Memorandum

TO: **J Carter Planning Limited**

FROM: Alan Hopkins

DATE: 29/06/2022

SUBJECT: Brackens Ridge – Service Feasibility Assessment

At the request of Jenny Carter (J Carter Planning Ltd), Queenstown Civil Consulting Limited (QCC) have undertaken a high-level assessment of the ability of the existing Council and network utility service infrastructure to cater for a 100-allotment residential subdivision to the south of the current Arrowtown growth boundary, with each allotment capable of accommodating a main dwelling and secondary unit/residential flat. The subject site is legally identified as Sec 1 SO24781, Lot 1 DP25880, Part Section 104 Block VII Shotover SD and is bounded by Centennial Avenue to the east and McDonnell Road to the west. The development area and project are referred to as Brackens Ridge.

Subject site aerial

WATER

To the west the site has access to a recently installed 200mm PE Council watermain located within the unsealed eastern shoulder of McDonnel Road. To the east the site has access to a 50mm alkathene Council rider main located within the grass berm of Centennial Avenue.

Discussions with Council Development Engineer (Richard Powell) have confirmed that the project can be serviced via the existing Council Arrowtown water supply network. The developer will need to replace the existing 50mm alkathene rider main on Centennial Avenue with a 100 or 150mm main from the Cotter Avenue intersection 300m south to the site. This new main will then need to be ringed through the site and connected to the existing 200mm main within McDonnel Road. In addition to these works, Mr Powell has also indicated that volume upgrades will likely be required at the Arrowtown water storage reservoir tank farm. The exact volume required could not be determined at this time, but Mr Powell has indicated that the volume is likely to be relatively minor.

Based on discussions with the Council's Development Engineer and a review of existing Council water infrastructure, I can confirm that the project can be catered for via the existing Council water supply network with limited pipe and reservoir upgrades.

WASTEWATER

To the west the site has access to a recently installed 75mm PE Council sewer rising main that conveys wastewater flows from the Arrowtown retirement village north to the McDonnell Road pump station. To the north the site has access to a 300mm PVC Council sewer rising main that conveys all of Arrowtown's wastewater flows from the Norfolk Street pump station west to the Lake Hayes wastewater scheme and ultimately to the Queenstown wastewater treatment plant.

Discussions with the Council's Development Engineer have confirmed that due to localised capacity constraints the project cannot be serviced via the existing 75mm rising main on McDonnell Road. The project can however feasibly be serviced via a pressure connection to the existing large diameter 300mm rising main on the norther boundary. This connection will require the developer to include a localised gravity network feeding to a new centralised pump station. This pump station will then feed via pressure to the existing 300mm main. The design and operation of the pump station will need to work in conjunction with the Norfolk Street pump station, via Scada controlled alternate pumping cycles or similar.

Based on discussions with the Council's Development Engineer and a review of existing Council wastewater infrastructure, I can confirm that the project can be catered for via the existing Council wastewater network with a new localised pump station that feeds into the existing Council infrastructure as described above.

STORMWATER

The site has very limited access to existing Council stormwater pipe reticulation. The only feasible point of connection to the Council network is an existing 450mm main located north-east of the site at the intersection of Centennial Avenue and Jopp Street. The site does however contain an unnamed tributary of the Arrow River that currently conveys the majority of the existing runoff from the site.

While connection to the existing Council 450mm main at the Jopp Street intersection is feasible, due to the invert of this pipe only a small portion of the project can be serviced in this direction. Any connection to this service would need to confirm adequate remaining capacity within the Council pipe network and/or attenuate flows via ponds or storage galleries.

The project can feasibly be serviced via outlets to the existing unnamed tributary of the Arrow River that crosses the lower portions of the site. To avoid any increase in flows to downstream properties and subsequent increases in flooding risk, the stormwater runoff from the site will need to be attenuated to pre-development levels via ponds or storage galleries prior to discharge.

Given the existing wetland areas within the site and proposed significant areas of open space, the required attenuation of flows is likely best catered for via damming of these areas to create dedicated attenuation ponding in series with the existing waterway. This approach will assist in ensuring a pleasing aesthetic. This ponding will discharge at the pre-development rate and include suitable live storage to cater for the critical duration event under the 100yr return period with provision for climate change. Initial calculation indicated that 400-500m^2 of on-site pond storage will be required to attenuate the project flows.

The discharge flows from the project will also need to include appropriate treatment to ensure sustained compliance with Regional Council discharge rules and no impacts on downstream water quality. This treatment will likely take the form of an initial proprietary device (Hynds 'First Defence', SW360 'VortCapture', or similar) at the outlet and final polishing within the on-site ponds and wetlands. This approach will ensure that there will be negligible impact on downstream water quality and may potentially serve to increase water quality through the introduction of formalised ponds/wetlands.

Based a review of the existing Council stormwater infrastructure, and existing flow paths and waterways, I can confirm that the project can feasibly be serviced for stormwater runoff as described above.

POWER & TELECOMMUNICATIONS

Significant Chorus telecommunications and Aurora power network reticulation is located within both McDonnell Road and Centennial Avenue. These utilities are suitably located to service the project. If required, the network utility providers will be willing to upgrade this infrastructure to cater for the increased customer base the project would achieve.

CONCLUSIONS

Overall, an assessment of the existing infrastructure surrounding the site and discussions with Council's Development Engineer have confirmed that the project can feasibly be serviced. This servicing will require limited and achievable upgrades to Council's existing water supply network, and relatively common internal servicing infrastructure requirements in the form of a wastewater pump station and stormwater attenuation.

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