The Township of Rideau Lakes



Rideau Lakes

Request for Tenders

Bass Lake Outlet – Dam and Control Structure

'ADMIN2021-01

Bidders Name:

Total Amount of Tender (Including HST) \$ _

INCLUDE THIS PAGE IN THE SEALED ENVELOPE WITH THE ADDITIONAL REQUIRED DOCUMENTS

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1.0 INFORMATION TO BIDDERS

General Description

The Township has completed a design of the Bass Lake outlet control consisting of a replacement dam and cross vane water level control structure to improve site conditions and minimize water level fluctuations in Bass Lake. This RFT is for the site preparation, dam reconstruction, cross vane structure, safety fencing and site stabilization.

The Township of Rideau Lakes, hereinafter referred to as the "Township", is seeking proposals from firms with the necessary expertise, hereinafter referred to as the "Bidder", to implement Section 3 – Scope of Work.

Bid Submission

Proposals shall be made in the format specified in Section 1, include the forms in Section 2. Proposals shall be properly labeled with the proposal number 'ADMIN2021-01' and submitted no later than the Closing Date and Time.

Proposals are to be submitted by email to: mdwyer@rideaulakes.ca. No sealed/hard copy submission is required. **Proposals will be received until 1:00p.m. E.S.T., April 29, 2021.** It is the Bidder's responsibility to ensure that the bid submission is received by the Chief Administrative Officer (CAO) prior to the submission deadline.

All proposals received will be held in strict confidence until after the closing date and time.

Registration

Individuals or firms interested in submitting a proposal should register as a Bidder with the municipality to ensure they receive any addenda which may be issued. Individuals or firms may register by contacting the CAO by email at the contact below:

Michael Dwyer CAO mdwyer@rideaulakes.ca

Mandatory Site Meetings

A MANDATORY site meeting will be held on **Friday April 16**, at **10:00am** at the site (meeting at the bend in Bass Lake Road). Water's Edge, the firm overseeing the project will be in attendance to answer any technical questions related to the site or design. You MUST register if you plan to attend this MANDATORY site meeting. You can do so by emailing Michael Dwyer at mdwyer@rideaulakes.ca

Firms may also visit the site at any time during daylight hours from 9 AM to 5PM.

RFT Schedule

Every attempt will be made to meet all dates. The Township of Rideau Lakes reserves the right to modify any or all of the following dates at its sole discretion:

- 1. Issuance of RFT: April 1, 2021
- 2. Mandatory Site Meeting: April 16, 2021

- 3. Last Day for Questions: April 23, 2021
- 4. RFT Closing Date and Time: April 29, 2021 at 1:00pm
- 5. Selection of Successful Vendor: May 10, 2021 (Council Meeting)
- 6. Project Execution: As per proposal, however the project must start after Labour Day (September 6, 2021) and the work is to be completed by December 10, 2021.

COVID-19 Considerations

The Contractor is to be aware of the above noted schedule and take sufficient care that appropriate precautions are in place within the workplace and for staff that the schedule will be met. The Contractor must note that there will be no additional payments made, or delays permitted in the timely delivery of the construction contract, due to COVID-19.

Cost of Submission

The Township of Rideau Lakes will not be liable nor reimburse any Bidder for any costs incurred in developing a Proposal submission, attending meetings/interviews, demonstrating the goods and or services, legal services, or any other services that may be required in responding to this Request for Proposal.

Right to Accept or Reject Proposal

The Township of Rideau Lakes reserves the right to reject any or all Proposals, as a whole or in part, and waive formalities as the interests of the Corporation may require, without stating reasons. Therefore, the lowest or any Proposal may not necessarily be accepted. If there are a limited number of responses to this request, the Township reserves to right to terminate the request or make further requests for proposals.

Validity

The Proposal submitted shall remain valid for at least one hundred and twenty (120) days from the Proposal Closing Date.

Withdrawal of Proposal Prior to Closing

A Bidder who has submitted a response to this Request for Proposal may request that such response be withdrawn. Withdrawals shall be completed and shall be allowed under the following conditions:

- 1 The RFT closing date and time has not passed. There shall be no withdrawals of Proposals allowed after the closing date and time for receiving Proposals;
- 2 The request is made in writing on the Bidder's letterhead and signed by a senior official of the Bidder, and include his direct contact information; and
- 3 The request is made to the CAO by email or by hand.

In all cases, a request for the withdrawal of a Proposal will be verified by the Township of Rideau Lakes, by way of a telephone call to the senior official representing the Bidder and making the request, to confirm the withdrawal.

All confirmed requests for withdrawal will be placed on record and the associated Proposal shall be given no further consideration.

Review of Documents

The Bidder must personally study the entire Request for Proposal document as to satisfy himself/herself of the conditions and requirements of the Proposal. There will be no

consideration of any claim, after submission of Proposals, that there is a misunderstanding with respect to the conditions imposed by the Request for Proposal.

Multiple Proposals

Multiple responses from any one Bidder are acceptable, providing each response is complete as per the format specified herein, and is packaged and transmitted separately;

Addenda

The Township of Rideau Lakes may choose to issue addenda to provide clarification or additional information. Addenda will only be sent to vendors that have registered as Bidders. It is the Bidder's responsibility to ensure they have received all addendums and provide the Township of Rideau Lakes with the proper contact information through the registration process.

Price Submission

The Proposal price shall include total costs, in Canadian Dollars, including, but not limited to: labour, material, equipment, supervision, statutory charges and vendor overhead and profit.

Award

Upon completion of evaluations, the Township of Rideau Lakes may select a Bidder with whom it wishes to undertake negotiations for the project. Negotiations may take the form of adding, deleting, or modifying certain requirements based on the response to the Request for Proposal, and adjusting pricing accordingly if required. Assuming mutually acceptable terms and conditions can be agreed upon, a purchase order will be issued to the selected bidder.

The Township of Rideau Lakes reserves the right in its absolute discretion to:

- 1 Adjust, discontinue, or cancel the submission process, and/or commence a new process for the same or similar goods or services, if the Township of Rideau Lakes, at its sole discretion, deems it necessary.
- 2 Accept or reject any submission(s) in whole or in part.

Therefore, the lowest cost Proposal may not necessarily be accepted. The acceptance and award of a Proposal shall be subject to the approval of The Township of Rideau Lakes Council.

Collection of Personal Information and Confidentiality Provision

Any personal information collected through the Request for Proposal process will be done so, and managed, in accordance with the *Municipal Freedom of Information and Protection of Privacy Act.* Any personal information collected is being done so for the purposes of proposal review and potential vendor selection.

All responses to this Request for Proposal will only be treated as Third Party Information and/or Economic or Other Interests in accordance with the provisions of the *Municipal Freedom* of Information and Protection of Privacy Act where **an explicit request to do so is provided in writing in the proposal**. Submission of a proposal without this explicit request shall constitute consent for disclosure in accordance with the Act. The information contained in this Request for Proposal will be utilized by the Bidder solely for the purposes of preparing a submission. Any other use of the information for any other purpose is not authorized by the Township of Rideau Lakes.

Standard Terms and Conditions

The Township of Rideau Lakes maintains standard procurement Terms and Conditions that apply to this Proposal. A copy of the Township's Procurement of Goods and Services Policy – Revised March 2013 will be provided on request.

Terms of Payment and Invoices

The project will be paid upon completion of work and a 10% holdback will apply with release shall be subject to inspection and approval by the Township's agent and any identified contract deficiencies being addressed.

The Township of Rideau Lakes terms of payment are net thirty (30) calendar days upon receipt of invoice.

Michael Dwyer Chief Administrative Officer mdwyer@rideaulakes.ca

Termination

The Township of Rideau Lakes reserves the right to terminate the contract for sufficient cause, including, but not limited to, poor performance, late deliveries, inferior quality, incorrect pricing, statutory non-compliance, and health and safety concerns. If any successful Bidder should neglect to perform the work properly or fail to perform any provision of the Request for Proposal, the Township of Rideau Lakes may terminate the contract after fifteen (15) business days with written notice to the vendor.

Background Check

The Township of Rideau Lakes, at its discretion, may perform background checks on any service personnel, and reserves the right to refuse access to buildings or equipment to any personnel or other representatives of any successful vendor or manufacturer.

Conduct of Vendor Staff

The successful vendor shall employ orderly, competent and skilled staff to ensure that the Request for Proposal is completed in a respectable manner. If any one person employed by the successful vendor in connection with the Request for Proposals efforts, in the opinion of the Township of Rideau Lakes is just cause for complaint, the vendor, upon notification from the Township of Rideau Lakes, shall not permit such person to continue in any future work arising out of the Request for Proposal.

Accessibility

The Township of Rideau Lakes is required to comply with the Accessibility for Ontarians with Disabilities Act, 2005 as amended and any associated regulations.

Any successful Bidder for the completion of work with regards to this Request for Proposal must be aware of these requirements and certifies that all statutory requirements will be met at the vendor's full cost.

Insurance – Liability, Automotive and Non-Owned Automobile Insurance

Without in any way limiting the liability of any successful vendor, the vendor shall:

- 1 Maintain and keep in force during the term of the contract, General Liability Insurance protecting the contractor's liability, legal or assumed, under the contract for all claims arising from personal injury to members of the public, damage to property of public including loss of use of such property and the minimum insurance shall be \$5,000,000.00.
- 2 Maintain and keep in force during the term of the contract, automobile and nonowned automobile insurance on all vehicles used in connection with the work under this contract. Such insurance is to carry the minimum limit of \$2,000,000.00.
- 3 Maintain and keep in force during the term of the contract, Contractor's contingent liability insurance, covering the liability of the Contractor under this contract in respect to his sub-contractor's same limits as required in Clause (a).
- 4 Deposit with the Township of Rideau Lakes, before commencing any work under this contract, a certificate of insurance detailing the coverage and expiry date for all polices duly executed by the insuring company stating that if said policies are cancelled or changed in any manner, sixty (60) days written notice of such change or cancellation will be given to the Corporation of the Township of Rideau Lakes, Clerk, Delta Ontario. The Township shall be shown as an additional insured.

Workplace Safety Insurance Act

Any successful vendor is required to comply with all the regulations of the Workplace Safety and Insurance Board (WSIB) in respect to the contract work and all persons employed on or in connection therewith and shall furnish a Certificate of Clearance from the Board to the Township of Rideau Lakes, and maintain good standing with the WSIB throughout the contract period.

Contractor's Liability

Any successful vendor shall be liable for all injuries and/or death to persons and for damage to property caused by his/her operations and those of sub-contractors and their employees engaged on and off site; and shall indemnify and save harmless the Township of Rideau Lakes from all suits and actions for damages and costs to such damages to property of others as well as the Township, resulting from negligence, poor workmanship and materials, as well as any cause whatsoever in the performance of the work.

Quality of Work

Any successful vendor at all times shall provide the Township of Rideau Lakes Representative with suitable access, and or status of the work covered under the Request for Proposal. The Township of Rideau Lakes Representative shall be the sole judge of the work and therefore of its acceptability. Work that is unsatisfactory, in the opinion of the Township of Rideau Lakes Representative, shall be made satisfactory at no additional cost to the Township of Rideau Lakes.

Conflict of Interest

By submitting a bid, a Bidder declares that the submission is not made in connection with any other submitting Bidder or vendor and is in all respects fair and without collusion or fraud and further that no member of Council, officer or employee of the Township of Rideau Lakes has become interested, directly or indirectly, as a contracting party, partner, stockholder, surety or otherwise on the performance of the said contract.

Lobbying

In order to ensure fairness to all Proponents, the Township must endeavour to prevent unfair advantage created by lobbying. Therefore, the Township reserves the right to disqualify, at any time and at its sole discretion, any Proponent engaging in lobbying in connection with a competitive bidding process between a date that is no later than the date of issue of the RFT and the date of signing of a contract or Purchase Order between the Township and the Successful Proponent(s). The Township may disqualify a Proponent at any time in the procurement process, including after the selection process has been completed.

