Appendix A

Infrastructure Assessment

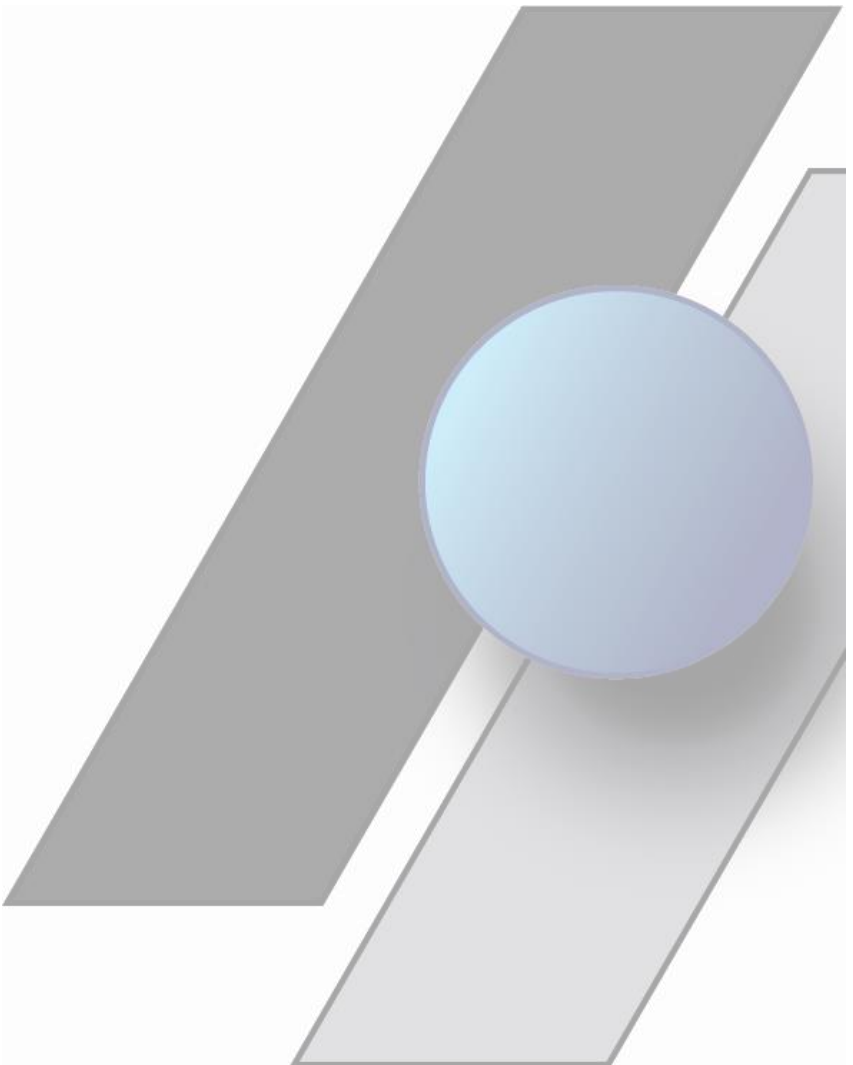
Project No:	2788	Issue Date	9 February 2021

Lot 1 DP 50631 and Lot 1 DP 357634
Plan Change Servicing Report

153 Lincoln – Rolleston Road

for

Yoursection Ltd



Contents

This report has been:

Prepared by:

(Designer) John Bannock, 2 December 2020

Approved by:

(Principal designer)

1. Scope

As part of a wider submission for the rezoning a portion of land at 153 Lincoln Rolleston Road which is a portion of the Urban Limit for Rolleston, this report reviews the matters associated with the servicing of the area identified below and referred to as 'report area'.

This report covers the availability of existing infrastructure elements and the probable extension of the infrastructure to allow for residential development for the 'report area'. It is intended to accompany the zone change application.

This report describes the infrastructure elements for the development proposal, namely

- Earthworks
- Roading
- Stormwater
- Overland Flows
- Wastewater
- Water Supply
- Power and Telecommunication

2. Land Description

2.1. Contextual Location

The 'report area' is within the areas identified as being within the Metropolitan Urban Limit for Rolleston within the Rolleston Structure Plan. The report area comprises of two titles which are identified as Lot 1, DP 50631 and Lot 1, DP 357634.

