Private Plan Change Request – Urban Estates Limited
Appendix A – Infrastructure Report
(Kim Sanders)

Urban Estates Ltd

Submission to District Plan to Rezone Land

Selwyn Road / Lincoln Rolleston Road • Rolleston

Infrastructure Report

November 2020

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1. Introduction

This East Rolleston site is comprised of 13 land parcels on the corner of Selwyn Road & Lincoln Rolleston Road, in Rolleston. It could be referred to as the logical extension of Falcons Landing (to the north) and Acland Park (to the west). The land has been identified by the Proposed Selwyn District Plan as "Urban Growth Overlay".

A submission is being made on behalf of a group of landowners and Urban Estates Ltd. The latter are acting as co-ordinator to the submission. Whilst this submission covers 63.3ha, the whole of the "Future Growth Overlay in this general area includes 19 hectares of land to the north and 23.4 hectares in the southeast corner. The sewer and water for this block will be designed to enable the extra 41.4 hectares to be able to connect if (as expected) they become zoned for residential development sometime in the future.

The current zone densities being produced are 12 per hectare. The General Residential zoning requested by this submission will create the potential for 756 lots and the total area of 104.4ha, if the whole block is rezoned, will create 1263 lots.

The land is currently utilised as a mixture of lifestyle blocks and rural production There are existing houses that will either be developed around or demolished, that decision to be made at subdivision consent stage once the land is rezoned. There are a significant number of existing mature trees over the site which will be removed, as is normal for large residential developments.

The land is undulating and generally slopes gently to the south/southeast at 1 in 400, although there is a "flatter" area in the middle of Lot 3 DP48064. Ground conditions are expected to be the same as current areas of residential Rolleston, where there are shallow free draining gravels and potentially a thin layer of silt immediately under fair to poor grade topsoil.

Secondary flow paths will be along the road reserves to the south or to adjacent recreation reserves, with house building platforms above the 1 in 50 year critical storm event.

The frontages onto Selwyn and Lincoln Rolleston Roads will be upgraded as the development proceeds.

The subdivision is proposed to be in general keeping with (or better than) the neighbouring urban design approaches. The outline development plans (ODP) reflects this and can be amended in response to requests following further consultation with Selwyn District Council.

It is acknowledged that this area was the most challenging "earmarked" block of land to be able to be serviced for sewer. The applicants have every intention to install pump station(s) at an early stage, and to then set up a private developer agreement so as to recoup their initial significant outlay as the development area proceeds.

The submitter recognises the strategic approach required for servicing this area and understands the need to integrate the greater catchment area into these concepts. To that end please note the details supplied in sections 5 & 7 (Sewer & Water) are preliminary ideas, many of which will be adjusted to suit the final outcome.

2. Site Conditions

2.1. Soils

A desktop geotechnical investigation and assessment has been undertaken by ENGEO Ltd, and is attached to the main submission.

This geotechnical investigation was compiled using data obtained from the Canterbury geotechnical database, Environment Canterbury database and from recent site investigations. The following observations can be made from this report;

- Geotechnical materials underlying the site typically comprise of between 0.2 and 0.4m of topsoil, underlain by 0.1 to 0.4m silt/sand in some locations, underlain by dense sandy gravels to an unknown depth.
- Environment Canterbury borehole logs surrounding the site indicate gravel and sandy gravel with thin clay layers to depths of at least 42m below ground level and groundwater can be found approximately 9 to 13m below ground level.
- There has been no evidence of liquefaction in developed areas near the site during recent large earthquakes. The likelihood of liquefaction or lateral spreading occurring at the site is very low based on the depth to groundwater and the nature of the sub-surface materials (namely gravel).
- The site is considered Technical Category 1 (TC1), where future land damage as a result of liquefaction is unlikely.

2.2. Soil Contamination

A desktop contamination investigation (for rezoning purposes) has been undertaken by ENGEO Ltd, and is attached to the main submission.

It is expected that minor contaminants will be encountered during development. These will be dealt with in accordance with the NES and validated at the end of each stage of the development.

We do not foresee any potential difficulties in remediating this site if areas are found to contain discrete areas of contamination. ~~be contaminated~~.

3. Earthworks

Earthworks will be carried out on the site to ensure that all future house sites will drain towards the street between the grades of 1/200 and 1/500. Subject to final earthworks design, the house sites will be elevated above the street by up to 0.5m.