Lobbying may include any activity that the Township, in its sole discretion, determines has or may give an unfair advantage to one Proponent relative to other Proponents. Without limiting the foregoing, lobbying may include:

a) Verbal or written communication with or to any Township staff / Council member other than those identified as contacts in this RFT in respect of this RFT.

b) Verbal or written communication with or to any expert or other advisor assisting the

Evaluation and Selection of this RFT.

c) Verbal or written communication with or to any member of the RFT Evaluation and

Selection team other than those identified as contacts in this RFT.

d) Direct or indirect requests by the Proponent to any person, organization or group to provide a written or verbal expression of support not required by this competitive bidding process to any member of the Evaluation and Selection team or Council.
e) Verbal or written communication with or to media organizations.

f) Direct or indirect offer of gifts of any kind or value to any Township representative or personnel.

Questions Regarding the Request for Proposal

Bidders having questions or finding discrepancies or omissions, or having doubts as to the meaning or intent thereof, shall contact the CAO. The CAO may elect to provide clarifications directly or via an Addenda to all vendors, depending on the nature, scope, and materiality of the questions. Any questions arising from the Request for Proposal shall be directed to:

> Michael Dwyer CAO 613-928-2345 ext. 231 mdwyer@rideaulakes.ca

2.0 SUBMISSION FORMS

Form #1 – Price and Schedule Form

(This entire section and title page to be returned via email)

2.1 Witness Our Hand

· · · · · ·	~ -		
NAME	OF	FIRM:	

(Official Complete Name)

hereinafter called "the Contractor"

INCORPORATED UNDER THE LAWS OF:

(or indicate if individual, partner or unincorporated company)

ADDRESS OF FIRM:

HEAD OFFICE:		
(If different from above)		
DATE:		

TELEPHONE No. OF FIRM:

FAX No. OF FIRM:

AUTHORIZED SIGNING OFFICER

> (Signature) I have authority to bind the Corporation.

(Print Name)

EMAIL:

The Bidder hereby bids and offers to supply and do all or any part of the work which is set out or called for in this Bid, at the unit prices, and/or lump sums, hereinafter stated.

ITEM	SPEC.	DESCRIPTION	UNIT		UNIT PRICE	TOTAL
NO.	NO.			QUANTIT		
1	S.P. 3- 2.01, 04	Construction Site Fencing - supply all labour, equipment and materials to erect steel fencing 'Fast Fence' or equal 1.8 m min. height	m	50		\$
2	S.P. 3- 2.01, 02, 03, 04, 09, 23	Site Access - Access preparation and rehabilitation including removals and replacements	L.S.	1		\$
3	S.P. 3- 2.11	Clearing and Grubbing - Remove and dispose of existing vegetation within in construction area	L.S.	1		\$
4	S.P. 3- 2.11, 12	Grading - Remove and dispose of channel material in proposed berm footprint (disposal to be along access road – as required)	c.m.	200		\$
5	S.P. 3- 2.12, 15	Berm - Supply and place berm clay core and fill material	c.m.	610		\$
6	S.P. 3- 2.13	Rip Rap - Supply and place rip rap 300mm	c.m.	200		\$
7	S.P. 3- 2.13	Rip Rap - Supply and place rip rap 600mm	c.m.	100		\$
8	S.P. 3- 2.13	Riverstone - Supply and place riverstone 300mm	c.m.	30		\$
19	S.P. 3- 2.14	Cross Vane - Supply and place armourstone cross vane	tonnes	32		\$
10	S.P. 3- 2.05, 08, 11	Existing Berm - Remove and dispose of existing berm material, culverts and sandbags (c.m.	140		\$
11	S.P. 3- 2.17, 19	Seed - Supply and place seed	s.m.	1300		\$
12	S.P. 3- 2.08, 18	Silt Curtain - Supply, place and maintain sediment silt curtain	L.S.	1		
13	S.P. 3- 2.18	Coir Mat - Supply and place coir 400	s.m.	200		
14	S.P. 3- 2.18	Coir Log - Supply and place coir log	m	330		

15	S.P. 3- 2.208	Fencing - Supply and place chain link fence at each end of berm	m	27		
16	S.P. 3- 2.20	Fencing - Supply and place chain link gate at each end of berm	unit	2		
17	SP 3- 2.21	Entrance Access Gate (Standard agricultural steel pole gate)	L.S.	1		
18	S.P. 3- 2.14	Bentonite Clay Liner	s.m.	34		
19	SP 3- 2.10	Geotechnical Support	L.S.	1		
		PRO	VISIONA	AL ITEMS		
20	S.P. 3-2- 03	Tree Hoarding - supply all labour, equipment and materials required to erect tree hoarding	m	310		\$
21	S.P. 3- 2.08	Bypass Pump - Supply, place and maintain bypass pump throughout construction	L.S.	1		
22	S.P. 3- 2.08, 18	Dewatering Pump - Supply, place and maintain dewatering pump and silt bag as needed	L.S.	1		
23	S.P. 3- 2.16, 19	Shrubs - Supply and place shrubs	unit	25		\$
24	S.P. 3- 2.16, 19	Trees - Supply and place trees	unit	9		
25	S.P. 3- 2.22	Fencing - Supply and place 7 chain link fence and gate at each end of berm	m	700		
26	GP 3- 1.17, SP 3-2.08	Fish Salvage Specialist to de-fish site	per	2		
					Subtotal:	
				Applic	able HST(13%):	
					Total Bid Price:	

It is possible that additional material may be required due to unknown site conditions and upon exposing the entire work area. The bidder agrees that the unit prices specified in the above table may be used to determine the additional cost in the event of additional or extra work.

I (We) ______having carefully examined the locality and site of the proposed works, and all Contract documents relating thereto, including the Drawings, Form of Tender, Information for Contractors, Specifications, General Conditions, Special Provisions, Form of Agreement, Form of Performance, and Payment Bond and <u>Addendum/Addenda No.</u>____to ____ (See Note 1) inclusive hereby tender and offer in accordance therewith to enter into a Contract within the prescribed time to construct the said works in strict accordance with the Contract documents and such further detail Drawings as may be supplied from time to time, and to furnish all materials, labour, tools, plant, matters and things necessary therefore complete and ready for use within the time specified for the sum of:

(\$_____)

Including HST or such other sum as may be ascertained in accordance with the Contract.

Dollars

The total amount of the tender is to be repeated in here in writing. Including HST.

Note 1: The Contractor shall insert here the numbers of the Addenda received and taken into account in preparing the Tender.

H.S.T. Registration Number:_____

The Bidder hereby proposes to commence, undertake and complete the works in full during the following period:

_____ day of ______, 20____ and ____ day of _____, 20____

Note for Signing Office: By my signature, I hereby confirm I am a principal, or have been duly authorized by the principal or board, to sign on behalf of the above-named organization.

Form #2 - Experience Form

To assist with proposal evaluation, please identify up to three projects of a similar nature that you completed, the scope of work involved and a reference contact. **Please submit this information as a separate attachment in the format you wish.**

Form #3 - Contractor's Senior Supervisory Staff

The Contractor must list below the names and experience of the Supervisory Personnel to be employed in this Contract. The Contractor shall not be allowed to substitute other supervisory staff without written approval.

Name		
Telephone number and email for contact named above.	Telephone	Email
Appointment / Role:		
Qualifications:		
Experience:		

Name		
Telephone number and email for contact named above.	Telephone	Email
Appointment / Role:		
Qualifications:		
Experience:		

Name		
Telephone number and email for contact named above.	Telephone	Email
Appointment / Role:		
Qualifications:		
Experience:		

Add additional pages as needed.

Form #4 - List of Subcontractors

The contractor shall not be allowed to substitute other sub-contractors in place of those named herein, without written approval.

Sub-Trade	Proposed Sub-Contractor & Address

Form #5 - List of Approved Construction Waste Disposal Sites

Name:	Address:

Form #6 – Bidder's Declaration Form

I/We (enter name)_____

Title/Position_____

Name of Organization or Business

- Declare that no person, firm or corporation other than the one whose signature or the signature of whose proper officers is attached below, has any interest in this proposal or in the contract proposed to be undertaken;
- 2) Further declare that this proposal is made without any connection, knowledge, comparison of figures or arrangements with any other company, firm or person making a proposal for the same work and is in all respects fair and without collusion or fraud;
- 3) Further declare that no Township of Rideau Lakes employee, or member of Township of Rideau Lakes Council and their families is, or will become, interested directly as a contracting party or otherwise or in the performance of the contract or in the supplies, work or business to which it relates or in any portion of the profits thereof, or of any such supplies to be used therein or any of the monies to be derived therefrom;
- 4) Further declare that the several matters stated in the said proposal are in all respects true;
- 5) Further declare that I/We have examined the Project Documents and hereby propose and offer to enter into a contract to provide all of the items mentioned and described or implied therein, including, in every case, freight, duty, exchange, and to accept in full payment therefore, the sums calculated in accordance with the actual quantities provided, and unit prices attached to this proposal; and,
- 6) Agree that this offer is to continue open for acceptance until a formal contract is executed or a purchase order is issued to the successful Bidder.

Signature of Authorized Officer_____

Name of Authorized Officer (please print)

Signature of Witness _____

Name of Witness (please print) _____

Dated_____

3.0 PROJECT SCOPE AND DETAILS

The following list of documents form the scope of work for this RFT.

- General Provisions (Section 3-1)
- Special Provisions Document (Section 3-2)
- List of Design Drawings (Section 3-3)
- Geotechnical Report (Section 3-4)

3-1 General Provisions for Contract

3-1.01 Contract Award and Start Date

Bidders shall note that the award of this contract is subject to the Township of Rideau Lakes receiving the necessary Government and/or agency approvals and funding. The Start Date will be after Labour Day (September 6,2021).

3-1.02 Completion Date

All works must be completed by 5:00 PM on December 10, 2021.

Within 1 week of Notice of Award of Contract, Contractor shall submit to Project Administrator for acceptance a scheduling of operations in the form of a Microsoft EXCEL GANTT Chart, providing details of Contractor's proposed operations for the work in accordance with the tender schedule. Contractor shall indicate the sequence of operation, taking into account the following key dates:

- a. Mobilization and construction access
- b. Dewatering system in place
- c. Removal works
- d. Cross Vane installation works
- e. Plantings
- f. Demobilization and restoration
- g. Completion

December 10, 2021

September 7, 2021

The Contractor shall submit construction schedule and take all necessary measures to ensure that the project is completed by the above noted deadline. The Project Administrator must approve the construction schedule.

The Contractor shall be aware of the above clause, more specifically:

If the time limit specified in the Special Provisions is not sufficient to permit completion of the work by the Contractor working a normal number of hours each day or week on a single daylight shift basis, it is expected that additional and/or augmented daylight shifts will be required throughout the life of the Contract to the extent deemed necessary by the Contractor to ensure that the work will be completed within the time limit specified. Any additional costs occasioned by compliance with these provisions will be considered to be included in the prices bid for the various items of work and no additional compensation will be allowed therefore.

3-1.03 Deletions and Reduction of Quantities

It should be noted that portions of this contract may be deleted or quantities reduced to meet budget restraints.

3-1.04 Provisional Items

All items in the Form of Tender marked 'Provisional' shall be used only where specifically ordered by the Project Administrator. In the event of any deletions of the contract, no adjustment or compensation will be awarded to the Contractor for loss of revenue or for any other reason.

3-1.05 Environmental Considerations

The Contractor shall undertake a detailed review of the proposed route of construction to plan access routes and fuelling areas. Suitable fuelling and maintenance areas shall be established and approved by the

Project Administrator. Refuelling and maintenance of equipment shall not be undertaken in or adjacent to watercourses.