The report site is adjacent or within the near vacinity of a number of recently completed or under construction residential developments. There are still areas of the identified Metropolitan Urban Limit that remain to be developed.

2.2. Location and Description of Site

The site is located at 153 Lincoln Rolleston Road and is south of the Falcons Landing residential deveopment and to the east of the Farringdon and Acland residential developments. The site is a logical extension of the Falcons Landing residential development to the north and will allow the completion of the west – east connections that have been commenced within the Farringdon and Acland developments.

The report site is currently held in two titles, the larger (Lot 1 DP 50631) has an area of 20.675 Ha and the smaller (Lot 1 DP 357634) having an area of 4 Ha. Aside from the two residential houses the land is used for grazing, pasture crops and associated rural sheds and use. There are a number of hedge rows and shelter belt trees along the paddock fencelines.

The land coverage is generally pasture of good quality for grazing. There are portions of a irrigation waterrace that lie on western and southern boundaries of the overall report area. The irrigation race supplies agricultural water to a number of properties within the area north of Selwyn Road, however, only a few properties actually make use of the water for irrigation.

Figure 1: Contextual Location of Site

2.3. Underlying Ground Conditions

A geotechnical investigation of the site has been carried out by Miyamoto (dated 25 November 2020) and covered the report area site.

A summary subsurface profile is

0 – 400mm	Topsoil
400mm – 1100mm	Sandy SILT
1100mm - depth	Gravels (sandy fine – course)

The general underlying ground conditions wihtin the report area land is considered to be similar to that experienced within the Falcons Landing development to the north. Borelog records of wells to the north, south, west and east of the site indicates that the wider area has a similar profile.

Experience within the development of the Falcons Landing development suggests that there are isolated pockets of weak silts. However these are easily mitigated within the normal construction of roads.

The borelogs indicated that the ground water level is approximately 10m – 13m below the ground level.

3. Engineering Design Considerations

Engineering design and construction will be carried out in accordance with the Selwyn District Council's development standards and in terms of any consents issued by the Selwyn District Council or Environment Canterbury.

Details of any design will be provided to the Council for approval prior to any construction works. The details will be particular to the development layout and will generally follow the following format (based on the development of neighbouring sites).

3.1. Earthworks

The design of the site will be such that the need to import additional material will be minimised as far as possible (cuts will balance fills). The cuts will be primarily out of roads and high points of the site with the filling being the low areas and for site contouring.

The underlying ground conditions means that suitable fill material is readily available on site.

It is not considered that there are any significant impediments within the site relating to earthworks that would impact on the ability to form a residential subdivision.

3.2. Roading

Road formation will be to general intention of the overall development plan for the area. This will entail the creation of a Primary Road that runs south-west to north-east through a number of developments. Liaison between the Council and other landowners will be required to ensure that the formation of the road linkage is of a reasonably consistent format.

Roads will be formed to Selwyn District Council construction requirements to meet the required traffic loading and planning requirements. The layout of internal roads will incorporate the need for secondary flow paths along with connectivity links.

It is not considered that there are any significant impediments within the site that will impact on the ability to meet the overall intentions of the Rolleston Structure Plan.

3.3. Stormwater

3.3.1. Principal Disposal

Stormwater runoff within the greater Rolleston area is to ground via the free draining gravels. The underlying ground conditions under the report area are similar to developments within the surrounding area, meaning that the stormwater disposal will be similar to the adjacent developments.

Individual residential houses' rooves will discharge to ground within the site. Hardstand areas and roads will be collected within kerb and channel and sumps to soak-pits located within the road reserve.

It is anticipated that a consent for disposal to ground will have to be gained from Environmental Canterbury for the purpose of discharging to ground.

It is not considered that there are any significant impediments within the site that will impact on the ability to meet the Council's intention to dispose to ground.

3.3.2. Secondary Flow Paths

Secondary flows paths within the developed residential areas are via developed road corridors. The general 'fall' of the land is from the north-west to the south-east. The development will likely incorporate a number of road and reserve corridors between the Falcons Landing development and the undeveloped land to the south. This will maintain the secondary flow paths from the Falcons Landing development.

