



CH2M Beca

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Report

Prince of Wales Park- Raising Playing Fields Summary of Benefits/ Dis-Benefits

Prepared for Wellington Water Ltd (Client)

By CH2M Beca Limited

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1 Introduction

CH2M Beca have prepared a report *Prince of Wales/Omāroto Reservoir: Raising of the Playing Fields Feasibility Study* (the feasibility study) for Wellington Water Limited (WWL).

This brief report summarises the findings of the feasibility study and discusses the benefits and dis-benefits of raising the upper and lower Prince of Wales playing fields.

2 Summary of Feasibility Study

The feasibility study considers whether the volume of excavated material from the proposed Prince of Wales/Omāroto Reservoir site requiring off-site disposal can be reduced to help minimise the impacts of truck movements on residents and users of Rolleston Street.

The original preliminary design concept for the Prince of Wales/Omāroto Reservoir, May 2013, provided only for the upper Prince of Wales Park playing field to be used for material stockpiling during reservoir construction. All excavated material not required for backfilling and burying the reservoir would be disposed offsite. This scenario gave rise to a very large stockpile of material that was deemed to have significant visual impact on adjacent landowners. Additionally, the size of the stockpile meant there was insufficient space for other necessary construction activities.

It was determined that a feasible scenario involving stockpiling on the upper Prince of Wales Park playing field must have a significantly reduced stockpile volume/height from that proposed under the preliminary design. The implications of this were increased disposal offsite of excavated fill and a need to bring additional fill back to site for backfill around the reservoir. Both of these activities would have lead to an increase in truck movements to/from site and hence increased costs.

The feasibility study therefore established concepts for two new scenarios:

- Scenario 1: Stockpiling on the Upper **and** Lower Playing Fields only:
Using both the upper and lower Prince of Wales Park playing fields for stockpiling excavated material, required for reservoir backfilling and burial, and topsoil stockpiling during construction. Remaining excess excavated material would be disposed off-site.
- Scenario 2: Raising **and** Stockpiling on both Upper **and** Lower Playing Fields:
Using both the upper and lower Prince of Wales Park playing fields for stockpiling excavated material, required for reservoir backfilling and burial, and topsoil stockpiling during construction **plus** using excess excavated material to permanently raise both fields. Any remaining balance of excavated material would be disposed off-site.

The study includes a comparison of the estimated costs of these scenarios 'over' the original 2013 preliminary design cost estimate.

The extra 'over' costs for each scenario are estimate at:

- Stockpiling on the Upper and Lower Playing Fields only: \$1,710,500.
- Raising and Stockpiling on both Upper and Lower Playing Fields: \$2,189,500
(inclusive of \$280,000 allowance for relocation of HV cables and water mains).

The estimated cost difference between the two scenarios, that is the additional cost to raise both fields rather than just use them for stockpiling, is approximately \$480,000. This is inclusive of a

\$280,000 risk allowance for possible relocation of HV cables and water mains that could be associated with field raising.

Raising the levels of both playing fields to utilise some of the excavated material is considered feasible.

Additional works and related additional costs required to support field raising include:

- **Earthworks:**
Additional earthworks design, survey, and onsite earthwork activity required to raise and prepare field surfaces for playing surface reinstatement.
- **Lower playing field drainage:**
Additional subsurface drainage design and construction works required within the lower playing field, to support field raising, and the function of this redesigned field as a new flood attenuation area for a 1:10yr return flood event (10% chance of annual exceedance) within the Papawai stream catchment.
- **Retaining Walls:**
Design and construction of retaining walls on both the upper (approximately 1m high) and lower fields (1.5- 4.5m high) required to support raised field surfaces.
- **Provision for service relocation:**
Provision of a risk allowance for the possible relocation of HV cables and water mains, which may be required as a result of field raising. The need for this work would be determined in conjunction with production of final detailed designs for the sports fields.

Cost savings associated with a reduction in the volume of excess excavated material requiring off-site disposal have been provided for in this assessment.

3 Benefits/Dis-Benefits

In addition to the monetary costs associated with both scenarios, there are a number of benefits and dis-benefits that should be recognised and considered with each scenario.

These benefits and dis-benefits are outlined for each scenario in the following tables.

