

POLICE STATION BUILDING

Listuguj Mi'gmaq Government



Listuguj
MI'GMAQ GOVERNMENT

Request for Proposal

Date	April 20, 2022	
Closing Date	May 12, 2022 - 10:00 AM Atlantic time/9:00 AM Eastern time	
Approved by	Peter Arsenault	
Approved by	Bassem Abdrabou, P.Eng, M.A.Sc	General Manager/ Advisor, Capital & Infrastructure
Prepared by	Julianne Jacobs	Project Coordinator

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PART 1: INFORMATION AND INSTRUCTIONS TO BIDDERS

1. OBJECTIVES

Obtain bids/proposals in compliance with the Listuguj Mi'gmaq Government (LMG) tender policy from interested consultant firms, to carry-out the detailed design, cost estimates, contract documents and tender administration/supervision fees for the Police Station Building Project in Listuguj, Quebec.

2. BRIEF PROJECT OVERVIEW

The Listuguj Mi'gmaq Government (LMG) intends to construct a Police Station Building to house all Listuguj Police Department (LPD), emergency command center and detention center to improve the safety and well-being of the occupants of the policing facilities.

3. THE OWNER REQUIREMENTS

The building shall be divided following sections:

- Main Floor
 - Reception area
 - Police Team and Administration section
 - Emergency command center
 - Detention Center
 - Garage Area
 - Armory
 - Recreational/Gym Room
 - Interrogation Room
 - Other Utilities
- Common areas
 - Such as reception, entrances, meeting rooms, corridors, kitchens, bathrooms, service/utility rooms, etc.
- External Area
 - Visitor Parking area
 - Staff Parking area
 - Impound yard

4. SITEMAP

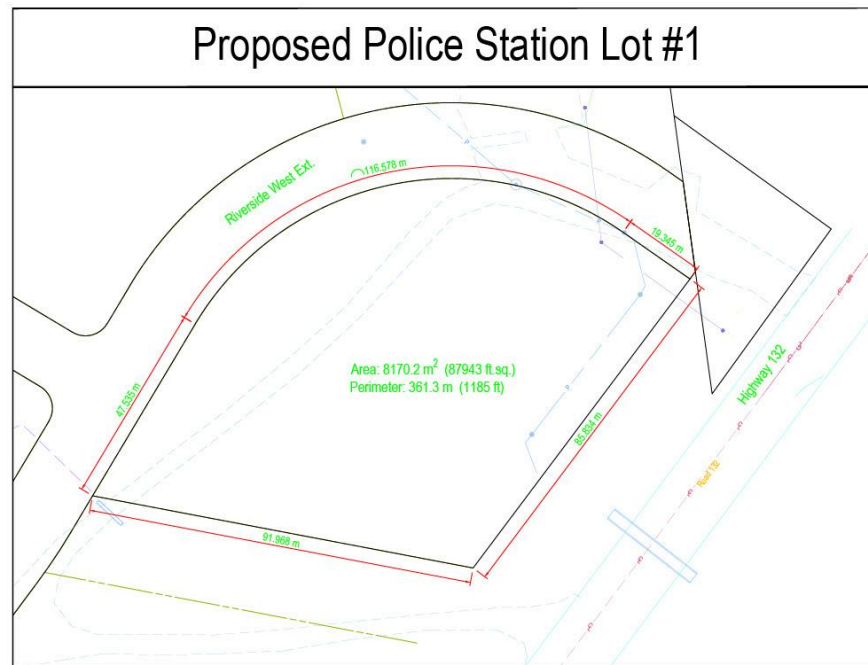


Figure 1

Figure 1 shows the proposed land for the project.

See Appendix (pg. 35)

- ❖ Bidders to note that the proposed layout/areas are indicative and for information only, it is the Bidders/Consultant responsibility to develop a fit for purpose design which complies with all Authorities' Regulations, Laws, National Standards and Building Code.
- ❖ No claim shall be made against the Owner for misinterpretation of these information.

4A. BUILDING ORIENTATION



See Appendix (pg. 36)

5. SCOPE OF WORK

The scope of work will be divided into 3 stages

- Review of the proposed layout and ensure its compliance to all the requirements of authorities' regulations, laws, national standards, federal/provincial building codes and develop the building elevations and images.
- Review the geotechnical report in appendix B and provide suitable construction method for construction
- Detailed Design Package/Contract Documents

- Tender posting and Administration
- Full Complete Site Supervision , Including but not limited : review shop drawings and samples, review and approve progress claims, site inspection, site meetings, closeout , etc..

For more details, refer to the Bill of Quantities form (BOQ form), which is available in **“Part 3: BID FORMS.”**

It is possible that some items on the bidding slip may be partially or completely removed from the tender following the opening of the proposal. The Bidder must take this into account in preparing its proposal. This modification shall not give rise to any claim on the part of the Bidder.

5A- ACKNOWLEDGMENT

Any firm interested in submission of its proposal must send an e-mail to the General Manager and Project Coordinator (refer to Item No. 27: Communications), to acknowledge that they have received the Request for Proposals (RFP) documents and to ensure that all the addendums are received by them.

6. BID SUBMISSION FORM AND CONTENT

Bidders must demonstrate that they have sufficient capacity to manage and perform all consulting services and produce all the required deliverables within the project schedule/bidder’s schedule.

The Bidder's proposal must be submitted in a sealed envelope and clearly identified using the identification labels provided in "Part 3: BID FORMS", and shall include (but not limited to) the following documents:

1. The Bidder's presentation document to evaluate the proposal quality
2. The Bidder's experience in previous and similar projects
3. The experience of the proposed team
4. Methodology and project organization
5. Insurances as explained in “Part 2: ADMINISTRATIVE CLAUSES”
6. Commitment to start design upon award of contract and to meet the schedule outline in the RFP documentation
7. Contact Person for the purpose of RFP
8. Quotation for the Professional Service agreement as explained in the scope of works, Bill of Quantity form (BOQ form) is provided in "Part 3: BID FORMS"
9. Signed schedule of hourly rates

The Bidders shall ensure that all addendums are included and considered in their submission.

Electronic submission is allowed by e-mail and must be submitted to the General Manager and Project Coordinator (refer to Item No. 27: Communications) before the closing date.

➤ **Submission Cover Page:**

A copy of the identification label is available in "Part 3: BID FORMS". No other information should appear on the envelope.

The Bidder must ensure that its proposal is signed and dated by the receiver. If a submission is not duly signed and dated by the person responsible for receipt proving the date and time of receipt, it will not be opened and automatically rejected.

All submissions shall be in English language.

The above requirements are mandatory. Non-compliance to these requirements may result in disqualification of the relevant bidder.

7. BID VALIDITY PERIOD

The proposal validity period is fifty (50) calendar days from the proposal opening date indicated in this document. Any Bidder who, at the end of the proposal validity period, has not been notified in writing by the Owner that its proposal has been accepted may withdraw it at the end of that period.

The Owner reserves the right to use the entire validity period of the proposals to analyze the proposals and to award or not to award the contract.

8. SIGNATURE OF THE SUBMISSION

The proposal forms must be duly signed by the Bidder's authorized representative(s). The latter must initial all pages of the submission form.

If the Bidder is a company not incorporated by law, all partners or a proxyholder authorized to do so by notarial or private power of attorney must sign the proposal. In the latter case, the signature of the power of attorney must be attested by a person authorized to receive the oath.

If the Bidder is a company or corporation, the proposal must be accompanied by a certified copy of a resolution of the Board of Directors authorizing the appropriate persons to prepare and sign the proposal and any other documents required by the Owner. The resolution must contain the full names and functions of these persons recognized by the company.

9. PRICES

All proposal submissions should be a fixed price.

The tendered fixed prices are fixed for the entire duration of the contract.

The submitted fixed prices include labour, expertise, subcontractors, reproduction, and printing costs provided by the Bidder and, in general, all costs to be incurred in carrying out the mandate as well as profits, overheads, taxes and all other related expenses, excluding the federal Goods and Services Tax (GST) and the Québec Sales Tax (QST).

In the event of an error or omission, the Owner shall reconstruct the Bidder's proposal form as follows:

- If the proposal is composed only of fixed prices, the total amount of the proposal must equal the sum of these prices.
- In the event of an addition error to establish the total amount of the proposal, the sum of the totals of the various items prevails.

10. COST OF PREPARING THE PROPOSAL

The Bidder is not entitled to any compensation for any costs incurred in preparing its proposal or obtaining the tender document.

11. TRANSMISSION

Proposals must be submitted in four (4) copies (**one (1) original** and three (3) legible copies) and must be in ink or typed on the "SUBMISSION FORM" provided in "Part 3: BID FORMS" and signed separately by the Bidder.

The submission must only be submitted in paper form.

Electronic submissions may also be sent by e-mail (refer to Item No. 27: Communications) as per Section 6 (pg. 8) before the closing date.

12. PLACE OF SUBMISSION

All submissions shall be submitted to:

Capital and Infrastructure Department

*44 Dundee Road, Listuguj, Quebec
GOC 2RO
Phone: (418) 788-3022*

13. PROPOSAL SUBMISSION CLOSING DATE AND TIME

All Submissions should be received before 10:00 AM Atlantic time/9:00 AM Eastern time on May 12, 2022.

No Question or request for Information should be submitted 2 business days before the closing date

No Submissions will be received after this time.

14. CORRECTION AND WITHDRAWAL OF A SUBMISSION FILE

The Bidder may correct, amend, or withdraw its proposal only by sending written notice to that effect in a clearly identified envelope addressed to the Owner, before the closing time and date set for receipt of bids, without alienating its right to submit a new bid within the time set. To be valid, this notice must be signed by the same person who completed the submission.

However, The Bidder may not modify or withdraw its bid after the bid opening time and during the entire bid validity period.

15. RECEIPT AND OPENING

Submissions will be opened and evaluated by an evaluation committee based on the evaluation criteria described, after the submission closing date and time. Bidders will be disclosed by the Owner's representative.

16. PRESENTATION

The Bidder must submit a proposal that complies with all the requirements of the proposal document and addenda. Any deletions or corrections made to the submission form must be initialled by the person(s) authorized to sign the submission.

The submission must be submitted in English.

17. PROPOSAL ANALYSIS

The Owner and its representatives will review the proposals received by verifying the eligibility of the Bidders and the compliance of their proposals.

The evaluation committee will carry out the evaluation of the proposals based on the factors mentioned in the "BID EVALUATION". The committee will determine, in a private open discussion, the extent to which each proposal meets the requirements of the established criteria and will evaluate them based solely on the information they contain. It is therefore essential that the Bidder develops, in a precise and orderly manner, in its presentation document, the elements of response to the criteria established by demonstrating for each of them what makes it capable of carrying out the mandate.

18. PROPOSAL EVALUATION

The Owner will be solely responsible for the decision and selection of the successful proposal, the owner reserves the rights to accept any or all parts of the proposals. The bidders will be evaluated based on the following criteria:

1. Bidders experience in previous and similar projects, especially within Mi'gmaq First Nations, Bidder's project management and technical team and Bidder's experience with Federal/Provincial government regulations.....15%
2. Price evaluation.....75%
3. Timeline evaluation.....10%

All Bidders to note that all proposals should be prepared and will be evaluated based on Listuguj Mi'gmaq Government (LMG) tender policy.

19. PROHIBITION ON COMMUNICATING WITH MEMBERS OF THE EVALUATION COMMITTEE

A Bidder may not, in any way, attempt to contact the members of the evaluation committee to influence them on the bidding process and its proposal.

20. ACCESS TO INFORMATION

The Owner reserves the right to communicate to others the information contained in the "SUBMISSION FORM" provided in "Part 3: BID FORMS."

21. ESSENTIAL DOCUMENTS TO BE INSERTED IN THE TENDER ENVELOPES (OR BY ELECTRONIC SUBMISSION)

Before submitting its bid, the Bidder must ensure that it has inserted the following documents in the envelopes:

1. Submission form
2. Bidder's presentation
3. Quotation; Bill of Quantities
4. Bidder's Schedule
5. Resolution of the Board of Directors authorizing the appropriate persons to sign the bid and any other document required by the Owner
6. Certificate of the Bidder's of Probity
7. Proof of civil and professional liability insurance
8. Signed Schedule of hourly rates
9. Commitment letter to start design upon award of contract and to meet the schedule outline in the RFP documentation

Note: All Addendums must be listed in the Addendum Schedule found in the Submission Form (page 1/5).

For each of the required documents, the Bidder must comply with the specific requirements of the tender documents.

All forms are provided in "Part 3: BID FORMS" and should be signed by the authorized person(s).

22. ACCEPTANCE AND REJECTION OF PROPOSALS

The Bidder must ensure that the proposal it submits complies with the requirements of this document, as any of the following defects automatically results in the rejection of the proposal:

1. Absence of any of the essential documents required
2. Absence of signature of the authorized person(s) on an essential document to be signed
3. Any deletions or corrections made to the prices submitted and not initialled by the authorized person(s)
4. Any conditional or restrictive submission
5. Failure to comply with the place, date and time limit set for the receipt of proposals
6. Failure to comply with any other conditions indicated as essential in the tender document

Any proposal that is deemed unbalanced or does not contain all the information required to analyze and compare proposals may be rejected.

23. DISCONTINUATION

The Owner reserves the right to discontinue this Request for Proposal (RFP) at any time either before or after the completion of the evaluation process.

24. COMPLIANCE WITH APPLICABLE LAWS, RIGGING, INFLUENCE PEDDLING AND CORRUPTION

The Owner intends to take appropriate measures to fight intimidation, influence peddling and corruption.

By filing the duly signed "Certificate of the Bidder's Probity" form available in "Part3: BID FORMS", the Bidder certifies that it has not engaged in any acts of intimidation, influence peddling, collusion, corruption or arrangement with a competitor that are contrary to the Competition Act (R.S.C. 1985 c. C-34) issued by the federal government, including the prices, methods, factors or formulas used to establish prices, the decision to submit or not submit or withdraw a bid, and the submission of a bid that does not voluntarily meet the specifications of the call for tenders.

25. COMPLIANCE WITH BUILDING CODE

All bidders must comply with the latest version of the National Building Code of Canada including (but not limited to) all applicable federal, provincial, municipal, or territorial laws.

