

Client:	SR & BJ Williams Charitable Trust Board	Job Number:	J5864
Project Address:	Mangakuri Road	Job Name:	Mangakuri Road Subdivision
Project Manager:	Simon Gabrielle	Date:	21/09/2023
Completed By:	Simon Gabrielle	Checked By:	PM

Text below in italics has been copied from the Section 92, dated the 18th September 2023. Strata Group Consulting Engineers Limited (SGL) responses are as noted within the table below, pertaining to the 3 waters comments only.

RFI Comment	Recommended Action	SGL Response
<p><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, 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>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval to:</i></p> <p><i>Time of concentration for design of culverts, channels and overflows shall be based on the time of concentration calculated in accordance with the method detailed in NZBC E1/VM1 Section 2.</i></p>	Accepted
<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>	Accepted
<p><i>c) Detention calculations have used</i></p>	<p><i>Noted for consideration by CHBDC</i></p>	No action required

<p><i>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>going forward, but no action recommended for this consent application.</i></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 modification works to the embankment and outlets.</i></p>	<p><i>Include comment in consent conditions for the engineering design drawings and calculations submitted for Engineering Approval to: Integrity of the existing pond shall be assessed by a 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>	Accepted
<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</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. 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>	Accepted



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