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

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Regional Manager/Real Property Contracting/PWGSC
Ontario Region, Tendering Office
12th Floor, 4900 Yonge Street
Toronto, Ontario
M2N 6A6
Ontario

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
Kingston Mills Locks 46 to 49 Rehab

Solicitation No. - N° de l'invitation	**Date**
EQ754-171827/A	2016-12-07

Client Reference No. - N° de référence du client
R.079796.006

GETS Reference No. - N° de référence de SEAG
PW-$PWL-046-2254

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
PWL-6-39137 (046)	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2017-01-17

Time Zone
Fuseau horaire
Eastern Standard Time
EST

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

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Schmidt, Jeff	pwl046

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(905) 615-2058 ( )	(905) 615-2060

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
Kingston Mills Lockstation
Rideau Canal, Southern Sector
563 Kingston Mills Road
Kingston, ON
X1X 1X1

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**

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
Regional Manager/Real Property Contracting/PWGSC
Ontario Region, Tendering Office
12th Floor, 4900 Yonge Street
Toronto, Ontario
M2N 6A6
Ontario

Canada

REQUEST FOR PROPOSAL (RFP)

TABLE OF CONTENTS

The following is intended to clarify the general structure of the whole document.

SUPPLEMENTARY INSTRUCTIONS TO PROPONENTS (SI)

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 requirement and the anticipated limited number of response by the industry leads PWGSC to believe that this approach will not unduly force a large number of firms to expend an overall unreasonable amount of effort in response to PWGSC.

3. Proponents responding to this RFP are requested to submit a full and complete proposal. The proposal will cover not only the qualifications, expertise, availability, 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);

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

   (c) Project Brief;

(d) the document entitled "Doing Business with Public Works and Government Services Canada";

(e) the document entitled "Heritage Canals and Engineering Works CADD Standard" (Appendix E)

(f) selected existing photos, drawings and reports (Appendix F)

(g) the document entitled "Team Identification Format"

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

(i) 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 OPTIONAL SITE VISIT

Arrangements have been made for a tour of one of the work Sites. The site visit will be held on Monday, December 19, 2016 at 1:30 p.m. at Kingston Mills, Rideau Canal, 563 Kingston Mills Road, Kingston, Ontario, K0G 1E0.

The site is currently under construction and proponents must wear Personal Protective Equipment (PPE) including helmet, safety boots, vest and glasses to access the site.

Proponents are requested to communicate with the Contracting Authority named on the RFP - Page 1 two (2) business days before the scheduled visit to confirm attendance and provide the name(s) of the person(s) who will attend. Proponents may be requested to sign an attendance form.

Proponents who do not attend or send a representative will not be given an alternative appointment. Proponents who do not attend will not be precluded from submitting a proposal. Any clarifications or changes to the solicitation resulting from the site visit will be included as an amendment to the solicitation.

SI4 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 ten (10) 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.

SI5 CANADA'S TRADE AGREEMENTS

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

SI6 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.

SI7 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

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

Contracts Canada
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
   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
   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
   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;
(d) the document entitled "Doing Business with Public Works and Government Services Canada";
(e) the document entitled "Heritage Canals and Engineering Works CADD Standards";
(f) the completed "Team Identification" document;
(g) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
(h) 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;
(h) the document entitled "Doing Business with Public Works and Government Services Canada";
(i) the proposal.

SUPPLEMENTARY CONDITIONS (SC)

SC1 SECURITY REQUIREMENT

There is no security requirement applicable to this Agreement.

SC2 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.

PROJECT BRIEF (PB)

Project Requirements (PR)

- **PR 1 Project Information**
- **PR 2 Project Identification and Background**
- **PR 3 Project Objectives**
- **PR 4 Scope of Work**
- **PR 5 Project Constraints**
- **PR 6 Existing Documentation**

Project Administration (PA)

- **PA 1 General Project Administration**
- **PA 2 Project Team**
- **PA 3 Submissions to Authorities Having Jurisdiction**
- **PA 4 Invoicing and Payments**

Required Services (RS)

- **RS 1 Management of Consulting Services**
- **RS 2 Analysis of Project Scope of Work**
- **RS 3 Estimating and Cost Planning**
- **RS 4 Risk Management**
- **RS 5 Quality Management**
- **RS 6 Investigations, Studies and Reports**
- **RS 7 Design Concept**
- **RS 8 Design Development**
- **RS 9 Construction Documents**
- **RS 10 Tender Call, Bid Evaluation & Construction Contract Award**
- **RS 11 Construction and Contract Administration**
- **RS 12 Resident Site Services During Construction**
- **RS 13 Post Construction Services**

PROJECT REQUIREMENTS (PR)

PROJECT REQUIREMENTS

Public Works and Government Services Canada (PWGSC) intends to engage an engineering consulting firm for the provision of services required for this project.

PR 1 PROJECT INFORMATION

1.1	**PWGSC Project Title:**	**Kingston Mills Locks 46 to 49 Rehabilitation**
1.2	**Location of the Projects:**	**Kingston Mills Lockstation Rideau Canal, Southern Sector 563 Kingston Mills Road Kingston, Ontario.**
1.3	**PWGSC Project Numbers:**	**R.079796.001**
1.4	**PWGSC Project Team:**	**Pierre Grambart, Project Manager Luc Beriault, Program Manager**
1.5	**Client Department:**	**Parks Canada Agency (PCA), Ontario Waterways Unit, Rideau Canal**
1.6	**Client Project Numbers:**	**1377**

PR 2 PROJECT IDENTIFICATION AND BACKGROUND

2.1 Overview

1. PWGSC will engage the services of an engineering consulting firm to undertake the rehabilitation of the locks and associated structures at the Kingston Mills Locks 46 to 49 located on the Rideau Canal. The design project is to be undertaken in two phases: Year One; and combined Year Two and Three tender packages.

2.2 Client Department

1. The Client Department is the Rideau Canal, Ontario Waterways Unit of the Parks Canada Agency (PCA).
2. The Rideau Canal meanders 202 kilometers along Eastern Ontario and consists of many locks, bridges and dams.

3. The Rideau Canal is designated as a National Historic Site and has been designated as a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site.

4. Additional information can be found online at: http://www.pc.gc.ca/eng/lhn-nhs/on/rideau/index.aspx

2.3 Project Objectives

1. General Objective

.1 The primary objective is a masonry rehabilitation of the Kingston Mills Locks following the *Standards and Guidelines for the Conservation of Historic Places in Canada* to improve the condition of Locks 46 and 47 that are both rated poor (C); Lock 48 and Lock 49 that are both rated fair (B) to good (A) condition while protecting their heritage values and character-defining elements to the extent possible and promoting visitor experience. The rehabilitation to include site components such as: Lock gates; sluice tunnels; airvent shafts and mechanical components. Also included in the repairs are: stairways; railings; ladders; mooring cables; masonry sidewalks and basin walls downstream of Lock 46. Pedestrian safety railing repair or replacement requirements to be developed in conjunction with Cultural Resource Management policies and safety considerations.

2. Lock 46

.1 Project specific components include: wing walls, coffer dam, monoliths, upstream and downstream sills, upstream breastwall, lock floor and chamber walls.

3. Lock 47

.1 Project specific components include: approach walls, monoliths, upstream sill and breastwall, lock floor and chamber walls.

4. Lock 48

.1 Project specific components include: monoliths, upstream sill and breastwall, lock floor and chamber walls.

5. Lock 49

.1 Project specific components include: monoliths, upstream and downstream sills, upstream breastwall, lock floor and chamber walls, wing walls, and coffer dam.

2.4 Construction Cost

1. The Client funding allocations, inclusive of HST, are:

.1 YEAR 1 - $2.25 Million
.2 YEAR 2 - $2.75 Million
.3 YEAR 3 – $5.0 Million

2. These figures include all project related costs such as: PWGSC Project Management and Engineering fees; administration costs; Consultant fees and Class D Construction costs.

2.5 Project Schedule

1. The project schedule is based on preliminary project information and is to be reviewed and updated as the project is developed.
2. Early milestones for investigations and concept design are important to maintain project momentum.
3. Dates are for final reports or deliverables, the Consultant is to schedule delivery of draft reports/deliverables and progress reports sufficiently in advance to allow for review and update.
4. Milestones are of additional importance to coordinate with the cultural resource management components of the project.
5. Tender ready Construction Documents for Year One works required by August 7, 2017 at the latest.
6. Latest allowable Year One Construction Contract Award Date is September 27, 2017.
7. Tender ready Construction Documents for Year Two and Three works required by May 1, 2018 at the latest.
8. Substantial completion date for construction for entire site to be no later than April 30, 2020.
9. Post Construction Services continue until at least May 2021, at which time Consulting project will end.

10. Project Schedule:

Milestone	Date
Start Date	Baseline
Designated Substance and Hazardous Materials Report	prior to on-site
Health and Safety Plan	prior to on-site
Completion date for substantial site work	March 2017
Submit Draft Reports	April 2017
Submit Final Reports	May 2017
Tender Ready Year One Construction Documents	August 7 2017
Construction Year One Tender Documents posted on BuyandSell.gc.ca	Sept 2017
Year One Construction Contract Award	Oct 2017
Tender Ready Year Two and Three Construction Documents	May 1 2018

Construction Year Two and Three Tender Documents posted on BuyandSell	July 2018
Year Two and Three Construction Contract Award	Sept 2018
Contract Administration and Site Supervision	Nov 2017 – April 2020
Certificate of Substantial Completion (SC)	April 2020
Review End of Construction Doc. Report (SC + 2 months)	June 2020
Record Drawings (SC + 3 months)	July 2020
Initial Warranty Inspection Report (SC + 10 months)	Feb 2020
Final Warranty Inspection Report (SC +12 months)	April 2021
Contract End	May 2021

2.6 Background Information

Parks Canada is mandated to protect significant examples of Canada's cultural heritage so that they can be enjoyed by present and future generations. As of March 2015, there were 959 designated National Historic Sites of Canada. Parks Canada directly administers 167 of these, including nine historic canals. The National Historic Sites Conservation Program reflects Parks Canada's mandate to ensure the commemorative integrity of national historic sites on Parks Canada lands. A national historic site possesses commemorative integrity when:

- the resources directly related to the reasons for designation as a national historic site are not impaired or under threat;
- the reasons for designation as a national historic site are effectively communicated to the public;
- the site's heritage values (including those not related to the reasons for designation as a national historic site) are respected in all decisions and actions affecting the site.

Understanding and managing the condition of these cultural resources is critical to their protection. Parks Canada considers the Standards and Guidelines for the Conservation of Historic Places in Canada, version 2 (2010) as its primary source of heritage conservation guidance for all work on the Rideau Canal, be it for maintenance, or interventions such as preservation, rehabilitation and restoration. These guidelines address four types of resources (i.e., cultural landscapes, archaeological sites, buildings and engineering works) and materials. As of May 2016, an electronic version of the Standards and Guidelines for the Conservation of Historic Places in Canada, version 2 (2010) can be found at: www.historicplaces.ca

1. General

.1 The Kingston Mills Lock site is located approximately 5 km north of Lake Ontario within the City of Kingston, Ontario on the Cataraqui River. The site can be accessed off Frontenac County Road 21

about 2 km west of Highway No. 15. County Road 21 intersects Highway 15 about 1 km north of Highway 401.

.2 A brief summary of the current condition of the assets includes:

1) The flight locks are mainly the original stone with surface concrete patch repairs.
2) Lock 46 is a mixture of original stone with concrete replacement blocks at the lower gate wingwalls. Deteriorated concrete and stones have been have been repaired with concrete refacing.

.3 Construction of the locks began in 1827 and was completed in 1832. Locks 46 to 49 were built by Colonel By with the difference of water level of 14.8 meters between the upstream Colonel By Lake and downstream Cataraqui River. The locks are historic examples of masonry work arranged as a group of three (Locks 47 to 49 – flight locks) with the fourth (Lock 46) upstream lock separated from the chain of three locks by a large turning basin. Lock 46 is located immediately below the swing bridge. The locks are owned and operated by Parks Canada Agency.

.4 The Kingston Mills Locks (Locks 46-49) were constructed in a side channel west of the main channel of the river. The upper lock is attached to the south end of the stone arch dam. The large turning basin used for steamship repair still exists below the first lock. The lower three locks are constructed in flight, descending the river gorge over a series of rocky terraces with the lowest lock terminating at the level of Lake Ontario.

.5 The Kingston Mills Lockstation landscape and locks are cultural resources of national historic significance (NS) that are fundamental resources of the Canal system and integral to the Rideau's unique historical environment.

.6 The bedrock is indicated to be at a depth of 27 meters below the lower sill of Lock 49. The sill itself is underlain by a silty clay fill with some boulders on top. The sill between locks 49 and 48; however, appears to be underlain directly by the bedrock. Visual observation also showed that the floor of Lock 48 is also bottomed on bedrock (Golder 1979).

.7 Boreholes drilled through the walls of Lock No. 47 indicate that the wall is founded on gneissic syenite, alternating ribbons of alkali feldspar and chlorite, brick red locally jointed and oriented 60^0 degrees to core axis with poor to good quality. The monolith between Lock Nos. 47 and 48 is founded on metadiabase bedrock, dark green, fine to medium weathered, minor vugs, moderately soft to hard with very poor to good quality (Trow 1990).

.8 The locks are gravity structures equipped with manual upper gates and lower gates.

.9 The flight lock chambers, monoliths and wing walls were originally constructed of large limestone masonry blocks.

.10 Due to an original surveying error the lift of the flight locks had to be increased to a lift of 11'-8" with 7'-8" of water on the upper sill.

