

3 Waters review Response

Client:	SR & BJ Williams Charitable Trust Board	Job Number:	J5864
Project Address:	Mangakuri Road	Job Name:	Mangakuri Road Subdivision
Project Manager:	Simon Gabrielle	Date:	15/08/2023
Completed By:	Simon Gabrielle	Checked By:	PM

Text below in italics has been copied from the original Stantec memo, dated the 22nd March 2023. Strata Group Consulting Engineers Limited (SGL) responses are as noted with contributions from RDCL (Geotechnical Engineers).

This memo has been prepared to document findings of the review of the submitted engineering report, drawings and calculations for the stormwater, wastewater and water supply elements of the proposed subdivision of Lot 2 DP 481291, Mangakuri Station.

Documents reviewed:

- 230016_ Williams Appendix G1 - Engineering and Infrastructure Report Mangakuri 20230224.pdf*
- 230016_ Williams Appendix G2 - Engineering Plans - reduced size 20230224.pdf*
- 230016_ Williams Appendix G3 - Engineering Calculations 20230224.pdf*

2 Stormwater

Draft reporting and calculations of the stormwater design were provided by Strata Group Consulting Engineers in October 2022 for review prior to lodging of the consent application. These documents were reviewed, and feedback provided by Stantec in November 2022 to Strata Group.

The design approach and basis, as included with the recently submitted report and calculations dated February 2023, have generally taken on board the feedback provided in November 2022. However, the following items with recommendations are noted.

Comment	Recommended Action	SGL Response
<i>a) Calculations have used a Horton roughness value for overland flow roughness, and this is expected to potentially overestimate the time of concentration for assessing pre and post peak flow mitigation storage volumes, which is conservative and acceptable for demonstrating mitigation measures. However peak flow designs for culverts,</i>	<i>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval to: Time of concentration for design of culverts, channels and overflows shall be based on the time of concentration calculated in accordance with</i>	Accepted

<p><i>channels and overflows should consider a shorter time of concentration based on the Mannings roughness values in the E1 building code verification method.</i></p>	<p><i>the method detailed in NZBC E1/VM1 Section 2.</i></p>	
<p><i>b) Detention calculations have used a simplified spreadsheet approach with assumptions. This may underestimate required detention volumes when using a hydrograph and routing the flows through the ponds with the proposed outlet control mechanism.</i></p> <p><i>Also, detention storage assessments have considered 2-year and 100-year ARI events. In accordance with the HBRC Waterway guidelines consideration of the 10-year event should also be made to confirm that this has not increased with the development.</i></p>	<p><i>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval to:</i></p> <p><i>The development shall mitigate stormwater runoff to pre-development rates in accordance with the HBRC Waterway Guidelines for the 2-year and 10-year ARI events and less than 80% of the 100-year event. The required detention volumes and outlet details shall be confirmed through pond routing using a flow routing programme for a range of storm durations. (Ponds should drain within an acceptable period in accordance with the HBRC waterway guidelines).</i></p>	<p>Accepted</p>
<p><i>c) Detention calculations have used future climate rainfall intensity (estimated in the years 2081-2100) for assessment of pre-development runoff. Whilst this is not specifically identified in the HBRC Waterway guidelines, the more common approach is to use the historic rainfall intensity for pre- development and the future climate for post-development.</i></p>	<p><i>Noted for consideration by CHBDC going forward, but no action recommended for this consent application.</i></p>	<p>No action required</p>
<p><i>d) An existing farm pond is proposed to be modified to provide detention storage for the development. The integrity of the pond embankment has not been addressed but should be assessed as part of the engineering design with confirmation of the</i></p>	<p><i>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval to:</i></p> <p><i>Integrity of the existing pond shall be assessed by a</i></p>	<p>Accepted</p>