The exception to this fuelling location requirement shall be diesel generators, cranes or backhoes which may be fuelled at other than the designated fuelling areas. However, no fuelling of backhoes shall be carried out within thirty metres (30 m) of any water course. This requirement may be relaxed at the discretion of the Project Administrator if non-spill fuelling equipment is used.

The Contractor shall prepare a contingency plan and have available the means for the interception and rapid clean up and disposal of any spillage to land and/or water. Any spill causing impairment to the natural environment, as defined by current legislation, must be reported immediately by the Contractor.

3-1.06 Topsoil and Sod Restoration

All topsoil shall be screened using $35 \text{mm} (1 \frac{1}{2})$ size screen. This applies to all topsoil whether acquired from the jobsite or imported from offsite.

The topsoil shall be a fertile, friable natural loam containing not less than 4% of organic matter for clay loams and not less than 2% for sandy loams with an acidity value ranging from PH 6.0 to 7.5 and capable of sustaining vigorous plant growth. It shall be free of any admixtures of subsoil, clay lumps and free of stones, roots and other extraneous matter. If this is not attainable from topsoil on site, then either this topsoil shall not be used or it shall be mixed with imported material to attain the above-mentioned specification.

Topsoil shall be spread at a uniform depth of a minimum 100mm compacted soil.

Topsoil shall be rolled with a 50kg roller for compaction. The finished topsoil surface shall be smooth and firm against footprints.

3-1.07 Sediment and Erosion Control

The Contractor shall exercise extreme precaution during all construction operations to keep sediment disturbance to a minimum and to minimize sediment entering the river. The following special construction techniques and erosion control measures shall be a requirement of this Contract:

All work is to be completed in the dry. The Contractor shall monitor the weather several days before construction begins to ensure that work will be conducted during favourable weather conditions (i.e., dry conditions).

Upon evidence of an inherent storm event the Contractor shall cease in-water and near water operations. All equipment and loose materials shall be removed from the regional storm flood plain immediately. Erosion and sediment controls shall be checked and reinforced where maintenance is required to reduce the risk of sediment release during the storm event. The Contractor is responsible for monitoring the site conditions, particularly if wet weather is expected, including evenings, weekends and holidays.

Any temporary filtration check dams (e.g., silt fences) shall be inspected after each significant rainfall. Necessary repairs shall be made promptly and sediment shall be removed when it reaches half the original height or sooner. Sediment shall be removed from the temporary filtration check dam at the direction of the Engineer and disposed of in accordance with OPSS 510.

Erosion and sediment controls indicated on Contract Drawings are the minimum that is required. The Contractor is responsible for ensuring that all measures are functional and is required to use additional appropriate measures if needed and as needed, to prevent the release of sediment into any adjacent watercourse, waterbody or other adjacent natural feature (i.e. forest, wetland). No excess earth or granular materials shall be left in areas where it will be subject to erosion into the river channel.

Installation and maintenance of sediment and erosion controls shall be done in accordance with the publication, "Erosion and Sediment Control Guideline for Urban Construction", December 2006, by the Greater Golden Horseshoe Area Conservation Authorities.

Payment for this item shall be made, at the completion of the period, at the contract lump sum price and shall include all labour, equipment and materials necessary to complete the work as specified on the Contract Drawings and for the maintenance and for the removal and disposal of the silt material, and the removal of the filter products.

Payment will be made as follows:

50 % for supply and installation 30 % for maintenance 20% for removal

3-1.08 Disposal of Materials

Ontario Provincial Standard Specification O.P.S.S. 510 shall apply to the work.

When the Contractor is required to dispose of material off-site such as rubble and debris resulting from clearing operations, demolitions and removals, surplus excavation from landscaping, river work, roadway excavation, or any other work under this contract, this debris and surplus earth shall be disposed of outside the contract limits at an acceptable site to be arranged and paid for by the Contractor. Do not bury rubbish and waste materials on site.

If a private dump site is used the Contractor shall prior to its use, provide the TOWNSHIP OF RIDEAU LAKES with a letter of release.

No burning will be permitted within the limits of the Contract.

The contract unit prices shall include full compensation for all labour, equipment and materials required for excavation, dewatering, removal and disposal off-site, as specified.

3-1.09 Protection of Existing Trees

09.01 Trees Located within the Right-of-Way

Caution must be exercised around existing trees in order to minimize disturbance.

It will be the responsibility of the Contractor to report to the Project Administrator, in writing, any conditions encountered before or during work that will adversely affect the performance of the work or which may result in damage to the trees.

09.02 Root Cutting

As a note, all of the tree protection and root cutting must be done prior to any construction work beginning. Protection fencing must be inspected before any work begins. The tree root cut lines will be established by the TOWNSHIP OF RIDEAU LAKES as indicated on the drawings. As per normal course the General Contractor will be required to provide all locates for the project.

09.03 Tree Protection

Fencing should be installed at a minimum distance of 1m from the drip line of trees within the work area or as discussed with the Project Administrator.

3-1.10 Noise Levels

Noise levels shall be controlled in accordance with local By-laws and the Occupational Health and Safety Act.

All internal combustion engines shall be equipped with original equipment in proper working order to minimize noise levels in the project area.

For compressors and pumps operated beyond normal working hours, special measures for noise attenuation will be required.

3-1.11 Private Lands

The Contractor shall not enter upon or occupy with men, tools, equipment or materials of any nature, any lands outside of the public streets and roadways and the rights-of-ways or easements shown on the plans, except after consent has been received by him from the proper parties, a certified copy of which consent shall be furnished to the Project Administrator.

3-1.12 Construction Layout / Locates

The Contractor is responsible for all layout work and utility locates. The Contractor shall be responsible for all errors in setting line or grade and pay the costs of any additional works that may result from such error.

3-1.13 Traffic and Street Signs

Any traffic signs and banners that have been removed due to proposed construction work must be reinstalled immediately to ensure the safety of pedestrian and vehicle traffic at all times. If the signs are not reinstalled or replaced by the end of the day or sooner, then the TOWNSHIP OF RIDEAU LAKES will do this work at the Contractor's expense. All traffic and street signs are to be placed in locations approved by the TOWNSHIP OF RIDEAU LAKES's Project Administrator.

3-1.14 Maintenance of Traffic

The Contractor will be responsible for all signage pertaining to road closures at all appropriate locations, traffic control devices, and flagmen, etc. in a manner that is acceptable to the TOWNSHIP OF RIDEAU LAKES. All lane restrictions must be reviewed and approved by the TOWNSHIP OF RIDEAU LAKES prior to their implementation.

All traffic control signs must conform to the M.T.O Handbook for Construction Signs. It shall be the responsibility of the Contractor to supply traffic control persons and supply, erect and maintain in good condition all barricades, signs, lights and other safety devices for the purpose of informing, directing and safeguarding the public in advance of and within the limits of construction for the duration of the construction. All traffic control persons must follow M.T.O.'s Uniform Traffic Control Manual. Costs of these signs, barricades, lights, other safety devices, and traffic control persons is to be included in the cost of construction.

3-1.15 Project Inspection

All work performed under this contract will be inspected by the TOWNSHIP OF RIDEAU LAKES. At least 48 hours' notice of start of construction will be given so that inspection can be arranged with the Contractor, the Engineer and the TOWNSHIP OF RIDEAU LAKES staff.

3-1.16 Other Contractors Within or Adjacent to the Limits of the Contract

The Contractor shall co-operate with other Contractors and utility companies and they shall be allowed free access to their work at all times. The Project Administrator reserves the right to alter the method of operations on this contract to avoid interference with other work.

No claims for extra payment will be allowed for this requirement.

3-1.17 Fish Removal (PROVISIONAL)

The Contractor shall be responsible to ensure that fish trapped in the work area during dewatering are safely transported downstream. An assessment of current conditions immediately before start of construction will be conducted to determine if it is necessary to execute a fish removal plan. If so, the following is applicable:

Fish that may be stranded in a work zone will be collected and transferred further downstream by qualified professional after being issued a License to Collect Fish for Scientific Purposed by the Ministry of Natural Resources. Fish removal, using a backpack electro-fishing unit, will begin at the onset of dewatering activities and will continue as water levels subside and fish are concentrated into deeper areas. All fish will be transferred alive downstream of the work zone.

Additional fish assessments shall be conducted and addressed as outlined above in the event that stream flows enter the work area during the construction period.

Payment for this item is as per plan quantity. The Contractor will coordinate timing of the fish removal with the aquatic specialist and the Project Administrator.

3-1.18 Dewatering and Stream Control

The work to be paid for under this item is for all costs for pumping, the removal and disposal off-site of accumulated sediments, and the restoration of any disturbed areas.

The work under this item shall include the provision of labour, equipment and materials for the implementation of dewatering and stream control under this contract.

All dewatering and stream control work shall be done:

- a) To facilitate the construction of the proposed works, as defined under this contract in the dry;
- b) To ensure full protection is given to life and property at and below the site; and
- c) To ensure that the requirements of the construction scheduling are met.

Failure of dams or other dewatering controls shall be the responsibility of the Contractor and all compensation related to the maintenance and/or reconstruction of facilities shall be incorporated within the lump sum price for this item.

Payment for this item shall be based on the actual works performed for dewatering and stream control in accordance with the terms and conditions of this contract and shall be compensation in full for all work as specified herein.

The Contractor is responsible for the collection, control, treatment and discharge of surface runoff and trench water. In addition, the Contractor is responsible for monitoring discharge runoff through a sediment trap (or filter bag) in a well vegetated area at least 10m from the watercourse.

The Contractor shall maintain the site of the works free of surface and groundwater so that construction may be carried out in the dry.

The Contractor shall note that should the monitoring by the Project Administrator or Engineer reveal that there is an adverse effect to the environment or the groundwater regime as a result of the construction activities, the Project Administrator may request that the Contractor alter its construction practices.

The Contractor shall at all times keep all excavations free from water at his own expense and shall build all dams and other works necessary for this purpose and provide and keep in operation on the work, when necessary, a pump or pumps of sufficient capacity for this purpose. The Contractor's proposed techniques for the collection, control, treatment, discharge and monitoring of site runoff and trench water shall be subject to approval by the Engineer prior to implementation.

Quality Control of Site Runoff and Trench Water

Water from the groundwater dewatering operations is expected to be clean and suitable for discharge to the environment at suitable locations. The Contractor shall monitor the discharge area throughout dewatering. If erosion occurs, the Contractor shall stop dewatering operations and propose an alternate location or method.

Discharge Locations for Site Runoff and Trench Water

The Contractor will be allowed to propose alternate methods for the discharge of water from site runoff and trench operations. Any alternate method shall be at no additional cost to the TOWNSHIP OF RIDEAU LAKES and any alternate methods proposed by the Contractor will be subject to review and approval by the Project Administrator.

Measurement and Payment for Dewatering

Payment shall be made, without measurement at the end of the period, at the contract lump sum for the handling of site runoff and trench water.

The need for and the method of dewatering shall be determined by the Contractor at the beginning of construction and submitted to the Project Administrator and the Engineer for review and approval. The Contractor shall amend the method of dewatering as construction progresses as required to meet actual site conditions.

3-2 Special Provisions for Contract – Project Specific Items

3-2.01 Site Access

Access shall be through the public ROW as indicated on the plans. The TOWNSHIP OF RIDEAU LAKES will keep the residents on Bass Lake Road informed. Specific details regarding site access will be discussed at the MANDATORY site meeting.

The staging areas shall be as generally indicated on the plans.