All topsoil on site will be stockpiled and replaced on the land immediately following bulk earthworks. All disturbed topsoil will be re-sown with Selwyn District Council specified grass seed mixes. A balance of cut and fill will be maintained on site and removal of material from site will be kept to a minimum.

Sediment flow off the site will be controlled according to Regional Council requirements. The basis of the sediment control will be the Environment Canterbury Guidelines and the discharge during construction will either be dealt with in association with the overall discharge consent or will be maintained in a fully compliant state.

All dust created on the site will be controlled by water cart, dust suppression fencing or other such Council approved methods and construction methodologies.

A comprehensive erosion, dust and sediment control management plan will be submitted Selwyn District Council and Environment Canterbury for approval prior to the commencement of construction.

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

4. Roading

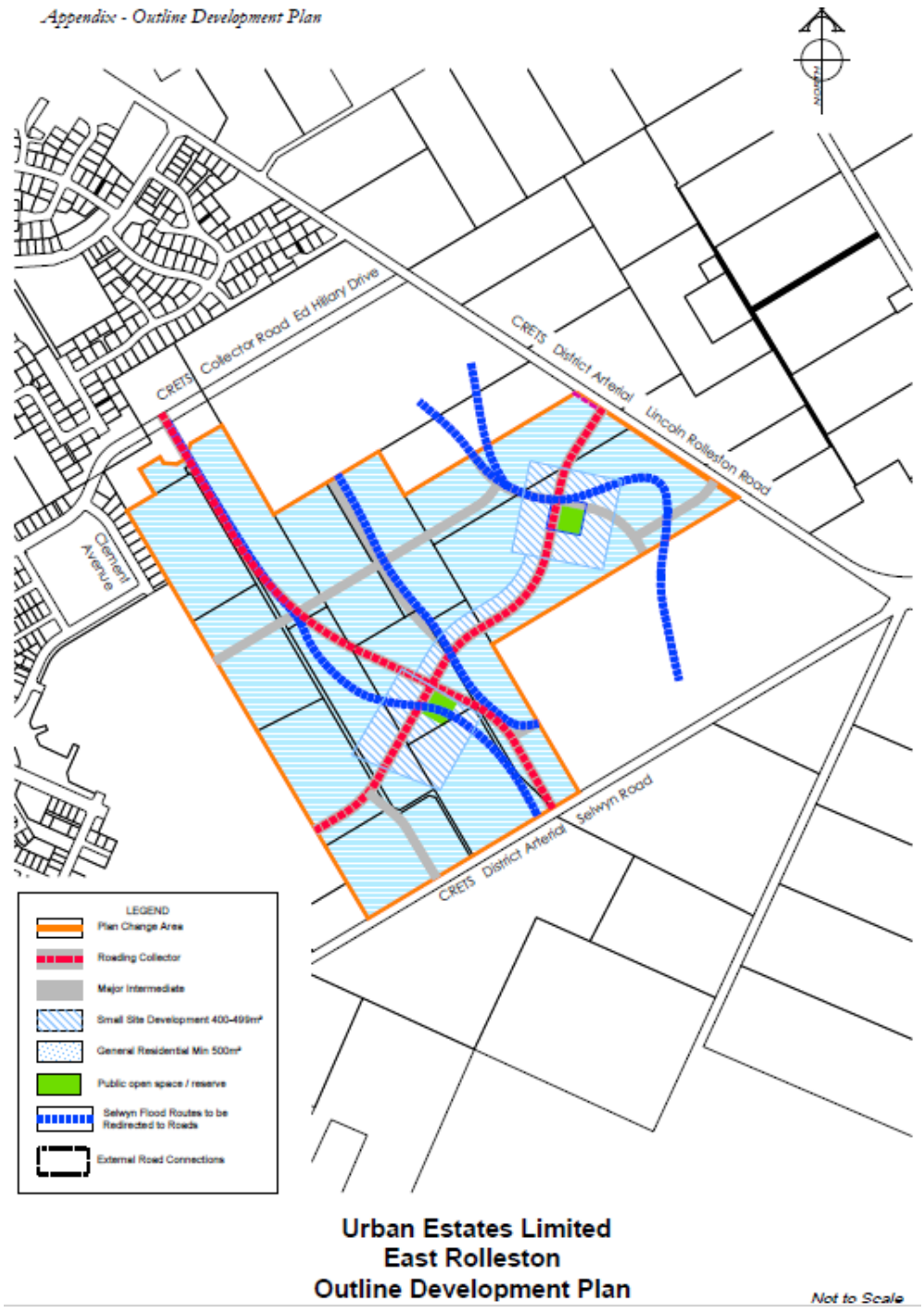
A comprehensive study of roading pattern and entry/exit routes will be carried out and have regard to the Traffic Engineer's report attached to the main submission, with reference to the CRETS network and neighbouring developments.