26. LIST OF SUBCONTRACTORS

The Bidder's proposal must be accompanied by a list of subcontractors it intends to use to carry out the mandate.

Before signing the contract, the Owner requires the selected Bidder to provide a complete list of all subcontractors with whom it has agreed to entrust part of its work and the prices submitted for each of them, refer to "SUBMISSION FORM" provided in "Part 3: BID FORMS"

27. COMMUNICATIONS

All correspondences and inquiries to be sent to the Project Coordinator, Julianne Jacobs

Project Coordinator

E-mail: julianne.jacobs@listuguj.ca

Copied to the General Manager of Capital and Infrastructure, Bassem Abdrabou, P.Eng, M.A.Sc

E-mail: bassem.abdrabou@listuguj.ca

Response to inquiries will be sent to all bidders that registered their interest as per Section 5A for a fair evaluation process.

PART 2: ADMINISTRATIVE CLAUSES

1. DEFINITIONS

- **The Contract**

Includes all the tender documents and all addenda sent to the bidder, the proposal documents submitted to and accepted by the Owner, the documents establishing the conditions of such acceptance and entrusting it with the execution of the entire Mandate.

The Contract shall be subject to all applicable federal, provincial, municipal, or territorial laws.

- **Addenda/Addendum**

Amend in the tender documents before the tender submissions' opening.

- **Letter of Award**

The document by which the Owner awards the contract to the Bidder.

- **The Owner**

Listuguj Mi'gmaq Government (LMG)

- **LMG**

Listuguj Mi'gmaq Government

- **Mandate**

Functions or charges entrusted by the Owner to the Agent or Tenderer to carry out the tasks described or expected as detailed in the "Scope of works and Deliverables" and BOQ form.

- **Project Manager**

The person responsible for the execution of the contract from the Owners side.

- **The Bidder**

The interested consultant engineering firms in submission of their proposal for the design and supervision of the project.

- **The Consultant**

The successful Bidder which entered into agreement with the Owner to provide the professional service agreement described in the "Scope of Works and Deliverables."

2. INTERPRETATION

The Owner's obligations and liabilities to the Bidder are defined in the contract. The Owner does not assume any obligation or liability that is not formally mentioned in this contract document.

The contract documents complement each other and shall be interpreted in the following order:

1. Contract
2. Addendums
3. Submission Form
4. Information and instructions to bidders
5. Administrative clauses

3. PLACE OF AWARD OF THE CONTRACT

The district where the Owner's place of business is located.

4. INTELLECTUAL PROPERTY

The Bidder acknowledges that any intellectual or material works it designs or produces on behalf of the Owner under the Contract are the sole property of the Owner. They hereby assign all their intellectual property rights in the works produced under the contract in addition to waiving all their moral rights to the Owner. They also undertake not to use them without the Owner's authorization and, when required by the Owner, to sign any document confirming their exclusive ownership rights over such works.

5. CONTRACT SCOPE

The scope of the contract is defined in "Scope of works and deliverables" and detailed in the Bill of Quantities Form (BOQ Form), which is available in "Part 3: BID FORMS."

6. AVAILABLE DOCUMENTS

Available documents are for information only. It is the Bidder's/Consultants responsibility to provide a fit for purpose design which complies with all Authorities' Regulations, Laws, National Standards and Building Code.

No claim shall be made against the Owner for misinterpretation of these documents/plans.

7. KNOWLEDGE OF PROJECT SITE

The Bidder shall visit the proposed site and have full knowledge of its nature, importance and geographical location, the works to be carried out, and must consider in preparing its proposal all provisions, circumstances, general and local conditions that may affect the execution and price of the works, as well as the time required for the execution of the works.

8. LAWS AND REGULATIONS

The Bidder must comply with all regulations, laws, and orders in council of federal, provincial, or municipal governments and agencies that apply to the work it performs.

9. PERMITS AND AUTHORIZATIONS

The Bidder must obtain all permits and certificates of authorization required to carry out the described works.

10. TAXES

The Owner is exempt from the Goods and Services Tax (GST) and the Quebec Sales Tax (QST) since the work site is located within an Aboriginal community.

Therefore, the prices presented in the bidding form must be tax-exempt.

A tax exemption letter will be sent to the awarded consultant.

11. INSURANCE

The Bidder must include in its proposal proof of civil, professional, and automobile liability insurance. This proof must be issued by the Insurer for the specific purposes of this mandate and must include a minimum coverage of two million dollars (\$2,000,000) per event.

12. MEETINGS

The Consultant and the Owner shall hold meetings at appropriate times to report on the situation and coordinate the progress of the mandate. The meetings will be held in Listuguj and in English language. The Bidder shall submit, after each meeting, a written report in English language to the stakeholders.

At a minimum, the following meetings are to be expected: -

- Contract Start-up and Award Meeting
- Coordination meeting for analysis and design discussions
- Meeting to coordinate and present plans and specifications with cost estimates at different stages

13. DELIVERABLES

BIDDER'S SCHEDULE shall consider the target dates/time limits specified in the "PROJECT TARGETED DATES" which is provided in the "ADMINISTRATIVE CLAUSES" (Page No.20). Deliverables shall be sent to the Owner within the time limits submitted in the "BIDDER'S SCHEDULE" by the successful bidder. (BIDDER'S SCHEDULE form is available in "Part 3: BID FORMS")

The content of the deliverables is described in the "Part 2: INFORMATION AND INSTRUCTIONS TO BIDDERS".

Deliverables must be sent in both signed hard copy and/or electronic formats to the owner.

Reports, studies, and specifications should be submitted in paper format size A4 bound in two (2) copies, and electronic format in PDF format and in Word (. docx) format.

Plans must be submitted in paper format size A1, and electronic format in PDF format and in AUTOCAD (. dwg) format.

Electronic formats may be submitted by email.

All deliverables are subject to the Approval of Listuguj Mi'gmaq Government (LMG).

All deliverables must be in English.

14. PROJECT TARGETED DATES

The below schedule shows the Project targeted dates; the bidders should consider these dates.

Timeline will be evaluated based on the dates submitted by the bidders "BIDDER'S SCHEDULE"; form is provided in "Part 3: BID FORMS"

Whenever the Bidder anticipates or notices a delay in the program so established, it must immediately notify the Owner in writing, stating the reasons for the delay, its probable duration, and the measures it intends to take to remedy it.

The receipt by the Owner of this project schedule or a notice of delay does not reduce the Bidder's contractual obligations and responsibilities.

PROJECT TARGETED DATES		
SN.	Description	Dates
Stage 1		
1	Bid Submission Closing Date	May 12, 2022
2	Consultant Appointment "Contract Award"	May 19, 2022
Stage 2		
1	<ul style="list-style-type: none"> - Review Concept Design/Building Layout, ensure its compliance to all the requirements of authorities' regulations, laws, provincial and federal standards and building codes and authority - The consultant could edit or propose a new concept plan or layout design - Develop the building elevations and images - Provide Class "D" Cost Estimate 	June 9, 2022
Stage 3		
1	Preliminary design	June 30, 2022
2	Plans and specifications 66% with Cost Estimates	August 4, 2022
3	Plans and specifications 99% with Cost Estimates (Class A Cost Estimate and design report)	September 8, 2022
4	Plans and specifications for construction	October 13, 2022
Stage 4		
1	Contractors Tender Close	November 24, 2022
2	Contractors' proposal review and recommendations	December 8, 2022

15. DEFAULT BY THE CONSULTANT

When the Consultant does not comply with the conditions of the contract such as (but not limited to) the following:

- Delay in starting the described scope of works
- Not complying with the Project Schedule/Bidder's Schedule submitted to the Owner.
- Not complying with the contractual deadlines
- Not complying with the requirements, laws, and regulations
- Assigns third parties not designated as provided for in the contract without prior consent of the Owner

Upon the Owner's notification, the Consultant should take an immediate action and submit to the Owner the measures to be taken and the corrections required and then fix the number of days within such measures and corrections are to be undertaken, carried out and completed, without modifying in any way the contractual time limits.

Where the Consultant fails to take immediate action, corrections, and measures to bring the schedule back inline with the contractual time limits, the Owner may terminate the contract in accordance with clause "CONTRACT TERMINATION"

16. CONTRACT TERMINATION

The Owner has the right at any time to terminate the contract, in whole or in part, before or after the commencement of its performance.

When the Owner decides to terminate the contract, it must notify the Consultant in writing and indicate the effective date.

Upon receipt of such notice, the Consultant shall:

1. Submit all the work done, reports and specification in word format, drawings in DWG format.
2. Cancel all contracts with subconsultants.
3. Continue, complete, and submit the parts of described work that have not been terminated, if any.

On the date specified in the notice of termination, the Owner, with the assistance of the Consultant, shall make an inventory of all the work performed, those terminated and those to be continued, if any.

Following this inventory, the Owner takes possession of all the works as they were then completed. The Consultant shall be entitled to all fees, disbursements and sums representing the actual value of the services rendered up to the date of termination of the contract.

The Consultant is not entitled to any compensation for loss of earnings and anticipated profit, in all cases of termination of the contract by the Owner.

17. TERMS OF PAYMENT AND ACCEPTANCE OF DELIVERABLES

Invoicing and contractual documents will be drawn up in the name and for the attention of the Owner and then sent to the above-mentioned address. The Owner will make monthly progress payments upon presentation of supporting evidence and after approval by the Owner's project manager. Payment will be done within 45 days after invoice approval.

Deliverables submitted to the Owner must be accepted in writing by its authorized representative and to its complete satisfaction. In case of dissatisfaction, payments will be withheld until the deliverable fulfill the Owner's expectations.

PART 3: BID FORMS

1. IDENTIFICATION FORMS

1A. IDENTIFICATION FORM ON THE SUBMISSION ENVELOPE

Listuguj Mi'gmaq Government	IDENTIFY COPY	
	ORIGINAL COPY	
	LEGIBLE COPY	

SUBMISSION ENVELOPE

PROJECT: POLICE STATION BUILDING

BIDDER'S NAME: _____

BIDDER'S ADDRESS: _____

Attention: Bassem Abdrabou, P.Eng., M.A.Sc

SUBMISSION ADDRESS:

Capital and Infrastructure
44 Dundee Road, Listuguj, Quebec
GOC 2R0

SUBMISSION RECEIVED				
TIME	DAY	MONTH	YEAR	INITIAL

**NO SUBMISSIONS WILL BE RECEIVED AFTER
10:00 AM (ATLANTIC TIME) ON MAY 12, 2022**

Fill in the requested information, and affix it on the submission envelope.

2. SUBMISSION FORM

Listuguj Mi'gmaq Government

Project: Police Station Building

SUBMISSION MADE BY (Bidder)	
BIDDER'S ADDRESS	
PHONE	
FAX	
E-MAIL ADDRESS	

After having read the complete tender document, carefully read, examined and understood the conditions and requirements of the contract to be awarded, the Bidder undertakes to provide the Owner, the Listuguj Mi'gmaq Government, with the services described in the tender documents, including but not limited to all labour, expertise, materials and services required for a complete project, at the price submitted, within the prescribed time limits.

By initialing all pages, the Bidder, through its signatory, certifies that it has carefully examined the premises, the form of the contract, the terms of reference, the bidding documents, including each section of this document, as well as any other documents inclusively and not inclusively indicated in this document required for the proper performance of the work, and the addenda Nos.:

ADDENDUM NO.	DATE

Initial

SUBMISSION FORM- PAGE 1/5

The Bidder, by filing the " CERTIFICATION OF THE BIDDER'S PROBITY " with its proposal, certifies that its proposal was prepared without collusion and without having in any way, directly or indirectly, communicated, compared or exchanged information, entered into an agreement or other arrangement with a competitor, including with respect to:

- 1) At the price;
- 2) The calculation methods used to establish prices;
- 3) The decision to bid or not to bid;
- 4) Submitting a proposal that does not meet the criteria of this call for tenders.

By initialing at the bottom of this page, the Bidder acknowledges the Owner's right not to accept the lowest or any of the proposals received for this project and the Bidder undertakes to comply with all contract conditions.

By initialing at the bottom of this page, the Bidder undertakes to respect the total duration of the mandate from the date of award and any other limitations indicated in the section "ADMINISTRATIVE CLAUSES".

The Bidder understands that the price of its proposal includes all costs related to field investigations and required studies which, although not mentioned in the tender documents, are customary and necessary for the completion of the mandate.

REPORTING OF SUBCONTRACTORS, QUALIFICATIONS AND SUPPLIERS

The Bidder will use the following subcontractors who are competent to perform the portion of the work requested of them. All work performed by subcontractors will be under the supervision of the Bidder.

SUBCONTRACTOR NAME	WORK TO BE CARRIED

N.B.: The list of subcontractors, once the contract has been awarded by the Owner, may not be modified without the Owner's consent.

Initial

SUBMISSION FORM- PAGE 2/5

❖ **BILL OF QUANTITIES**

SN.	Description	Quantity	Unit	Prices
Section A - Preliminary Studies				
1	<ul style="list-style-type: none"> - Review Concept Design/Building Layout, ensure its compliance to all the requirements of authorities' regulations, laws, provincial and federal standards and building codes and authority - The consultant could edit or propose a new concept plan or layout design - Develop the building elevations and images - Provide Class "D" Cost Estimate 	----	Fixed Price	
	Subtotal 1	----	Fixed Price	
Section B - Design				
1	Preliminary design including required meetings	----	Fixed Price	
2	Plans and specifications 66% with Cost Estimates including coordination meetings	----	Fixed Price	
3	Plans and specifications 99% with Cost Estimates (Class A Cost Estimate and design report), including coordination meetings	----	Fixed Price	
4	Plans and specifications for construction	----	Fixed Price	
	Subtotal 2	----	Fixed Price	
Section C - Tender Administration and Site Supervision Fees				
1	Tender Administration /Full Construction Supervision includes all necessary tasks including but not limited to: review shop drawings, site inspection, project meetings, final inspection, close out documents, etc.	----	Fixed Price	
	Subtotal 3	----	Fixed Price	
	Grand Total	----	Fixed Price	

(Name of the bidder)

(Name and Signature of the Person authorized by the bidder)

SUBMISSION FORM- PAGE 3/5

❖ **BIDDER'S SCHEDULE**

SN.	Description	Milestone Dates
Section A - Preliminary Studies		
1	<ul style="list-style-type: none"> - Review Concept Design/Building Layout, ensure its compliance to all the requirements of authorities' regulations, laws, provincial and federal standards and building codes and authority - The consultant could edit or propose a new concept plan or layout design - Develop the building elevations and images - Provide Class "D" Cost Estimate 	
Section B - Design		
1	Preliminary design	
2	Plans and specifications 66% with Cost Estimates	
3	Plans and specifications 99% with Cost Estimates (Class A Cost Estimate and design report)	
4	Plans and specifications for construction	
Section C - Tender and Contract Administration		
1	Contractors Tender Close	
2	Contractors' Bids review and recommendations	
Section D - Construction Supervision		
1	Full Construction Supervision includes all necessary tasks including but not limited to: review shop drawings, site inspection, project meetings, final inspection, close out documents, etc.	