.11 In general the problems noted in 1990 with all three flight locks included: extensive re-pointing is needed in all three locks, and the stones on the top of the east lock chamber walls and monoliths have settled unevenly. (Trow 1990)

.12 The repairs that occurred prior to 1990 included:

1) In 1972 Lock 47 and Lock 48 were pressure grouted.
2) In 1979 pressure grouting of the east chamber walls of Lock 47 and Lock 48 and all four gate sills in the flight locks were performed.
3) In 1960 a portion of the west wall of Lock 48 was dismantled and the adjacent railway bridge pier was stabilized by grouting a void under the footings. The opening in the lock wall was filled with concrete.

.13 The grouting investigation performed in 1990 recommended a rehabilitation program that was a combination of repointing materials and techniques, together with the selection and application of cementitious and chemical grouts is required to achieve the cured materials cutting off migration paths through the entire structure. The application of repointing materials is interdependent with the application of grouting materials. (Trow 1990)

.14 In 1994/95 repairs to Locks 46, 47, 48 and 49 included:

1) Pressure grouting with cementitious grout and anchoring the existing stone masonry structures
2) Repointing the stone masonry
3) Dismantling and resetting portions of the breast wall coping of Locks 47 and 48
4) Construction of dry stone walls
5) Refacing of concrete
6) Rip-rap
7) Note that chemical grouting was not used

.15 During the 1994/95 repairs a research testing program on pressure grouting of Locks 47, 48 and 49 was undertaken. The main findings of the ECO 1995 report included:

1) The grout-filling ratios were 300% lower than the estimated as a result of the difficult in-situ conditions and low amenability of the cement based grout formulations used, leading to a less than satisfactory outcome. Presently some locations in the locks are already leaking. The project only partly achieved its goals.

2) The 1994-95 rehabilitation of Locks 47, 48 and 49 was the fourth documented grouting/rehabilitation operation to be executed on these locks during the last 15 years; the other operations took place in 1979-80, 1989 and 1992-93.
3) In 1979-80 a rehabilitation project involved the grouting of the east lock chamber walls of locks no. 47, 48 and 49 including all four sills. The total grout volume injected on this project was documented at being 4 (four) cubic meters.
4) In 1989 a test grouting program work involved both horizontal and vertical grout holes (20 horizontal holes and 6 vertical holes). The work focused on Lock No. 47 and No. 48. No work was done in Lock No. 49 and on any of the Sills. The grouting work was limited to Monoliths No. 3, 4, 5 and 6 as well as the east and west chamber walls of Locks No. 47 and 48. The total grout volume injected during the 1989 investigation program was 9 cubic meters.
5) In 1992-93, a maintenance project covering the east wall of Lock 47 (including a small zone in the upstream end of the west wall) and Monoliths No. 6, No. 7 and No. 8 was implemented. The overall total grout volumes injected were approximately 15 cubic metres.
6) The 1994-95 rehabilitation project was large in scope and perhaps because of its overall size, it was more technically challenging than the previous ones. The grouting works focused on the following structures:
   a) Monoliths No.'s 1,2,3,4,5,6,7 and 8
   b) Sill between Monolith's No. 1 and 2 (designated as Sill No. 1)
   c) Sill between Monolith's No. 3 and 4 (designated as Sill No. 2)
   d) Sill between Monolith's No. 5 and 6 (designated as Sill No. 3)
   e) Sill between Monolith's No. 7 and 8 (designated as Sill No. 4)
   f) East and West Lock Chamber Walls of Lock No. 47
   g) East and West Lock Chamber Walls of Lock No. 48
   h) East and West Lock Chamber Walls of Lock No. 49
   i) Wingwalls south of Monolith No.'s 1 and 2
7) The installation of vertical and horizontal anchors followed the grouting operations. Vertical anchors (either the Conventional Williams type anchor or Membrane anchors) were drilled and installed at the locations of the grouted holes.

8) The major problem encountered with the Sill grouting operations was grout leakage along mortar joints, the sluice recesses, and the Lock floor/gate sill interface.
9) The absolute grout filling ratio of the 6 chamber walls was 2.52%. The individual filling rations for each wall ranged from a low of 0.56% to 4.10%. These numbers are in a sharp contrast with the 7.5% - 10% filling ratio as obtained in the Kingston Mills Locks test grouting program in 1989.
10) The absolute filling ratios for the eight monolith structures was 1.05%. Based on the results of the 1989 pilot grouting program on Locks 47 and 48, the above takes are low. The degree of improvement to the structural integrity of the monoliths as a result of the pressured grouting program is debatable.
11) The absolute filling ratio of the wingwalls was 1.06%. The low takes, and hence low filling ratio of the wingwall south of Monolith No. 1 is likely due to the similar site conditions found on the west wall of Lock No. 49. The holes were "buried" in mud making the borehole preparation an almost impossible task.
12) It was observed during the removal of several coping stones in need of replacement (east chamber wall of Lock No. 48 – downstream portion, Monolith No. 4 and Monolith No. 6) that there was an abundance of ungroutable debris including clayey silts, organics (black top soil) and plant and tree roots.
13) Furthermore, throughout the grouting operations, it was observed time after time, that a preferential travel path for the grout was to the surface. Even when grouting the lower zones of a borehole, grout travel was more often than not observed to make its way to the surface, before showing up else-where.

.16 There was a basin wall project in 2001/02 where the works included:
1) Reconstructing a section of the wall
2) Refacing a section of the wall
3) Executing concrete patching repairs
4) Reinstating sodded areas and repairing damaged path-ways

.17 Water levels downstream of Lock 49 are controlled by Lake Ontario water levels. The gradient in the Cataraqui River from the lake to Kingston Mills flows in the river.

.18 The record high Lake Ontario level is 75.75 meters in 1952. The record low water level in Lake Ontario is 73.75 meters in 1934.

.19 The Rideau Canal has no control over the water levels downstream of Lock 49.

.20 During the navigation season an acceptable operating range upstream of Lock 46 is 88.57 meters to 88.70 meters.

.21 During the non-navigation season an acceptable operating range upstream of Lock 46 is 88.32 meters to 88.70 meters.

.22 The long reach above Lock 46 (and the short reach between Lock 46 and Lock 47) must be maintained at navigation levels until mid-October. Water levels will be drawn down to non-navigation levels in the first week of November. Non-navigation water levels fluctuate depending upon the precipitation inflow.

.23 After the long reach has been lowered, stoplogs are placed in the gains above the Lock 46 by the Rideau Canal.

.24 The short reach between Lock 46 and Lock 47 is then drained, as are Locks 47 and 48. The water level in Lock 49 depends on the lake level and fluctuates naturally.

.25 The water in the basin can only be lowered to the level of the outlet valve sill. Water will remain in certain places in the basin even after the basin is drained.

2. Lock 46

.1 The dimensions that are available for Lock 46 are approximate: chamber length 22.2 m; chamber wall height 5.8 m; chamber wall height 6.6 m and the top of wall width varies from 0.985m to 1.12 m (2007 repair project).

.2 The Kingston Mills lock 46 is a cultural resource of national historic significance (NS) and a fundamental resource of the Canal system and integral to the Rideau's unique historical environment.

.3 The original limestone masonry of Lock 46 was repaired with plain unreinforced concrete blocks laid to imitate masonry at the upper and lower monoliths and lower wingwalls (exact date unknown). The condition of the concrete was poor in 2005 with an extensively fractured surface layer; no air-entrainment; and subject to Alkali-Aggregate Reaction (AAR). Some of the concrete was refaced in 1995 and coping repairs at the downstream wingwalls was completed in 1998. There was a grouting repair project in 1995 for the flight locks but Lock 46 was not included in this scope of work.

.4 Lock 46 concrete blocks consist of coarse aggregates mainly a mixture of Potsdam sandstone; dolostone and biotite hornblende granite. The fine aggregate; natural sand; contains mono-mineralic particles of quartz and feldspar and assorted rock fragments. The same rock types were observed in the fine aggregate. The cement paste was dense and un-carbonated; not air-entrained but contains some entrapped air.

.5 Material testing of the original stone fabric was performed on a stone with an area where some of the face had spalled off. The stone was found to be 400 mm thick and backed with rubble. The RQD value of the recovered core was only 47% that reflects a "poor quality" rock containing a large number of fractures. The compressive strength of the limestone was 75.7 MPa. Testing from 1990 indicated that the compressive strength of the masonry stone varies from 56.4 to 176.8 MPa with the average compressive strength being 129.8 MPa for properties of the intact stone.

.6 The east side of Lock 46 wall and the swing bridge concrete abutment are in close proximity and rehabilitation of both structures are interrelated. The main factor that has led to the present (1976 bulging of wall) situation on the east side of the lock is a lack of adequate attachment of the concrete abutment to sound bedrock. The backfill behind the abutment appears to consist in part of rock fill too coarse to auger. The surface of the rock dips to the north-west and is in the order of 7 feet deep at the south wing wall (lower right) and 11 feet deep at the north wing wall (upper right). The bedrock is slightly weathered in the surface 1-1/2 to 2 feet but is sound and massive below this level.

.7 Cores taken for the Swing Bridge from the east abutment (north side) near Lock 46 wall indicated that the syenite blocks recovered in the coring were without any bond with the cement paste (1999 Quantacon Associates).

.8 The Lock 46 project in 2007/08 included the following works:

1) Concrete removal
2) Stone removal
3) Cast-in-place concrete
4) Anchors installed after concrete excavation of gate quoin (at Monolith M6) and spider then post-tensioned prior to concrete placement
5) Anchors for refacing of monoliths and coping
6) One gate quoin removal and replacement with cast in place concrete

3. Lock 47

.1 At Lock 47 the stone masonry thickness varies from 3.0 m to 3.8 m at the east wall, 1.94 m to 3.02 m at the west wall, 3.8 m to 4.0 m at the east monolith and from 2.3 m to 3.9 m at the west monolith. Behind the west wall and the monolith, silty clay fill was encountered in the boreholes drilled in the upper to mid height of the locks and gneissic syenite bedrock in the boreholes drilled close to the floor of the lock. Silty clay fill was also encountered in

the boreholes drilled through the east wall and monolith close to the floor of the lock. (Trow 1990)

.2 At Lock 47 the height of the masonry wall varied from 5.7 m to 5.9 m whereas the monoliths are approximately 7.4 m high. (Trow 1990)

.3 The Kingston Mills lock 47 is a cultural resource of national historic significance (NS) and a fundamental resource of the Canal system and integral to the Rideau's unique historical environment.

.4 Problems noted in 1990 with Lock 47 included: extensive leakage occurs through the east wall when the lock chamber is full and wet areas appear on the ground surface adjacent to the west wall. The lower monoliths walls, upstream of the gate recess, show significant movement of individual stones. The lower monoliths walls upstream and downstream of the gate recess show bulging and leaning of up to 165 mm.

4. Lock 48

.1 The west wall of Lock 48 is approximately 2 m wide whereas the east wall of the lock is 3.0 m to 3.6 m wide. The west monolith between Lock 48 and Lock 49 is 3.9 m wide whereas the east monolith is approximately 3.7 m wide. The west wall and monolith are constructed against bedrock face whereas silty clay was encountered behind the east wall and monolith close to the floor of the lock. The height of the masonry varies from 4.4 m for the west wall to 7 m for the east wall. (Trow 1990)

.2 The Kingston Mills lock 48 is a cultural resource of national historic significance (NS) and a fundamental resource of the Canal system and integral to the Rideau's unique historical environment.

.3 Problems noted in 1990 with Lock 48 included: leakage occurs through the east wall and through the east sluices. The lower monoliths walls are bulging and leaning by up to 160 mm.

.4 A recommendation from the 1990 Trow report included:

1) After grouting program it will be required to drill drain holes to monitor and remove any water building up behind the rehabilitated wall. It is required to grout the west wall of Lock 48, following the normal procedures but to install a number of drain holes extending well into the fractured rock behind the wall. These holes should be near the floor of the lock to prevent damage to boats. A drain pipe should be sealed inside the hole in the lock structure equipped with a simple one way valve system to allow the water to drain from the rock formation into the lock during the winter. This drainage system is required to prevent further deformation of this wall due to freezing.

2) In the west wall, in Lock 48, it might be required to inject one component hydrophobic water reactive prepolymers at the interface between the rock and the wall. A short set time is to be selected. The test program indicated easy travel of stable cementitious grout along the interface and through the lock wall. These travel paths have to be cut-off with fast setting prepolymer grout to prevent movement of the structure during the regular grouting program with cementitious grout. The cement grout has to be water repellant and buffered against dilution to prevent the formation of bleed pockets or channels.

5. Lock 49

.1 The exterior dimensions for Lock 49 can be approximated from the last detailed inspection report available for the flight locks completed during Heritage Recording Site Plans of 1991.

.2 The Kingston Mills lock 49 is a cultural resource of national historic significance (NS) and a fundamental resource of the Canal system and integral to the Rideau's unique historical environment.

.3 There were no significant repairs undertaken at this structure since the last rehabilitation program in 1994-95.

PR 3 PROJECT OBJECTIVES

3.1 Quality

1. The Department expects the Consultant to maintain a high standard of design. All design elements, planning, engineering and commissioning are to be fully coordinated, and consistent in adherence to good design principles and good engineering practice.

2. The project is to be implemented in an environmentally responsible manner while protecting heritage value and character defining-elements of the site to the extent possible.

3.2 Sustainable Development

Parks Canada is committed to helping Canada combat climate change and reduce greenhouse gas emissions, consistent with our nation's international obligations and our nation's need for sustainable economic growth. The Rideau Canal National Historic Site and World Heritage Site is a holding for the long-term that is to be maintained for the enjoyment and benefit of Canadians today and in future generations. Parks Canada therefore wishes the work to be implemented in Rideau Canal projects to endure for many decades with minimized maintenance and Operation & Maintenance costs - a long-term capital investment that illustrated excellence in environmental sustainability.