3.3.3. Flood Levels

The site has areas that have been identified as being affected by the Plains Flood Management Overlay of the proposed District Plan where there are flow paths that have been identified as potentially being impacted by flood waters under a 1:200 ARI event.

The development of the site and, in particular the road corridors, will formalise the flow paths as shown in the Plains Flood Management overlay that cross the site. This will effectively divert flows to within road corridors and around housing areas. The probable north-south road links as indicated in Figure 8.2 of the Rolleston Structure Plan will provide continuity of the overland flows from the Falcons Landing development to the north, through to the undeveloped land to the south. As the land generally falls to the south, the formation of secondary flow paths is not considered to be difficult.

Reserves also provide a means of ensuring that secondary flow paths are continuous across a number of development sites. The location of the roads and reserves will be partially determined by the need to ensure continuity of the flow paths.

As part of the urbanisation of the wider area, the secondary flow paths (and potential locations of flooding) are more defined and constrained. The urbanisation of Lincoln-Rolleston Road will provide an additional flow break with the use of kerb and channel and berms forming a shallow barrier to the north-south flow pattern.
It is not considered that the Plains Flood Management overlay indicates any impediment to the development of the land that is unable to mitigated with a road and reserve layout to ensure the continuity of flow paths, and limit areas of flooding to placed outside of residential development.

