Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Réception des soumissions - TPSGC / Bid Receiving - PWGSC
1550, Avenue d'Estimauville
1550, D'Estimauville Avenue
Québec
Québec
G1J 0C7

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

Proposal To: Public Works and Government Services Canada

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

Proposition aux: Travaux Publics et Services Gouvernementaux Canada

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet
Exp-Conseil Quai 93 & 94

Solicitation No. - N° de l'invitation	**Date**
EE517-180117/A	2017-06-22

Client Reference No. - N° de référence du client
EE517-180117

GETS Reference No. - N° de référence de SEAG
PW-$QCM-008-17147

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
QCM-7-40014 (008)	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2017-08-02

Time Zone
Fuseau horaire
Heure Avancée de l'Est
HAE

F.O.B. - F.A.B.
Plant-Usine: ☐ **Destination:** ☑ **Other-Autre:** ☐

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Rochette, Jean	qcm008

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(418) 649-2834 ( )	(418) 648-2209

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
Quai 93 &94
Base de la Garde côtière
101, boul. Champlain
Québec, QC, Canada

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
Voir doc	

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Telephone No. - N° de téléphone
Facsimile No. - N° de télécopieur

Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)
Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

Issuing Office - Bureau de distribution
TPSGC-PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

Canada

REQUEST FOR PROPOSAL (RFP)

TITLE: RECONSTRUCTION OF WHARVES 93 AND 94

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SI1 INTRODUCTION

1. Public Works and Government Services Canada (PWGSC) intends to retain an individual consulting firm or joint venture to provide the professional services for the project as set out in this Request for Proposal (RFP).

2. This is a single phase selection process. The nature of the services required and strict time frames to implement this project do not allow sufficient time to conduct the usual two phases selection process.

3. Proponents responding to this RFP are requested to submit a full and complete proposal. The proposal will cover not only the qualifications, experience and organization of the proposed Consultant Team, but also the detailed approach to the work, and the pricing and terms offered. A combination of the technical and price of services submissions will constitute the proposal.

SI2 PROPOSAL DOCUMENTS

1. All instructions, general terms, conditions and clauses identified in the RFP by number, date and title, are hereby incorporated by reference into and form part of this solicitation and any resultant contract.

   All instructions, general terms, conditions and clauses identified in the RFP by number, date and title, are set out in the Standard Acquisition Clauses and Conditions Manual (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

2. The following are the proposal documents:

   (a) Supplementary Instructions to Proponents (SI);
   R1410T (2016-04-04), General instructions (GI) – Architectural and/or Engineering services – Request for Proposal;
   Submission Requirements and Evaluation (SRE);

   Subsection 2.b. of section GI16, Submission of proposal of R1410T, incorporated by reference above, is deleted in its entirety and replaced with the following:

   b. send its proposal only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit specified on page 1 of the RFP;

   (b) the general terms, conditions and clauses, as amended, identified in the Agreement clause;

   (c) Project Brief / Terms of Reference;

   (d) the document entitled "Doing Business ";

   (e) any amendment to the solicitation document issued prior to the date set for receipt of proposals; and

   (f) the proposal, Declaration/Certifications Form and Price Proposal Form.

3. Submission of a proposal constitutes acknowledgment that the Proponent has read and agrees to

be bound by these documents.

SI3 QUESTIONS OR REQUEST FOR CLARIFICATION

Questions or requests for clarification during the solicitation period must be submitted in writing to the Contracting Authority named on the RFP - Page 1 as early as possible. Enquiries should be received no later than five (5) working days prior to the closing date identified on the front page of the Request for Proposal. Enquiries received after that date may not be answered prior to the closing date of the solicitation.

SI4 CANADA'S TRADE AGREEMENTS

This procurement is subject to the provisions of the North American Free Trade Agreement (NAFTA), the World Trade Organization - Agreement on Government Procurement (WTO-AGP).

SI5 CERTIFICATIONS

1. **Integrity Provisions – Declaration of Convicted Offences**
In accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Proponent must **provide with its bid**, **as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3b**.

2. **Federal Contractors Program for Employment Equity - Proposal Certification**

By submitting a proposal, the Proponent certifies that the Proponent, and any of the Proponent's members if the Proponent is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Employment and Social Development Canada (ESDC) - Labour's website.

Canada will have the right to declare a proposal non-responsive if the Proponent, or any member of the Proponent if the Proponent is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

Canada will also have the right to terminate the Agreement for default if a Consultant, or any member of the Consultant if the Consultant is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list during the period of the Agreement.

The Proponent must provide the Contracting Authority with a completed Federal Contractors Program for Employment Equity - Certification (see Appendix B - Declaration/Certifications Form), before contract award. If the Proponent is a Joint Venture, the Proponent must provide the Contracting Authority with a completed Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

SI6 - WEBSITES

The connection to some of the Web sites in the RFP is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Employment Equity Act
http://laws-lois.justice.gc.ca/eng/acts/E-5.401/index.html

Federal Contractors Program (FCP)
http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/index.shtml

Certificate of Commitment to Implement Employment Equity form LAB 1168
http://www.servicecanada.gc.ca/cgi-bin/search/eforms/index.cgi?app=profile&form=lab1168&dept=sc&lang=e

Ineligibility and Suspension Policy
http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html

Code of Conduct for Procurement
http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html

Lobbying Act
http://laws-lois.justice.gc.ca/eng/acts/L-12.4/?noCookie

Buy and Sell
https://buyandsell.gc.ca/

Supplier Registration Information
https://srisupplier.contractscanada.gc.ca

Consultant Performance Evaluation Report Form
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/2913-1.pdf

Canadian economic sanctions
http://www.international.gc.ca/sanctions/index.aspx?lang=eng

National Joint Council (NJC) Travel Directive
http://www.njc-cnm.gc.ca/directive/travel-voyage/index-eng.php

TERMS, CONDITIONS AND CLAUSES

AGREEMENT

1. The Consultant understands and agrees that upon acceptance of the offer by Canada, a binding Agreement shall be formed between Canada and the Consultant and the documents forming the Agreement shall be the following:

   (a) the Front Page and this Agreement clause;
   (b) the General Terms, Conditions and Clauses, as amended, identified as:
   R1210D (2016-04-04), General Condition (GC) 1 - General Provisions – Architectural and/or Engineering Services
   R1215D (2016-01-28), General Condition (GC) 2 - Administration of the Contract – Architectural and/or Engineering Services
   R1220D (2015-02-25), General Condition (GC) 3 - Consultant Services
   R1225D (2015-04-01), General Condition (GC) 4 - Intellectual Property
   R1230D (2016-01-28), General Condition (GC) 5 - Terms of Payment – Architectural and/or Engineering Services
   R1235D (2011-05-16), General Condition (GC) 6 - Changes
   R1240D (2011-05-16), General Condition (GC) 7 - Taking the Services Out of the Consultant's Hands, Suspension or Termination
   R1245D (2016-01-28), General Condition (GC) 8 - Dispute Resolution – Architectural and/or Engineering Services
   R1250D (2015-07-03), General Condition (GC) 9 - Indemnification and Insurance

   Section GC1.1 of R1210D, Definitions, incorporated by reference above, is amended as follows:

   ADD:

   "Architectural and Engineering Services":
   means services to provide a range of investigation and recommendation reports, planning, design, preparation, or supervision of the construction, repair, renovation or restoration of a work and includes contract administration services, for real property projects.

   "Construction Services":
   means construction, repair, renovation or restoration of any work except a vessel and includes; the supply and erection of a prefabricated structure; dredging; demolition; environmental services related to a real property; or, the hire of equipment to be used in or incidentally to the execution of any construction services referred to above.

   "Facility Maintenance Services":
   means services related to activities normally associated with the maintenance of a facility and keeping spaces, structures and infrastructure in proper operating condition in a routine, scheduled, or anticipated fashion to prevent failure and degradation including inspection, testing, servicing, classification as to serviceability, repairs, rebuilding and reclamation, as well as cleaning, waste removal, snow removal, lawn care, replacement of flooring, lighting or plumbing fixtures, painting and other minor works.

   Section GC1.12 of R1210D, Not applicable, incorporated by reference above, is deleted in its entirety and replaced with the following:

   R1210D CG1.12 (2016-04-04) Performance evaluation - contract

1. Consultants shall take note that the performance of the Consultant during and upon completion of the services shall be evaluated by Canada. The evaluation includes all or some of the following criteria:
   a. Design
   b. Quality of Results
   c. Management
   d. Time
   e. Cost

2. A weighting factor of 20 points will be assigned to each of the five criteria as follows:
   a. Unacceptable: 0 to 5 points
   b. Not satisfactory: 6 to 10 points
   c. Satisfactory: 11 to 16 points
   d. Superior: 17 to 20 points

3. The consequences resulting from the performance evaluation are as follows:
   a. For an overall rating of 85% or higher, a congratulation letter is sent to the Consultant.
   b. For an overall rating of between 51% and 84%, a standard, meets expectations, letter is sent to the Consultant.
   c. For an overall rating of between 30% and 50%, a warning letter is sent to the Consultant indicating that if, within the next two (2) years, they receive 50% or less on another evaluation, the firm may be suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.
   d. For an overall rating of less than 30%, a suspension letter is sent to the Consultant indicating that the firm is suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.
   e. For a rating of 5 points or less on any one criterion, a suspension letter is sent to the Consultant indicating that the firm is suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.

The form PWGSC-TPSGC 2913-1, Select - Consultant Performance Evaluation Report (CPERF), is used to record the performance.

Supplementary Conditions
Agreement Particulars

(c) Project Brief / Terms of Reference;
(d) the document entitled "Doing Business";
(e) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
(f) the proposal, the Declaration/Certifications Form and the Price Proposal Form.

2. The documents identified above by title, number and date are hereby incorporated by reference into

and form part of this Agreement, as though expressly set out herein, subject to any other express terms and conditions herein contained.

The documents identified above by title, number and date are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual

3. If there is a discrepancy between the wording of any documents that appear on the following list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

   (a) any amendment or variation in the Agreement that is made in accordance with the terms and conditions of the Agreement;
   (b) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
   (c) this Agreement clause;
   (d) Supplementary Conditions;
   (e) General Terms, Conditions and Clauses;
   (f) Agreement Particulars;
   (g) Project Brief / Terms of Reference;
   (h) the document entitled "Doing Business with National Capital Area";
   (i) the proposal.

SUPPLEMENTARY CONDITIONS (SC)

SC1 LANGUAGE REQUIREMENTS

Use the following in Agreements where the consultant must be capable to provide services in both official languages.

1. Communication between Canada and the Consultant shall be in the language of choice of the Consultant Team, which shall be deemed to be the language of the Consultant's proposal.

2. The Consultant's services during construction tender call (such as addenda preparation, tenderers' briefing meetings, technical answers to questions by bidders, including translation of bidder's questions) shall be provided expeditiously in both languages, as necessary.

3. The Consultant's services during construction shall be provided in the language of choice of the Contractor. The successful Contractor will be asked to commit to one or other of Canada's official languages upon award of the Construction Contract and, thereafter construction and contract administration services will be conducted in the language chosen by the Contractor.

4. Other required services in both of Canada's official languages (such as construction documentation) are described in detail in the Project Brief.

5. The Consultant Team, including the Prime Consultant, Sub-Consultants and Specialists Consultants shall ensure that the services being provided in either language shall be to a professional standard.

SC2 OPTIONAL WORK

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Section Required Services of the Contract under the same conditions and at the prices and/or rates stated

in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time during the contract.

SC3 FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - DEFAULT BY THE CONSULTANT

The Consultant understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Consultant and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the contract. If the AIEE becomes invalid, the name of the Consultant will be added to the "FCP Limited Eligibility to Bid" list. The imposition of such a sanction by ESDC will constitute the Consultant in default as per the terms of the contract.

AGREEMENT PARTICULARS

The Agreement Particulars will be issued at time of award of contract and will identify the fee to be paid to the Consultant for the services determined in the Price Proposal Form.

SUBMISSION REQUIREMENTS AND EVALUATION

SRE 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

An "Overview of the Selection Procedure" can be found in R1410T General Instructions to Proponents (GI3).

1.2 Calculation of Total Score

For this project the Total Score will be established as follows:

Technical Rating x 90 %=		Technical Score (Points)
Price Rating x 10 %	=	Price Score (Points)
Total Score	=	Maximum of 100 points

SRE 2 PROPOSAL REQUIREMENTS

2.1 Requirement for Proposal Format

The following proposal format information should be implemented when preparing the proposal:

1. Submit one (1) bound original plus five (5) bound copies of the proposal.
2. Paper size should be – 216 mm x 279 mm (8.5" x 11").
3. Minimum font size - 11 point Times or equal.
4. Minimum margins - 12 mm left, right, top, and bottom.
5. Double-sided submissions are preferred.
6. One « page » means one side of a sheet of paper.
7. 11" x 17" (279 mm x 432 mm) fold-out sheets for spreadsheets, organization charts, etc., will be counted as two pages.

8. The order of the proposals should follow the order established in the Request for Proposal SRE section.

2.2 Specific Requirements for Proposal Format

The maximum number of pages (including text and graphics) to be submitted for the Rated Requirements under SRE 3.2 is thirty (30) pages.

The following are not part of the page limitation mentioned above:

1. Covering letter
2. Consultant team identification (Appendix A)
3. Declaration/certification forms (Appendix B)
4. Code of Conduct Certifications
5. Front page of the RFP
6. Front page of revision(s) to the RFP
7. Price Proposal Form (Appendix C)

Consequence of non-compliance: any pages which extend beyond the above page limitation and any other attachments will be extracted from the proposal and will not be forwarded to the PWGSC Evaluation Board members for evaluation.

SRE 3 SUBMISSION REQUIREMENTS AND EVALUATION

3.1 Mandatory Requirements

Failure to meet the mandatory requirements will render the proposal as non-responsive and no further evaluation will be carried out.

3.1.1 Consultant Team Identification

The proponent shall be a Consulting Engineering firm, licensed to provide the necessary professional services to the full extent that may be required by provincial or territorial law in the province of Québec.

3.1.2 Consultant Team Identification

The Consultant team to be identified must include the following:

1. Proponent (Prime Consultant) – Marine Engineering (wharves structures)
2. Key-Sub-consultants/Specialists- Consultant on timetables

If the Proponent proposes to provide multi-disciplinary services which might otherwise be performed by a sub-consultant, this should be mentioned here.

Information required:

1. Name of firm, key personnel to be assigned to the project;
2. For the Prime Consultant, indicate current license and/or how you intend to meet the provincial or territorial licensing requirements.
3. In the case of a joint venture identify the existing or proposed legal form of the joint venture (refer to R1410T General Instructions to Proponents, GI9 Limitation of Submissions).

An example of an acceptable format (typical) for submission of the team identification information is provided in Appendix A.

3.1.3 Declaration/Certifications Form

Proponents must complete, sign and submit Appendix B, Declaration/Certifications Form, as required.

3.1.4 Integrity Provisions – Required documentation

In accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Proponent must provide, **as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal**, section 3a.**

3.2 Rated Requirements

3.2.1 Achievements of Proponent on Projects

Describe the Proponent's accomplishments, achievements and experience as prime consultant on similar projects.

The proponent must demonstrate that since June 1, 2007, he himself, or his key personnel have participated to different design and construction projects requiring a comprehensive continuum of services such as described in sections Required Services (RS 1 to 7).

Submit four (4) port structure projects of comparable complexity as described in the "Project Brief". Of these four projects, proponents are permitted to submit one project for a steel pile slab that is not a port structure. The four projects are to be undertaken after June 1, 2007 and completed.

Joint venture submissions are not to exceed the maximum number of projects. Only the first four (4) projects listed in sequence will receive consideration and any others will receive none as though not included.

Similarities and comparable aspects for port structure projects include:

1. Steel sheet & pile combination wall or steel sheet
2. Rock anchoring and socketing

Similarities and comparable aspects for projects of slab on steel piles include:

1. Piles
2. Structural slab

Information that should be supplied:

1. Clearly indicate how this project is comparable/relevant to the requested project;
2. Brief project description and intent. Narratives should include a discussion of design philosophy / approach to meet the intent, design challenges and resolutions;
3. Scope of services performed and objectives, constraints and deliverables, as well as dates at which prior services were rendered;
4. Budget control and management - i.e. contract price and final construction cost - explain variation;
5. Project schedule control and management - i.e., initial schedule and revised schedule - explain variation;
6. Client references - name, address, phone and fax of client contact at working level - references may be checked;
7. Names of key personnel responsible for project delivery;
8. Awards received.

The Proponent (as defined in R1410T General Instructions to Proponents, GI2 Definitions) must possess the knowledge on the above projects. Past project experience from entities other than the Proponent will not be considered in the evaluation unless these entities form part of a joint venture Proponent.

Please indicate those projects which were carried out in joint venture and the responsibilities of each of the entities involved in each project

3.2.2 Achievements of Key Personnel on Projects

Demonstrate that the personnel identified as members of the proposed work team meet the essential requirements in terms of capacity, experience and qualifications to perform the full continuum of services listed in the Required Services (RS) section.

The key persons identified below are members of the proponent's personnel who will be called upon to perform the full continuum of services listed in the Required Services section (RS).

To this end, submit four (4) port structure projects of comparable complexity as described in the "Project Brief". Of these four projects, proponents are permitted to submit one project for a steel pile slab that is not a port structure. The four projects are to be undertaken after June 1, 2007 and completed.

Describe the experience and performance of key personnel to be assigned to this project regardless of their past association with the current proponent firm. This is the opportunity to emphasize the strengths of the individuals on the team, to recognize their past responsibilities, commitments and achievements.

For each key-person, Submit four (4) port structure projects of comparable complexity as described in the

"Project Brief". Of these four projects, proponents are permitted to submit one project for a steel pile slab that is not a port structure. The four projects are to be undertaken after June 1, 2007 and completed. Only the first four (4) projects listed in sequence will receive consideration and any others will receive none as though not included.

Similarities and comparable aspects are identical to those described in 3.2.1

For the Project manager and the principal supervisor, present for each four (4) major marine projects costing more than $ 5 million. Of these four projects, proponents are permitted to submit one project for a steel pile slab that is not a marine structure. The four projects must be undertaken after June 1, 2007 and completed.

Only the first four (4) projects listed in sequence will receive consideration and any others will receive none as though not included

Information that should be supplied for each key personnel:

1. Professional accreditation;
2. Accomplishments/achievements/awards;
3. Relevant experience, expertise, number of years' experience;
4. Role, responsibility and degree of involvement of individual in past projects;
5. Client references: name, address, phone number and e-mail of client contact at working level; references may be checked.

For each of the following key-person, demonstrate the experience acquired assuming same status and role in previous projects. For the approver, the experience gained may be as an approver or designer.

1. **Project manager**: senior engineer with experience in the management of harbour structures;
2. **Design team**
   a. Senior designer: senior structural engineer (1)
   b. Assistant designer: intermediate structural engineer (1)
   c. Approver (Design Engineer to approve structural drawings): senior engineer in structures (1).
   d. Draftsperson in charge of drawing the structural plans: senior draftsperson (2).
3. **Senior Supervisor :** experience as a senior supervisor of marine structure;
4. **Assistant supervisor (**intermediate technician**):** experienced in construction supervision (2)

(1): The name of this person to appear in the title box of the drawings pertaining to that specialty. The designers are responsible for the design and also the elaboration of the most relevant sections of the specifications.

(2) Not included in the evaluation.(Cf. 3.3: Evaluating and rating). CVs of non evaluated resources to be appended. It is therefore not necessary to present their achievements. However, their CV must be appended to the proposal in the same way as all members of the project team

NB: The design Engineer in charge may not be the person who will approve the drawings.

3.2.3 Understanding of the Project

The proponent should demonstrate understanding of the goals of the project, the functional/technical requirements, the constraints and the issues that will shape the end product.

Information that should be supplied:

1. In your own words, explain the functional and technical requirements of project;

2. Broader goals (federal image, sustainable development, sensitivities);
3. Significant issues, challenges and constraints, including the risks and how your team's approach will apply to the issues and challenges at hand.
4. Project schedule and cost; review schedule and cost information and assess risk management elements that may affect the project.

3.2.4 Scope of services

The proponent shall demonstrate his capability to perform the services, to meet the challenges and solve the constraints; to address the project issues and to provide a plan of action allowing to deliver a quality product to the client's requirements at all stages of the project. Submit scope of services briefly.

Information that should be supplied:

1. Scope of services - detailed list of services;
2. Work plan – detailed breakdown of work tasks and deliverables;
3. Project schedule - proposed major milestone schedule;
4. Risk management strategy.

3.2.5 Management of services

The Proponent should describe how he/she proposes to perform the services and meet the constraints, how the services will be managed to ensure continuing and consistent control as well as production and communication efficiency, how the team will be organized and how it will fit in the existing structure of the firms; and should describe how the team will be managed. The proponent is also to identify sub-consultant disciplines and specialists required to complete the consultant team.

If the Proponent proposes to provide multi-disciplinary services which might otherwise be performed by a sub-consultant, this should be reflected here.

Information that should be supplied:

1. Confirm the makeup of the full project team including the names of the consultant, sub-consultants and specialized personnel and their role on the project.
2. Organization chat with position titles and names (Consultant team). Joint venture business plan, team structure and responsibilities, if applicable.
3. What back-up will be committed;
4. Profiles of the key positions (specific assignments and responsibilities);
5. Outline of an action plan of the services with implementation strategies and sequence of main activities.
6. Reporting relationships;
7. Communication strategies;
8. Response time - demonstrate how the response time requirements will be met.

3.2.6 Design/approach/methodology

The proponent should develop those aspects of the project considered to be a major challenge and which illustrate the design philosophy / approach / methodology. This is the opportunity for the Proponent to state the overall design philosophy of the team as well as their approach in solving design issues and to focus on the unique aspects of the current project.

Information that should be supplied:

1. Design philosophy/approach/methodology;
2. Describe the major challenges and how your team approach will be applied to those particular challenges.

3.3 Evaluation and rating

In the first instance, price envelopes will remain sealed and only the technical components of the proposals which are responsive will be reviewed, evaluated and rated by a PWGSC Evaluation Board in accordance with the following, to establish Technical Ratings:

Criterion	Weight factor	Rating	Weighted rating
Achievements of proponent	2,0	0 - 10	0 - 20
Achievements of key personnel • Project manager : maximum 10 points • Design team: - Senior engineer: maximum 12 points - Assistant designer: maximum 6 points - Approval designer: maximum 8 points • Senior supervisor: maximum 10 points	4,6	0 - 10	0 - 46
Understanding of the project	1,0	0 - 10	0 - 10
Scope of services	0,6	0 - 10	0 - 6
Management of services	0,8	0 - 10	0 - 8
Design philosophy/approach/methodology	1,0	0 - 10	0 - 10
Technical rating	10,0		0 - 100

Generic Evaluation Table

The PWGSC Evaluation Board will evaluate the strengths and weaknesses of the Proponent's response to the evaluation criteria and will rate each criterion with even numbers (0, 2, 4, 6, 8 or 10) using the generic evaluation table below:

	INADEQUATE	WEAK	ADEQUATE	FULLY SATISFACTORY	STRONG
0 point	**2 points**	**4 points**	**6 points**	**8 points**	**10 points**
Did not submit information which could be evaluated	Lacks complete or almost complete understanding of the requirements	Has some understanding of the requirements but lacks adequate understanding in some areas of the requirements	Demonstrates a good understanding of the requirements	Demonstrates a very good understanding of the requirements	Demonstrates expert understanding of the requirements.
[redacted]	Weakness cannot be corrected	Generally doubtful that weaknesses can be corrected	Weaknesses can be easily corrected	No significant weaknesses	No apparent weaknesses
[redacted]	Proponent lacks qualifications and experience	Proponent does not have minimum qualifications and experience	Proponent has minimum qualifications and experience	Proponent is qualified and experienced	Proponent is highly qualified and experienced
[redacted]	Team propose dis not likely able to meet requirements	Team does not cover all components or overall experience is weak	Team covers all components and will likely meet requirements	Team covers all components – some members have worked successfully together	Strong team that has worked successfully together on comparable projects
[redacted]	Sample projects not related to this project's needs	Sample projects generally not related to this project's needs	Sample projects generally related to this project's needs	Sample projects directly related to this project's needs	Leads in sample projects directly related to this project's needs
[redacted]	Extremely poor, insufficient to meet performance requirements	Little capability to meet performance requirements	Minimum acceptable capability, should meet minimum performance	Satisfactory capability, should ensure effective results	Superior capability, should ensure very effective results

To be considered further, proponents **must** achieve a minimum Technical Rating of sixty (50) points out of the hundred (100) points available as specified above.

No further consideration will be given to proponents not achieving the pass mark of sixty (50) points.

SRE 4 PRICE OF SERVICES

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of sixty (50) points will be opened upon completion of the technical evaluation. An average price is determined by adding all the price proposals together and dividing the total by the number of price proposals being opened.

All price proposals which are greater than twenty-five percent (25%) above the average price will be set aside and receive no further consideration.

The remaining price proposals are rated as follows:

1. The lowest price proposal receives a Price Rating of 100.
2. The second, third, fourth and fifth lowest prices receive Price Ratings of 80, 60, 40 and 20 respectively. All other price proposals receive a Price Rating of 0.
3. On the rare occasions where two (or more) price proposals are identical, the matching price proposals receive the same rating, and the corresponding number of following ratings are skipped.

The Price Rating is multiplied by the applicable percentage to establish the Price Score.

SRE 5 TOTAL SCORE

Total Scores will be established in accordance with the following:

Cote	Possible range	% of total score	Score (points)
Technical Rating	0 - 100	90	0 - 90
Price Rating	0 - 100	10	0 - 10
Total Score		100	0 - 100

The Proponent receiving the highest Total Score is the first entity that the Evaluation Board will recommend for the provision of the required services. In the case of a tie, the proponent submitting the lower price for the services will be selected.

SRE 6 SUBMSSION REQUIREMENTS - CHECKLIST

The following list of documents and forms is provided with the intention of assisting the Proponent in ensuring a complete submission. The Proponent is responsible for meeting all submission requirements.

Please follow detailed instructions in R1410T General Instructions to Proponents, GI16 Submission of Proposal. Proponents may choose to introduce their submissions with a cover letter.

1. Team identification – see typical format in Appendix A
2. Declaration/Certification Form – completed and signed form provided in Appendix B
3. Integrity Provisions – list of Directors/Owners
4. Integrity Provisions – The completed Declaration Form (if applicable in accordance with the Declaration of Conviction, section of the Integrity - Submission Provisions of the General Instructions).
5. Proposal – submit one (1) original plus five (5) copies
6. Front page of RFP
7. Front page of any solicitation amendment

In a separate envelope:

Price proposal form - one (1) completed and submitted in a separate envelope.

PROJECT BRIEF

This Project Brief is divided into two sections:

Description of Project
Description of
Services Project
Administration Required
Services Additional
Services.

For standards relating to the service provisions herein please refer to the document "Doing Business". The standards in "Doing Business" must be adhered to in conjunction with this scope of services.

DESCRIPTION OF PROJECT

PD 1 PROJECT INFORMATION

Public Works and Government Services Canada (PWGSC) intends to retain a Prime Consultant engineering firm for the provision of the services required for this project. To simplify the text, the project designates the reconstruction of wharves 93 & 94 and part of wharf 95.

1.1 PWGSC Project Title: Reconstruction of wharves 93 & 94

1.2 Location of the Project: Canadian Coast Guard (Laurentian base)
101 boul. Champlain, Québec (P.Q.)

1.3 PWGSC Project Number: R. 083401.001

1.4 Client/User: Fisheries and Oceans / Real Property

1.5 PWGSC Project Manager: will be appointed for the award.

PD 2 PROJECT IDENTIFICATION

2.1 Description

2.1.1 Introduction

Fisheries and Oceans Canada (DFO) assigned Public Works and Government Services Canada (PWGSC) to proceed to the competitive selection of a consulting expert who shall prepare drawings and specifications toward a call for tenders, provide resident worksite services and manage the contract for the reconstruction of wharves 93 & 94 at the Canadian Coast Guard (CCG) base in Quebec City (Quai de la Reine).

2.1.2 Location and site considerations

Quai de la Reine is located at the Canadian Coast Guard (CCG) base in Quebec City, 101 boulevard Champlain. The historic character of the premises shall be given consideration as well as restrictions relating to a tourist area and applicable City of Québec bylaws.

The level of activity on the Quai de la Reine premises is substantial and mostly due to the presence of vessels and related operations. Traffic by the occupants of the different buildings in the (buildings 100 to 900), as well as the handling of supplies and equipment in the compounds and hangars also contribute to increase the level of activity in the work zones. In addition, the layout of the installations make the premises relatively exiguous in terms of footprint which contributes to the complexity of the harbour operations.

Le Quai de la Reine is divided in several sections numbered 93 to 98; they extend over 580 meters in length, approximately. The numbering is ascending from north to south (some documents mention an East/West orientation with reference to the St. Lawrence River). The sectors concerned with this project are wharves 93 & 94 and a part of wharf 95 at North end.

Approximate chainings of the sectors designated for reconstruction are as follows:

- Wharf 93: 0+000 à 0+134
- Wharf 94: 0+134 à 0+233
- Wharf 95 (part): 0+233 à 0+300

2.1.3 Role and purpose of Quai de la Reine

Quai de la Reine is the Canadian Coast Guard operations hub for the region. It is an essential asset for the, environmental and ice breaking interventions, marine safety, the vessel fleet and heliport, the storage and maintenance of navigational aids, and for all users of such facilities and services.

Quai de la Reine is used by four icebreakers and two beaconage ships. A number of cruise ships also use the premises pursuant to a leasing agreement with the Québec Port Authority. Moreover, the dock is a service area for the onshore facilities supporting the Canadian Coast Guard programs such as navigational aids, vehicles, cranes, lift trucks, specialized rescue and pollution control equipment and kits.

Quai 93

Wharf 93 is used for docking the Canadian Coast Guard ships. Part of the surface is taken by building 100 (administrative offices), and for ship resupply.

The work areas on wharf 93 include buried services and services kiosq

Wharf 94 and Wharf 95-part

The wharf 94 and wharf 95-part are used for docking the Canadian Coast Guard ships and for ship resupply

The work areas on wharf 93 include buried services and services kiosq.

2.1.4 Description of existing structures

A plan view and an elevation drawing of wharves 93 & 94 and 95-part are include on Appendix F. All elevations are given with reference to hydrographic chart datum.

Wharf aprons 93 & 94 and wharf 95-part are of reinforced concrete slabs.

The existing wall along wharf 93 to 95 consists of steel sheet piles surmounted by a concrete wall. The steel sheet piles are erected at a variable distance from a wooden crib structure and are retained by tie-rods connected to a concrete dead men wall embedded in the fill materials. Above the sheet piles and up to the top of the wharf, a concrete wall is constructed on a timber deck (see appendix F).

The timber platform rests on wooden piles and at the inner end, on a wooden crib structure built earlier

The archive plans show that the space between the steel sheet piles and the wood crib is filled with granular material to the underside of the timber platform but it is known that material loss is present at the top of the sheet pile. The surface above the load platform and the existing wood-bearing structures also filled with granular materials up to the top of the dock structure

A berm was installed on the south side of the 95-part reconstructed wharf in 2013. A scouring problem at Pier 93 was filled in 2012.

2.1.5 History of work and technical investigations at Quai de la Reine

Quai de la Reine has undergone several reconstruction programs, some of which were substantial. Wharf 96 was reconstructed in 2006, wharf 95 in 2015 on an approximate length of 40 m, and wharves 97 & 98 in 2016.

Various geotechnical studies carried out at the Quai de la Reine in various sections are available for

consultation.

The environmental review will be performed by PWGSC concurrently with this mandate. The section concerning environmental issues and statements provides more information in this regard.

A study on archaeological potential was carried out. An archaeological inventory is recommended.

2.1.6 Current structural conditions

The last structural study was carried out in 2013 and reports the degradation of the wharf over time. Currently load restrictions are imposed on the Queen's Wharf (see appendix F). For Pier 94 and Pier 95-part, a capacity of 5 kpa is currently permitted.

At Pier 93 it is known that material losses occur periodically at the rear of the wharf not far from Building 100. In addition, it has been reported by users that the slab of 93 appears to be undergoing settlement, visible by the accumulation of water after precipitation. This aspect should be addressed in the choice of the concept.

An underwater inspection is planned in the spring of 2017 to update the wharf monitoring.

2.1.7 Description of intended work

2.1.7.1 General

Chaining of the wharves identified for reconstruction are modified, because the new wall is in front of the existing one

Work to be performed in the framework of this project at the CCG base is as follows:

1. Rebuild docks 93, 94 and 95-part according to the concept that will be retained by PWGSC as a result of step SR2. See the details of SR2 in the "Required Services" section of this RFP; For design purposes only, calculations of the structural elements shall consider two levels of the wharf at 7.25 m and 6.5 m. However, tender P & S will have to be produced with a dock level of 6.5 m. See the SR3 details in the "Required Services" section of this RFP;

2. Include into the wharf project, the design of the surface drainage system according to the plans and specifications (P & S) to be provided by PWGSC. The successful proponent must, however, coordinate with the system designer in the event of interference with wharf elements;

3. Dredging of the seabed to reach -12 m everywhere;

4. Setting up a berm. The design of the berm must take into account the design vessels but also the cruise ships;

5. Integration into the project of the P & S of services kiosq to be provided by PWGSC. However, the successful proponent will, if necessary, coordinate with the designer of the services kiosq for the civil aspects of the project

6. P & S for the rehabilitation of the building 100 skin will be produced by a consultant appointed and paid by PWGSC, who will also be responsible for project management and site supervision of the envelope work. There is a single call for tenders for the contract for the construction of the wharves and the envelope. The P & S's of the latter will therefore be annexed to the P & S of the wharves. Coordination is, however, to be foreseen with the consultant of the envelope during the stage of works. It is expected that the work of the envelope, which will last approximately four months, will be carried out after wharf 93 piles ; sheet piling and slab infrastructure construction,.

7. Depending on concept that will be used, observation wells in the concrete slab are to be provided to detect any loss of material under the slab

An archaeological inventory shall be performed before beginning of Work. Provide for archaeological monitoring during construction.

For more information and details, refer to the RS (Required Services) section, Scope of Services.

The area between the 0 + 00 and 0 + 017 chainings is planned to be backfilled so that the wharf is continuous, but it is possible that the wharf retains its current configuration. A final decision will be communicated prior to the start of design.

The design of the final works must remain the responsibility of the consultant. No design shall be transferred to the Contractor except for temporary works. The consultant is expected to perform preliminary calculations for temporary cases, such as: partial backfilling of the wharf without berm, partial installation of the tie rods, including typical construction loads. The aim is to ensure the constructability of the proposed concept and to avoid delay in implementation

All the engineering required in the project shall comply with the most up-to-date recognised references in the discipline.

Following the concept currently under consideration, **which will necessarily be validated by the consulting expert selected**, the existing wharf will be partly demolished and replaced by a new combination wall system (steel piles-sheet piling) erected at a minimal of the existing face of wharf in a manner to have a straight wharf between chainage 0+00 and the end of wharf 95-part. Consider SR2 requirements for possible reconstruction concepts)

The new wharf configuration shall be designed for the characteristics of design ships and available draught, it shall take into account the findings of the geotechnical investigations and presence of building 100, the integrity of which must be preserved during the work. Demolition limits will have to be determined according to type and geometry of new structure to be built. During demolition works, poor condition of wharf and underlying cribwork and presence of building 100 will have to be considered. Reconstruction concept and construction methods shall be planned accordingly.

The top of the wharf shall be a reinforced concrete slab.

Sloping of the wharf surface shall ensure efficient drainage of the entire area affected by the work, taking account of the activities conducted by the CCG.

Demolition of the front surface of the wharf and excavation of the underlying space in the sector identified for reconstruction shall be performed with care, since the exact location of buried services remains unknown. During excavation, special care should be taken in the establishment of temporary support measures to prevent reoccurrence of known soil subsidence and instability in the sector.

The problematic related to settlement between the existing and projected walls and at the slab shall be carefully analysed, including the possibility of allowing sufficient wait time between concreting's slabs and backfilling, particularly in the sector between chainings 0+00 et 0+017 m.

The problem of reconstruction / demolition must be rigorously analyzed.

2.1.7.2 Wharves accessories and services

Finishing work on the wharves shall include:

1. Installation of a concrete wheel guard (curb) to match the existing;
2. Installation of fenders;
3. Installation of mooring bollards;
4. Installation of ladders and potable water supply;
5. Installation of service kiosk*;

6. Marking and signposting of maneuvering areas, traffic zones and storage sectors.

* The design of service kiosk is not part of the consultant's mandate. However, the civil engineering aspects of the kiosk are part of it (concrete base, connection of buried pipes, etc.)