1. Canada 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 are required to have a Sustainable Development Strategy (SDS). Real Property Services Branch of PWGSC has developed their Strategy Plan, which sets out principles, goals and actions for integrating sustainable development principles into its policies and operations.
2. Sustainable Development is defined in broad terms as a strategy that routinely and consistently includes the consideration of the environmental, cultural, historic, economic and social impact of every decision made for the project. The Consultant shall review the PWGSC SDS and ensure that the project is delivered accordingly.

3.3 Waste Management

1. A waste management program must be implemented for all construction phases.
2. Ensure conformance with pertinent recommendations of Environmental Impact Assessment Report(s).
3. 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. The Consultant shall review the protocol and ensure that the project is delivered accordingly.

3.4 Code Compliance/Conformance

1. Codes, regulations, by laws and decisions of authorities having jurisdiction shall be observed. In cases of overlap, the most stringent will apply. The Consultant shall identify other jurisdictions appropriate to the project.
2. It is the responsibility of the Consultant to ensure that the design is in accordance with the latest versions of all applicable standards, codes, regulations and specifications. Consultant shall identify and report to the PWGSC Project Manager all unavoidable non-conformances and shall be responsible for securing approval for variance with the authority having jurisdiction.
3. Lock structures have no Canadian codes that cover their design.
4. Standards, codes and specifications to be used for the design and construction of the asset to be the latest edition of the following (including

all amendments, supplements and revisions thereto). In case of conflict or discrepancy between codes and standards, the most stringent requirement to apply.

.1 Parks Canada Directive for Safety on Dams and Water Retaining Structures
.2 Permanent International Association of Navigation Congresses Design Criteria
.3 Lakes and Rivers Improvement Act (LRIA)
.4 Canadian Manual on Foundation Engineering, National Research Council, Canada.
.5 Concrete design in accordance with CAN3-A23.3, steel design in accordance with CAN/CSA-S16.1.
.6 Masonry design in accordance with CSA S304-14. Mortar and grout for unit masonry, masonry connector, and masonry construction in accordance with CSA A179, CSA A370 and CSA A371, respectively.
.7 Environmental loads in accordance with the Supplement to the National Building Code of Canada.
.8 National Master Specifications to be used with project specific modification as required to suit specific needs and to reflect specific provincial requirements.
.9 Canada and Provincial Occupational Health and Safety Regulations
.10 Canada Labour Code (including latest revisions of all regulations)
.11 Provincial and Municipal Traffic Acts and Regulations
.12 Workplace Safety and Insurance Act
.13 Occupational Health and Safety Act of Ontario
.14 Municipal Statutes and Authorities
.15 Navigation Waters Protection Act
.16 Transport Act - Historic Canals Regulations
.17 Standards and Guidelines for the Conservation of Historic Places in Canada
.18 Operational Guidelines for the Implementation of the World Heritage Convention

5. The Consultant has the option of consulting other design codes and is expected to utilize new developments in structural engineering whenever they appear appropriate in accordance with proper engineering practice but to provide documented evidence of suitability satisfactory to the Departmental Representative.

3.5 Risk Management

1. The Consultant shall develop a comprehensive risk management strategy that incorporates all project stakeholders and project phases. Specific

services required are identified in RS Section for Risk Management in this Project Brief.

3.6 Health and Safety

1. In keeping with the responsibility and in order to enhance health and safety protection for all individuals on federal construction sites, the Consultant shall comply with the applicable provincial/territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations. Consultant shall identify and report to the PWGSC Project Manager all unavoidable non-conformances.
2. Consultant is to review and update health and safety requirements in contract documents to suit this project and PWGSC or Client Department requirements.

3.7 Cultural Resources Management

For the rehabilitation of the cultural resources located at Kingston Lockstation on the Rideau Canal National Historic Site WHS, a Cultural Resource Impact Analysis (CRIA) will be required for each project. The CRIA is now a component of the Agency's Project Management Standard and must be considered as part of each project. A CRIA is a process that allow Cultural Resources Management (CRM) to study and determine the impact of the proposed projects on the heritage value and character-defining elements of a resource, and to recommend an overall approach for the conservation of the heritage resources. Cultural resource management (CRM) advice and mitigation measures will be incorporated into the Environmental Impact Assessment (EIA) report by PCA.

1. Consultant is to provide information and review documentation to support Cultural Resources Management.
2. Consultant is to review and update Cultural Resources Management requirements in contract documents to suit this project and PWGSC or Client Department requirements.
3. Rehabilitation designs are to be compatible with the historic values and character-defining elements of the locks, and cultural landscapes located at Kingston Mills. To ensure that the project managers and design consultants planning interventions on the Rideau Canal have guidance with respect to cultural resource management, the consultant is required to liaise with and incorporate more specific guidance from Parks Canada conservation staff to gain an understanding of Parks Canada's expectations of those undertaking planning and design work for the Rideau Canal NHS.

4. The Kingston Mills Lockstation landscape and locks are cultural resources of national historic significance (NS) that are fundamental resources of the Canal system and integral to the Rideau's unique historical environment.

5. The heritage value of the Kingston Mills lockstation landscape of national historic significance of the Rideau Canal derives from its:

   .1 associative and physical connection with the construction and early operation of the canal system;
   .2 contribution to the unique historical environment of the canal system;
   .3 visual and historic associations with heritage continuity along the central system such as Chaffeys Locks, Newboro, Merrickville, Burritts Rapids and Ottawa;
   .4 role as landmark and providing a sense of continuity along the canal system;
   .5 surviving historic layout and configuration including their open spaces and circulation patterns;
   .6 surviving historic views both within and beyond the station boundaries;
   .7 contextual and heritage settings for the station's buildings and engineering works.

6. Character-Defining Elements:

   .1 Key elements contributing to the heritage value of the Kingston Mills lockstation landscape include:
      1) Locks 46-49, which contribute to maintaining the original appearance and function of the canal;
      2) the 1833 two storey stone blockhouse, complete with loopholes, machicolations and overhanging eaves, dominates the landscape adjacent to lock 46;
      3) the 1830 east and west clay dams, which created Colonel By Lake and are important in the continuing operation of the canal;
      4) the 1830 stone arch dam and outer weir;
      5) the 1904 two storey L-shaped, wood-framed lockmaster's house;
      6) the 1925 wood-framed lock office;
      7) the replica single-lane swing bridge carry local traffic over lock 46
      8) the rugged, rocky terrain, part of the Frontenac Arch geologic formation, as evidenced to the east of the locks and south through the excavated channel;

9) the surviving historic layout and configuration including their open spaces and circulation patterns; and
10) the known and potential terrestrial and underwater archaeological cultural resources.

7. CRM Policy (PCA Cultural Resource Management Policy, 2013) outlines the requirements for managing the wide range of cultural resources administered by Parks Canada. Its objective is to ensure that cultural resources administered by Parks Canada are conserved and their heritage value is shared and protected. Under the Parks CRM Policy, conservation of heritage value must be a primary consideration in any intervention directed at a cultural resource. Therefore, the primary recommended conservation approach based on the Standards and Guidelines for the Conservation of Historic Places in Canada is rehabilitation with an emphasis on minimal intervention. Minimal intervention in the context of heritage conservation means doing what is required to arrest and correct deterioration or meet necessary codes while protecting heritage value as much as possible. The following guidelines are recommended to be followed in this investigation and design process:

.1 Evaluate the existing condition of the cultural resource to determine the appropriate intervention needed. Use the gentlest means possible for any intervention. Respect heritage value when undertaking an intervention.
.2 Maintain heritage value and character-defining elements on an ongoing basis. Repair character-defining elements by reinforcing their materials using recognized conservation methods. Replace in kind any extensively deteriorated or missing parts of character-defining elements, where there are surviving prototypes.
.3 Repair rather than replace character-defining elements. Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements. Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the historic place.

8. The following guidelines specific to masonry are recommended to be followed in this investigation and design process:

.1 Understanding the properties and characteristics of the masonry of the historic place;
.2 Retaining sound and repairable masonry that contributes to the heritage value of the historic place;
.3 Repairing masonry by repointing the mortar joints where there is evidence of deterioration;

.4 Removing deteriorated or inappropriate mortar by carefully raking the joints, using hand tools or appropriate mechanical means to avoid damaging the masonry;

.5 Using mortars that ensure the long-term preservation of the masonry assembly, and are compatible in strength, porosity, absorption and vapour permeability with the existing masonry units. Pointing mortars should be weaker than the masonry units; bedding mortars should meet structural requirements; and the joint profile should be visually compatible with the masonry in colour, texture and width.

.6 Duplicating original mortar joints in colour, texture, width and joint profile.

.7 Replacing in kind extensively deteriorated or missing parts of masonry elements, based on documentary and physical evidence provided by CRM and Built Heritage advisors.

9. The addition of all new works to be aesthetically and physically compatible with, subordinate to and compatible with the heritage character of the historic place. The following guidelines are recommended to be followed in this investigation and design process:

.1 design and installation of safety measures and equipment such as fencing; signs; and other safety measures are to respect the heritage significance of the cultural resource;

.2 CRM and Built Heritage advisors will provide clarification of heritage value and character-defining elements as required for each intervention in order to properly assess impacts and propose mitigation measures. Specific recommendations and required mitigations – based on heritage value and character-defining elements – are to be incorporated throughout the phases of the project.

.3 If an opportunity arises to address or correct past repairs that are no longer considered best conservation practices or that seriously impacted heritage value, CRM to evaluate and determine if it makes sense to include this as a part of this project.

10. As part of the Cultural Resource Impact Analysis (CRIA) an Archaeological Overview Assessment (AOA) will be done for the Project Area by PCA, including vehicular access routes, staging areas and areas proposed for signage and fencing. Based on the results of the AOA, an Archaeological Impact Assessment and/or additional mitigation measures may be required, prior to construction activities. The Consultant to include all measures identified in this process into the project documents.

3.8 Environmental Protection

1. Consultant is to provide information and review documentation to support development of Environmental Impact Assessment documents.
2. Consultant is to review and update Environmental Protection requirements in contract documents to suit this project and PWGSC or Client Department requirements. The construction documents are to include provisions for the submission of the Environmental Protection Plan and Erosion & Sediment Control Plan (locations of silt fences, spills prevention, cleanup and all remaining project specific details of proposed protection/mitigations strategies). Both plans are required to be submitted, reviewed and accepted by PCA.

3.9 Quality Assurance / Quality Control

1. The Consultant is to develop Quality Assurance / Quality Control (QA/QC) plan for the Consulting Contract and for the Construction Contract.
2. The Consultant is to review and update the Quality Control and Quality Assurance requirements in contract documents to suit this project and PWGSC or Client Department requirements.

PR 4 SCOPE OF WORK

4.1 Project Scope

1. The scope of work is based on information available. The full scope of work for construction is to be reviewed and revised after investigations are completed and during the design development process.
2. To provide a two year phased design approach for the rehabilitation of Lock 46 and the Flight Locks 47, 48, and 49 at Kingston Mills. The Year One design phase is to focus upon the repair or rehabilitation of Lock 47 components that do not require dewatering during construction. The Year Two design phase is to focus on all remaining items of repair or rehabilitation for the remaining project site that includes all dewatering measures during construction. The work includes, but is not limited to, the following items:
   - .1 reviewing existing site investigation reports, existing documentation of repairs completed to date and prepare an Analysis of Project Scope Letter Report for review and acceptance.
   - .2 Preparing an investigation testing plan and schedule to execute the Investigations, Studies and Reports to:
     1) Perform an assessment of concrete and masonry conditions through inspection, coring and testing to develop repair and rehabilitation options

2) collect information that may be lacking in the existing investigation reports
3) assess and record the current condition of the locks
4) produce heritage record drawings that illustrate composition of masonry and concrete components
5) determine the quantity and quality of historical fabric remaining
6) collect information to determine all design parameters for options analysis and design of tender packages
7) retain a geotechnical and materials testing consultant to assess the current condition of the locks and appurtenant structures; provide testing of the stone material in order to source stone material supply for the anticipated repair and replacement materials
8) scope to include inspection of every component of each of the Locks: upper wing walls, upper monoliths, lock gates and mechanical components as determined, sluice tunnels and valves, upstream and downstream breastwall and sills, lock floor and chamber walls, lower monoliths, lower wing walls, ladders and mooring cables. Also included are stairways, pedestrian railings, masonry sidewalks, and basin walls downstream of Lock 46.
9) Components that require specific study and recommendations for interventions:
    a) West Wingwall at Lock 46 built of concrete blocks
    b) East Chamberwall at Lock 47
    c) Seepage from Lock 46 and Basin East Access Road
    d) There are stairways and pathways within the site area that require measures to improve conditions that integrate Cultural Resource Management policies and public safety requirements.
    e) Turning Basin Wall repairs
        i. Investigate and document current condition of assets and provide repair options for wall deficiencies. The objective is to repair or rehabilitate the walls that were not recently replaced to extend the overall service life. It is not envisioned that these walls would be demolished and reconstructed. The selected rehabilitation approach is to be similar to the approach adopted for the rehabilitation of other masonry structures at the lock station.
10) Provide technical research, investigation and testing services in order to determine available suitable stone supply for the anticipated repair and replacement materials:

a) Determine original sources of stone used during the initial construction of the Kingston Mills Lock site.
b) Determine compatibility of present day stone utilized by the Rideau Canal with a review of the materials testing reports that were executed in accordance with ASTM C616M.
c) Recommend material properties of stone suitable for this project site in accordance with ASTM C616M.
d) Recommend supply source quarries of stone that can meet project technical and schedule requirements within the Central and Eastern North America region.
e) Provide a list of all quarries and suppliers reviewed including technical details (test results and technical data sheets) of stone availability. Compile results within Report submission.
f) Report submission to recommend a minimum of three quarries that meet current project requirements to be used as possible material suppliers.