(Name of the bidder)

(Name and Signature of the Person
authorized by the bidder)

SUBMISSION FORM- PAGE 4/5

The Bidder, after having visited the site and ascertained the nature of the mandate, as well as after carefully reading the tender documents and appendices, hereby undertakes to provide all necessary preliminary studies, field investigations, professional services, reproduction services and other services, to execute and complete the mandate in accordance with the tender documents and to the full satisfaction of the Owner within the applicable contractual deadlines, for a total price for the proper execution of:

NOTHING TO WRITE HERE: SEE BILL OF QUANTITIES dollars (\$)

excluding applicable taxes, and as detailed in the price schedule.

The price submitted is in lawful money of Canada, the value of which is firm for the bid validity period described in this call for proposal/tenders and for the entire duration of the contract.

SIGNED AT (PLACE)	
DATE	
COMPANY NAME	
ADDRESS	
TELEPHONE	
FAX	
NAME OF THE REPRESENTATIVE	
FUNCTION	
SIGNATURE:	

*Attach a resolution from the Board of Directors, authorizing the appropriate person to prepare and sign the bid, and any other document required by the Owner.

N.B. All pages in this section must be initialized

Initial

SUBMISSION FORM- PAGE 5/5

3- COMPANY RESOLUTION

Extract from the minutes of the meeting of the board of directors of the company or corporation

_____ held at
(Name of Company)

_____ on _____ which it was proposed,
(Location) (date)

Seconded and resolved that _____ be authorized, for and
(Name of authorized person)

on behalf of the company, to sign and submit a bid to the Owner.

Certified true copy, dated of _____.

(Signature of the issuer)

(Print name)

(Signature of the person authorized to sign submission forms)

Document to be attached obligatorily with any submission

4- CERTIFICATION OF THE BIDDER'S PROBITY

I, the undersigned _____,
(Name and title of the person authorized by the bidder)

submitting to the Owner in respect of this tender document, the tender (hereinafter referred to as the "tender"), certifies that the following statements are true and complete in all respects.

On behalf of: _____
(Name of the bidder)

(hereinafter referred to as "the Bidder")

I declare the following:

1. I have read and understand this certificate.
2. I understand that the submission will be rejected if the statements contained in this certificate are not true or complete in all respects.
3. I acknowledge that this certificate may be used for judicial purposes;
4. I am authorized by the bidder to sign this certificate.
5. The person or persons, as the case may be, whose name appears on the bid, have been authorized by the bidder to set the terms and conditions set out therein and to sign the bid on its behalf.
6. For the purposes of this certificate and the bid, I understand that the word "competitor" refers to any partnership or person, other than the bidder, whether or not related, within the meaning of the second paragraph of point 9, to the latter:
 - a) who has been invited to submit a bid;
 - b) who could potentially submit a bid following the call for tenders based on their qualifications, skills or experience.
7. The bidder has prepared this bid without collusion and without having established an agreement or arrangement with a competitor, except with respect to the possible conclusion of a subcontract, in particular as to:
 - at prices;
 - the methods, factors or formulas used to establish prices;
 - the decision to submit, not submit or withdraw a bid;
 - the submission of a bid that does not voluntarily meet the specifications of the call for tenders.

Initial

CERTIFICATION OF THE BIDDER'S PROBITY- PAGE 1/3

8. Except for the possible conclusion of a subcontract, the terms of the bid have not been and will not be intentionally disclosed by the bidder, directly or indirectly, to a competitor before the time and date set for receipt of bids, a criminal act or an offence under the Act.
9. Neither the bidder nor any person related to the bidder has been found guilty within five (5) years prior to the date of submission of the bid, of a criminal act or an anticipated offence:
- Sections 119 to 125 and sections 132, 136, 220, 221, 236, 336, 336, 362, 366, 368, 375, 380, 388, 397, 398, 426, 462.31, 463 to 465* and 467.13 of the Criminal Code (R.S.C. 1985, c.C-46);
 - Sections 45, 46 and 47 of the Competition Act in respect of a public tender or contract of a public authority of Canada:
 - In section 3 of the Corruption of Foreign Public Officials Act (S.C. 1998 c. 34);
 - In sections 5, 6 and 7 of the Controlled Drugs and Substances Act (S.C. 1996 c. 19);
 - In sections 62, 62.0.1 and 62.1 of the Tax Administration Act (R.S.Q., C. C. C. A-6.002)
 - In section 44 of the Act respecting fuel tax (R.S.Q., c. T-1);
 - In sections 239 (1) (a) to 239 (1) (e) of the Income Tax Act (R.S.C.) (1985), c. 1, 5th supplement);
 - In sections 327 (1) (a) to 327 (1) (e) of the Excise Tax Act (R.S.C., c. E-21) (1985), c. E-15);
 - In section 46 b) of the Deposit Insurance Act (R.S.Q., c. A-26);
 - In section 406 c) of the Insurance Act (R.S.Q., c. A-32);
 - In section 605 of the Act respecting financial services cooperatives (R.S.Q., c. C-67.3);
 - Section 469.1 of the Act respecting the distribution of financial products and services (R.S.Q., c. D-9.2);
 - In section 66 (1) of the Act respecting money-services businesses (R.S.Q., c. E-12.0000001);
 - In section 148 (6) of the Derivatives Act (R.S.Q., c. I-14.01);
 - In section 356 of the Act respecting trust companies and savings companies (R.S.Q., c. S- 29.01);
 - In sections 195 (6), 196 and 197 of the Securities Act (R.S.Q., c. V-1.1);
 - Section 45.1 of the Regulation respecting service contracts of public bodies (R.R.Q., c. C- 65.1, r.2) concerning a violation of sections 50.4 and 50.5 of this Regulation;
 - Section 58.1 of the Regulation respecting construction contracts of public bodies (R.R.Q., c.C-65.1, r.5) concerning a violation of sections 40.6 and 40.7 of this Regulation;
 - In section 10 of the regulations respecting contracts for the supply, services and construction work of organizations referred to in section 7 of the Act respecting contracts of public bodies (R.R.Q., c. C-65.1, r.1.1) concerning a violation of sections 7 and 8 of these regulations;
 - In section 10 of the by-law respecting construction contracts of municipal bodies (R.R.Q., c.C-19, r.3) concerning a violation of sections 7 and 8 of this by-law.

Initial

CERTIFICATION OF THE BIDDER'S PROBITY- PAGE 2/3

OR

Having been convicted of such an act or offence, the bidder or a person related to it has obtained a pardon or rehabilitation.

* For the purposes of this certificate, sections 463 to 465 of the Criminal Code apply only in respect of the indictable offences and offences mentioned above.

For the purposes of this certificate, related person means: where the bidder is a corporation, one of its directors and, where applicable, one of its other officers and the person who holds shares of its capital stock that give it at least fifty percent (50%) of the voting rights that may be exercised in all circumstances attached to the shares of the corporation and, where the bidder is a general partnership, limited partnership or participation, one of its partners and, where applicable, one of its other officers. The offence committed by a director, partner or other officer of the bidder must have been committed in the course of that person's duties within the bidder.

I acknowledge the following:

1. If the Owner in respect of this tender document discovers, despite this certificate, that there has been a conviction for a criminal act or offence referred to in point 9, the contract that may have been awarded to the bidder without knowledge of this fact may be terminated and damages may be sought against the bidder and any party.
2. In the event that the bidder or a person related to it is found guilty of a criminal act or offence referred to in point 9 during the performance of the contract, the contract may be terminated by the Owner.

And I signed it _____

(Signature)

(Date)

(Print name of the signatory)

5- Hourly Rates

Function	Hourly Rate

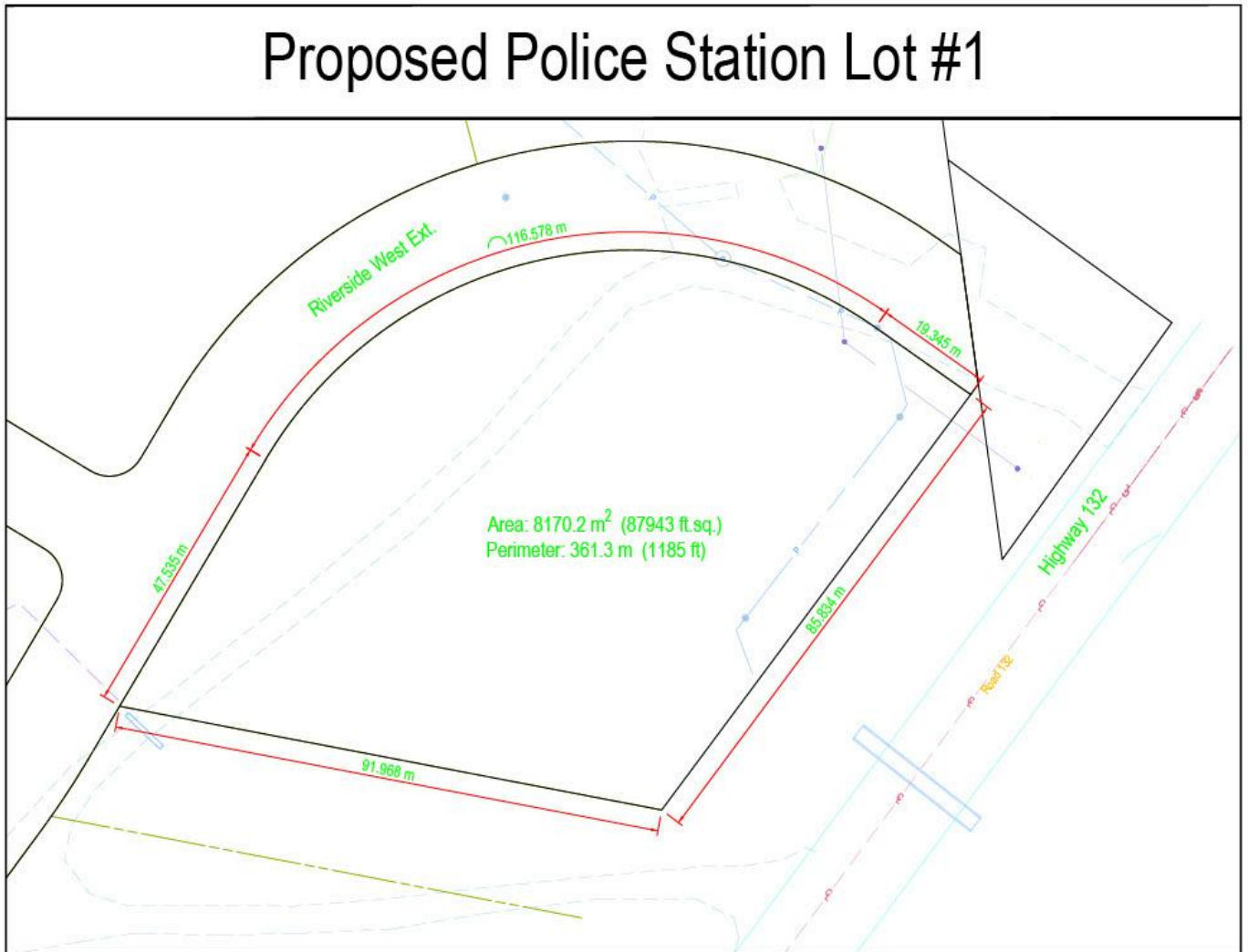
(Name of the bidder)