2.1.7.3 Lighting

This project does not include lighting systems.

2.1.7.4 Cathodic Protection

The design of the cathodic protection (bilingual P&S) as well as the administration of the contract are optional.

2.1.7.5 Archaeological potential and historic character of the sector

An archaeological potential study recommends an archaeological inventory to be performed in order to gather the information and data in support of accurate recommendations as to whether continuous archaeological monitoring (or spot checks) is required during excavation activities in the sectors concerned.

The call for tender documents shall underline the work areas concerned with archaeological digs. The consulting expert shall propose a measurement method for work stoppage contingencies involved with archaeological monitoring during construction. Costs incurred for the archaeological services shall be paid from the Disbursement for Services budget described in Appendix C of the RFP (Request for Proposals), along with the laboratory services required for quality assurance purposes.

2.1.7.6 Design criteria toward the performance of the project

1. Elevation above the wharf: +6.5 m above chart datum;
2. Location of facade: the new wall shall be constructed in front of the existing one;
3. Design load:
    1. Uniformly distributed load of 25 kPa;
    2. Live or traveling load equal to that of a CL-625 truck of the CAN/CSA-S6-06 standard;
    3. Concentrated or point load equal to the reaction of a 100-ton-self-propelled crane, stabilized.
4. Seismic risks: consider a 10% probability of exceedance in 50 years;
5. Required useful life: 30 years (without cathodic protection);
6. Required water depth (relative to chart datum)
7. Rate:

Sheet piles (outer surface) - Above the tidal range:	0,10 mm/an
- Within the tidal range	0,20 mm/an
- Below the tidal range:	0,10 mm/an
Walers and tie-rods:	0.10 mm/year (adjusted according to the tie-rods location)

9. Design ship (vessels)

Icebreakers	Des Groseillers	Diefenbaker
Overall length	98.15 m	150 m
Width	19.84 m	28 m

Draft	-7.16 m	-10.5 m
Displacement	To come up	23 700 t

2.2 Cost

Total indicative preliminary Class D estimate of construction cost: $32,000,000 taxes included.

2.3 Schedule

The Prime Consultant shall conduct the project and meet all the quality, budget and timeline requirements.

The overall project should be performed according to the provisional timetable presented which may be reviewed according to contract award dates. The terms or periods between the different steps or phases remain unchanged. Dates shown are that of document presentations (taking holidays into account):

1.	Designation of the Prime Consultant	August 28, 2017
2.	RS1	6 weeks
3.	RS2	5 weeks
4.	RS3	4 weeks
5.	RS4:	
	a. Plans and specs at 33% and Class C estimate	5 weeks
	b. Plans and specs at 66% and Class B estimate	10 weeks
	c. Plans and specs at 99% and Class A estimate	7 weeks
	d. Plans and specs at 100% and Class A estimate	3 weeks
6.	Call of tenders and granting of construction contract	19 weeks
7.	Substantial completion of work	90 weeks
8.	Work completion[1]	5 weeks

N.B. : The works will be interrupted from December 20 to March 31 of each year

PD 3 PROJECT HISTORY

Wharves 93, 94 and 95-part of the Quai de la Reine are located in sector displaying the following features that the Prime Consultant must take into consideration in the preparation of plans and specs:

1. Archaeological potential of the site;
2. Site located near buildings;
3. Site located in an urban and touristic area;
4. Several stakeholders operating on the site.
5. Continuation of services during construction.

PD 4 AVAILABLE DOCUMENTS

Documents are available for consultation at our offices: Public Works and Government Services Canada, 1550 d'Estimauville avenue, Québec. Qc. Suppliers shall take an appointment with the contract authority.

1. Analyse structurale_2013
2. Étude géotechnique Bâtiment 100_2015
3. Étude géotechnique Quai 96_ 2003
4. Forage-quai 93_2013
5. Inspection sous-marine 2013

PD 5 PROGRAM

Non applicable

PD 6 PROJECT OBJECTIVE

Object: Develop project objectives

The project aims to provide the Client with viable, sustainable and safe harbour facilities while minimizing the impact of construction activities on both the environment and the continuation of services. The project shall be carried out in compliance with all applicable codes, within schedule and budget, and to strict quality standards.

6.1 Quality

6.1.1 Design Principles - General

Le Departmental Representative expects the Consultant to maintain a high standard of structural design, based upon recognized contemporary design principles. All design elements, planning, engineering must be fully co-ordinated, and consistent in adherence to good design principles.

The project is to be implemented in an environmental responsible manner.

Quality of materials and construction methods shall be commensurate with harbour structures and the budget. Avoid experimental materials. Take into account the total life-cycling of the harbour structure

The character, massing, scale, materials of this project will be compatible with its surrounding context.

6.1.2 Design Principles - Specific

Typical Elements:

1. Reconstruction of existing wharves. Reconstruction of the wharf requires a work sequence so the existing tie-rods are maintained until the new tie-rods are operational
2. Projects requiring increased coordination and communication between project stakeholders
3. Presence of Building 100 in the work area
4. Reduced capacity of existing wharves

6.2 Sustainable Development

The Canadian Federal Government has begun a series of initiatives to ensure that sustainable development principles are built into the policy of all federal organizations. Public Works and Government Services Canada (PWGSC), like all federal departments, is required to uphold a Sustainable Development Strategy (SDS). Real Property Services Branch of PWGSC has developed a Strategy Plan that sets out principles, goals and actions for integrating sustainable development principles into policies and operations. The Branch has established the following sustainable development goals under the issues of management, leadership and operation.

6.3 Waste Management

The Construction, Renovation, and Demolition (CRD) Non-hazardous Solid Waste Management Protocol to which Real Property Services (RPS) is bound, provides directions on the undertaking of non-hazardous solid waste management actions for CRD projects. The protocol is designed to meet the requirements of federal and provincial policies and the objectives of the RPS Sustainable Development Strategy (SDS) as these relate to non-hazardous solid waste generated in CRD projects.

When possible, encourage the reuse of materials generated by demolition as fill.

6.4 Code Compliance

Codes, regulations, by laws and decisions of authorities having jurisdiction (AHJ) will be observed. In cases of overlap, the most stringent will apply. The Prime Consultant shall identify other jurisdictions appropriate to the project.

6.5 Risk Management

A risk management strategy is crucial for PWGSC Project Management and integrates project planning into procurement planning. All the stakeholders of a project will be an integral part of the risk management strategy, culminating in an integrated product team. Specific services required for project delivery are outlined in Required Services (RS).

The consultant must provide a written report on project risks and before going to tender. See "Doing Business with A&ES" for "Definitions" and "Checklist" of risk management.

6.6 Health and Safety

Public Works and Government Services Canada (PWGSC) recognizes the responsibility to ensure the health and safety of all persons on Crown construction projects and the entitlement of both federal employees and private sector workers to the full protection afforded them by occupational health and safety regulations.

In keeping with the responsibility and in order to enhance health and safety protection for all individuals on federal construction sites, PWGSC will voluntarily comply with the applicable provincial/territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.

PD 7 ISSUES

7.1 Major Cost Issues

Effective cost estimating and cost control is of critical importance and shall be provided by professional quantity surveyors. The Class C and Class B cost estimates shall be submitted in elemental cost analysis format. The standard of acceptance for this format is the current issue of the elemental cost analysis format issued by the Canadian Institute of Quantity Surveyors.

The Class A cost estimate shall be submitted in trade cost breakdown format. Cost estimates shall have a summary plus full back-up showing items of work, quantities, unit prices and amounts. The estimate must take into account the indexation according to the dates of realization of the main elements of the project.

7.2 Major Time Issues

The Prime Consultant must be aware of the importance of time issues for both the design phase and the construction and monitoring phase of the project. This concern is all the more critical since the project schedule and the risks involved with delays are closely related to the project's inherent issues.

Follow-up and analysis of the contractor's timelines should be done as often as necessary to ensure that the project is completed on time

Due to the presence of ice, the works will be interrupted from December 20 to March 31 of each year

These include the Canadian Coast Guard ships will relocate during construction and building staff 100 and therefore any delay will have a financial impact.

7.3 Continuation of services (maintaining activities and operations)

Continued services must be provided throughout the construction period in order to minimize interference with users' activities. It is the Contractor's responsibility to implement the measures deemed necessary and sufficient for uninterrupted user activities. Collaboration and co-ordination must prevail between the Contractor and all users. The relevant requirements in the drawings and specifications shall convey a strict liability to perform and the Contractor shall propose and obtain from PWGSC and the client (DFO) the advance approval of continued service measures he will deem appropriate.

The Work requires extensive planning in conjunction with maintenance operations. It is also the Prime Consultant's responsibility to contemplate all the means required to plan and perform the work in order to ensure that users may continue their activities and operations outside and near the work zone.

7.4 Archaeological potential and historic character

An archaeological potential study is included in the reference documents. A mandate to perform an archaeological inventory is included in the Prime Consultant's assignment with an objective to outline the areas containing vestiges, which would require archaeological monitoring. The tendering documents shall indicate the work areas concerned. The Prime Consultant shall propose a measurement method to manage work stoppages caused by archaeological monitoring during construction.

7.5 Presence of buildings in the work area

Wharf to be constructedis located near existing buildings with unknown structural condition and therefore wharf design must ne planned accordingly.. Therefore, during the implementation phase, protection, monitoring and follow-up measures during the excavation and pile driving shall be planned by the consultant

7.6 Presence of Remains in the Work Area

Work area is located over old cribworks that remained in place, which may constitute a risk of subsequent settlement in the event of rotting of the timber from the tidal zone.

7.7 Environment

In addition to the legal and regulatory requirements usually prescribed in the specifications, specific environmental requirements will have to be taken into account during the design, planning and construction phases, especially with regard to the protection of fish habitat. These requirements will be clarified according to applicable regulations in this area, including, but not limited to, the Fisheries Act and various regulations.

To this end, the Prime Consultant shall obtain from PWGSC the required alleviation measures and any other directives (anticipated or) issued by the Department of Fisheries and Oceans (DFO) and he shall include them in the drawings and specifications before the construction tender call is launched.

7.8 Health and safety

The Prime Consultant shall specify the safety measures required at all times and until work completion to ensure worksite safety, the security of the infrastructures, and the safety of users and the public.

7.9 Local conditions

The site is exposed to weather conditions that may be severe at times (tides and high tides of autumn) and to ice in winter which are likely to affect adversely or complicate access to the wharf and carrying out the work.

Further, the alignment of the wharves, the dense land occupancy of adjacent buildings and the general narrowness of the federal property confer very little space on land for the movement and operation of vehicles such as trucks, cranes and other heavy equipment that must either transit or operate on the wharf. The Prime Consultant shall therefore take this fact into account in preparing his drawings and specifications, especially where the Contractor needs to obtain in advance the required permits and authorizations for site layout (performance of the work, storage and handling of materials, temporary office and services, etc.).

With due regard for the Contractor's construction methods, the Prime Consultant should nevertheless enquire early on the feasibility of conducting construction activities from marine equipment (barges) in whole or in part.

PD 8 CONSULTANT SERVICES

The Consultant team for this project must be capable of providing the following services:

- Marine engineering
- Civil engineering
- Geotechnical
- Archeology
- Scheduling

DESCRIPTION OF SERVICES

PA 1 PROJECT ADMINISTRATION

Object: The following administrative requirements apply during all phases of project delivery.

1.1 PWGSC Project Management

The Project Manager assigned to the project is the Departmental Representative.

The Project Manager is the Departmental representative directly concerned with the project and responsible for its progress. The Project Manager is the liaison between the Prime Consultant, Public Works and Government Services Canada, and other client Departments.

Public Works and Government Services Canada administers the project and exercises continuing control over the Prime Consultant's work during all phases of development. Unless directed otherwise by the Project Manager, the Prime Consultant obtains all Federal requirements and approvals necessary for the work.

1.2 General Project Deliverables

Where deliverables and submissions include summaries, reports, drawings, plans or schedules, three (3) hard copies shall be provided, and two (2) copies shall be provided in electronic format unless otherwise specified. Electronic files shall be provided in PDF format in addition to the original formats (DWG, Word, Excel, MS-Project, etc.).

The number of required hard copies for construction plans and specifications is ten (10) copies.

1.3 Lines of Communication

Unless otherwise arranged with Project Manager, the Prime Consultant shall communicate with the Project Manager only. There shall be no direct official contact between client Departments and the Prime Consultant.

During construction tender call, Public Works and Government Services Canada conducts all correspondence with bidders and makes the contract award.

1.4 Media

The consultant shall not respond to requests for project related information or questions from the media. Such inquiries are to be directed to the Project Manager.

1.5 Meetings

Only the first meeting (launch) shall be called by the PWGSC Project Manager. The Prime Consultant shall thereafter convene the other meetings (note 1) during the project preparation phase, to which all the members of the Prime Consultant's project team shall attend.

The Prime Consultant shall attend the meetings, record the items discussed and decisions taken, and draft and distribute the minutes of the meetings within five (5) days following each meeting.

NOTE 1

Design Phase: eight (8) meetings are scheduled at the PWGSC offices in Québec city including a meeting with tenderers during tender process.

Construction Phase: Meetings will take place at the worksite. Every two weeks during the critical phases of the project and every three weeks for less critical work.

1.6 Response Time

It is a requirement of this project that the key personnel of the successful proponent and sub-consultant or specialized firms be personally available to attend meeting or respond to inquiries within three (3) days.

1.7 Submissions, views and approvals

The Prime Consultant shall submit the project documents to PWGSC as follows:

1. Presentation format: oral presentation of report(s), drawings and specifications, cost estimates and work implementation schedule with screen projection.
2. Presentation schedule : presentations hall be examined at every step of the design (RS1, RS2, RS3, 33%, 66%, 99%, and final presentation);
3. Submission of presentation documents to PWGSC and DFO: one (1) week ahead of meeting date.
4. Number of presentations: six (6).

Work in progress is to be reviewed by the Project Manager at different stages as follows:

Chart of reviews and approvals	**PWGSC**		**DFO**	
	E	A	E	A
RS1 Analysis of project brief				
Project scope of services report		x		x
RS2 Design concept				
Design option	x		x	
Recommended design option		x		x
Class D estimate		x		x
RS3 Design development				
Design development documents		x	x	
Class C estimate		x		x
RS4 Construction documents / Tender call				
33% construction drawings		x	x	
66% construction drawings and specifications		x	x	
99% construction drawings and specifications		x	x	
Class B estimate		x		x
Class A estimate		x		x
Final tender documents		x	x	

E = Review
A = Approval

1.8 Official languages

This project requires services in both official languages. Refer to the Supplementary Condition section of this Request for Proposal document entitled "Language Requirements".

REQUIRED SERVICES

RS 1 ANALYSIS OF PROJECT REQUIREMENTS

1.1 Intent

The purpose of this stage is to ensure the Prime Consultant has reviewed and integrated all the project requirements, identified and evaluated conflicts or problems; the he has provided alternative strategies, presented and received approval on a Project scope, delivery process, schedule and estimate required to deliver a cohesive quality project. This approved deliverable will become the Project Scope of Services and will be utilized throughout the project to guide the delivery.

1.2 General

Scope and activities:

1. Visit the site and adjacent structures, and assess the availability and capacity for the services required in this project.
2. Attend the project launch meeting;
3. Analyse the project's program and requirements;
4. Examine all the drawings, reports, studies and surveys provided by the Departmental Representative relative to the project;
5. Meet with ALL the stakeholders who pursue activities on Quai de la Reine that are likely to have an impact on the flow of work;
6. Identify the various reference documents needed to perform the design;
7. Establish the need for further studies and complementary surveys;
8. Perform all surveys and inspections required to update one's knowledge of the structures' condition toward project design (includes materials, equipment and labour).
9. Establish the list of required/missing documents and request them from the Departmental Representative;
10. Gather all documentation likely to be useful toward the definition and development of the project (construction background, current conditions of the structures, data on the utilization of the sites and their working loads, etc.);
11. Review, validate, supplement and finalize the project brief, presentation and parameters;
12. Study, examine and assess the sustainable development strategies likely to be applied in the framework of the project;
13. Explore and examine different construction and implementation schedule options and outline their impact or consequence on the activities at Quai de la Reine and on budget planning.
14. Review the proposed schedule and assess whether all phases and stages can be performed as planned;
15. Review the budget/cost planning in order to assess whether they are realistic and whether such planning can be adhered to;
16. Determine and verify all authorities involved in the project;
17. Establish a list of all applicable codes, regulations and standards;
18. Follow-up on PWGSC comments.

1.3 Deliverables

Comprehensive summary of the project requirements/program demonstrating understanding of the scope of work, including:

1. Visual Inspection of the Ground Floor Slab of Building 100
2. Analyze the impact of the work on the building 100
3. List of work implementation options (schedule) and cost planning of the project—confirmed and/or readjusted.
4. List of additional studies and surveys, if necessary;
5. List of the design criteria;
6. Complete list of existing documentation;
7. List of codes, regulations and standards;
8. Identification in writing of any problem, discrepancies and/or any other information (hypothetical or perceived) for the benefit of the Project Manager;
9. Mandate of geotechnical study.

RS2 DESIGN CONCEPT

2.1 Intent

To translate the project requirements into space perimeters, to explore design options and analyze them against previously identified priorities and program objectives. Out of this process, one option will be recommended to proceed to Design Development.

2.2 General

Scope and activities:

1. Perform the complementary studies and surveys approved by the Departmental Representative. Any complementary studies and surveys are paid for by PWGSC from the "Disbursement for Services" budget.
2. Evaluate the sequence of work in the zone between the 0 + 00 and 0 + 017m chaining.
3. Assess the risks of future settlement that may occur due to the risks that wood encroachment will further degrade and propose solutions where appropriate.
4. Submit viable and feasible design options. At least two options should be analyzed. A wharf with slab on ground and a wharf with a structural slab. For the option of slab on ground, present the possible alternatives to inclined tie-rods with respect to building 100 and its surroundings.
5. Analyse each proposed solution with respect to project objectives, cost and schedule.
6. Recommend one option subject to further development and include all the supporting literature and technical rationale.
7. Examine and propose a strategy to manage demolition materials in view of maximising reuse in the project or recycling.
8. Updated timeline of the overall project (explain discrepancies if any).

9. Coordinate all disciplines and trades involved.

2.3 Details

2.3.1 Structural drawings:

1. Proposed structural systems, including the related construction methods, descriptive sketches, etc., as well as a copy of the on-site investigation report on which the design is based.
2. Site layout (plan) showing the location of the proposed structures, their orientation, main access points, traffic/travel lanes/corridors, and continuation of services.
3. Elevation and cross-section sketches showing the basic conceptual/design approach/basis.

2.4 Deliverables

Provide the following:

1. List of engineering design of accepted option;
2. Drawings of the design study process.
3. Report describing the options proposed as well as the recommended solution; PWGSC is not obliged to choose the recommended option;
4. Validated class D estimate;
5. Report on schedule deviations and recommended corrective measures or updated timeline.
6. Report on the management of demolition materials.
7. Report on the management of excavation materials, both clean and contaminated.
8. Sequence of work in the zone between the 0 + 00 and 0 + 017 m chains
9. Risks of future settlements that may occur due to the risk that wood casing will degrade further and propose solutions where appropriate
10. Mandates of the others complementary studies and surveys.
11. Report analyzing the impact of work on existing building.

RS 3 DESIGN DEVELOPMENT

3.1 Intent

To further develop one of the options presented at the Design Concept stage. The Design Development documents consist of drawings and other documents to describe the size and character of the entire project as to structural, mechanical and electrical systems, materials and such other elements as may be appropriate.

3.2 General

Scope and activities:

1. Obtain the Project Manager's written authorisation to develop one of the proposed options prepared in the Design Study.
2. Where modifications are required, provide all the data and information (documentation) in support of any such required change, analyse the impacts and effects of said modifications on all the components of the project, and resubmit the documents for approval.
3. Develop and clarify the object of the concept studies for each discipline in terms of design.
4. For design purposes only, develop structural elements design for two projected wharf levels, 7.25 m and 6.5 m and assess the additional cost, if any, between the two levels. A decision will be made by the Departmental Representative regarding the level to be considered for design purposes. Regardless of the level used for design purposes, the level to be considered in the tendering plans is 6.5 m
5. Review project feasibility and provide an opinion on the construction processes and duration.
6. Based on all the information and data available at this stage, prepare a schedule of control points (events) for consideration, and pay special attention to the repercussions on the users' activities in and around Quai de la Reine.
7. Identify any particular methods (i.e. scheduling of the work).
8. Update the project schedule.
9. Update the work/project estimate.
10. Examine on an ongoing basis all the municipal bylaws and regulations, codes and standards pertaining to the project.
11. Provide a list and summaries (briefs) of all NMS specification sections to be used.
12. Submit a specification abstract or synopsis for all systems, and main elements and equipment concerned. Include the manufacturers' documentation on the main elements and equipment proposed for the purpose of this project.
13. Coordinate all the disciplines involved.

3.3 Details

Scope and activities:

3.3.1 Layout drawings

Plans showing the work zones, including traffic and operational travel paths of the equipment brought to bear on Quai de la Reine.

3.3.2 Structural drawings

1. Site layout showing both the accepted option and the existing structures.
2. Elevation and cross sectional views of the different structures.
3. Cross sectional details of any special characteristic or design feature which, at this stage, require some

form of graphic representation or explanation.

4. Drawings to depict the proposed structural elements, the type of foundation, the construction materials as well as any other relevant and/or unusual feature proposed.

3.4 Deliverables

1. General layout showing current condition of the facility before construction.
2. General layout showing the structures after construction.
3. Two (2) or three (3) sections of each type of structure.
4. Demolition drawing.
5. Elevation and cross sectional views.
6. Temporary support (false work) of the existing structures near the work zones.
7. All structural, civil, and marine/harbour engineering details as required to determine the selection of materials.
    a. Table of contents of specifications;
    b. Class C estimate of construction cost;
    c. Preliminary construction schedule;
    d. Project file describing in detail all the project und relying assumptions (concepts) and the rationale behind every significant decision.

RS 4 CONSTRUCTION DOCUMENTS

4.1 Intent

To prepare drawings and specifications setting forth in detail the requirements for the construction and final cost estimate of the project.

1. 33% indicates 33% completeness of all technical working documents;
2. 66% indicates substantial technical development of the project - well advanced architectural and engineering plans, details, schedules and specifications;
3. 99% is the submission of complete Construction Documents ready for tender call;
4. Final Submission incorporates all revisions required in the 99% version and is intended to provide PWGSC with complete construction documents for tender call.

4.2 General

Activities are similar at all three stages. Completeness of the project development should reflect the stage of a submission.

Scope and activities:

1. Obtain Project Manager's approval for Design Development submissions (33%, 66%, 99% and final).
2. Confirm format of drawings and specifications.
3. Clarify special procedures (i-e. phased construction).
4. Specify the sequence of placement of the main structural elements: piles, sheet piles, tie-rods, berm, dock filling and more particularly the section between 0 + 00 and 0 + 017 m chaining.
5. Submit drawings and specifications at the required stages. (33%, 66%, 99%).
6. Provide written response to all review comments and incorporate them into Construction.

7. Advice as to the progress of cost estimates and submit updated cost estimates as the project develops.
8. Update the project schedule.
9. Prepare a Class B estimate at 66%.
10. Prepare a final Class A estimate.
11. Review and approve materials and construction processes & specifications to meet sustainable development objectives.
12. Develop a plan of risk management for carrying out the work.

4.3 Details

Scope and activities:

4.3.1 Technical and production meetings

1. Production of construction documents will be reviewed during the meetings arranged by Prime Consultant.
2. Representatives from client Department(s) and PWGSC support staff will be present as arranged by the Project Manager.
3. Prime Consultant shall ensure that his staff and the sub-consultant representatives attend the technical and production meetings as required.
4. Prime Consultant shall arrange for all necessary data, progress prints, etc.
5. Prime Consultant shall prepare minutes of the meetings and distribute copies to all participants.

4.3.2 Progress review

1. As work progresses on construction drawings, submit drawings, schedules, details, pertinent design data and updated Cost Plan and Project Schedule as required.
2. Calculations submitted shall not necessarily be reviewed. They are required for record purposes and in certain instances to assist in the understanding and interpretation of designs. Calculations shall be submitted in a format that is legible, neat and easily understandable.
3. Sections of specifications must be prepared using the latest version of NMS.

4.4 Deliverables

Deliverables are similar at all three stages; completeness of the project development should reflect the stage of a submission.

4.4.1 Presentation at 33%, 66% and 99 %: Complete specifications and construction drawings.

1. One (1) copy of the design criteria, studies, etc., required by PWGSC Technical Services for archiving and final verification purposes.
2. One (1) copy of the updated cost plan and project schedule.

4.4.2 Final Submission

This submission incorporates all revisions required by the review of the 99% submission. Provide the following:

1. Complete set of signed and sealed construction drawings (originals), for tender;
2. Complete sets of signed and sealed specifications;
3. Class A construction cost estimates;

4. Bid schedule/form;
5. Construction schedule in MS-Project format;
6. Project risk management plan/program;
7. List of shop drawings to be submitted by the Contractor (submit this list before the launch meeting with the Contractor).
8. Quality assurance laboratory assignments during construction (submit this item before the launch meeting with the Contractor).

As a safeguard against loss of or damage to the originals, retain a complete set of drawings in reproducible form and one copy of specifications

RS 5 TENDER CALL, BID EVALUATION & CONSTRUCTION CONTRACT AWARD

5.1 Intent

To obtain and evaluate bids from qualified Contractors to construct the project as per the Tender Documents, to award the construction contract according to government regulations, including Federal Rules for Bid Depositories.

5.2 General

Scope and activities:

1. Attend tenderers briefing meeting(s).
2. Prepare addenda based on questions arising in such meetings for issue by the Project Manager
3. Provide the Project Manager with all information required by tenderers to fully interpret the Construction Documents. The Project Manager will issue the addenda to all participants.
4. Keep full notes of all inquiries during the bidding period and submit same to Project Manager at the end, for PWGSC records.
5. Assist in tender evaluation by providing advice on the following:
   a) Completeness of tender documents in all respects;
   b) Technical aspects of tenders;
   c) Effect of alternatives and qualifications which may have been included in the tender. Tenderers' capability to undertake the full scope of work.
   d) Tenderers' capability to undertake the full scope of work.
   e) Availability of adequate equipment to carry out the work.
   f) If PWGSC decides to re-tender the project, provide advice and assistance to the Project Manager.
6. Revise and amend, at your expense, the construction documents to bring the cost of the work within the limits stipulated
   a) Examine and report on any cost and schedule impact created by the issue of tender / contract addenda.

5.3 Deliverables

1. Originals of drawings and specifications;
2. Electronic copies of drawings and specifications.
3. Addenda where needed;
4. Changes to the documents, if re-tendering is necessary, including updated cost estimate or schedule.

RS 6 CONSTRUCTION AND CONTRACT ADMINISTRATION

6.1 Intent

To implement the project in compliance with the Contract Documents and to direct and monitor all necessary or requested changes to the scope of work during construction.

6.2 General

Scope and activities:

1. During the implementation of the project, act on PWGSC's behalf to the extent provided in this document.
2. Revise the submitted calculation notes for temporary works.
3. Analyze the contractor's work methods and ensure that they comply with plans and specifications and do not jeopardize the safety of the wharf
4. Carry out the review of the work at intervals appropriate to determine if the work is in conformity with the Contract Documents.
5. Keep PWGSC informed of the progress and quality of the work and report any defects or deficiencies in the work observed during the course of the site review.
6. Determine the amounts owing to the Contractor based on the progress of the work and certify payments to the Contractor.
7. Act as interpreter of the requirements of the Contract Documents.
8. Provide cost advice during construction.
9. Advise the Project Manager of all potential changes to scope for the duration of the implementation.
10. Review the Contractor's submittals.
11. Prepare and justify change orders for issue by the Department Representative.
12. Indicate any changes or material/equipment substitutions on Record Documents.
13. During the twelve (12) month warranty period investigate all defects and alleged defects and issue to the instructions to Contractor.
14. Finalize Systems Operations Manual
15. Conduct a final warranty review.

6.3 Details

6.3.1 Construction Meetings

Immediately after contract award arrange a briefing meeting with the Contractor and the Departmental representative. Prepare minutes of the meeting and distribute copies to all participants and to other persons agreed upon with the Project Manager.

Call job meetings as frequently as required, commencing with the construction briefing meeting.

The meetings should include the job superintendent, Inspector of Construction, main sub-subcontractors, affected sub-consultants and Departmental Representative as necessary. Prepare minutes of the meeting and distribute copies to all participants. The Project Manager may invite client Departments to attend any of these meetings.

6.3.2 Project Schedule

Obtain Project Schedule with detailed commissioning component shown separately, as soon as possible after contract award and ensure proper distribution.

Monitor the approved construction schedule, take necessary steps to ensure that the schedule is maintained and submit a detailed report to the Departmental Representative concerning any delays.

Keep accurate records of causes of delays.

Make every effort to assist the Contractor to avoid delays.

6.3.3 Time Extensions

Only the Departmental Representative may approve any request for Time Extensions. Approval will be issued in writing by the Project Manager.

6.3.4 Cost Breakdown

Obtain from the Contractor detail cost breakdown on standard PWGSC form and submit to the Departmental Representative with the first Progress Claim.

6.3.5 Sub-contractor Changes

The Contractor is required to use the sub-contractors listed on the tender form unless a change is authorized by the Departmental Representative. Changes are only considered when they involve no increase in cost. Review all requests for changes of sub-contractors, and submit recommendations to the Project Manager.

When sub-contractors have not been listed on the Tender Form, obtain the list from contractors not later than 10 working days after date of award.

6.3.6 Labour Requirements

The Contractor is bound by the Contract to maintain competent and suitable workmen on the project and to comply with the Canada Department of Labour - Labour Conditions. Inform the Departmental Representative of any labour situations that appear to require corrective action by the Departmental representative.

The Prime Consultant shall ensure that a copy of the Labour Conditions for the Contract is posted in a conspicuous place on site.

6.3.7 Bylaw Compliance

Ensure that construction complies with applicable bylaws and regulations. Matters pertaining to the Department of Labour shall be referred to the Project Manager.

6.3.8 Construction Safety

All construction projects that are occupied by Federal employees during construction are subject to the Canada Occupational Safety and Health Act and Regulations as administered by Health and Welfare Canada.

Fire safety provisions during construction must comply with FCC standards 301 and 302, administered by the Fire Commissioner Canada.

In addition to the above, the Contractor must comply with the provincial and municipal safety laws and regulations, and with any instructions issued by the officers of these authorities having jurisdiction relating to

construction safety.

Ensure the Contractor is mandated to provide all required coordination, isolation, protection and reinstatement of the fire protection and suppression systems throughout construction. Notify the Property Manager each time the fire protection and suppression systems are bypassed and advise of estimated reinstatement time. Ensure the Contractor is mandated to provide Watchman Service as defined in FC 301 and by the Fire Commissioner.

6.3.9 Site Visits

1. Provide non-resident construction inspection services. Ensure compliance with contract documents.
2. Provide services of qualified personnel who are fully knowledgeable with technical and administrative requirements of the project.
3. Establish a written understanding with contractors as to what stages or aspect of the work are to be inspected prior to being covered up.
4. Assess quality of work and identify in writing to the Contractor and to the Departmental representative all defects and deficiencies observed at time of such inspections.
5. Inspect materials and prefabricated assemblies and components at their source or assembly plant, as necessary for the progress of the project.
6. Any directions, clarifications or deficiency list shall be issued in writing to PWGSC.

6.3.10 Clarifications

Provide clarifications on Plans and Specifications or site conditions, as required in order that project not be delayed.

6.3.11 Progress Reports

Report to the Departmental Representative regularly on the progress of the work. Submit weekly reports.

6.3.12 Work Measurement

If work is based on unit prices, measure and record the quantities for verification of monthly progress claims and the Final Certificate of Measurement.

When Contemplated Change Notice is to be issued based on Unit Prices, keep accurate account of the work. Record dimensions and quantities.

6.3.13 Detail Drawings

Provide for the Departmental Representative's information any additional detail drawings as and when required to properly clarify or interpret the contract documents.

6.3.14 Shop Drawings

1. On completion of project forward three (3) copies of reviewed shop drawings to the Departmental Representative.
2. Ensure that shop drawings include the project number and are recorded in sequence.
3. Verify the number of copies of shop drawings required. Consider additional copies for Clients' departmental review.
4. Shop drawings shall be stamped: "Checked and Certified Correct for Construction" by the Contractor and stamped: "reviewed" by the Prime Consultant before return to the Contractor.
5. Expedite the processing of Shop Drawings.

6.3.15 Inspection and Testing

1. Prior to tender, provide Departmental representative with recommended list of tests to be undertaken, including on site and factory testing.
2. Ensure all testing is detailed within commissioning plan.
3. When Contract is awarded, assist Departmental Representative in briefing testing firm on required services, distribution of reports, communication lines, etc.
4. Review all test reports and take necessary action with Contractor when work fails to comply with contract.
5. Immediately notify Project Manager when tests fail to meet project requirements and when corrective work will affect schedule.
6. Assist Departmental Representative in evaluating testing firm's invoices for services performed.

6.3.16 Training

1. Prior to tender, provide Departmental representative with recommended list of training to be undertaken.
2. Ensure all training is detailed within the commissioning plan.

6.3.17 Construction Changes (Change Orders)

The Prime Consultant does not have authority to change the work or the price of the Contract.

Changes which affect cost or design concept must be approved by the Departmental Representative.

Upon Departmental representative approval obtain quotations from the Contractor in detail. Review prices and forward promptly recommendations to the Departmental Representative.

The Departmental Representative will issue Prime Consultant-prepared Change Orders to the Contractor, with copy to Prime Consultant.

All changes, including those not affecting the cost of the project, will be covered by Change Orders.

The practice of "trade offs" is not allowed.

6.3.18 Contractor's Progress Claims

Each month the Contractor submits a progress claim for work and materials as required in the Construction Contract.

Where applicable, the claims are made by completing the following forms:

1. Cost Breakdown for Unit and/or combined Price
2. Cost Breakdown for Fixed Price Contract.
3. Cost Breakdown for Fixed Price Contract.
4. Statutory Declaration Progress Claim.
5. Review and sign designated forms and promptly forward claims to the Departmental representative for processing.
6. Submit with each progress claim:
   a. Updated schedule of work progress;

b. Pictures of work progress.

6.3.19 Materials on Site

The Contractor may claim for payment of material on site but not incorporated in work.

Material must be stored in a secure place designated by the Departmental Representative.

Detailed list of materials with supplier's invoice showing price of each item must accompany claim; Prime Consultant shall check and verify the list.

Items shall be listed separately on the Detail Sheet after the break-down list and total.

As material is incorporated in the work the cost must be added to the appropriate Detail item and removed from the material list.

6.3.20 Acceptance Board

Inform the Departmental Representative when satisfied that the project is substantially completed. The Prime Consultant shall ensure that his representative, his sub-consultant representative, Resident On-Site Reviewer, Contractor and major sub-trade representatives shall form part of the Project Acceptance Board and attend all meetings as organized by the Departmental Representative.

6.3.21 Interim Inspection

The Acceptance Board shall inspect the work and list all unacceptable and incomplete work on a designated form. The Board shall accept the project from the Contractor subject to the deficiencies and uncompleted work listed and priced.

6.3.22 Interim Certificates

Payment requires completion and signing, by the parties concerned, of the following documents:

1. Certificat provisoire d'achèvement des travaux
2. Cost breakdown for fixed price contrat
3. Cost breakdown for unit or combined price contract
4. Inspection and acceptance
5. Statutory Declaration Interim Certificate of Completion
6. Workmen's Compensation Board Certificate

Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Departmental Representative for processing.

6.3.23 Wharf Occupation

The Departmental Representative or client Department may occupy the wharf after the date of acceptance of the building by the Acceptance Board. The acceptance date is normally that of the Interim Certificate issued to the Contractor. As of the acceptance date, the Contractor may cancel the Contract Insurance, and the Departmental Representative or client Department (as the case may be) assumes responsibility for:

1. Security of works;
2. Fuel and utility charges;
3. Proper operation and use of equipment installed in the project;

4. General maintenance and cleaning of works;
5. Maintenance of the site (except any landscaping maintenance covered by the contract).

6.3.24 Operation and Maintenance Data Manual

Operation and Maintenance Data Manual: four (4) sets of each volume produced by the Contractor in accordance with Section 01 78 00 of project specification and verified for completeness, relevance and format by the Architectural, Mechanical and Electrical consultants and submitted to PWGSC Project Manager prior to interim acceptance or actual start of operation and instruction period, whichever occurs sooner. The Contractor shall retain one copy of each volume for his record and use during the instruction period.