.3 Provide a Design Concept Option Report that summarizes alternative design options and Class C cost estimates for the repair or rehabilitation of the locks, and appurtenant structures. Design Concept Option Report to include:

1) Providing repair and rehabilitation options that are in accordance with Cultural Resource Management (CRM) policies.
2) Design measures to preserve the exterior appearance and functionality of the lock components.
3) Analysis and verification of overall stability that the existing dimensions, size and configuration of the walls, floors, foundations and sills of the Locks can withstand all load configurations including seismic. Any modifications to the existing design are to be presented to CRM for review and final acceptance into project scope.
4) Consultant to propose design details for level of intervention required within CRM policies for the treatment of existing concrete components and concrete patch repairs for the following options:
   a) Replacing existing concrete patches with full face stone Dutchman repairs
      i. Option one to consider in-kind similar replacement of original limestone face stones with available compatible sourced stone.
      ii. Other options to be proposed by the Consultant.

b) Rehabilitation of concrete components with a 300 mm thick stone veneer to match historic stone patter
c) Repair concrete surfaces with concrete faux stone block finish to improve aesthetic appearance
d) Demolish concrete components and restore to original stone masonry construction
e) Other alternatives proposed by the Consultant
f) Repair concrete Lock components at Lock 46:
    i. Option one to consider is to rebuild with a new concrete structure with a full face stone pattern veneer 300 mm thick.
    ii. Option two to consider is to replace with concrete and instead of a stone veneer, the exposed concrete would receive a faux "stone block" finish that would blend in but be distinguishable with the existing masonry.
    iii. Option three to consider and in-kind similar replacement of original structure with available compatible sourced stone.
    iv. Salvage/reuse stones where possible and restore to original construction
    v. Other options to be proposed by the Consultant.

5) Design options for masonry repair
    a) Propose standard repair detail alternatives that can be applied to assets within project scope
6) Design for full repointing of all of the flight locks and consolidate inaccessible voids in the core or at the rear of the wall with grout.
7) Design for public safety measure improvements for pedestrian railing installation at Monoliths and Staircases:
    a) Provide two design options for pedestrian safety railing within Cultural Resource Management guidelines to be provided by PCA. Improve public safety with respect to historical characteristics of the site. Pedestrian guard rails will be repaired or replaced at areas where they are already installed but excludes lock gates.
8) Provide Class C cost estimates for the various options separately for each lock to facilitate alternative comparison based on recommendations, cost, feasibility, schedule and CRM principles. Along with text explanation, summarize and highlight pertinent information in tabular form where possible.

9) Recommend a Preferred Concept Design for Design Development consideration. Provide a summary to highlight pertinent information in tabular form.

3. Installation and maintenance of environmental mitigation measures to facilitate all stages of construction in accordance with impact assessments: Provide technical advice and incorporate environmental mitigation requirements in contract documents. Monitor Contractor measures to ensure that they are in accordance with requirements.

4. Coffer dam installation, fish rescue and dewatering upstream of Lock 46, downstream of Lock 49 and dewatering: Construction documents to include provisions for the construction Contractor to be responsible to design, install and maintain coffer dams and dewatering systems under the direction of a Professional Engineer. Consultant to provide design options for type of acceptable coffer dam; provide survey of bottom to establish profile; provide adequate detail for construction contractors to bid and design coffer dam and dewatering systems. Provide all investigations for geotechnical parameters of overburden and bedrock including underwater locations to determine all parameters (identification, quality, permeability, strength) for design purposes to be used by others; provide performance specification for dewatering; provide technical advice for environmental mitigation measures.

5. Site demolition and removals: provide performance specifications; provide technical services for Waste Management; provide technical advice for Designated Substance and Hazardous Material Reporting requirements.

6. Decommissioning of coffer dam: provide performance specifications.

7. Commissioning of rehabilitated lock: provide technical services.

8. Site restoration to conditions prior to construction start: provide technical advice and design services.

9. Gate Fabrication Project by Others

.1 New gates may be fabricated and installed by others during the course of the project. Consultant is responsible to coordinate with other parties assigned to facilitate gate installation. PCA to provide details of project scope and schedule when available.

10. Metal Components

.1 Provide painting specification for all steel components including but not limited to: winches; railings; valves and embedded steel parts.

4.2 Scope of Work Inspection and Construction Site Access

1. Site Access for Comprehensive Inspection of Lock Structures

.1 Provide all scaffolding, equipment, dewatering, diving / barge to fully access structure components to complete material investigations. Priority is to undertake any required inspections without de-watering by using diving and underwater equipment techniques.

.2 Dewatering Schedule

1) Lock 46, Basin, Lock 47, Lock 48:
   a) Dewatered starting in late October/early November
2) Lock 46 upstream of stoplog gains
   a) Water remains at upper reach level.
3) Lock 49
   a) Water level remains same as the lower reach.

2. Swing and Fixed Bridge Evaluation for Construction Access

.1 PCA intends to rehabilitate the existing Swing and Fixed Bridges prior to the start of this project.

.2 The bridges will likely be used as part of the construction site access plan.

.3 The scope of work for this component to include:

1) Perform a visual inspection of bridge deck, superstructure and abutments to document bridge(s) condition at start of construction works and to confirm bridge(s) condition at completion of construction project.

4.3 Investigations and Engineering Studies

1. The following investigations and reports are the minimum required in order to quantify the project scope and design requirements.

.1 All Lock and Appurtenant Structure Inspections

1) Comprehensive Inspections to confirm details and condition of structures including Heritage Record Drawings.

.2 Development of Construction Access, Staging, and Cofferdam Plans and Parameters: as the major construction effort will take place on both sides of the locks, construction access and staging will be a major project component. Possible access options that need to be examined by the Consultant during the design process include both the East and West access roads.

.3 Topographical and Bathymetric Survey

1) Consultant to obtain topographical and bathymetric information for the site structures and canal bottom through 3D Realtime Sonar, LiDAR and Surveys supplemented by diving inspections at:
   a) Lock 46 upper wing walls, including cofferdam potential location

b) Lock 49 lower wing walls, including cofferdam potential location

.4 Geotechnical and Materials Investigations

1) Carry out geotechnical investigations to confirm information on soil/bedrock properties and elevation for related Lock work and for cofferdam construction.
2) Carry out materials investigations to confirm the properties and condition of existing masonry and concrete to determine the feasibility and suitability of repair alternatives.
3) Conduct geotechnical investigations upstream of Lock 46 and downstream of Lock 49 to determine parameters for coffer dam design.

.5 Stone Supply Research and Investigations

1) Carry out research and investigations to confirm information for supply of stone suitable for the structure repair and rehabilitation construction.
2) Document results and submit report.

4.4 Project Deliverables

1. Meeting Minutes
2. Analysis of Project Scope of Work Report
3. Plan and Schedule for Investigations, Studies and Reports
4. Letter reports for each Investigation and Study
5. Topographical and Bathymetric site plans
6. Comprehensive Inspection of the Lock and Appurtenant Structures Report
7. Report investigating access, staging, and cofferdam options
8. Report of Lock Inspection and Masonry and Concrete Test Results
9. Design Concept Report
10. Design Concept Presentation materials and presentation
11. Construction Schedule
12. Final Design Concept Report
13. Report of Stone Supply Research and Investigations
14. Preliminary Design Report and Class B Estimates for all project components
15. Design Development Presentation materials and presentation
16. Updated Construction Schedule
17. Final Design Development Report

18. Information required for Environmental Detailed Impact Assessment
19. Presentations to Client, Management, Authorities having jurisdiction and Public
20. 50% completion Construction Documents
21. 99% completion Construction Documents
22. Tender ready Construction Documents and Class A estimate
23. Final Construction Schedule
24. Construction Documents marked "Issued For Construction"
25. Feedback and Amendments during Tendering
26. Reviewed and Accepted Construction Schedule
27. Minutes of Construction Meetings
28. Weekly Construction Progress Reports
29. Health and Safety Plans
30. Inspection Letter Reports
31. Instructions to Contractor
32. Contractor's Progress Claims
33. Certificate of Substantial Completion
34. Interim Inspection
35. Review of Shop Drawings and submittals
36. Review of As-built drawings
37. Design and Construction Report
38. Warranty Inspection reports, Initial and Final
39. Certificate of Completion

4.5 Meetings

1. Unless otherwise specified, the Consultant is to attend meetings throughout the entire project development and implementation period.
2. Consultant is to ensure only required members of the Consultant Team participate in teleconferences or attend meetings in-person.
3. Anticipated number of meetings is shown in table below:

	Anticipated Number of Meetings

Project Phase	Teleconference	In-Person PWGSC Office Ottawa	In-Person PCA Office Smith Falls	In-Person On Site
RS2 Start-up, Document Review and Analysis of Project Requirements	2	1	1	1
RS 6 Investigations, Studies and Reports	2	1	1	1
RS 7 Design Concept	2	1	1	0
RS 8 Design Development	2	2	0	0
RS 9 Construction Documents	4	2	1	0
RS 10 Tender/Bid/Award	2	0	0	0
RS 11 Construction and Contract Administration	12	1	0	36
RS 13 Post Construction Services	2	0	0	2
Urgent Problem Solving Issues	12	4	2	12

PR 5 PROJECT CONSTRAINTS

5.1 General Constraints

1. Navigation Season
   - .1 Work must not disrupt navigation in the main channel, locks or lock approaches of the Rideau Canal during navigation season.
   - .2 Navigation season typically starts on the Friday before Victoria Day weekend and ends on Monday of the Thanksgiving weekend.
   - .3 Client Department to confirm planned start and end of navigation season during project development.
2. Maintenance Period
   - .1 Work must not disrupt the maintenance period before and after each navigation season on the Rideau Canal.
   - .2 The maintenance period typically lasts a few weeks before and a few weeks after the navigation season on the Rideau Canal.

.3 Maintenance activities vary from site to site and may include work to prepare sites for navigation season or for the winter shutdown such as raising/lowering water levels, installing/removing navigation aids and carrying out minor maintenance activities.

.4 Client Department to confirm planned start and end of maintenance periods and planned activities for each site during project development.

3. Other Environmental Restrictions

.1 No in-water work may occur between March 15th and June 30th to protect spawning fish.

.2 Migratory birds, their nests and eggs are protected under the Migratory Birds Convention Act (1994). Project works or activities that are potentially disruptive activities to birds should be avoided during breeding times. No vegetation shall be removed from April 1st to August 28th to protect nesting birds. If vegetation must be removed during this period, an avian biologist must screen the area to be cleared for nests, no more than two days prior to clearing. If active nests are found, a buffer shall be implemented and the vegetation cannot be removed until the nest is no longer active.

.3 As per the *Historic Canal Regulations* applicable to lands administered by the Rideau Canal National Historic Site of Canada, a permit signed by Parks Canada's Ontario Waterways Director will be required to authorize the project work prior to commencement of project activities. The permit process will be facilitated by Parks Canada.

.4 Environmental Impact Assessment – An Environmental Impact Analysis (EIA) will need to be conducted for this project as per Parks Canada's Policy on Environmental Impact Analysis (2015) and section 67 of the *Canadian Environmental Assessment Act* (CEAA 2012). The Parks Canada project leader will work with the Ontario Waterways Environmental Assessment Officer to help scope, prepare, review and approve the impact analysis. The environmental mitigations identified through this process will be included in the construction contract specifications and drawings as contract requirements. All EIA constraints shall be incorporated in the design and applied to the construction stage.

.5 A number of Species at Risk and their Critical Habitat are present at Kingston Mills and that may affect work windows, staging areas and project design. Critical habitat in the area includes: Eastern Musk Turtle, Blanding's Turtle, Golden-winged Warbler and Eastern Whip-poor-will.

4. Construction Schedule

.1 Year One Construction to occur between November 2017 and April 2018.
.2 Year Two Construction to occur between November 2018 and April 2019.
.3 Year Three Construction to occur between November 2019 and April 2020.
.4 All work to be substantially complete by April 2020.

5. Access to the Work

.1 Access to the East Side: Ontario Highway 15 approximately 1.5 km north of Highway 401 to Kingston Mills Road to the lock station. This access road requires the use of the Swing Bridge that is planned to be under construction during August 2016 through April 2017.
.2 Access to the West Side: Highway 15 to County Road No. 11 then to Kingston Mills Road.
.3 Access to the east side of Locks 48 and 49 by large vehicles is restricted by the railway bridge pier and steep embankment. There is no vehicular access to the west side of Locks 48 and 49.
.4 Access to the lock site must remain unobstructed for emergency and Canal vehicle access.

6. Limited Construction Period

.1 Consultant is to develop design options that ensure Construction can be completed within the indicated time constraints.
.2 Consultant is to develop specifications that allow Contractor to develop innovative construction options that ensure Construction can be completed within the indicated time constraints.
.3 Requirements for winter construction to be included in Contract Documents.
.4 No Construction work permitted during Navigation season and site is to be restored to original pre-construction condition after each Yearly construction phase.

7. Environmental Assessment

.1 The proposed project will require an Impact Analysis under Parks Canada's Impact Assessment Directive and s.67 of the Canadian Environmental Assessment Act (CEAA).
.2 Consultant to provide input and assistance to PWGSC or PCA Environmental Services during development of environmental impact assessment reports.
.3 All EA constraints shall be incorporated in the design and applied to the construction stage.

8. Cultural Resources Assessment

.1 A Cultural Resource Impact Analysis (CRIA) will be required. Cultural Resource Management (CRM) advice and mitigation measures will be incorporated into the detailed environmental impact assessment report. The CRIA will be undertaken by Parks Canada; however, the Consultant is required to incorporate mitigations from the CRIA into final design documents.

.2 A Statement of Heritage Value for the Locks (46 to 49) and landscape will be required in order to properly assess impacts and propose mitigation measures. Specific recommendations and required mitigations – based on heritage value and character-defining elements – will be incorporated throughout the phases of the projects and the CRIA. The Statement of Heritage Value will be undertaken by Parks Canada; however, the Consultant is required to incorporate mitigations into final design documents.