The proposed roading network will be designed to comply with discussions with Council Urban Design, Planning and Engineering staff. It is expected that the roads will connect to roads within Acland Park and Falcons Landing during the development. New entrances will be created off both Lincoln Rolleston Road and Selwyn Road. When the development fronts onto an existing road, it is accepted that frontage upgrades will be undertaken by the developer. The cost of other works such as widening and works on the opposite side of the road will need to be addressed by Council.

All kerb and channel used within the development will be Selwyn District Council mountable kerb. All wearing courses will be 35mm AC10 in accordance with NZTA M10. Some cobbled thresholds may be installed at intersections to indicate a change in road hierarchy and to add visual amenity.

All roading works including street lighting will be constructed to approved engineering drawings and relevant Council specifications.

The Outline Development Plan for the proposed area for rezoning is shown below with the proposed collector and major intermediate roads. The densities are also specified on the ODP with the higher densities focused on the northeast/southwest collector road and with its intersection with the collector linking Selwyn Road with Ed Hillary Drive.



5. Sewer Infrastructure

As mentioned previously, there is work to be done to formulate the best sewer solution for this general area. Consultation with Council engineers is expected to involve engaging of specialist consultants to work on the final design. It is expected that Urban Estates will pay for this consulting work and that cost will be included in the proposed private developer agreement for "upfront sewer costs". Any costs relating to "other areas" will be repaid by the appropriate developments.

A previous report for another zone change request in South Rolleston (by Davie Lovell Smith for Farringdon) concluded that the new system including the RADAR Pump Station built at the corner of Selwyn Road/Springston Rolleston Road along with the accompanying 525mm pipe along Selwyn Road, could cope with a total of 7200 homes, or 600 hectares catchment area. It is assumed that the East Rolleston area proposed by this rezoning can be part of that design catchment area, with its requirement being to get its sewage ,along with other adjacent catchments,to the RADAR pump station.

Confirmation will be gained from SDC to confirm the installed downstream infrastructure including the pump stations have the capacity to accommodate additional flows produced by this development within the catchment area.

The proposed sewage network will discharge into the existing sewer network at the approved location, (probably RADAR pump station) which drains to the main Rolleston sewer outfall (Pines Wastewater Treatment Plant). The pipe network will be sized accordingly with a trunk main linking into the block from a pump station site which is expected to be centrally located "but" perhaps being slightly closer to Selwyn Road.

The sewer demand for the proposal will be calculated using the SDC Code of Practice. Calculations will be carried out to assess the peak domestic demand. An allowance will be made in the new sewer infrastructure for additional upstream or downstream catchments. An example of how this could work is:

Catchment Area: This submission 63.35ha, plus extended area 41.4ha. At 12 per hectare = 756 lots (1263 total)

Average sewer flow
ASF = 756 lots (1263 total) x 220 L/person/day x 2.7 people/lot = 428 m3/day = 5.25L/s (8.77L/s)

Peak wet weather ratio
P/A = 2.5 SPF = 2
MF = P/A ratio x SPF x ASF = 2 x 2.5 x 5.25 (8.77) = 26.2 L/s (43.8L/s total) = Pump Rate

An early estimate of the pipe sizes to connect from a new pump station (close to Selwyn Road) to the RADAR pump station (approx. 920m away with a headloss of around 1m per 100m length) would be an OD180mm PE PN12.5 for our submission area and an OD250mm PE PN12.5 for the total catchment area.

The internal sewer pipes (gravity toward a new pump station close to Selwyn Road) will generally be 150mm sewer mains laid at minimum grades of 1 in 200, with the last upstream mains to be laid at a 1 in 160 grade as per SDC guidelines.