6.3.25 Instruction of Operating Personnel

Make arrangements and ensure that the Departmental Representative operating personnel is properly instructed on the operation of all services and systems using the final manuals as reference.

Prime Consultant to provide training sessions, as required, on the subject of design intent and systems operations. Utilize Systems operations manual for training sessions.

6.3.26 Keys

Ensure that all keys and safe combinations are delivered to the Departmental Representative and/or the client Department as applicable.

6.3.27 Final Inspection

Inform the Departmental Representative when satisfied that all work under the Contract has been completed, including the deficiency items. Inspection and Acceptance as a result of the Interim Inspection: the Departmental Representative reconvenes the Acceptance Board which makes a final inspection of the project. If everything is satisfactory the Board makes final acceptance of the project from the Contractor.

6.3.28 Final Certificate

The final payment requires completion and signing, by the parties concerned, of the following documents:

1. Final Certificate of completion
2. Cost Breakdown for fixed price contract
3. Inspection and acceptance
4. Statutory Declaration Final Certificate of Completion.
5. Cost Breakdown for unit and/or combined price contract
6. Workmen's Compensation Clearance Certificate.
7. Hydro Certificate

Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Departmental representative for processing.

6.3.29 Take-over

The official take-over of the project, or parts of the project, from the Contractor is established by the PWGSC Project Team which includes the Prime Consultant and the client Department. The date of Interim Certificate of Completion and the Final Certificate of Completion signifies commencement of the 12 month warranty period for work completed on the date of each certificate in accordance with the General Conditions of the Contract.

Provide Departmental Representative with original copy of contractors' warranties for all materials and work covered by an extended warranty or guarantee, according to the conditions of the specifications. Verify their completeness and extent of coverage.

6.3.30 As-built and Record Drawings and Specifications

Following the take-over, obtain as-built marked-up hard copy from the Contractor:

1. Show significant deviations in construction from the original Contract drawings, including changes shown on Post-Contract Drawings, changes resulting from Change Orders or from On Site Instructions.
2. Check and verify all as-built records for completeness and accuracy and submit to PWGSC.
3. Produce Record Drawings by incorporating As-Built information into project drawings.
4. Submit Record Drawings and Specifications in number and format required by the Prime Consultant Agreement within [8] weeks of final acceptance.
5. Provide a complete set of final shop drawings.

6.4 DELIVERABLES

1. Written reports from site visits including persons involved.
2. Written reports on the progress of the work and the cost of the project at the end of each month.
3. Additional detail drawings when required to clarify, interpret or supplement the Construction Documents.
4. Post contract drawings.
5. Interim or Final certificates.
6. Debrief of Commissioning Activities.
7. As built records.
8. Warranty deficiency list.
9. Report on Final Warranty Review.

SR 7 COMMISSIONING THE FACILITY

Provide a project life cycle management plan that includes, but is not limited to, instructions for proper use of the wharf, inspections to be carried out during the life of the project

SR 8 RISK MANAGEMENT

The Prime Consultant is to provide support to the Project Manager in identifying risks throughout the project life cycle.

See "Doing Business with A&ES" for Risk Management "Definitions" and "Checklist".

Risk Management Process:

1. Identify risk events based on past experience and using proposed checklist or other available lists.
2. Qualify/quantify probability of risk event (Low, Medium, High) and their impact (Low, Medium, High).
3. Prioritize risk events (i.e. concentrate efforts on risk events with High probability and Medium to High impact).
4. Develop risk response (i.e. evaluate alternatives for mitigation; this is the real added-value of risk

management), and

5. Implement risk mitigation measures.

ADDITIONAL SERVICES

AS 1 BILINGUAL CONSTRUCTION DOCUMENTS

Construction Documents in both official languages as required.

Bilingual Requirements:

The Prime Consultant shall prepare all construction documents in Canada's two official languages.

The languages are considered equal in status; neither is considered to be a translation of the other.

The Prime Consultant shall be responsible for the accuracy and completeness of translations and the consistency of documents.

It is standard practice to produce a single set of drawings (originals) on which written information is shown in both languages and separate written documents for each language for tendering, record drawings, operating and maintenance documentation.

AS 2 RESIDENT SITE SERVICES DURING CONSTRUCTION

2.1 Description of services

The purpose of the Resident Site services is to ensure the presence the Prime Consultant's full-time representative on site to inspect, co-ordinate and monitor all aspects of the work during the construction of the facility, and liaise with the Contractor, Public Works and Government Services Canada and other agencies as appropriate to the work. More than one person may be required to suit the hours of construction.

The Consultant Resident Site Representative is responsible for providing full time (including overtime) resident inspection for all aspects of the project, maintaining daily records of all construction work placed. He is to ensure constant communication amongst the PWGSC Property Manager, the Project Manager, design agencies, Contractor, Regional Fire Commissioner and the Provincial Department of Labour.

The Consultant Resident Site Representative is directly responsible to the Prime Consultant.

The Consultant Resident Site Representative shall become thoroughly familiar with the Contract documents, the National Building Code of Canada and all Fire Commissioner of Canada Standards for Construction operations (incl. FCC No. 301 dated June 1982 and the Standard for Welding and Cutting FCC No. 302 dated June 1982); he shall also be aware of all provincial and municipal standards for the health and safety of construction workers.

The Consultant Resident Site Representative shall become thoroughly familiar with the requirements of the Project Brief and project responsibilities of others which relate to services.

2.2 Specific Duties and Responsibilities

The Consultant Resident Site Representative provides full time resident inspection, co-ordination and monitoring during the construction work and be responsible to the Prime Consultant. In addition, the Departmental Representative may delegate additional responsibilities subject to Prime Consultant's agreement.

The Consultant Resident Site Representative maintains daily records of all construction work placed and ensure constant communication amongst PWGSC Property Manager, the Project Manager, the Regional Fire Commissioner, the Prime Consultant, the Contractor, the appropriate PWGSC Departmental Representative and consultants.

The Consultant Resident Site Representative co-ordinate and direct an assistant as approved by PWGSC.

In case of emergencies, the Consultant Resident Site Representative is empowered to stop the work, or give orders to protect the safety of the workers or Crown property.

2.3 Inspection and Reporting

The Consultant Resident Site Representative shall inspect all phases of the work in progress for the purpose of bringing to the attention of the Contractor, after checking with the Prime Consultant, and Departmental Representative any discrepancies between the work, the contract documents and accepted construction procedures. He shall keep a daily log of such inspections and shall issue a weekly written report to the Prime Consultant, both for distribution, in the form directed. The Resident Site representative shall make any other reports or surveys as may be requested by the Project Manager through the Prime Consultant.

2.4 Interpretation of the Contract Documents

Interpretation of the contract documents shall be the responsibility of the Prime Consultant. The Prime Consultant may, however, have the Resident Site representative provide him with information regarding job conditions and may require him to relay day-to-day instructions to the Contractor.

It shall be the duty of the Resident Site Representative to assist the Prime Consultant and further inform the Prime Consultant of any anticipated problems which may delay the progress of the work. The method of relaying such information shall be determined by the Prime Consultant.

2.5 Changes in Work

The Resident Site Representative shall not authorize or order any change in the work which will constitute a change in design or in the value of the contract except as delegated by the Departmental Representative.

The Prime Consultant may call upon the Resident Site Representative to assist in the evaluation of changes in the work, where a knowledge of job conditions is required.

2.6 Communication and Liaison

The Resident Site Representative shall:

1. Convey the Prime Consultant's instructions regarding the required standards of workmanship to the Contractor. Confer and obtain guidance on these findings with the Prime Consultant; the matter is then to be brought to the attention of the Contractor's superintendent. Although informal discussions with sub-trade superintendents are usually permissible (but only with the agreement of the Contractor), the Resident Site representative should not deal directly with foremen or tradesmen, or interfere with the progress of the work.
2. Communicate formally with the Contractor via memorandum form only. When this form is issued, the Resident Site Representative must immediately file copies with PWGSC and the Prime Consultant.
3. Contact the Prime Consultant immediately when it is apparent that information or action is required of the Prime Consultant, e.g. general instructions, clarifications, sample of shop drawing approvals, requisitions, contemplated change orders, site instructions, details, drawings, etc.

4. Accompany PWGSC representatives on inspections and report to the Prime Consultant requirements, comments or instructions of the PWGSC's forces. Note that the Resident Site Representative should encourage such requirements, comments or instructions to be provided to him in writing.
5. Consider and evaluate any suggestions or modifications to the documents advanced by the Contractor and immediately report these to the Prime Consultant with comments.
6. Ensure that PWGSC and the Prime Consultant are notified promptly when key pieces and/or components of materials and equipment are delivered so that these parties can arrange for the appropriate personnel to have an opportunity to inspect same prior to installation.
7. The Resident Site representative will investigate, schedule and approve in writing, all temporary or permanent connections into any of the buildings' systems prior to the work being done. He shall provide advanced forecasts and advise the PWGSC Property Manager of any interruption of normal building services with a minimum 24 hours notice prior to the work being undertaken, where this work cannot be done during the silent hours.

2.7 Daily Log

The resident Site Representative shall keep a daily log recording, including:

1. Weather conditions, particularly unusual weather relative to construction activities in progress;
2. Major material and equipment deliveries;
3. Daily activities and major work done;
4. Start, stop or completion of activities;
5. Presence of inspection and testing firms, tests taken, results, etc.;
6. Unusual site conditions experienced;
7. Significant developments, remarks, etc.;
8. Special visitors on site;
9. Authorities given Contractor to undertake certain or hazardous works;
10. Environmental incident;
11. Reports, instructions from Appropriate Authorities Response Actions.

Note: The log is the personal property of the Resident Site representative. Copies of the log book, certified as copies, are to be provided to PWGSC and Prime Consultant at the end of the project.

2.8 Weekly Records

The Resident Site Representative shall prepare weekly reports for the Prime Consultant in the form directed:

1. Progress relative to schedule.
2. Major activities commencing or completed during the week, and main activities now in progress.
3. Major deliveries of materials and/or equipment.
4. Difficulties which may cause delays in completion.
5. Materials and labour needed immediately.
6. Cost estimates of work completed and materials delivered (cost plus contracts);
7. Outstanding information or action required by Prime Consultant or PWGSC;
8. Work force;
9. Weather;
10. Remarks;

11. Accidents on site;
12. Life safety or building hazards caused by the work, the Contractor or his agents.

2.9 Site Records

The Resident Site representative shall maintain orderly and updated files at the site for the use of the PWGSC, Prime Consultant and himself as follows:

1. Contract and tender documents;
2. Approved shop drawings;
3. Approved samples;
4. Samples;
5. Site instructions;
6. Contemplated change orders;
7. Change orders;
8. Memorandum;
9. Test and deficiency reports.
10. Correspondence and Minutes of Meeting;
11. Names, addresses, telephone numbers of Client Representatives, Prime Consultant and all contractors, sub-trades key personnel associated with the contract, including home telephone numbers in case of emergencies;
12. In addition, the Resident Site Representative shall maintain an updated progress schedule;
13. A reproduction of the original contract drawings shall be carefully preserved and shall be kept marked up to date with all addenda, change orders, site instructions, details, as-built conditions, etc., issued subsequent to the award of the contract.

2.10 Work Inspection

The Resident Site Representative shall make on site observations and spot checks of the work to determine whether the work, materials and equipment conform with the contract documents and supplementary conditions. The Site Consultant's Representative shall advise the Contractor of any deficiencies or unapproved deviations via memorandum and report immediately to the Prime Consultant and Departmental Representative any of these on which the Contractor is tardy or refuses to correct.

The Resident Site Representative shall arrange for the Sub-Consultants to make the periodic inspections required by the Prime Consultant's contract, and for these inspections to be made timely with respect to the progress of the work.

The Resident Site Representative shall also report if materials and equipment are being incorporated into the project prior to approval of relative shop drawings or samples.

The Resident Site Representative shall assist in the preparation of all deficiency reports, interim, preliminary and final, in collaboration with the PWGSC and Prime Consultant's Representatives.

The Resident Site Representative shall be responsible for the measurement of all work to be done on a unit-cost basis.

2.11 Site Meetings

The Resident Site Representative shall attend all job-site meetings.

2.12 Inspection and Testing

The Resident Site Representative must see that the tests and inspections required by the Contract documents are conducted, and should observe these tests and report the results in the daily log.

The Prime Consultant should be notified if the test results do not meet the specified requirements, or if the Contractor does not have tests undertaken as required.

2.13 Emergencies

In the case of emergency where safety of persons or property is concerned, or work is endangered by the actions of the Contractor of the elements, to safeguard the interests of PWGSC, the Resident Site Representative shall give immediate written notice to the Contractor of the possible hazard. He shall further, if necessary, stop the work or give orders for remedial work, and contact the Prime Consultant immediately for further instruction.

2.14 Limitations

The Resident Site Representative shall not:

1. Authorize deviations from the contract documents;
2. Conduct tests;
3. Approve shop drawings or samples;
4. Advise the user-client in any matter without obtaining guidance from the Prime Consultant.
5. Accept any work or portions of the building.
6. Enter into the area of responsibility of the Contractor's field superintendent, stop the work unless convinced that an emergency exists as noted above.

2.15 Hazardous Construction Operations

It is the duty of the Resident Site Representative to examine all site conditions and methods to be used by the Contractor undertaking hazardous operations.

Give written authority to undertake hazardous operations to the Contractor when fully satisfied that all necessary precautions and acts have been taken by the Contractor to safeguard the life safety of the workers and building occupants and Crown property. Such written authority shall be countersigned by the Contractor to acknowledge that the latter is aware of the Resident Site Representative's instructions and requirements and both parties will retain copies of the authority document signed mutually by them.

The Resident Site Representative shall inspect the areas where hazardous work is under way to ensure that the Contractor is maintaining the agreed safety standards. Any infraction to such standards may result in the Resident Site Representative stopping the work. All infractions, or work stoppages ordered shall be reported in writing and verbally to the Prime Consultant and PWGSC Construction Supervisor.

2.16 Site Security

Special precautions must be taken at all times to prevent unauthorized entry of the site of work. The Resident Site Representative is to ensure that all contractor-made openings and means of access are firmly secured when the Contractor leaves the site.

The Resident Site Representative will liaise closely with the Prime Consultant and PWGSC Representative on all security and/or safety problems that may arise due to the contractor's operations.

APPENDIX A –TEAM IDENTIFICATION FORMAT

For details on this format, please see SRE in the Request for Proposal.

Members of the Prime Consultant and members of Sub-Consultant team shall be, or eligible to be, licensed, certified or otherwise authorized to provide the necessary professional services to the full extent that may be required by provincial or territorial law.

I. Prime Consultant (Proponent):

Firm or Joint venture name: .....

.....

.....

Key individuals and provincial professional licensing status:

Name	N° OIQ
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

II. Key Sub-Consultants / S pecialists (if applicable)**:**

Firm name: .....

.....

.....

Key individuals and provincial professional licensing status and:

Name	N° OIQ
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Copy from the above for other required disciplines.

APPENDIX B – DECLARATION/CERTIFICATIONS FORM

Project Titlre:

Name of Proponent:

Street Address:

Mailing Address
(if different than street address)

City:
Prov./Terr./State:
Postal Code:
Telephone Number:
Fax Number:
E-Mail:
Procurement Business Number:

City:
Prov./Terr./State:
Postal Code:

Type of Organization:	**Size of Organization:**
_____ Sole Proprietorship _____ Partnership _____ Corporation _____ Joint Venture	Number of Employees ____ Graduate Architects/Professional Engineers ___ Other Professionnal _____ Technical Support _____ Other _____

APPENDIX B - DECLARATION/CERTIFICATION FORM (CONT'D)

Federal Contractors Program (FCP) - Certification
Pursuant to GI 12, The Proponent must complete the following certification.

1. The Proponent, or, if the Proponent is a joint venture the member of the joint venture, certifies its status with FCP, as follows:

   The Proponent or the Member of the Joint Venture:

   a) ( ) is not subject to the FCP, having a workforce of less than 100 full- time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada,

   b) ( ) is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c.44;

   c) ( ) is subject to the requirements of the FCP, having a workforce of 100 or more full time or part-time permanent employees, or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC, (having not bid on requirements of $200,000 or more), in which case a duly signed certificate of commitment is attached;

   d) ( ) is subject to the FCP, and has a valid certificate number (i.e. has not been declared an ineligible Contractor by HRSDC).

   Please check the appropriate item above. Further information on the FCP is available on the HRSDC Web site.

2. If the Proponent does not fall within the exceptions enumerated in 1. (a) or (b), or does not have a valid certificate number confirming its adherence to the FCP, the Proponent must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity, to the Labour Branch of HRSDC.

APPENDIX B - DECLARATION/CERTIFICATION FORM (CONT'D)

Former Public Servant (FPS) – Certification

Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, proponents must provide the information required below.

Definitions

For the purposes of this clause:

"former public servant" is any former member of a department as defined in the *Financial Administration Act*, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

a) an individual;
b) an individual who has incorporated;
c) a partnership made of former public servants; or
d) a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, in the context of the fee abatement formula, a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act,* R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c. C-17, the *Defence Services Pension Continuation Act,* 1970, c. D-3, the *Royal Canadian Mounted Police Pension Continuation Act,* 1970, c. R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c. R-11, the *Members of Parliament Retiring Allowances Act*, R.S., 1985, c. M-5, and that portion of pension to the *Canada Pension Plan Act*, R.S., 1985, c. C-8.

APPENDIX B - DECLARATION/CERTIFICATION FORM (CONT'D)

Former public servant in receipt of a pension

Is the Proponent a FPS in receipt of a pension as defined above?
YES ( ) NO ( )

If so, the Proponent must provide the following information:

a) Name of former public servant;
b) Date of termination of employment or retirement from the Public Service.

Work Force Reduction Program

Is the Proponent a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? YES ( ) NO ( )

If so, the Proponent must provide the following information:

a) Name of former public servant;

b) Conditions of the lump sum payment incentive;

c) Date of termination of employment;

d) Amount of lump sum payment;

e) Rate of pay on which lump sum payment is based;

f) Period lf lump sum payment including start date, end date and number of weeks;

g) Number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is $5,000, including the Goods and Services Tax or Harmonized Sales Tax.

Certification

By submitting a proposal, the Proponent certifies that the information submitted by the Proponent in response to the above requirements is accurate and complete.

APPENDIX B - DECLARATION/CERTIFICATION FORM (CONT'D)

Name of Proponent

DÉCLARATION :

I, the undersigned, being a principal of the proponent, hereby certify that the information given on this form and in the attached proposal is accurate to the best of my knowledge. If any proposal is submitted by a partnership or joint venture, then the following is required from each component entity.

.....
Name .....
Signature

.....
Title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

.....
Name .....
Signature

.....
Title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

.....
Name .....
Signature

.....
Title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

During proposal evaluation period, PWGSC contact will be with the following person: _____.

Phone number: ( ) _____Fax number: ( ) _____

E-Mail : _____

This Appendix "B" should be completed and submitted with the proposal, but may be submitted afterwards as follows: if Appendix "B" is not completed and submitted with the proposal, the Contracting Authority will so inform the Proponent and provide the Proponent with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the proposal non-responsive.

APPENDIX C – PRICE PROPOSAL FORM

INSTRUCTIONS: Complete this Price Proposal Form and submit in a **separate sealed envelope** with the Name of Proponent, Name of Project, PWGSC Solicitation Number, and the words "PRICE PROPOSAL FORM" typed on the outside of the envelope. Price Proposals **are not to include GST and QST**

PROPONENTS SHALL NOT ALTER THIS FORM

Project Title:

Name of Proponent:

The following will form part of the evaluation process:

REQUIRED SERVICES

- **Fixed Fees** (R1230D (2011-05-16), CG 5 – Terms of Payment)

SERVICES	**FIXED FEES**
RS1 to RS4 including meetings and translation : (1)	_____$
RS5 (including translation) to RS7 (Optional work)	_____$
Meetings during construction phase (Optional work) (2) Approximate quantity: 40 meetings / Unit price: $_____X 40 =	_____$
TOTAL - FIXED FEES (A):	_____$

(1) Deliverables in the preliminary stages are in French only.

(2) Costs related to meetings include round trip travel time, site visits, meeting time and the cost of hotel and meals.

APPENDIX C – PRICE PROPOSAL FORM (CONT'D)

Time based fees (R1230D (2015-02-25), GC 5 – Terms of payment)

Time based fees – Payment for changes and revisions

Title	Experience	Estimated hours	Hourly rate	Time based fees
Senior design engineer	10 years and more	1500	$_____	$ _____
Intermediate engineer	5 to 10 years	1500	$_____	$ _____
Junior engineer	Up to 5 years	1800	$_____	$ _____
Senior technician	10 to 15 years	1000	$_____	$ _____
intermediate technician	5 to 10 years	1800	$_____	$ _____
Junior technician	Up to 5 years	1000	$_____	$ _____
Senior draftsperson	10 to 15 years	1000	$_____	$ _____
Intermediate draftsperson	5 to 10 years	1000	$_____	$ _____
Administrative assistant	5 years and more	500	$_____	$ _____
MAXIMUM TIME BASED FEES (B)				$ _____

Resident Site Services* (Optional work)	**Estimated hours** **Column (a)**	**Hourly rate**** **Colomn (b)**	**Fees based on time** **Columns (a) x (b)**
Senior supervisor			
Based on a 40 hours average week X 90 weeks	3600	$.....	$.....
Based on a 15 hours overtime average week X 90 weeks	1350	$.....	$.....
Assistant supervisor:			
Based on a 40 hours regular hour average week X 80 weeks	3200	$.....	$.....
Based on a 2 hours overtime hour average week X 80 weeks	160	$.....	$.....
MAXIMUM TIME BASED FEES (C)			$.....

Note: This additional service shall be submitted to and approved beforehand by the Project Manager, including fees and disbursements estimates. Payable time for the supervision personnel will only include the hours worked on the site and keeping in mind the construction duration may be shorter or longer than herein estimated.

* Payment will be based on actual hours spent. Travel time and/or expenses have to be included in these fees and will not be reimbursed separately.

** All inclusive hourly rate is applicable to both normal working hours and any other shift work as required.

MAXIMUM TIME BASED FEES

Time based fees - for changes and revisions (B)	_____$
Time based fees – resident inspection services (C)	_____$
TOTAL MAXIMUM TIME BASED FEES (B+C)	_____$

MAXIMUM FEES FOR REQUIRED SERVICES

FIXED FEES (A):	_____$
TIME BASED FEES (B+C)	_____$
TOTAL MAXIMUM FEES FOR REQUIRED SERVICES (RS) (A+B+C)	_____$

ADDITIONAL SERVICES

AS1 BILINGUAL DOCUMENTS

Include in RS1 to RS5

AS2-DISBURSEMENTS FOR RESIDENT SITE SERVICES (Optional)

Disbursements shall belong to the project and may not include normal operation costs of the Consultant's business. Unless prior authorization is obtained from the Department Representative, the amounts payable shall not exceed the amount indicated in the section entitled «Agreement particulars » herein included.

For the purposes of the proposal, the total duration of work execution is estimated at 500 days, spread according to the Contractor's execution schedule.

Senior supervisor, **boarding expenses**
500 days (estimated) x $_____ (fixed) = (estimated total) (D) _____$

Assistant supervisor, **boarding expenses**:
500 days (estimated) x $_____ (fixed) = (estimated total) (E) _____$

Site equipment:
500 days (estimated) x $_____ (fixed) = (estimated total) (F) _____$

NOTE: In addition, the Consultant shall give thought to the following hypotheses:

1. Plant (implements, etc.) means one (1) vehicle including motor vehicle registration, insurance, fuel and maintenance at the disposal of the supervisors, the necessary surveying tools and equipment, computer with scanner, printer and stationary, digital camera and cellular phone. All personal protection equipment used by the Consultant's employees shall be furnished by the Consultant and are included in the Plant item. Any other equipment shall be submitted to and approved beforehand by the project manager.

2. A total of 500 days, for the personal protection, computer and electronics, survey and others needed by the supervision personnel during construction.

3. Boarding costs for the supervision personnel: payable for each day over the duration of construction according to the Contractor's execution schedule on site. Boarding costs include: the cost of travel and travel time to and from CCG base, boarding, meals and incidental expenses.

4. Any extended leave of worksite supervisors, i.e., more than seven (7) consecutive days, is subject to the project manager's approval regarding effectively payable disbursements regardless of the reason for this absence (interruption of work, temporary shutdown of worksite or other).

TOTAL MAXIMUM AMOUNT FOR ADDITIONAL SERVICES (AS) (D+E+F) _____$

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

TOTAL MAXIMUM FEES FOR REQUIRED SERVICES (RS) (A+B+C): _____$

TOTAL MAXIMUM AMOUNT FOR ADDITIONAL SERVICES (AS) (D+E+F): _____$

TOTAL COST FOR EVALUATION PURPOSES (RS+AS) (A+B+C) + (D+E+F): _____$

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

The following will NOT form part of the evaluation process

Canada may accept or reject any of the following fees, disbursements and/or hourly rates. Canada reserves the right to negotiate on these fees, disbursements and/or hourly rates.

OTHER ADDITIONAL SERVICES

DISBURSEMENTS

At cost without allowance for mark-up or profit, supported by invoices/receipts - see clause R1230D (2011-05-16), GC 5 - Terms of Payment, section GC5.12 Disbursements:

The geotechnical study and environmental characterization, the sedimentation study, the services of a specialist in project planning and the expenses related to the quality assurance of the works such as the tests on site, in the quarry, the laboratory, the workshop or underwater surveys, etc., shall be carried out by the consultant. The latter will be in charge of coordination and administration of the mandate until payment, including the latter, which will be reimbursed to him by the Departmental Representative at cost without any mark-up.

MAXIMUM AMOUNT FOR DISBURSEMENTS: $600,000.00

END OF PRICE PROPOSAL FORM

APPENDIX D – DOING BUSINESS

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

Canada

Respect • Integrity • Excellence • Leadership

Serving GOVERNMENT, Serving CANADIANS.

Doing Business
Quebec Region

Architectural and Engineering Services

May 1st, 2013 – GDDE # 721745

www.pwgsc-tpsgc.gc.ca

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SECTION 1 INTRODUCTION

This document must be used in conjunction with the Terms of Reference TOR (Project brief, Request for proposals or others), as the two documents are complimentary. The TOR describes project-specific requirements while this document deals with information common to all projects. In case of a conflict between the two documents, the requirements of the TOR override this document.

The Consultant shall check with the Project Manager if this document is current. The updated version of the latest is the one applicable to the project.

SECTION 2 PWGSC NATIONAL CADD STANDARD

Drawings shall be in accordance with Public Works and Government Services Canada (PWGSC) National CADD Standards, **Quebec regional version**, and CSA B78.3 of Canadian Standards Association.

Refer to:
http://www.tpsgc-pwgsc.gc.ca/biens-property/cdao-cadd/index-eng.html

For the Quebec region:
http://www.tpsgc-pwgsc.gc.ca/cdao-cadd/index-eng.html

The above link is subject to change. The Consultant shall check with the Project Manager to ensure that the link and related information are current and relevant with regards to PWGSC National CADD Standards **for the Quebec region.**

SECTION 3 - GUIDE TO PREPARATION OF CONSTRUCTION DOCUMENTS FOR PWGSC

1 Purpose

This document provides direction in the preparation of construction contract documents (namely specifications, drawings and addenda) for Public Works and Government Services Canada (PWGSC).

Drawings, specifications and addenda must be complete and clear, so that a contractor can prepare a bid without guesswork. Standard practice for the preparation of construction contract documents requires that:

- Drawings are the graphic means of showing work to be done, as they depict shape, dimension, location, quantity of materials and relationship between building components.
- Specifications are written descriptions of materials and construction processes in relation to quality, colour, pattern, performance and characteristics of materials, installation and quality of work requirements.
- Addenda are changes to the construction contract documents or tendering procedures, issued during the tendering process.

2 Principles of PWGSC Contract Documents

PWGSC's contract documents are based on common public procurement principles. PWGSC does not use Canadian Construction Document Committee (CCDC) documents.

The terms and conditions are prepared and issued by PWGSC as well as other related bidding and contractual documents. For information, the clauses are available on the following web site: http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/tmtc-eng.jsp
Any questions should be directed to the Project Manager.

3 Quality Assurance

Consultants are required to undertake their own quality control process and must review, correct and coordinate (between disciplines) their documents before sending them to PWGSC.

SPECIFICATIONS

1 National Master Specification

The National Master Specification (NMS) is a master construction specification available in both official languages, which is divided into 48 Divisions and used for a wide range of construction and/or renovation projects. In preparing project specifications, the Consultant must use the current edition of the NMS in accordance with the “NMS User’s Guide”.

The Consultant retains overriding responsibility for content and shall edit, amend and supplement the NMS as deemed necessary to produce an appropriate project specification free from conflict and ambiguity.

2 Specification Organization

Narrowscope sections describing single units of work are preferred for more complex work, however, broadscope sections may be more suitable for less complex work. Use either the NMS 1/3 - 2/3 page format or the Construction Specifications Canada full-page format.

Start each Section on a new page and show PWGSC Project Number, Section Title, Section Number and Page Number on each page. Specification date, project title, and consultant’s name are not to be indicated.

3 Terminology

Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect. "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor.

Notations such as: "verify on site", "as instructed", “to match existing”, “example”, “equal to” or “equivalent to”, "to be determined on site by “Departmental Representative", should not be indicated in the specifications as this promotes inaccurate and inflated bids. Specifications must permit bidders to calculate all quantities and bid accurately. In exceptional cases, if quantities are impossible to identify (i.e. cracks to be repaired) give an estimated quantity for bid purposes (unit prices). Ensure that the terminology used throughout the specifications is consistent and does not contradict the applicable standard construction contract documents.

4 Dimensions

Dimensions are to be in metric only (no dual dimensioning).

5 Standards

As references in the NMS may not be up to date, it is the responsibility of the consultant to ensure that the project specification uses the latest applicable edition of all references quoted. The following is a list of some of the Internet websites which provide the most current publications of standards for reference in the construction specification document.

- CSA standards: http://www.csa.ca
- CGSB standards: http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html
- ANSI standards: http://www.ansi.org
- ASTM Standards: http://www.astm.org
- ULC standards: http://www.ulc.ca
- General reference of standards: http://www.techstreet.com/

The NMS website (http://www.tpsgc-pwgsc.gc.ca/biens-property/ddn-nms/index-eng.html) also links to other documents references in the NMS under its "Links" feature.

6 Specifying Materials

The practice of specifying actual brand names, model numbers, etc., is against departmental policy except for special circumstances. The method of specifying materials shall be by using recognized standards such as those produced by Canadian Gas Association (CGA), Canadian General Standards Board (CGSB), Canadian Standards Association (CSA), and Underwriters' Laboratories of Canada (ULC), or by trade associations such as Canadian Roofing Contractors' Association (CRCA) and Terrazzo, Tile, Marble Association of Canada (TTMAC). Canadian standards should be used wherever possible.

If the above method cannot be used and where no standards exist, specify by a non-restrictive, non-trade name "prescription" or "performance" specifications.

In exceptional or justifiable circumstances or, if no standards exist and when a suitable non-restrictive, non-trade name "prescription" or "performance" specification cannot be developed, specify by trade name. Include all known materials acceptable for the purpose intended, and in the case of equipment, identify by type and model number.

Acceptable Materials: set up the paragraph format as follows:

Acceptable Materials:

1. ABC Co. Model [_____].
2. DEF Co. Model [_____].
3. GHI Co. Model [_____].
4. Alternative Materials: Approved by addendum in accordance with Instructions to Tenderers.

Alternatively, include the following article in Part 1 of each Section in which trade names appear:

> ***Acceptable Materials****: Where materials are specified by trade name refer to the "Instructions to Tenderers" for a procedure to be followed in applying for approval of alternatives.*

Alternative materials to those specified may be considered during the solicitation period, however, the onus will be on the Consultant to review and evaluate all requests for approval of alternative materials.

The term “Acceptable Manufacturers” should not be used, as this restricts competition and does not ensure the actual material or product will be acceptable. A list of words and phrases that should be avoided is included in the NMS User's Guide.

Sole Sourcing: Sole sourcing for materials and work can be used for proprietary systems (ie. fire alarm systems, EMCS – Energy Monitoring and Control Systems). A justification will be required in this context.

Wording for the sole source of work should be in Part 1 as:

“Designated Contractor

.1 Hire the services of [_____] to do the work of this section.”

Wording for the sole source of Energy Monitoring and Control Systems (EMCS) should be in Part 1 as:

“Designated Contractor

.1 Hire the services of [_____] or its authorized representative to complete the work of all EMCS sections.”

and in Part 2 as “Materials

.1 There is an existing [_____] system presently installed in the building. All materials must be selected to ensure compatibility with the existing [_____] system.

Wording for the sole source of materials (ie. fire alarm systems) should be in Part 2 as:

“Acceptable materials

.1 The only acceptable materials are [_____] .”

Prior to including sole source materials and/or work, the Consultant should contact the Project Manager to obtain the approval for the sole sourcing.

7 Unit Prices

Unit prices are used where the quantity cannot be precisely estimated (eg. earth work). The approval of the Project Manager must be sought in advance of their use.

Use the following wording:

[The work for this section] or [define the specific work if required, e.g. rock excavation] will be paid based on the actual quantities measured on site and the unit prices stated in the Bid and Acceptance Form.

In each applicable NMS section, replace paragraph title "Measurement for Payment" with "Unit Prices”.

Refer to Appendix 1 of the Bid and Acceptance Form to view a sample of Unit Price Table.

8 Cash Allowances

Construction contract documents should be complete and contain all of the requirements for the contractual work. Cash allowances are to be used only under exceptional circumstances (ie. utility companies, municipalities), where no other method of specifying is appropriate. Obtain approval from the Project Manager in advance to include cash allowances and then use “Section 01 21 00 - Allowances” of the NMS to specify the criteria.

9 Warranties

It is the practice of PWGSC to have a 12 month warranty and to avoid extending warranties for more than 24 months. When necessary to extend beyond the 12 month warranty period provided for in the General Conditions of the contract, use the following wording in Part 1 of the applicable technical sections, under the heading "Extended Warranty":

- "For the work of this Section [_____], the 12 month warranty period is extended to 24 months.

- Where the extended warranty is intended to apply to a particular part of a specification section modify the above as follows: "For [_____] the 12 month ... [_____] months."

Delete all references to manufacturers' guarantees.

10 Scope of Work

No paragraphs noted as "Scope of Work" are to be included.

11 Summary and Section Includes in Part -1 General of Section

Do not use the terms "Summary" and "Section Includes."

12 Related Sections

In every section of the specification at 1.1 "Related Sections": coordinate the list of related sections and appendices. Ensure co-ordination among the sections of the specification and ensure not to reference any section or appendices which do not exist.

13 Index

List all the plans and specification sections with correct number of pages, section names and correct drawing titles in the format shown in Appendix C.

14 Regional requirements

The Consultant should contact the Project Manager to obtain the regional requirements concerning Division 01 or other short form specifications as might be appropriate. For example, in the Quebec Region, the use of the *Section 01 11 01 – Work related general information* is necessary.

15 Health and Safety

It is required that all project specifications include "Section 01 35 29.06 - Health and Safety Requirements." Confirm with the Project Manager to determine if there are any instructions to meet regional requirements.

16 Designated Substances Report

Include "Section 01 14 25 - Designated Substances Report"

17 Subsurface Investigation Reports

Subsurface Investigation Report(s) are to be included after Section 31 and the following paragraph should be added to Section 31:

Subsurface investigation report(s)

.1 Subsurface investigation report(s) are included in the specification following this section.

When the Project Manager determines that it is not practical to include the subsurface investigation report(s), alternate instructions will be provided.

Where tender documents are to be issued in both official languages, the subsurface investigation report(s) shall be issued in both languages.

In addition to the provision of the Subsurface Investigation Report, the foundation information required by the National Building Code of Canada 2005 (Division C, Part 2, 2.2.4.6) shall be included on foundation drawings.

18 Experience and Qualifications

Remove experience and qualification requirements from specification sections.

19 Prequalification and Pre-award submissions

Do not include in the specification any mandatory contractor and/or subcontractor prequalification or pre-award submission requirements that could become a contract award condition. If a prequalification process or a pre-award submission is required, contact the Project Manager.

There should be no references to certificates, transcripts or license numbers of a trade or subcontractor being included with the bid.