.3 An Archaeological Overview Assessment (AOA) will be done for the Project Area, including vehicular access routes, staging areas and areas proposed for signage and fencing. Based on the results of the AOA, an Archaeological Impact Assessment (AIA) and additional mitigation measures may be required to construction activities. The AOA will be undertaken by Parks Canada; however, the Consultant is required to incorporate mitigations into final design documents.

9. Client Department Property

.1 The Client Department owns the property on which the structures are located.

.2 Construction activities, access and staging areas are to be restricted to Client Department Property.

.3 The Consultant is to coordinate through Client Department for approval and to make arrangements for access through other properties.

.4 Work on Client Department property to follow Client Department requirements and Historic Canals Regulations.

10. Water Management

.1 The Consultant must include provisions in the design and construction documents to maintain locks in the dry during construction works.

.2 The Consultant is to develop parameters related to cofferdams, dewatering plans required for the project.

11. Property Issues

.1 The Consultant is to consult and confirm with PCA for access limitations for Swing and Fixed Bridge use during construction and confirm load limits.

12. Masonry Condition of Lock Structure

.1 It is assumed that lock masonry will be adequate for Dutchman refacing. If complete demolition and reconstruction of the components of the lock in part or whole, is required it could delay project and impact access to site.

13. Bridge Construction

.1 Project to proceed with no interference with Swing Bridge and Fixed Bridge Rehabilitation projects currently scheduled for August 2016 to April 2017.

PR 6 EXISTING DOCUMENTATION

6.1 Existing Documentation

1. Existing documentation available for review:

.1 Existing Drawings:
1) Kingston Mills Site Plan 1976
2) Kingston Mills Site Plan 1991
3) Various CAD Topographic drawings 2007 – 2012
4) Lock 46 Rehabilitation Drawings 100 -102 (2007)
5) Lock 47 HOKM 91/H21 1 to 4 (1991)
6) Locks 47 – 49 Removal of Buildings and Landscaping (1970)
7) Basin Walls Site Plan CORID01/R22 (2001)
8) Lock 46 Concrete Repairs RCKM 1 – 4 (1991)
9) Lock Repairs CORCKM 94/R21 101 to 104
10) Lock 47 – 49 As-builts 10-760 (1979)
11) Lock 47 Proposed Grouting Scheme 7326 (1969)
12) Grouting and Associated Repairs 46, 48, 49 RC – 7446 Site Plan (1972)
13) Basin Walls New Wall Detail As-built Info CORID01/R22 103 (2002)

.2 Existing Reports:
1) Geotechnical Investigations Swing Bridge 1999
2) Geotechnical Investigation for the Kingston Mills Lock No. 46, Jacques Whitford, 2005
3) Geotechnical Investigation Grouting Test Program Locks 47 and 48, Trow, 1990
4) Locks 46 – 49 Rehabilitation Project – Pressure Grouting, ECO, 1995
5) Borehole Results, Golder Associates, 1979

6) Petrographic Report on Concrete Cores from Lock No. 46, Materials & Petrographic Research G-B Inc., 2005
7) Underwater Inspection at Kingston Mills Lock 49, McNeeley, 1979

2. Property records plans:

.1 Client Department owns considerable property at this site and property records plans will be made available as required.

PROJECT ADMINISTRATION (PA)

PROJECT ADMINISTRATION

PA 1 GENERAL PROJECT ADMINISTRATION

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

1.1 PWGSC Project Management

1. The PWGSC Project Manager assigned to the project is the Departmental Representative.
2. The Departmental Representative is directly concerned with the project and responsible for its progress on behalf of PWGSC.
3. PWGSC administers the project and exercises continuing control over the project during all phases of development.
4. The Departmental Representative is the liaison amongst and between the Consultant, PWGSC and the Client Department.
5. Unless directed otherwise by the Departmental Representative, the Consultant is to obtain all Federal and Provincial permits, requirements and other approvals necessary for the work.

1.2 Language

1. The language of communication for the project to be English.

1.3 Lines of Communication

1. Unless otherwise arranged by the Departmental Representative, the Consultant is to communicate with the Departmental Representative only.
2. Formal communications between the Consultant and the Client Department is to be through the Departmental Representative unless authorized in writing.
3. Direct requests for project related information or questions from other federal agencies, provincial agencies, municipalities/counties or the public are to be directed to the Departmental Representative.

1.4 Media

1. Direct requests for project related information or questions from the media are to be directed to the Departmental Representative.

1.5 General Project Deliverables

1. Unless otherwise indicated, submit draft versions of final reports for review and acceptance prior to submission of final report.
2. Submit draft versions of presentation materials for review and acceptance prior to submission of final presentation materials.
3. Submit hardcopies of reports and presentations, drawings and specifications as follows;
   - .1 Submit three (3) hardcopies of final reports.
   - .2 Submit ten (10) hardcopies of presentation materials.
   - .3 Submit three (3) hardcopies of drawings and specifications at 50%, 99% and 100% completion.
   - .4 Submit four (4) hardcopies of drawings and specifications "Issued for Tender".
   - .5 Submit six (6) hardcopies of drawings and specifications "Issued for Construction".
   - .6 Copies of submissions to be shipped directly to PWGSC Project Manager, PWGSC Design Manager, Client Department, PWGSC Contracting Services, Construction Administrator or Contractor as directed.
   - .7 Reports, presentation materials and specifications are to be two-sided, full-colour, plastic comb bound with rigid covers or in binders for large documents as directed by Departmental Representative.
   - .8 Drawings to be prepared as described in "Doing Business with PWGSC".
4. Submit editable electronic versions of reports, letter reports, documents, drawings and specifications as follows:
   - .1 Electronic files are to be submitted via Email or using a file transfer site to be provided by Departmental Representative.
   - .2 Final version of electronic submissions are to be provided on one (1) DVD or USB inserted into a sleeve in each hard copy of final reports.
   - .3 Submit one (1) copy of all documents in editable PDF format.
     1) Editable Adobe Acrobat PDF files are to be unlocked and include bookmarks of chapters, appendices and main sections of the documents for ease of navigation for large documents.
     2) Rotate pages to match normal screen viewing.
     3) Break large documents up into multiple files as directed to create manageable file sizes.

.4 Submit one (1) DVD copy of Construction documents in electronic file and directory format required for publishing to PWGSC tendering system Buyandsell.gc.ca.

.5 Submit one (1) copy of all documents in an editable electronic version in their original file format.

1) Electronic deliverables to be created using Microsoft Office applications.

2) Drawings to be generated using AutoCAD and using the layering and file transfer protocols as prescribed in the "Doing Business with PWGSC", and the "Heritage Canals and Engineering Works CADD Standards" supplement, both found in the appendices to this Project Brief.

3) Specifications are to be prepared using the National Master Specification (NMS) format, as referred to in Appendix D "Doing Business with PWGSC".

a) Provide copy of editable files for specifications in Word or native NMS format.

b) Use the 1/3-2/3 format.

c) Use NMS sections required for Federal projects.

d) Obtain Regional master specifications from Departmental Representative.

e) Review, edit and update all NMS sections, including sections developed from NMS and Regional Master Specifications, to meet requirements of the NMS User's Guide.

4) Images, photos, sketches, graphics or videos are to be provided in original editable format.

5) Specialized files such as those used for structural evaluations are to be provided in their original file format.

.6 Provide one (1) DVD or USB with all electronic files at the end of project.

5. Submissions from the Contractor are to be reviewed by the Consultant and Quality Control sign-offs are to be returned dated and signed "accepted" or dated and returned with comments.

.1 One (1) electronic copy of all returned submissions and the corresponding Quality Control sign-offs are to be provided to Departmental Representative at the same time.

1.6 Acceptance of Project Deliverables

1. While PWGSC acknowledges the Consultant's obligations to meet project requirements, the project delivery process entitles PWGSC to review work. PWGSC reserves the right to reject undesirable or unsatisfactory work.

2. The Consultant must obtain Departmental Representative acceptances during each of the project stages, and whenever new direction, concept, solution, etc. is contemplated by the Consultant Team.

3. Acceptance indicates that based on a general review of material for specific issues, the material is considered to comply with governmental and departmental objectives and practices, and that overall project objectives are being satisfied.

4. Acceptance does not relieve the Consultant of professional and legal responsibilities for the work and compliance with the contract.

5. PWGSC acceptance does not prohibit rejection of work that is determined to be unsatisfactory at later stages of review. If progressive design development, or time / cost / risk updates, or technical investigation reveal that earlier acceptances must be withdrawn, the Consultant is responsible for re-designing work and re-submitting for acceptance.

6. Review and acceptance of submittals by PWGSC will require a minimum of one (1) week and as much as two (2) weeks for each submittal depending on complexity and quality of submission.

7. Review and acceptance of specific submittals by the Client Department and other Authorities having jurisdiction may be required to supplement PWGSC acceptances. Additional review time may be required as described in PA3 SUBMISSIONS TO AUTHORITIES HAVING JURISDICTION.

8. The Consultant is to assist the Departmental Representative in securing acceptances and adjust or revise documents and designs as required by such authorities when securing acceptance.

9. During each review period, maintain full production on the project, and revise documents as necessary and when review comments are received.

1.7 Coordination with Sub-Consultants / Specialists

1. The Consultant throughout all phases of the project is to assume responsibility for and coordinate the work of all in-house personnel and Sub-consultants and Specialists retained by the Consultant.

2. Coordinate submissions of Sub-consultants and Specialists and ensure they are complete and signed-off.

1.8 Co-ordination with Contractor

1. The Consultant is not to enter into the area of responsibility of the Contractor's Superintendent.

2. The Consultant is not to make any changes that will affect scope/budget/schedule without prior written acceptance from the Departmental Representative.

1.9 Project Response Time

1. It is a requirement of this project that the key personnel of the Consultant and sub-consultants or specialist firms are personally available to attend meetings within two (2) business days of the request.
2. Key personnel of the Consultant and sub-consultants or specialist firms are to respond to inquiries within one (1) business day.
3. Feedback to the Consultant Team during document reviews to be reviewed by Consultant and comments returned within three (3) business days of their receipt.
4. Review and respond to Contractor submissions within three (3) business days of receipt.
5. Review and respond to technical issues raised during construction within three (3) business days.

1.10 Project Schedule

1. Project schedule and specific delivery dates for project are to be achieved, unless otherwise accepted by the Departmental Representative in writing.

1.11 Meetings

1. The Departmental Representative is to arrange monthly meetings throughout the entire project development and implementation period.
2. The Departmental Representative is to arrange and chair the Project Start-up Meeting by teleconference.
3. The numbers of meetings for each phase of the project are noted in the Project Requirements section are to be used for estimating and planning purposes.
4. The Consultant is to record the issues and decisions, as well as prepare and distribute minutes to all participants within seventy-two (72) hours of the meeting.
5. The Departmental Representative may be required to call urgent problem-solving meetings. The Consultant is to be available to attend such meetings, in the location specified by the Departmental Representative, within one (1) working day notice.
6. The Consultant is required to attend all additional meetings as needed and make presentations to satisfy Authorities having jurisdiction as identified.

7. Design meetings will normally be held in PWGSC offices at 2720 Riverside Drive, Ottawa, Ontario, or at the Consultant's office if so requested by the Departmental Representative.

8. Meetings to be held at the Client Department's offices will be at 34 Beckwith St. South, Smiths Falls, Ontario K7A 2A8.

9. During Construction and implementation, participate in teleconferences and attend meetings to be held on-site as requested by Departmental Representative.

1.12 Health and Safety

1. General Requirements:

   .1 Develop written Site-Specific Health and Safety Plans (SSHSP) based on hazard assessment of each site prior to beginning any field work and continue to implement, maintain, and enforce the plan through all phases of the project.

   .2 The SSHSP is to cover all activity of the Consultant Team (consultant personnel and sub-consultants).

   .3 Any underwater inspection is to require: a separate Site Specific Health and Safety Plan for the diving work; a copy of the Ministry of Labour Dive Notice and copies of divers' Certifications to be submitted to the Departmental Representative. Use of underwater Remote Operating Vehicle equipment is preferred, if equivalent or better results can be achieved.

   .4 The Consultant is to incorporate in their SSHSP and abide by any additional constraints or safety requirements imposed by PWGSC or Parks Canada for accessing and using Parks Canada property or part thereof.

   .5 Coordinate field work with owners and stakeholders for any activity on or adjacent to the project site. Initial requests are to be channeled through the Departmental Representative.

   .6 Provide Personal Protective Equipment, equipment and material as required to meet the intent of the safety requirement set forth in the SSHSP, or as required by the Provincial Occupational Health and Safety Legislation.

   .7 The Consultant is to be responsible for their Team members on site, and for protection of the general public and government employees adjacent to site to the extent that they may be affected by conduct of the field work.

   .8 Assign responsibility and obligation to Competent Person or Supervisor to oversee the field work. At Competent Person's discretion, the field work may be stopped, if necessary or interrupted for reasons of health or safety. The Departmental

Representative may also stop work for health and safety considerations.

.9 Prior to starting field work, organize and attend a Safety Briefing meeting with PWGSC and Parks Canada representatives.

.10 The Consultant is to ensure that the SSHSP and all field work is completed in accordance to applicable codes and standards, including Federal, Provincial and Municipal Statutes, Regulations and Acts.

2. Submittals

.1 Submit Site-Specific Health and Safety Plan (SSHSP) within seven (7) days after date of Notice to Proceed and at least seven (7) days prior to commencement of field work. Plan must include:

1) Results of site specific safety hazard assessment,
2) Mitigation and precaution measures to be implemented as a result of safety and health risk of hazard analysis for site tasks and operations,
3) Consultant's Team Safety Communications Plan,
4) Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Where applicable, coordinate plan with existing PWGSC Emergency Response requirements and procedures provided by Departmental Representative.

