected for the internal road network

Table 1: Road design criteria

Road Type	Legal Width	Formed Width	Footpath
Distributor Road	20-24m	9.0m	Both sides
Local Road	17-18m	7.5m	One Side
Neighbourhood Road	13m	m	None
ROW (4 lots)	6.5m	4.5m	No
ROW (2 lots)	4.5m	3.5m	No

4.1.3 Stormwater drainage

Stormwater runoff within the road corridors will be via kerb and channel into appropriately spaced sumps which will be connected to rapid soakage trenches/soakpits. All sumps will have trapped and/or inverted outlets.

It is envisaged that all lots will have individual soakpits onsite that will enable direct connections of dwelling and hardstand area stormwater.

The road corridor will be used as overland flow paths to direct stormwater runoff when the piped system is at full capacity (i.e. larger than a 50 year storm).

4.1.4 Pavement profiles

In reviewing the existing Geotech report, the underlying material will be suitable to achieve required compaction levels to ensure that the roading can be built to necessary standards.

4.1.5 Kerbing Options

Standard “SDC Low Profile” kerb and channel will be used in all roads in the subdivision, with cutdowns where appropriate.

4.1.6 Footpaths

Footpaths are to be installed in the roading network. This will be discussed further with SDC at engineering approval stage.

4.1.7 Roading Upgrades

It is anticipated that the East Maddisons Road frontage will be required to be upgraded to full roading standard. This includes kerb and channel, footpath and piping the stormwater drain.

5. Stormwater

5.1 Existing site stormwater management

There is currently no existing reticulated stormwater network located on the subject site, or close to the site.

Minor depressions and drains run throughout the site which will be dealt with through the detailed design process.

5.2 Existing Water Race

As reported above there is a stock water race running through the site. It enters the from the northern site boundary and exits the site on the western boundary of Lot 1 DP 26880. We are aware that the neighbouring plan change (PC70) has proposed to underground the water race at the boundary, meaning that there would be no further use of the water race once it leaves the subject site. It is therefore proposed that the water race would be terminated at the northern extremity of the subject site where it enters the property.

5.3 Proposed Stormwater Disposal

The proposed stormwater network for the development is proposed to be a surface water conveyance system which will discharge to soakage trenches or soakpits.

Individual lots will need to apply for individual consents for lot discharges to ground.

5.4 Proposed stormwater design

5.4.1 Roading System

It is proposed that the roading stormwater network for the development will consist of a surface water conveyance system which will discharge into sumps to soakage devices.

Key design parameters of the system are as follows;

- Kerbs will direct stormwater from roads into the appropriately spaced sumps.
- 50m² of hardstand area from private lots will be accounted for within the roading sumps.
- All sumps will have submerged outlets into the soakpits.
- Stormwater up to and including the 2 percent annual exceedance probability critical storm for the site will be catered for within the soakpits.

5.4.2 Private Lots

It is envisaged that all lots will have individual soakpits onsite that will enable direct connections of dwelling and hardstand area stormwater.