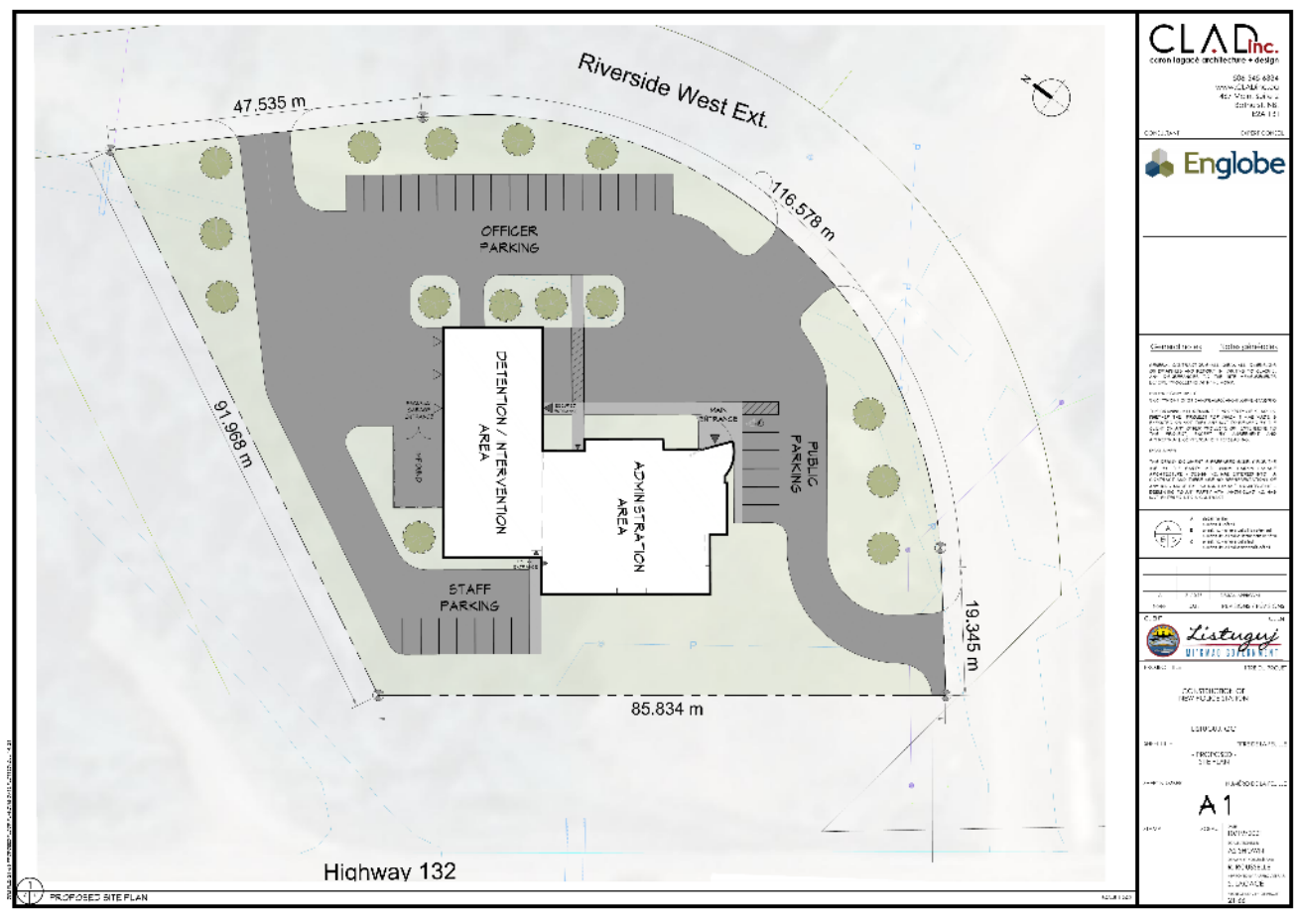
(Name and Signature of the Person
authorized by the bidder)

PART 4: APPENDICES

Appendix A

Land drawing





Appendix B

GEOTECHNICAL REPORT

Listuguj Police Station

Geotechnical Study

Listuguj Mi'gmaq Government
Final Report | Version 00
2110264.000

April 13, 2022



eNGLOBE

Listuguj Mi'gmaq Government

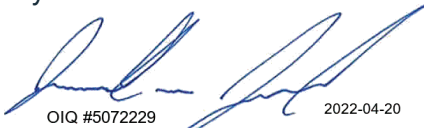
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OIQ #5072229 2022-04-20

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Error! No text of specified style in document.

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Revisions and publications log

REVISION No.	DATE	DESCRIPTION
00	April 13, 2022	Final Report

Distribution

1 PDF copy	Mr. Bassem Abdrabou, M.Sc.A., P.Eng.
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Appendix A Exploration Location Plan
Appendix B Symbols and Terms & Borehole Records
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1 Introduction

Englobe Corp. (Englobe) at the request of the Listuguj Mi'gmaq Government has performed a geotechnical investigation at the site of the proposed Listuguj Police Station located on the northwest corner of Riverside Road West Extension and Perron Boulevard (PQ Route 132) in Listuguj, Quebec. The purpose of the investigation was to identify the subsurface soil and bedrock conditions at the site and make recommendations for the use of design of the new building.

This report presents the observations and engineering recommendations associated with the geotechnical investigation for the proposed development. Included herein are the factual results of the field investigation including discussion of field procedures, subsurface conditions, laboratory analysis and recommendations for site development.



2 Site and Project Description

We understand the Listuguj Mi'gmaq Government proposes the construction of a new police barracks building at the corner of Route 132 and West Riverside Road Extension in Listuguj, Quebec. According to conceptual drawings prepared by CLAD, Inc. dated October 19, 2021, the barracks building will be approximately 1150 square meters in area and included an administration office and detention/intervention area. Exterior improvements will include the asphalt-surfaced access drives and parking areas as well as concrete curbs and sidewalks.

The detention/intervention area will be a one-storey area including a garage as well as a partial basement for a firing range. The administrative section of the building will be slab-on-grade. First floor elevation is not known but expected to be higher than existing site grade. We understand the site grade may be raised by approximately 1.5 meters to achieve design grades. Conceptually, site access from West Riverside Road Extension is to be near parking area grade.

The host property is approximately 1 acre in size. According to spot elevations provided by Listuguj Public Works Department, the site is relatively flat in the central and northeastern portions of the property around elevation 7.9 to 7.5 meters. A low-lying flood zone for the Sipi Geej Creek is located in the southwestern portion of the property with elevations ranging from approximately 5.8 meters at the southern end of the site and 3.9 meters at the eastern side where the creek runs into a culvert under Route 132.

The upper meter of the site was previously mined in the northeastern portion of the property. The site has been mostly tree-cleared. An existing buried drainage culvert runs from the existing West Riverside Road Extension under the proposed building location in a near-north-south direction and discharges to the culvert under Route 132.



3 Subsurface Investigation Procedures

3.1 Borehole Investigations

The current geotechnical investigation included the completion of a total of eight boreholes, identified as BH21-01 to BH21-04, and BH22-05 to BH22-08. The explorations were advanced to depths ranging from approximately 7.72 to 25.63 meters, using a track-mounted drill rig supplied by Lantech Drilling Ltd. (Lantech) of Dieppe, New Brunswick on October 14th, 2021, February 28th, 2022 and March 1st, 2022 under the observation of a senior technician from Englobe.

The borehole locations are shown on the attached plan entitled Exploration Location Plan, in Appendix A. The locations were established based on tape measurement referencing existing site features.

The boreholes were advanced using casing and tri-cone bit methods with water flushing. Standard Penetration Tests (SPT) were performed in overburden soils and inferred bedrock to obtain blow counts (i.e. N-values) using a 50-milimeter, outside-diameter split-barrel sampler in general accordance with ASTM International (ASTM) standard D1586 *Standard Test Method for Standard Penetration Test (SPT)*. SPT testing was completed with an automatic hammer assembly. Bedrock coring was not performed. Drilling rod penetration was monitored by BH22-05 to determine refusal depth on presumed bedrock.

Soil and inferred bedrock samples obtained were logged and transported to our Moncton laboratory for further classification. Representative samples were selected for the laboratory testing program discussed herein.

4

4 Subsurface Conditions

The subsurface conditions encountered during the investigation program consisted of topsoil/rootmat, outwash sand and gravel, soft of loose upper glaciomarine clay and silt, lower glacial marine sandy gravel and inferred bedrock. A summary of the encountered geologic conditions is described in the sections below and included in Table 1 as well as on the Boreholes Records shown in Appendix B.

- TOPSOIL / ROOTMAT
- OUTWASH DEPOSIT: SAND and GRAVEL, trace silt, some cobbles and boulders
- GLACIOMARINE DEPOSIT: Lean clay, some sand to sandy silt, trace gravel
- GLACIOMARINE DEPOSIT: Sandy gravel, some silt
- INFERRED BEDROCK: SHALE

Table 1: Summary of Subsurface Conditions

Borehole	Borehole Depth (m)	TOPSOIL / ROOTMAT Thickness (m)	OUTWASH Sand and Gravel Thickness (m)	GLACIO-MARINE Clay and Silt Deposit Thickness (m)	GLACIO-MARINE Sandy Gravel Thickness (m)	Inferred BEDROCK Depth (m)
BH21-01	9.14	0.10	NE	>9.04	NE	NE
BH21-02	9.14	0.15	0.76	>8.23	NE	NE
BH21-03	9.14	0.15	0.76	7.61	>0.62	NE
BH21-04	10.42	0.15	0.93	8.82	>0.62	NE
BH22-05	25.64	NE	0.61	25.03*	NS	25.64
BH22-06	10.87	NE	0.15	10.72	NE	10.87
BH22-07	7.72	0.61	NE	7.01	0.10	7.72
BH22-08	19.61	NE	0.60	17.68	0.71	19.61

¹ NE - Not Encountered

² > - Greater than

³ * - Based on penetration cone

⁴ NS - Not sampled

The attached Symbols and Terms used Borehole Records in Appendix B, provide a brief explanation of the terminology and graphics used. Please note, field and laboratory soil classification were performed in general accordance with the system recommended in the Canadian Foundation Engineering Manual, 4th edition. Borehole Records are included in Appendix B.

Note that the stratigraphic boundaries detailed in this section typically represent a transition of one soil or bedrock type to another and do not necessarily indicate an exact plane of geologic change. Subsurface conditions may vary between and beyond the testing locations.

4.1 Topsoil / Rootmat

A thin surficial layer of topsoil and rootmat was encountered at the ground surface in boreholes BH21-01 to BH21-04 and BH22-07. The topsoil and rootmat was described as dark brown sand with organic silt and root matter. The thickness of the topsoil and rootmat, where encountered, ranged from approximately 100 to 150 millimeters except for BH22-07 where the thickness is 610 mm.

4.2 OUTWASH

A native layer of sand and gravel, trace silt to silt, and sand, some gravel was encountered in six boreholes either beneath the topsoil/rootmat or at the ground surface. Cobbles and boulders were noted in the deposit. The thickness of the outwash deposit ranged from approximately 0.15 to 1.52 meters. The outwash was reddish brown to greyish brown in colour. The outwash was loose to very dense in situ. The outwash in BH22-05, BH22-06 and BH22-08 was frozen at the time of the exploration program potentially yielding higher density values.

4.3 GLACIOMARINE DEPOSIT

4.3.1 Upper Silt and Clay Deposit

A glaciomarine deposit was encountered in each borehole beneath the topsoil/rootmat or outwash deposit. The glaciomarine deposit was stratified and varied in thickness and composition. The full thickness of the glaciomarine deposit was approximately 7.61 meters in BH22-07 to approximately 25.03 meters in BH22-05. The full thickness of the glaciomarine deposit was not penetrated in BH21-01 to BH21-04.

The glaciomarine deposit is varved with layers of lean clay with some to trace sand to sandy silt, trace gravel. The in-situ densities ranged from very loose to very dense and very soft to stiff for cohesionless and cohesive layers, respectively,

Sixteen representative samples were tested to determine the moisture content of the glaciomarine deposit as per ASTM D2216 *Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*. Three representative samples were tested for gradation in accordance with ASTM D6913 *Standard Test Methods for Particle-Size Distribution of Soil Using Sieve Analysis* and plasticity in accordance with ASTM D4318 *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*. The test results confirm the material characteristics detailed in the appended Borehole Records. The laboratory testing results are included in Appendix C, Laboratory Test Results.

Two Shelby tubes were extracted from the glaciomarine clay in BH22-06 in generally accordance with ASTM D1587 *Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes*. The samples were transported to our laboratory for constant-rate-of-strain (CRS) consolidation laboratory testing by BGC Engineering Inc. (BGC) of Fredericton, New Brunswick.

Field shear vane testing was performed within the glaciomarine deposit in general accordance with ASTM D8121 *Standard Test Method for Approximating the Shear Strength of Cohesive Soils by the Handheld Vane Shear Device*. Undrained shear strengths were calculated based on the geometry of the shear vane using by Lantech. One laboratory shear vane test was also completed on the undisturbed CRS sample by BGC in accordance with ASTM D4648 *Standard Test Method for Laboratory Miniature Vane Shear Test for Saturated Fine-Grained Clayey Soil*. The results of the field shear vane testing are reported in the following Table 2.

Table 2: Summary of Shear Vane Testing

Borehole	Depth (m)	Torque (N-m)	Calculated Undrained Shear Strength (kPa)
BH22-06	3.05	-	31.7*
BH22-06	4.88	13.6	22.9
BH22-07	3.35	189.8	320.4
BH22-08	3.35	67.8	114.4
BH22-08	4.88	27.1	45.8
BH22-08	6.40	40.7	68.7
BH22-08	7.93	54.2	91.6
BH22-08	9.45	54.2	91.6
BH22-08	10.98	54.2	91.6
BH22-08	12.50	27.1	45.8

Notes : * - Laboratory Shear Vane Test

4.3.2 Sandy Gravel, some Silt

A lower layer of the glaciomarine deposit was proven in two of the boreholes below the upper layer. The lower glaciomarine deposit consisted of sandy gravel, some silt. Based on N-values and drill rod resistance, the sandy gravel, some silt deposit is anticipated to be present in five of eight boreholes. The lower glaciomarine deposit was proven to greater than 0.52 meters thick and was compact to very dense in-situ. One representative sample was tested to determine the moisture content as per ASTM D2216 and gradation in accordance with ASTM D6913. The test results confirm the material characteristics detailed in the appended Borehole Records. The laboratory testing results are included in Appendix C, Laboratory Test Results.

4.4 Inferred Bedrock

Inferred bedrock was encountered in BH22-05 to BH22-08 below the glaciomarine deposits at depths ranging from approximately 7.72 to 25.64 metres below existing grade. The bedrock was inferred based on penetration cone or split-barrel sample refusal. Apparent bedrock pieces were noted in split-barrel samples. Bedrock was not cored during the investigation programs.

Based on split barrel samples, bedrock is visually described as red and gray shale. According to the Système d'information géominière of Québec, bedrock in the area on consists of gray conglomerate, and red and green mudstone of the Pirate Cove or La Garde Formations of Silurian and Devonian age.

4.5 Groundwater

Groundwater was not measured during subsurface investigation program. Groundwater levels can be expected to fluctuate during periods of heavy precipitation associated with seasonal weather trends or a particular event, site use, tides, adjacent site use, and construction activity.



5 Discussion and Recommendations

5.1 General Discussion

The current project consists of constructing an approximately 1150-square-meter, one-storey police barracks with a partial basement. We understand the original proposed construction schedule plans for up to approximately 18 months for building construction. Foundation loads are not currently known but anticipated to be up to approximately 100 kPa based on the nature of the development.

The majority of the site is relatively flat around El 8.0 to 7.0 meters which a low-lying creek flood plane in the southern portion of the site. First-floor elevation has not been established but is anticipated around El 8.0 meters based on our understanding of the project. The following paragraphs present a discussion on subsurface conditions relating to building foundation support.