.2 In addition to the SSHSP the following documents also to be submitted:

1) A copy of the Consultant Team WSIB Clearance Certificates.
2) Occupational training and certification records: The Consultant must provide documentation verifying all members of the Consultant Team have received the appropriate safety training including equipment operation training as required to perform the specific field work.

.3 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request a resubmission with correction of deficiencies, concerns, or requested improvements implemented.

.4 Departmental Representative's review of Consultant's final SSHSP is not to be construed as approval and does not reduce the Consultant's overall responsibility for Health and Safety at the project site.

PA 2 PROJECT TEAM

2.1 General Organization

1. PWGSC and the Consultant Team are to work cooperatively at every stage of the design and construction process in order to assure the creation of appropriate, successful and meaningful work within time constraints specified.
2. The Project Team refers to the representatives, both federal and private, involved in delivering and coordinating the project.

2.2 Roles for the Consultant Team

1. The Consultant is to be responsible for mobilization, co-ordination and direction of all Consultant Team members and their activities.
2. The Consultant is to provide all engineering and specialist services to complete the project as defined herein.
3. The Consultant Team is to comprise of appropriately qualified professional and technical personnel with relevant expertise and extensive experience and to provide the services identified in the Required Services (RS) section of this Project Brief.
4. All Services are to be performed by staff of the Consultant and/or their accepted sub-consultants. The Consultant is not to engage others to perform services unless prior acceptance, in writing, is obtained from the Departmental Representative.

2.3 Roles for the PWGSC Project Management Team and the Client Department

1. The PWGSC Project Manager:
   - .1 Accountable for the expenditure of public funds and delivery of the project in accordance with terms accepted by Treasury Board;
   - .2 Responsible for the day-to-day management of the project;
   - .3 Is the Departmental Representative for all project contract services and, as such, will be the Consultant's single point of contact for all project information and direction.
2. The PWGSC Design Manager:
   - .1 Responsible for ensuring the project meets the Client Department's technical requirements.
   - .2 Will provide professional advice and quality assurance reviews of Consultant and Contractor deliverables.
   - .3 Will coordinate and review information or services required from other in-house technical resources through PWGSC Project Manager.

3. The Client Department Authority:

   .1 Will coordinate the quality, timing and completeness of information and decisions to form the Functional Program, and provide this information and decisions to the PWGSC Project Manager;
   .2 Will ensure Functional Program requirements are met, and are communicated in a timely manner to the PWGSC Project Manager.

PA 3 SUBMISSIONS TO AUTHORITIES HAVING JURISDICTION

3.1 Federal Government Authority/Jurisdiction

1. The following are authorities having Federal Government jurisdiction over the project:

   .1 Public Works and Government Services Canada: Contracting authority and project delivery.
   .2 Parks Canada Agency: Functional design requirements, approvals and standards.
   .3 Parks Canada Agency: Navigable Waters Protection Act.
   .4 Department of Fisheries and Oceans: Fisheries Act.
   .5 Environment Canada: Canadian Environmental Assessment Act and Canadian Environmental Protection Act.

3.2 Provincial, Municipal and Other Local Authorities

1. Although the Federal Government does not formally recognize jurisdiction at other levels of government voluntary compliance with the requirement of these other Authorities is required unless otherwise directed by the Departmental Representative.

2. In some cases, the Federal government may defer to provincial and municipal authorities for specific regulations, standards and inspections. In areas of conflict, the Federal authority prevails. Other Authorities include:

   .1 Municipality/City Authority
   .2 Local Police and Emergency Services
   .3 Ministry of Natural Resources and Forestry
   .4 Ministry of Environment

3. The Consultant, with the assistance of the Departmental Representative, is to identify other Authorities Having Jurisdiction and endeavor to ensure that design work meets or exceeds codes, regulations and standards of authorities having jurisdiction.

4. The Consultant is required to submit project documents to Authorities Having Jurisdiction for review during both the design and the preparation of construction documentation.

5. The Consultant is to complete negotiations, identify the cost of any required permits, and resolve permit related issues prior to tender.

3.3 Submissions, Reviews, Acceptance and Approval

1. The Departmental Representative will review work in progress on a continuing basis.
2. Formal presentations are required for design and project approvals with Authorities having jurisdiction listed above. Ad-hoc presentations may be required to various committees and senior officials.
3. Submissions are to be reviewed and accepted by PWGSC before submission to authorities having jurisdiction.
4. Submissions to Parks Canada Agency
   - .1 The frequencies of meetings and submissions indicated are only estimates. They are affected by the project phase, issues and requirements for decisions and approvals.
   - .2 The Consultant is required to attend other meetings as needed and to make presentations to satisfy Authorities identified.
   - .3 Submission format:
     1) Electronic and hard copy reports, drawings and specifications.
     2) Oral presentation with slides and presentation materials.
   - .4 Submission schedule:
     1) Submissions are reviewed at the design concept phase, design development phase, and when construction documents are complete.
     2) Meeting time to be arranged within two (2) days' notice, after completed work has been forwarded to the Departmental Representative.
   - .5 Expected turnaround time a maximum of three (3) weeks depending on complexity and quality of submission.
   - .6 Number of re-submissions: until approval received.
5. Submission to Other Authorities Having Jurisdiction
   - .1 Codes, regulations, by laws and decisions of authorities having jurisdiction are to be observed.
   - .2 In cases of overlap, the most stringent to apply. The Consultant is to identify other jurisdictions appropriate to the project.
   - .3 PWGSC will voluntarily comply with the applicable provincial Construction Health and Safety Acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.
   - .4 Expected Turnaround Time: up to twelve (12) weeks for each review (outside PWGSC control).

6. Number of re-Submissions: until approval received.

Chart of Reviews, Acceptance and Approvals:

Chart of Reviews, Acceptance and Approvals	PWGSC		Authorities Having Jurisdiction	
	Review	Acceptance	Review	Approval
RS 2 Analysis of Project Requirements				
Detailed Project Schedule	x	x	x	x
Analysis of Project Scope of Work Report	x	x	x	x
Updated Class 'D' Estimate	x	x		
RS 7 Design Concept				
Design Concept (Options) Report	x	x	x	x
Final Design Concept Report	x	x	x	x
Class 'C' Estimate(s)	x	x		
RS 8 Design Development				
Design Development Reports	x	x	x	x
Class 'B' Estimate(s)	x	x		
RS 9 Construction Documents				
50% Construction Drawings and Specs	x	x	x	
99% Construction Drawings and Specs	x	x	x	x
100% Construction Drawings and Specs	x	x	x	
Class 'A' Estimate	x	x		x
Construction Schedule	x	x	x	

PA 4 INVOICING AND PAYMENTS

1. Further to R1230D GC 5.3 Payments to the Consultant, the payment schedule during the design stage of the project is to be on the basis of deliverables. Progressive monthly payments between deliverables will be permitted.
2. Payment for work completed on a time-basis will be issued upon receipt of monthly invoicing.
3. For processing of invoices, include the following information on each invoice for payment:
   - .1 PWGSC project number;
   - .2 Invoicing period with dates;
   - .3 Work done to justify invoice (short narrative) for services provided;
   - .4 Summary of costs, separately for each Required Service performed, as follows:

     Amount for current invoice (1) Fees

Total previous invoices	(2)	Fees
Total invoiced to date	(1+2) = (3)	Fees
Agreed fees for RS	(4)	Fees
Amount to complete RS	(4-3) = (5)	Fees
% Required Services completed	(6)	

TOTAL Invoiced for Required Services Performed
HST to be indicated separately

.5 Authorized signature(s) of the Consultant, Quality Control sign-off, and the date.

REQUIRED SERVICES (RS)

REQUIRED SERVICES

The Required Services related to the various stages of project development and implementation are presented in each of the subsequent RS sections.

Services are to be provided in accordance with the requirements identified elsewhere in this Project Brief including but not limited to the requirements identified in "Doing Business with Public Works and Government Services Canada (PWGSC)" attached in the Appendix.

RS 1 Management of Consulting Services

1.1 Project Management:

1. Perform all pertinent internal project management and administrative functions necessary for proper management of all services being provided including services by sub-consultants and specialists.

1.2 Meetings:

1. Attend and record issues and decisions for project meetings and prepare and distribute minutes of meetings.

1.3 Time Management:

1. All services and requirements detailed in Section 5 TIME MANAGEMENT of "Doing Business with Public Works and Government Services Canada (PWGSC)" apply to this project.
2. The specific frequency required for Progress Reports, Schedule Monitoring and Control, is to be monthly.
3. Prepare detailed project schedule and work breakdown structure.

1.4 Budget Management:

1. Provide interactive and continuous budget management from the commencement of project design through to construction completion.
2. Provide monthly reports forecasting expenditures.

1.5 Health and Safety Plans and Environmental Protection Plan:

1. Submit a Site Specific Health and Safety Plan (SSHSP) for review and acceptance by Departmental Representative for site visits and field investigations.
   .1 Update and resubmit SSHSP if scope of field work changes.

2. Submit an Environmental Protection Plan (EPP) for review and acceptance by Departmental Representative for site visits and field investigations.

   .1 Update and resubmit EPP if scope of field work changes.

1.6 Liaison with Agencies Having Jurisdiction and Stakeholders:

1. Communicate with agencies having jurisdiction and other stakeholders as directed by PWGSC.

1.7 Construction Project Closure Report

1. Submit documents and electronic files required for completion of Construction Project Closure Report to the Departmental Representative.
2. Provide one (1) DVD or USB with electronic copies of all design project documentation.

1.8 Management of Consulting Services Deliverables:

1. Minutes of meetings
2. Detailed Project Schedule and Work Breakdown Structure
3. Monthly reports including:
   .1 status of required services
   .2 updated financial forecast
   .3 updated project schedule
   .4 updated Risk Management Plan
4. Site Specific Health and Safety Plans
5. Environmental Protection Plans
6. Construction Project Closure documents and files

RS 2 Analysis of Project Scope of Work

2.1 Review existing documentation provided by PWGSC to understand the project scope of work, background and scope of previous investigations and studies.

2.2 Visit the project sites to perform a preliminary visual reconnaissance and site review to obtain site specific information to understand the scope of work, meet key personnel from Engineering and Operational areas of Client Department, plan investigations and studies and record information applicable to design and construction.

2.3 Prepare and submit, for the review and approval of the Departmental Representative a letter report on the Analysis of Project Scope of Work including:

1. an executive summary
2. list and description of documentation that was reviewed
3. discussion of major findings and analysis of scope of work
4. recommendations for adjustments to project requirements
5. proposed changes to scope of work
6. describe impact of proposed changes in terms of their effect on project cost and schedule

2.4 Analysis of Project Scope of Work Deliverables:

1. Letter report of the Analysis of Project Scope of Work

RS 3 Estimating and Cost Planning

3.1 Provide quantity estimates, cost estimates, detailed cost breakdowns, cash flow planning, contingency estimating, and cost reduction strategies to support options being evaluated for the Construction project and for the selected final design.

3.2 Estimating and Cost Planning Deliverables:

1. Update Class "D" (Indicative) Estimates
2. Prepare Class "C" Estimates for various options and reports
3. Prepare Class "B" Estimates
4. Prepare Class "A" Estimates

RS 4 Risk Management

4.1 Develop a Risk Management Plan that identifies risks and methods to manage the risks throughout the project life cycle, from the analysis of project scope of work through to construction completion.

4.2 The Consultant to work with the Department Representative as part of the development and update of the overall Risk Management Plan.

4.3 A risk management strategy is essential to the project management at PWGSC. Such a strategy combines project planning, design development planning, procurement planning and implementation planning. The Consultant is to implement Risk Management strategies and requirements.

4.4 As part of the Risk Management Process the Consultant is to:

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
4. develop risk response, including but not limited to risk avoidance, transfer, mitigation and acceptance
5. implement risk controls and risk response strategies as required
6. submit the initial Risk Management Plan at the end of the Analysis of Project Scope of Work
7. submit Construction Risk Management Plan identifying risks, risk controls and risk response strategies during the construction phase
8. submit updates to the Risk Management Plan at the end of each major milestone during the design phase of the project (minimum quarterly) and on a quarterly basis during the construction phase

4.5 Risk Management Deliverables

1. Initial Project Risk Management Plan
2. Construction Risk Management Plan
3. Updated Risk Management Plans

RS 5 Quality Management

5.1 Prepare and submit a Quality Management Plan (QMP) to implement and manage Quality Control (QC) through all phases of the project. Allow ten (10) working days for review of draft QMP.

5.2 Submit updated Quality Management Plans or confirmation of no changes to the schedule or QMP to the Departmental Representative at major milestones or on a quarterly basis at a minimum.

5.3 Quality Control (QC) sign-off sheets are to be completed and attached to each submittal during the project to confirm Quality Control review.

5.4 PWGSC may retain the services of a Quality Assurance (QA) Review Consultant under a separate contract to review deliverables. The QA Review Consultant will also sign QC sign-off sheets.

5.5 Prepare in collaboration with PWGSC a Construction Quality Assurance / Quality Control (QA/QC) plan to be used during the Construction Document development and during the Construction phase of the project.

5.6 QA/QC plan is to indicate Contractor's QC requirements during Construction and notify Contractor of QA activities to be carried out by Consultants and Departmental Representative.

5.7 Incorporate approved QA/QC plan into the Construction documents.

5.8 Quality Management Deliverables

1. Initial Project Quality Management Plan
2. Construction Quality Assurance / Quality Control (QA/QC) plan
3. Updated Quality Management Plans

RS 6 Investigations, Studies and Reports

6.1 Prepare and submit to the Departmental Representative a plan and schedule to carry out the investigations, studies and reports required to fulfill the scope of work and address the specific investigation, studies and reports identified in the PR section of the Project Brief. Describe terms of reference for each individual study and investigation.