5.5 Soil profile and Groundwater

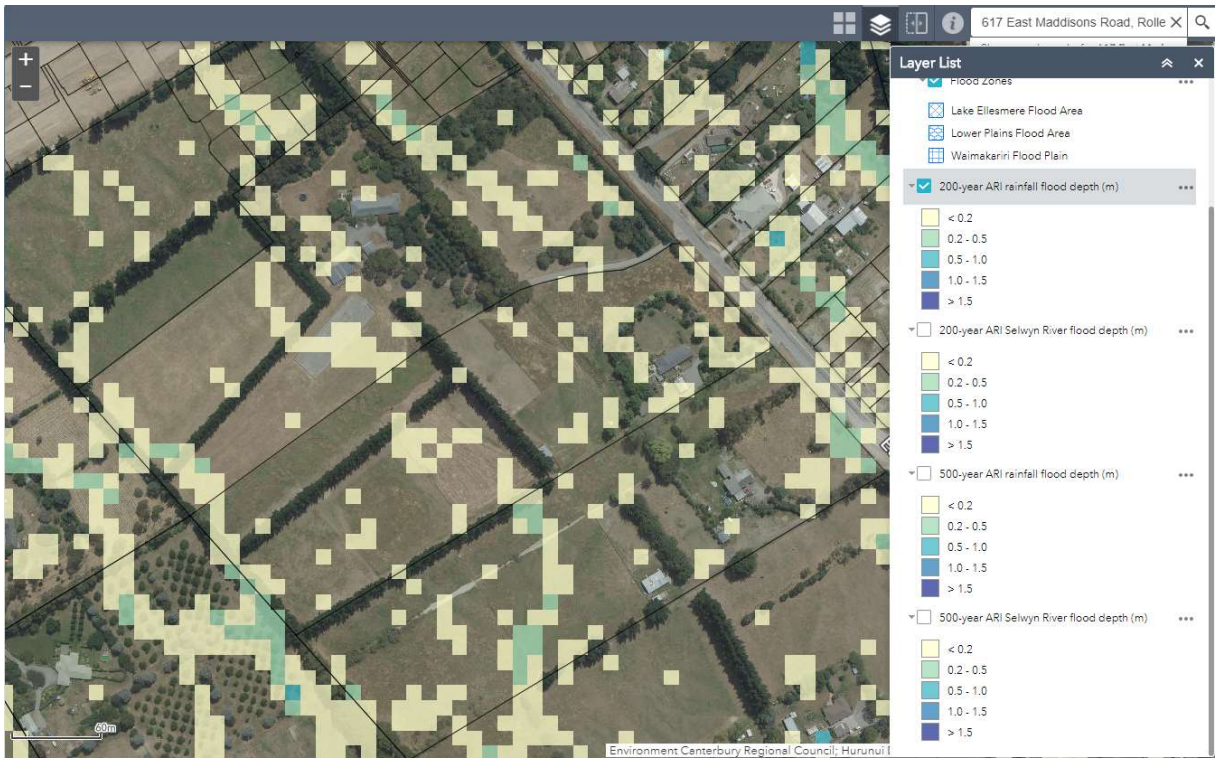
The geotechnical report, alongside the analysis of several well cards adjacent to the area, indicate that the ground profile would be similar to the following

- 250mm of topsoil, on
- Silty Gravels

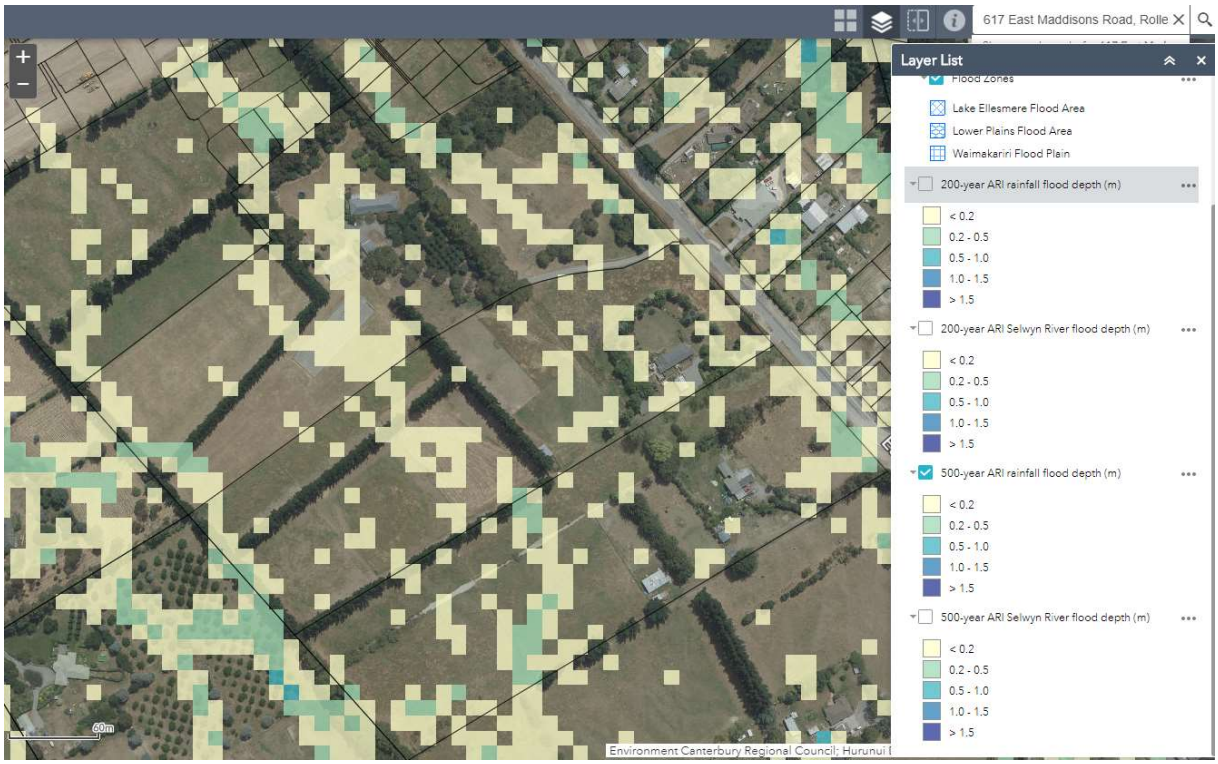
The indicative ground water level is between 6.0m and 10.0m Below Ground Level (BGL) in this general area of Rolleston.