The Contractor shall:

- 1. Ensure that the access road through the ROW is satisfactory for the use of all construction equipment during the entire project and can be used as an access road for future dam and control structure maintenance.
- 2. Use a "bridge structure" for any river crossing and minimize disturbance of any existing riverbed and substrate prior to site isolation.
- 3. Maintain proper access to and within the Site for all persons and vehicles entitled to such access and maintain existing roads and paths in reasonable condition or provide suitable detours.
- 4. Erect protective fencing as required by the TOWNSHIP OF RIDEAU LAKES to limit public access to construction site. All associated costs to be included in tender item.
- 5. Keep the site safe and secure at all times, and as clean and tidy as possible and, as soon as practicable, clear all surplus construction equipment and surplus material and leave clean and in good order to the satisfaction of the TOWNSHIP OF RIDEAU LAKES.
- 6. Maintain trucks and machines used in the process of the Site in a condition so that they are tight and that spillages will not occur. Before trucks leave the site trim loads.

Should the Contractor be negligent of his duties in maintaining proper street cleanliness, the TOWNSHIP OF RIDEAU LAKES will take such steps as are necessary to perform such cleaning and shall charge all the costs to the Contractor.

Movement of equipment outside of the immediate construction area must be minimized.

Any costs associated with the maintenance or restoration of construction access roads, or areas affected or damaged by construction traffic including existing roadways, shall be included in the contract unit prices and no additional payment will be made for this work.

3-2.02 Utilities, Fences and Private Properties

The Contractor will not be responsible for any necessary permanent relocations of hydro, telephone, watermain or gas services along the line of construction. However, the Contractor will be held responsible for the protection of fences, private properties, and all services whether aerial or underground, including telephone cables, hydro cables, traffic detector loops, watermains, sanitary sewers, gas mains, etc., during the time of construction and will be held liable for any damage to same.

Prior to commencing any excavation operations, the Contractor shall obtain the necessary stake-outs and clearances from all utilities concerned and arrange for, at his own expense, any temporary relocations and/or protection that may be required. Proof of stakeout is to be retained at the work location.

In the event that all utilities requiring relocation have not been relocated prior to the time when the Contractor commences work, the Contractor will be required to co-operate with the utility companies and work around them such that the existing services are protected until such time as they can be removed from the line of construction. No claims for extra payment or extension of time will be allowed for this requirement.

3-2.03 Protection of Existing Trees (HOARDING IS PROVISIONAL)

Caution must be exercised around existing trees in order to minimize disturbance. For this reason, the following shall be incorporated into the construction practices and the general contractor and all trades on this project shall be aware of the tree concerns.

- a) Prior to construction start up, the Contractor is to arrange and attend a site visit with the TOWNSHIP OF RIDEAU LAKES to review the existing conditions of trees and which may be affected by the construction. It will be the responsibility of the Contractor to report to the TOWNSHIP OF RIDEAU LAKES, in writing, any conditions encountered before or during work that will adversely affect the performance of the work or which may result in damage to the trees.
- b) Existing trees, as directed by the TOWNSHIP OF RIDEAU LAKES Inspector and/or Construction Drawings, shall be protected with a snow fence to the drip line during construction and the cost of this work is to be included in the tendered item specified.
- c) In order to minimize damage during construction the following practices are to be followed:
 - (i) Roots (over 25mm in caliper) when necessary are to be cut clean and treated with an approved tree dressing.
 - (ii) Trees, shrubs and hedges 200mm and under diameter, breast height will be trenched by machine until drip lines, and from here on boring or trenching must be done by hand with no roots over 25mm in diameter to be cut.
 - (iii) All fertilizing, pruning, and lifting will be done in accordance with generally accepted specifications and be performed by a qualified tree specialist as approved by the TOWNSHIP OF RIDEAU LAKES.
 - (iv) Trees requiring pre-pruning, for clearance of construction equipment, will be termed as lifting.
 - (v) Care must be taken while working around trees to prevent exhaust burn on the foliage and breakage of limbs.
 - (vi) Tunneling and boring will be required under the tree drip line as per generally approved standards. The cost shall be included in the cost of services.
- d) Loss of any tree or shrub within one year of the date of total completion as established by the Contract Administrator proven to be directly caused by over fertilization or faulty materials or poor construction practice is the responsibility of the Contractor. The Contractor is responsible for compensating the TOWNSHIP OF RIDEAU LAKES for any such damage caused by him/herself, his/her work persons, or his/her subcontractors. Under such circumstances, the Contractor shall remunerate the TOWNSHIP OF RIDEAU LAKES of a value set by the TOWNSHIP OF RIDEAU LAKES' Engineer or a mutually acceptable arbitrator using the Ontario Shade Tree Council evaluation formula as published in "Evaluating Trees in our Environment in the Province of Ontario"
- e) The final release of the Maintenance Security will be subject to the TOWNSHIP OF RIDEAU LAKES Engineer's inspection and acceptance.
- f) Minimize stripping of topsoil and vegetation.

3-2.04 Traffic Control and Signage

The Contractor is fully responsible for traffic control and its costs. The Contractor shall:

- Minimize interruption to traffic.
- Notify the Police Authorities should it be found necessary to interrupt the normal flow of traffic. Submit details to the Police Authorities and obtain their approval as to the method intended to divert traffic and to the placing of signs, barricades, and flagmen.

• In a similar manner, inform the Fire Department of the area of the Township of Rideau Lakes concerned in advance of his program of street blockage and detour so that the Fire Department can set up plans for servicing the area in case of emergency.

Any traffic or street signs that have been removed due to proposed construction work must be reinstalled immediately to ensure the safety of pedestrian and vehicle traffic at times. If the signs are not reinstalled or replaced by the end of the day or sooner, then the TOWNSHIP OF RIDEAU LAKES will do this work at the Contractor's expense. All traffic and street signs are to be placed in locations approved by the TOWNSHIP OF RIDEAU LAKES' Contact administrator.

3-2.05 Disposal of Materials

Do not bury rubbish and waste materials on site unless approved by Contract Administrator.

Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

Excess and/or unsuitable excavated material shall be disposed of on-site or within the access right-of-way.

Unsuitable excavated material such as asphalt, concrete and all other similar materials shall be disposed of to a dump site arranged for by the Contractor. If a private dump site is used the Contractor shall, prior to its use, provide the Township of Rideau Lakes with a letter of release.

3-2.06 Fires

Fires and burning of rubbish are not permitted on site.

3-2.07 Conduct of Workers

No worker shall enter onto neighbouring sites without prior authorization of the site owner.

Foul language and behaviour are unacceptable. Any worker under the employ of the contractor will be asked to leave the site should unwanted verbal or physical contact be made with any person on adjacent sites or public in general.

3-2.08 Watercourse / Fisheries Protection

In-stream works are prohibited from April 1st to June 30th. Extensions can be negotiated with the Ministry of Natural Resources by the Project Administrator.

The Contractor shall work "in the dry" as per the plans (i.e., Dam and Pump) or approved alternative.

At all times, operations shall be controlled so as to prevent the entry of deleterious materials to the watercourse.

Watercourses shall not be diverted, or blocked, and temporary watercourse crossings shall not be constructed or utilized, unless otherwise specified in the Contract.

Construction material, excess material, construction debris, and empty containers shall be stored away from watercourses and watercourse banks.

All equipment maintenance and refueling shall be controlled so as to prevent any discharge of petroleum products. Vehicular maintenance and refueling shall be conducted away from watercourses and watercourse banks.

The Contractor shall:

- 1. Bear all costs in connection with the dewatering of excavations, the removal of accumulations of water from the finished structures prior to their being taken over for use, and any other pumping and drainage necessary at the Site for the proper construction and inspection of the Works.
- 2. Dispose of all groundwater drained or pumped as above in a manner approved by the TOWNSHIP OF RIDEAU LAKES.
- 3. Seed and subsequently install coir matting on all exposed soils to limit erosion and sediment delivery to the stream. Coir matting to be installed as per manufacturer's specifications.

The Contractor is to be aware and implement appropriate erosion and sediment controls as per the current the TOWNSHIP OF RIDEAU LAKES standards (Erosion and Sediment Control Guidelines for Urban Construction, 2006 or most recent version/standard).

3-2.09 Mud and Dust Control

The Contractor shall throughout the duration of the Contract, control dust nuisance resulting directly or indirectly from his operations associated with this Contract. If excessively dusty conditions occur, the Contractor shall cause same to be immediately corrected. Should the Contractor fail to comply with this provision, within 3 hours of verbal notice by the Project Administrator to the Contractor or his authorized representative, the Project Administrator may, without further notice, cause the conditions to be corrected by others, and the cost of such correction to be deducted from monies owing to the Contractor at a minimum rate of \$100.00 per hour for a minimum of three (3) hours plus the cost of calcium chloride and/or water used.

The Contractor shall also clean and maintain the cleanliness of adjacent streets and the property occupied by him from waste materials or refuse resulting from his operations to the satisfaction of the Project Administrator.

Trucks hauling excavation material, construction materials or other loose materials from or to the site shall have their loads trimmed before leaving the site and their bodies shall be tight in order that no spillage of their loads will occur.

The Contractor's truck and equipment operations on all streets shall be governed by all local traffic by-laws and regulations of the local Fire, Police and Public Works and Building Departments.

The Contractor is to be aware and implement appropriate erosion and sediment controls as per the current the TOWNSHIP OF RIDEAU LAKES standards (Erosion and Sediment Control Guidelines for Urban Construction, 2006 or most recent version/standard).

3-2.10 Geotechnical

The Contractor shall engage a geotechnical consultant to inspect the subgrade and provide confirmation that the soils are compacted to the stated levels.

The geotechnical report completed during the design process is appended to this document (Section 3-4).

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.11 Clearing and Grubbing

Under these items for the unit price, the Contractor shall supply all equipment, labour and materials to complete the clearing, grubbing and rough grading in accordance with the contract documents.

The Contractor shall grub, clear and remove the existing channel debris and dispose of the material offsite. The Contractor shall rough grade the proposed dam area to the approximate dimensions on the contract documents and to the satisfaction of the Project Administrator. All material is to be disposed of offsite and outside of any area regulated by the Rideau Valley Conservation Authority. The Contractor shall work "in the dry" (i.e. isolated from the general flow of water in the river or lake).

The Contractor shall limit the extent of the activity to the general area shown on the plans. Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.12 Grading

Under these items for the unit price, the Contractor shall supply all equipment, labour and materials to complete the placement of excavation, placement, grading and dam works and channel adjustments in accordance with the contract documents.

The Contractor shall remove material to the specifications noted on the contract drawings. The Contractor shall work "in the dry" (i.e. isolated from the general flow of water in the river or lake).

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.13 Riverstone

Supply of Riverstone:

Under this item for the unit price, the Contractor shall supply all materials to complete the placement of the riverstone treatments in accordance with the contract documents.

The riverstone material shall include the cost of stone and larger stone as per the contract drawings.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

Placement of Riverstone:

Under these items for the unit price, the Contractor shall supply all equipment and labour to complete the construction of the riverstone transition treatments in accordance with the contract documents.

The Contractor shall work "in the dry" (i.e. isolated from the general flow of water in the river).

The riverstone shall include the cost of excavation, grading, placement and compaction of stone and larger stone as per the contract drawings.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.14 Armourstone Cross Vane

Supply of Cross Vane Boulders:

Under this item for the unit price, the Contractor shall supply all materials to complete the construction of the cross vane control structure in accordance with the contract documents.

Cross Vanes shall be constructed of riverstone and armourstone. Rock should be of sufficient hardness to resist weathering and shall be free of cracks and other blemishes. Porous rock, such as some limestones, and soft rock, such as shales, are not allowed. Materials are to be composed of rounded stone which generally mimics the natural geology of alluvial watercourses.