20 Contracting Issues

Specifications describe the workmanship and quality of the work. Contracting issues should not appear in the specifications. Division 00 of the NMS is not used for PWGSC projects.

Remove all references within the specifications, to the following:

- General Instructions to Bidders
- General Conditions
- CCDC documents
- Priority of documents
- Security clauses
- Terms of payment or holdback
- Tendering process
- Bonding requirements
- Insurance requirements
- Alternative and separate pricing
- Site visit (Mandatory or Optional)
- Release of Lien and deficiency holdbacks

DRAWINGS

1 Title Blocks
Use PWGSC title block for drawings and sketches (including addenda).

2 Dimensions
Dimensions are to be in metric only (no dual dimensioning).

3 Trade Names
Trade names on drawings are not acceptable. Refer to SECTION 3, SPECIFICATIONS, 6.0 Specifying Materials for specifying materials by trade name.

4 Specification Notes
No specification type notes are to appear on any drawing.

5 Terminology
Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect. "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor.

Notes such as: "verify on site", "as instructed", “to match existing”, “example”, “equal to” or “equivalent to”, "to be determined on site by “Departmental Representative", should not appear on drawings as this promotes inaccurate and inflated bids. Drawings must allow bidders to calculate all quantities and bid accurately. In exceptional cases, where quantities are impossible to quantify (i.e. cracks to be repaired), refer to indications contained in section 3, Specifications, 3 Terminology.

6 Information to be included
Drawings should show the quantity and configuration of the project, the dimensions and details of how it is constructed. There should be no references to future work or any information planned to be changed by future addenda. The scope of work should be clearly detailed and elements not in contract should be eliminated or kept to an absolute minimum.

7 Drawing Numbers: Sets of drawings shall be numbered according to the type of drawing and the discipline involved, as indicated in the PWGSC NATIONAL CADD STANDARD.

During the Design Phase of the project each issue and review of documents must be noted on the Notes block of the drawing title, but at the time of construction document preparation, all revision notes should be removed.

8 Presentation Requirements: Present drawings in sets comprising the applicable civil, architectural, structural, mechanical and electrical drawings in that order. All drawings should be of uniform standard size.

9 Prints: Print with black lines on white paper. Confirm with Project Manager the size of prints to be provided for review purposes.

10 **Binding:** Staple or otherwise bind prints into sets. Where presentations exceed 20 sheets, the drawings for each discipline may be bound separately for convenience and ease of handling.

11 **Legends:** Provide a legend of symbols, abbreviations, references, etc., on the front sheet of each set of drawings or, in large sets of drawings, immediately after the title sheet and index sheets.

12 **Schedules:** Where schedules occupy entire sheets, locate them on top of each set of drawings for convenient reference. *See CGSB 33-GP-7 Architectural Drawing Practices for schedule arrangements.*

13 **North Points:** On all plans include a north point. Orient all plans in the same direction for easy cross-referencing. Wherever possible, lay out plans so that the north point is at the top of the sheet.

14 **Drawing Symbols:** Follow generally accepted drawing conventions, understandable by the construction trades, and in accordance with PWGSC publications.

ADDENDA

1 Format

Prepare addenda using the format shown in Appendix B. No signature type information is to appear.

Every page of the addendum (including attachments) must be numbered consecutively. All pages must have the PWGSC project number and the appropriate addendum number. Sketches shall appear in the PWGSC format, signed and sealed.

No Consultant information (name, address, phone #, consultant project # etc.) should appear in the addendum or its attachments (except on sketches).

2 Content

Each item should refer to an existing paragraph of the specification or note/detail on the drawings. The clarification style is not acceptable.

DOCUMENTS FOR TENDER CALLS

1 Translation

When required, all documentation included in the construction contract documents shall be in both official languages.

Ensure that English and French documents are equal in all respects. There can be no statement that one version takes precedence over the other.

2 Consultant shall provide:

- Per construction document submission, a completed and signed Checklist for the Submission of Construction Documents. See Appendix 'A'.
- Specification: originals printed one side on 216 mm x 280 mm white bond paper.
- Index: as per Appendix 'C'
- Addenda (if required): as per Appendix 'B' (to be issued by PWGSC).
- Drawings: reproducible originals, sealed and signed by the design authority.
- Tender information:
  - Including a description of all units and estimated quantities to be included in unit price table.
  - Including a list of significant trades including costs. PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.

    Government Electronic Tendering System (MERX): Consultants to provide an electronic true copy of the final documents (specifications and drawings) on one or multiple CD-ROM in Portable Document Format (PDF) without password protection and printing restrictions. The electronic copy of drawings and specifications for bidding and construction purposes are required to be signed and sealed by professionals in each discipline. See Appendix 'D' and Appendix 'E'.

3 PWGSC shall provide:

- General and Special Instructions to Bidders
- Bid and Acceptance Form
- Standard Construction Contract Documents

SECTION 4 CLASSES OF CONSTRUCTION COST ESTIMATES USED BY PWGSC

DESCRIPTION OF THE CLASSES OF ESTIMATES USED BY PWGSC FOR CONSTRUCTION COSTING OF BUILDINGS PROJECTS

Class 'D' (Indicative) Estimate:

Based upon a comprehensive statement of requirements, and an outline of potential solutions, this estimate is to provide an indication of the final project cost, and allow for ranking all the options being considered.

Submit Class D cost estimates in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors with cost per m² for current industry statistical data for the appropriate building type and location. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

The level of accuracy of a class D cost estimate shall be such that no more than a 20% design contingency allowance is required.

Class 'C' Estimate:

Based on a comprehensive list of requirements and assumptions including a full description of the preferred schematic design option, construction/design experience, and market conditions. This estimate must be sufficient for making the correct investment decision.

Submit Class C cost estimates in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors with cost per m² for current industry statistical data for the appropriate building type and location. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

The level of accuracy of a class C cost estimate shall be such that no more than a 15% design contingency allowance is required.

Class 'B' (Substantive) Estimate:

Based on design development drawings and outline specifications which include the design of all major systems and subsystems, as well as the results of all site/installation investigations. This estimate must provide for the establishment of realistic cost objectives and be sufficient to obtain effective project approval.

Submit Class B cost estimates in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

The level of accuracy of a class B cost estimate shall be such that no more than a 10% design contingency allowance is required.

Class 'A' (Pre-Tender) Estimate:

Based on completed construction drawings and specifications, prepared prior to calling competitive tenders. This estimate must be sufficient to allow a detailed reconciliation/negotiation with any contractor's tender.

Submit Class A cost estimates in both elemental cost analysis format and trade divisional format latest edition issued by the Canadian Institute of Quantity Surveyors. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

The level of accuracy of a class A cost estimate shall be such that no more than a 5% design contingency allowance is required.

SECTION 5 TIME MANAGEMENT

5 Time Management, Planning, and Control

The Time Management, Planning, and Control Specialist (scheduler) shall provide a Project Planning and Control System (Control System) for Planning, Scheduling, Progress Monitoring and Reporting and a Time Management, Planning, and Control Report (Progress Report). It is required that a fully qualified and experienced Scheduler play a major role in providing services in the development and monitoring of the project schedule.

The scheduler will follow good industry practices for schedule development and maintenance as recognized by the Project Management Institute (PMI).

PWGSC presently utilizes the Primavera Suite software and MicroSoft Project for it's current Control Systems and any software used by the consultant should be fully integrated with these, using one of the many commercially available software packages.

5.1 Schedule Design

Project Schedules are used as a guide for execution of the project as well as to communicate to the project team when activities are to happen, based on network techniques using Critical Path Method (CPM).

When building a Control System you must consider:

1. The level of detail required for control and reporting;
2. The reporting cycle- monthly and what is identified in the Terms of Reference, but also includes Exception Reports;
3. That the duration must be in days;
4. What is required for reporting in the Project Teams Communications Plan and
5. The nomenclature and coding structure for naming and reporting requirements of activities, schedules and reports.

5.2 Schedule Development

For purposes of monitoring and reporting of project progress and ease of schedule review it is important to maintain a standard for all schedules and reports starting with the Work Breakdown Structure (WBS), identification of Milestones, naming of activities as well as schedule outputs and paper sizing and orientation.

Work Breakdown Structure

When developing the schedule the consultant needs to use PWGSC standards and practices. Two basic requirements are the National Project Management System (NPMS) and a Work Breakdown Structure (WBS), structured supporting the NPMS (Levels 1-4).

The WBS is as follows:

- Level 1 Project Title (NPMS)
- Level 2 Project Stage (NPMS)
- Level 3 Project Phase (NPMS)
- Level 4 Processes to meet Deliverables/Control Points Milestones (NPMS)
- Level 5 Sub-Processes and Deliverables in support of Level 4
- Level 6 Discrete activities. (Work Package)

Not all the Stages, Phases and Processes in the NPMS will be required on all the projects, however the structure remains the same.

Major and Minor Milestones

The Major Milestones are standard Deliverables and Control Points within NPMS and are required in all schedule development. These Milestones will be used in Management Reporting within PWGSC as well as used for monitoring project progress using Variance Analysis. The Minor milestones are process deliverables (Level 4) or sub-process deliverables (level 5) also used in Variance Analysis.

Each Milestone will also be assigned appropriate coding for Status Reporting and Management Reporting.

Milestones must have zero duration and are used for measuring project progress.

Milestones may also be external constraints such as the completion of an activity, exterior to the project, affecting the project.

Activities

All activities will need to be developed based on Project Objectives, Project Scope , Major and Minor Milestones, meetings with the project team and the scheduler's full understanding of the project and it's processes.

Subdivide the elements down into smaller more manageable pieces that organize and define the total scope of work in Levels 5-6 that can be scheduled, costed, monitored and controlled. This process will develop the Activity List for the project.

Each activity is a discrete element of work and is the responsibility of one person to perform.

Each activity will describe the work to be performed using a verb and noun combination (i.e. Review Design Development Report).

Activities should not have durations longer that 2 update cycles, with exception of activities not yet defined in a “Rolling Wave”.

Each activity will be assigned at WBS level 6 and appropriately coded for Status Reporting and Management Reporting.

These elements will become activities, interdependently linked in Project Schedules.

Project Logic

Once the WBS, Milestones and Activity List have been developed the activities and milestones can be linked in a logical manner starting with a Project Start Milestone. Every activity and milestone must be linked in a logical manner using either a Finish to Start (FS), Finish to Finish (FF), Start to Start (SS) or Start to Finish (SF) relationship. There can be no open-ended activities or milestones.

A Finish to Start (FS) is the preferred relationship.

When developing relationships; avoid the use of lags and constraints in place of activities and logic.

Activity Duration

The activity duration (in days) is the estimated length of time it will take to accomplish a task.

Consideration needs to be taken in how many resources are needed and are available, to accomplish any activity. (Example: availability of Framers during a “Housing Boom”.) Other factors are the type or skill level of the available resources, available hours of work, weather etc.

There will be several types of lists and schedules produced from this process, which will form part of the Progress Report.

Activity List

An Activity List identifies all activities including milestones required to complete the whole project.

Milestone List

A Milestone List identifies all project Major and Minor milestones.

Master Schedule

A Master Schedule is a schedule used for reporting to management at WBS level 4 and 5 that identifies the major activities and milestones derived from the detailed schedule. Cash Flow projections can be assigned at WBS level 5 for monitoring the Spending Plan.

Detailed Project Schedule

A Detailed Project Schedule is a schedule in reasonable detail (down to WBS Level 6 and 7) for progress monitoring and control, this will ensure that the schedule shall be in sufficient detail to ensure adequate planning and control.

5.3 Schedule Review and Approval

Once the scheduler has identified and properly coded all the activities; put them into a logical order and then determined the appropriate durations. The scheduler can then analyze the schedule to see if the milestone dates meet the contractual requirements and then adjust the schedule accordingly by changing durations, resource leveling or changing logic.

When the schedule has been satisfactorily prepared the scheduler can present the detailed schedule to the Project Team for approval and be Baselined. There may be several iterations before the schedule meets with the Project Teams agreement and the contractual requirements.

The final agreed version must be copied and saved as the Baseline to monitor variances for reporting purposes.

5.4 Schedule Monitoring and Control

Once Baselined the schedule can be better monitored, controlled and reports can be produced.

Monitoring is performed by, comparing the baseline activities % complete and milestone dates to the actual and forecast dates to identify the variance and record any potential delays, outstanding issues and concerns and provide options for dealing with any serious planning and scheduling issues in report form.

Analyze and report from early start sequence on all activities due to start, underway, or finished for the complete project.

Thee will be several reports generated from the analysis of the baseline schedule and will form part of the Time Management Report in the Required Services Sections (RS)

Progress Reports

A Progress Report reflects the progress of each activity to the date of the report, any logic changes, both historic and planned, projections of progress and completion the actual start and finish dates of all activities being monitored.

The Progress Report includes:

A Narrative Report, detailing the work performed to date, comparing work progress to planned, and presenting current forecasts. This report should summarize the progress to date, explaining current and possible deviations and delays and the required actions to resolve delays and problems with respect to the Detail Schedule, and Critical Paths.

Narrative reporting begins with a statement on the general status of the project followed by a summarization of delays, potential problems and project status criticality, any potential delays, outstanding issues and concerns and options for dealing with any serious planning and scheduling issues.

A Variance Report, with supporting schedule documentation, detailing the work performed to date, comparing work progress to planned. This report should summarize the progress to date, explaining all causes of deviations and delays and the required actions to resolve delays and problems with respect to the Detail Schedule, and Critical Paths.

A Criticality Report identifying all activities and milestones with negative, zero and up to five days Total Float used as a first sort for ready identification of the critical, or near critical paths through the entire project.

Included in the Progress Report as attachments are: WBS chart, Activity Lists, Milestone Lists, Master Schedules, Detailed Project Schedule

Exception Report

The Scheduler is to provide continuous monitoring and control, timely identification and early warning of all unforeseen or critical issues that affect or potentially affect the project.

If unforeseen or critical issues arise, the Scheduler will advise the Project Manager and submit proposed alternative solutions in the form of an Exception Report.

An Exception Report will include sufficient description and detail to clearly identify:

1. Scope Change: Identifying the nature, reason and total impact of all identified and potential project scope changes affecting the project.
2. Delays and accelerations: Identifying the nature, the reason and the total impact of all identified and potential duration variations.
3. Options Enabling a Return to the project baseline: Identifying the nature and potential effects of all identified options proposed to return the project within baselined duration.

5.5 Standard issue of documents

At each issue of documents or deliverable stage provide a complete and updated Progress Report, the contents of each report will vary with requirements and at each project phase. Typically a Progress Report has:

1. Executive Summary;
2. Narrative Report;
3. Variances Report;
4. Criticality Report;
5. Exception Report (as required)
6. Work Breakdown Structure Chart;
7. Activity List;
8. Milestone List;
9. Master Schedule with Cash Flow Projections;
10. Detail Project Schedule (Network Diagram or Bar Charts);

5.6 Schedule Outputs and Reporting Formats

The sheet sizing and orientation is more a suggestion that a role, changes to the paper format may vary to accommodate the information and column information required.

Progress Reports

Paper Size: Letter
Paper Format: Portrait
Title Format: Project Title; Report Type; Print Date; Data Date; Revision Block
Body Text: Narratives for each report to match other reports generated in the D.S.S.
Variance Report Columns: Activity ID, Activity Name, Planned Finish, Revised Finish, Variance, Activity % Complete,
Criticality Report Columns: Activity ID, Activity Name, Duration, Start, Finish, Activity % Complete, Total Float.

Exception Reports

Paper Size: Letter
Paper Format: Portrait
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Body Text: Narrative to match other reports generated in the D.S.S.
Paper Size: Letter
Paper Format: Landscape
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Columns: Activity ID, Activity Name, Duration, Remaining Duration, Start, Finish, Total Float.
<u>Work Breakdown Structure (indent tree):</u>

Paper Size: Letter
Paper Format: Portrait
Columns: WBS Code, WBS Name, Duration, Cost estimate, start and finish dates.
Footer Format: Project Title; Report Type; Print Date; Data Date; Revision Block

Activity Lists

Paper Size: Letter
Paper Format: Portrait
Columns: Activity ID, Activity Name, Start, Finish, Predecessor, Successor.
Footer Format: Project Title; Report Type; Print Date; Data Date; Revision Block

Sort with Early Start, then Early Finish, then Activity ID and with the WBS.

Milestone Lists

Paper Size: Letter
Paper Format: Portrait
Footer Format: Project Title; Report Type; Print Date; Data Date; Revision Block
Columns: Activity ID, Activity Name, Start, Finish.

Sort with Early Start, then Early Finish, then Activity ID and without the WBS.

Master Schedule (Bar Chart)

Paper Size: 11X17
Paper Format: Landscape
Footer Format: Project Title; Report Type; Print Date; Data Date; Revision Block
Columns: Activity ID, Activity Name, Duration, Activity % Complete, Start, Finish, Total Float.

Sort with Early Start, then Early Finish, then Activity ID and with the WBS.

Detailed Project Schedules (Bar Chart)

Paper Size: 11X17
Paper Format: Landscape
Footer Format: Project Title; Report Type; Print Date; Data Date; Revision Block
Columns: Activity ID, Activity Name, Duration, Activity % Complete, Start, Finish, Total Float.

Sort with Early Start, then Early Finish, then Activity ID and with the WBS.

SECTION 6 RISK MANAGEMENT

6.1 DEFINITIONS

Procurement Plan: Formal submission for approval to enter into a contract and composed of a (1) cost estimate of the requirement (including cash allowances, and design, estimating and inflation allowances), (2) a contingency and, (3) an anticipated amendment amount.

Allowances: Additional resources included in an estimate to vcover the cost of known but undefined requirements for an individual activity, work item, account or sub account: design allowance, ecstimating allowance, inflation allowance and other allowances specifically identified are part of a cost estimate

Cash Allowances : a specific amount to be used for specific work item or service.
(a) Cash Allowance Construction: additional resources included in an estimate to cover the cost of known but undefined requirements whose probability of occurrence is high. this allowance is specifically identified in a cost estimate.
(b) Cash Allowance Consultant: additional services included in an estimate to cover the cost of known but undefined requirements whose probability of occurrence is high. this allowance is specifically identified in a cost estimate.

Risk Allowance: Anticipated monetary value of risk events, due to the complexity of the project, market conditions, competitiveness, and timing of project, contingencies are likely to happen and do not form part of cost estimates.

Anticipated Amendments: This is basically the pre-authorization of amending authority to a certain level. Individual contract amendments within this authority must still be approved by the correct level of authority.

The total amount of the Anticipated Amendment to a project cost estimate is determined as the summation of the Expected Monetary Value of risk events reasonably expected to occur during the life cycle of a project.

Risk Management: The art and science of identifying, analyzing, and responding to risk factors throughout the life of a project and in the best interests of its objectives. (PMBOK)

Risk Event: A discrete occurrence that may effect the project for better or worse (i.e. late delivery of a piece of equipment is a “risk event” that may cause a schedule delay).

Probability: The likelihood that an event will occur (i.e. Low, Medium, High).

Impact: The result of the occurrence of an event on the project either positive or negative. (i.e. a schedule delay as a result of late delivery of a piece of equipment may have a high negative impact on a project; increased access to a construction site due to early departure of occupants in an office space may have a positive impact on a project).

The Impact of individual Risk Events can be qualified as low, medium, high or quantified in terms of time, cost (immediate cost or in-service cost (O&M)) or performance.

High risk*: A project (or element of a project) may be assessed as high risk if one or more hazards exist in a significant way and, unless mitigated, would result in probable failure to achieve project objectives.

Medium risk*: A project (or element of a project) may be assessed as medium risk if some hazards exist but have been mitigated to the point that allocated resources and focused risk management planning should prevent significant negative effect on the attainment of project objectives.

Low risk*: A project (or element of a project) should be assessed as low risk if hazards do not exist or have been reduced to the point where routine project management control should be capable of preventing any negative effect on the attainment of project objectives.

**per Treasury Board Secretariat Manuals Chapter 2-2 Project Management*

EMV: Expected monetary value of risk event (i.e. cost or saving to the project if risk event occurs)

6.2 RISK MANAGEMENT CHECKLIST

Probability, impact, over all risk, risk response and risk allowance are to be determined for each item listed below;

Resources External to Project Management Team

- Planning Resources and Performance
  - errors and omissions
  - low accuracy of estimates (allowances)
  - data inadequacies
  - level of liability insurance
  - potential for misinterpretation / misunderstanding of documents
  - planning inexperience
- Construction Resources Required & Performance
  - level of liability insurance
  - design versus execution methods
  - suitability of execution methods to design
  - commissioning issues (start up / turnover difficulties)
  - contractor construction strategy
  - reputation of contractor
  - contractor financial stability
  - contractor inexperience
  - resources obtained less qualified than desired
  - availability / suitability / performance of resource

Project Scope Delivery

- Delivery of Specified Requirement
  - accuracy of client requirements in terms of cost/ schedule / performance / quality and ability to interface with existing environment
  - conflicting client priorities
  - low level of client knowledge

- Unstated Client Requirements
  - completeness of client requirements in terms of cost/ schedule / performance / quality and ability to interface with existing environment
  - restricted working conditions
  - opportunities for changes / positive impact

- Stakeholder Requirements, Stated and Unstated
  - low involvement of user groups in scope of definition
  - interface with existing systems
  - restricted working conditions
  - operational needs

Site / Asset / Building Actual Conditions

- Actual Physical Environment
  - availability / accuracy of as built documentation and existing condition reports
  - high variability / low stability of soils
  - potential for soil contamination
  - presence of hazardous materials
  - availability / access to site
  - presence of other contractors on site
  - climate (winter conditions, rain, wind, water levels)

Government / PWGSC / Client / Context

- Impact on Adjacent Areas Actual
  - impact on adjacent areas (land / tenants/ traffic / operations)

- Impact from External Sources
  - legal lawsuits, patent rights, licensing, etc.
  - political impacts including visibility of project
  - social sensibilities
  - potential strikes
  - market risks
  - bad press (media coverage)

- Impact from Unanticipated Regulatory Change
  - environmental legislation and environmental screening
  - potential changes to Acts, Codes and Regulations
  - municipal building / occupancy permit issues

- Procedures Known
  - suitability of tender documents
  - suitability of contracting method
  - delays in tendering process
  - client internal coordination
  - change order process

- Plan Approval / Design Reviews
  - approvals may be required from Client, PWGSC, Treasury Board, FHBRO, Fire Commissioner, Police, Emergency Services, Municipalities, Cities, etc.
  - absence of Investment Analysis
  - unstable / changing client organization
  - heritage building issues
  - health and safety issues
  - potential for “hold orders”
  - design review delays (client / PWGSC / TBS / other)
  - approval delays (client / PWGSC / TBS / other)

APPENDIX 'A' - Checklist for the issue of Construction Documents to PWGSC

Last updated 2011-07-28

Date:	
Project Title:	**Project Location:**
Project Number:	**Contract Number:**
Consultant's Name:	**PWGSC Project Manager:**
Review Stage: **66%** ☐ 99% ☐ 100% ☐	

Item	**Verified by:**	**Comments:**	**Action by:**
Specifications:			
1 National Master Specifications			
1a The current edition of the NMS has been used.			
2 Specification Organization			
2a Either the NMS 1/3 - 2/3 page format or the Construction Specifications Canada full page format is used.			
2b Each Section starts on a new page and the Project Number, Section Title, Section Number and Page Number show on each page.			
2c Specification date and consultant's name are not indicated.			
3 Terminology			
3a The term Departmental Representative is used instead of Engineer, PWGSC, Owner, Consultant or Architect.			
3b Notations such as: "verify on site", "as instructed", "to match existing", "example", "equal to", "equivalent to" and "to be determined on site by" are not used.			
4 Dimensions			
4a Dimensions are provided in metric only.			
5 Standards			
5a The latest edition of all references quoted is used.			

Item	Verified by:	Comments:	Action by:
Specifications:			
6 Specifications Materials			
6a The method of specifying materials uses recognized standards. Actual brand names and model numbers are not specified.			
6b Identify if non-restrictive, non-trade name "prescription" or "performance" specifications are used.			
6c Indicate if a list of acceptable materials have been used.			
6d The term "Acceptable Manufacturers" is not used.			
6e Indicate if sole sourcing has been used.			
7 Unit Prices			
7a Unit prices are used only for work that is difficult to estimate.			
8 Cash Allowances			
8a Indicate if cash allowances have been used.			
9 Warranties			
9a Indicate if warranties extend more than a 12 or 24 months period.			
9b Manufacturers guarantees are not indicated.			
10 Scope of Work			
10 No paragraphs noted as "Scope of Work" are included.			
11 Summary and Section Includes			
11a In part 1 of section, paragraphs "Summary" and "Section Includes" are not used.			
12 Related Sections			
12a The list of related sections and appendices are coordinated.			
13 Index			
13a The index shows a complete list of drawings and specification sections with the correct number of pages and correct drawing titles and section names.			

Item	Verified by:	Comments:	Action by:
Specifications:			
***14* Regional requirements**			
14a General Instructions are included (Section 01 11 01 for Quebec region).			
15 Health and Safety			
15a Section 01 35 29.06 - Health and Safety Requirements is included.			
16 Designated Substances Report			
16 a Section 01 14 25 - Designated Substances Report is included.			
***17* Subsurface Investigation Reports**			
17a Subsurface Investigation Reports are included in Division 31.			
18 Experience and qualifications			
18a Experience and qualification requirements do not appear in the specification sections			
19 Pre-qualifications			
19a There are no mandatory contractor and/or subcontractor pre-qualification requirements or references to certificates, transcripts or license numbers of a trade or subcontractor being included in the bid.			
20 Contracting Issues			
20a Contracting issues do not appear in the specifications.			
20b Division 00 of the NMS is not used.			
21 Quality Issues			
21a There are no specification clauses with square brackets "[ ]" or lines "__" indicating that the document is incomplete or missing information.			

Item	Verified by:	Comments:	Action By:
Drawings:			
1 Title Blocks			
1a The PWGSC title block is used.			
1b The project information in the title block is coordinated between disciplines.			
2 Dimensions			
2a Dimensions are provided in metric only.			
3 Trade Names			
3a Trade names are not used.			
4 Specification Notes			
4a There is no specification type notes.			
5 Terminology			
5a The term Departmental Representative is used instead of Engineer, PWGSC, Owner, Consultant or Architect.			
5b Notations such as: “verify on site”, “as instructed”, “to match existing”, “example”, “equal to”, “equivalent to” and “to be determined on site by” are not used.			
6 Information to be included			
6a The project quantity and configuration, dimensions and construction details are included.			
6b References to future work and elements not in contract do not appear or are kept to an absolute minimum and clearly marked.			

Item	Verified by:	Comments:	Action By:
Drawings:			
7 ***Respect of PWGSC standards for electronic format***			
7a The electronic format of drawings respects the current CADD standards of PWGSC.			
7b The electronic format of drawings and specifications, in English and French, respects the PWGSC directory structure for electronic tender documents.			

I confirm that the plans and specifications of all disciplines have been thoroughly reviewed and that the items listed above have been addressed or incorporated. I acknowledge and accept that by signing certifying that all items noted above have been addressed, should it be found during the tendering of these documents or implementation of the project, that the items above were not properly addressed, my firm will be responsible to resolve all related issues at my firm's expense and may receive an unsatisfactory consultant performance evaluation which could have an impact on my firm's ability to obtain work from PWGSC in the future.

Consultant's Representative: _____

Firm name: _____

Signature:_____ Date: _____

APPENDIX 'B' - Sample of Addendum
Last updated April 22, 2008

ADDENDUM No. _____

Project Number: _____

The following changes in the bid documents are effective immediately. This addendum will form part of the contract documents

DRAWINGS

SPEC NOTE: indicate drawing number and title, then list changes or indicate revision number and date, and re-issue drawing with addendum.

1 A1 Architectural

.1

SPECIFICATIONS

SPEC NOTE: indicate section number and title.

1 Section 01 11 01 – Work related general information

SPEC NOTE: list all changes (i.e. delete, add or change) by article or paragraph

.1 Delete article (xx) entirely.
.2 Refer to paragraph (xx.x) and change ...

2 Section 23 05 00 - Common Work Results - Mechanical

.1 Add new article (x) as follows:

APPENDIX 'C' - Sample of Index for Drawings and Specifications
Last updated April 22, 2008

Project No: _____

Index
Page 1 of ___

DRAWINGS AND SPECIFICATIONS

SPECIFICATIONS:

SPEC NOTE: List all Divisions, Sections (by number and title) and number of pages.

DIVISION	SECTION	NO. OF PAGES
DIVISION 01	01 11 01 – Work related general information.....	xx
	01 14 25 - Designated Substances Report.....	xx
	01 35 29.06 - Health and Safety.....	xx
DIVISION 23	23 xx xx	
DIVISION 26	26 xx xx	

DRAWINGS:

SPEC NOTE: List all Drawings by number and title.

C-1	Civil and landscaping
A-1	Architectural
S-1	Structural
M-1	Mechanical
E-1	Electrical

APPENDIX 'D'

USER MANUAL ON DIRECTORY STRUCTURE AND NAMING CONVENTION STANDARDS FOR CONSTRUCTION TENDER DOCUMENTS ON CD ROM

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005

Last Updated: June 3, 2008

Version 1.0

PREFACE

The Government of Canada (GoC) has committed to move towards an electronic environment for the majority of the services it offers. This covers the advertisement and distribution of contract opportunities, including construction solicitations. As a result, it is now necessary to obtain a copy of construction drawings and specifications (in PDF format ***without*** password protection) on one or multiple CD-ROM to facilitate for the GoC the transfer of the construction drawings and specifications electronically to the Government Electronic Tendering System (GETS).

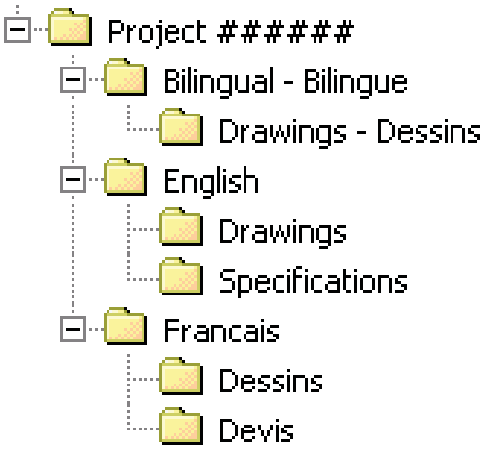
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction. This manual defines the standard to be followed by both consultants and print shops at time of formatting and organizing the information, whether drawings and specifications are created by scanning print documents or saved as PDF files from the native software (AutoCAD, NMS Edit, MS-Word, etc…) in which these were created.

It is important to note that the procedure described in this manual is not an indication that consultants are relieved from following the established standards for the production of drawings and specifications. The sole purpose of this manual is to provide a standard for the organization and naming of the electronic files that will be recorded on CD-ROM.

1. DIRECTORY STRUCTURE

1.1 1st, 2nd and 3rd Tier Sub-Folders

Each CD-ROM, whether it is for the original solicitation (tender call) or for an amendment (addendum), must have the applicable elements of the following high-level Directory Structure created:



The following important points are to be noted about the Directory Structure:

- The "*Project ######*" folder is considered the 1st Tier of the Directory Structure where ###### represents each digit of the Project Number. The Project Number must always be used to name the 1st Tier folder and it is always required. Free text can be added following the Project Number, to include such things as a brief description or the project title;

- The "*Bilingual - Bilingue*", "*English*" and "*Français*" folders are considered the 2nd Tier of the Directory Structure. The folders of the 2nd Tier **cannot** be given any other names since GETS uses these names for validation purposes. At least one of the "*Bilingual - Bilingue*", "*English*" and "*Français*" folders is always required, and these must always have one of the applicable sub-folders of the 3rd Tier;

- The "*Drawings - Dessins*", "*Drawings*", "*Specifications*", "*Dessins*" and "*Devis*" folders are considered the 3rd Tier of the Directory Structure. The folders of the 3rd Tier **cannot** be given any other names since GETS also uses these names for validation purposes. There must be always at least one of the applicable 3rd Tier folder in each document.

IMPORTANT:	The applicable elements of the Directory Structure (1st, 2nd and 3rd Tier folders) are always required and cannot be modified.

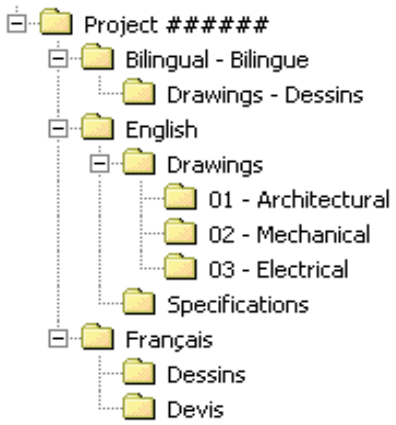
1.2 4th Tier Sub-Folders for Drawings

The "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders must have 4th Tier sub-folders created to reflect the various disciplines of the set of drawings.

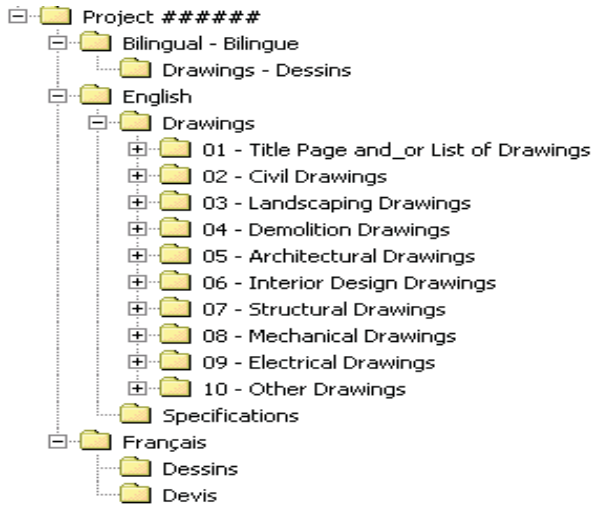
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders.

<u>Note</u>: The first sub-folder must be always reserved for the Title Page and/or the List of Drawings unless the first drawing of the set is an actual numbered discipline drawing.

Examples of 4th Tier sub-folders for <u>drawings</u>:



or



1.2.1 Naming Convention

The 4th Tier sub-folders for drawings must adhere to the following standard naming convention.

For the "*Drawings*" and "*Dessins*" folders:

- Y

Where:

= A two digit number ranging from 01 to 99 (leading zeros must be included)

Y = The title of the folder

Example: 03 – Mechanical

For the "*Drawings - Dessins*" folder:

- Y - Z

Where:

= A two digit number ranging from 01 to 99 (leading zeros must be included)

Y = The English title of the folder

Z = The French title of the folder

Example: 04 - Electrical - Électricité

It should be noted that the numbering of the 4th Tier sub-folders is for sorting purposes only and is not tied to a specific discipline. For example, "*Architectural*" could be numbered 05 for a project where there is four other disciplines before "*Architectural*" in the set of drawings or 01 in another project where it's the first discipline appearing in the set.

It is essential to ensure that the order of the drawings on the CD-ROM be exactly the same as in the hard copy set. GETS will sort each drawing for both screen display and printing as per the following rules:

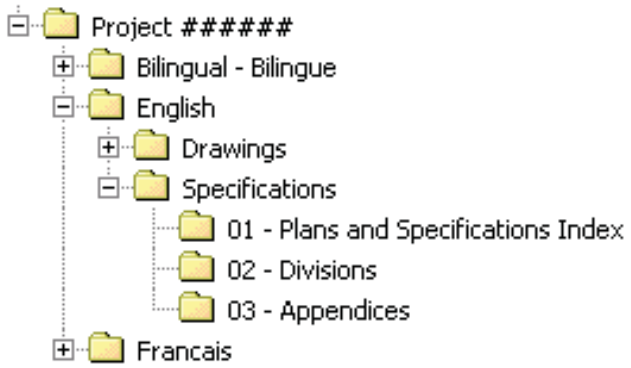
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the drawings in the 02 sub-folder etc…);
- Each drawing PDF file within each sub-folder will also be sorted alphanumerically. This will determine the order of appearance on the screen as well as the order of printing (i.e. Drawing A001 will be printed before Drawing A002, Drawing M02 before Drawing M03, etc…).

1.3 4th Tier Sub-Folders for Specifications

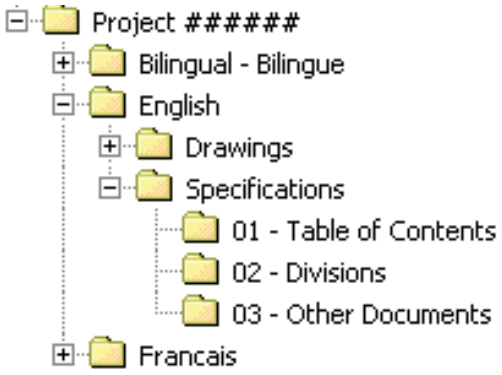
The "*Specifications*" and "*Devis*" folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.

Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Specifications*" and "*Devis*" folders.

Examples of 4th Tier sub-folders for specifications:



or



1.3.1 Naming Convention

The 4th Tier sub-folders for specifications must adhere to the following standard naming convention.

For the "*Specifications*" and "*Devis*" folders:

- Y

Where:

## =	A two digit number ranging from 01 to 99 (leading zeros must be included)
Y =	The title of the folder

Example: **02 – Divisions**

It should be noted that the numbering of the 4th Tier sub-folders is for sorting purposes only and is not tied to an element of the specifications.

It is essential to ensure that the order of the elements of the specifications on the CD-ROM be exactly the same as in the hard copy. GETS will sort each element of the specifications for both screen display and printing as per the following rules:

- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the specifications PDF files in the 01 sub-folder will be printed, in alphanumerical order before the PDF files in the 02 sub-folder, etc…);
- Each specifications PDF file within each sub-folder will also be sorted alphanumerically. This will determine the order of appearance on the screen as well as the order of printing (i.e. Division 01 will be printed before Division 02, 01 - Appendix A before 02 - Appendix B, etc…).

2. NAMING CONVENTION FOR PDF FILES

Each drawing, specifications division or other document that are part of the tender documents must be converted in PDF format (without password protection) in accordance with the following standard naming convention and each PDF file must be located in the appropriate sub-folder of the Directory Structure.

2.1 Drawings

Each drawing must be a **separate single page** PDF file. The naming convention of each drawing must be:

X### - Y

Where:

X =	The letter or letters from the drawing title block ("*A*" for Architectural or "*ID*" for Interior Design for example) associated with the discipline
### =	The drawing number from the drawing title block (one to three digits)
Y =	**The drawing name from the drawing title block (for bilingual drawings, the name in both English and French is to appear)**
Example:	A001 - First Floor Details

Each drawing that will be located in the appropriate discipline 4th Tier sub-folders must be named with the same letter ("*A*" for Architectural Drawings for example) and be numbered. The drawing number used to name the PDF file must match as much as possible the drawing number of the actual drawing (the exception being when leading zeros are required).

The following important points about drawings are to be noted:

- The drawing PDF files within each sub-folder are sorted alphanumerically for both displaying and printing. If there are more than 9 drawings in a particular discipline the numbering must use at least two numerical digits (i.e. A01 instead of A1) in order to avoid displaying drawing A10 between A1 and A2. The same rule applies when there are more than 99 drawings per discipline i.e. three digits instead of two must be used for the numbering (for example M003 instead of M03);

- If drawing PDF files are included in the "*Bilingual - Bilingue*" folder, these cannot be included as well in the "*English*" and/or "*Français*" folders;

- If drawings not associated with a particular discipline are not numbered (Title Page or List of Drawings for example), these will be sorted alphabetically. While this does not represent a problem if there is only one drawing in the sub-folder, it could disrupt the order when there are two or more drawings. If the alphabetical order of the drawings name does not represent the order on the hard copy set, the drawings are to be named as per the following standard convention when converted in PDF format to ensure proper display and printing order.

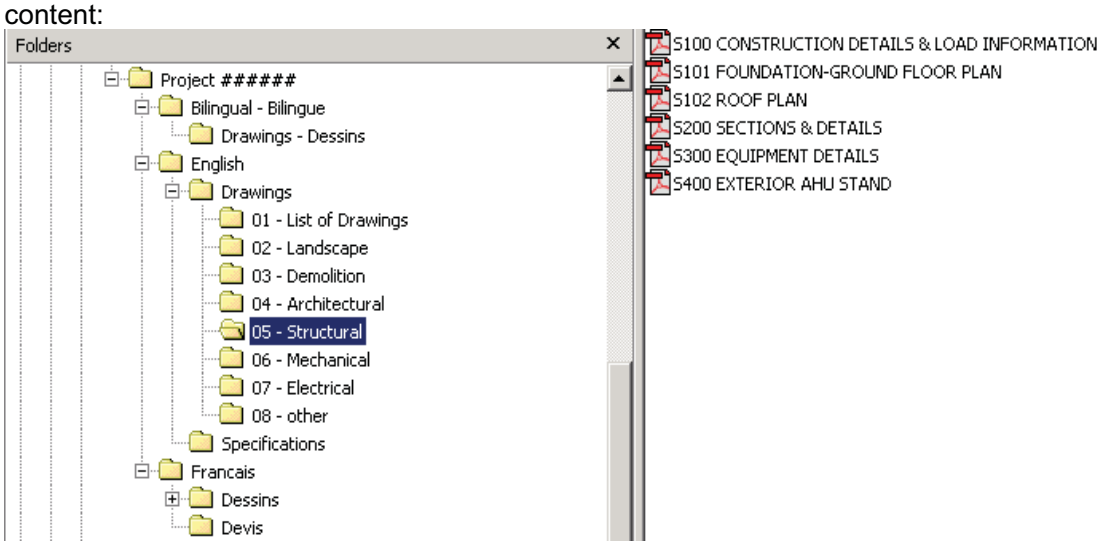
  ## - Y

  Where:

## =	A two digit number ranging from 01 to 99 (leading zeros must be included)
Y =	The name of the drawing
Example:	01 - Title Page 02 - List of Drawings

  If numbers are not used in the PDF files name, "*List of Drawings*" will be displayed before "*Title Page*" because "L" comes before "T" in the alphabet.

Example of a 4th Tier Drawings sub-folder's content:



2.2. Specifications

Each Specifications Division must be a separate PDF file and all pages contained in each PDF file must have the same physical size (height, width). The Plans and Specifications Index must also be a separate PDF file. If there are other documents that are part of the Specifications (e.g. Appendix or other) these are to be separate PDF files as well.

2.2.1 Documents other than Specifications Divisions

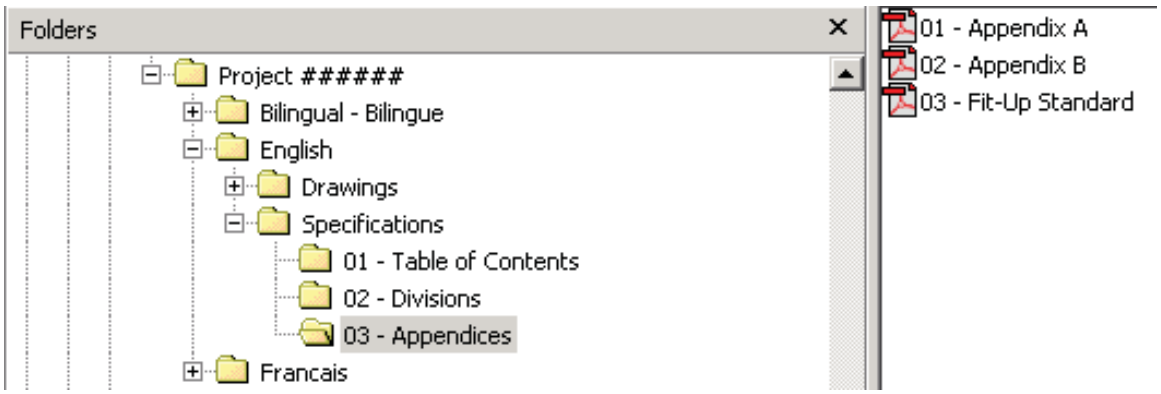
Because PDF files within the Specifications sub-folders are sorted alphanumerically (in ascending order) for both on screen display and printing order, all files that appear in folders other than the "*Divisions*" sub-folder must be named using a number:

- Y

Where:

## =	Two digit number ranging from 01 to 99 with leading zeros required
Y =	Name of the document
Example:	01 - Plans and Specifications Index

Example of a sub-folder content (sub-folder other than "*Divisions*"):



2.2.2 Specifications Divisions

The Specifications Divisions must be named as follows:

Division ## - Y

Where:

Division ## = The actual word "*Division*" followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)

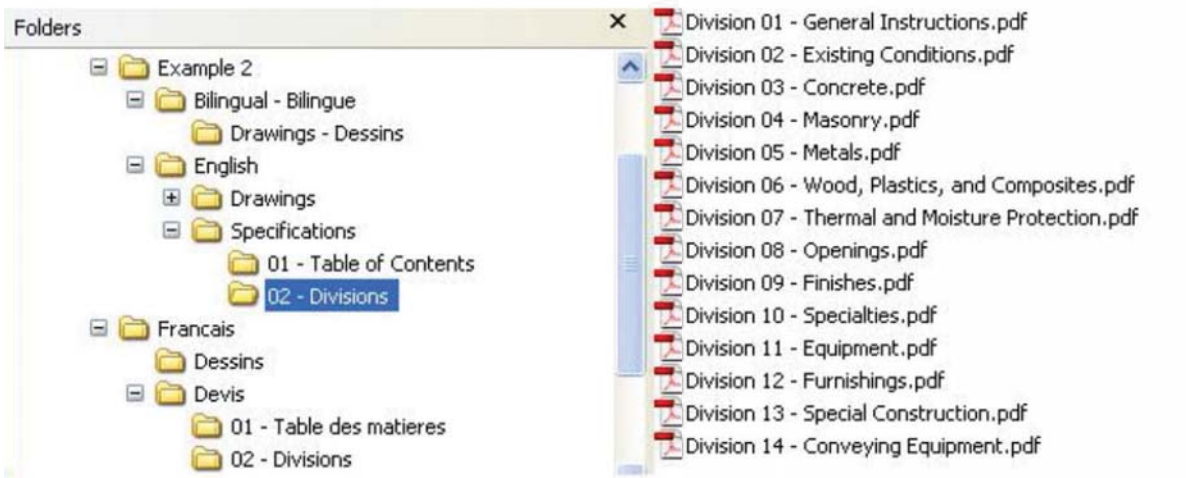
Y = Name of the Specifications Division as per **CSC/CSI MasterFormat™**

Example: Division 05 – Metals

The following important point about specifications is to be noted:

- The Numbering of the Divisions **cannot** be altered from **CSC/CSI MasterFormat™** even if some Divisions are not used in a given project. For example, Division 05 will always remain Division 05 even if Division 04 is not used for a given project.

Example of a "*Divisions*" sub-folder content:



3. CD-ROM LABEL

Each CD-ROM is to be labeled with the following information:

Project *Number* / *Numéro* de projet
Project Title / *Titre du projet*
Documents for Tender / Documents pour appel d'offres
CD *X* of/de *X*

Example:

Project 123456 / Projet 123456
Repair Alexandra Bridge / Réparation du pont Alexandra
Documents for Tender / Documents pour appel d'offres
CD 1 of/de 1

APPENDIX 'E'

BASIC REFRENCE GUIDE ON CONVERTING CONSTRUCTION DRAWINGS INTO PORTABLE DOCUMENT FORMAT (PDF)

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005Last Updated: May 3, 2005

Version 1.0

PREFACE

Portable Document Format (PDF) is the standard format for documents that are posted on the Government Electronic Tendering System (GETS). There is therefore a need to obtain from architectural and engineering consultants an electronic copy of drawings and specifications in PDF for tendering Government of Canada (GoC) construction projects.

In order to have the highest quality in term of resolution and printing, consultants should to the greatest extent possible have the PDF drawing and specification files derived from the native software in which they were created. Scanning is permissible but only in special circumstances, for example when there is no electronic version of a drawing being included in a construction tender package.

The purpose of this document is to provide basic information on the conversion of Computer Aided Design and Drafting (CADD) drawings in PDF. Creating a PDF file from a CADD drawing is a relatively simple process once all the necessary configurations and settings are in place. It actually should not take any longer than it would take to create a plot file or to send a drawing to a printer. The information in this guide is not intended to cover all technical aspects of the conversion, which can be done using various methods, but rather to highlight important points about the process and file settings. The conversion of specifications is not covered in this basic reference guide since it does not require any special configuration or setting.

The information provided in this basic reference guide is not an indication that consultants are relieved from following the established standards for the production of drawings and specifications. The sole purpose of this guide is to provide basic information on the PDF conversion process bearing in mind that additional detailed technical information is available from the various software manufacturers.

1.0 PRINTER DRIVERS

Adobe Acrobat provides two different printer drivers that are able to convert CADD drawing into PDF format, Acrobat PDF Writer and Acrobat Distiller. Before creating a PDF file from a CADD drawing, a choice must be made as to which one will be used.

Acrobat PDF Writer is a non-PostScript printer driver that works best with documents that don't contain complex graphics

Acrobat Distiller is a PostScript printer driver that works best with documents that contain PostScript fills, Encapsulated PostScript (EPS) graphics, or other complex elements.

It is recommended that Acrobat Distiller be used to create PDF file of architectural and engineering drawings due to their size and complex graphical nature.

2.0 PRINTER CONFIGURATION

Before converting a CADD drawing to PDF, an Acrobat printer configuration file for the PDF paper size needs to be created. This function can be done in the CADD software rather than using a custom paper size defined for the Acrobat distiller feature. The recommended method is to add a PostScript Adobe plotter in the CADD software and making the necessary setting in terms of media source and size, scale and orientation. The configuration can then be re-used to simplify the conversion process for future files that use the same page size.

As an alternative, although not recommended, a custom-defined size can be created in Acrobat Distiller in the *properties* menu.

3.0 CREATING PDF FILES

Once the printer configuration has been done in the CADD software, open up Acrobat Distiller and make the necessary settings in the *preferences* and *job options* sub-menu. Ensure that the page size match the sheet size selected in the CADD software to create the file. Particular settings can be saved under different names for future use.

With the Acrobat Distiller application open, ensure the required sheet size is displayed in the *job options* window. Then it is simply a matter of bringing the CADD file into the Acrobat Distiller creation box.

A progress bar will show during the conversion and the newly converted PDF file should open up and be displayed for verification.

4.0 PDF FILES SETTINGS

4.1 Security

Adobe Acrobat contains security features that can de used to secure the files by restricting any changes to the files. However, since the files will be posted on GETS and will be used for printing copies, the files **must not** be password protected and **must** allow printing.

4.2 Drawing Orientation

The final PDF drawing files must be displayed on the screen in the same direction that the users are intended to view them. This can be achieved by adjusting the setup of the plotter. If the drawing is not oriented properly after the conversion, it can be rotated manually within Adobe Acrobat.

4.3 Font Type

In order to avoid any problems during the conversion and to minimize the potential for font display errors, the fonts used for the production of construction drawings must be *PostScript or True Type fonts.*

4.4 Resolution

Since the PDF files will be used for printing, it is important that a proper resolution be selected. It is recommended to select 600 dots per inch (dpi).

4.5 Scale

When choosing the Plot scale in Adobe, it is important to choose the 1:1 scale to ensure the integrity of the scale from which the drawings were created in the CADD software.

5.0 SCANNING

Scanning is not recommended and should be done only when the drawing is not available electronically. When scanning a drawing, it is important that it be done in real size (scale 1:1) to ensure that the scale remains intact in subsequent printing. It is recommended that each scanned drawing be opened and verified to ensure that the resolution, scale and border are of an acceptable quality.

6.0 FINAL CHECKLIST

When the drawing file has gone trough the PDF conversion, it is recommended to open it and verify the following:

- That the sheet size displayed is what was intended to be created (the size is viewable in the lower left corner of the drawing).
- That the orientation of the sheet is correct.
- That the line types, line weights and fonts match the CADD drawing.
- That the PDF file is in black and white.
- That each drawing is a single PDF file.
- That the PDF file is not password protected and printable.

If all the items are verified, the PDF file is useable

7.0 ADDITIONAL INFORMATION

For more information about the creation of PostScript and EPS files please refer to the User's Guide of the CADD software being used to produce the drawings. For more information about creating PDF file please refer to the Acrobat Distiller User's Guide and/or visit the Adobe Web site at www.adobe.com.

APPENDIX E – GEOTECHNICAL REPORT – WHARF 95

Report No. 4160-04-01

GEOTECHNICAL STUDY

De La Reine Wharf - Section #95
Reconstruction of Zone 0+300 to 0+332
Quebec City, Quebec

Public Works and
Government Services Canada

Project No. 4160-04
April 2007

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D'EXPERTISES
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1.0 INTRODUCTION

Laboratoires d'Expertises de Québec ltée was retained by Public Works and Government Services Canada (PWGSC) as a result of call for tender EE517-6-0575 and under a contract awarded on November 23, 2006, to provide geotechnical, hydrogeological and soils and materials engineering consulting services and produce a geotechnical study as part of the project to rebuild zone 0+300 to 0+332 of section #95 of De La Reine Wharf in Quebec City.

More specifically, the project involves demolishing and rebuilding the wharf installing new pile and sheet-pile walls or box and sheet-pile walls.

This report covers all the results of the field work and laboratory testing along with comments and recommendations on integrating the project with the soil and bedrock found at the site.

2.0 GEOTECHNICAL SITE INVESTIGATION

2.1 Site work

A preliminary site visit was undertaken on November 30, 2006, to verify access to the wharf. Geotechnical field work was carried out from December 11 to 22, 2006, and January 8 to 17, 2007. A conventional BBS-15 Boyles drill was used for drilling the boreholes, and a cantilever platform, 2.24 m by 5.87 m, was secured to the wharf railing to facilitate drilling work in the St. Lawrence River. Boreholes were drilled on the wharf with the same drill mounted on a trailer.

A total of seven geotechnical boreholes, numbered F-1 to F-7, three from the cantilever platform (F-1 to F-3) and four on the wharf (F-4 to F-7), were drilled to depths ranging from 9.74 to 32.83 m from the surface of the wharf. The boreholes were rotary driven with HW and/or NW casing and the bedrock was cored using a NW size double core barrel.

A standardized 50.8 mm splitspoon was used to collect the soil samples for the visual description and laboratory analyses. In conjunction with the sampling, standard penetration tests were undertaken in compliance with NQ standard 2501-140.

The boreholes were sited by our firm's technical staff using a general plan provided by PWGSC. The elevations at each borehole site were determined by our staff using the benchmark 8824005 located at the east end of the Alpha heliport. This point corresponds to a tide gauge level of 6.87 m.

From an environmental perspective, soil and sediment quality was verified at each borehole site in compliance with requirements specified as regards sampling depths and parameters to be analyzed.

Also, a rigorous management procedure, in compliance with the environmental analyses sampling guide (*Guide d'échantillonnage à des fins d'analyses environnementales*) published by the Quebec Ministry of Sustainable Development, Environment and Parks (MDDEP) and Environment Canada's Sediment Sampling Guide for Dredging and Marine Engineering Projects in the St. Lawrence River, was followed for the collection, identification and temporary storage and transport of samples collected for environmental purposes so as to preserve the integrity of the samples during transfer to the analytical laboratory retained under the contract.

Prior to collecting each soil sample, the instruments were washed in soapy water, then rinsed successively in demineralized water, acetone, hexane, acetone, and then finally demineralized water.

The samples were all carefully placed in new glass bottles, sealed and capped with a hermetically sealed lid. Sample bottles were filled by minimizing contact of samples with the air so as to prevent the loss of any volatile organic compounds.

2.2 Laboratory work

The samples collected at the site were transported to our laboratory in Quebec City where they were each visually inspected by engineer Luc Carrier from a geotechnical standpoint, and by engineer Châtelaine Beaudry from an environmental perspective. Geotechnically, 12 samples deemed to be representative of the soil found at the site underwent sieve analyses using mechanical sieving and natural water content measurements. Also, the angle of repose was determined for

seven of these samples. And the wet and dry unit weight was assessed on splitspoon samples. On rock core samples that were sufficiently long and solid, uniaxiale compression testing was done to determine the compressive strength of the rock. Each of the boxes containing rock core samples was photographed.

Moreover, as part of the environmental assessment, 11 soil samples were sent to *Bodycote Groupe d'Essais* in Quebec City (Sainte-Foy) for chemical analyses.

Samples that were not used in testing will remain in storage for three months as of the date this report is released. After this three-month period, the samples will be destroyed unless a PWGSC representative indicates otherwise.

2.3 Report

The drilling reports presented in Appendix A, contain all the information obtained from the site, along with indications on the depths at which the samples subject to laboratory testing were collected. Particle size curves are presented in Appendix B and the results of the environmental analyses are presented in Appendix C. Location plan # 4160-04-01 in Appendix D indicates the site of every borehole drilled in relation to the existing wharf, whereas plan # 4160-04-02 shows three stratigraphic sections. General photos of the work undertaken and of the rock core samples placed in wood boxes by borehole are shown in Appendix E.

3.0 TYPE AND PROPERTIES OF MATERIALS

Based on the results for boreholes F-1 to F-7, the following materials were found. For further information the detailed stratigraphic information on each of the boreholes is presented in the drilling reports in Appendix A.

3.1 Asphalt concrete

The surface of the wharf at the F-6 and F-7 borehole sites is covered respectively in a 0.11 and 0.10 m layer of asphalt concrete.

3.2 Cement concrete

At boreholes F-4 and F-5, the surface of the wharf consists of cement concrete slabs, respectively 0.23 and 01.9 m thick.

3.3 Backfill: foundation material

Under both types of wharf surfaces there is a base material from 0.56 to 3.81 m deep. The upper part of the foundation consists of gravel and brown sand containing traces of silt or gravel or crushed rock, the grade of which corresponds to about MG-20 or MG-20b, according to Quebec Ministry of Transport classification.

With the exception of borehole F-5, the upper foundation sits on granular material varying from sandy gravel containing traces of to some silt, and a mix of sand and crushed rock.

Two sieve analyses undertaken on the upper part of the backfill revealed, as shown in plate B-4 in Appendix B, that this material contains 55.8 and 61.2% gravel, 32.3 and 34.0% sand, and 6.5 and 10.2% silt. The natural water content of these same samples was 7.8 and 13.7%.

3.4 Backfill: wharf

At borehole F-4 to F-7 sites, under the foundation materials described in Section 3.3, backfill is present from 0.75 to 4.00 m (elevation 2.44 to 4.07 m) to 7.01 and 11.87 m deep (elevation 0.25 to 5.43 m). Located behind the vertical face of the wharf, this heterogeneous backfill essentially consists of granular materials such as gravel containing traces of sand, pure crushed rock, sandy gravel containing some silt or sand, and silty gravel. Some wood fragments were also observed.

A sieve analysis conducted on a sample from borehole F-6 revealed as shown in Plate B-4 in Appendix B that the material contained 52.8% gravel, 38.3% sand and 8.9% silt. The natural water content for this sample was 10.0%.

It should be noted that an odour of naphthalene was observed at borehole F-4, between 7.31 and 7.91 m under the surface of the wharf.

Finally, the backfill, depending on its type, had a compacters ranging from very loose to dense, with standard N penetration resistance indicators between 2 and 33 strikes to drive a splitspoon down a 300 mm run.

3.5 Fluvial sediment

At borehole F-1, at the level of the St. Lawrence riverbed or 17.45 m (elevation 10.51 m) under the wharf surface, a thin layer of fluvial sediment was observed. The 0.05 m layer consisted of grey silt containing traces of sand. Hydrocarbon odours were identified in this layer.

3.6 Backfill: silty sand

At borehole F-1, under the fluvial sediment horizon, silty sand backfill containing traces of gravel was present in a 1.45 m layer (elevation -10.56 to -12.01 m). Within this backfill, fragments of wood and cement concrete were observed. Hydrocarbon odours were also detected in the samples.

The compactness of this backfill is qualified as loose, with N indicators of 4 and 6 strikes to drive a splitspoon down a 300 mm run.

3.7 Sand and gravel

Except for borehole F-4, which was terminated in the wharf backfill described in Section 3.4, all the boreholes intercepted a sand and gravel deposit from 2.18 to 6.88 m thick. This deposit was present under one of the backfills described in Sections 3.4 and 3.6, also in the form of horizons observed between 19.73 and 20.50 m deep (elevation -77 to -14.89 m) at F-2, and between 28.49 and 29.45 m deep (elevation -21.53 to -22.49 m) at F-3.

The sieve analyses conducted on the six samples deemed representative of the deposit, the results of which are shown in plates B-1 to B-5 in Appendix B, indicate that the particle size for this deposit ranges from gravely sand containing traces of silt to gravel and sand containing traces of silt. An examination of plates B-1 to B-5 indicates that the test samples contain between 22.0 and 61.79% of gravel, 34.5 and 69.3% of sand, as well as between 3.6 and 15.3% of silt. The natural water content measured for these same samples ranged from 10.0 to 33.2%.

Determining the unit weight and the angle of repose for this deposit using the four samples indicated the values below:

Borehole	Sample	Depth (m)	Elevation (m)	γh	γd (kN/m^3)	γ'	ϕ (degrees)
F-1	6-CF	21.33–21.93	-16.36 – -16.96	23.0	20.8	13.2	36
F-2	2-CF	16.76–17.36	-11.77 – -12.37	23.0	18.3	13.2	37
F-5	16-CF	13.41–14.01	-6.97 – -7.57	21.6	19.6	11.8	39
F-7	11-CF	8.99–9.59	-1.83 – -2.43	20.8	18.6	11.0	36

Finally, the compactness of this deposit is defined as moderate to very dense with standard N penetration resistance indicators ranging between 10 strikes and refusal to drive a splitspoon over a 300 mm run.

3.8 Sand, traces of silt

Except for boreholes F-4 and F-6, both of which stopped in the wharf backfill (Section 3.4) and the sand and gravel deposit (Section 3.7), all the boreholes revealed the presence of a sand deposit containing traces of silt and sometimes gravel under the previously described sand and gravel deposit.

Information contained from the boreholes reveals that this deposit is present from 12.90 to 23.06 m deep, between elevations -5.64 to -13.34 m. The thickness of this deposit varies from 3.00 to 11.10 m. Also, at F-3, the presence of a sand and gravel horizon (Section 3.7) was observed between 19.73 and 21.85 m deep (elevation -12.77 to -14.89).

The three particle analyses conducted on the representative samples for this deposit revealed that they contained less than 4.4% gravel, between 88.1 and 93.9% sand and between 2.9 and 7.7% silt.

The natural water content measured on these samples varied between 19.8 and 22.5%. These test results are shown in plates B-1 to B-3 in Appendix B.

Furthermore, the unit weight assessment and angle of repose for these samples are as follows:

Borehole	Sample	Depth (m)	Elevation (m)	γh	γd (kN/m^3)	γ'	ϕ (degrees)
F-1	12-CF	25.90-26.50	- 20.93 – -21.53	19.4	16.3	9.6	32
F-2	9-CF	22.09-22.69	- 17.10 – -17.70	20.0	16.3	10.2	33
F-3	11-CF	25.14-25.74	- 20.15 – -20.75	18.1	15.0	8.3	34

The compactness of this deposit varies from loose to very dense, with N indicators varying between 9 and 67 strikes to drive the splitspoon down a 300 mm run.

3.9 Pebbles and gravel

At borehole F-5, under the sand deposit with traces of silt described in Section 3.8, between 25.10 and 26.17 m deep (elevation. -18.66 to -19.73 m), there is a deposit consisting of pebbles and gravel in a sand matrix.

The compactness of this horizon was defined as very dense given that the diamond corebarrel was required to drill through it.

3.10 Bedrock

Boreholes F-1 to F-3, F-5 and F-7 were drilled into the bedrock. At 15.90 and 29.45 m deep (elevation -8.64 to -22.49 m), the bedrock consists of black calcareous shale with some veinlets of white calcite

The upper part of the bedrock corresponding to the first two metres is generally of lesser quality than the deeper bedrock. The rock core samples all indicate a rock quality designation (RQD) of between 0 and 88%, giving a rock quality of very poor to good.

According to the literature, the stratification runs N30° E. The bedrock dip measured from the core samples drops to the southeast between 38° and close to 90° (sub-vertical) in relation to the horizontal.

Sections of the bedrock core samples were selected for laboratory uniaxiale compressive strength testing and for measuring the unit weight of the bedrock. The results of this testing are shown in the following table.

Borehole	Depth (m)	Tide gauge level (m)	Mean diameter (mm)	Compressive strength (MPa)	Unit weight (kN/m^3)
F-1	31.86 – 31.96	-24.92 – -25.02	47.0	153.1	26.2
F-2	31.04 – 31.14	-24.08 – -24.18	47.3	151.3	26.1
F-3	30.71 – 30.81	-23.75 – -23.85	47.4	> 204.0	26.3
F-3	31.78 – 31.85	-25.24 – -25.31	47.1	17.6 *	22.2 *
F-5	28.89 – 28.96	-22.45 – -22.52	47.2	65.1	26.3
F-7	19.43 – 19.52	-12.17 – -12.26	47.2	109.2	26.3

* Results invalid because small part of sample was cracked and shattered.

Appendix E contains photographs of the core samples collected at boreholes F-1 to F-3, F-5 and F-7.

For the purposes of the calculations, a mean compressive strength value of 119.7 MPa should be used, which excludes the non-representative value of 17.6 MPa and the maximum value of 204.0 MPa.

4.0 LABORATORY CHEMICAL ANALYSES

4.1 Laboratory analyses

The laboratory analyses conducted as part of the environmental assessments included in this contract were carried out by the Laboratoire *Bodycote Groupe d'Essais* in Sainte-Foy, an MDDEP accredited laboratory.

The certificates of analysis are provided in Appendix C.

4.2 Sample selection and analytical parameters

The test samples and analytical parameters were selected in compliance with specified requirements. Surface sediments in boreholes F-1 to F-3, as well as two samples (one near the surface and another at depth) from boreholes F-4 to F-7 were analyzed for the following parameters:

- PAH (polycyclic aromatic hydrocarbons);
- TOC (total organic carbon);
- Petroleum hydrocarbons C_{10}-C_{50};
- Metals (As, Cd, Cr, Cu, Ni, Pb, Zn).

In addition, samples from boreholes F-1 to F-3 and two samples taken at depth in boreholes F-4 to F-7 were analyzed for the following parameter:

- PCB (Arochlor 1016, 1221, 1231-32, 1242, 1254, 1260, 1262, 1268 and total PCBs).

4.3 Soil and sediment test results

The results of the chemical analyses are presented in tables 1 and 2 in Appendix C, along with related certificates of analysis.

As a reference, and for information purposes only, the following table shows the environmental soil and sediment classifications for borehole samples in terms of the A, B and C criteria set out in the MDDEP's *Soil Protection and Contaminated Sites Rehabilitation Policy*. Moreover, the sediments were compared with level 1, 2 and 3 interim sediment quality criteria established for the St. Lawrence River (SLC): no effect threshold (NET), minimal effect threshold (MET) and toxic effect threshold (TET).

SUMMARY OF THE RESULTS OF CHEMICAL ANALYSES OF SOIL AND SEDIMENT SAMPLES

Borehole	Sample	Depth (m)	Tide gauge level (m)	Parameters				
				PAH	TOC	PH $C_{10}C_{50}$	Metals	PCB
F-1*	1-CF	17.5 to 18.1	-10.5 to -11.1	**B-C (>TET)**	- (<1%)	<A (-)	A-B (>NET / <MET)	- (>NET / <MET)
F-2*	1-CF	16.0 to 16.6	-9.1 to -9.7	**B-C (>TET)**	- (<1%)	<A (-)	<A (>NET / <MET)	- (<NET)
F-3*	1-CF	17.4 to 18.0	-10.4 to -11.0	A-B (>MET / < TET)	- **(>1%)**	<A (-)	**A-B (>TET)**	- (<NET)
F-4	2-CF	0.2 to 0.4	-0.8 to 6.1	<A	- (<1%)	<A	<A	---
F-4	6-CF	5.6 to 7.1	1.1 to -0.6	<A	---	---	---	---
F-4	9-CF	7.3 to 7.9	0.8 to 1.4	**>C**	- (<1%)	<A	<A	-
F-5	1-CF	0.2 to 0.8	6.2 to 5.6	<A	- (<1%)	<A	<A	-
F-5	9-CF	6.7 to 7.3	-0.3 to -0.86	<A	---	---	---	---
F-5	15-CF	12.4 to 13.0	-6.0 to -6.56	**>C**	- **(>1%)**	<A	**>C**	---
F-6	2-CF	0.6 to 1.2	6.6 to 6.0	<A	- (<1%)	<A	A-B	---
F-6	10-CF	7.6 to 8.2	0.4 to -1.0	A-B	- (<1%)	<A	<A	---
F-7	2-CF	0.6 to 1.2	6.7 to 6.1	A-B	- **(>1%)**	<A	<A	---
F-7	18-CF	15.2 to 15.8	-7.9 to -8.5	<A	- (<1%)	<A	<A	---

*** Note**: Boreholes F-1 to F-3 were carried out from the cantilevered platform over the river. Hence the depth of the surface sediments collected is in reference to the surface of the wharf.

A, B and C: Generic criteria established in MDDEP policy;

NET: No effect threshold (level 1 – CSL criteria);

MET: Minimal effect threshold (level 2 – CSL criteria);

TET: Toxic effect threshold (level 3 – CSL criteria);

--- : Parameter not analyzed;

- : No available criteria.

Four of the results indicate the presence of significant levels of contaminants. They are identified with black shading in the above table.

First, the sediments collected from borehole F-3 show a lead concentration almost three times higher than the level 3 interim sediment quality criteria or toxic effect threshold (TET) established for the St. Lawrence River.

Second, the results of the chemical analyses show that two of the soil samples collected at depth, that is F-4/9-CF and F-5/15-CF, have PAH and/or metal concentrations that exceed the C criteria established in the MDDEP Policy. It should be noted that sample F-4/9-CF revealed concentrations of naphthalene, 2-methylnaphthalene and phenanthrene (all PAHs) that exceed the limits set out by the MDDEP in the *Regulation respecting the burial of contaminated soils* (c.Q-2,r.6.01). Moreover, this sample exuded a strong smell of naphthalene (moth balls) when it was collected. According to the MDDEP Policy, soils with concentrations of contaminants that exceed criteria C exceed the acceptable limit for industrial land use. However, since the problem soils are at depths of 7.3 and 12.4 m, it is very unlikely that these soils will be disturbed during the reconstruction of wharf 95.

It should be noted that borehole F-3 sediments, soil sample 15-CF from borehole F-5, and the surface soils associated with F-7 (sample 2-CF) have TOC concentrations that exceed 1%. However, there are no criteria applicable to this case. Also, the values obtained for the PCB analysis are low, i.e., below the detection limit in most cases. There are no criteria applicable to these parameters in the MDDEP policy, as the case for TOC.

4.4 Quality control and assurance program

The Bodycote analytical laboratory applies a strict internal quality control protocol to ensure compliance with analytical methods and the credibility of its results. This protocol includes duplicates, blanks and spikes. This information is provided on each of the certificates of analysis in Appendix C.

5.0 GROUNDWATER

No observation pipe was installed in the boreholes since the groundwater level is the same as the level of the St. Lawrence River. This level fluctuates significantly with the tides.

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6.0 GEOTECHNICAL COMMENTS AND RECOMMENDATIONS

6.1 General

The project to rebuild zone 0+300 to 0+332 of section # 95 of the De La Reine Wharf entails demolishing the existing wharf by excavating and demolishing the existing gravity walls and replacing them with pile and sheet pile walls or box and sheet-pile walls.

The surface of the wharf will remain at the same elevation as the current wharf, which is at a tide gauge level of about 6.7 m.

6.2 Geotechnical resistance

The piles or box piles associated with the sheet piles will be anchored in bedrock along the face of the wharf between tide levels –22.11 and –22.49 m or between 11.60 and 13.28 under the St. Lawrence riverbed.

Boreholes F-1 to F-3 revealed that the upper part of the bedrock is of very poor to poor quality (RQD between 0 and 39%). Consequently, the presence of fractured surface rock limits the geotechnical resistance at ultimate limit states (ULS), the factored geotechnical resistance at ultimate limit state design (FGULS) and the serviceability at limit states (SLS). For example, according to the depth of embedment of the piles or box piles, the following values apply:

Diameter (m)	Embedded into bedrock (m)	ULS kPa	FGULS kPa	SLS kPa
0.25	1.0	6465	2585	2155
	1.5	10770	4310	3590
	2.0	10770	4310	3590
0.30	1.0	8370	3350	2790
	1.5	10770	4310	3590
	2.0	10770	4310	3590
0.45	1.0	6780	2710	2260
	1.5	8370	3350	2790
	2.0	9975	3990	3325
0.60	1.0	6000	2400	2000
	1.5	7180	2870	2395
	2.0	8370	3350	2790

These values were established using the following formula, which incorporates the compressive strength of the bedrock:

$$q_a = \sigma_c \cdot K_{sp} \cdot d.$$

where q_a = Serviceability at limit states (SLS)

σ_c = Mean unconfined compressive strength of bedrock core sample

K_{sp} = Empirical coefficient equal to 0.1, including a safety factor of 3

d = Depth factor = $1+0.4 \times L_S/B_S \leq 3$

where L_S = Socket length

B_S = Socket diameter

Furthermore, to account for the degree of fracturation of the bedrock, a reduction factor of 0.1 was used owing to the RQD observed in the upper part of the bedrock (RQD < 50%).