5.6 Flooding Information

Flooding from both the 1:200 and 1:500-year ARI rain events is present on the subject site. Please see following flooding maps. It is envisaged that any of the minor depressions that are running through site will be locally filled and the overall site will be graded such that any minor flooding issues are minimised.



1:200 ARI Rainfall Flooded Depth Map



1:500 ARI Rainfall Flooded Depth Map

5.7 ECAN Consents

It is envisaged that Ecan consents will be required for the following activities;

- To use land for excavation and earthworks
- Discharge construction phase stormwater
- Discharge operational discharge to land

These consents will be applied for at the time of subdivision consent or engineering approval.

6. Wastewater

6.1 Existing Infrastructure

There is an existing 225mm uPVC sewer main in East Maddisons Road that was installed in 2016. Council have advised that this pipe has sufficient capacity to take the subject site.

The existing sewer line is approx. 3.6m deep, which will provide sufficient depth to service the entire subject site catchment.

6.2 Proposed wastewater design

It is proposed that the basis of the wastewater reticulation is to be a gravity reticulation grading to the existing sewer main on East Maddisons Road.

The gravity sewer is proposed to be laid at 1:200 (minimum grade) for the development.

Minimum grades as per the below table will been used for the system

Table 3: Minimum Grades

Pipe Diameter	Public/Private	Min Grade Used
150mm uPVC SN10	Public	1:200
100mm uPVC (laterals)	Private	1:80

All new lots will be supplied with a 100mm uPVC lateral connection which will be connected to the wastewater mains.

7. Water Supply

7.1 Existing Infrastructure

As per the SDC 5 Waters Activity Management Plan, there has been a 375mm watermain laid along the frontage of the subject site. Discussions with Council have indicated that this is readily to connect onto.

There is an existing water main located to the north in Lennon Drive.

7.2 Proposed Water Reticulation

It is envisaged that a ring water main would be extended from East Maddisons Road and connected to the Lennon Drive watermain. Additional mains would be extended through the development to connect onto other watermains if available. All other internal reticulation sizing and layout would be modelled and designed to maintain required pressure. A combination of main and submain reticulation would be used throughout the development area.

7.3 Fire fighting requirements

All reticulated supply would be unrestricted, and as such would be subject to the provisions of FW2 from SNZ PAS 4509:2008.

This standard requires at least one fire hydrant to be located within 135 m of any dwelling, and two hydrants located within 270m of any dwelling. Each hydrant must have the capacity to provide a minimum of 12.5 L/s with a minimum residual pressure of 100 kPa.

It is anticipated that there would be sufficient pressure in the current system to comply with the above requirements.

All new mains will have hydrants spaced to satisfy SNZ PAS 4509:2008.

8. Power, Telecommunications and Streetlights

8.1 Power Supply

There is an existing overhead HV line on the western side of East Maddisons Road. It is envisaged that the subject site will be reticulated from this line.