Armourstone material shall be sourced from an approved quarry. All armourstone shall be clean, hard, durable rock as well as free of cracks, of angular shape and a uniform gradation with a Specific Gravity of no less than 2.6 t/m³. All material measurements shall be within 10% of the specified plan dimensions in width, depth and height. Stone not meeting these requirements or not within any dimensional tolerance will be rejected and shall be returned to the quarry at no charge to the Township of Rideau Lakes. All armourstone placed in the works as specified in this item shall be approved by the Engineer or Contract Administrator.

The contractor shall work "in the dry" (i.e. isolated from the general flow of water in the creek or lake).

Payment shall be compensation in full for all labour, material costs, and equipment required to supply, to transport the stone to the site, to load and unload such transport and to place such stone in the works as specified. The unit price for the armourstone shall include the cost of granular backfill as per the contract drawings.

Riverstone size to be $D_{50} = 300$ mm on the B-axis. Any rock material which fails to meet the specifications for size and weight will be returned to the source by the Contractor.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

Placement of Cross Vane Stone:

Under these items for the unit price, the Contractor shall supply all equipment and labour to complete the construction of the proposed cross vanes in accordance with the contract documents.

The Contractor shall work "in the dry" (i.e., isolated from the general flow of water in the creek or lake).

Construction of Cross Vane to include the following.

- The contractor shall place a bentonite clay blanket curtain in front of the leading armourstone from 1 metre past each end of the emergency spillway (+/- 17 metres in length).
- Cross Vane shall be constructed so that adjoining rocks taper in an upstream direction, from the bankfull elevation to the stream invert. The upstream (lower) end of the Cross Vane is set at an angle of 20° -30° tangent to the banks.
- The downstream end of the Cross Vane shall be keyed into the berm at the bankfull elevation. The Cross Vane shall be keyed a minimum of two metres (2m) into the bank. The upstream end of Cross Vane shall be keyed into the berm at the invert elevation. The Cross Vane shall be installed with a slope of 4% to 7% from the streambed invert to the berm elevation.
- The Cross Vanes shall be completed by the placement of a cross channel sill at the design invert of the streambed. Cross channel rocks shall be properly secured behind Footer Rocks and shall be placed so that the sill rock is level across the channel. Sill rock shall be placed in close rock to rock contact with no space between adjoining rocks. The elevation of the sill shall be as determined on the plan drawings, specifications, construction notes or as determined onsite by the Contracting Officer or Contract Administrator.

- Footer Rocks shall be installed as shown in the Contract Drawings and Details and shall be firmly keyed into the streambed.
- Vane Rocks shall be placed in a linear fashion so as to produce the sloping Cross Vane, and shall be placed with tight, continuous surface contact between adjoining rock. Rock shall be placed so as to have no significant gap between adjoining rock.
- Vane Rock shall be placed so as to have a final smooth surface along the top plane of the Cross Vane. No Vane Rock shall protrude higher than the other rock in the Rock Vane. A completed Cross Vane has a smooth, continuous finish grade from the bankfull elevation to the streambed.
- As the cross vane is constructed, the Contractor shall chink all voids between the footer rocks, and between the footer rocks and vane rocks. Voids shall be chinked with small boulders, cobble or rock fragments. Chinking will be conducted such that no voids greater than ten centimetres (10cm) in size will be present.
- Upon completion of the Cross Vane, the Contractor shall place stabilizing vegetation as shown in the Vegetation Plan and Specifications.
- The Contractors shall upon completion of the work reshape the slopes and stream bottom to the specified elevations. All unsuitable and surplus rocks will be removed from the site.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Contract Administrator.

3-2.15 Channel Improvements

Under these items for the unit price, the contractor shall supply all equipment, labour and materials to complete the channel works accordance with the contract documents.

The contractor shall work "in the dry" (i.e. isolated from the general flow of water in the creek or lake).

The contractor shall place material into the remnant channel as required to suit wetland and channel profile and substrate requirements (to match existing substrate characteristics and upstream and downstream substrate).

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the contract administrator

3-2.16 Supply and Planting of Shrubs and Trees (PROVISIONAL)

Under this item the contractor shall supply all equipment, labour and materials to supply and plant shrubs and trees for restoration. This includes supply and planting of shrubs, trees, and plant material stock as indicated on the plans. All planting work is to be carried out by experienced personnel under the direction of a skilled foreman.

With regards to product, delivery, storage, and handling, the following conditions must be met:

The contractor will recognize the following conditions and will:

- Make plant material available for inspection at source by the Contract Administrator if requested;
- Approval of plant material at source will not impair the right of the Contract Administrator to inspect plants upon arrival on the site or during the course of construction and to reject plants which have been damaged, or which, in any way do not conform to the specifications;
- If partial acceptance is desired, give notice to the Contract Administrator in writing; and

• Final inspection of all plant material will be made at the end of the specified guarantee period. All plants must be in a healthy growing condition at the time of this inspection.

The contractor is to include the following maintenance services:

- Maintain all plants and planting areas immediately after installation until final acceptance;
- Maintenance shall include all measures necessary to establish and maintain all plants in a vigorous and healthy growing condition, including, but not limited to:
 - Watering when required and in sufficient quantities to saturate the root system;
 - Pruning, including the removal of dead or broken branches; and
 - Disease and insect control when required. Use chemical methods in accordance with the manufacturer's directions.
 - Make good any damage at no extra cost.
- Keep all accessories in good condition and properly adjusted. Repair or replace accessories when required at no extra cost; and
- At the time of acceptance, all material must be in a healthy vigorous growing condition. Beds and tree pits must be free of rubbish and debris.

All plants shall be inspected one year after installation and at the end of the guarantee period(s). Plants which, at that time, are not in a healthy vigorous growing condition, to the Contract Administrator's approval, shall be replaced at no extra charge to the Township of Rideau Lakes.

Replacements shall be planted as soon as possible, but during the proper planting season, in accordance with accepted horticultural practice. All replacement trees shall be clearly marked in a visible manner. The contractor shall notify the Contract Administrator in writing when replacements are to be planted.

Measurement for payment shall be made on a Per Unit basis. The payment associated with the supply of all labour, equipment, and materials for all works outlined in this section shall be included in the prices tendered for the planting of trees and shrubs. Breakdown of individual plant costs, as indicated in the Pricing Form, shall be completed by the Contractor in accordance with the plant lists on the plans. If additions or deletions of plant material are required, the plant unit values listed by the Contractors shall be used to determine credits or debits to the Contract.

3-2.17 Seeding

Under these items for the unit price, the contractor shall supply all equipment, labour and materials to complete the seeding in accordance with the contract documents.

The contractor shall work "in the dry" (i.e. isolated from the general flow of water) and remain out of the rehabilitated channel during completion of the seeding.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the contract administrator.

3-2.18 Erosion Controls

Under these items for the lump sum price, the Contractor shall supply all equipment, labour and materials to complete the installation of the erosion control measures in accordance with the contract documents (silt fence, coir logs and coir matting).

Temporary erosion and sediment control measures shall be carried out as per the approved plans or as amended herein or as amended in the field under direction of the Contract Administrator.

The work includes the supply, installation and removal of sediment and erosion control measures as required, to prevent soil erosion and the siltation of adjacent water courses or properties. The Contractor

shall control his operations in such a way as to minimize erosion and discharge of sediment-laden water. Disturbed areas are to be stabilized as soon as possible. The operation of construction equipment and the placement of temporary material stockpiles are to be done so as to prevent the tracking or erosion of mud onto the adjacent roadway and properties.

As part of this item, the Contractor shall maintain the erosion and sediment control measures in proper working condition. If, in the opinion of the Contract Administrator, the function of the control measures are impaired by excess silt and debris, the Contract Administrator may request that the Contractor, at his own expense, remove all silt and debris from the erosion and sediment control measure area and return it to its proper working condition. Dumping of excess silt and debris within protected natural areas is prohibited. Should the Contractor fail to complete this work in a timely fashion, the Contract Administrator may issue a stop work order for all work on the site until the removal of excess material and the restoration of the erosion and sediment control measure is complete. The Contractor shall not begin any additional work until the Contract Administrator has provided the Contractor with a Recommence Work order.

a) Supply and Install Silt Fence

The Contractor shall supply and install temporary site fencing as noted on the contract drawings. All work shall be completed as per OPSD 219.110 and modified as per details on the Erosion & Sediment Control Plan.

Payment at the Contract Price for this item shall be; 40% after initial installation, 40% for maintaining the fence during construction and 20% after removal of the temporary fencing. The unit bid price shall include full compensation for all labour, equipment and material required to do the work including costs and fees for disposal of material off site.

b) Supply and Install Coir Logs

The Contractor shall supply and install temporary biodegradable coir logs as per manufacturer's specifications. All work shall be completed as per OPSD 219.120 and OPSD 219.191, the approved Contract Drawings or as directed by the Contractor Administrator.

Where possible, the Contractor is to remove, stockpile and reuse existing siltsoxx where possible.

Payment at the Contract Price for this item shall be; 40% after initial installation, 40% for maintaining the fence during construction and 20% after removal of the temporary fencing. The unit bid price shall include full compensation for all labour, equipment and material required to do the work including costs and fees for disposal of material off site.

c) Supply and Install Coir Fabric

Erosion Control Blankets (ECB) shall be biodegradable material 'Geo-Jute', also known as 'coir fabric'. ECB shall be placed as per the design drawings or as determined by the Contract Administrator at the time of construction.

ECB shall be installed from edge of normal water level to the outside edge of bankfull bench (+/- 3m) on each side of channel. All slopes shall have ECB installed.

The Contractor shall apply seed as required before the installation of the ECB. The ECB shall be installed as per manufacturer's specifications including installation in the proper direction, overlapping and fastening. Fastening shall be completed with biodegradable materials (e.g., wood pegs or corn-based manufactured staples) unless otherwise approved by the Contract Administrator. Any plantings shall be undertaken after the installation of the ECB.

Payment at the Contract Price for this item shall be; 50% after initial installation, 50% for maintaining the fence during construction and 20% after removal of the temporary fencing. The unit bid price shall include full compensation for all labour, equipment and material required to do the work including costs and fees for disposal of material off site.

3-2.19 Landscaping and Bioengineering

Under these items for the unit price, the Contractor shall supply all equipment, labour and materials to complete the landscaping in accordance with the contract documents.

All plantings are to be completed as per the design details and directions indicated on the contract drawings. Seed mix is to consist of specified seed mix on plans combined with native flowering seed mix also at 20kg/ha. Timing of planting to be determined with the Project Administrator.

The Contractor shall work "in the dry" (i.e. isolated from the general flow of water in the river) and remain out of the rehabilitated river during completion of the plantings.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.20 Chain Link Fencing

The unit price bid shall include the installation of chain link fencing. Measurement for payment shall be per metre of fence installed.

The Contractor shall provide all labour, equipment, and materials required to install the chain link fence, including any miscellaneous appurtenances, fastening components, poles, caps, chain link fence, gates,, as necessary for the work proposed under this contract.

All work shall be completed in accordance with OPSS.MUNI 772 (formerly OPSS 541), Construction Specification for Chain Link Fence.

Materials shall consist of the following:

- 1) Concrete mixes and materials: Cast-in-Place CSAA23.1/A23.2 with nominal aggregate size: 40-5 and compressive strength: 21Mpa minimum 28 days.
- 2) Chain-link fence fabric: to CAN/CGSB-138.1 (Type 1, Class A, medium style). Height of wire: 1.8m or as indicated on drawings.
- 3) Posts and Rails: to CAN/CSGB-138.2 + ASTM A53, galvanized steel pipe, Schedule 40 pipe minimum.
- 4) Bottom tension wire: single strand, galvanized steel wire, 5 mm diameter.
- 5) Tie wire fasteners: single strand, galvanized steel fabric, 3 mm diameter.
- 6) Tension bar: 5 x 20 mm minimum galvanized steel
- 7) Tension bar bands: 3 x 20 mm minimum galvanized steel
- 8) Gate Frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.
- 9) Gates to be electrically welded joints, and hot-dip galvanized, painted with zinc pigmented paint after welding. Fasten fence fabric to gate with wire fasteners. Furnish gates with heavy duty galvanized hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate. Furnish double gates with chin hook to hold gates open and centre rest with drop bolt for closed position.
- 10) Fittings and hardware: galvanized steel. Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
- 11) Zinc pigmented paint: to CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating
- 12) Knuckled wire: 2 mm diameter galvanized steel wire to ASTM A121.
- 13) Finishes: Galvanizing for chain link fabric: to CAN/CGSB-138.1, Grade 1 coating. For pipe: 550 g/m² minimum to ASTM A90/A90M. For other fittings: to CSA G164.
Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.21 Entrance Access Gate

The unit price bid shall include the installation of a single standard agricultural steel pole gate at the entrance to the site in the location shown on the plan.