Surficial soils at the site include topsoil/rootmat and a thin sand and gravel outwash deposit that has been partially mined, underlain by a stratified glaciomarine deposit of varying thickness. Inferred bedrock was encountered at depths ranging from approximately 7.72 to 25.64 meters below existing grade, where encountered.

5.2 Foundation Support Alternatives

Subsurface conditions at the site consist primarily of a thin outwash deposit over soft or loose, stratified, glaciomarine silts and clays, over denser glaciomarine sand and gravel, and/or inferred bedrock at varying depths. The thick, potentially compressible glaciomarine silts and clays are generally not suitable or recommended for shallow, spread foundation support without site improvement, particularly if site grades will be raised. The thickness of the glaciomarine deposit is variable across the site from 7,61 to 25,03 meters and is anticipated to cause differential settlement greater the conventional tolerance of 20 millimeters for typical building loads of up to 100 kilopascals.

We understand site grades may be increased up to approximately 1.5 meters to achieve design grades. The addition of site fill would increase loading on the potentially compressible cohesive soils and in turn, induce settlement of the building. The amount of settlement associated with an increase in site loading of approximately 130 kPa ranges from approximately 50 to 150 millimeters based on the thickness of the glaciomarine deposit and the results of consolidation laboratory testing performed on the undisturbed sample by BGC.

As such in order to support the proposed development on spread footings or a thickened raft slab, we recommend preloading or surcharging the site. Alternatively, the building may be supported on deep foundations, such as piles, or using ground improvement techniques to densify the existing soils.

The advantages of the preloading/surcharge methodology include that construction involves only earthworks and can be performed by local contractors. Monitoring of settlements is also relatively simple and by preloading or surcharging the entire site, settlement to exterior site improvements such as asphalt parking and drives, retaining walls and site services should also be limited. The disadvantages of preloading/surcharging are the amount of time construction may be delayed while the consolidation occurs, some potential settlement post-fill removal and potentially, double-handling of preload/surcharge fill.

Deep foundation options include driving steel pipe or H-piles or augered helical piles end bearing below the glaciomarine deposit in dense till or on bedrock. Advantages of deep foundations include relatively quick installation and limiting of post-construction settlements. Also, the thickness of the potentially compressible soils is variable on the site though deep foundations may be installed to great depths by adding additional pile lengths. Disadvantages include higher material costs for piles and structural steel required for reinforced slabs and the need for specialty contractors for installation.

A third option is ground improvement techniques that involve soil densification such as rammed or vibrated aggregate piers or deep dynamic compaction (DDC). Rammed or vibrated aggregate piers stiffen the surrounding soil and permit the traditional shallow-spread-footing construction on soil cushion placed above the piers. DDC involved dropping a large weight with mounted on a crane in a grid pattern that densifies the soils to also permit conventional construction. Soil densification, similar to deep foundation alternatives, requires speciality contractors and would increase construction costs. In addition, the thickness of the glaciomarine deposit is highly variable at the site and the cost and effectiveness of soil densification may be limited.

5.3 Preloading or Surcharging

Provided the construction schedule permits, we anticipate the most cost-effective method for site improvement is preloading or surcharging. For the purpose of discussion, deep foundations and ground improvement techniques are not further considered. Should detailed pile or ground improvement design and costing be required, Englobe can assist.

Preloading has been performed successfully on other construction sites in the Listuguj community including the on-going construction project for the new community water reservoir where with similar soil deposits, measured settlements were greater than 40 millimeters (and likely greater than 50 millimeters in total) in approximately 3 to 4 months.

In order to support building loads on conventional shallow spread footing foundations or a raft slab, the site may be preloaded or surcharged to induce consolidation of the glaciomarine layer prior to building construction. Preloading would consist of placing an equivalent amount of fill on site prior to construction to simulate anticipated building loads whereas surcharging would include additional fill placement beyond planned design loads to expedite consolidation.

The glaciomarine deposit at the site consists of interbedded silts and clays. Clay is a cohesive soil and would exhibit plastic behaviour when strained meaning the consolidation is time dependant. Consolidation of cohesive soils occurs as porewater is dissipated. The degree of consolidation is a function of severable variables including the thickness and composition of the compressible deposit.

Generally, primary consolidation or the time required to achieve 90 percent of the anticipated consolidation occurs within one year whereas secondary consolidation, or the remaining 10 percent of predicted consolidation occurs long term, possibly over 20 years or more. Silt, theoretically is a non-cohesive soil where densification from loading is elastic and occurs as the load is applied. As both fine-grained soil types are present at the site, the consolidation of the deposit is likely complex where silt densifies relatively quickly and clay consolidates as porewater is squeezed out the clay and migrates to drainage paths.

Based on constant-rate-of-strain laboratory testing on a representative, undisturbed sample of the glaciomarine deposit performed by BGC, the anticipated amount of settlement was predicted based on an assumed preload stress of up to 130 kPa. The preload value assumes approximately 1.5 meters of fill would be added to the site, equivalent to approximately 30 kPa, and an applied stress of 60 to 100 kPa from building loading. The associated anticipated range in settlement is 50 to 150 millimeters over a period of up to 6 months.

In general, the magnitude of settlement experienced by loaded structures is dependant on the uniformity of the total soil profile, in this case, the thickness of the glaciomarine deposit as well as the glacial outwash and engineered fill required to level the site for development. The ground surface is relatively flat in the building area however the thickness and composition of the glaciomarine deposit varies. Therefore, the magnitude of predicted settlement and the time to achieve 90 percent consolidation is variable.

As previously discussed, wick drains may also be used with preloading or surcharging to expedite consolidation of the glaciomarine deposit. Wick drains are vertical geosynthetic members that are installed in combination with preload or surcharge fill the reduce consolidation times by reducing the distance pore water must travel to exit the compressible layer. The reduction in consolidation time is a function of the wick drain spacing. Wick drains are typically installed by specialty contractors.

5.4 Shallow Foundations

If the site is preloaded or surcharged as discussed herein, and following approval from the geotechnical engineer to remove the preload/surcharge fill, the building may be supported on conventional spread footing foundations placed proofrolled native outwash or on engineered fill placed above the outwash or glaciomarine deposit.

In order to limit post-construction settlements, the recommend Ultimate Limit States (ULS) and Serviceably Limit States (SLS) factored geotechnical resistance should not exceed 100 kPa. Foundations should be sized accordingly.

5.5 Subgrade Preparation

Following the removal of surficial organic soils, the resulting outwash or upper glaciomarine deposit soils should be static compacted with a highway roller under the observation of geotechnical personnel. In areas where deflections greater 10 millimeters and/or subgrade cracking are noted, the subgrade should be overexcavated and replaced with a 300-millimeter-thick lift of 200-millimeter minus crushed rock underlain by a geotextile separator fabric. Alternatively, a high strength biaxial geogrid may be placed over failing areas prior to additional fill placement

Subgrade soil are anticipated to be moisture sensitive. If construction is planned for seasonally wet months (i.e. spring or fall), consideration should be given to minimizing construction traffic on exposed subgrades by establishing construction haul roads. The subgrade should be graded to promote surface runoff to collect outside the construction area or in trenches that are pumped off the area.

Site soils are also frost susceptible and will require management if construction is planned for winter months. Exposed subgrades will freeze readily and therefore should be covered overnight if the forecast predicts temperatures below freezing. Alternatively, subgrades may be protected using insulating materials such as rigid foam or straw.

5.6 Engineered Fill

Unless otherwise specified, imported engineered fill for backfill should consist of well-graded, granular soil with a maximum particle size of 100 millimeters and a maximum of 10 percent passing the 75-micron sieve (such as quarried rock fill).

Unless otherwise specified, engineered fill should be placed in lifts not exceeding 300 millimeters in loose thickness and be compacted throughout the lift thickness with suitable equipment to at least 98 percent of the standard Proctor maximum dry density as determined in accordance with ASTM standard D698 *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort*. Engineered fill compaction should be verified by means of in-place density testing using a nuclear density gauge in accordance with ASTM D6938 *Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*.

Alternative engineering fill materials may be considered for construction subject to the approval of the geotechnical engineer.

5.7 Re-use of Existing Soil

Excavated topsoil/rootmat contain organics and are not suitable for reuse as engineered fill. The topsoil/rootmat may be stockpiled for reuse in landscape areas. Excavated glaciomarine soils have an elevated fines content and will not readily compact and we are not recommended for use as engineered fill or borrow fill for preloading but may be used in landscape areas.

Excavated outwash may be selectively reused as engineered fill to re-establish site grades provided deleterious materials including organics are removed. The outwash may be moisture sensitive therefore we recommend adequate laboratory testing of stockpiled soils be performed to determine whether the soil moisture content will be appropriate to achieve the required compaction described in Section 5.6 for engineered fill. Outwash may not readily compact if above the optimum moisture content and will only dry readily during warm and dry weather; therefore, reuse of outwash as fill should be limited to late spring to early fall construction.

The reuse of site soils would also be subject to their condition following excavation, handling, and stockpiling. Protection of fills from excessive moisture ingress (e.g. through shaping/compaction or covering) and from frost penetration (e.g. straw, insulated tarps) should be undertaken to maximize reuse of materials deemed of suitable quality for reuse at the site.

Representative samples of existing site soils proposed for reuse should be obtained to establish moisture-density relationships for compaction testing. Different in-situ soil types proposed for reuse should be stockpiled separately.



6 Engineering Design Recommendations

6.1 Frost Depth

Based on subsurface conditions, local meteorological data and the extended site use, exterior pile caps and grade beams should have a minimum of 2.0 meters of soil cover for frost protection. If exterior footings are not located at least 2.0 meters below exterior grade, we recommend installing void forms or placing rigid polystyrene insulation around exterior foundations for frost protection. The thickness and extent of insulation is a function of installation depth. A frost protection detail may be provided if requested.

6.2 Lowest Floor Slab

Provided the site is preloaded as discussed herein, floor slabs may be designed as slab-on-grade construction supported on compacted engineered fill placed above native soils. The slabs should be placed cast on a minimum of 300 millimeters of soil meeting the requirements for engineered fill in Section 5.6. Engineered fill for slabs should be compacted to 95 percent of the Standard Proctor in accordance with ASTM D698. If a sub-floor depressurization system is required for the control of radon gas, we recommend the crushed rock below the slab meet the requirements of applicable NBCC regulations.

6.3 Seismic Considerations

The recommended site classification for seismic site response is Site Class E in accordance with NBCC 2015 ((section 4.1.8.4) requirements. Seismic site classification analysis was performed using the N-

value for granular soils and undrained shear strength for cohesive soils method based on boreholes from the current subsurface investigation program. Based on the encountered surface conditions and laboratory testing program. the site is not susceptible to liquefaction in the event of an earthquake.

6.4 Preload Placement

The preload fill, fill placed above design floor slab elevation, may consist of common borrow and be placed in 500 to 600-millimeter-thick lifts and tracked with a bulldozer or compacted with a roller to increase soil density and improve slope stability. Temporary slope angles can be constructed as recommended in Section 7.2. The full height of the preload fill embankment should extend to a minimum of 3 meters beyond the limits of the building footprint.

6.5 Settlement Monitoring

Settlement should be periodically monitored during the preloading process by installing settlement plates prior to preload fill placement. Settlement plates consist of a bottom plate coupled with steel rods with threaded ends so that additional extensions may be coupled on during placement of subsequent fill lifts. The rod is placed in a plastic sleeve for protection and the top remains accessible for surveying to monitor the settlement of the plate. A minimum of five settlement plates should be installed in the building area.

A settlement monitoring program should be developed and implemented during the preloading phase of the project. Settlement monitoring frequency typically begins with a benchmark elevation once fill is placed and daily monitoring occurs for a week or two until a steady-state of settlement is achieved and the monitoring frequency can be reduced. Surveying should be performed by level survey to achieve the highest level of accuracy. The geotechnical engineer should review the settlement data to determine, in consultation with the structural engineer, when preloading settlements have stopped or the anticipated remaining settlements are within a tolerable range and the preload fill may be removed to permit construction.

6.6 Underground Services

New underground services should be placed on free-draining granular material such as 19-millimeter minus well-graded gravel with a minimum thickness of 150 millimeters below the pipe and 300 millimeters above the pipe; subject to the pipe diameter. The bedding should be compacted in-place to a minimum of 95 percent of the corrected maximum dry density, as determined in accordance with ASTM D698. The remainder of the service trench can be backfilled with approved site fill or inorganic soils compacted to a minimum of 95 percent of the corrected maximum dry density, as determined in accordance with ASTM D698. Services should be placed a minimum of 2.0 meters below the finished grade for frost protection unless permanent insulation is provided.

A minimum of 25 millimeters of insulation should be placed for every 300 millimeters that buried utilities are located above the recommended depth of 2.0 meters. The width should be 300 millimeters beyond the edge of the utility for each 300 millimeters the insulation is above the recommended utility depth.



7 Construction Considerations

7.1 Earthwork in Wet and Cold Environments

Approved soil subgrades will be susceptible to softening in the presence of water and construction traffic; therefore, excavations should be maintained in a dry condition. Subgrade surfaces disturbed or softened during construction should be over-excavated and replaced with engineered fill meeting the requirements of Section 5.3.

Excavations should be maintained in a dry condition and protected if the weather forecast calls for precipitation. Wherever possible, surfaces should be graded to promote runoff to collection pits for subsequent pumping.

For winter construction, the potential exists for the onset of frost if exposed subgrade soils are not insulated during cold weather construction. Frost can occur in fine-grained soils due to the expansion of water during the freezing process and during seasonal thaw, producing displacement. In addition, the compaction effort applied to frozen soil cannot be accurately verified with a nuclear density gauge. Proofrolling inspection of frozen soil may suggest subgrades are temporarily stable but still soften during seasonal thaw.

During cold-weather construction, fill imported to the site should be newly quarried, and placed and compacted immediately following delivery to the site. Compaction testing and proofrolling activities should be completed immediately following the initial compactive effort. Failing areas should be remediated before the onset of frost.

Fill should not be placed on frozen, or snow and ice-covered subgrades. In excavations, subgrade surfaces should be covered with insulating blankets or heated tarps if the forecast calls for below-freezing conditions.