All new residential allotments will be provided with a 100mm diameter gravity lateral laid at least 1m into the net area of each lot. The system will be constructed to Council standards and will be vested in

Council. Any public sewer pipes over private land will be covered by easements in gross in favour of Council.

6. Water Reticulation

The Council have a strategic plan for the delivery of water trunk mains to the south east side of Rolleston. It is contained in the SDC 5 Waters Activity Management Plan and is described as Rolleston Master Plan 2017 – 2048. The plan describes the network of pipes and bore upgrades with specific timing.

The development will connect into the existing watermains constructed in Lincoln Rolleston Road, Acland Park, Falcons Landing & Springston Rolleston Road. Modelling will be required for assessment in the Council's overall Network Analysis Model. This will determine the size of pipes and location of the connection.

A new watermain may be laid along Selwyn Road to connect to the existing 450mm pipe on corner of Springston Rolleston Road and Selwyn Road. This would only be done if the Acland Park water connection (which comes off the 450mm pipe) proves to be too small.

An early estimate of watermain size is 200 to 250mm (for max flow rate of 45L/s for our submission or 75L/s for the total area). Depending on the number of other houses connecting over & above our 756 lots will determine the size and whether it needs to be a new pipe connecting to the 450mm pipe.

Within the subdivision the reticulated system will generally comprise of 150mm uPVC watermains (or larger for trunk main purposes) with 100mm uPVC watermains in minor roads throughout the site. This will be accompanied by 63mm PE submains.

A metered connection will be supplied at the boundary of each residential allotment in accordance with council requirements. All sites serviced via a right of way will have metered connections located in the road reserve boundary and 32mm PE laterals installed to the net area of the lot.

Hydrants will be attached to uPVC mains and will be designed and installed to satisfy the requirements of the New Zealand Fire Service Firefighting Water Supplies Code of Practice for a water supply classification of FW2.

7. Stormwater Reticulation and Drainage

On individual sites, roof stormwater will be disposed of directly to ground via soak pits in accordance with the Building Act, and constructed as part of the Building Consent process. All other stormwater emanating from roads, berms and lot frontages will be collected by sumps and pipes and directed to disposal systems in the streets. The drainage and soak pits associated with the roads will be constructed as part of the subdivision and will be vested in SDC.

The individual site soak pits will deal with storm events up to a 10% AEP 1hr event. The soak pits in the street will accommodate flows off the streets up to a 2% AEP critical duration event plus the runoff from the house sites once the on-site soak pit is inundated. This will be calculated as the flows generated by a 2% AEP critical duration event, less a 10% AEP 1hr event.

The soak pits are designed for easy maintenance with an additional sump in the receiving manhole to catch all sediment which may travel through the channel sumps. All systems will be sealed to ensure no floating contaminants or rubbish can enter the soak pits.

It is expected that all stormwater will be permitted to discharge to ground without treatment. Consent to discharge developed phase stormwater directly to ground, will be sought from Environment Canterbury. All roading stormwater infrastructure will be designed to meet both regional and local council standards including Selwyn District Councils specified rainfall intensities.

The site will be designed to ensure that secondary overflow path for storm events greater than 2% AEP will drain via road and reserves network. Road contours will match the general overland flow direction from north to south along the roads. The secondary flow paths will correspond with any natural depression and flow channel (see attached Selwyn Flooding Map in Appendix A)

As the stormwater is being dealt with on-site, no development contributions for this asset are required.

8. Services

Power and Telecommunications will be provided to all sites in line with utility and industry standards. Cables will be laid underground. Where required, electricity kiosks will be installed on individual lots.

Existing power connections to the sites will be incorporated into the proposed power design. A single connection will be provided at the boundary to each site and the system will be controlled by Orion upon completion.

Telecommunications will be installed as part of the Enable fibre network.

9. Conclusion

This report has addressed the servicing of the proposed residential rezoning of land already earmarked by Selwyn District Council for Future Urban Growth.