The Contractor shall provide all labour, equipment, and materials required to install the gate, including any posts, miscellaneous appurtenances, fastening components, as necessary for the work proposed under this contract.

Measurement for payment shall be as per plan quantity (one). No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.22 Agricultural Fencing (PROVISIONAL)

The contractor shall install agricultural fencing in the location shown on Detail D3 the plan.

Fencing to extend into lake to a water depth of no more than 200mm. The fence shall be a 7-wire fence with steel posts every 5.03 metres (16.5'). The contractor shall install double-span brace assemblies at each corner and install single-span brace end brace assemblies. In-line single-span brace assemblies shall be installed every 304.8 metres (1000') where necessary. Brace assemblies shall use raw 127 mm (5") cedar posts.

The contractor is to undertake any tree clearing, etc., to allow the line fence construction.

The Contractor shall provide all labour, equipment, and materials required to install the fencing including any posts, miscellaneous appurtenances, fastening components, as necessary for the work proposed under this contract.

Measurement for payment shall be as per plan quantity. No measurement for payment shall be made on site unless the site has been changed based on instruction of the Project Administrator.

3-2.23 Clean-Up Reinstatement

The Contractor is advised that the work site must be maintained in as clean a condition as possible during the period of the Contract.

Upon completion of the major works, the Contractor shall proceed with all expediency to carry out any necessary reinstatement to the satisfaction of the TOWNSHIP OF RIDEAU LAKES.

The Contractor shall ensure that the access road through the ROW is satisfactory for the use of all construction equipment during the entire project and can be used as an access road for future dam and control structure maintenance.

In case of undue delay, the TOWNSHIP OF RIDEAU LAKES will carry out these operations with other forces, and deduct all cost incurred from monies due to the Contractor.

3-2.24 Scheduling, Milestones and Notifications

Prior to initiating construction, the Contractor shall attend a Pre-Construction Meeting with the Contract Administrator and the Engineer to review the project requirements and site conditions.

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Prior to the Pre-Construction Meeting, the Contractor shall provide the Contract Administrator with a proposed work schedule. This schedule shall include key milestones and deliverables. This schedule shall be implemented upon approval by the Contract Administrator.

During the implementation of the approved schedule, the Contractor shall give the Contract Administration a 48-hour notice so that key milestones of the on-going works might be inspected in a timely manner. This is to ensure that ensure critical work is performed properly, especially the geotechnically-related components during the Construction Stage.

3-2.25 Contingencies

The Contractor is advised that due to budgetary constraints, there is no contingency line item in this budget.

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3-3 Contract Drawings

Sheet Number	Sheet Title
0	Title Page
1	Existing Conditions & Removals
2	Erosion & Sediment Controls
3	Staging
4	Plan & Profile
5	Cross Sections

5 Cross Sections 6 Planting Plan



TOWNSHIP OF RIDEAU LAKES

BASS LAKE OUTLET RECONSTRUCTION



Bass Lake Property Owners Association



DRAWING LIST

Sheet Number	Sheet Title
0	TITLE PAGE
1	EXISTING CONDITIONS & REMOVALS
2	EROSION & SEDIMENT CONTROLS
3	STAGING
4	PLAN & PROFILE
5	CROSS SECTIONS
6	PLANTING PLAN

MARCH 2021





















THE FLUVIAL GEOMORPHOLOGIST SHALL BE ON SITE OR AVAILABLE DURING ALL PHASES OF CONSTRUCTION OF THE CHANNEL AND IN-WATER WORKS.

ENVIRONMENTAL NOTES

I. REFUELLING ACTIVITIES SHOULD BE CONDUCTED IN AN ENVIRONMENTALLY RESPONSIBLE MANNER. THIS INCLUDES KEEPING THE FUELLING OPERATIONS 30 M SETBACK FROM THE WATER'S EDGE, DRAINAGE PATHWAY OR UNLESS OTHERWISE DIRECTED BY THE CONTRACT ADMINISTRATOR. SPILL KITS AND SUFFICIENT AMOUNT OF SORBANT MATERIAL SHOULD BE AVAILABLE ON THE FUEL OR SERVICE VEHICLES.

2. ANY PART OF EQUIPMENT ENTERING THE WATER SHOULD BE FREE OF FLUID LEAKS AND EXTERNALLY CLEANED AND DEGREASED TO PREVENT ANY DELETERIOUS SUBSTANCES FROM ENTERING THE WATER.

3. ANY SPILLS RESULTING FROM REFUELLING OPERATIONS, HYDRAULIC LEAKS, MAINTENANCE ETC. MUST BE REPORTED IMMEDIATELY TO THE CONTRACT ADMINISTRATOR WHO WILL THEN NOTIFY THE SPILLS ACTION CENTRE IF REQUIRED.

4. ALL MATERIALS AND EQUIPMENT USED FOR THE PURPOSE OF SITE PREPARATION AND PROJECT COMPLETION SHOULD BE OPERATED AND STORED IN A MANNER THAT PREVENTS ANY DELETERIOUS SUBSTANCE (E.G. PETROLEUM PRODUCTS, SILT, DEBRIS, ETC) FROM ENTERING THE WATER.

5. THE AREA OF DISTURBANCE WITHIN THE CHANNEL AND ON THE STREAMBANKS MUST BE KEPT TO A MINIMUM. HEAVY EQUIPMENT TRAFFIC WILL BE RESTRICTED TO ESTABLISHED TRAVEL PATHWAYS.

6. STOCKPILE AND STAGING AREAS SHOULD BE WELL REMOVED FROM THE WATERCOURSE AND CONTAINED BY APPROPRIATE SEDIMENT AND EROSION CONTROLS.

7. SEDIMENT AND EROSION CONTROL MEASURES SHOULD BE INSTALLED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. THE INSTALLED MEASURES SHOULD BE ROUTINELY INSPECTED TO ENSURE THAT THEY ARE FUNCTIONING AS INTENDED. DISTURBED SOILS SHOULD BE STABILIZED IMMEDIATELY WITH SUITABLE PLANTINGS/SEED/MAT. MAINTENANCE SHOULD CONTINUE UNTIL SUCH TIME AS THE DISTURBED AREAS ARE SUFFICIENTLY STABILIZED THROUGH VEGETATIVE GROWTH.

8. TRAFFIC MANAGEMENT PLAN OR CROSSING CONSTRAINTS - SPAN STRUCTURE ONLY. SPECIFIC DETAILS TO BE PROVIDED BY CONTRACTOR.

9. WEATHER CONDITIONS SHOULD BE MONITORED TO ADEQUATELY PREPARE THE SITE FOR RAIN EVENTS.

10. AS CONSTRUCTION ACTIVITIES IN AND AROUND WATER IS CHALLENGING, WITH A SIGNIFICANT POTENTIAL FOR ENVIRONMENTAL EFFECT, IT IS RECOMMENDED THAT THE CONTRACTOR ORGANIZE AN IN-WATER CONSTRUCTION TEAM WHICH WILL CONSIST OF AN ENVIRONMENTAL MONITOR, SUPERVISOR, SELECTED MACHINE OPERATORS AND GENERAL LABOURERS. THIS TEAM WILL BE RESPONSIBLE FOR THE CONSTRUCTION ACTIVITIES WITHIN THE CHANNEL INCLUDING THE CONSTRUCTION OF THE CHANNEL AND RE-GRADING OF THE STREAMBANKS AND FLOODPLAINS.

GENERAL CREEK NOTES

1. THE BASS LAKE OUTLET IS CLASSIFIED AS A COLDWATER SYSTEM WITH AQUATIC HABITAT WITHIN THE CONSTRUCTION AREA. AS A RESULT OF THESE CHARACTERISTICS A CONSTRUCTION TIMING WINDOW THAT PROHIBITS IN-WATER CONSTRUCTION ACTIVITIES BETWEEN MAR 15TH AND JULY 15TH MUST BE RESPECTED.

2. ALL CHANNEL ACTIVITIES MUST BE COMPLETED IN THE DRY USING CONVENTIONAL DAM AND PUMP METHODS (IN-STREAM PLUG AND BYPASS PUMPING), OR A COMBINATION OF DIVERSION PIPING AND DAM AND PUMP METHODS.

3. NEW BANKS TO BE INTEGRATED INTO EXISTING BANK HEIGHT IN BOTH UPSTREAM AND DOWNSTREAM DIRECTIONS AND BE KEYED IN FOR 2-5M.

4. ANY FILL MATERIAL IS TO BE COMPACTED TO 95% SPD AND CONFIRMED WITH COMPACTION TESTING.

5. PROPER EROSION AND SEDIMENT CONTROL MEASURES TO BE USED AT ALL LOCATIONS TO PREVENT SEDIMENT FROM ENTERING WATER COURSE.

6. BANKS TO BE REVEGETATED AS PER THE DESIGN DRAWINGS WITH COIR FABRIC, SEED AND STABILIZED WITH NATIVE VEGETATION AS PER SPECIFICATIONS.

7. CONTRACTOR TO RESTORE ANY DAMAGED AREAS TO THE EXISTING CONDITION OR TO THE SATISFACTION OF THE CLIENT AND CONTRACT ADMINISTRATOR.

LEGEND



EXISTING CULVERT EXISTING TOP OF BANK EXISTING BOTTOM OF BANK EXISTING CENTRELINE EXISTING ELEVATION PROPOSED ELEVATION EXISTING TREE EXISTING TREE TO BE REMOVED

PROPERTY LINE

BENCHMARK: SIB LOCATED ON THE NORTH SIDE OF ACCESS ROUTE. 42m NORTHEAST OF DAM ALONG FENCELINE EL. 134.88m





Bass Lake Property Owners Association

BASS LAKE OUTLET RECONSTRUCTION

PLAN & PROFILE

DESIGN	PROJECT No.
EEG	20010
CHECKED	SHEET No.
EG	4























SHOULD SETTLEMENT.

