



Wooring Tree Developments  
14 July 2021

## Servicing Capacity for Proposed Wooring Tree Development, Cromwell

This analysis is in response to a request from Wooring Tree Property Development Limited to undertake an assessment of infrastructure capacity for the Wooring Tree subdivision following the proposal to reduce the area of retail and business activity in Wooring Tree and correspondingly increase the number of residential lots.

CODC's agent, Mott MacDonald, who holds their models for water and wastewater reticulation was engaged in 2020 to model the capacity of the existing Cromwell reticulation networks to accommodate & service a development of 350 lots with 1.65ha of commercial development on the Wooring Tree site in Cromwell.

Their report, dated 14 August 2020, concluded the following:

- The proposed development could be adequately serviced for water using a single-ended reticulation supply connected to the existing reticulation network at Roberts Drive.
- The proposed development could be adequately serviced for waste water by connecting up to 130 lots to the existing sewer pump station in Scott Tce and construction of a new pump station connecting the balance directly into the existing Lowburn Rising main.

It should be noted that network modelling is an imprecise science and that the numbers reported and relied upon below have been rounded. It is unclear what exact numbers were entered into the modelling software.

The Wooring Tree developer has recently changed their proposed lot / commercial area balance in light of CODC concerns and feedback as part of the consenting process. Their revised proposal now incorporates 364 residential lots with 0.93ha of commercial development. The lot total includes those lots developed as part of stage 1 under RC 190519.

Below is an assessment of how this revised development matches with the one modelled by Mott MacDonald.

The Mott MacDonald modelling appears to have used the following parameters:

Water:	Daily Flow	Instant peak
Residential	525 m3 per day,	30.4 l/s
Commercial	71.3 m3 per day,	1.2 l/s
TOTAL	596.3 m3	31.6 l/s

Sewer:	Peak dry weather	Peak wet weather
Residential	7.6 l/s	15.2 l/s
Commercial	1.2 l/s	1.2 l/s
TOTAL	8.8 l/s	16.3 l/s (their figure)

They modelled 350 lots & 1.65ha commercial in total.

Working back from their figures we can determine that, as far as their modelling of demand / flows goes, each lot was modelled as being equivalent to  $Xm^2$  of commercial land:

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Water: 247.2m<sup>2</sup> (Daily flow) , 1194.3m<sup>2</sup> (instant peak)  
 Sewer: 298.6m<sup>2</sup> (dry peak) , 597.2m<sup>2</sup> (wet peak)

The modelling was for 1.65ha commercial. This has been reduced to 0.93ha, a difference of 0.72ha or 7,200m<sup>2</sup>. This is equivalent to the following number of lots (using the equivalents above):

Water: 29.13 and 6.03 lots (Daily flow / instantaneous peak)  
 Sewer: 24.11 and 12.06 lots (Dry weather peak / Wet weather peak)

Taking the most restrictive case (water being instantaneous peak and wastewater being wet weather peak) and based on the current planned connections, this means infrastructure could accommodate 356 residential sites and 0.72ha of commercial land for potable water, and 362 sites and 0.72ha of commercial land for wastewater.

**Water:**

- The modelling was carried out using a single ended supply. It has always been the intention to connect to the 300mm main at the western end of the site that will be relocated as part of the development works.
- The average flow, as modelled, was 6.9 l/s. The instantaneous peak flow, as modelled, was 31.6 l/s.
- The report indicates that an increase to a 200mm singled ended supply is sufficiently close to satisfactorily meeting the modelled demands (5.1m/km head loss predicted vs 5.0m/km allowable). The velocity through a single 200mm pipe at peak anticipated flows is 1.0m/s.
- The modelling carried out is the equivalent to a total of 356 lots with 0.93ha commercial.
- The restricting factor in the modelled flow was the high head loss through a 200mm pipe within the development. The development was connected to the Roberts St main with a 200mm pipe and splits into three 150mm or larger pipes to service Stage 1. Connecting to the existing 300mm main running thorough the western end of the site with another 200mm pipe would halve this pipe velocity with the net effect of reducing the headloss to around 40% of the modelled quantum. The total lot capacity through a double ended system connecting to both the western 300mm main and the Roberts St main before the head loss limits would be met is likely to far exceed 400 lots.
- From the figures in the Mott MacDoanld report, reticulation pressures across the site are more than adequate and, particularly when coupled with a double ended supply, do not appear as if their lower bounds would be approached by the servicing of in excess of 400 lots.



## Sewer:

- The modelling carried out was for a split disposal of 130 lots to the Scott Tce pump station (subject to confirmation of the pump capacity / curve) and 220 lots + 1.65ha commercial direct to the Lowburn rising main.
- The maximum flow determined to be allowed from the development was "approximately 9 l/s".
- The figure above indicates that dry weather peak flows (totalling 8.8 l/s) were modelled to set the capacity of the development.
- The modelling carried out is the equivalent to a total of 374 lots with 0.93ha commercial.

## Summary

The incorporation of a double-ended water supply into the Wooing Tree reticulation network should result in more than ample supply to meet the demand of in excess of 400 lots plus the proposed commercial area. The splitting of the wastewater between the Scott Tce pumping station and the Lowburn rising main, as modelled, should result in sufficient capacity to service 374 lots plus the proposed commercial area.

This proposal is for 360 lots plus the reduced commercial area. Based on the Mott MacDonald modelling results and recommendations, the dual potable water connection to the Roberts Drive water main and new connection to the water main on the western part of the site will provide adequate water supply capacity for the development and the Scott Tce pump station / Lowburn Rising Main split will provide adequate wastewater capacity for the development.

Regards



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Principal