It is noted that all the benefits and dis-benefits associated with scenario 1 (using the upper and lower fields for stockpiling only) also apply to scenario 2 (involving the raising and stockpiling on both fields).

Scenario 1: Benefits and Dis-benefits of Stockpiling on the Upper and Lower Playing Fields

Matter	Benefit / Dis-Benefit	Who	Benefit/Dis-Benefit Explanation
Reduced visual effect of material stockpiles	Benefit	Rolleston Street Residents	Use of both fields allows material stockpiled for reservoir backfilling and burial, to be shared between the two fields, reducing the height and footprint of material stockpiles that would be required if only the upper playing field was used. Instead of one 8.5 m high stockpile on the upper field, two smaller stockpiles can be provided at a height of between 4 m high (upper playing field) and 5.5 m (lower playing field), and positioned on the fields in positions away from adjacent properties.
Temporary resident parking	Benefit	Rolleston Street Residents	A number of residential carparks on Rolleston Street will need to be closed during the construction period to enable heavy truck access to the reservoir site for construction. Use of both fields will allow space to be set aside on the upper field to provide temporary parking for displaced Rolleston Street residential parking. Use of both fields would also allow space to be set aside on the lower field for temporary car parking for site workers. This will ensure that workers don't use existing car parking on Rolleston Street and surrounding streets, reducing parking impacts associated with construction activity.
Reduced heavy vehicle movements	Benefit	Rolleston Street Residents	Use of both fields would allow sufficient space to be set aside on both fields to stockpile harvested top soil from the playing fields for reuse, reducing the amount of material that needed to be removed from the site for disposal and the import of new topsoil required for field resurfacing.
Flexible worksite area for construction activities	Benefit	Contractor	Use of both fields would provide additional space for construction and site management activities. This includes space to not only accommodate stockpiling of harvested topsoil from the fields for reuse (above), but to establish and operate erosion and sediment control measures, provide additional space for vehicle manoeuvring and equipment, vehicle and construction material storage, and temporary parking of light construction vehicles on the lower playing field.
Playing surface and field drainage enhancements	Benefit	Sports field users	Using the sports fields for construction activities will require both fields to be re-leveled, shaped and restored/rehabilitated to at least their existing condition, post construction. An improved field surface profile, and improved field side drainage, will likely result in better playing field surfaces, with improved drainage performance, and greater utility of these surfaces.
Visual, dust and noise effects	Dis-benefit	Salisbury Terrace Residents	Use of both fields would however extend the construction footprint of the site. Impacts of construction activities (including visual, noise, and dust) would potentially be brought closer to residents of Salisbury Terrace (in the absence of appropriate mitigation of construction effects).
Field closure:	Dis-benefit	Field users	Use of both fields will result in the additional closure of the lower fields to all field users for the duration of the reservoir development.

Scenario 2: Additional Benefits and Dis-benefits of Raising and Stockpiling on both Upper and Lower Playing Fields:
 (Additional Benefits/ Dis-benefits to Scenario 1)

Matter	Benefit / Dis-Benefit	Who	Benefit/Dis-Benefit Explanation
Reduced heavy vehicle movements	Benefit	Rolleston Street Residents	<p>Upper field: Using some of the excess spoil from the reservoir excavation site to raise the upper field by between 1-1.5 m will allow the re-use and storage on site of approximately 8,000 m³ of material (unbulked).</p> <p>This will reduce the number of heavy truck movements on Rolleston Street during the reservoir site excavation period by around 1,400 return movements, or 2,800 total movements. This will reduce construction effects along Rolleston Street associated with heavy vehicle traffic movements, such as noise and vibration, and reduce safety risks associated with heavy vehicle movements.</p> <p>Lower field: Using some of the excess spoil from the reservoir excavation to raise the lower field (including access track) in accordance with the option outlined in the feasibility study (field raising is linked to the height of the bund on the lower field) will allow the re-use of around 8100 m³ of material (unbulked), also reducing the number of heavy truck movements on Rolleston Street during the reservoir site excavation period by around approximately 1,420 return movements, or 2,840 total movements.</p> <p>This will further reduce construction effects associated with heavy vehicle traffic movements, such as noise and vibration, and reduce safety risks associated with heavy vehicle movements.</p> <p>Combined: Raising both fields (including access track modification) would retain approximately 16,100 m³ of excavated material onsite, reducing material to be disposed offsite to 14,700m³ (in situ volume). Return truck movements along Rolleston Street (also allowing for top soil retention on site in Scenario 1) would be reduced from approximately 5,400 anticipated under the preliminary design option to approximately 2500.</p> <p>A combined field raising scenario would result in a significant reduction in heavy truck movements along Rolleston Street over the duration of reservoir construction.</p>
Reduced Flood Risk	Benefit	Salisbury Terrace Residents	<p>Raising of the lower field allows a more holistic approach to be taken to the existing flooding and scour issues along the Papawai Stream.</p> <p>Currently Papawai stream, during flood flows, overtops a bund on its eastern bank on to the lower field and flows across the southern end of the field and onto Salisbury Terrace, causing flooding issues for local residents.</p>