					MATURE	MATURE	
KEY	BOTANICAL NAME	COMMON NAME	SIZE	CONT	HEIGHT	SPREAD (m)	QNTY.
	TREES				()	(,	
ps	Pinus strobus	White Pine	250cm Ht.	#5cont	35	15	3
as	Acer saccharinum	Silver Maple	250cm Ht.	#5cont	25	15	3
qr	Quercus rubra	Red oak	250cm Ht.	#5cont	25	15	3
	TOTAL				•		9
	SHRUBS						
CS	Cornus stolonifera	Red Osier Dogwood	50cm	#3cont	2.0	2.5	5
seq	Salix exiqua	Sandbar Willow	50cm	#3cont	3.0	2.0	5
sc	Sambucus canadensis	Elderberry	50cm	#3cont	3.0	2.5	5
sa	Spirea alba	Meadowsweet	50cm	#3cont	1.5	1.0	5
со	Cephalanthus occidentalis	Buttonbush	50cm	#3cont	3	1.5	5
	TOTAL						25

ACCESS TO HAVE A STANDARD AGRICULTURAL STEEL POLE GATE INSTALLED TO PREVENT MOTOR VEHICLE ACCESS PART 4 PLAN 28 R 11669 TREE PLANTING SHRUB PLANTING ξ• } SEED SITE REVEGETATION: ALL DISTURBED AREAS, INCLUDING ACCESS ROUTES, STAGING AREAS AND WORK ZONES ARE TO BE CLEARED (PLANT MATERIAL TO BE SALVAGED) PRIOR TO CONSTRUCTION AND REVEGETATED WITH SPECIFIED SEED MIX AND SALVAGED PLANT MATERIAL UNLESS DIRECTED OTHERWISE BY DESIGN DETAILS. BENCHMARK SIB LOCATED ON THE NORTH SIDE OF ACCESS ROUTE, 42m NORTHEAST OF DAM ALONG FENCELINE EL. 134.88m LANDSCAPE NOTES: I. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BY-LAWS AND CODES HAVING JURISDICTION OVER SITE LOCATION. 2. COMPLETE ALL WORK TO THE SATISFACTION OF THE PROJECT MANAGER. REPORT ANY CHANGES, DISCREPANCIES OR SUBSTITUTIONS TO THE PROJECT MANAGER FOR REVIEW. OBTAIN APPROVAL FROM THE PROJECT MANAGER BEFORE PROCEEDING. DATE REVISIONS BY 3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXISTING SERVICE LOCATIONS. 4. EXACT LOCATIONS OF PLANT MATERIAL WILL BE DETERMINED BY PLACEMENT OF SITE SERVICES SUCH AS HYDRO VAULTS, METERS, UTILITIES ROOF RAIN WATER DATE: LEADERS, DRIVEWAYS, LIGHT STANDARDS, ETC. E. GAZE/NDAM MARCH 15, 2021 5. ALL PLANT MATERIAL LOCATIONS TO BE STAKED OR MARKED OUT AND APPROVED BY PROJECT MANAGER PRIOR TO INSTALLATION. SCALE: HORIZONTAL - 1:250 6. SUPPLY ALL PLANT MATERIAL IN ACCORDANCE WITH THE CANADIAN STANDARDS FOR NURSERY STOCK (7TH ED.). 7. INSTALL PLANT MATERIAL ACCORDING TO DETAILS SHOWN. CONSULTANT Water S C UTIONS TEAM 8. DISTURBED SOIL AREAS AROUND TREES AND SHRUBS ARE TO BE COVERED WITH SHREDDED CONIFER BARK MULCH SUCH AS CANADA RED OR GRO BARK, SPM MULCH, OR APPROVED EQUIVALENT. ALTERNATIVE MULCHES MUST BE APPROVED BY THE PROJECT MANAGER. 9. CONTRACTOR TO UTILIZE LAYOUT DIMENSIONS WHERE PROVIDED. 10. PROVIDE PLANTING BED AREA AS NOTED ON THE DRAWING OR TO ACCOMMODATE MATURE SIZE OF PLANT MATERIAL. Ć 11. ALL SUPPORT SYSTEMS MUST BE REMOVED TO THE SATISFACTION OF THE PROJECT MANAGER ONCE THE TREE IS ESTABLISHED. **Rideau Lakes** 12. SUPPLY AND PLACE TOPSOIL IN ACCORDANCE WITH OPSS 570 TO A MINIMUM DEPTH OR 100MM UNLESS OTHERWISE SPECIFIED. Bass Lake 13. SUPPLY AND PLACE SEED IN ACCORDANCE WITH OPSS 572 UNLESS OTHERWISE SPECIFIED. Property Owners Association 14. CONTRACTOR TO PROVIDE NECESSARY EROSION CONTROL PROTECTION AS REQUIRED TO ENSURE SOIL STABILIZATION AND PROPER SEED GERMINATION. BASS LAKE OUTLET 15. ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED. RECONSTRUCTION 16.IF DISCREPANCIES ARISE BETWEEN PLANT MATERIAL COUNT SHOWN ON DRAWING AND PLANT LIST THE DRAWING SHALL BE CONSIDERED CORRECT. 17. CONTRACTOR TO PROVIDE MINIMUM 1 YEAR WARRANTY FROM DATE ACCEPTED PLANTING PLAN ON ALL WORK UNLESS OTHERWISE SPECIFIED. 18. ANY SITE PLAN OR GRADING AND SERVICING SHOWN IS FOR INFORMATION ONLY. REFER TO APPROVED DRAWINGS. PROJECT No. DESIGN EEG 20010 CHECKED SHEET No. EG

ADMIN2021-01

3-4 Geotechnical Report



Soil Engineers Ltd.

GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

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A REPORT TO WATER'S EDGE ENVIRONMENTAL SOLUTIONS TEAM LTD.

A GEOTECHNICAL INVESTIGATION FOR **BASS LAKE OUTLET RECONSTRUCTION**

BASS LAKE **TOWNSHIP OF RIDEAU LAKES**

REFERENCE NO. 2010-S130

JANUARY 2021

DISTRIBUTION

- 3 Copies Water's Edge Environmental Solutions Team Ltd.
- 1 Copy Soil Engineers Ltd. (Oshawa)
- 1 Copy Soil Engineers Ltd. (Richmond Hill)



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1.0 **INTRODUCTION**

In accordance with the written authorization from Dr. Ed Gazendam, P.Eng., of Water's Edge Environmental Solutions Team Ltd., a geotechnical investigation was carried out at the site of Bass Lake outlet in the Township of Rideau Lakes.

The purpose of the investigation was to reveal the subsurface conditions and to determine the engineering properties of the disclosed soils for the outlet structure at Bass Lake outlet. The geotechnical findings and resulting recommendations are presented in this Report.

2.0 SITE AND PROJECT DESCRIPTION

The Township of Rideau Lakes is situated on Smith Falls Limestone Plain, where continuous tract of the soil overburden beds on bedrock at relatively shallow depths. Due to the gentle gradient, the surface drainage is poor, with numerous lakes and swamps in places.

The site of investigation is located beside Bass Lake Road, at the north outlet of Bass Lake, where wetland is present and connecting into a creek flowing to the north towards Lower Rideau Lake. There is an existing berm in place, approximately 35 m long and 1 m high. The project includes the construction of a new earth dam, with a cross vane for the outlet at about 10 m downstream of the berm.

3.0 FIELD WORK

The field work, consisting of three (3) sampled boreholes, was performed on December 21, 2020, at the locations shown on the Borehole Location Plan, Drawing No. 1. The ground elevation at each borehole location was determined with reference to the temporary benchmark, "Top of Iron Bar" at the east limit of the site boundary, as shown on Drawing No. 1. It has a geodetic elevation of 134.92 m.

The boreholes were advanced at intervals to the sampling depths by a track-mounted drill rig, with continuous-flight power-auger and equipment for soil sampling, up to the depth of auger refusal at 0.7 to 0.9 m. Standard Penetration Tests, using the procedures described on the enclosed "List of Abbreviations and Terms", were performed at the sampling depths. The test results are recorded as the Standard Penetration Resistance (or 'N' values) of the subsoil. Split-spoon samples were recovered for soil classification and laboratory testing.

Beyond the depth of auger refusal, at a depth of 0.7 m in Borehole 2, 'NQ' size rock coring was carried out for verification of bedrock and to establish the rock quality. The results are



Reference No. 2010-S130

shown on the corresponding Borehole Log. The field work was supervised and the findings were recorded by a Geotechnical Technician.

4.0 SUBSURFACE CONDITIONS

The investigation has disclosed that beneath a topsoil veneer, or an alluvium, the area is underlain by silty clay and silty sand till, overlying limestone bedrock at a depth of 0.7 to 0.9 m. Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 3, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing No. 2. The engineering properties of the disclosed soils and bedrock are discussed herein.

4.1 **Topsoil** (Borehole 3)

The revealed topsoil is 45 cm in thickness. Topsoil thicker than that found in the borehole may occur in places.

4.2 <u>Alluvial Deposit</u> (Boreholes 1 and 2)

The alluvial deposit consists of silt and clay, with organics and remnants of plant debris, probably accumulated on flood plain or previous wetland. It is compressible and is considered void of engineering value. The organic material will generate volatile gases under anaerobic condition, if it is buried.

4.3 <u>Silty Clay</u> (Boreholes 1)

The silty clay deposit was contacted as the native stratum in the area of investigation. It is a glaciolacustrine deposit, laminated with silt and sand seams. Grain size analysis was performed on a representative sample and the result is plotted on Figure 4.

The silty clay extends to a depth of 0.8 m. The obtained 'N' values range from 1 blow per 30 cm of penetration to 5 blows per 15 cm of penetration, indicating the consistency is very soft to stiff. The natural water content values of the clay samples are 43% and 38%, indicating very moist or wet conditions.

The engineering properties of the clay deposit are given below:

- High frost susceptibility and soil-adfreezing potential.
- Low water erodibility.

Reference No. 2010-S130

• Low permeability, with an estimated coefficient of permeability of less than 10^{-7} cm/sec and runoff coefficients of:

Slope	
0% - 2%	0.15
2% - 6%	0.20
6%+	0.28

- The shear strength is derived from consistency and augmented by the internal friction of the sand and silt.
- A poor pavement-supportive material, with an estimated California Bearing Ratio (CBR) value of 3%.
- Moderately high corrosivity to buried metal, with an estimated electrical resistivity of 2500 ohm·cm.

4.4 <u>Silty Sand Till</u> (Borehole 3)

The silty sand till deposit was contacted below the topsoil. It consists of a random mixture of particle sizes ranging from clay to gravel, with sand and silt being the predominant fractions. Grain size analysis was performed on a representative sample and the result is plotted on Figure 5.

The obtained 'N' value is 10 blows per 30 cm of penetration, indicating the till is compact in relative density. The natural water content value is 18%, indicating the till is in very moist or wet conditions.

The engineering properties of the sand till deposit are listed below:

- High frost susceptibility and moderate water erodibility.
- Semi-permeable, with an estimated coefficient of permeability of 10⁻⁵ cm/sec and runoff coefficients of:

Slope	
0% - 2%	0.11
2% - 6%	0.16
6% +	0.23

- The shear strength is primarily derived from internal friction and is augmented by cementation.
- Fair pavement-supportive material, with an estimated CBR value of 8%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm cm.



4.5 **<u>Bedrock</u>** (All Boreholes)

Refusal to auger drilling was contacted in the boreholes at 0.7 to 0.9 m from the prevailing ground surface, or between El. 133.4 m and El. 133.1 m.

Rock coring was conducted into the bedrock at Borehole 2, from a depth of 0.9 to 2.0 m. It is limestone bedrock, having the core recovery of 97% and 88%; the Rock Quality Designation (RQD) values are 30% and 50%.

The bedrock can be classified as poor to fair quality, probably becoming good quality at deeper levels. Effective rock excavation will require a rock-ripper and pneumatic hammer. Any excavation into the sound rock will require rock blasting.

Where excavation is to be carried out in sound bedrock, slight lateral displacement of the excavation walls is often experienced. This is due to the release of residual stress stored in the bedrock mantle.

5.0 **GROUNDWATER CONDITION**

Free groundwater was not evident in the shallow boreholes terminated above the bedrock, upon the completion of drilling.

Due to the presence of wetland in the vicinity, groundwater can be anticipated at shallow depths, probably through the fractures in bedrock.

6.0 DISCUSSION AND RECOMMENDATIONS

The investigation has disclosed that the limestone bedrock exists at a depth of 0.7 to 0.9 m from grade. The overburden consists of topsoil and alluvial deposit, with silty clay or silty sand till.

The construction of a new dam is proposed at about 10 m downstream of the berm. The recommendations for the project are presented herein.

One must be aware that the subsurface conditions may vary between boreholes. Should this become apparent during construction, a geotechnical engineer must be consulted.