7.2 Slopes

Preload fill slope angles should be constructed no steeper than one horizontal to one vertical (1H:1V). Permanent fill slopes should be construction steeper than three horizontal to one vertical (3H:1V). Permanent fill slopes designed at inclinations steeper than 3H:1V should be designed by a geotechnical engineer and may require soil reinforcing. Permanent slope surfaces should be vegetated to protect against erosion. Temporary sedimentation and erosion control methods should be implemented during construction and left in place until the slope surface has been permanently stabilized.

7.3 Temporary Excavations

The excavation methods and equipment shall be appropriate for the work to be accomplished (used of a blade on the mechanical shovel on clayey layer bottom).

The grades of the temporary excavation slopes must be conformed to the NBCC 2015 and Québec's CNESST in order to preserve the stability of the excavation. Considering that the excavation slopes are temporary, the stability of the slopes, as well as the safety and security of the workers and integrity of the structures are under the entire responsibility of the contractor. As an indication for designer, and for soil volume estimation purposes, temporary excavation slopes shall not exceed:

- ▶ 2H:1V in topsoil and outwash layers;
- ▶ 1.5 horizontal to 1.0 vertical in glaciomarine soils.

The slopes shall be checked daily and reduced when necessary. If unsupported excavations are left open for a long period, an examination of the slopes should be carried out on a regular basis by a geotechnical engineer or his representative to detect and correct improper conditions.

The excavation slopes must be adjusted on site according to the observed conditions at the moment of excavation and the contractor's methodology. The temporary excavation slopes must be uniform. In the presence of any sign of instability, the slopes should be immediately reduced.

During excavation, machinery and heavy-weight traffic shall not be allowed at the top of the excavation slope unless they are located at a distance greater than the excavation depth.

At the top of the slope, excavated materials must always be placed at a distance greater than the excavation depth. This condition must be satisfied at all times, except if special investigations are performed for each particular case.

7.4 Dewatering

Periodic construction dewatering may be required to maintain excavations in a dry condition. Dewatering may be accomplished by using submersible pumps. Pumps should be located sufficiently deep to lower groundwater levels a minimum of 600 millimeters below subgrade elevation. Water pumped from excavations is expected to contain fine-grained soils and will require care in the disposal.

Groundwater pumping at the construction stage should meet the requirements of the Environmental Management Plan for the project that should include applicable municipal, provincial, and federal environmental requirements. A permit may be required to discharge site groundwater to a municipal sewer system or watercourse. Potential groundwater management solutions may include pumping from one excavation to another, subject to approval.

7.5 Materials Testing and Inspection

During construction of the proposed development, we recommend a geotechnical engineering firm be retained by the owner and/or the contractor to provide on-going consultation, confirm these recommendations are followed, and ensure the materials used during construction meet specifications. Englobe can provide these services if requested.



8 Closure

All material information provided including descriptions, conditions, laboratory testing results and sampling locations made in this report were established based on on-site conditions at the time Englobe conducted the geotechnical investigation. The geotechnical investigation undertaken has involved random sampling of site conditions. Should conditions be encountered during construction that is contrary to those reported herein, we request immediate notification so that reassessment can be undertaken.

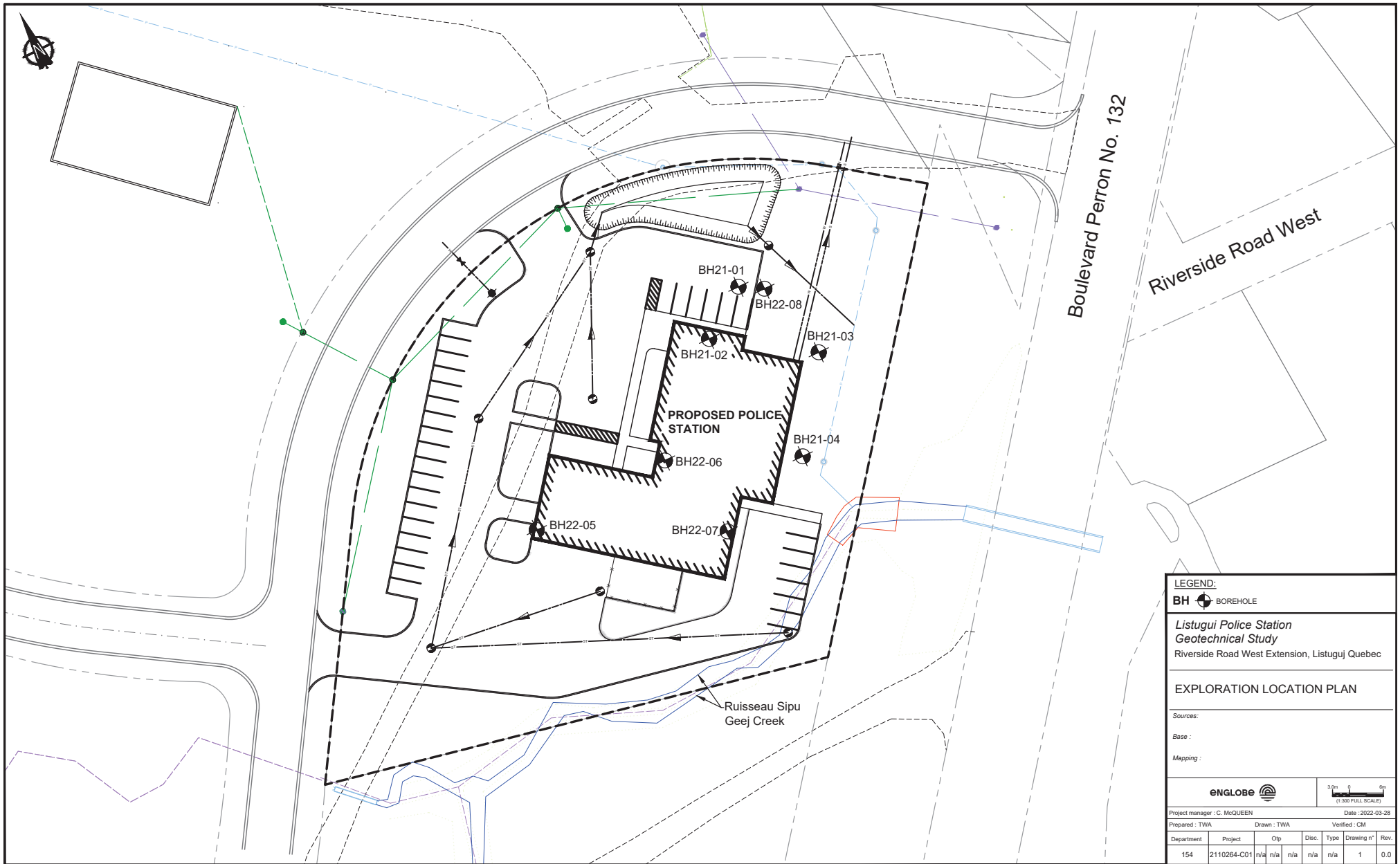
It should be noted that the stratigraphic boundaries on the exploration records typically represent a transition of one soil type to another and do not necessarily indicate an exact plane of geologic change. Subsurface conditions may vary between and beyond the exploration locations.

Classifications and descriptions made are in accordance with accepted practices which are subjective in nature, no specific description should be considered exact, but rather reflective of the foreseen material behaviour. Preparation of this report, and all associated work, was carried out in accordance with normally accepted standard of care in the province of execution for the specific professional service provided to the client. No other warranty is made.

Appendix A

Exploration Location Plan





LEGEND:
 BH BOREHOLE

Listugui Police Station
 Geotechnical Study
 Riverside Road West Extension, Listuguj Quebec

EXPLORATION LOCATION PLAN

Sources:
 Base :
 Mapping :

ENLOBE

3.0m 0 6m
 (1:300 FULL SCALE)

Project manager : C. McQUEEN Date : 2022-03-28

Prepared : TWA	Drawn : TWA		Verified : CM			
Department	Project	Op	Disc.	Type	Drawing n°	Rev.
154	2110264-C01	n/a	n/a	n/a	n/a	1 0.0

Appendix B

Symbols and Terms & Borehole Records



eNGLOBE

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

STRATA PLOT

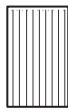
Strata plots symbolize the soil or bedrock descriptions, using a combination of the following basic symbols.



Boulders
Cobbles
Gravel



Sand



Silt



Clay



Topsoil
Organics



Asphalt



Concrete



Fill



Glacial Till



Bedrock

SOIL SAMPLES

Sample Type

A	- auger sample
B	- block sample
C	- core sample
D	- drive sample
G	- grab (bulk) sample
SS	- split spoon sample
U	- tube sample (thin wall)
W	- wash or air return sample
HQ, BQ, NQ	- Rock core sample

Sample Condition

	- undisturbed
	- disturbed
	- no recovery

Water Level Measurement

	Measured in standpipe, piezometer, or well
	Inferred groundwater condition

Standard Penetration Resistance (N-Value) – unless otherwise noted this column refers to the Standard Penetration Test N-Value: the number of blows for a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil. Where insufficient penetration was achieved and N-Values cannot be presented, the number of blows is reported over sampler penetration in millimetres (e.g. 50/75). No corrections have been applied to the N-Values presented in the log.

Dynamic Cone Penetration Test (DCPT) – performed using a standard 60-degree apex cone connected to 'A' size drill rods. Applied energy is as per the Standard Penetration Test [140 pound (64 kg) hammer falling 30 inches (760 mm)]. The DCPT value is represented as the number of blows of the hammer required to drive the penetrating cone one foot (300 mm) into the soil.

SOIL TESTING

Soil Testing Descriptors

MA	- mechanical grain size analysis (reported separately)
\emptyset	- moisture content
C	- consolidation test (reported separately)
D_R	- relative density
k	- permeability coefficient (reported separately)
pp	- pocket penetrometer strength
q	- triaxial compression test
UCS	- unconfined compressive strength
SB	- shear box test (reported separately)
TV	- torvane shear strength
VS	- vane shear strength
γ	- unit weight of soil or rock
γ_d	- dry unit weight of soil or rock
ρ	- density of soil or rock
ρ_d	- dry density of soil or rock

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

The classification of soil types is made in accordance with the Canadian Foundation Engineering Manual (4th Edition)

SOIL DESCRIPTIONS

Common Soil Descriptors

<i>Rootmat/Topsoil</i>	- Organic matter (roots, moss, topsoil) typically forming a vegetative mattress, and/or is capable of supporting vegetative growth
<i>Fill</i>	- Material identified as placed by others
<i>Till</i>	- Undisturbed in-situ stratified deposit <i>Glacial Till</i> – unsorted sediment from glacial sources <i>Alluvial/Fluvial Till</i> – material deposited by watercourses, commonly stratified
<i>Peat</i>	- Partially decayed vegetation (humas) material that has accumulated in a water-saturated environment
<i>Bedrock</i>	- Deposit of rock beneath soil and other broken or unconsolidated material (regolith)

Soil Structure Descriptors

<i>Desiccated</i>	- Having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
<i>Fissured</i>	- Having cracks and, hence, a blocky structure
<i>Varved</i>	- Composed of regular alternating layers of silt and clay
<i>Stratified</i>	- Composed of alternating layers of different soil types (e.g. silt and sand/silt and clay)
<i>Well-Graded</i>	- Having a generally uniform distribution in a range of grain sizes, with no dominating size
<i>Poorly Graded</i>	- predominantly of one-grain size

Terminology used for describing soil strata based on the proportion of individual particle size present:

<i>main component</i>	(gravel, sand, silt, clay)	>35 % and main fraction
<i>“and”</i>	(and gravel, and silt, etc.)	>35 %
<i>adjective</i>	(gravelly, sandy, silty, clayey, etc.)	20 % – 35 %
<i>“some”</i>	(some sand, some silt, etc.)	10 % - 20 %
<i>“trace” or “occasional”</i>	(trace sand, trace silt, etc.)	1 % - 10 %

COMPACTNESS CONDITION

The standard terminology to describe soils, as determined by the Standard Penetration Test N-Value: the number of blows for a 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil.

Compaction Condition Cohesionless Soils

Compactness Condition	SPT N-Index
Very Loose	0 – 4
Lose	4 – 10
Compact	10 – 30
Dense	30 – 50
Very Dense	> 50

Consistency and Undrained Shear Strength of Cohesive Soils

Consistency	Undrained Shear Strength		SPT N-Index
	(Kips/ft ²)	(kPa)	
Very Soft	< 0.25	<12	0 – 2
Soft	0.25 – 0.5	12 – 25	2 – 4
Firm	0.5 – 1.0	25 – 50	4 – 8
Stiff	1.0 – 2.0	50 – 100	8 – 15
Very Stiff	2.0 – 4.0	100 – 200	15 – 30
Hard	> 4.0	> 200	> 30

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

ROCK DESCRIPTIONS

RQD (Rock Quality Designation) denotes the percentage of intact and sound rock retrieved from a borehole of any orientation. Reported as the fraction of all pieces of intact and sound rock core equal to or greater than 4 inches (100 mm) are summed and divided by the total length of core run (as per ASTM 6032)

TCR (Total Core Recovery) denotes the percentage of solid (cylindrical) core retrieved from a borehole of any orientation. Reported as the fraction of all pieces of the solid (cylindrical) core are summed and divided by the total length of the core run.

FI (Fracture Index) denotes the number of naturally occurring fractures within a given length of the core. Reported as a simple count of naturally occurring fractures.