6.3 Settlement

The settlement of piles and box piles embedded into bedrock is not easy to determine. Settlement of a pile or box pile in sound bedrock is generally negligible. In the current case, there is black calcareous shale stratified at an angle varying between 38 and close to 90° in relation to the horizontal. We do not anticipate any significant settling because none was encountered in the rock mass with open joints or zones of compressible material. Moreover, the stratification angle reduces the risk of settling in relation to horizontal schistosity if interbedded compressible materials are present.

In light of the above, the greatest risk of settling is associated with the quality of the bottom of the socket. Extra care is required to ensure that no drilling mud and/or rock debris remains in the bottom of the pile socket before the concrete is poured.

6.4 Anchors

The piles or box piles are small in diameter in relation to the total height of each of the units. They could therefore be subject to lateral earth pressure leading to significant overturning moments requiring anchoring in the bedrock.

Two types of anchors are possible: passive and active anchorage. Generally speaking, the anchors need to be sized in terms of the following:

- Rupture at the rock mass;
- Rupture at the rock-grout interface
- Rupture at the tendon-grout interface;
- Rupture at steel tendon.

As for the rock mass, a unit weight of 26.2 kN/m^3 could be retained for the sizing. Also, according to data reported in the literature, a friction angle on the order of 27° could be assigned given the type of bedrock observed.

The allowable rock-grout bond stress should be less than 1/30^e of the unconfined compressive strength of the bedrock and 1/30^e of the unconfined compressive strength of the grout. Since the unconfined compressive strength established for the bedrock in the laboratory is equal to 119.7 MPa on average and is therefore greater than that for the grout, this value should be retained for dimensioning purposes. For example, a preliminary rock-grout bond stress value of 1 MPa (grout resistance of 30 MPa) could be used.

The tendon-grout bond is a function of the steel rod model and the grout used. From a preliminary perspective, for a deformed bar and a grout with at least 30 MPa compressive strength, an ultimate tendon-grout bond of 2 MPa could be considered.

Also, a rupture at the steel tendon does not generally pose problems, with the anchorage selected directly in terms of the anticipated stress.

Finally, regardless of the type of anchorage selected, it is recommended that at least one tensile test be done to validate the anchorage capacity of the bedrock.

The minimum spacing between passive anchors should be equal to 4b where b is the diameter of the sealed area. If the spacing is less than 4b or if it is less than one fifth the length of the anchor, the interaction among the tie rods must be considered.

We hope this report meets your expectations and we remain at your disposal for any additional information you may require. The environmental component of this report was prepared by engineer Châtelaine Beaudry.

LABORATOIRES D'EXPERTISES DE QUÉBEC LTÉE

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Quebec City, April 19, 2007

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APPENDIX A

Borehole logs

Boreholes F-1 to F-7

LEQ

GENERAL

EXPLANATION OF THE BOREHOLE RECORD FORM

FV-1003 (2003-02)

The object of the Borehole Record is to assemble all the field and laboratory data regarding the soil, bedrock and ground water conditions obtained during the investigation at each borehole.

PROFILE

Elevation: This column gives the elevation of boundaries between various geological strata. The elevation refers to the datum given in the general heading.

Description: Each geological stratum is described using the standard classification given below.

The proportion of each constituent part of the soil as defined by the grain size range is denoted by the terms given below. The compactness of granular soils is defined by the Standard Penetration Value and the consistency of cohesive soils by the shear strength.

Classification	Particle sizes
Clay	smaller than 0.002 mm
Silt	0.002 to 0.08 mm
Sand	0.08 to 5.00 mm
Gravel	5.00 to 80 mm
Cobbles	80 to 200 mm
Boulders	larger than 200 mm

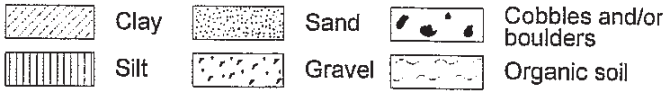
Descriptive terms	Proportion
"trace"	1 to 10%
"some"	10 to 20%
Adjective (e.g. sandy, silty)	20 to 35%
"and" (e.g. sand and gravel)	35 to 50%

Compactness	Standard Penetration Test "N" Value (blows per 0.3 m)
Very loose	0 to 4
Loose	4 to 10
Medium or compact	10 to 30
Dense	30 to 50
Very dense	over 50

Consistency	Shear strength (kPa)
Very soft	less than 12
Soft	12 to 25
Medium of firm	25 to 50
Stiff	50 to 100
Very stiff	100 to 200
Hard	over 200

Degree of plasticity	Liquid limit
Low	less than 30%
Medium	between 30 and 50%
High	more than 50%

Stratigraphy: In this column the hatching symbols follow the symbols of the United Soil Classification System. The basic soil types are designated by the following symbols:



GROUND WATER

The depth to ground water level as measured in the borehole is given in this column. The observation dates are given in the graph column at the right.

SAMPLES

Condition: The location, length and condition of each sample is shown in this column. The sample condition is defined by the symbols in the general heading.

Number & type: Each sample of the borehole is designated by the number as shown in this column. The sample type is also shown by a symbol that refers to the legend given in the general heading.

Recovery: Soil sample and rock core recoveries are given in percent of the penetration of the sampler. The sample length is equal to the distance from the top of the sample to the cutting edge irrespective of whether the lower part of the sample is lost.

R.Q.D.: The Rock Quality Designation is obtained by summing up the total length of core recovered but counting only those pieces of core which are 10 cm in length or longer, given in per cent of the core run.

$$\text{R.Q.D.} = \frac{\Sigma li \geq 10\ \text{cm}}{Lcr}$$

TESTS

Laboratory tests and results of *in-situ* tests are shown in this column at their corresponding depths.

Standard Penetration Test Values, commonly designated as "N" values, are given in this column. This value is obtained by dropping a 63,5 kg hammer onto the drill rods from a height of 760 mm. The number of blows necessary to produce the penetration of the last 305 mm of the 51 mm standard split spoon sampler is regarded as the "N" value.

GRAPH

Any pertinent observations noted during drilling and in the laboratory are given in the column. Also shown graphically are the results of Atterberg limits and moisture content tests as well as those of the 51 mm cone dynamic penetration test when performed. This latter penetration test consists in the continuous driving of a 51 mm diameter 60 degrees cone under constant energy, generally 475 joules, and thus differs from the Standard Penetration Test.

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Géotechnique, hydrogéologie et contrôle des matériaux

BOREHOLE LOG

Hole #: F-1

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,94m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-20/21

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	6.94	Cantilever platform.							
1									
2									
3									
4									
5	1.97	(4.97m)							
		St.Lawrence river.							
6									
7									
8									
9									
10									
11									

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BOREHOLE LOG

Hole #: F-1

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,94m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-20/21

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
		St.Lawrence river.							
12									
13									
14									
15									
16									
17									
	-10.51	(17.45m)							
	-10.56	Grey silt, traces of sand. Hydrocarbon odours. (17.50m)				1-CF	67	N=6 ACH	
18		Backfill: Grey silty sand, traces of gravel. Presence of wood and concrete fragments. Hydrocarbon odours. Compact. (18.95m)				2-CF	33	N=4	
	-12.01					3-CF	20	N=56/150mm Refusal	
19									
20		Grey sandy gravel, traces of silt. Presence of pebbles. Presence of wood fragments. Compact to very dense. (20.50m)				4-CF	25	N=28 Ag Wc=33,2%	
	-13.56					5-CF	67	N=43	
21									
22		Grey and brown sand and gravel, some silt. Presence of pebbles. Compact to very dense. 6-CF γh=23,0 kN/m3 γd=20,8 kN/m3 γ'=13,2 kN/m3				6-CF	58	N=43 Ag Wc=10,5%, , ϕ=36°	
						7-CF	0	N=50/0mm Refusal	
23	-16.12	(23.06m)							
		Grey sand, traces of silt and gravel. Presence of shells. Compact.				8-CF	25	N=37	
24						9-CF	50	N=12	

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BOREHOLE LOG

Hole #: F-1

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,94m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-20/21

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
25	-18.12	Grey sand, traces of silt and gravel. Presence of shells. Compact. (25.06m)				10-CF	42	N=14	
						11-CF	33	N=12	
26		Grey sand, traces of silt. Presence of shells. Loose to compact. 12-CF h=19,4 kN/m3 d=16,3 kN/m3 '= 9,6 kN/m3				12-CF	42	N=9 Ag Wc=19,8% ϕ=32°	
27									
28						13-CF	33	N=9	
29	-22.11	(29.05m)				14-CF	77	N=30	
		Bedrock: Grey calcareous sandstone from 29,13 to 29,26m. Black calcareous shale after. Presence of calcite veinlets. Very poor quality down to 30,20m, poor to good after. 19-CR σc=153,1 MPa γ= 26,2 kN/m3				15-CR	84	RQD=0%	
30						16-CR	76	RQD=0%	
						17-CR	100	RQD=24%	
31						18-CR	100	RQD=69%	
32						19-CR	96	RQD=46% σc	
	-25.49	(32.43m)							
		End of boring.							
33									
34									
35									
36									
37									

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BOREHOLE LOG

Hole #: F-2

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-12/14

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	6.96	Cantilever platform.							
1									
2									
3									
4									
5	1.97	(4.99m)							
		St.Lawrence river.							
6									
7									
8									
9									
10									
11									

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BOREHOLE LOG

Hole #: F-2

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-12/14

DEPTH (m)	ELEV (m)	PROFILE DESCRIPTION	STR	GROUND WATER	SAMPLES COND	No & TYPE	REC (%)	TESTS	NOTES
		St.Lawrence river.							
12									
13									
14									
15									
16	-9.06	(16.02m)							
	-9.49	Grey silty sand, traces of gravel. Presence of shell fragments. Hydrocarbon odours. (16.45m)				1-CF	20	N=37 ACH	
17		Grey and black gravelly sand, traces of silt. Occasional presence of shells. Presence of wood fragments.				2-CF	50	N=16 Ag Wc=24,1%, γ φ=37°	
18	-11.24	Compact. 2-CF γh=23,0 kN/m3 γd=18,3 kN/m3 γ'=13,2 kN/m3 (18.20m)				3-CF	50	N=10	
19		Grey and brown sand, traces of silt and gravel. Occasional presence of small clods of silt. Dense to very dense. (19.73m)				4-CF	50	N=46	
	-12.77					5-CF	42	N=67	
20	-13.54					6-CF	33	N=44	
21		Grey and brown sand, some silt and gravel. Occasional presence of small clods of silt. Dense. (20.50m)				7-CF	75	N=96	
	-14.89					8-CF	71	N=50/20mm Refusal	
22		Grey sand and gravel, traces of silt. Light hydrocarbon odours between 20,57 and 21,17m. Very dense. (21.85m)				9-CF	75	N=27 Ag Wc=22,8%, , φ=33°	
23						10-CF	0	N=26	
24		Grey sand, traces of gravel and silt. Presence of shells. Light hydrocarbon				11-CF	12	N=13	

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BOREHOLE LOG

Hole #: F-2

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-12/14

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
25		Grey sand, traces of gravel and silt. Presence of shells. Light hydrocarbon odours between 28,95 and 29,30m.				12-CF	33	N=19	
26		Compact. 9-CF γh=20,0 kN/m3 γd=16,3 kN/m3 γ'=10,2 kN/m3				13-CF	0	N=11	
27									
28						14-CF	17	N=12	
29	-22.34	(29.30m)				15-CF	75	N=73	
30		Bedrock: Black calcareous shale. Occasional presence of calcite veinlets. Dip between 38 to 60° with horizontal. Very poor quality down to 31,30m, good after.				16-CR	86	RQD=24%	
31		17-CR σc=151,3 MPa γ= 26,1 kN/m3				17-CR	100	RQD=17% σc	
32						18-CR	100	RQD=77%	
33	-25.87	(32.83m) End of boring.							
34									
35									
36									
37									

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BOREHOLE LOG

Hole #: F-3

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-18/19

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼	Groundwater level
Ag	Grain size analysis
N	Standard penetration test
Sed	Grain size analysis (sediment.)
Wl	Liquid limit
Wp	Plastic limit
Wc	Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	6.96	Cantilever platform.							
1									
2									
3									
4									
5	1.97	(4.99m)							
		St.Lawrence river.							
6									
7									
8									
9									
10									
11									

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BOREHOLE LOG

Hole #: F-3

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-18/19

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
		St.Lawrence river.							
12									
13									
14									
15									
16									
17									
	-10.42	(17.38m)							
18	-11.09	Brown and black silty sand, traces of gravel. Compact. (18.05m)				1-CF	58	N=12 ACH	
19		Brown gravelly sand, some silt. Very dense.				2-CF	33	N=74 Ag Wc=15,0%	
						3-CF	100	N=22-52/100mm Refusal	
20						4-CF	0	N=60/70mm Refusal	
	-13.34	(20.30m)							
21		Grey sand, traces of silt and gravel. Occasional presence of shell fragments. Hydrocarbon odours between 25,14 and 25,74m. Compact to dense.				5-CF	8	N=27	
22		11-CF γh=18,1 kN/m3 γd=15,0 kN/m3 γ'= 8,3 kN/m3				6-CF	0	N=15	
						7-CF	40	N=22	
23						8-CF	25	N=13	
24						9-CF	17	N=17	

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BOREHOLE LOG

Hole #: F-3

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,96m

Location: Reconstruction of zone 0+300 to 0+332 Date: 06-12-18/19

PROFILE				GROUND WATER	SAMPLES				
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)	TESTS	NOTES
25		Grey sand, traces of silt and gravel. Occasional presence of shell fragments. Hydrocarbon odours between 25,14 and 25,74m. Compact to dense. 11-CF γh=18,1 kN/m3 γd=15,0 kN/m3 γ'= 8,3 kN/m3				10-CF	67	N=19	
26						11-CF	67	N=31 Ag Wc=20,5%, γ, ϕ=34°	
						12-CF	25	N=12	
27									
28						13-CF	25	N=14	
	-21.53	(28.49m)							
29		Grey sand and gravel, traces of silt. Compact.				14-CF	17	N=16	
	-22.49	(29.45m)							
30		Bedrock: Black calcareous shale. Occasional presence of calcite veinlets. Dip between 70° to sub-vertical. Fractured between 31,00 to 31,74m. Poor quality. 16-CR σc=>204,0 MPa γ= 26,3 kN/m3 17-CR σc= 17,6 Mpa* γ= 22,2 kN/m3* *Invalid results				15-CR	82	RQD=39%	
31						16-CR	79	RQD=44% σc γ	
32						17-CR	86	RQD=38% σc γ	
	-25.56	(32.52m)							
33		End of boring.							
34									
35									
36									
37									

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BOREHOLE LOG

Hole #: F-4

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,54m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-09

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES				
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)	TESTS	NOTES
	6.54	Surface of the wharf.							
	6.31	Cement concrete slab. (0.23m)				1-CF	80	N=81/50mm Refusal	
	5.94	Backfill: Brown gravel and sand, traces of silt. Very dense. (0.60m)				2-CF	50	N=45 ACH Ag Wc=7,8%	
1									
2		Backfill: Grey sandy gravel, traces of silt. Dense to very dense. (2.50m)				3-CF	37	N=61	
	4.04	Backfill: Grey gravel, traces of silt. Presence of pebbles. Presence of wood fragments at about 2,90 and 7,30m. Odour of naphtalene at 9-CF. Compact down to about 8,06m, very loose after caused by the presence of voids.				4-CF	8	N=16	
3									
4						5-CF	0	N=13	
5						6-CF	17	N=22 ACH	
6						7-CF	0	N=14	
7						8-CF	0	N=22	
8						9-CF	10	N=10 ACH	
9						10-CF	0	N=2	
	-3.20	(9.74m)				11-CF	0	N=2	
10		End of boring.							
11									

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BOREHOLE LOG

Hole #: F-5

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,44m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-09/12

Equipment used: Boyles BBS-15
Casing size: HW et NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	6.44	Surface of the whraf.							
	6.25	Cement concrete slab. (0.19m)							
	5.69	Backfill: Grey crushed stone which corresponds to about MG-20b grade. (0.75m)				1-CF	58	N=133 ACH	
1						2-CF	0	N=25/0mm Refusal	
		Backfill: Grey crushed stone which corresponds to about MG-20 grade. The grain-size distribution is related to a sandy gravel, some silt. Presence of wood fragments between 3,48 and 3,65m. Compact to very dense.				3-CF	50	N=45 Ag Wc=13,7%	
2						4-CF	25	N=26	
3						5-CF	22	N=74/45mm Refusal	
4	2.44	(4.00m)							
		Backfill: Fragments of black clean crushed stone. Presence of a wood fragments between 11,27 and 11,87m. Loose to compact.				6-CF	8	N=25	
5						7-CF	2	N=8	
6						8-CF	2	N=19	
7						9-CF	10	N=10 ACH	
8						10-CF	3	N=13	
9						11-CF	3	N=10	
10						12-CF	5	N=11	
11						13-CF	5	N=30	

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BOREHOLE LOG

Hole #: F-5

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,44m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-09/12

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
		Backfill: Fragments of black clean crushed stone. Presence of a wood fragments between 11,27 and 11,87m. Loose to compact. (11.87m)				14-CF	28	N=22	
	-5.43								
12						15-CF	25	N=14 ACH	
	-6.46	Grey silty sand, some gravel. Compact. (12.90m)							
13						16-CF	42	N=30 Ag,Wc=10,0% γ,ϕ=39°	
14		Brown and grey gravel and sand. Dense. 16-CF γh=21,6 kN/m3 γd=19,6 kN/m3 γ'=11,8 kN/m3				17-CF	60	N=65/100mm Refusal	
15						18-CF	42	N=35	
16	-9.56	(16.00m)							
		Grey sand and gravel, traces to some silt. Compact to very dense.				19-CF	25	N=19	
17						20-CF	67	N=67	
18						21-CF	0	N=58	
	-12.31	(18.75m)							
19		Grey sand, traces of silt. Occasional presence of shells. Loose to dense.				22-CF	8	N=44	
20						23-CF	8	N=23	
21						24-CF	33	N=15	
22						25-CF	75	N=15	
23						26-CF	67	N=10	
24						27-CF	67	N=11	

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BOREHOLE LOG

Hole #: F-5

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 6,44m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-09/12

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
25	-18.66	Grey sand, traces of silt. Occasional presence of shells. Loose to dense. (25.10m)				28-CF	83	N=8	
						29-CR	51		
26	-19.73	Pebbles and gravel in a sand matrix. Very dense. (26.17m)				30-CR	77	RQD=0%	
						31-CR	88	RQD=0%	
						32-CR	100	RQD=0%	
27		Bedrock: Black calcareous shale. Presence of calcite veinlets. Dip between 65° to sub-vertical. Very poor quality down to 28,33m, poor after. 36-CR σc=65,1 MPa ɣ =26,3 kN/m3				33-CR	100	RQD=20%	
						34-CR	95	RQD=0%	
28						35-CR	100	RQD=21%	
29						36-CR	100	RQD=39% σc ɣ	
						37-CR	100	RQD=50%	
30	-23.64	(30.08m)							
		End of boring.							
31									
32									
33									
34									
35									
36									
37									

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BOREHOLE LOG

Hole #: F-6

Project: De la Reine Wharf, section #95 Number: 4160-04 Elevation: 7,18m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-12/15

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	7.18								
	7.07	Asphalt concrete. (0.11m)				1-CF	100	Frozen soil	
	6.73	Backfill: Crushed gravel which corresponds to about MG-20 grade. (0.45m)				2-CF	25	N=64 ACH	
1	6.08	Backfill: Brown sandy gravel, some silt. (1.10m)				3-CF	0	N=21	
2		Backfill: Fragments of black clean crushed stone.				4-CF	0	N=23	
3						5-CF	8	N=22	
	3.28	(3.90m)							
4		Backfill: Brown sandy gravel, some silt. Occasional presence of wood fragments. Compact.				6-CF	17	N=25	
5						7-CF	25	N=22 Ag Wc=31,8%	
6						8-CF	10	N=15	
	0.43	(6.75m)							
	0.28	Wood piece. (6.90m)				9-CF	63	N=33	
7	-.17	Backfill: Grey silty sand, some gravle. Presence of wood fragments. Compact. (7.35m)				10-CF	42	N=43 ACH	
8		Grey gravelly sand, traces of silt. Compact to dense.				11-CF	50	N=28	
9						12-CF	50	N=32	
10						13-CF	50	N=29	
	-3.46	(10.64m)							
11		End of boring.							

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BOREHOLE LOG

Hole #: F-7

Project: De la Reine Whraf, section #95 Number: 4160-04 Elevation: 7,26m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-15/16

Equipment used: Boyles BBS-15
Casing size: NW
Hammer weight: 63,5 Kg
drop: 760 mm

SAMPLE CONDITION

DISTURBED GOOD LOST

SAMPLE TYPE

CF Split spoon sampler O.D.: 50,8mm
CR Diamond core, size NQ
LA Wash sample
TA Auger sample
TM Thin-wall sampler
PS Fixed piston sampler

SYMBOLS

▼ Groundwater level
Ag Grain size analysis
N Standard penetration test
Sed Grain size analysis (sediment.)
Wl Liquid limit
Wp Plastic limit
Wc Natural water content

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	7.26								
	7.16	Asphalt concrete. (0.10m)				1-CF	75	Frozen soil	
	6.51	Backfill: Crushed stone which corresponds to about MG-20 grade. (0.75m)				2-CF	17	N=21 ACH	
1	5.91	Backfill: Mixture of sand and crushed stone. (1.35m)				3-CF	8	N=24	
2		Backfill: Fragments of grey clean crushed stone.				4-CF	7	N=8	
3	4.07	(3.19m)							
		Backfill: Black silty sand and gravel. Loose to compact.				5-CF	7	N=12	
4						6-CF	12	N=6	
5						7-CF	12	N=8	
6						8-CF	12	N=29	
7	0.25	(7.01m)				9-CF	0	N=30/0mm Refus	
		Grey gravelly sand, some silt. Presence of pebbles. Occasional presence of shells. Dense to very dense. 11-CF γh=20,8 kN/m3 γd=18,6 kN/m3 γ'=11,0 kN/m3				10-CF	50	N=103	
8						11-CF	50	N=88 Ag,Wc=11,8% γ',ϕ=36°	
9						12-CF	16	N=44	
10						13-CF	42	N=60	
11									

LABORATOIRES D'EXPERTISES de Québec ltée
Géotechnique, hydrogéologie et contrôle des matériaux

BOREHOLE LOG

Hole #: F-7

Project: De la Reine Whraf, section #95 Number: 4160-04 Elevation: 7,26m

Location: Reconstruction of zone 0+300 to 0+332 Date: 07-01-15/16

PROFILE				GROUND WATER	SAMPLES			TESTS	NOTES
DEPTH (m)	ELEV (m)	DESCRIPTION	STR		COND	No & TYPE	REC (%)		
	-4.16	Grey gravelly sand, some silt. Presence of pebbles. Occasional presence of shells. Dense to very dense. 11-CF γh=20,8 kN/m3 γd=18,6 kN/m3 γ'=11,0 kN/m3 (11.42m)				14-CF	45	N=60 N=28	
12						15-CF	0	N=25/0mm Refusal	
13	-5.64	Grey sand, some gravel and silt. Presence of pebbles. Compact to very dense. (12.90m)				16-CF	42	N=16	
14		Grey sand, traces of silt and gravel. Compact.				17-CF	25	N=17	
15						18-CF	50	N=22 ACH	
	-8.64	(15.90m)							
16		Bedrock: Black calcareous shale. Presence of calcite veinlets. Dip between 50 to 65°. Very poor to poor quality down to 18,96m, good after. 25-CR σc=109,2 MPa γ = 26,3 kN/m3				19-CR	93	RQD=25%	
						20-CR	91	RQD=22%	
17						21-CR	100	RQD=20%	
						22-CR	100	RQD=0%	
18						23-CR	100	RQD=0%	
						24-CR	97	RQD=0%	
19						25-CR	100	RQD=88% σc γ	
	-12.38	(19.64m)							
20		End of boring.							
21									
22									
23									
24									

APPENDIX B

Sieve Analyses

Plates B-1 to B-5

LEQ LABORATOIRES D'EXPERTISES de Québec ltée
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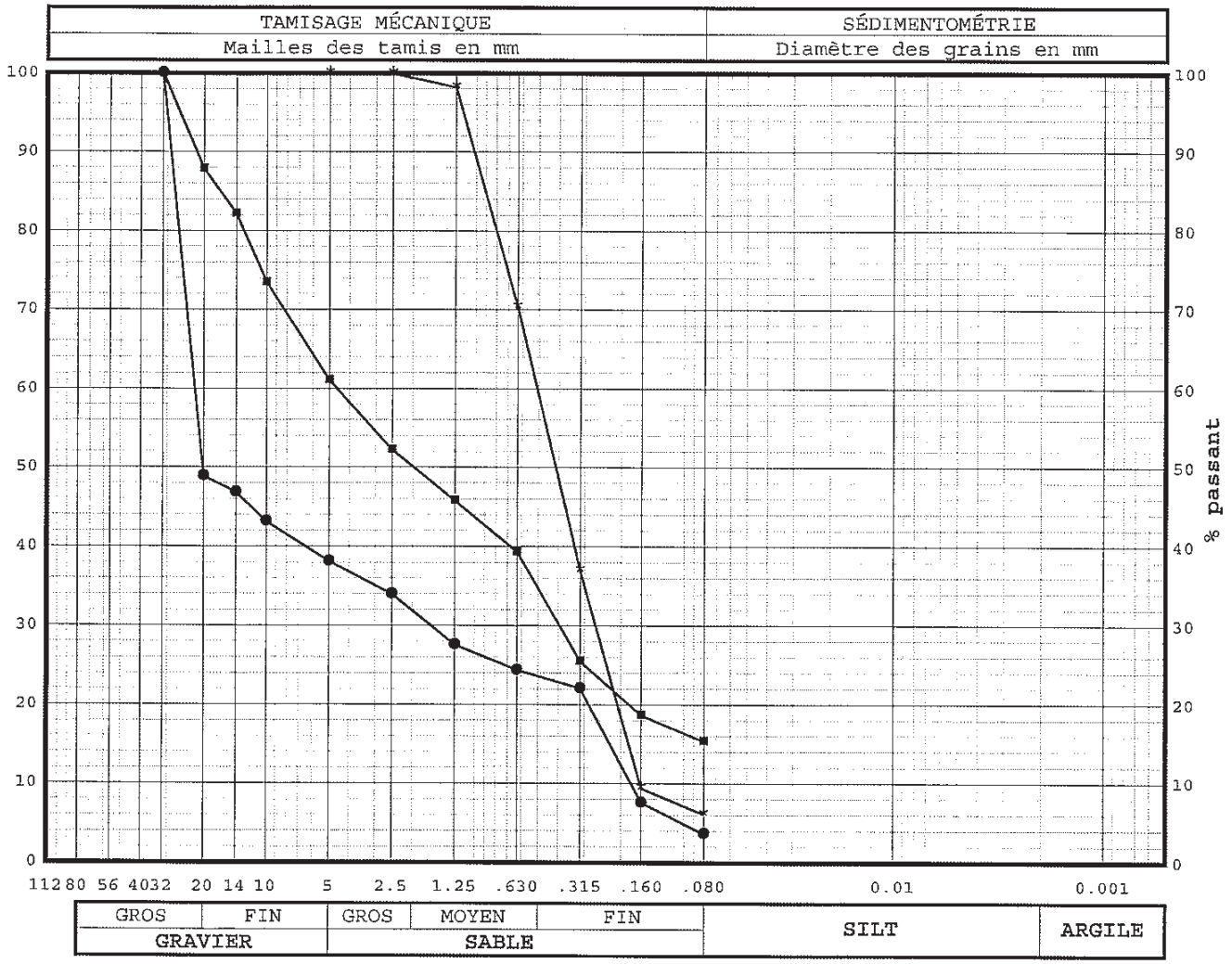
Normes LC 26-040
NQ 2501-025
CAN/BNQ 2501-070

Planche no.: B-1
Page: 1/1

ANALYSE GRANULOMÉTRIQUE

Soumis à: Public Works Canada
Projet: De la Reine Wharf, section 95
Reconstruction zone 0+300 to 0+332
Quebec City

No. de projet: 4160-04
échantillon: 4160-04-001
4160-04-002
4160-04-003



	FORAGE	ECHANTILLON	PROFONDEUR (m)	DESCRIPTION
●	F-1	4-CF	19,81-20,41m	Sandy gravel, traces of silt
■	F-1	6-CF	21,33-21,93m	Sand and gravel, some silt
*	F-1	12-CF	25,90-26,50m	Sand, traces of silt

● grav.=61.9%
sable=34.5%
silt = 3.6%
W=33.2%

■ grav.=38.9%
sable=45.8%
silt =15.3%
W=10.5%

* sable=93.9%
silt = 6.1%
W=19.8%

APPROUVÉ PAR: Rene Parrei

DATE: 2007/01/26

Note: Les résultats des essais ne se rapportent qu'à l'échantillon analysé.

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Normes LC 26-040
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Planche no.: B-2
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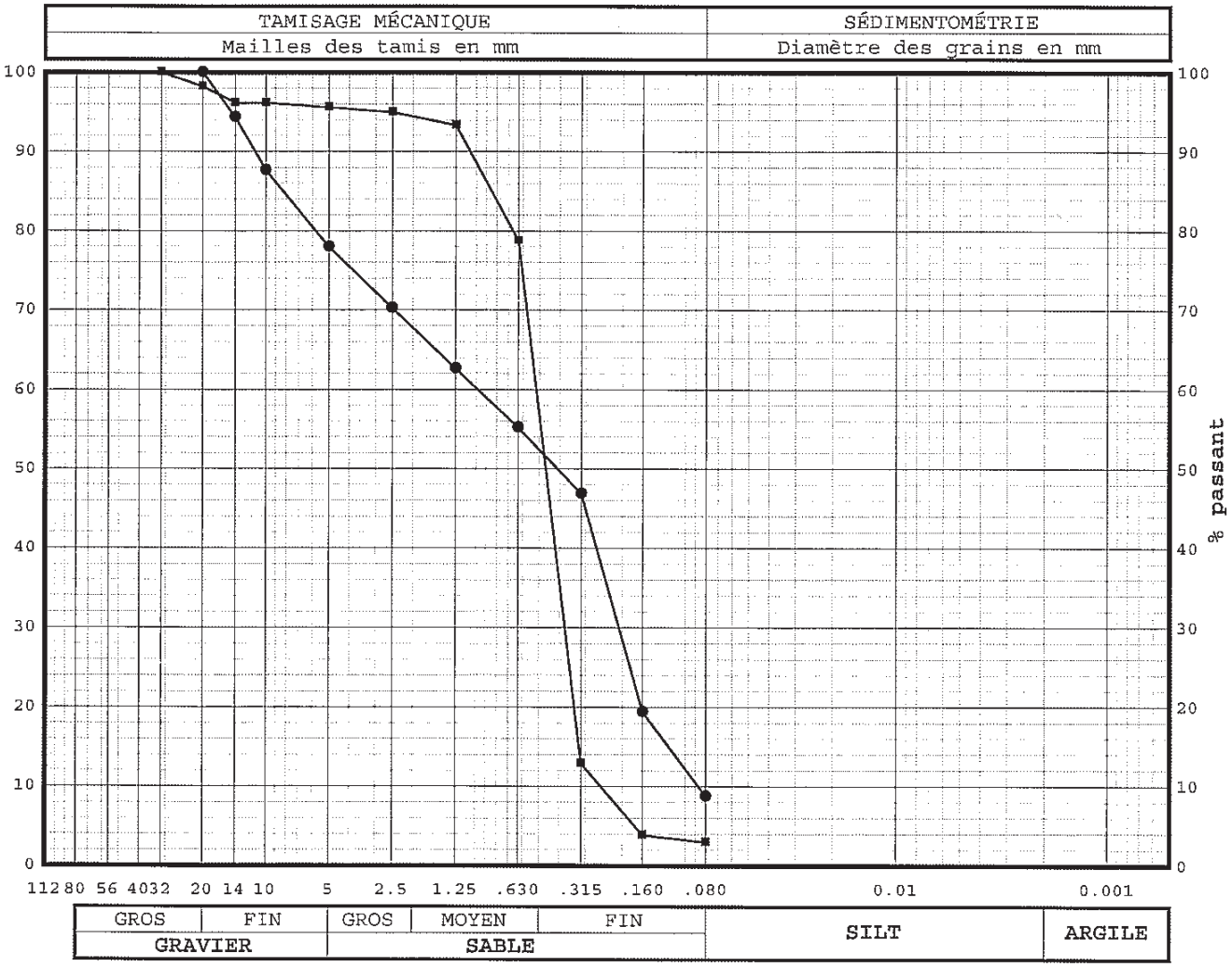
ANALYSE GRANULOMÉTRIQUE

Soumis à: Public Works Canada
Projet: De la Reine Wharf, section 95
Reconstruction zone 0+300 to 0+332
Quebec City

No. de projet: 4160-04
échantillon: 4160-04-004
4160-04-005



	FORAGE	ECHANTILLON	PROFONDEUR (m)	DESCRIPTION
●	F-2	2-CF	16,76-17,36m	Gravelly sand, traces of silt
■	F-2	9-CF	22,09-22,69m	Sand, traces of gravel and silt

● grav.=22.0%
sable=69.3%
silt = 8.7%
W=24.1%

■ grav.= 4.4%
sable=92.7%
silt = 2.9%
W=22.8%

APPROUVÉ PAR: Que Garnier

DATE: 2007/01/26

Note: Les résultats des essais ne se rapportent qu'à l'échantillon analysé.

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Planche no.: B-3
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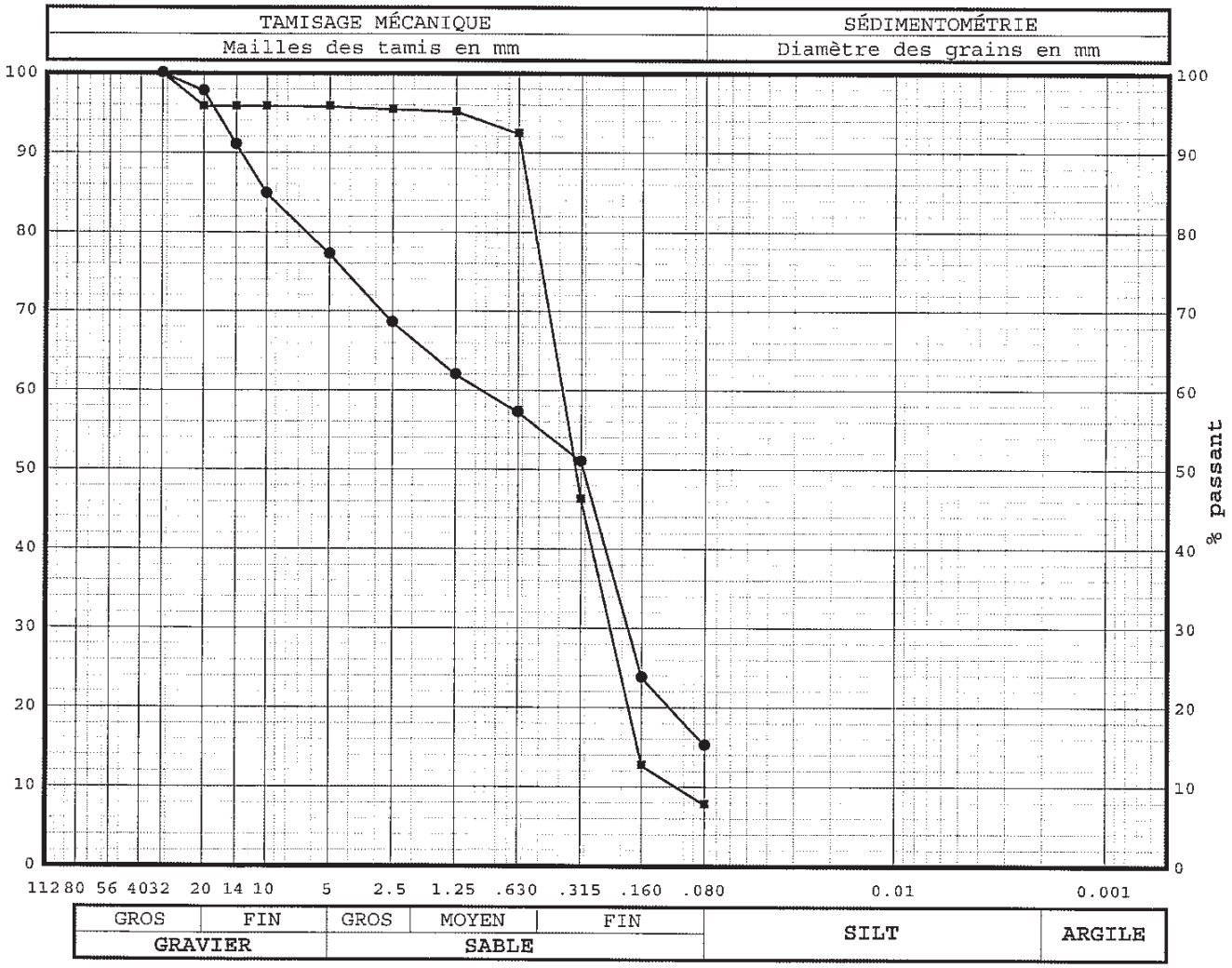
ANALYSE GRANULOMÉTRIQUE

Soumis à: Public Works Canada
Projet: De la Reine Wharf, section 95
Reconstruction zone 0+300 to 0+332
Quebec City

No. de projet: 4160-04
échantillon: 4160-04-006
4160-04-007



	FORAGE	ECHANTILLON	PROFONDEUR (m)	DESCRIPTION
●	F-3	2-CF	18,28-18,88m	Gravelly sand, some silt
■	F-3	11-CF	25,14-25,74m	Sand, traces of silt and gravel

● grav.=22.8%
sable=62.0%
silt =15.2%
W=15.0%

■ grav.= 4.2%
sable=88.1%
silt = 7.7%
W=20.5%

APPROUVÉ PAR: Que Garnier

DATE: 2007/01/26

Note: Les résultats des essais ne se rapportent qu'à l'échantillon analysé.