6.1 Site Preparation

Site preparation will consist of installing a silt curtain at the upstream of the construction site and coffer-dams at the downstream, with bypass pumps to divert the water flow and to maintain a dry zone for construction.

Before construction and placement of earth fill, the existing topsoil and alluvial deposit, which is compressible, should be completely removed.

Soft clay and weathered soils should also be removed before earth filling for the dam, since the soft soil will be subject to long term settlement.

6.2 Construction of Outlet Structure

Preliminary design drawings of the outlet structure, provided by Water's Edge Environmental Solutions Team, are enclosed in the Appendix. It is an earth berm, with a central clay core, flanked on both sides with semi-pervious earth fill and riprap on the sideslope.

The material for the construction of embankment should be free of organics, compacted in lifts not exceeding 200 mm to at least 98% of the Standard Proctor Maximum Dry Density (SPMDD), with the water content close to its optimum moisture content. The fill placement and compaction should be inspected by either a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer under full-time basis.

Topsoil and organic soils should be removed. Soft clay and weathered soils should also be removed since they will be subject to long term settlement. The subgrade of the earth dam should consist of sound native soils or bedrock. It must be inspected by a geotechnical engineer before placement of earth fill. Cut off curtain wall consisting of clay or cement grout should be constructed at the toe of embankment to prevent under-seepage and erosion.

The on-site soils are generally too wet to achieve the specified density. They will require aeration by spreading thinly on the ground in the dry and warm weather, prior to placement and structural compaction.

The fill should be compacted using a heavy-weight, kneading-type roller. The thickness of each lift should be limited to 20 cm or less (before compaction), or to a suitable thickness as assessed by test strips performed by the equipment which will be used at the time of construction.

Reference No. 2010-S130

The rock fragment and boulders will prevent transmission of the compactive energy into the underlying material to be compacted. Rock fragments over 15 cm in size must be sorted for other uses such as the rip-rap.

The shattered rock from blasting can be used as the rip-rap. It should be constructed over a geofabric filter (Terrafix 360 R, or equivalent). The revetment should extend to 0.3 m above the design high water level to allow for wave rush. Spillways should be provided with a liner consisting of rip-rap stone or gabion mattress above a filter fabric (Terrafix 360R, or equivalent).

6.3 Excavation

All excavation should be carried out in accordance with Ontario Regulation 213/91. The types of soils and rock are classified in Table 1.

Material	Туре
Bedrock	1
Silty Clay and Silty Sand Till	3
Wet and soft soils	4

Table 1 - Classification of Soils and Rock for Excavation

Effective rock excavation will require a rock-ripper and pneumatic hammer. Any excavation into the sound rock will require rock blasting. A specialist should be consulted to assess the zone of influence of the shock wave in order to prevent any potential damage of the nearby structures in rock blasting.

Where excavation is to be carried out in sound bedrock, slight lateral displacement of the excavation walls is often experienced, due to the release of residual stress in the bedrock. Groundwater is anticipated in the excavation, especially through fractured rock. It can be collected into pump pits and removed by conventional pumping.

6.4 Site Classification for Seismic Design

The Site Classification for Seismic Site Response in the Ontario Building Code is to evaluate the impact of ground response during an earthquake. As a guide, the outlet structure should be designed to resist an earthquake force using Site Class 'C' (very dense soil and soft rock).



6.5 Slope Stability

Slope stability analysis was conducted for the embankment, using force-moment equilibrium criteria, with the soil strength parameters presented in Table 2.

Soil Description	Unit Weight γ (kN/m³)	Cohesion c' (kPa)	Internal Angle of Friction, \$ '
Compacted Clay Core	21.5	5	20°
Compacted Earth Fill	21.0	0	26°
Riprap Revetment	23.0	0	40°
Bedrock	24.0	200	40°

Table 2 -	Soil	and F	Rock	Strength	Parameters
1 4010 -	2011			Sugu	

Details of the analyses and the results of the various loading conditions are shown on Drawing Nos. 3 to 7, inclusive. The resulting Factor of Safety (FOS) is compared with the requirement stipulated in the Ontario Ministry of Natural Resources and Forestry (OMNRF) guidelines and summarized in Table 3.

Loading Condition	FOS	Minimum FOS (OMNRF)
End of Construction	1.54	1.3
Long-Term Condition (Upstream Slope)	1.40	1.3
Long-Term Condition (Downstream Slope)	1.54	1.3
Rapid Draw-down (Upstream Slope)	1.24	1.2
Seismic Loading (Downstream Slope)	1.21	1.0
Seismic Loading (Upstream Slope)	1.00	1.0

Table 3 - Factors of Safety of Embankment

Based on the analytical results, the slope satisfies the OMNRF requirements under all loading conditions and the dam is considered geotechnically stable.

6.6 Soil Parameters

The recommended soil parameters for the project design are given in Table 4.

Reference No. 2010-S130

Table 4 - Soil 1	Parameters
------------------	------------

Unit Weight and Bulk Factor	Unit Weight (kN/m ³)	Esti Bulk	imated Factor
	Bulk	Loose	Compacted
Silty Clay	21.5	1.30	1.05
Silty Sand Till	22.0	1.25	1.03
Shattered Rock	24.5	1.40	1.30
Lateral Earth Pressure Coefficients	Active	At Rest	Passive
	Ka	Ko	Kp
Silty Clay/compacted Earth Fill	0.45	0.55	2.50
Silty Sand Till/Rip-rap	0.35	0.50	3.00
Bedrock	0.20	0.30	5.00
Coefficients of Friction			
Between Concrete and Bedrock			0.65
Between Concrete and Granular Fill			0.50

7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Water's Edge Environmental Solutions Team Ltd., and for review by the designated consultants and government agencies. Use of the report is subject to the conditions and limitations of the contractual agreement.

The material in the report it reflects the judgement of Basim Al Ali, P.Eng., and Bennett Sun, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.





Bennett Sun, P.Eng.

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

- AS Auger sample
- CS Chunk sample
- DO Drive open (split spoon)
- DS Denison type sample
- FS Foil sample
- RC Rock core (with size and percentage recovery)
- ST Slotted tube
- TO Thin-walled, open
- TP Thin-walled, piston
- WS Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches. Plotted as '—•—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil. Plotted as ' Ω '

- WH Sampler advanced by static weight
- PH Sampler advanced by hydraulic pressure
- PM Sampler advanced by manual pressure
- NP No penetration

SOIL DESCRIPTION

Cohesionless Soils:

<u>'N' (blov</u>	<u>ws/ft)</u>	Relative Density
0 to	4	very loose
4 to	10	loose
10 to	30	compact
30 to	50	dense
over	50	very dense

Cohesive Soils:

Undrai	ined	Shear				
<u>Strength (ksf)</u>			<u>'N' (</u>	blov	Consistency	
less t	han	0.25	0	to	2	very soft
0.25	to	0.50	2	to	4	soft
0.50	to	1.0	4	to	8	firm
1.0	to	2.0	8	to	16	stiff
2.0	to	4.0	16	to	32	very stiff
0	ver	4.0	0	ver	32	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

- x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding
- \triangle Laboratory vane test
- □ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres11b = 0.454 kg 1 inch = 25.4 mm1 ksf = 47.88 kPa



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JOB NO.: 2010-S130

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Bass Lake Outlet Reconstruction

PROJECT LOCATION: Bass Lake Road, Township of Rideau Lakes

METHOD OF BORING: Flight-Auger

DRILLING DATE: December 21, 2020

		5	SAMP	LES		•	Dynam	nic Cone	(blows/3	00 cm)							
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Deptn (m)		Imber	be	Value	pth S	0	Peneti (b	ration Re blows/30	esistance cm)		•	Moist	ure (Conter	nt (%)		
		ź	È	ż	ă	10	30	50	70	90	1	0 2	20	30	40		3
134.2	Ground Surface				0											161	1
133.9	ALLUVIAL DEPOSIT a mixture of silt and clay occasional peat and organics	1A	DO	WH													
0.3	Grey, very soft to stiff SILTY CLAY a tr_of sand	1B	DO	1		D C									43 ●		
400.4	occ. silt seams	2	DO	8	-	0									38 ●		
0.8	Refusal to Augering				-												
	END OF BOREHOLE				1 –												
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JOB NO.: 2010-S130

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Bass Lake Outlet Reconstruction

PROJECT LOCATION: Bass Lake Road, Township of Rideau Lakes

METHOD OF BORING: Flight-Auger /n Rock Core

DRILLING DATE: December 21, 2020

SAMPLES Dynamic Cone (blows/30 cm)																				
EI.			Ξ Ξ Ξ Ξ Ξ Λ Atterber Ξ Ξ Ξ Ξ Ξ Ξ ΡL Ξ							erg L	Limits			EL						
(m)	SOIL DESCRIPTION		ype	Ð	scale (50 100 150 200														RLEV
(m)		umbe		-Value	epth S	() ^{₽€}	enetra (blo	ition Re bws/30	esistan cm)	nce		•	Moi	stur	e Co	ntent	t (%)		/ATEF
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0.0					0														190	
	ALLUVIAL DEPOSIT	1	DO	WН		•														
	occasional peat and organics				-	-														
133.3																				
0.7	Grey					-														
	LIMESTONE BEDROCK	C1	REC RQD	97% 30%	1 -															
					-															
		C2	REC RQD	88% 50%																
132.0 2.0	END OF BOREHOLE				2 –										_	_			_	
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		Sc	oil	En	gin	e	er	S	L	td	-						F	⊃age	∋: ´	1 of 1

JOB NO .: 2010-S130

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Bass Lake Outlet Reconstruction

PROJECT LOCATION: Bass Lake Road, Township of Rideau Lakes

METHOD OF BORING: Flight-Auger

DRILLING DATE: December 21, 2020

		ę	SAMP	LES		Dynamic Cone (blows/30 cm) 10 30 50 70 90 Atterberg								its	
El. (m)	SOIL				ale (m)	×	Shear	Strengt	h (kN/m²))	F	י∟ ►	L	L 	EVEL
Depth (m)	DESCRIPTION	mber	e	/alue	pth Sca	0	Peneti (b	ration Rollows/30	esistance	,	• Ma	isture	Conte	nt (%)	TERLI
		N	Typ	Z-Z	Del	10 	30	50	70	90	10	20	30	40	- M
134.0 0.0	Ground Surface				0										_
	45 cm TOPSOIL	1	DO	WH	(20			
133.5 0.5					_										_
133.1	Grey, compact SILTY SAND TILL a tr. to some clay occ. silt seams and rock fragments	2	DO	10	-	0						18 ●			_
0.9	Refusal to Augering Inferred Bedrock END OF BOREHOLE				1 -										_
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GRAIN SIZE DISTRIBUTION

U.S. BUREAU OF SOILS CLASSIFICATION





GRAIN SIZE DISTRIBUTION

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JOB NO	.:	2010-S130		LEGEND	
REPOR	DATE:	January 2021		TOPSOIL 🛛 📈 SILTY CLAY 📛 LIMESTONE 🕅 ALLI	.UVIL
PROJEC	CT DESCRIPTION:	Bass Lake Out	et Reconstruction	SILTY SAND TILL	
PROJEC	T LOCATION:	Bass Lake Roa	d, Township of Rideau Lakes		
				🐺 WATER LEVEL (END OF DRILLING) 🗧 CAVE-IN 🛛 🐺 WATER LEVEL (STABILIZ	(ED)
BH No.: El. (m):	1 134.2	2 134	3 134		
Elevation (m)	WH 1 8	WH			34 33 32
131 —				- 13	31
130 —				13	30
129 — - -				- 12	29















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<u>APPENDIX</u>

DESIGN DRAWINGS OF DAM (BY WATER'S EDGE ENVIRONMENTAL SOLUTIONS TEAM LTD.)

REFERENCE NO. 2010-S130