Rock Quality Descriptors

Rock Mass Quality		RQD	Alternate (Colloquial) Rock Mass Quality	
<i>Very Poor</i>		0 – 25	Very Severely Fractured	crushed
<i>Poor</i>		25 – 50	Severely Fractured	shattered or very blocky
<i>Fair</i>		50 – 75	Fractured	blocky
<i>Good</i>		75 – 90	Moderately Jointed	sound
<i>Excellent</i>		90 - 100	Intact	very sound

Rock Discontinuity Descriptors

Spacing (mm)	Discontinuities	Bedding
< 20	Extremely close	Laminated
20 – 60	Very close	Very thin
60 – 200	Close	Thin
200 – 600	Moderately close	Medium
600 – 2000	Wide	Thick
2000 – 6000	Very wide	Very thick
> 6000	Extremely wide	-

Rock Strength Descriptors

Strength Classification	Grade	Unconfined Compressive Strength (MPa)	Point Load Index (MPa)
<i>Extremely Weak</i>	R0	0.25 – 1	-
<i>Very Weak</i>	R1	1 – 5	-
<i>Weak</i>	R2	5 – 25	-
<i>Medium Strong</i>	R3	25 – 50	1 – 2
<i>Strong</i>	R4	50 – 100	2 – 4
<i>Very Strong</i>	R5	100 – 250	4 – 10
<i>Extremely Strong</i>	R6	> 250	> 10

Rock Weathering Descriptors

Term	Symbol	Description
<i>Fresh</i>	W1	No visible signs of rock weathering, slight discoloration along major discontinuities
<i>Slightly</i>	W2	Discoloration indicates weathering of rock on discontinuity surfaces, all rock material may be discoloured
<i>Moderately</i>	W3	Less than half of the rock is decomposed and/or disintegrated into the soil.
<i>Highly</i>	W4	More than half of the rock is decomposed and/or disintegrated into the soil.
<i>Completely</i>	W5	All the rock material is decomposed and/or disintegrated into the soil, original mass is still largely intact.
<i>Residual Soil</i>	W6	All the rock converted to the soil. Structure and fabric destroyed.



DWN.: GM

CKD.: MCR

DATE DRILLED: 2021-10-14

JOB NO.: 2110264

HOLE NO.: BH21-01

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓
10 20 30 40 50

DEPTH
ft m

ELEVATION (m)

SOIL SYMBOL

LOCATION: See Exploration Location Plan
COORD.: LAT 48.01971 LON -66.72543

SAMPLES

DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE / RECOVERY

OTHER TESTS/NOTES
WELL DETAILS

ROOTMAT / TOPSOIL

GLACIOMARINE DEPOSIT

Lean CLAY, stiff, bluish grey

Lean CLAY, some sand to sandy SILT, very soft to firm/very loose to loose, stratified, wet, bluish grey

END OF BOREHOLE AT 9.14m

SS 1

N10 / R500

SS 2

N15 / R150

SS 3

N5 / R600

∅

SS 4

N4 / R600

SS 5

N2 / R600

∅

SS 6

N2 / R600

∅

SS 7

N5 / R330

∅

SS 8

N2 / R480

SS 9

N3 / R485

∅

SS 10

N7 / R460

SS 11

N3 / R510

∅



97 Troop Avenue
Dartmouth NS
B3B 2A7

BOREHOLE RECORD BH21-02

CLIENT: Listuguj Mi'gmaq Government

PROJECT: New Police Barracks, Lot 6177986 Route 132, Listuguj, Quebec

DWN.: GM

CKD.: MCR

DATE DRILLED: 2021-10-14

JOB NO.: 2110264

HOLE NO.: BH21-02

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓
10 20 30 40 50

DEPTH
ft m

ELEVATION
(m)

SOIL
SYMBOL

LOCATION: See Exploration Location Plan
COORD.:LAT 48.01969 LON -66725446.00000

SAMPLES

DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE /
RECOVERY

OTHER TESTS/NOTES
WELL DETAILS

ROOTMAT / TOPSOIL

OUTWASH DEPOSIT

SAND and GRAVEL, some cobbles and
boulders, compact, greyish brown

SS
1

N12 / R435

GLACIOMARINE DEPOSIT

Lean CLAY, some sand to sandy SILT, soft
to firm/very loose to loose, stratified, wet,
bluish grey

SS
2

N41 / R280

SS
3

N3 / R510

SS
4

N3 / R330

SS
5

N4 / R400

SS
6

N6 / R600

Ø / MA

SS
7

N5 / R600

SS
8

N4 / R400

SS
9

N4 / R0

SS
10

N6 / R150

SS
11

N3 / R460

Lean CLAY, wet, soft, bluish grey

END OF BOREHOLE AT 9.14m

12



97 Troop Avenue
Dartmouth NS
B3B 2A7

BOREHOLE RECORD BH21-03

CLIENT: Listuguj Mi'gmaq Government

PROJECT: New Police Barracks, Lot 6177986 Route 132, Listuguj, Quebec

DWN.: GM

CKD.: MCR

DATE DRILLED: 2021-10-14

JOB NO.: 2110264

HOLE NO.: BH21-03

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓
10 20 30 40 50

DEPTH
ft m

ELEVATION
(m)

SOIL
SYMBOL

LOCATION: See Exploration Location Plan
COORD.: LAT 48.01964 LON -66.72531

SAMPLES

DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE /
RECOVERY

OTHER TESTS/NOTES
WELL DETAILS

ROOTMAT / TOPSOIL

OUTWASH DEPOSIT

SAND and GRAVEL, some cobbles and
boulders, compact, greyish brown

SS
1

N14 / R200

GLACIOMARINE DEPOSIT

Lean CLAY, some sand to sandy SILT, firm
to stiff/very loose to loose, stratified, wet,
bluish grey

SS
2

N22 / R75

SS
3

N8 / R400

SS
4

N8 / R510

SS
5

N5 / R600

SS
6

N7 / R480

SS
7

N3 / R600

SS
8

N5 / R400

SS
9

N4 / R600

SS
10

N7 / R430

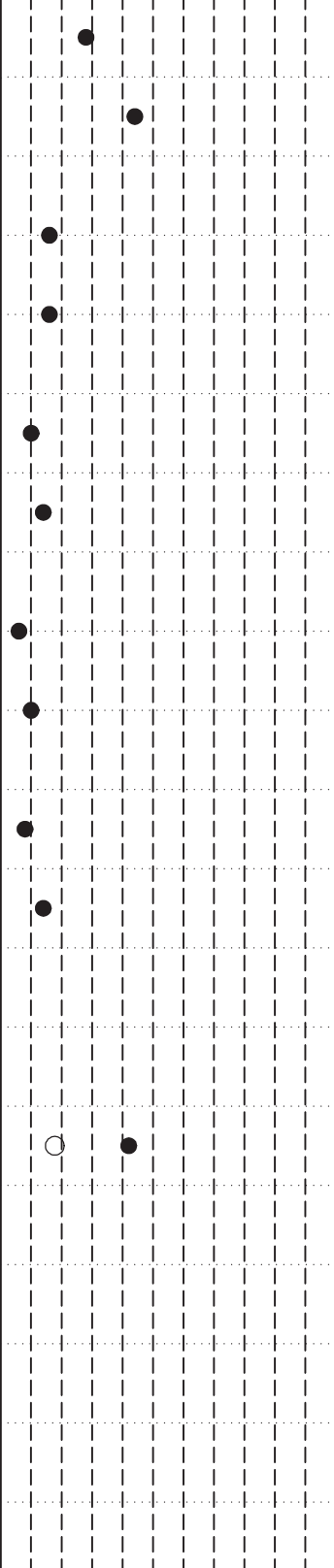
SS
11

N21 / R300

Ø / MA

Sandy GRAVEL, some silt, compact, bluish
grey

END OF BOREHOLE AT 9.14m





97 Troop Avenue
Dartmouth NS
B3B 2A7

BOREHOLE RECORD BH21-04

CLIENT: Listuguj Mi'gmaq Government

PROJECT: New Police Barracks, Lot 6177986 Route 132, Listuguj, Quebec

DWN.: GM

CKD.: MCR

DATE DRILLED: 2021-10-14

JOB NO.: 2110264

HOLE NO.: BH21-04

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓
10 20 30 40 50

DEPTH
ft m

ELEVATION (m)

SOIL SYMBOL

LOCATION: See Exploration Location Plan
COORD.: LAT 48.01959 LON -66.72547

SAMPLES

DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE / RECOVERY

OTHER TESTS/NOTES
WELL DETAILS

ROOTMAT / TOPSOIL

OUTWASH DEPOSIT
SAND and GRAVEL, some cobbles and
boulders, loose, greyish brown

GLACIOMARINE DEPOSIT
Lean CLAY, some sand to sandy SILT, very
soft to stiff/very loose to loose, stratified, wet,
bluish grey

Sandy GRAVEL, some silt, compact, bluish
grey

END OF BOREHOLE AT 10.42m

SS 1

N7 / R200

SS 2

N5 / R320

SS 3

N5 / R0

SS 4

N7 / R100

SS 5

N8 / R600

SS 6

N6 / R600

SS 7

N0 / R255

SS 8

N5 / R200

SS 9

N4 / R330

PI

SS 10

N0 / R0

SS 11

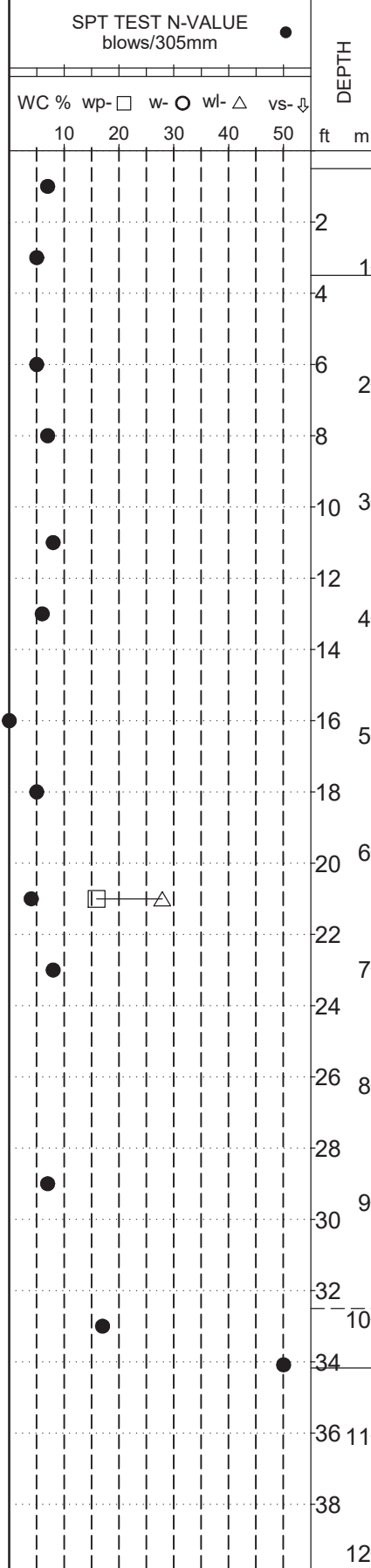
N7 / R300

SS 12

N17 / R255

SS 13

N50 / R50





DWN.: GM

CKD.: MCR

DATE DRILLED: 2022-02-28

JOB NO.: 2110264

HOLE NO.: BH22-05

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓

DEPTH
ft m

ELEVATION (m)

SOIL SYMBOL

LOCATION: See Exploration Location Plan
COORD.:LAT 48.01977 LON -66.72592

SAMPLES

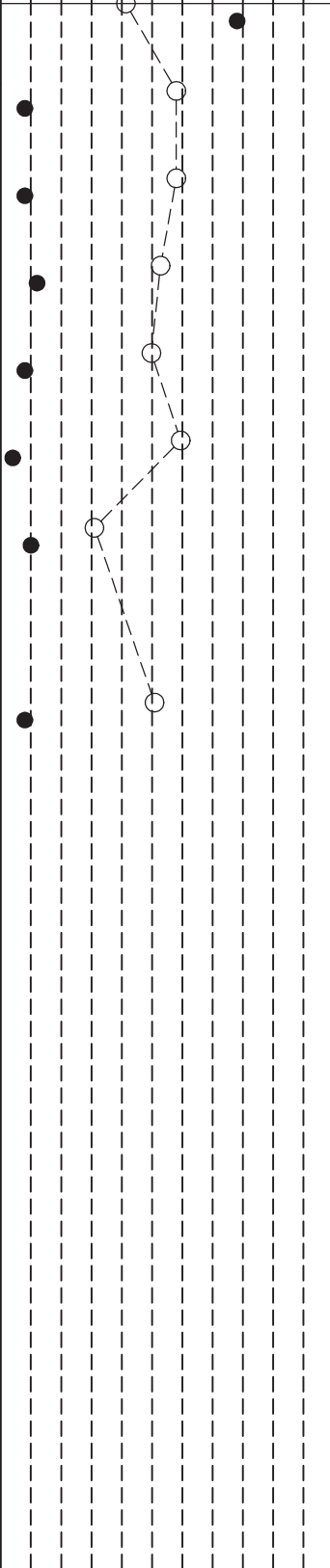
DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE / RECOVERY

OTHER TESTS/NOTES
WELL DETAILS



OUTWASH DEPOSIT
SILT, some gravel, dense, reddish brown

GLACIOMARINE DEPOSIT
Lean CLAY, some sand to sandy SILT, trace gravel, very soft to firm/very loose to loose, stratified, wet, grey



- SS 01
- SS 02
- SS 03
- SS 04
- SS 05
- SS 06
- SS 07
- SS 08
- AU 09
- CPT 10
- CPT 11
- CPT 12
- CPT 13
- CPT 14

N39 / R200
N4 / R450
N4 / R510
N6 / R600
N4 / R600
N2 / R600
N5 / R600
N4 / R110

Ø
Ø / MA / PI
Ø
Ø
Ø
Ø
Ø / MA / PI
Ø
9-9-9-8-8-9-10-10
10-10-10-10-11-13-11-13-16
14-14-14-16-16-17-18-18
18-18-16-20-20-21-22-19-17-22
22-24-24-24-23-23-23-27-30-31

END OF BOREHOLE AT 25.63m ON BEDROCK REFUSAL



DWN.: GM		CKD.: MCR		DATE DRILLED: 2022-02-28		JOB NO.: 2110264		HOLE NO.: BH22-06	
SPT TEST N-VALUE blows/305mm		DEPTH ft m	ELEVATION (m)	SOIL SYMBOL	LOCATION: See Exploration Location Plan COORD.: LAT 48.01965 LON -66.72540	SAMPLES		DRILL TYPE/METHOD: CME55 Trackmount Drill Rig, Solid Stem Augers	
WC %	wp-□					w-○	wl-△	vs-↓	TYPE / No.
10	20	30	40	50	SUBSURFACE DESCRIPTION				
					OUTWASH DEPOSIT SILT, some gravel, compact, reddish brown				
					GLACIOMARINE DEPOSIT Lean CLAY, some sand to sandy SILT, trace gravel, soft to firm/loose, stratified, wet, grey				
						SS 1	N17 / R350		
						SS 2	N7 / R270		
						VANE 3		32 kPa	
						VANE 5		23 kPa	
						SS 6	N4 / R0		
						SS 7	N50 / R100		
					GRAVEL Sandy GRAVEL, some silt, very dense, bluish grey				
					END OF BOREHOLE AT 10.87m ON BEDROCK REFUSAL				