Scenario 2: Additional Benefits and Dis-benefits of Raising and Stockpiling on both Upper and Lower Playing Fields:
 (Additional Benefits/ Dis-benefits to Scenario 1)

Matter	Benefit / Dis-Benefit	Who	Benefit/Dis-Benefit Explanation
			<p>The proposed profile for raising the lower field would continue to allow flood flows to spill onto the lower field, but water would be held in the re-profiled field design on the field to attenuate excess flows before discharging to new swales along the edges of the field, into a new stormwater pipe at the northern end of the field and then to the Salisbury Terrace stormwater system (currently being upgraded).</p> <p>This is expected to result in a significant benefit associated with reduced flooding of Salisbury Terrace residential properties.</p>
Flood drainage improvements:	Benefit	Papawai Stream	<p>As noted above raising of the lower field allows a more holistic approach to be taken to the existing flooding and scour issues along the Papawai Stream. Flood flows down the stream itself have also scoured a large area of bank near the changing sheds at the northern end of the lower field.</p> <p>The proposed profile for raising the lower field along with changes to field drainage would allow flood flows to be held on the field, in the re-profiled field design, to attenuate excess flows before discharging to new swales along the edges of the field, into a new stormwater pipe at the northern end of the field and then to the Salisbury Terrace stormwater system (currently being upgraded).</p> <p>This is expected to result in the improved management of flood flows into Papawai stream potentially reducing stream scouring.</p>
Excavated material reuse, reduced excavated material disposal to landfill	Benefit	Wellington community, Environment	<p>Reuse of excavated material to raise both fields (including access track modification) would retain approximately 16,100 m³ of excavated material onsite, significantly reducing the distance excavated material needed to be physically transported (versus the option of disposal) and the volume of excavated material requiring disposal at the landfill.</p> <p>Reuse of excavated materials for field raising also facilitates a range of significant short term and long term ancillary benefits (outlined above) associated with reduced heavy traffic for excavated material disposal, and improvements to field drainage and reduced flooding risk to the local community.</p>
Privacy	Dis-benefit	Residences adjoining playing fields, Salisbury Terrace Residents	<p>Raising the playing field surfaces is expected to give rise to some concerns amongst some adjacent residents around reduced privacy associated with a modest increase in field elevation.</p> <p>Privacy issues may be able to be mitigated with planting and landscaping.</p>

Scenario 2: Additional Benefits and Dis-benefits of Raising and Stockpiling on both Upper and Lower Playing Fields:
 (Additional Benefits/ Dis-benefits to Scenario 1)

Matter	Benefit / Dis-Benefit	Who	Benefit/Dis-Benefit Explanation
Visual effect of retaining wall:	Dis-benefit	Residences adjoining playing fields, Salisbury Terrace Residents	<p>A 1 m timber retaining wall will be required along the north, east and part of the west side of the upper field.</p> <p>A 1.5- 4.5 m high retaining wall will be required along the eastern edge of the lower field.</p> <p>While the upper retaining wall will be on the south side of adjoining residential properties, it will be a new structure and could have some effect on some outlooks over the adjoining park areas.</p> <p>The retaining wall on the east side of the lower field will effect outlooks over this area for some residents. Mitigation landscaping could be applied to soften and offset this impact, particularly once planting is established.</p>