LABORATOIRES D'EXPERTISES de Québec ltée
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Planche no.: B-4
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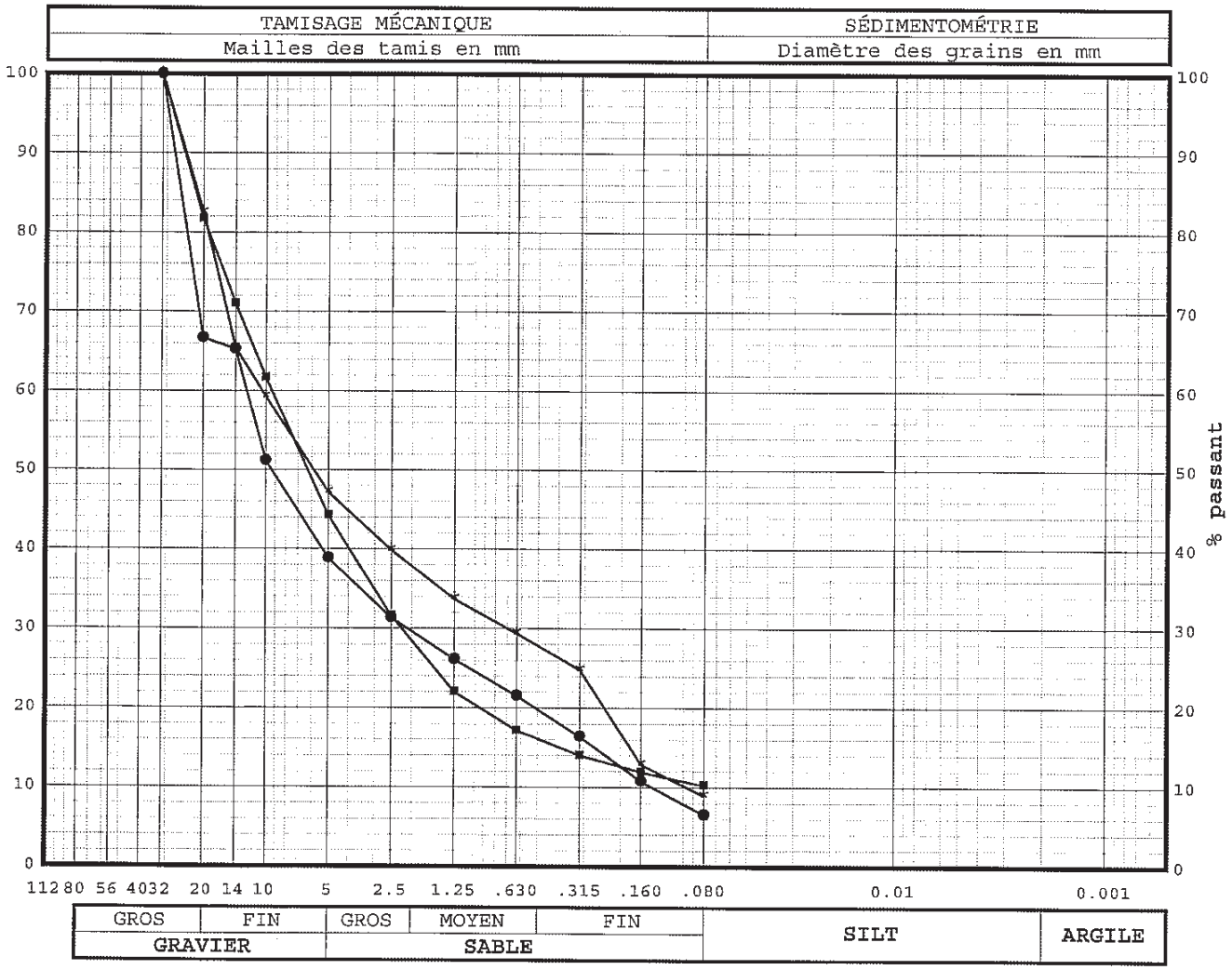
ANALYSE GRANULOMÉTRIQUE

Soumis à: Public Works Canada
Projet: De la Reine Wharf, section 95
Reconstruction zone 0+300 to 0+332
Quebec City

No. de projet: 4160-04
échantillon: 4160-04-008
4160-04-009
4160-04-010



	FORAGE	ECHANTILLON	PROFONDEUR (m)	DESCRIPTION
●	F-4	2-CF	0,92-1,52m	Sandy gravel, traces of silt
■	F-5	3-CF	1,20-1,80m	Sandy gravel, some silt
*	F-5	16-CF	13,41-14,01m	Gravel and sand, traces of silt

● grav.=61.2%
sable=32.3%
silt = 6.5%
W= 7.8%

■ grav.=55.8%
sable=34.0%
silt =10.2%
W=13.7%

* grav.=52.8%
sable=38.3%
silt = 8.9%
W=10.0%

APPROUVÉ PAR: Rene Poirier

DATE: 2007/01/26

Note: Les résultats des essais ne se rapportent qu'à l'échantillon analysé.

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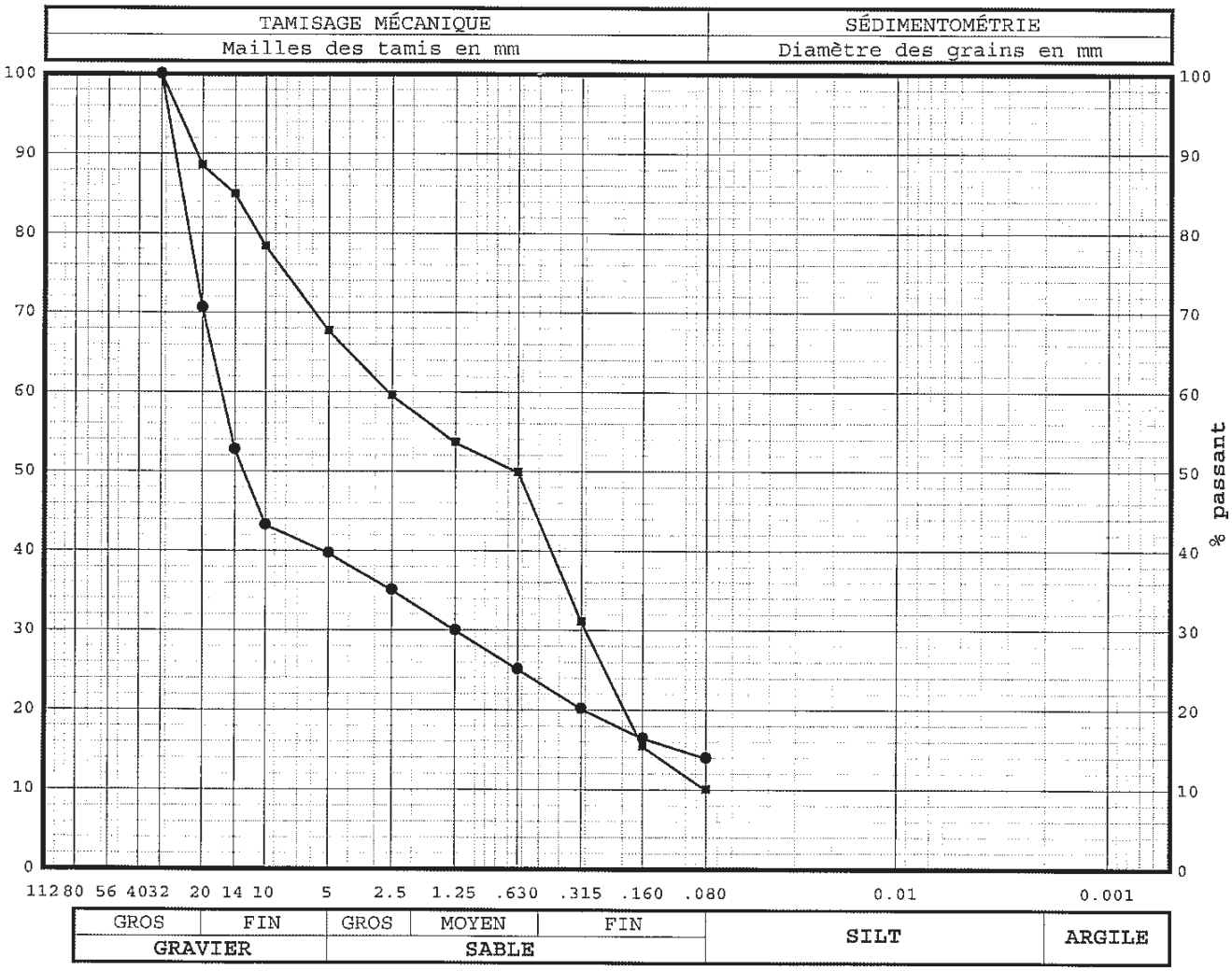
Planche no.: B-5
Page: 1/1

ANALYSE GRANULOMÉTRIQUE

Soumis à: Public Works Canada
Projet: De la Reine Wharf, section 95
Reconstruction zone 0+300 to 0+332
Quebec City

No. de projet: 4160-04
échantillon: 4160-04-011
4160-04-012



	FORAGE	ECHANTILLON	PROFONDEUR (m)	DESCRIPTION
●	F-6	7-CF	4,87-5,47m	Sandy gravel, some silt
■	F-7	11-CF	8,99-9,59m	Gravelly sand, some silt

● grav.=60.3%
sable=25.8%
silt =13.9%
W=31.8%

■ grav.=32.4%
sable=57.6%
silt =10.0%
W=11.8%

APPROUVÉ PAR: Rec Garrier

DATE: 2007/01/26

Note: Les résultats des essais ne se rapportent qu'à l'échantillon analysé.

APPENDIX C

Test Results
and
Certificates of Chemical Analyses

TABLE 1: RESULTS OF CHEMICAL ANALYSES OF SEDIMENT SAMPLES DE LA REINE WHARF - SECTION # 95 - QUEBEC CITY

PARAMETERS	CONCENTRATIONS (mg/kg)			GENERIC CRITERIA - MDDEP (mg/kg, ppm)			CSL CRITERIA 1992 (mg/kg, ppm)		
Borehole: Sample: Depth (m):	F-1 1-CF 17,48-18,06	F-2 1-CF 16,02-16,62	F-3 1-CF 17,38-17,96	A	B	C	NET (Level 1)	MET (Level 2)	TET (Level 3)
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)									
Naphtalene	0,84	3,6	0,21	0,1	5	50	0,02	0,4	0,6*
1-Methyl naphtalene	0,28	2,0	0,09	0,1	1	10	---	---	---
2-Methyl naphtalene	0,51	0,72	0,13	0,1	1	10	0,02	---	---
1,3-Dimethyl naphtalene	<0,2	1,8	0,11	0,1	1	10	---	---	---
Acenaphtylene	<0,2	0,57	<0,01	0,1	10	100	0,01	---	---
Acenapthene	1,9	13	0,22	0,1	10	100	0,01	---	---
2,3,5-Trimethyl naphtalene	<0,2	<0,3	0,08	0,1	1	10	---	---	---
Fluorene	1,7	8,4	0,10	0,1	10	100	0,01	---	---
Phenanthrene	5,5	16	0,33	0,1	5	50	0,03-0,07	0,4	0,8*
Anthracene	1,0	2,7	0,07	0,1	10	100	0,02	---	---
Fluoranthène	3,4	8,0	0,18	0,1	10	100	0,02-0,2	0,6	2*
Pyrene	2,2	5,1	0,17	0,1	10	100	0,02-0,1	0,7	1*
Benzo (c) phenanthrene	<0,2	<0,3	0,01	0,1	1	10	---	---	---
Benzo (a) anthracene	0,62	1,5	0,04	0,1	1	10	0,05-0,1	0,4	0,5*
Chrysene	0,67	1,7	0,06	0,1	1	10	0,1	0,6	0,8*
5-Methyl chrysene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
Benzo (b + j + k) fluoranthene	0,52	2,2	0,05	0,1	1	10	0,3	---	---
7,12 -Dimethylbenzoanthracene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
Benzo (e) pyrene	<0,2	0,82	0,03	0,1	1	10	---	---	
Benzo (a) pyrene	0,21	0,93	0,02	0,1	1	10	0,01-0,1	0,5	0,7*
3-Methylcholanthrene	<0,2	<0,3	<0,01	0,1	1	10	---	---	---
Indeno (1,2,3-cd) pyrene	<0,2	0,45	0,01	0,1	1	10	0,07	---	---
Dibenzo (a,h) anthracene	<0,2	<0,3	<0,01	0,1	1	10	---	---	---
7H-Dibenzo(c,g)carbazole	<0,2	<0,3	<0,01	0,1	1	10	---	---	---
Benzo (g,h,i) perylene	<0,2	0,43	0,02	0,1	1	10	0,1	---	---
Dibenzo (a,l) pyrene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
Dibenzo (a,e) pyrene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
Dibenzo (a,i) pyrene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
Dibenzo (a,h) pyrene	<0,3	<0,6	<0,02	0,1	1	10	---	---	---
METALS									
Arsenic	2,5	3,8	2,6	6	30	50	3	7	17
Cadmium	0,22	0,19	0,10	1,5	5	20	0,2	0,9	3
Chromium	27	22	8	85	250	800	55	55	100
Copper	16	27	21	40	100	500	28	28	86
Nickel	15	15	8	50	100	500	35	35	61
Lead	16	30	490	50	500	1 000	23	42	170
Zinc	130	100	140	110	500	1 500	100	150	540
POLYCHLORINATED BIPHENYL (PCBs)									
Aroclor 1016	<0,01	<0,01	<0,01	---	---	---	---	0,01	0,4*
Aroclor 1221	<0,07	<0,01	<0,01	---	---	---	---	---	---
Aroclor 1231-1232	<0,01	<0,01	<0,01	---	---	---	---	---	---
Aroclor 1242	0,04	<0,01	<0,01	---	---	---	---	---	---
Aroclor 1248	<0,01	<0,01	<0,01	---	---	---	---	0,05	0,6*
Aroclor 1254	0,02	<0,01	<0,01	---	---	---	---	0,06	0,3*
Aroclor 1260	<0,01	<0,01	<0,01	---	---	---	---	0,01	---
Aroclor 1262	<0,01	<0,01	<0,01	---	---	---	---	---	---
Aroclor 1268	<0,01	<0,01	<0,01	---	---	---	---	---	---
Aroclor (total)	0,06	<0,01	<0,01	---	---	---	0,02	0,2	1
INTEGRATING PARAMETERS									
Petroleum hydrocarbons (C_{10}-C_{50})	<100	160	<100	300	700	3 500	---	---	---
OTHER PARAMETERS									
Total organic carbon (%)	0,46	0,97	3,27	---	---	---	---	---	---

* = For the 3th level, the criteria associated to this parameter must be multiplicated by the % of TOC, if the TOC>1%.

TABLE 2: RESULTS OF CHEMICAL ANALYSES OF SOIL SAMPLES DE LA REINE WHARF - SECTION # 95 - QUEBEC CITY

PARAMETERS	CONCENTRATION (mg/kg)										GENERIC CRITERIA - MDDEP (mg/kg, ppm)		
Borehole:	F-4	F-4	F-4	F-5	F-5	F-5	F-6	F-6	F-7	F-7			
Sample:	2-CF	6-CF	9-CF	1-CF	9-CF	15-CF	2-CF	10-CF	2-CF	18-CF	A	B	C
Depth (m):	0,23-0,45	5,44-7,06	7,51-7,81	0,10-0,70	6,70-7,30	12,39-12,99	0,60-1,20	7,42-8,32	0,60-1,20	15,24-15,84			
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)													
Naphtalene	<0,1	<0,1	230	<0,1	<0,1	1,3	<0,1	<0,1	<0,1	<0,1	0,1	5	50
1-Methyl naphtalene	<0,1	<0,1	35	<0,1	<0,1	0,5	<0,1	<0,1	<0,1	<0,1	0,1	1	10
2-Methyl naphtalene	<0,1	<0,1	65	<0,1	<0,1	0,6	<0,1	0,1	<0,1	<0,1	0,1	1	10
1,3-Dimethyl naphtalene	<0,1	<0,1	15	<0,1	<0,1	0,4	<0,1	0,1	<0,1	<0,1	0,1	1	10
Acenaphtylene	<0,1	<0,1	3,2	<0,1	<0,1	1,6	<0,1	<0,1	<0,1	<0,1	0,1	10	100
Acenapthene	<0,1	<0,1	60	<0,1	<0,1	0,7	<0,1	<0,1	<0,1	<0,1	0,1	10	100
2,3,5-Trimethyl naphtalene	<0,1	<0,1	2,7	<0,1	<0,1	0,3	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Fluorene	<0,1	<0,1	71	<0,1	<0,1	1,7	<0,1	<0,1	<0,1	<0,1	0,1	10	100
Phenanthrene	<0,1	<0,1	190	<0,1	<0,1	20	<0,1	<0,1	<0,1	<0,1	0,1	5	50
Anthracene	<0,1	<0,1	80	<0,1	<0,1	3,0	<0,1	<0,1	<0,1	<0,1	0,1	10	100
Fluoranthène	<0,1	<0,1	82	<0,1	<0,1	24	<0,1	<0,1	<0,1	<0,1	0,1	10	100
Pyrene	<0,1	<0,1	55	<0,1	<0,1	20	<0,1	<0,1	<0,1	<0,1	0,1	10	100
Benzo (c) phenanthrene	<0,1	<0,1	3,5	<0,1	<0,1	1,4	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Benzo (a) anthracene	<0,1	<0,1	23	<0,1	<0,1	8,1	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Chrysene	<0,1	<0,1	24	<0,1	<0,1	9,8	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Benzo (b + j + k) fluoranthene	<0,1	<0,1	25	<0,1	<0,1	12	<0,1	<0,1	0,2	<0,1	0,1	1	10
7,12 -Dimethylbenzoanthracene	<0,1	<0,1	<2,0	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Benzo (e) pyrene	<0,1	<0,1	8,3	<0,1	<0,1	4,5	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Benzo (a) pyrene	<0,1	<0,1	12	<0,1	<0,1	8,2	<0,1	<0,1	<0,1	<0,1	0,1	1	10
3-Méthylcholanthrene	<0,1	<0,1	<2,0	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Indeno (1,2,3-cd) pyrene	<0,1	<0,1	6,7	<0,1	<0,1	5,5	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Dibenzo (a,h) anthracene	<0,1	<0,1	<2,0	<0,1	<0,1	1,3	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Benzo (g,h,i) pérylène	<0,1	<0,1	4,7	<0,1	<0,1	4,1	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Dibenzo (a,l) pyrene	<0,1	<0,1	<2,0	<0,1	<0,1	1,8	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Dibenzo (a,e) pyrene	<0,1	<0,1	<2,0	<0,1	<0,1	0,8	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Dibenzo (a,i) pyrene	<0,1	<0,1	<2,0	<0,1	<0,1	0,6	<0,1	<0,1	<0,1	<0,1	0,1	1	10
Dibenzo (a,h) pyrene	<0,1	<0,1	<2,0	<0,1	<0,1	0,2	<0,1	<0,1	<0,1	<0,1	0,1	1	10
METALS													
Arsenic	1,3	---	3,6	1,1	---	17	1,6	6,9	1,9	1,8	6	30	50
Cadmium	<0,4	---	<0,4	<0,4	---	1,3	<0,4	<0,4	<0,4	<0,4	1,5	5	20
Chromium	9	---	17	7	---	18	20	12	7	5	85	250	800
Copper	10	---	9	6	---	150	66	8	16	5	40	100	500
Nickel	9	---	10	6	---	29	24	16	9	10	50	100	500
Lead	8	---	7	<5	---	400	<5	<5	14	<5	50	500	1 000
Zinc	36	---	34	15	---	1 600	61	21	69	12	110	500	1 500
POLYCHLORINATED BIPHENYL (PCBs)													
Aroclor 1242	---	---	<0,1	<0,1	---	---	---	---	---	---	---	---	---
Aroclor 1248	---	---	<0,1	<0,1	---	---	---	---	---	---	---	---	---
Aroclor 1254	---	---	<0,1	<0,1	---	---	---	---	---	---	---	---	---
Aroclor 1260	---	---	<0,1	<0,1	---	---	---	---	---	---	---	---	---
Aroclor (total)	---	---	ND	ND	---	---	---	---	---	---	---	---	---
INTEGRATING PARAMETERS													
Petroleum hydrocarbons (C_{10}-C_{50})	120	---	<100	110	---	270	<100	<100	<100	<100	300	700	3 500
OTHER PARAMETERS													
Total organic carbon (%)	0,22	---	0,58	0,13	---	8,68	0,18	0,08	2,45	0,03	---	---	---

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Certificat d'analyse

Numéro de demande d'analyse: **06-205087**

Demande d'analyse reçue le: 2006-12-21

Date d'émission du certificat: 2007-01-11

Numéro de version du certificat: 1

☑ Certificat d'analyse officiel

☐ Certificat d'analyse préliminaire

Requérant

LABORATOIRE EXPERTISE DE QUEBEC

2320, DE CELLES
QUEBEC, Québec, Canada
G2C 1X8
Téléphone : (418) 845-0858
Télécopieur : (418) 845-0300

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Commentaires

REÇU Le
23 JAN. 2007
Pén.

Cette version remplace et annule toute version antérieure, le cas échéant.
NA : Information non-fournie et/ou non-applicable

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Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Échantillon(s)

	No Labo.	**968967**	**968968**	**968969**
	Votre Référence	F-1 1-CF	F-2 1-CF	F-3 1-CF
	Matrice	Sédiment	Sédiment	Sédiment
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2006-12-20	2006-12-20	2006-12-20
	Reçu Labo	2006-12-21	2006-12-21	2006-12-21
Paramètre(s) Méthode Référence				
Arsenic	Préparation	2007-01-05	2007-01-05	2007-01-05
QC050-02 / dig. acide, perte feu, génération hydrure par AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
MENVIQ 90.02/204-As1.1	No. séquence	201331	201331	201331
Arsenic	mg/kg	2.5	3.8	2.6
Cadmium	Préparation	2007-01-05	2007-01-05	2007-01-05
Digestion acide, dosage GFAA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
EPA3050, MA200.Met1.0	No. séquence	201326	201326	201326
Cadmium	mg/kg	0.22	0.19	0.10
Carbone organique total	Préparation	2007-01-02	2007-01-02	2007-01-02
Combustion LECO Analyse en sous-traitance	Analyse	2007-01-02	2007-01-02	2007-01-02
	No. séquence	NA	NA	NA
Carbone organique total	%C	0.46	0.97	3.27
Chrome	Préparation	2007-01-05	2007-01-05	2007-01-05
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	201327	201327	201327
Chrome	mg/kg	27	22	8
Cuivre	Préparation	2007-01-05	2007-01-05	2007-01-05
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	201347	201347	201347
Cuivre	mg/kg	16	27	21
Nickel	Préparation	2007-01-05	2007-01-05	2007-01-05
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	201348	201348	201348
Nickel	mg/kg	15	15	8

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Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Échantillon(s)

	No Labo.	**968967**	**968968**	**968969**
	Votre Référence	F-1 1-CF	F-2 1-CF	F-3 1-CF
	Matrice	Sédiment	Sédiment	Sédiment
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2006-12-20	2006-12-20	2006-12-20
	Reçu Labo	2006-12-21	2006-12-21	2006-12-21
Paramètre(s) Méthode Référence				
Plomb	Préparation	2007-01-05	2007-01-05	2007-01-05
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	201357	201357	201357
Plomb	mg/kg	16	30	490
Zinc	Préparation	2007-01-05	2007-01-05	2007-01-05
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-05	2007-01-05	2007-01-05
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	201358	201358	201358
Zinc	mg/kg	130	100	140

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Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Échantillon(s)

No Labo.	**968967**	**968968**	**968969**
Votre Référence	F-1 1-CF	F-2 1-CF	F-3 1-CF
Matrice	Sédiment	Sédiment	Sédiment
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2006-12-20	2006-12-20	2006-12-20
Reçu Labo	2006-12-21	2006-12-21	2006-12-21

Paramètre(s) / Méthode / Référence				
Biphényles polychlorés (BPC)	Préparation	2007-01-05	2007-01-05	2007-01-05
QC071-97 / ext. Acétone-hexane, dosage GC-ECD (Aroclor) Résultat sur base sèche	Analyse	2007-01-08	2007-01-08	2007-01-08
MA 408 BPC 2.0	No. séquence	201336	201336	201336
Aroclor 1016	mg/kg	< 0.01	< 0.01	< 0.01
Aroclor 1221	mg/kg	< 0.07	< 0.01	< 0.01
Aroclors 1231-1232	mg/kg	< 0.01	< 0.01	< 0.01
Aroclor 1242	mg/kg	0.04	< 0.01	< 0.01
Aroclor 1248	mg/kg	< 0.01	< 0.01	< 0.01
Aroclor 1254	mg/kg	0.02	< 0.01	< 0.01
Aroclor 1260	mg/kg	< 0.01	< 0.01	< 0.01
Aroclor 1262	mg/kg	< 0.01	< 0.01	< 0.01
Aroclor 1268	mg/kg	< 0.01	< 0.01	< 0.01
Total	mg/kg	0.06	< 0.01	< 0.01
Hydrocarbures aromatiques polycycliques (HAP)	Préparation	2007-01-08	2007-01-08	2007-01-08
QC058-97 / extraction dichlorométhane, dosage GC-MS Résultat sur base sèche	Analyse	2007-01-09	2007-01-09	2007-01-09
EPA3540, 8270 / MA400 HAP1.1	No. séquence	201482	201482	201482
Naphtalène	mg/kg	0.84	3.6	0.21
1-Méthylnaphtalène	mg/kg	0.28	2.0	0.09
2-Méthylnaphtalène	mg/kg	0.51	0.72	0.13
1,3-Diméthylnaphtalène	mg/kg	<0.2	1.8	0.11
Acénaphtylène	mg/kg	<0.2	0.57	<0.01
Acénaphtène	mg/kg	1.9	13	0.22
2,3,5-Triméthylnaphtalène	mg/kg	<0.2	<0.3	0.08
Fluorène	mg/kg	1.7	8.4	0.10
Phénanthrène	mg/kg	5.5	16	0.33
Anthracène	mg/kg	1.0	2.7	0.07
Fluoranthène	mg/kg	3.4	8.0	0.18
Pyrène	mg/kg	2.2	5.1	0.17

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Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Échantillon(s)

No Labo.	**968967**	**968968**	**968969**
Votre Référence	F-1 1-CF	F-2 1-CF	F-3 1-CF
Matrice	Sédiment	Sédiment	Sédiment
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2006-12-20	2006-12-20	2006-12-20
Reçu Labo	2006-12-21	2006-12-21	2006-12-21

Paramètre(s) Méthode Référence				
Benzo (c) phénanthrène	mg/kg	<0.2	<0.3	0.01
Benzo (a) anthracène	mg/kg	0.62	1.5	0.04
Chrysène	mg/kg	0.67	1.7	0.06
5-Méthylchrysène	mg/kg	<0.3	<0.6	<0.02
Benzo (b, j et k) fluoranthènes	mg/kg	0.52	2.2	0.05
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.3	<0.6	<0.02
Benzo (e) pyrène	mg/kg	<0.2	0.82	0.03
Benzo (a) pyrène	mg/kg	0.21	0.93	0.02
3-Méthylcholanthrène	mg/kg	<0.2	<0.3	<0.01
Indéno (1,2,3-cd) pyrène	mg/kg	<0.2	0.45	0.01
Dibenzo (a,h) anthracène	mg/kg	<0.2	<0.3	<0.01
7H-Dibenzo (c,g) carbazole	mg/kg	<0.2	<0.3	<0.01
Benzo (g,h,i) pérylène	mg/kg	<0.2	0.43	0.02
Dibenzo (a,l) pyrène	mg/kg	<0.3	<0.6	<0.02
Dibenzo (a,e) pyrène	mg/kg	<0.3	<0.6	<0.02
Dibenzo (a,i) pyrène	mg/kg	<0.3	<0.6	<0.02
Dibenzo (a,h) pyrène	mg/kg	<0.3	<0.6	<0.02
Pourcentage de récupération				
Acénaphtène-d10	%	115%	dilue%	107%
Fluoranthène-d10	%	121%	dilue%	104%
Chrysène-d12	%	105%	dilue%	103%
Hydrocarbures pétroliers (C10-C50)	Préparation	2007-01-04	2007-01-04	2007-01-04
QC063-97 / extraction hexane, dosage GC-FID Résultat sur base sèche	Analyse	2007-01-04	2007-01-04	2007-01-04
MA410-Hyd. 1.0	No. séquence	201210	201210	201210
Hydrocarbures pétroliers (C10-C50)	mg/kg	<100	160	<100

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Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Échantillon(s)

No Labo.	**968967**	**968968**	**968969**
Votre Référence	F-1 1-CF	F-2 1-CF	F-3 1-CF
Matrice	Sédiment	Sédiment	Sédiment
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2006-12-20	2006-12-20	2006-12-20
Reçu Labo	2006-12-21	2006-12-21	2006-12-21

Paramètre(s)
Méthode
Référence

Note: Ces résultats et commentaires, le cas échéant, ne se rapportent qu'aux échantillons soumis pour l'analyse des paramètres ci-dessus mentionné

Geneviève Larose
Chimiste

CHIMISTE
Geneviève Larose
2002-128
QUÉBEC

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Certificat d'analyse

Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Arsenic					
No Séquence: 201331					
Arsenic	mg/kg	< 0.5	<0.5	24	18 - 34
Biphényles polychlorés (BPC)					
No Séquence: 201336					
Aroclor 1016	mg/kg	< 0.01	< 0.01	NA	NA
Aroclor 1221	mg/kg	< 0.01	< 0.01	NA	NA
Aroclors 1231-1232	mg/kg	< 0.01	< 0.01	NA	NA
Aroclor 1242	mg/kg	< 0.01	< 0.01	0.09	0.07 - 0.13
Aroclor 1248	mg/kg	< 0.01	< 0.01	NA	NA
Aroclor 1254	mg/kg	< 0.01	< 0.01	0.10	0.07 - 0.13
Aroclor 1260	mg/kg	< 0.01	< 0.01	NA	NA
Aroclor 1262	mg/kg	< 0.01	< 0.01	NA	NA
Aroclor 1268	mg/kg	< 0.01	< 0.01	NA	NA
Total	mg/kg	< 0.01	< 0.01	0.19	0.14 - 0.26
Cadmium					
No Séquence: 201326					
Cadmium	mg/kg	< 0.03	<0.03	15	11 - 16.4
Chrome					
No Séquence: 201327					
Chrome	mg/kg	< 2	<2	42	38 - 58
Cuivre					
No Séquence: 201347					
Cuivre	mg/kg	< 1	<1	440	400 - 540
Hydrocarbures aromatiques polycycliques (HAP)					
No Séquence: 201482					
Naphtalène	mg/kg	< 0.01	<0.01	0.16	0.12 - 0.28
1-Méthylnaphtalène	mg/kg	< 0.01	<0.01	0.16	0.12 - 0.28
2-Méthylnaphtalène	mg/kg	< 0.01	<0.01	0.11	0.072 - 0.17
1,3-Diméthylnaphtalène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28

Commentaires CQ

LDR : Limite de détection rapportée

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Certificat d'analyse

Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Acénaphtylène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Acénaphtène	mg/kg	< 0.01	<0.01	0.18	0.12 - 0.28
2,3,5-Triméthylnaphtalène	mg/kg	< 0.01	<0.01	0.18	0.12 - 0.28
Fluorène	mg/kg	< 0.01	<0.01	0.19	0.12 - 0.28
Phénanthrène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Anthracène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Fluoranthène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Pyrène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Benzo (c) phénanthrène	mg/kg	< 0.01	<0.01	0.21	0.12 - 0.28
Benzo (a) anthracène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
Chrysène	mg/kg	< 0.01	<0.01	0.20	0.12 - 0.28
5-Méthylchrysène	mg/kg	< 0.02	<0.02	0.21	0.12 - 0.28
Benzo (b, j et k) fluoranthènes	mg/kg	< 0.01	<0.01	0.76	0.48 - 1.1
7,12-Diméthylbenzo (a) anthracène	mg/kg	< 0.02	<0.02	0.18	0.12 - 0.28
Benzo (e) pyrène	mg/kg	< 0.01	<0.01	0.21	0.12 - 0.28
Benzo (a) pyrène	mg/kg	< 0.01	<0.01	0.19	0.12 - 0.28
3-Méthylcholanthrène	mg/kg	< 0.01	<0.01	0.37	0.24 - 0.56
Indéno (1,2,3-cd) pyrène	mg/kg	< 0.01	<0.01	0.15	0.12 - 0.28
Dibenzo (a,h) anthracène	mg/kg	< 0.01	<0.01	0.17	0.12 - 0.28
7H-Dibenzo (c,g) carbazole	mg/kg	< 0.01	<0.01	0.19	0.12 - 0.28
Benzo (g,h,i) pérylène	mg/kg	< 0.01	<0.01	0.18	0.12 - 0.28
Dibenzo (a,l) pyrène	mg/kg	< 0.02	<0.02	0.18	0.12 - 0.28
Dibenzo (a,e) pyrène	mg/kg	< 0.02	<0.02	0.10	0.12 - 0.28
Dibenzo (a,i) pyrène	mg/kg	< 0.02	<0.02	0.24	0.24 - 0.56
Dibenzo (a,h) pyrène	mg/kg	< 0.02	<0.02	0.25	0.24 - 0.56
Hydrocarbures pétroliers (C10-C50)					
No Séquence: 201210					
Hydrocarbures pétroliers (C10-C50)	mg/kg	< 100	< 100	1400	1200 - 1800
Nickel					
No Séquence: 201348					
Nickel	mg/kg	< 2	<2	71	61 - 91

Commentaires CQ

LDR : Limite de détection rapportée

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Certificat d'analyse

Numéro de demande: 06-205087

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4017	4160-04 Port de Québec	M. Luc Carrier

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Plomb					
No Séquence: 201357					
Plomb	mg/kg	< 5	<5	91	71 - 110
Zinc					
No Séquence: 201358					
Zinc	mg/kg	< 5	<5	700	500 - 750

Commentaires CQ

LDR : Limite de détection rapportée

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Certificat d'analyse

Numéro de demande d'analyse: **07-207286**

Demande d'analyse reçue le: 2007-01-23

Date d'émission du certificat: 2007-01-31

Numéro de version du certificat: 1

☑ Certificat d'analyse officiel

☐ Certificat d'analyse préliminaire

Requérant

LABORATOIRE EXPERTISE DE QUEBEC

2320, DE CELLES
QUEBEC, Québec, Canada
G2C 1X8
Téléphone : (418) 845-0858
Télécopieur : (418) 845-0300

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Commentaires

REÇU Le
-7 FEV. 2007
Rép.....