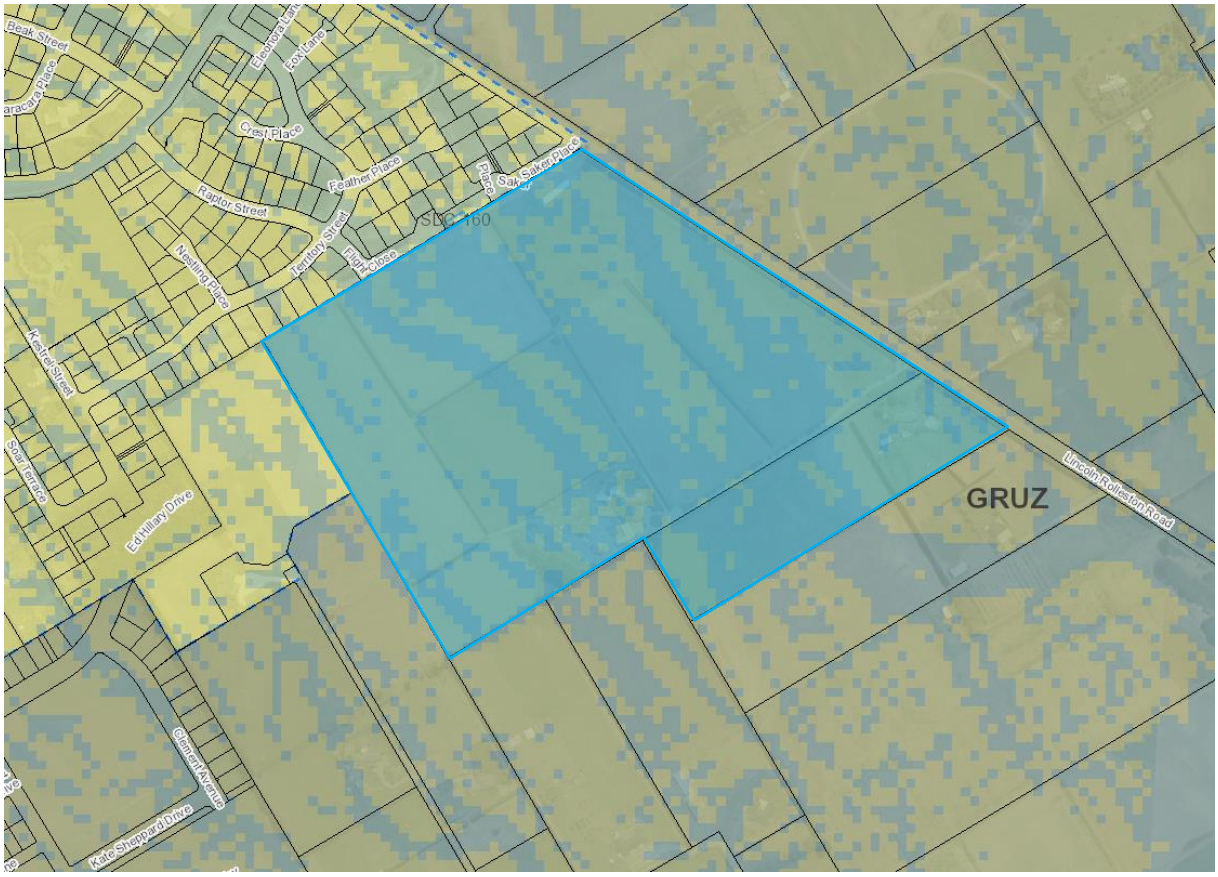


Figure 2: Plains Flood Management overlay with location of site indicated

3.4. Sewer

3.4.1. Existing Sewer Reticulation

Effluent for most of the Rolleston township is currently collected through the reticulated sewer pipework and ends up at the Southern Rolleston Pumping Station located at the intersection of Springston Rolleston Road and Selwyn Road. From there, it is pumped to the Pines activated sludge plant on Burnham School Road where it is treated.

Future sewage will need to be reticulated to the same terminus. The recent residential developments within the neighbouring area use a combination of gravity and pump stations to achieve this.

Two pump stations were constructed as part of the Falcons Landing development. No. 1 Pump Station was constructed for the Falcons Landing development and is located north of the proposed development. That pump station was designed to cater for 1294 lots and pump the effluent from those lots to the sewer trunk main on Springston Rolleston Road which discharges to the Southern Rolleston pump station. The sizing of the Falcons Landing No 1 Pump Station was based on the known contributing allotments with an allowance of 10 households / hectare for the undeveloped land.

At least 219 of those 1294 lots that the pump station was designed to service have not yet been developed. This is, in part, due to the lack of intensification of individual titles within the sewer catchment area.

A smaller pump station was constructed to cater for the Branthwaite development that is located next to 56 Branthwaite Drive. This pump station was designed to cater for the equivalent of a further 384 lots at standard usage. The plan was that the Brathwaite pump station would be decommissioned, and sewage would gravity feed to Falcons Landing No. 1 pump station. We understand that the Branthwaite pump station is still in use.

Based on the above, the Falcons Landing No. 1 Pump Station has sufficient capacity for an additional 603 lots (using the original yield of 10 households / hectare.

Using the revised sewer servicing rate of 12 households / hectare we note that Falcons Landing No 1 Pump Station has sufficient capacity for an additional **567 lots**, as calculated below

Branthwaite Development	*384*	*Actual Lot Number*
Undeveloped land	*183*	*Revised assessment based on 12 hh/ha*
	567	

3.4.2. Proposed Sewage Servicing

It is considered that the new development will be serviced by gravity sewer reticulation which will feed a new pump station situated in the vicinity of the south eastern section of the site (the lowest area). The exact location will be determined as a part of the overall development design. The effluent from this new pump station will then be pumped through to either the Southern Rolleston Pumping Station or the South Eastern Rolleston Pumping Station so it can be treated. There are several options that are available to achieve this.

3.4.2.1. Southern Rolleston Pumping Station Option

Effluent could be pumped from the new pump station to the Falcons Landing No. 1 pump station located between Flight Close and Saker Close until such time as the land to the south and west are developed. The development potential for the report area is likely to be less than the current spare capacity of the Falcons Landing No 1 pump station.

If it is not possible to utilise spare capacity within Falcons Landing No 1 pump station, then sufficient storage can be provided within the proposed pump station to cater for the report area.