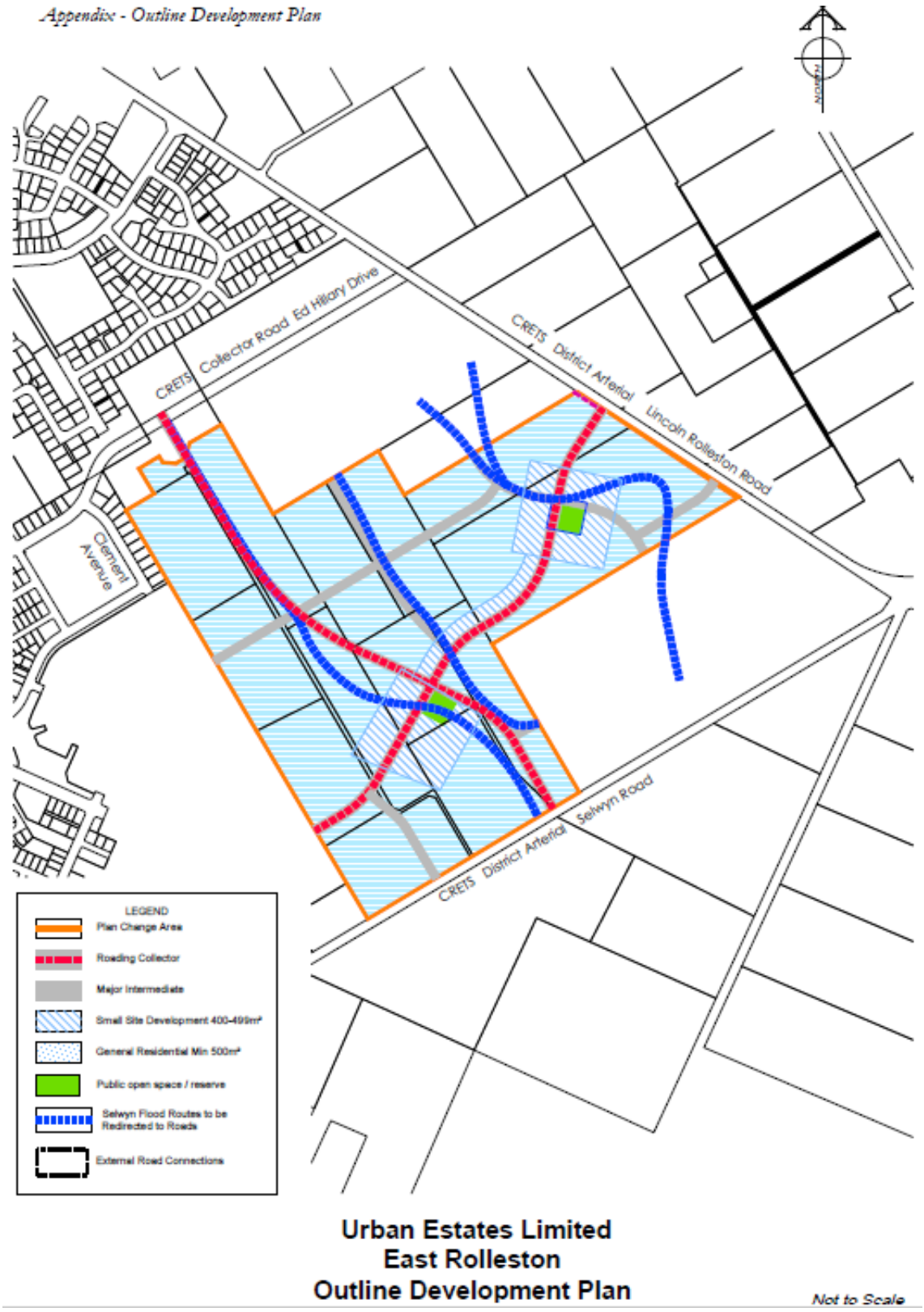
There are issues to work through with regard to sewer, but these are no more difficult than all the other sewer solutions that have evolved in the last 10 years. It is seen as a logical extension to Rolleston and the developer (Urban Estates Ltd) has indicated they will look at "funding" the significant upfront costs for design and construction by way of a private developer agreement to solve any high initial costs, if they are required.

With regards to all other services including earthworks, roading, stormwater disposal, water supply, power and telecommunications, they will be serviced to the same standard as the current development areas of Rolleston, using methodologies and proposals based on standard engineering practice and the Councils Infrastructure Design Standards.

On the basis of our investigations, we have concluded that the infrastructure proposed for this development is sufficient to meet all future servicing requirements.

Appendix A: Plans

OUTLINE DEVELOPMENT PLAN



SELWYN FLOODING MAP

LIDAR AND STORMWATER CHANNELS PLAN