Cette version remplace et annule toute version antérieure, le cas échéant.
NA : Information non-fournie et/ou non-applicable ND : Non-détecté

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Numéro de demande: 07-207286

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

	No Labo.	**977746**	**977747**	**977748**	**977749**
	Votre Référence	F-4 / 2-CF (0,23 à 0,43)	F-4 / 9-CF (7,31 à 7,91)	F-5 / 1-CF (0,19 à 0,79)	F-5 / 15-CF (12,39 à 12,99)
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
	Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23
Paramètre(s) Méthode Référence					
Arsenic	Préparation	2007-01-26	2007-01-26	2007-01-26	2007-01-26
QC050-02 / dig. acide, perte feu, génération hydrure par AA Résultat sur base sèche	Analyse	2007-01-26	2007-01-26	2007-01-26	2007-01-26
MENVIQ 90.02/204-As1.1	No. séquence	203444	203444	203444	203444
Arsenic	mg/kg	1.3	3.6	1.1	17
Cadmium	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203316	203316	203316	203316
Cadmium	mg/kg	<0.4	<0.4	<0.4	1.3
Carbone organique total	Préparation	2007-01-29	2007-01-29	2007-01-29	2007-01-29
Combustion LECO Analyse en sous-traitance	Analyse	2007-01-29	2007-01-29	2007-01-29	2007-01-29
	No. séquence	NA	NA	NA	NA
Carbone organique total	%C	0.22	0.58	0.13	8.68
Chrome	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203328	203328	203328	203328
Chrome	mg/kg	9	17	7	18
Cuivre	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203317	203317	203317	203317
Cuivre	mg/kg	10	9	6	150
Nickel	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203318	203318	203318	203318
Nickel	mg/kg	9	10	6	29

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Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

	No Labo.	**977746**	**977747**	**977748**	**977749**
	Votre Référence	F-4 / 2-CF (0,23 à 0,43)	F-4 / 9-CF (7,31 à 7,91)	F-5 / 1-CF (0,19 à 0,79)	F-5 / 15-CF (12,39 à 12,99)
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
	Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23
Paramètre(s) Méthode Référence					
Plomb	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203319	203319	203319	203319
Plomb	mg/kg	8	7	<5	400
Zinc	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203320	203320	203320	203320
Zinc	mg/kg	36	34	15	1600

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Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**977750**	**977751**	**977752**	**977753**
Votre Référence	F-6 / 2-CF (0,60 à 1,20)	F-6 / 10-CF (7,62 à 8,22)	F-7 / 2-CF (0,60 à 1,20)	F-7 / 18-CF (15,24 à 15,84)
Matrice	Sol	Sol	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23

Paramètre(s) / Méthode / Référence					
Arsenic	Préparation	2007-01-26	2007-01-26	2007-01-26	2007-01-26
QC050-02 / dig. acide, perte feu, génération hydrure par AA Résultat sur base sèche	Analyse	2007-01-26	2007-01-26	2007-01-26	2007-01-26
MENVIQ 90.02/204-As1.1	No. séquence	203444	203444	203444	203444
Arsenic	mg/kg	1.6	6.9	1.9	1.8
Cadmium	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203316	203316	203316	203316
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Carbone organique total	Préparation	2007-01-29	2007-01-29	2007-01-29	2007-01-29
Combustion LECO Analyse en sous-traitance	Analyse	2007-01-29	2007-01-29	2007-01-29	2007-01-29
	No. séquence	NA	NA	NA	NA
Carbone organique total	%C	0.18	0.08	2.45	0.03
Chrome	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203328	203328	203328	203328
Chrome	mg/kg	20	12	7	5
Cuivre	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203317	203317	203317	203317
Cuivre	mg/kg	66	8	16	5
Nickel	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203318	203318	203318	203318
Nickel	mg/kg	24	16	9	10

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Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

	No Labo.	**977750**	**977751**	**977752**	**977753**
	Votre Référence	F-6 / 2-CF (0,60 à 1,20)	F-6 / 10-CF (7,62 à 8,22)	F-7 / 2-CF (0,60 à 1,20)	F-7 / 18-CF (15,24 à 15,84)
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
	Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23
Paramètre(s) Méthode Référence					
Plomb	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203319	203319	203319	203319
Plomb	mg/kg	<5	<5	14	<5
Zinc	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC048-02 / digestion acide, dosage AA Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Digestion:MA200.Met.1.1,Dosage: SM3111B, D	No. séquence	203320	203320	203320	203320
Zinc	mg/kg	61	21	69	12

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Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

	No Labo.	**977746**	**977747**	**977748**	**977749**
	Votre Référence	F-4 / 2-CF (0,23 à 0,43)	F-4 / 9-CF (7,31 à 7,91)	F-5 / 1-CF (0,19 à 0,79)	F-5 / 15-CF (12,39 à 12,99)
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
	Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
	Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
	Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23
Paramètre(s) Méthode Référence					
Biphényles polychlorés (BPC)	Préparation	-	2007-01-29	2007-01-29	-
QC071-97 / ext. Acétone-hexane, dosage GC-ECD (Aroclor) Résultat sur base sèche	Analyse	-	2007-01-29	2007-01-29	-
MA 408 BPC 2.0	No. séquence	-	203547	203547	-
Aroclor 1242	mg/kg	-	< 0.1	< 0.1	-
Aroclor 1248	mg/kg	-	< 0.1	< 0.1	-
Aroclor 1254	mg/kg	-	< 0.1	< 0.1	-
Aroclor 1260	mg/kg	-	< 0.1	< 0.1	-
Total	mg/kg	-	ND	ND	-
Hydrocarbures aromatiques polycycliques (HAP)	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Extraction CH2Cl2, dosage GC-MS Résultat sur base sèche	Analyse	2007-01-26	2007-01-26	2007-01-26	2007-01-26
EPA3540, 8270	No. séquence	203361	203361	203361	203361
Naphtalène	mg/kg	<0.1	230	<0.1	1.3
1-Méthylnaphtalène	mg/kg	<0.1	35	<0.1	0.5
2-Méthylnaphtalène	mg/kg	<0.1	65	<0.1	0.6
1,3-Diméthylnaphtalène	mg/kg	<0.1	15	<0.1	0.4
Acénaphthylène	mg/kg	<0.1	3.2	<0.1	1.6
Acénaphtène	mg/kg	<0.1	60	<0.1	0.7
2,3,5-Triméthylnaphtalène	mg/kg	<0.1	2.7	<0.1	0.3
Fluorène	mg/kg	<0.1	71	<0.1	1.7
Phénanthrène	mg/kg	<0.1	190	<0.1	20
Anthracène	mg/kg	<0.1	80	<0.1	3.0
Fluoranthène	mg/kg	<0.1	82	<0.1	24
Pyrène	mg/kg	<0.1	55	<0.1	20
Benzo (c) phénanthrène	mg/kg	<0.1	3.5	<0.1	1.4
Benzo (a) anthracène	mg/kg	<0.1	23	<0.1	8.1
Chrysène	mg/kg	<0.1	24	<0.1	9.8
Benzo (b, j et k) fluoranthènes	mg/kg	<0.1	25	<0.1	12
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1	<2.0	<0.1	<0.1

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Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**977746**	**977747**	**977748**	**977749**
Votre Référence	F-4 / 2-CF (0,23 à 0,43)	F-4 / 9-CF (7,31 à 7,91)	F-5 / 1-CF (0,19 à 0,79)	F-5 / 15-CF (12,39 à 12,99)
Matrice	Sol	Sol	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23
Paramètre(s) Méthode Référence				
Benzo (e) pyrène	mg/kg	<0.1	8.3	<0.1	4.5
Benzo (a) pyrène	mg/kg	<0.1	12	<0.1	8.2
3-Méthylcholanthrène	mg/kg	<0.1	<2.0	<0.1	<0.1
Indéno (1,2,3-cd) pyrène	mg/kg	<0.1	6.7	<0.1	5.5
Dibenzo (a,h) anthracène	mg/kg	<0.1	<2.0	<0.1	1.3
Benzo (g,h,i) pérylène	mg/kg	<0.1	4.7	<0.1	4.1
Dibenzo (a,l) pyrène	mg/kg	<0.1	<2.0	<0.1	1.8
Dibenzo (a,e) pyrène	mg/kg	<0.1	<2.0	<0.1	0.8
Dibenzo (a,i) pyrène	mg/kg	<0.1	<2.0	<0.1	0.6
Dibenzo (a,h) pyrène	mg/kg	<0.1	<2.0	<0.1	0.2
Pourcentage de récupération					
Acénaphtène-d10	%	107%	dilue%	91%	98%
Fluoranthène-d10	%	111%	dilue%	99%	116%
Chrysène-d12	%	108%	dilue%	92%	111%
Hydrocarbures pétroliers (C10-C50)	Préparation	2007-01-24	2007-01-25	2007-01-24	2007-01-24
QC063-97 / extraction hexane, dosage GC-FID Résultat sur base sèche	Analyse	2007-01-24	2007-01-25	2007-01-24	2007-01-24
MA410-Hyd. 1.0	No. séquence	203152	203310	203152	203152
Hydrocarbures pétroliers (C10-C50)	mg/kg	120	<100	110	270

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Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**977750**	**977751**	**977752**	**977753**
Votre Référence	F-6 / 2-CF (0,60 à 1,20)	F-6 / 10-CF (7,62 à 8,22)	F-7 / 2-CF (0,60 à 1,20)	F-7 / 18-CF (15,24 à 15,84)
Matrice	Sol	Sol	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23

Paramètre(s) Méthode Référence					
Hydrocarbures aromatiques polycycliques (HAP)	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
Extraction CH2Cl2, dosage GC-MS Résultat sur base sèche	Analyse	2007-01-26	2007-01-26	2007-01-26	2007-01-26
EPA3540, 8270	No. séquence	203361	203361	203361	203361
Naphtalène	mg/kg	<0.1	<0.1	<0.1	<0.1
1-Méthylnaphtalène	mg/kg	<0.1	<0.1	<0.1	<0.1
2-Méthylnaphtalène	mg/kg	<0.1	0.1	<0.1	<0.1
1,3-Diméthylnaphtalène	mg/kg	<0.1	0.1	<0.1	<0.1
Acénaphthylène	mg/kg	<0.1	<0.1	<0.1	<0.1
Acénaphtène	mg/kg	<0.1	<0.1	<0.1	<0.1
2,3,5-Triméthylnaphtalène	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorène	mg/kg	<0.1	<0.1	<0.1	<0.1
Phénanthrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracène	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthène	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo (c) phénanthrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo (a) anthracène	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysène	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo (b, j et k) fluoranthènes	mg/kg	<0.1	<0.1	<0.1	<0.1
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1	<0.1	0.2	<0.1
Benzo (e) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo (a) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
3-Méthylcholanthrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Indéno (1,2,3-cd) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo (a,h) anthracène	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo (g,h,i) pérylène	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo (a,l) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo (a,e) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo (a,i) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1

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Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**977750**	**977751**	**977752**	**977753**
Votre Référence	F-6 / 2-CF (0,60 à 1,20)	F-6 / 10-CF (7,62 à 8,22)	F-7 / 2-CF (0,60 à 1,20)	F-7 / 18-CF (15,24 à 15,84)
Matrice	Sol	Sol	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	Port de Québec	Port de Québec	Port de Québec	Port de Québec
Prélevé le	2007-01-15	2007-01-15	2007-01-15	2007-01-15
Reçu Labo	2007-01-23	2007-01-23	2007-01-23	2007-01-23

Paramètre(s) Méthode Référence					
Dibenzo (a,h) pyrène	mg/kg	<0.1	<0.1	<0.1	<0.1
Pourcentage de récupération					
Acénaphtène-d10	%	94%	91%	113%	103%
Fluoranthène-d10	%	98%	103%	124%	106%
Chrysène-d12	%	96%	100%	119%	104%
Hydrocarbures pétroliers (C10-C50)	Préparation	2007-01-25	2007-01-25	2007-01-25	2007-01-25
QC063-97 / extraction hexane, dosage GC-FID Résultat sur base sèche	Analyse	2007-01-25	2007-01-25	2007-01-25	2007-01-25
MA410-Hyd. 1.0	No. séquence	203310	203310	203310	203310
Hydrocarbures pétroliers (C10-C50)	mg/kg	<100	<100	<100	<100

Commentaires:

977747 F-4 / 9-CF (7,31 à 7,91) Échantillon non homogéne (roches)

Note: Ces résultats et commentaires, le cas échéant, ne se rapportent qu'aux échantillons soumis pour l'analyse des paramètres ci-dessus mentionné

Geneviève Larose
Chimiste

CHIMISTE
Geneviève Larose
2002-128
QUÉBEC

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Certificat d'analyse

Numéro de demande: 07-207286

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Arsenic					
No Séquence: 203444					
Arsenic	mg/kg	< 0.5	<0.5	24	18 - 34
Biphényles polychlorés (BPC)					
No Séquence: 203547					
Aroclor 1242	mg/kg	< 0.1	< 0.1	0.9	0.7 - 1.3
Aroclor 1248	mg/kg	< 0.1	< 0.1	NA	NA
Aroclor 1254	mg/kg	< 0.1	< 0.1	0.9	0.7 - 1.3
Aroclor 1260	mg/kg	< 0.1	< 0.1	NA	NA
Total		NA	NA	1.8	1.4 - 2.6
Cadmium					
No Séquence: 203316					
Cadmium	mg/kg	< 0.4	<0.4	15	11 - 16.4
Chrome					
No Séquence: 203328					
Chrome	mg/kg	< 2	<2	53	38 - 58
Cuivre					
No Séquence: 203317					
Cuivre	mg/kg	< 1	<1	450	400 - 540
Hydrocarbures aromatiques polycycliques (HAP)					
No Séquence: 203361					
Naphtalène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
1-Méthylnaphtalène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
2-Méthylnaphtalène	mg/kg	< 0.1	<0.1	0.7	0.48 - 1.1
1,3-Diméthylnaphtalène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Acénaphthylène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
Acénaphtène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
2,3,5-Triméthylnaphtalène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
Fluorène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8

Commentaires CQ

LDR : Limite de détection rapportée

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Certificat d'analyse

Numéro de demande: 07-207286

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Phénanthrène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Anthracène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Fluoranthène	mg/kg	< 0.1	<0.1	1.3	0.8 - 1.8
Pyrène	mg/kg	< 0.1	<0.1	1.3	0.8 - 1.8
Benzo (c) phénanthrène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Benzo (a) anthracène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Chrysène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Benzo (b, j et k) fluoranthènes	mg/kg	< 0.1	<0.1	5.1	3.2 - 7.4
7,12-Diméthylbenzo (a) anthracène	mg/kg	< 0.1	<0.1	1.3	0.8 - 1.8
Benzo (e) pyrène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Benzo (a) pyrène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
3-Méthylcholanthrène	mg/kg	< 0.1	<0.1	2.3	1.6 - 3.7
Indéno (1,2,3-cd) pyrène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
Dibenzo (a,h) anthracène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
Benzo (g,h,i) pérylène	mg/kg	< 0.1	<0.1	1.2	0.8 - 1.8
Dibenzo (a,l) pyrène	mg/kg	< 0.1	<0.1	1.1	0.8 - 1.8
Dibenzo (a,e) pyrène	mg/kg	< 0.1	<0.1	1.0	0.8 - 1.8
Dibenzo (a,i) pyrène	mg/kg	< 0.1	<0.1	1.7	1.6 - 3.7
Dibenzo (a,h) pyrène	mg/kg	< 0.1	<0.1	1.7	1.6 - 3.7
Hydrocarbures pétroliers (C10-C50)					
No Séquence: 203152					
Hydrocarbures pétroliers (C10-C50)	mg/kg	< 100	<100	1400	1200 - 1800
Hydrocarbures pétroliers (C10-C50)					
No Séquence: 203310					
Hydrocarbures pétroliers (C10-C50)	mg/kg	< 100	<100	1400	1200 - 1800
Nickel					
No Séquence: 203318					
Nickel	mg/kg	< 2	<2	69	61 - 91
Plomb					
No Séquence: 203319					

Commentaires CQ

LDR : Limite de détection rapportée

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Certificat d'analyse

Numéro de demande: 07-207286

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Plomb	mg/kg	< 5	<5	87	71 - 110
Zinc					
No Séquence: 203320					
Zinc	mg/kg	< 5	<5	700	500 - 750

Commentaires CQ

LDR : Limite de détection rapportée

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Numéro de demande: 07-207286

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4020	4160-04 Port de Québec	MME CHATELAINE BEAUDRY

Résultats du Contrôle de Qualité (CQ) - 2e partie

Paramètres (No.Séquence)	Unité	Duplicata Valeur 1	Duplicata Valeur 2	Duplicata Écart (%)
Arsenic No Séquence: 203444 Arsenic	(No éch) mg/kg	1.8	(977753) 1.5	18.2
Cadmium No Séquence: 203316 Cadmium	(No éch) mg/kg	<0.4	(977753) <0.4	-
Chrome No Séquence: 203328 Chrome	(No éch) mg/kg	5	(977753) 6	18.2
Cuivre No Séquence: 203317 Cuivre	(No éch) mg/kg	5	(977753) 4	22.2
Nickel No Séquence: 203318 Nickel	(No éch) mg/kg	10	(977753) 6	50.0
Plomb No Séquence: 203319 Plomb	(No éch) mg/kg	<5	(977753) <5	-
Zinc No Séquence: 203320 Zinc	(No éch) mg/kg	12	(977753) 11	8.7

Commentaires CQ

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Certificat d'analyse

Numéro de demande d'analyse: **07-209740**

Demande d'analyse reçue le: 2007-02-19

Date d'émission du certificat: 2007-02-23

Numéro de version du certificat: 1

☑ Certificat d'analyse officiel

☐ Certificat d'analyse préliminaire

Requérant

LABORATOIRE EXPERTISE DE QUEBEC

2320, DE CELLES
QUEBEC, Québec, Canada
G2C 1X8
Téléphone : (418) 845-0858
Télécopieur : (418) 845-0300

Bon de commande	Votre Projet	Chargé de Projet
4058	4160-04 Réfection du quai 95	MME CHATELAINE BEAUDRY

Commentaires

Cette version remplace et annule toute version antérieure, le cas échéant.
NA : Information non-fournie et/ou non-applicable

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Numéro de demande: 07-209740

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4058	4160-04 Réfection du quai 95	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**987485**	**987486**
Votre Référence	F-4 6-CF	F-5 9-CF
Matrice	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	NA	NA
Prélevé le	2007-01-09	2007-01-09
Reçu Labo	2007-02-19	2007-02-19

Paramètre(s) Méthode Référence			
Hydrocarbures aromatiques polycycliques (HAP)	Préparation	2007-02-22	2007-02-22
Extraction CH2Cl2, dosage GC-MS Résultat sur base sèche	Analyse	2007-02-22	2007-02-22
EPA3540, 8270	No. séquence	206320	206320
Naphtalène	mg/kg	<0.1	<0.1
1-Méthylnaphtalène	mg/kg	<0.1	<0.1
2-Méthylnaphtalène	mg/kg	<0.1	<0.1
1,3-Diméthylnaphtalène	mg/kg	<0.1	<0.1
Acénaphthylène	mg/kg	<0.1	<0.1
Acénaphtène	mg/kg	<0.1	<0.1
2,3,5-Triméthylnaphtalène	mg/kg	<0.1	<0.1
Fluorène	mg/kg	<0.1	<0.1
Phénanthrène	mg/kg	<0.1	<0.1
Anthracène	mg/kg	<0.1	<0.1
Fluoranthène	mg/kg	<0.1	<0.1
Pyrène	mg/kg	<0.1	<0.1
Benzo (c) phénanthrène	mg/kg	<0.1	<0.1
Benzo (a) anthracène	mg/kg	<0.1	<0.1
Chrysène	mg/kg	<0.1	<0.1
Benzo (b, j et k) fluoranthènes	mg/kg	<0.1	<0.1
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1	<0.1
Benzo (e) pyrène	mg/kg	<0.1	<0.1
Benzo (a) pyrène	mg/kg	<0.1	<0.1
3-Méthylcholanthrène	mg/kg	<0.1	<0.1
Indéno (1,2,3-cd) pyrène	mg/kg	<0.1	<0.1
Dibenzo (a,h) anthracène	mg/kg	<0.1	<0.1
Benzo (g,h,i) pérylène	mg/kg	<0.1	<0.1
Dibenzo (a,l) pyrène	mg/kg	<0.1	<0.1
Dibenzo (a,e) pyrène	mg/kg	<0.1	<0.1
Dibenzo (a,i) pyrène	mg/kg	<0.1	<0.1

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Numéro de demande: 07-209740

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4058	4160-04 Réfection du quai 95	MME CHATELAINE BEAUDRY

Échantillon(s)

No Labo.	**987485**	**987486**
Votre Référence	F-4 6-CF	F-5 9-CF
Matrice	Sol	Sol
Prélevé par	M. Jean Blouin	M. Jean Blouin
Lieu de prélèvement	NA	NA
Prélevé le	2007-01-09	2007-01-09
Reçu Labo	2007-02-19	2007-02-19

Paramètre(s) Méthode Référence			
Dibenzo (a,h) pyrène	mg/kg	<0.1	<0.1
Pourcentage de récupération			
Acénaphtène-d10	%	122%	123%
Fluoranthène-d10	%	115%	117%
Chrysène-d12	%	103%	107%

Commentaires:

987485	F-4 6-CF	À la demande du client, l'analyse des HAP a été réalisée sur un échantillon dont le délai de conservation était dépassé.
987486	F-5 9-CF	À la demande du client, l'analyse des HAP a été réalisée sur un échantillon dont le délai de conservation était dépassé.

Note: Ces résultats et commentaires, le cas échéant, ne se rapportent qu'aux échantillons soumis pour l'analyse des paramètres ci-dessus mentionné

Geneviève Larose
Chimiste

CHIMISTE
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Certificat d'analyse

Numéro de demande: 07-209740

Client: **LABORATOIRE EXPERTISE DE QUEBEC**

Bon de commande	Votre Projet	Chargé de Projet
4058	4160-04 Réfection du quai 95	MME CHATELAINE BEAUDRY

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Hydrocarbures aromatiques polycycliques (HAP)					
No Séquence: 206320					
Naphtalène	mg/kg	< 0.1	<0.1	1.3	0.8 - 1.8
1-Méthylnaphtalène	mg/kg	< 0.1	<0.1	1.4	0.8 - 1.8
2-Méthylnaphtalène	mg/kg	< 0.1	<0.1	0.9	0.48 - 1.1
1,3-Diméthylnaphtalène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Acénaphthylène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Acénaphtène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
2,3,5-Triméthylnaphtalène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Fluorène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Phénanthrène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Anthracène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Fluoranthène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Pyrène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Benzo (c) phénanthrène	mg/kg	< 0.1	<0.1	1.4	0.8 - 1.8
Benzo (a) anthracène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Chrysène	mg/kg	< 0.1	<0.1	1.6	0.8 - 1.8
Benzo (b, j et k) fluoranthènes	mg/kg	< 0.1	<0.1	5.6	3.2 - 7.4
7,12-Diméthylbenzo (a) anthracène	mg/kg	< 0.1	<0.1	1.4	0.8 - 1.8
Benzo (e) pyrène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Benzo (a) pyrène	mg/kg	< 0.1	<0.1	1.4	0.8 - 1.8
3-Méthylcholanthrène	mg/kg	< 0.1	<0.1	2.9	1.6 - 3.7
Indéno (1,2,3-cd) pyrène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Dibenzo (a,h) anthracène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Benzo (g,h,i) pérylène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Dibenzo (a,l) pyrène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Dibenzo (a,e) pyrène	mg/kg	< 0.1	<0.1	1.5	0.8 - 1.8
Dibenzo (a,i) pyrène	mg/kg	< 0.1	<0.1	3.0	1.6 - 3.7
Dibenzo (a,h) pyrène	mg/kg	< 0.1	<0.1	2.7	1.6 - 3.7

Commentaires CQ

LDR : Limite de détection rapportée

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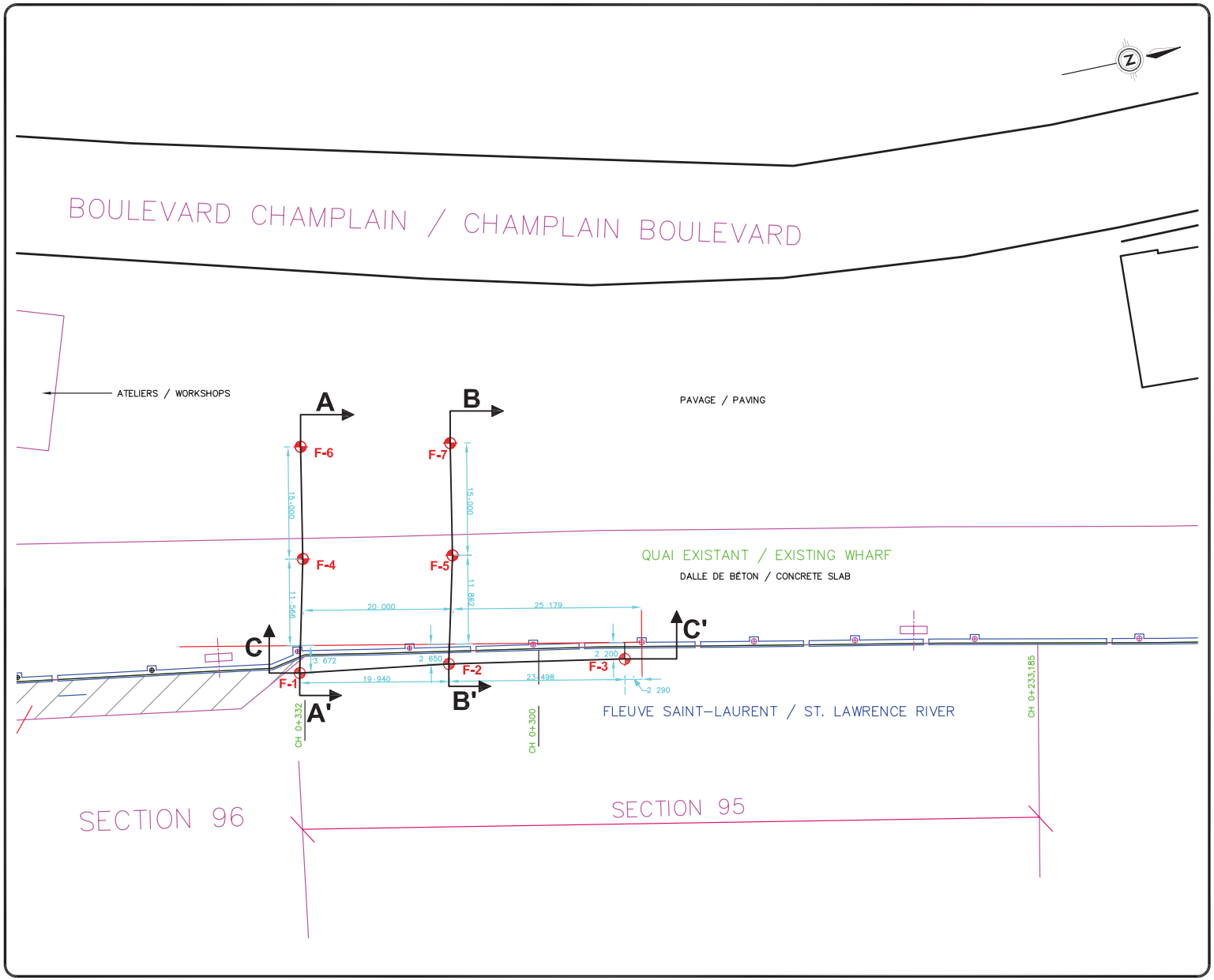
APPENDIX D

Location of Boreholes
and
Stratigraphic Sections

Drawings 4160-04-01 and 02



Légende:

F-1 Forage / Borehole

A / A' Coupe / Cross section

Préparé pour:

Travaux publics et Services gouvernementaux Canada
Public Works and Government Services Canada

Préparé par:

LEQ LABORATOIRES D'EXPERTISES DE QUÉBEC LTÉE
Géotechnique, hydrogéologie et ingénierie des sols et matériaux

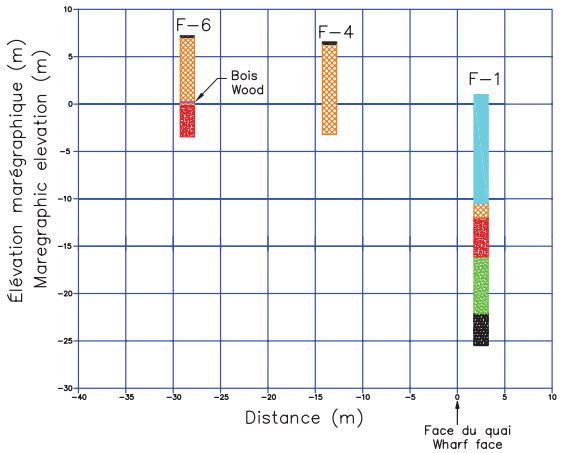
Titre du projet:

Étude géotechnique
Quai de la Reine - Section #95
Base de la Garde côtière canadienne
Reconstruction de la zone 0+300 à 0+332

Titre du dessin:

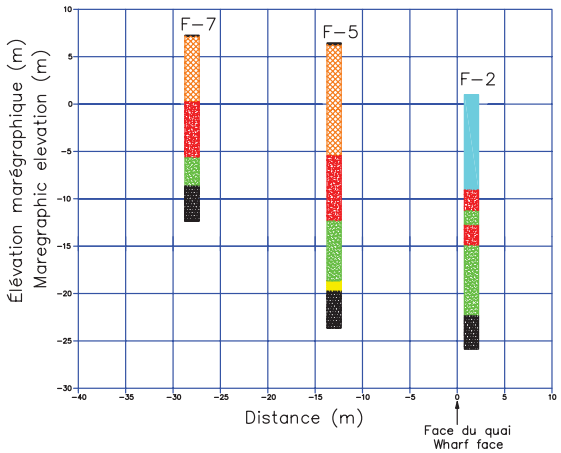
Localisation des forages
Boreholes location

Dessin / Draftsman: D.S.	Échelle / Scale: 1:500	Projet # / Project #: 4160-04
Vérifié / Checked: L.C.	Date: Février 2007 / February 2007	Dessin # / Drawing #: 4160-04-01



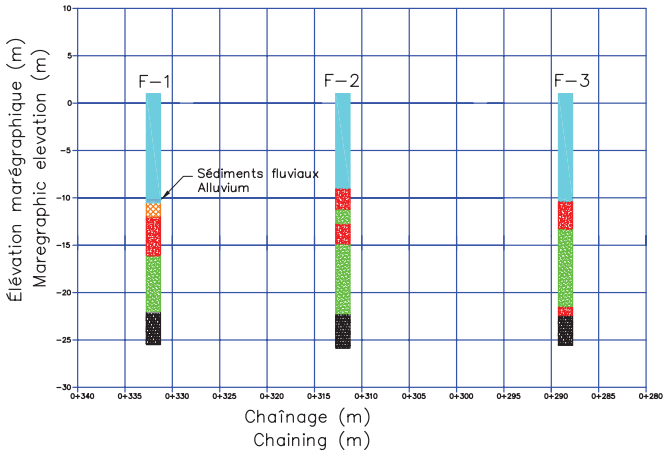
COUPE A-A'

Cross section



COUPE B-B'

Cross section



COUPE C-C'

Cross section

Légende:

- Béton bitumineux ou béton de ciment / Asphalt or concrete slab
- Eau (Fleuve Stain-Laurent) / Water (St. Lawrence River)
- Remblai/ Fill
- Sédiments fluviaux / Alluvium
- Sable et gravier / Sand and gravel
- Sable / Sand
- Cailloux et gravier / Cobbles and gravel
- Roc / Bedrock
- Bois / Wood

Préparé pour:

Travaux publics et Services gouvernementaux Canada
Public Works and Government Services Canada

Préparé par:

LEQ LABORATOIRES D'EXPERTISES DE QUÉBEC LTÉE
Géotechnique, hydrogéologie et ingénierie des sols et matériaux

Titre du projet:

Étude géotechnique
Quai de la Reine - Section #95
Base de la Garde côtière canadienne
Reconstruction de la zone 0+300 à 0+332

Titre du dessin:

Coupes stratigraphiques
Stratigraphic cross section
A-A', B-B' et/and C-C'

Dessin / Draftsman: J.P.	Échelle / Scale: 1:500	Projet # / Project #: 4160-04
Vérifié / Checked: L.C.	Date: Mars 2007 / March 2007	Dessin # / Drawing #: 4160-04-02

APPENDIX E

Photographs

Photo 1°: Cantilever platform installation at borehole F-3.

Photo 2°: Drill installation at borehole F-3.

Photo 3°: General view at borehole F-1.

Photo 4°: General view at borehole F-5.

Photo 5°: General view at borehole F-7.

ROCK CORE SAMPLES

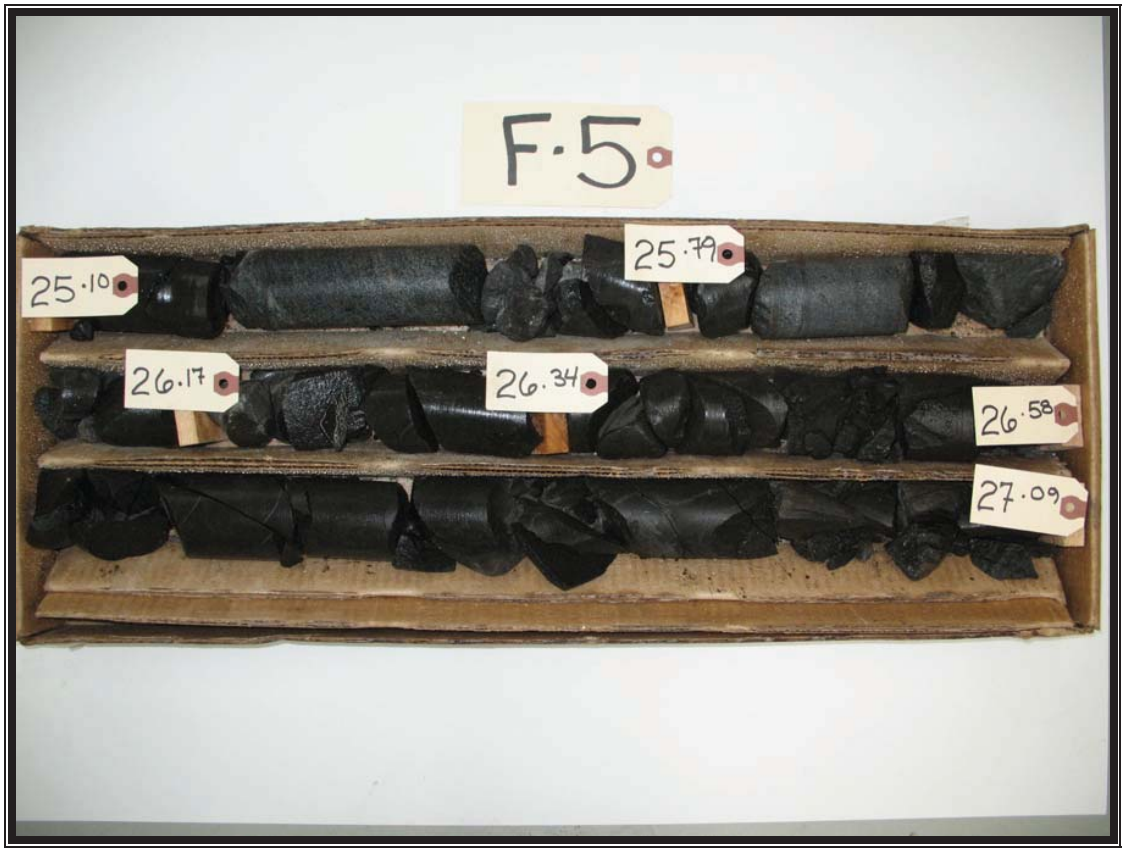

F·1
29.13
29.27
30.20
30.61
31.39


F·1
31.39
32.43


F·2
29.38
30·06
31·30
31.65


F·2
31.65
32.83


F·3
29.81
30·30
31·00
32.52


F·5
25·10
25·79
26·17
26·34
26·58
27·09


F·5
27.09
27.63
28.33
29.08


F·5
29.08
29.48
30.08


F-7
15.97
16.52
16.96
17.45
17.82
18.07


F-7
18.07
18.34
18.96
19.64

APPENDIX F - DRAWINGS

The drawings will be posted on buyandsell.gc.ca shortly.