<p><i>modification works to the embankment and outlets.</i></p>	<p><i>geotechnical engineer as being satisfactory for use as a detention storage, including any remedial works to be carried out as part of the modifications to the pond.</i></p>	
<p><i>e) Building developments, at the building consent phase will need to assess the required detention storage in relation to the engineering report limitations and assumed water tank sizes and diameters. The consent notice will need to be clear on the requirements and where engineering assessment is required for a building development or where the assumed basis in the Strata Group report can be used.</i></p> <p><i>Also, as different tank diameters and sizes maybe used the use of a tank height to be used for detention may not provide sufficient volume and therefore a minimum volume is recommended to be included in the consent notice for each of the relevant lots.</i></p>	<p><i>Include consent notice for requiring detention storage to be installed with the building development, and maintained in operating condition to the required volumes, including clearing of outlets and inlet screens.</i></p> <p><i>Include minimum detention storage volumes and outlet restriction orifice sizing in the consent notice with reference to the final approved engineering design and report.</i></p>	<p>Accepted</p>
<p><i>f) Stormwater outlets are to be formed for each proposed lot as part of the subdivision works. Details for these should be submitted for approval including details of the overflow arrangements and erosion protection measures.</i></p> <p><i>Location for stormwater disposal from access roads or hardstand areas has not been shown on the drawings and would need to be confirmed with engineering design approvals.</i></p> <p><i>It is not clear whether</i></p>	<p><i>Recommend geotechnical confirmation of slope stability in the areas proposed for stormwater disposal, and that discharge to lower levels or gullies or direct to the stormwater detention areas is not required. This should be confirmed as part of the resource consent process.</i></p> <p><i>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval of:</i></p> <p><i>Detailed designs to be submitted for approval for the bubble-up trenches for each lot including details for overflows, details for access</i></p>	<p>This has been discussed with RDCL and the geotechnical report has been updated to give reference to the slope stability and affects of stormwater discharge to the slopes.</p> <p>Increased piping was considered, but with the proposed planting plan, the detention enforced on the building platforms and the areas of stormwater discharge, the current stormwater layout is considered appropriate. One exception is for the culvert coming off of the Lot 8 access. If this pipe can be installed in a flexible, welded joint or EF joined pipe, a direct connection to the</p>

<p><i>concentrated disposal on slopes will affect slope stability or if longer reticulation to discharge to stable ground areas should be considered.</i></p>	<p><i>road drainage and stormwater discharge arrangements and any on-going maintenance or clean-out required.</i></p>	<p>existing pond will be considered during detailed design.</p>
<p><i>g) Proposed stormwater mitigation measures rely on the normally dry detention ponds servicing multiple lots. The developer is proposing that these will continue to be owned and maintained by the Mangakuri Station. The legal arrangements and/or easement for this including on-going provision to remain and be maintained needs to be addressed.</i></p>	<p><i>Confirm how the ongoing function of the detention ponds can be provided for through consent notice and/or easement provisions.</i></p>	<p>The ongoing function of the detention ponds will be ensured by regular maintenance. It is recommended that a consent notice is registered on Lot 11 (balance Lot) and for the pond on Lot 3 DP 481291 (western side of Williams Rd), a covenant will be put in place. Both the consent notice and the covenant will facilitate a maintenance schedule and register which shall be supplied to CHBDC on an annual basis.</p>

3 Water Supply

Water supply proposed relies on rain water storage tanks with treatment systems provided for potable water supply. Supplementary supply (likely tanker supplied) would be expected during dry-periods however this has not been assessed in the engineering report.

The report also notes that a 100mm coupling from tank is recommended to be included for fire-fighting purposes.

It is recommended that consideration is given to requiring house sites to provide an alternative fire-fighting water supply in accordance with SNZ PAS 4509:2008, including volumes and access provisions.

SGL Response

Firefighting provisions will be considered during detailed design. This may be by way of communal dedicated water tanks for firefighting, or by means of a consent notice on each title to ensure compliance with SNZ PAS 4509:2008.

4 Wastewater

An on-site wastewater system is proposed for each lot at time of building consent. Indicative sizing and disposal area requirements are noted in the engineering report, including slightly larger areas proposed for steeper slopes. It is unclear if slope stability has been considered in the selection or consideration of whether on-site disposal is feasible for some of the lots.

Recommend geotechnical confirmation of slope stability in the areas proposed for wastewater disposal and that confirmation is provided that on-site disposal is feasible, or if alternatives need to be provided including a centralised system and or remote disposal areas beyond the individual lots. This should be confirmed as part of the resource consent process.

SGL Response

A wastewater disposal overview was previously prepared for concept feasibility purposes but was not included in the previous plan set, as no wastewater services will be included in the development works. This plan (Sheet C300) is now included but is carefully noted as follows,

“This plan has been prepared to demonstrate the viability of onsite wastewater disposal and ensure the proposed parcels are large enough to accommodate a wastewater disposal field. This plan is not intended for construction. Future lot owners will be responsible for the construction of their own wastewater treatment and disposal, associated design, consents, and compliance with any applicable consent notices”.

RDCL have also reviewed the anticipated dosage rates from the wastewater fields, which will have an increased footprint where located in steeper terrain, and are comfortable with the proposal. As a result of this review, we have modified Lot 9 to allow the possible wastewater disposal field to be located west of the building platform where the terrain is more friendly. RDCL have encouraged that a consent notice ensures all wastewater disposal fields are planted. On this basis we deem that individual wastewater disposal fields are a viable option – but any disposal system will be the responsibility of the future Lot owner, including building consents and or resource consents as applicable.



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