6.2 Obtain written authorization of plan and schedule for investigations and studies from the Departmental Representative before proceeding with each investigation or study.

6.3 Incorporate the accepted plan and schedule for investigations and studies into the project Work Breakdown Structure and Detailed Project Schedule.

6.4 The inspection of dams, locks, bridges, specialized components and other infrastructure are to be carried out by specialized, experienced and licensed engineers and carried out in accordance with the PWGSC Dam Inspection Manual (DIM), the PWGSC Bridge Inspection Manual (BIM) and applicable codes, standards, guidelines and regulations.

6.5 Identify health and safety requirements and environmental requirements and integrate these requirements into the program of work for field investigations.

6.6 Investigations and studies are to be coordinated and executed in a manner that minimizes impact on Client Department operations, vehicle access, visitor access and the general public.

6.7 If additional investigations, studies and tests are required:

1. define the scope, schedule and cost for the proposed additional investigations, studies or tests
2. clearly indicate if additional work requires temporary roadway closures or access restrictions
3. with the assistance of the Consultant, PWGSC will seek approval for additional investigations or studies from authorities having jurisdiction
4. upon receiving written acceptance to proceed from the Departmental Representative, execute only the accepted additional studies, investigations and tests

6.8 Submit investigation letter reports to Departmental Representative for review within ten (10) business days following completion of field investigative work.

6.9 Assist PWGSC by collecting and providing information required for the completion of an Environmental Assessment Study to be prepared by PWGSC and others.

6.10 Investigation, Studies and Report Deliverables:

1. Plan and schedule for Investigations, Studies and Reports
2. Letter reports for each Investigation and Study

RS 7 Design Concept

7.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to Design Concept.

7.2 Analyze design options as described in the PR 4.1 section of this Project Brief and compare them against the project objectives, scope of work, constraints and opportunities to recommend a preferred design option. Within this process the Consultant is to:

1. submit a Design Concept Report
2. submit Design Concept Presentation materials prior to the Design Concept meeting that will describe the analysis of design options and the recommended design option
3. attend Design Concept meeting and present design concept options to the Departmental Representative and Client Department, complete with annotated sketches, order of magnitude cost estimates, initial construction time estimates, implementation challenges, and a list of unavoidable non-compliances to codes, standards and regulations

.1 Presentations

a) submit the presentation material, and supporting documentation, to the Departmental Representative for review and approval
b) based on the results of the Option Analysis, develop an appropriate combination of handouts, drawings, electronic slide show, etc., for presentations to PWGSC, Client Department and as required, other Authorities having jurisdiction
c) organize and deliver Design Concept presentations. Keep records of the comments received, changes requested, concurrence with presented material and approval of the recommended option, or decisions to investigate or select another option, for further design development

4. evaluate the options, following the Design Concept meeting, by each of the applicable Consultant Team disciplines in sufficient detail and clarity such that a single preferred option is recommended by the Consultant for Design Development

5. provide the following for the single preferred option:

.1 adequately demonstrate that options adhere to the project objectives and constraints
.2 submit a Design Concept Report adequately supported by graphs; lists; tables; drawings; sketches; plans; sections; perspective views and include Executive Summary
.3 include Class "C" Constructirehabilitationon Cost Estimate and Schedule
.4 include a list of unavoidable non-conformances
.5 include options analysis with life cycle cost analysis

7.3 Meetings during the Design Concept stage are to cover:

1. recap progress achieved to date and work remaining to be completed
2. submit an updated schedule for the Design Concept work and compare with previous schedule submitted
3. present progress achieved since the previous meeting
4. produce minutes for Departmental Representative review and acceptance

7.4 Submit the design concept documents for review in sufficient detail to illustrate the design concepts and to demonstrate compliance with the Project requirements.

7.5 Consider all design issues for all elements identified for rehabilitation, repair or replacement and items that could include unavoidable non-conformances.

7.6 Consider design elements such as construction approach and methodology, constructability, long-term cost-benefit considerations, project timelines, community impact, speed of construction, weather conditions during the pre-established construction period, environmental considerations, etc. Issues such as land ownership restrictions and continued usage of site, provision of a temporary structures, staging areas, safety, etc. are also to be considered.

7.7 Provide environmental technical advice to complete Detailed Environmental Impact Assessment coordinated by Parks Canada and PWGSC. The environmental mitigations identified to be included in the contract specifications and/or drawings as contract requirements.

7.8 Provide technical advice for Cultural Resource Assessment intervention review to be incorporated into the environmental impact assessment report. Required mitigations are to be incorporated into the drawings and specifications.

7.9 Recommend a Preferred Concept Design Option for Design Development consideration as part of the Design Concept Report to the Departmental Representative.

7.10 Design Concept Deliverables:

.1 Design Concept Report
.2 Design Concept Presentation materials
.3 Design Concept Presentation
.4 Class "C" Construction cost estimate
.5 Construction Schedule
.6 Final Design Concept Report

RS 8 Design Development

8.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to the Design Development.

8.2 Based on the approved Design Concept, the Consultant is to further develop the design option selected for refinement and produce a Design Development Report to describe the scope, quality and cost of the project in sufficient detail to: define the details of design components, identify systems and materials for all applicable disciplines, and confirm their compliance with codes, standards and all other Project Requirements; elaborate the details of construction implementation strategies (e.g. phased construction, demolition, dewatering, traffic control, mobilization, duration, etc.); identify and assess potential risks, and recommend mitigation measures; facilitate the reviews, discussions and decisions relating to the design; and obtain the necessary approvals to proceed to the development of Construction Documents.

8.3 Refine the Approved Concept Design Option to a level of detail to facilitate preparation of Class B Construction Cost Estimates, the updating of the Cost Plan, the Risk Management Plan, the Construction Project Schedule

8.4 Submit to the Departmental Representative, design development documents in sufficient detail to fully define the size, location, intent, character, schedule, commissioning, cost of the Project, and associated risks and means of their mitigation:

1. incorporate approved environmental protection measures into the design
2. incorporate approved Cultural Resource protection measures into the design
3. incorporate approved Operational requirements into the design
4. submit an updated and refined Construction Cost Estimate based on the design development documents, and the updated items identified in 8.4.1 above
5. submit design drawings, notes and calculations of the 50% completion stage of Design Development
6. implement where appropriate Departmental Representative comments and directions within the subsequent design submissions
7. submit copies of final design development documents in accordance with PA 1.5 subsection 4.

8.5 Presentations

1. Submit the presentation material, and supporting documentation, to the Departmental Representative for review and approval.
2. Based on Design Development Documents, develop an appropriate combination of handouts, drawings, electronic slide show, etc., for presentations to PWGSC and, as required, to Authorities Having Jurisdiction.
3. Provide sufficient quantities of approved presentation material, organize and deliver the presentations. Keep records of the comments received, changes requested, concurrence with presented material and approvals.
4. Prepare a report on the outcome of each presentation made and submit for the Departmental Representative's review and approval.

8.6 Final design to be all-inclusive, except for temporary works during construction to be designed by the Contractor. The design documents to be comprehensively detailed to permit fabrication and assembly/erection/casting of all structures, as well as purchase and installation of all equipment.

8.7 Drawings to include tables where appropriate to summarize work, location and extent. Provide a numbering scheme to assist when referencing work activities.

8.8 Meetings during the Design Development stage are to occur for each project deliverable listed in RS 8.9 and to meet Milestones in PR 2.5. The Consultant is to produce minutes for Departmental Representative review and acceptance. Ensure that pertinent members of the Consultant Team are participating in meetings as required. During the meetings, the Consultant Team is to at the minimum:

1. recap progress achieved to date and work remaining to be completed
2. submit an updated schedule for the Design Development work and compare with previous schedule submitted
3. present progress achieved since the previous meeting

8.9 Design Development Deliverables:

1. Initial Design Development Report with design development drawings
2. Design Development Presentation Materials
3. Design Development Presentation
4. Class "B" Construction Cost Estimate
5. Updated Construction Schedule
6. Final Design Development Report with design development drawings

RS 9 Construction Documents

9.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to the development of Construction Documents.

9.2 Submit outline of proposed drawings and specifications for review.

9.3 Incorporate approved environmental protection measures into the drawings and specifications.

9.4 Incorporate approved Cultural Resource protection measures into the drawings and specifications.

9.5 Incorporate approved operational requirements into the drawings and specifications.

9.6 Incorporate approved Quality Assurance / Quality Control measures into the drawings and specifications.

9.7 Submit Construction documents for review at 50%, 99% and 100% completion.

9.8 Implement Departmental Representative comments and directions following review of each submission. Provide written reply to Departmental Representative comments.

9.9 Submit a Class "A" Construction Cost Estimate, as well as an updated Cost Plan, Project Risk Management Plan, Construction Quality Management Plan and Project Schedule, as well as QA/QC documentation for this portion of document preparation work.

9.10 Submit Construction Document checklist for each submission from Doing Business with PWGSC - Appendix A: Checklist for submission of Construction Documents to PWGSC.

9.11 Submit final documents signed and sealed by specialist Professional Engineers licensed in the Province of Ontario.

9.12 Construction Documents Deliverables:

1. Outline of drawings and specifications
2. Construction Quality Assurance / Quality Control (QA/QC) plan
3. 50% completion Construction Documents
4. 99% completion Construction Documents
5. 100% completion Construction Documents
6. Class "A" Construction Cost estimate
7. Final Construction Schedule

RS 10 Tender Call, Bid Evaluation and Construction Contract Award

10.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to Tender Call, Bid Evaluation and Construction Contract Award.

10.2 Provide design services during tender period and assist with the evaluation of bids by qualified Contractors to award a contract for the construction of the project as per the Tender Documents and in accordance with Government Contract Regulations. During Tender Call the Consultant is to:

1. provide hard copies of construction documents "Issued for Tender" and electronic files in a format acceptable for tendering on Buyandsell.gc.ca.

2. assist the Departmental Representative in organizing a site visit (job showing) for the purpose of briefing potential bidders on the requirements of the construction contract
3. attend site visit (job showing) and record participants, questions and issues raised by bidders, as well as points of clarification and responses provided
4. prepare minutes of the site visit (job showing) and submit to the Departmental Representative
5. assist the Departmental Representative in addressing and responding to technical inquiries submitted by bidders during the tender period
6. advise the Departmental Representative in assessing the need for Addenda to address the questions and issues raised by bidders or to provide required corrections or points of clarification
7. examine the impact that any Addenda may have on cost and schedule, and advise the Departmental Representative accordingly
8. prepare and submit Addenda to Contract Documents to Departmental Representative for acceptance and distribution

10.3 Bid Evaluation and Construction Contract Award:

1. The Contracting Authority to be responsible for public posting of tender documents, arranging for the receipt of bids and awarding of the Construction Contract.
2. The Consultant is to, on request, review and evaluate the bids received for the construction of the Project, and provide advice on their relative merits and/or shortcomings.

10.4 Tender Call, Bid Evaluation and Construction Contract Award Deliverables

1. Updated Drawings and Specifications "Issued for Tender"
2. Minutes of Site Visit (Job Showing)
3. Letter Reports with Technical Advice
4. Addenda to Contract Documents

RS 11 Construction and Contract Administration

11.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to Construction and Contract Administration.

11.2 The Consultant Services during Construction and Contract Administration to include, but are not limited to the following activities:

1. Construction Schedule:

   .1 After the award of the Construction Contract, request from the Contractor a detailed construction schedule, and, after review for conformity with the Project Schedule and implementation of any necessary adjustments, forward an annotated construction schedule, dated, signed "Reviewed and Accepted" by the Consultant to the Departmental Representative in an electronic format.

   .2 Monitor and report to the Departmental Representative the progress of construction, or delays, on a weekly basis.

   .3 Immediately notify the Departmental Representative of any known and anticipated delays that may affect the completion date of the Project, and in conjunction with the Contractor propose delay mitigation measures, complete with associated costs.

   .4 Keep accurate records of the causes and duration of all delays, and update the Risk Management Plan as required.

   .5 Consultant to evaluate and provide advice to the Departmental Representative, for requests from the Contractor for time extensions. The Departmental Representative after consideration will issue directions to the Consultant to give to the Contractor. Only the Departmental Representative may authorize any request for Time Extension. Authorization must be issued in writing.

2. Construction Safety

   .1 All construction projects performed by the Contractor are subject to federal and provincial safety regulations.

   .2 The Contractor to provide Site Specific Health and Safety Plans in accordance with the contract that is to include emergency response plans; fire plans, and the identification of any additional site specific issues. The Consultant is to ensure that these plans are adequate and are adhered to.

3. Construction Meetings

   .1 Co-ordinate and schedule regular meetings with the Departmental Representative and Contractor, Contractor is to hold and attend construction meetings as required by the Construction Contract.

   .2 Prepare agenda and facilitate all such meetings.

   .3 Document minutes of each meeting and provide an electronic copy to the Departmental Representative and all attendees within a maximum of five (5) working days of the meeting.

4. Clarification and Interpretation

   .1 The Consultant is to provide clarifications and interpretations of the construction documents in written and/or graphic form, to the

Contractor, with a copy to the Departmental Representative as and when necessary.

.2 The Consultant is not to make any changes to affect scope/budget/schedule without prior written approval from the Departmental Representative.