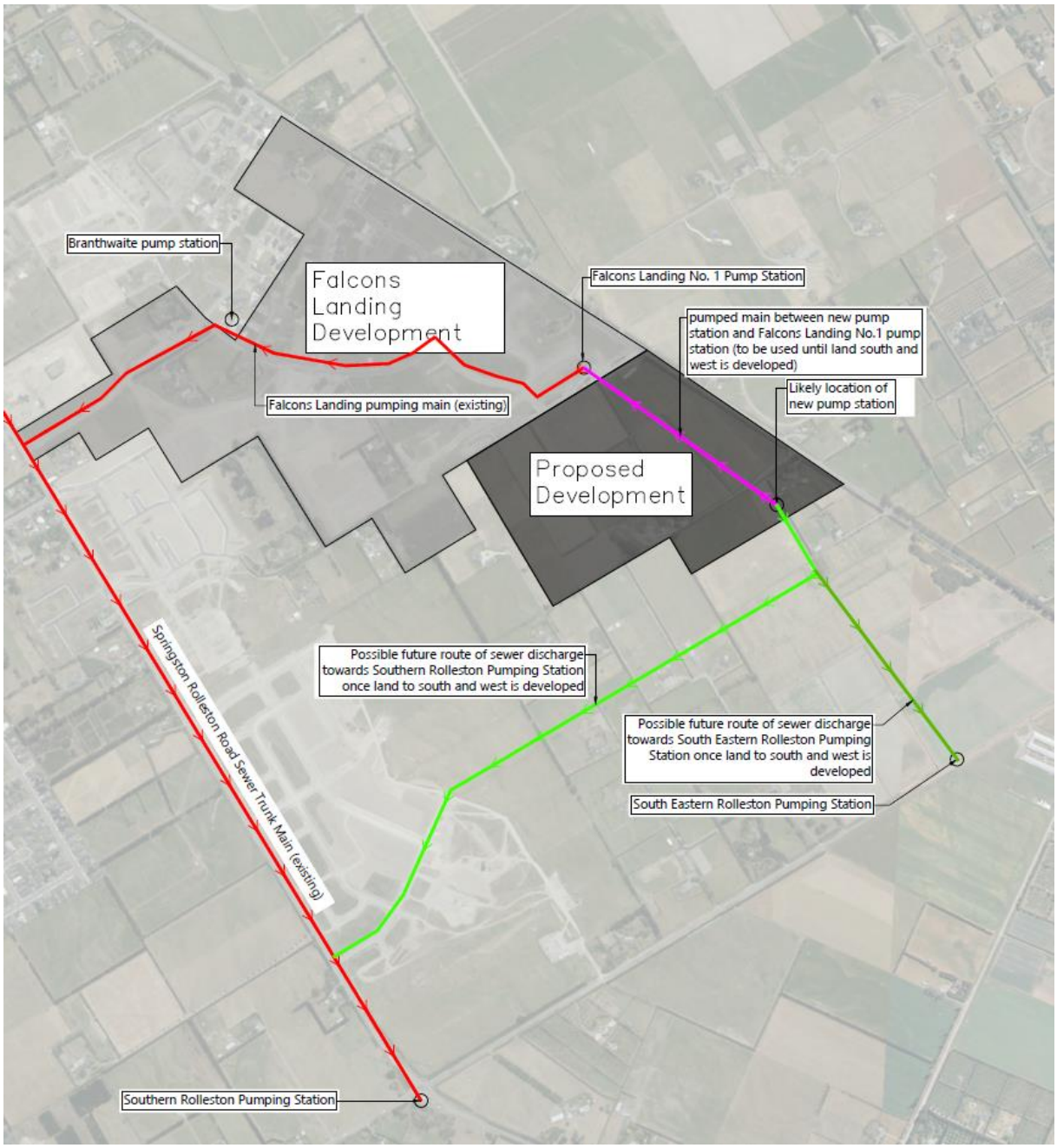
When the land to the south and east are developed, effluent discharge from the site can be re-routed to the Southern Rolleston pump station either solely by gravity or it can be pumped from the new pump station to a more appropriate discharge location where it can be gravity fed to its intended destination.

3.4.2.2. South Eastern Rolleston Pumping Station Option

Effluent could be pumped from the new pump station to the Falcons Landing No. 1 pump station located between Flight Close and Saker Close until such time as the land to the south and east are developed. The development potential for the report area is likely to be less than the current spare capacity of the Falcons Landing No 1 pump station.

If it is not possible to utilise spare capacity within Falcons Landing No 1 pump station, then sufficient storage can be provided within the proposed pump station to cater for the report area.

When the land to the south and east are developed, effluent discharge from the site can be re-routed to the South Eastern Rolleston pump station either solely by gravity or it can be pumped from the new pump station to a more appropriate discharge location where it can be gravity fed to its intended destination. Depending on the sewer design from the South Eastern Rolleston pump station, the pumps from the Falcons Landing Pump No. 1 Pump Station may be able to be removed.