DWN.: GM		CKD.: MCR		DATE DRILLED: 2022-03-01		JOB NO.: 2110264		HOLE NO.: BH22-07			
SPT TEST N-VALUE blows/305mm		DEPTH ft m	ELEVATION (m)	SOIL SYMBOL	LOCATION: See Exploration Location Plan COORD.: LAT 48.01957 LON -66.72520	SAMPLES		DRILL TYPE/METHOD: CME55 Trackmount Drill Rig, Solid Stem Augers			
WC %	wp- □					w- ○	wl- △	vs- ↓	TYPE / No.	N-VALUE / RECOVERY	OTHER TESTS/NOTES WELL DETAILS
10	20	30	40	50	SUBSURFACE DESCRIPTION						
●					TOPSOIL / ROOTMAT						
					GLACIOMARINE DEPOSIT Lean CLAY, some sand to sandy SILT, trace gravel, trace cobbles, soft to hard/loose to very dense, stratified, wet, grey						
						SS 1	N39 / R200				
						SS 2	N4 / R450				
						VANE 3			321 kPa		
						SS 4	N17 / R150				
						SS 5	N53 / R300				
						SS 6	N50 / R50				
					INFERRED BEDROCK Sandy GRAVEL, very dense, grey END OF BOREHOLE AT 7.72m ON BEDROCK REFUSAL						



97 Troop Avenue
Dartmouth NS
B3B 2A7

BOREHOLE RECORD BH22-08

CLIENT: Listuguj Mi'gmaq Government

PROJECT: New Police Barracks, Lot 6177986 Route 132, Listuguj, Quebec

DWN.: GM

CKD.: MCR

DATE DRILLED: 2022-03-01

JOB NO.: 2110264

HOLE NO.: BH22-08

SPT TEST N-VALUE
blows/305mm

WC % wp-□ w-○ wl-△ vs-↓
10 20 30 40 50

DEPTH
ft m

ELEVATION
(m)

SOIL
SYMBOL

LOCATION: See Exploration Location Plan
COORD.: LAT 48.01988 LON -66.72438

SAMPLES

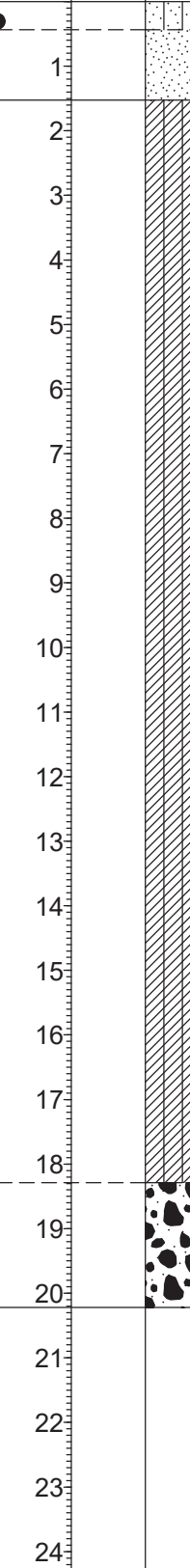
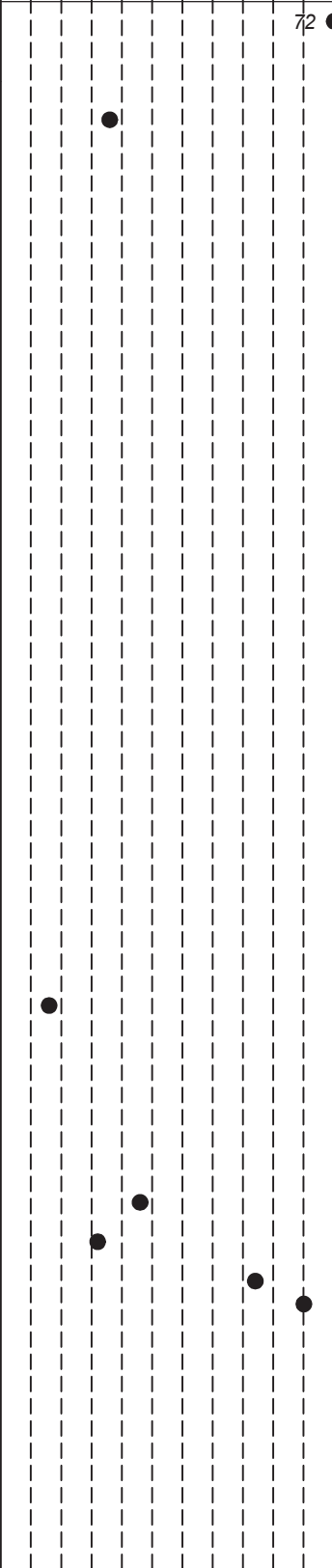
DRILL TYPE/METHOD:
CME55 Trackmount
Drill Rig, Solid Stem
Augers

SUBSURFACE DESCRIPTION

TYPE / No.

N-VALUE /
RECOVERY

OTHER TESTS/NOTES
WELL DETAILS



OUTWASH DEPOSIT
Sandy SILT, very dense, reddish brown
Sandy SILT, some gravel, very dense, grey

GLACIOMARINE DEPOSIT
Lean CLAY, some sand to sandy SILT, trace gravel, soft to very stiff/loose to compact, stratified, wet, grey

GRAVEL
Sandy GRAVEL, some silt, compact to very dense, bluish grey

END OF BOREHOLE AT 20.22m ON BEDROCK REFUSAL

SS 1 N75 / R560

SS 2 N18 / R320

VANE 3 114 kPa

VANE 4 45 kPa

VANE 5 69 kPa

VANE 6 92 kPa

VANE 7 92 kPa

VANE 8 92 kPa

VANE 9 45 kPa

SS 10 N8 / R600

SS 11 N23 / R200

SS 12 N16

SS 13 N42

SS 14 N50

OTHER TESTS/NOTES
WELL DETAILS

Appendix C

Laboratory Test Results



eNGLOBE



215 Horsman Road, Unit 4
Moncton, NB E1E 0J9

GRADATION CURVES

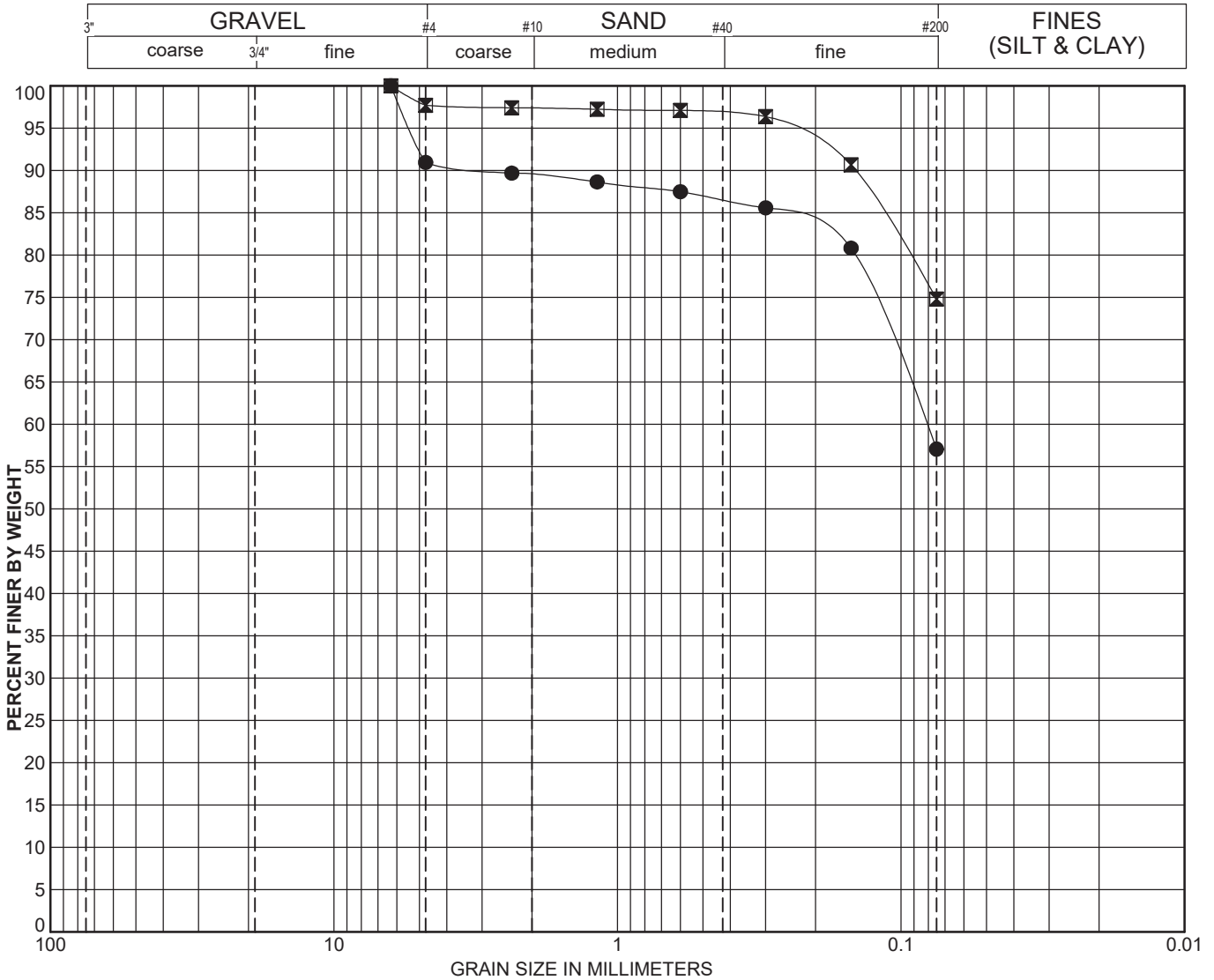
FIGURE No. 1 Page 1 of 1

CLIENT Listuguj Mi'gmaq Government

PROJECT NAME New Police Barracks

PROJECT NUMBER 2110264

PROJECT LOCATION Lot 6177986 Route 132, Listuguj, Quebec



Specimen Identification	Classification / Notes				MC%	LL	PL	PI	Cc	Cu
● BH22-05 9.45m	Sandy Silt, trace gravel				29.0	NP	NP	NP		
▣ BH22-05 9.45m	Sandy Silt, trace gravel				15.5	NP	NP	NP		
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● BH22-05 9.45m	6.30	0.08			9.0	33.9	57.1			
▣ BH22-05 9.45m	6.30				2.3	22.9	74.8			

Reference Test Standard(s):

ASTM C136 / C136M-14 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM C117-13 - Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing

ENGLOBE MONCTON GRAIN SIZE - ENGLOBE_P138_DATA_TEMPLATE_03-2017.GDT - 22-3-15 16:40 - C:\2021\2110264 NEW POLICE STATION\GEO\TECH\ALLOGS_2110264_POLICE BARRACKS_LISTUGUJ_20211014_GM.GPJ



1077 St. George Boulevard Blvd, Suite 400
 Moncton, NB E1E 4C9

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 F 506.857.2753

SUMMARY OF LABORATORY RESULTS

CLIENT Listuguj Mi'gmaq Government **PROJECT NAME** New Police Barracks

PROJECT NUMBER 2110264 **PROJECT LOCATION** Lot 6177986 Route 132, Listuguj, Quebec

Borehole	Depth (m)	Sample Type	Water Content (%)	% Gravel	% Sand	% Fines	Liquid Limit	Plastic Limit	Plasticity Index	UCS or Organic Content
BH21-01	1.83	CLAY	23.2							
BH21-01	3.35	CLAY	27.9							
BH21-01	3.96	CLAY	27.5							
BH21-01	4.88	CLAY	30.2							
BH21-01	6.40	CLAY	28.8							
BH21-01	8.84	CLAY	29.1							
BH21-02	3.96	CLAY	26.6	0.0	15.9	84.1				
BH21-03	8.84	GRAVEL	8.9	54.7	28.5	16.8				
BH21-04	6.40	CLAY					27.9	15.9	12.0	

LAB SUMMARY - GINT STD US LAB.GDT - 21-10-27 13:31 - Z:\SHARED\CAMONCTON\SHARES\MONWORK\2021\2110264 NEW POLICE STATION\GEOTECHNICAL\LOGS_2110264_POLICE BARRACKS_LISTUGUJ_20211014_GM.GPJ



215 Horsman Road, Unit 4
Moncton, NB E1E 0J9

SUMMARY OF LABORATORY RESULTS

CLIENT Listuguj Mi'gmaq Government

PROJECT NAME New Police Barracks

PROJECT NUMBER 2110264

PROJECT LOCATION Lot 6177986 Route 132, Listuguj, Quebec

Borehole	Depth (m)	Sample Type	Water Content (%)	% Gravel	% Sand	% Fines	Liquid Limit	Plastic Limit	Plasticity Index	UCS or Organic Content
BH22-05	0.30	FILL	20.7							
BH22-05	1.83	SILT	29.0	9.0	33.9	57.1	NP	NP	NP	
BH22-05	3.35	SILT	29.0							
BH22-05	4.88	SILT	26.4							
BH22-05	6.40	SILT	24.9							
BH22-05	7.92	SILT	29.7							
BH22-05	9.45	SILT	15.5	2.3	22.9	74.8	NP	NP	NP	
BH22-05	12.50	SILT	25.4							

LAB SUMMARY - GINT STD US LAB.GDT - 22-3-15 16:21 - O:\2021\2110264 NEW POLICE STATION\GEO\TECH\LOGS_2110264_POLICE BARRACKS_LISTUGUJ_20211014_GM.GPJ



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