

RYZUK GEOTECHNICAL
Engineering & Materials Testing

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November 25, 2015
File No: 8-5782-1

Gardom Pond Stakeholders
6604 Harbour Hill Drive
Pender Island, BC
V0N 2M1

Attn: [REDACTED]

Re: Gardom Dam Rehabilitation
Gardom Road – Pender Island, BC

As per our recent discussions, we are pleased to herein provide an estimate of costs for our associated involvement with the referenced project. Our proposal is provided in accordance with, and is subject to, the attached Terms of Engagement.

We understand that the project will involve constructing a new dam on the lower portion of the existing retention dam for Gardom Pond, and rehabilitating the existing spillway. Additionally, the pipes through the existing dam would be decommissioned and a siphon system installed for emergency use. Two options are being considered for the construction of the dam: an earthwork dam (similar to the existing structure), or a concrete dam. Our scope for work will include the three following phases: a feasibility study and preliminary design, detailed design of the selected dam structure, and construction monitoring including quality assurance/quality control (QA/QC).

PHASE 1 - FEASIBILITY STUDY/PRELIMINARY DESIGN

This phase is intended to determine if either an earthwork or concrete replacement dam is feasible, as proposed, and provide information for preliminary design and subsequent phases. We foresee the scope of work for phase 1 to include the following:

- Initial meeting with client.
- Review of all provided materials associated with Gardom Pond/Dam and the applicable CDA guidelines.
- Confirmation of materials (and associated costs) available on Pender, or otherwise, to inform design decisions and construction methodologies.
- Preliminary dam and spillway design calculations for performance criteria and dimensioning.
- Preparation of preliminary geotechnical summary report including proposed dam design and associated technical drawings and preliminary cost estimates.
- One site visit and weekly status update meeting with the client (teleconference or at our office), as well as final meeting after issuing the report.

For the above scope of work, we estimate that our involvement will have an associated cost of about **\$30,000 + GST**. We propose that the cost for our work be based on the actual time expended and that billing will be based on our attached fee schedule. If one lump sum payment is preferred for phase 1, we propose a cost of **\$37,500 + GST**,

with the additional cost acting as contingency. In the event of change in client direction or instruction, our fees would be subject to adjustment.

PHASE 2 – DETAILED DESIGN

Phase 2 will follow phase 1 if construction of either the earthwork or concrete dam is considered feasible by the stakeholders. We foresee the scope for the design the proposed dam will include the following:

- Initial meeting with client.
- A geotechnical site investigation, if determined necessary in the feasibility study, to confirm subsurface soil and/or bedrock conditions. The site investigation may require additional equipment, such as a drill or a backhoe.
- Lab tests, to confirm performance criteria of any in situ samples collected, or from imported construction materials.
- Refined dam and spillway design calculations for performance criteria and dimensioning.
- Preparation of a final geotechnical design report and associated technical drawings.
- Provision of construction volumes and requirements for tender.
- Ongoing weekly status update meeting with the client.

For the above scope of work, excluding the site investigation, we estimate that our involvement will have an associated cost of about **\$20,000 + GST**. If the site investigation is necessary, the cost will be dependent on the test equipment. An approximate cost for a site investigation on Pender Island would be between **\$8000 and \$20,000 + GST**. We propose that the cost for our work be based on the actual time expended and that billing will be based on our attached fee schedule. The above cost(s) may need to be refined following the feasibility study, and a lump sum cost estimate could be provided at that time.

PHASE 3 – CONSTRUCTION MONITORING AND QA/QC

We foresee the scope of the geotechnical component during construction of the dam to include the following:

- Initial meeting with client.
- Full-time field supervision during construction of the dam/spillway.
- Revisions to design/calculations based on conditions encountered in field.
- Answering technical questions from the contractor.
- Preparation of an as-built report and associated drawings.
- Associated on-site design/construction meetings, and weekly status update meeting with the client.

The cost for the above scope of work will depend on the time of construction, as well as any potential changes to the scope of work from the design phase. A preliminary estimate for our involvement will have a cost ranging between **\$50,000 and \$70,000 + GST**. We propose that the cost for our work be based on the actual time expended and that billing will be based on our attached fee schedule. Construction phase costs may be revised/updated closer to time of construction and following the contractor's planned work schedule.

ADDITIONAL CONSULTANTS

For additional work associated with design of the dam, construction practices, and preparation of our geotechnical reports, we propose to work with the following consultants:

- Kerr Wood Leidal – hydrotechnical analysis
- J.E. Anderson & Associates – land survey
- Environmental consultant(s) – fisheries and arborist (to be determined)
- Structural Consultant (to be determined)

Additional costs for the consultants are not included within cost estimates above. A preliminary estimate of the additional costs is between **\$30,000 and \$50,000**.

COST SUMMARY

The following is a summary of the costs as estimated at this time. At this time, we are only providing a lump sum cost for our own work associated with phase 1 of **\$37,500 + GST**. Lump sum costs may be provided for subsequent phases prior to commencement of those phases.

Table 1: Cost Estimate Summary

Scope of Work	Cost Range	
	Low Estimate	High Estimate
Phase 1 - Feasibility/Preliminary Design	\$ 30,000.00	\$ 30,000.00
Phase 2 - Refined Design*	\$ 20,000.00	\$ 40,000.00
Phase 3 - Construction Monitoring*	\$ 50,000.00	\$ 70,000.00
Additional Consultants**	\$ 30,000.00	\$ 50,000.00
Total	\$ 130,000.00 +GST	\$ 190,000.00 +GST

*Associated costs will be highly dependent on results of the feasibility study, and would require revision as work progresses.


**Costs would be evaluated by necessity as construction progresses, and would be spread out between the phases.

CLOSURE

If these terms are agreeable to you, please provide us a written acceptance (by e-mail, fax or in person) indicating that you agree to our proposal and the attached Terms of Engagement. We anticipate that phase 1 of our above scope can be completed within 3 to 4 weeks of acceptance of the proposal.

We look forward to working with you on your project and appreciate the opportunity to be of service to you.

Yours very truly,
Ryzuk Geotechnical


Isabelle Maltias, P.Eng.
Geotechnical Engineer



Attachments: Terms of Engagement
 Fee Schedule