It is not considered that there are any long-term impediments to the sewerage for the report area. For the short to medium term there are options associated with the wider development

timeframes and Council preferences. Options for the short and medium term are multiple and are able to be designed to ensure effective servicing of the report area.

3.5. Water

3.5.1. Existing Water Reticulation

Water supply for Rolleston is sourced from deep groundwater wells. A series of trunk water mains feeds smaller water mains which connect households to the on-demand supply. Council have been upgrading water supply and reticulation to meet the ongoing development of Rolleston including the recently completed Helpet upgrade.

Within the near vicinity there is;

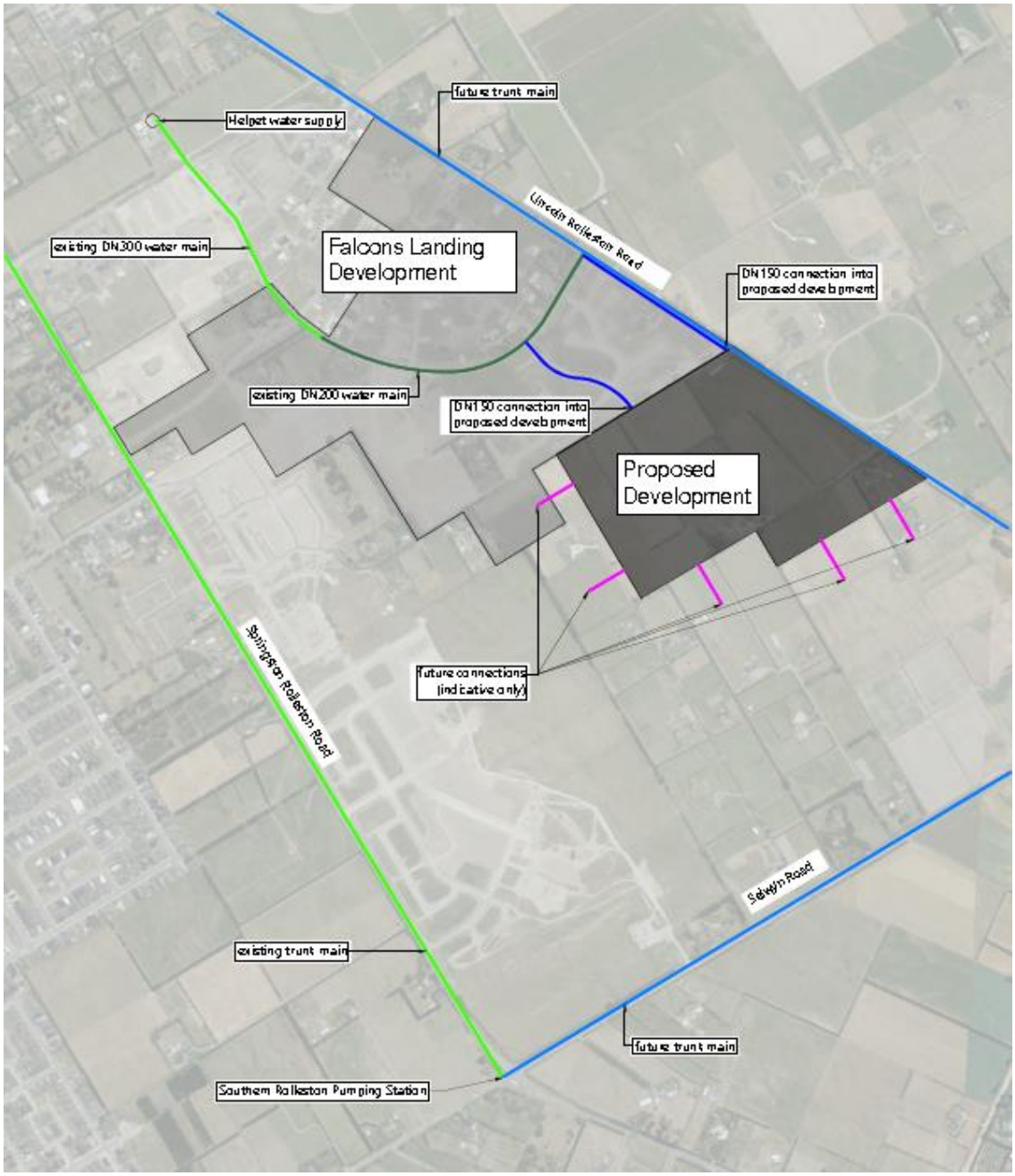
- A 450mm diameter truck main in Springston Rolleston Road.
- A 300mm diameter main in Branthwaite Drive connecting the Helpet water supply to residential lots to the south.
- A 150mm diameter water main was installed along Lincoln Rolleston Road as part of the Falcons Landing Development. This water main extends to the northern boundary of the report area.
- A 150mm diameter water main was also installed along Raptor Street to the boundary of the new development.