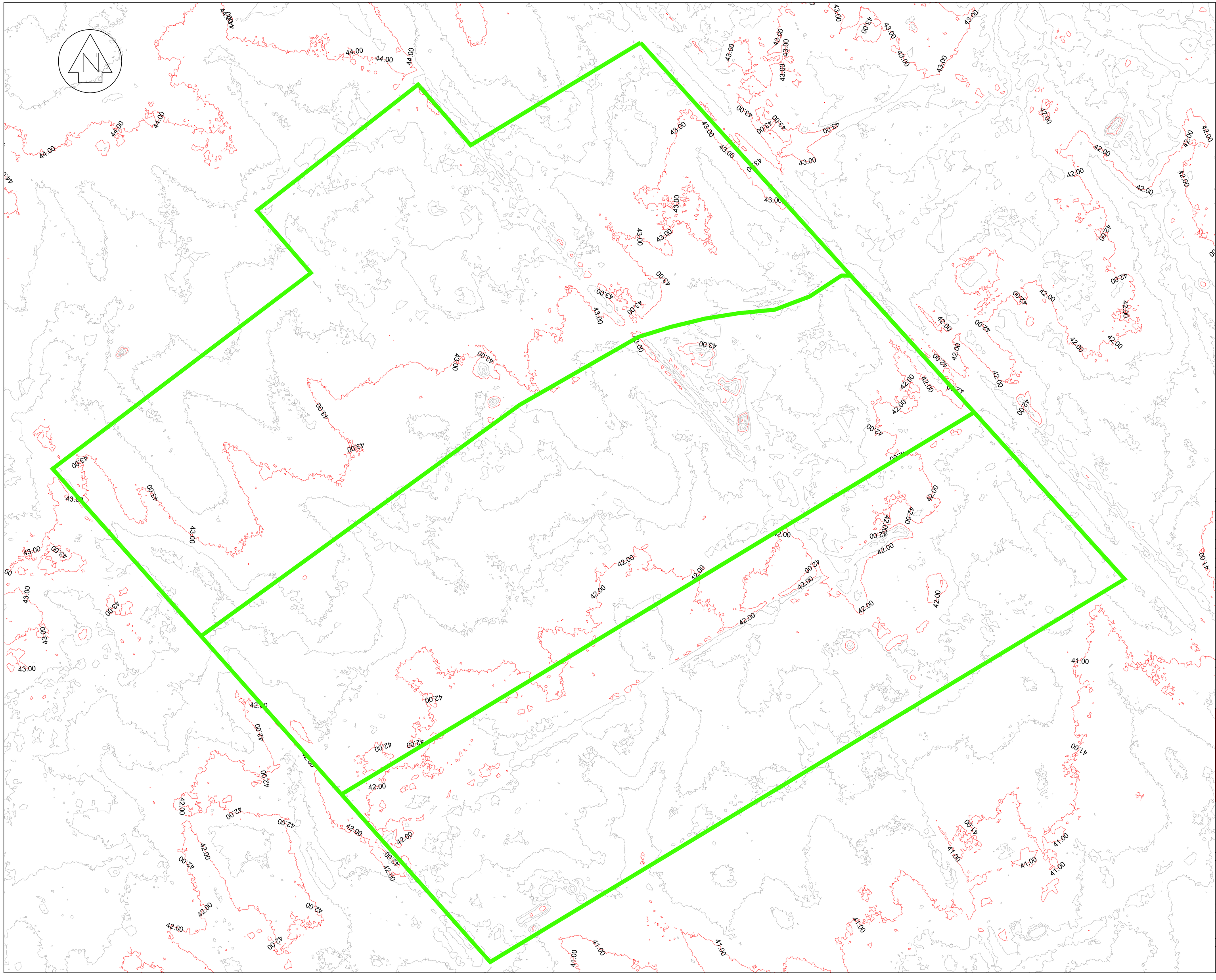
8.2 Telecommunication Supply

The subject site is within an Enable supply area. It is noted that all new subdivided land to the north have current enable connections

Liaison with Enable will be undertaken to determine network connection points.

8.3 Streetlighting

All streetlighting will be installed as per industry regulations. A lighting design will be completed at the detailed engineering approval stage.



LEGEND:

37.0 — MAJOR CONTOUR (1m)

MINOR CONTOUR (0.25m)

ALL HEIGHTS AND CONTOURS SHOWN HEREON HAVE BEEN CALCULATED USING THE FOLLOWING DATASET;

LINZ (2019) CANTERBURY NEW ZEALAND 2016 AIRBORNE LIDAR DATASET. COLLECTED BY AAM NEW ZEALAND LIMITED.

DATUM: *NZVD2016*

REV	DATE	REVISION DETAILS	ISSUED
A	07/12/20	FOR INFORMATION	CWH

PROJECT

EAST MADDISONS ROAD

CLIENT

DUNWEAVIN 2020 LIMITED

SURVUS CONSULTANTS
PLANNING + SURVEYING + ENGINEERING

4 Meadow Street, PO Box 5558, Papanui, Christchurch
P 03 352 5599 *AMBERLEY* 03 314 9200
F 03 352 5527 *ASHBURTON* 03 307 7021
TOLL FREE 0508 787 887 *DARFIELD* 03 318 8151

DRAWING TITLE

EXISTING CONTOURS
SHEET 1 OF 1

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	*1:400*	*A1*

PROJECT NO	*DRAWING NO*	REVISION
14828	*EN-100*	*A*

ODP EAST MADDISONS ROAD