

# Memo

Date: 07 July 2021  
 From: Robbert-Jan Lenselink  
 To: Dave Little  
 Cc: Kevin McDonnell  
 Reference: 21/967349

## Avonside Drive Stopbank Alignment - Potential for stopbank resilience following road closure

### Purpose of this Memo

This memo provides context related to the potential advantages for flood protection, gained by a road closure of Avonside Drive between Wainoni Rd and Avon Park.

The advice of this memo only applies to the specific section of potential road closure.

### Context

As part of their work in the Ōtākaro Avon River Corridor (OARC), Parks is looking at areas where road closures improve the quality of areas in the corridor. One of these potential road closures is along Avon side drive between Wainoni Rd and Avon Park. Figure 1 shows the area for which this advice is valid.

Figure 1 - Proposed Road Closure



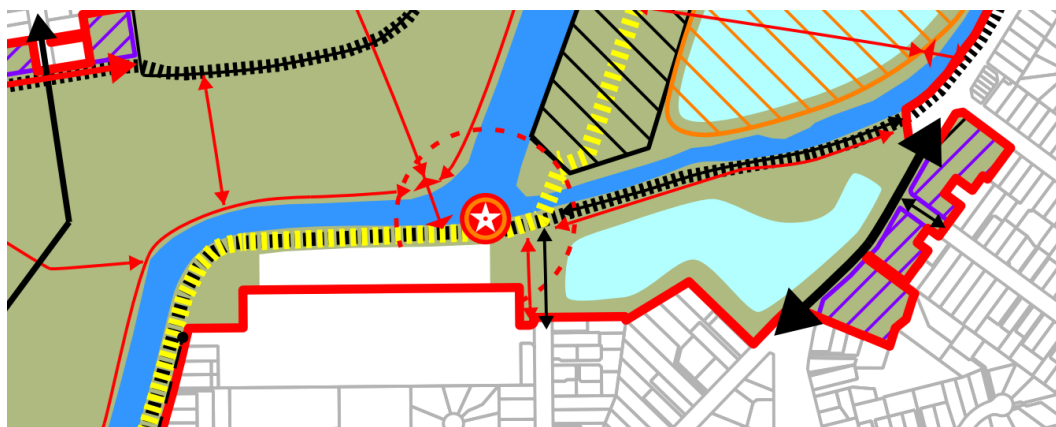
*The OARC Regeneration Plan provides direction of the future use of the corridor. Appendix One is referred to in Council’s District Plan. The Appendix shows a couple of features in this particular area, including stopbanks, the city to sea cycle route, pedestrian/cycle linkage and a landing on the river side of the current Avonside Drive. A snap shot of this area is presented below in*

Figure 2.

For this memo the assessment is focussing on the effects of a road closure on the flood protection works and the stormwater facility related works. It is assumed that other aspects are dealt with by

other disciplines. The scope and mandate for 3-Waters is realising flood protection and a stormwater facility in the area.

Figure 2 – Snap shot of OARC Regen Plan showing proposed features in the area of interest



## Flood Protection

In the current situation, the temporary stopbank is located on the riverside of Avonside Drive. This temporary stopbank has been designed for a 20 year design life and has no seismic resilience built in. The location of the stopbank, close to the river edge, raises the risk for significant damage or even complete failure as a result of a seismic event. The main reasons for this are caused by the geotechnical instability of the river bank and the liquefiable material that likely will cause cracks and slumping of the bank.

With the current arrangement, Avonside Drive is located on the landward side of the temporary stopbank. The temporary stopbank currently provides protection of the road against flooding from the river. In the future the road is likely to be inundated more regularly as a result of stormwater and groundwater issues that are driven by climate change. It is highly unlikely that Council will invest in water management to protect a low lying road.

Changing the location away from the river has two advantages. Firstly it reduces the risk related to seismic damage to the stopbank, not having a free face that influences the stability of the bank. Secondly the land away from the river is naturally higher than the current natural surface close to the river edge. This provides the advantage that a potential new flood protection structure will be less high and therefore reducing the cost of the structure. From a landscape point of view, the lower structures will be easier to blend in and providing more space for other features due to the reduced footprint.

Currently, the stopbanks are built on top of HV cables, owned and managed by Orion. At this stage it is unclear whether new flood protection works will interfere with these cables, but at least it is very likely that a new structure will negatively impact the HV cables, causing additional costs and effort.

As an indication of potential cost saving due to a landward shift of future flood protection, a high level calculation has been made based on cost per linear meter. The costs are based on input into the LTP earlier this year. The length assessed is 800m.

Scenario	Cost per m1	Construction Cost	20% Design Cost	Total Cost
Stopbank close to river	\$16,667	\$13,300,000	\$2,660,000	\$15,960,000

Stopbank away from river	\$3,788	\$3,000,000	\$600,000	\$3,600,000
			<b>Difference</b>	<b>\$12,360,000</b>

## Stormwater Facility

Currently, no stormwater facility is present for this local catchment. Stormwater is discharged directly into the Avon River. As part of the regeneration plan, a new stormwater facility is proposed on the north side between Kerrs Road and Wainoni Road.

The footprint of the facility greatly depends on surrounding infrastructure. The stormwater ponds are creating a free-face between neighbouring assets and the pond, increasing the risk of damage to those assets, unless otherwise mitigated. Currently these risks are mitigated by increasing the distance between an asset like a road and the facility or by providing ground improvements that improve the stability. Not having a public road on the north side of the facility will contribute to an optimum use of the available are and reduce the associated costs. It is important to utilise areas like these in order to comply with our global stormwater consent conditions.

## Conclusion

Closing Avonside Drive poses a number of advantages and potential cost savings for both future flood protection and stormwater management in this area.

Besides the cost savings of roughly \$12M, not having the public road in this area will greatly reduce the risk profile for the design, construction and safety of the future area's facilities.

## Attachments Ngā Tāpirihanga

There are no attachments to this report.

## Signatories Ngā Kaiwaitohu

<b>Author</b>	Robbert Lenselink - Princial Surface Water Engineer
<b>Approved By</b>	Kevin McDonnell - Team Leader Asset Planning