We understand that Council have a long-term plan to install a 400-diameter trunk main along Lincoln Rolleston Road down to the Branthwaite Drive intersection and continue that trunk main down to Selwyn Road with a 375-diameter pipe. We also understand that a 250-diameter main will be installed along Selwyn Road to link the existing trunk main on Springston Rolleston Road to the proposed trunk main on Lincoln Rolleston Road.

3.5.2. Proposed Water Network

The report area can be serviced water from the existing water reticulation on Lincoln Rolleston Road and Raptor Street. The exact details of water reticulation will come out in detailed design of the new development. Additional connections can be made to the water main that is extended along Lincoln-Rolleston Road. Additional connections will be made to land to the east and south when this is developed.

It is not considered that there are any restrictions to the development of the water supply that would impede the development of the report area for residential development. The development of the surrounding area will provide ample opportunities to provide ring mains and alternative connections.



3.5.3. Existing Irrigation Water Network

There is an existing irrigation scheme within the wider area. The irrigation water is conveyed to a number of properties via a network of open and piped waterways. The number of active users of this water is becoming less as the wider area is being developed for residential purposes.

A portion of the irrigation network lies along the southern boundary of the proposed development with a ponded area approximately 180m from the western boundary. The irrigation network leaves the property towards the south via a pipe.

It is understood that there is a high probability that this irrigation water will be abandoned in the near future due to drop in the users.

Until such time as the irrigation waterways are abandoned it is proposed to divert the irrigation network that lies within the proposed development to the internal roading network.

A piped system will be installed in the roading network to convey the irrigation flows through the site and to connect into the existing exit point from the site of the proposed development or other location as negotiated with the neighbouring landowner.

3.6. Services (Power and Telecommunications)

The power and telecommunication services will be extensions to the existing network. There are main trunk services within Lincoln Rolleston and Springston Rolleston Roads. The servicing of each development will likely occur off these trunk supplies.

The report land is immediately adjacent to Lincoln Rolleston Road and it is not dependant upon the development of other properties to gain access to this main supply.

It is not considered that there are any impediments to the provision of power or telecommunication servicing that would impact on the ability to develop a residential development.

4. Summary

We consider the ability to provide sufficient infrastructure to the report area we note

- The site lies within the Metropolitan Urban Limit as detailed in the Rolleston Structure Plan
- The site is a natural progression of the residential development of Falcons Landing to the north
- The ground conditions are similar to the surrounding developed area, namely topsoil covering gravels
- The site has several good connections to the north into the Falcons Landing development, along Lincoln Rolleston Road and developments expanding from the west
- The site includes principal roading and infrastructure connections, including those that have already been installed within other developments. The completion of these infrastructural elements will complete the intention of the Rolleston Structural Plan
- The quantum of earthworks is intended to be balanced within the development area
- Roading and other infrastructure can be constructed to the Selwyn District Council's standards
- Roading and reserve layout can take into account the need to convey secondary flow paths
- Stormwater will be to ground
- Sewerage has options for both short term and long-term conveyance of sewage to the Southern Rolleston Pump Station
- Water reticulation has good connections to the existing reticulation network
- Irrigation water will be conveyed within a piped network located in the road corridors and leave the site at the exiting location or other such location as agreed with the neighbour.
- Power and telecommunication connections are available to the existing network.

5. Comment

There are no constraints to the need to supply infrastructure to the report area that would impede the development of residential allotments to the density of the residential zone.