5. Shop Drawings, Contractor Design(s) and Construction Materials Submissions

.1 The Consultant is to:

a) specify in the construction specifications the shop drawings; materials data sheets/information and temporary works designs to be submitted by the Contractor

b) review within five (5) business days of receipt of shop drawings/designs/materials submissions provided by the Contractor to determine conformity with the design concept; intent of the construction documents and indicate to the Contractor general conformance

c) provide comments to and request re-submissions from the Contractor, as necessary

d) provide the Departmental Representative within five (5) business days of receipt of accepted submission, a signed "Reviewed and Accepted" and dated electronic copy

6. Testing and Inspection

.1 The Consultant is to:

a) recommend the need for testing, and review test reports of materials and/or construction

b) provide all quality assurance testing

c) specify in the construction documents and implement the Construction Quality Management Plan, recommend quality control testing to be undertaken during construction, evaluate the results and advise the Departmental Representative accordingly

d) request the Contractor to take remedial action when observed material or construction fails to comply with the requirements of the Construction Contract, and immediately advise the Departmental Representative in writing

e) specify in the construction documents material, product and performance testing to be undertaken by the Contractor and Commissioning agent

f) ensure that all specified testing, commissioning and other QA/QC specifications and recommendations are fully implemented throughout the construction process

g) provide copies of the testing report developed to the Departmental Representative
h) provide environmental monitoring and enforcement during construction

7. Site Visits by the Design Engineers

.1 The Consultant' design engineers are to:
a) perform site technical visits only when work in progress pertains to their respective discipline
b) advise Contractor as to elements to be inspected and the associated timing of their inspections
c) record and report to the Departmental Representative on the progress, quality of work observed at each site meeting, and provide the Contractor and Departmental Representative with written progress reports and lists of deficiencies observed with corrective actions
d) assist in the implementation by the Contractor of all remedial actions accepted by the Departmental Representative in writing
e) issue a written confirmation of the completion of all remedial actions to the Departmental Representative and to the Contractor

8. Changes to Construction Contract

.1 The Consultant is to:
a) submit to the Departmental Representative in writing, for approval, all requests and recommendations for changes; and to identify impact on Construction Contract
b) obtain quotations from the Contractor for contemplated changes, review, assess the effect on construction progress and completion date, and submit recommendations to the Departmental Representative in writing
.2 The Consultant does not have the authorization to approve a change in work or the prices of any contract.
.3 The Departmental Representative will issue Change Orders for all approved changes.
.4 All changes, including those not affecting the cost of the project, must be covered by Change Orders.

9. Contractor's Progress Claims

.1 The Consultant is to:
a) request from the Contractor prior to the issuance of the first progress claim, a cost breakdown of the Construction Contract Award Price in detail appropriate to the size and

complexity of the Project, or as may otherwise be specified in the Construction Contract, and submit the cost breakdown to the Departmental Representative

b) review Contractor submitted monthly progress claims (with cost breakdown, statutory declaration and WSIB certificate) in a timely manner and, if acceptable, certify the progress claims for work completed and materials delivered pursuant to the Construction Contract, and submit them to the Departmental Representative for approval and processing

c) measure and record the quantities of labour, materials and equipment involved for the purpose of certifying progress claims if the construction is based on unit prices

d) verify at each progress payment claim that the Contractor has accurately recorded information on the site as built set of construction documents

e) update schedule of work progress

10. Substantial Completion of the Project

.1 The Consultant is to:

a) review the construction work with the Departmental Representative and the Contractor, and record all unacceptable and incomplete work detected

b) develop a deficiency list of incomplete items and issue to the Contractor and Departmental Representative

c) request from the Contractor, review for completeness and adequacy, and provide the Departmental Representative with, all supporting documents in accordance with the Construction Contract

d) prepare and submit to the Departmental Representative for approval and processing, a Certificate of Substantial Completion as required by the Construction Contract, together with supporting documents properly signed and certified

11. Acceptance Board

.1 Inform the Departmental Representative when satisfied that the project is substantially completed. The Consultant is to ensure that his representative, Sub-Consultant representative, Resident On-Site Reviewers, Contractor(s) and major sub-trades representatives are to form part of the Project Acceptance Board and attend all meetings as organized by PWGSC.

12. Interim Inspection

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

.2 The Contractor(s) is required to provide a work plan of actions and schedule to correct all deficiencies.

13. As-Built Record Drawings

.1 Before the issuance of the final Certificate of Completion, the Consultant is to:

a) prepare and provide the Departmental Representative with a complete set of as-built records

b) verify that record drawings are suitable for digital storage and retrieval, incorporating all recorded changes to the original working drawings based on as-built prints, drawings and other information provided by the Contractor, together with Change Orders and Site Instructions

c) verify that record drawings are labeled ‘‘Record’’, dated and signed by the Consultant, and provide also a marked-up copy of the specifications recording changes thereto

.2 For each tender package, submit complete Record drawings and as-built specifications in number and format required by the contract within six (6) weeks of final certification.

.3 A complete set of final shop drawings are to be issued in hard copy and electronic format.

14. Final Completion of the Project

.1 The Consultant is to:

a) advise the Departmental Representative in writing that the construction has been completed in general conformity with the Construction Contract and the Approved Design

b) make a final review of the construction with the Departmental Representative and the Contractor and, if satisfactory, prepare and submit to the Departmental Representative for approval and final payment to the Contractor, a final Certificate of Completion as required by the Construction Contract, together with supporting documents properly signed and certified, including manufacturers’ and suppliers’ warranties

15. Design Services during Construction are to be provided from start of construction through to commissioning. The Design Consultant Services During Construction are to include, but are not limited to the following activities:

.1 submitting updated drawings and specifications that include amendments and issues raised during tendering
.2 attending and participating in project meetings as requested by the Departmental Representative
.3 performing site inspections for conformance of work as requested by the Departmental Representative
.4 reviewing and replying to Contractor's submittals
.5 advising Departmental Representative with respect to alternative construction methods or alternative materials proposed by the Contractor
.6 modifying design as required to provide for unexpected field conditions
.7 submitting Site Instructions to Contractor
.8 providing technical details, cost estimates, drawings and sketches for Contemplated Change Notices (CCN) and Change Orders (CO)
.9 assist in the commissioning activities as requested by the Departmental Representative
.10 inspect the completed work, provide list of deficiencies after substantial completion to be addressed prior to issuance of final certificate of completion
.11 review Contractor's end-of-construction deliverables by preparing a list of deliverables, reviewing and ensuring that all end-of-construction deliverables from the Contractor, including but not limited to warranties, as-built Record Drawings and Operations and Maintenance manuals, have been submitted in specified quantities and format to the Departmental Representative
.12 review and provide feedback on Contractor's marked-up Record Drawings for preparation of as-built Record Drawings and Final Record Drawings
.13 edit CADD files to incorporate Contractor's as-built markups to generate and submit final as-built record drawings
.14 review and comment on O&M Manuals

11.3 Construction and Contract Administration Deliverables

1. Reviewed and Accepted Construction Schedule
2. Minutes of Construction Meetings
3. Weekly Construction Progress Reports
4. Site Specific Health and Safety Plans
5. Updated Drawings and Specifications "Issued for Construction"
6. Site Inspection Letter Reports
7. Responses to Contractor's submittals

8. Site Instructions to Contractor
9. Contractor's Progress Claims
   .1 Technical details for CCNs and COs
10. Certificate of Substantial Completion
11. List of deficiencies to be addressed for certificate of final completion
12. Interim Inspection
   .1 Technical details
13. Comments on Contractor's O&M Manuals
14. Feedback on Contractor's marked-up "as-built" Record Drawings
15. Letter report on the review of Contractor's end-of-construction deliverables
16. Final As-built Record drawings
17. Certificate of Completion

RS 12 Resident Site Services During Construction

12.1 The Consultant is to obtain written authorization from the Departmental Representative before proceeding with the services related to the provision of Resident Site Services during Construction.

12.2 The purpose of Resident Site Services is to ensure the presence of the Consultant's representatives on-site to inspect, coordinate and monitor all aspects of the work from the start of the project construction to the completion of commissioning, and liaise with Public Works and Government Services Canada and other agencies as appropriate to the work.

12.3 The Consultant is to submit resumes, confirming the qualifications and experience of proposed Resident Site Services personnel, and obtain the approval of the Departmental Representative before assigning the personnel to the project.

12.4 Consultant Resident Site Representatives are responsible for providing resident inspection for all aspects of the project, maintaining daily records of all construction work placed.

12.5 The Resident Site Representative is to be thoroughly familiar with the Project drawings, specifications, general concept of the design and execution of works, and all pertinent details related to construction, sequencing, methodologies, Safety Plans, Project Schedule, Risk Management Plan, Construction Quality Management Plan and Cost Estimates.

12.6 Site Office

1. Resident Site Services are to include a site office and site-based office equipment, including but not limited to Internet access, appropriate computer system and software, telephone service, etc.

12.7 Site Resident Responsibilities

1. The Resident Site Representative is to:

.1 assist in carrying his construction and contract administration duties
.2 inspect all phases of the work in progress, for the purpose of bringing to the attention of the Contractor, after confirming with both the Consultant and the Departmental Representative, any discrepancies between the work, the contract documents, the schedule and accepted construction procedures and practices
.3 assist PWGSC in ensuring prompt implementation by the Contractor of all remedial actions accepted by the Departmental Representative in writing, and issue a written confirmation of their completion to the Consultant, to the Departmental Representative and to the Contractor
.4 maintain and submit to Departmental Representative a detailed and descriptive daily log of all inspections, attendees onsite, observations, work progress, equipment and workers, material quantities, site conditions, weather, and of unexpected occurrences on site, and additionally, on a consistent day of each week, electronically issue a weekly summary report to include pertinent photographs prepared in the format acceptable to the Departmental Representative and to the Consultant
.5 prepare weekly any other reports or surveys as may be required to provide complete information to Departmental Representative
.6 verify quantities of materials received and record work progress through photographs (digital files to be submitted to PWGSC in accordance with section 1.5.3, Project Administration)
.7 communicate with the Contractor in a formal manner (written as required) and contact the Consultant when actions of the Consultant are required (instructions, clarifications, requisitions, Change Orders etc.)
.8 maintain on site a complete inventory of construction documents and files for by the Departmental Representative, Consultant and himself
.9 stop work in the event of emergencies, contact local security or emergency services in the event of traffic related or public security emergencies
.10 provide environmental monitoring and enforcement during construction

12.8 Resident Site Service Deliverables

1. Electronic weekly summary report with pertinent photographs
2. Weekly surveys and report details to augment summary report
3. Quantities of materials verification documents
4. Copy of detailed and descriptive daily log of all inspections

RS 13 Post Construction Services

13.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to Post Construction.

13.2 Provide inspection, trouble-shooting, problem-solving and construction contract warranty review/assistance services for a period of one (1) calendar year following the date of issuance of the final Certificate of Completion by the Departmental Representative.

13.3 Initial (Ten-month) Warranty Inspection

1. Sixty (60) days prior to expiration of the warranty period, the Consultant is to:
   - .1 conduct a Ten-month Warranty Inspection of the construction projects
   - .2 verify the integrity and performance of all constructed components and systems, to ensure that they continue to effectively meet the prescribed requirements
   - .3 review all warranty service callback work performed by the Contractor
   - .4 identify and report deficiencies to the Departmental Representative and to the Contractor for corrective action
   - .5 submit Initial Warranty Inspection Letter report

13.4 Final Warranty Inspection

1. Just prior to the expiry of the warranty period, the Consultant is to:
   - .1 conduct a Final Warranty Inspection of the construction projects
   - .2 verify whether all deficiencies identified at the Ten-month Warranty Inspection have been corrected, and confirm any outstanding work
   - .3 identify any other deficiencies that might have developed since the Ten-month Warranty Inspection
   - .4 report all deficiencies to the Departmental Representative and to the Contractor for corrective action
   - .5 do a follow-up inspection when the Contractor has corrected all deficiencies

.6 inform the Departmental Representative in writing when all deficiencies listed on the Final Warranty Report have been corrected

.7 submit Final Warranty Inspection Report

13.5 Post Construction Services Deliverables:

1. Letter reports providing trouble-shooting, problem-solving and construction contract warranty review/assistance services
2. Initial Ten-Month Warranty Inspection Letter Report
3. Final Warranty Inspection Report

SUBMISSION REQUIREMENTS AND EVALUATION (SRE)

SUBMISSION REQUIREMENTS AND EVALUATION (SRE)

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 to be established as follows:

Technical Rating x 90%	=	Technical Score (Max. 90 Points)
Price Rating x 10%	=	Price Score (Max. 10 Points)
Total Score	=	Max. 100 Points

SRE 2 PROPOSAL REQUIREMENTS

2.1. Requirement for Proposal Format

The following proposal format information to be implemented when preparing the proposal.

- Submit one (1) bound signed original plus three (3) bound copies of the proposal
- Paper size should be - 216mm x 279mm (8.5" x 11")
- Minimum font size - 11 point Arial, or equivalent
- Minimum margins - 12 mm left, right, top, and bottom
- Double-sided submissions are preferred
- One (1) 'page' means one side of a 216mm x 279mm (8.5" x 11") sheet of paper formatted as described above
- 279mm x 432 mm (11" x 17") fold-out sheets for spreadsheets and organization charts to be counted as one page per side
- The order of the content of the proposals to follow the order established in the Request for Proposal SRE section

2.2. Specific Requirements for Proposal Format

2.2.1. The maximum number of pages (including text and graphics) to be submitted for the Rated Requirements under SRE 3.2 is **twenty-five (25) pages.**

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

a) Covering letter
b) Cover page
c) Tab/Dividers, provided they are free of text and/or graphics
d) Consultant Team Identification (Appendix A)
e) Declaration/Certification Form (Appendix B)
f) Integrity Provisions – Required Documentation (Appendix B – Annex A)
g) Front page of the RFP
h) Front page of revision(s) to the RFP
i) 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 REQUIREMENT

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

3.1.1. Licensing, Certification and Authorization

a) The proponent shall be a Structural Engineering Consultant licensed, or eligible to be licensed, certified or otherwise authorized to provide the necessary professional services to the full extent that is required by the province of Ontario.
b) This licensing and certification requirement also applies to key members of the proponent's team, including the Senior Team Leaders, Engineering Team Members, Specialists and Sub-consultants.

3.1.2. Consultant Team Identification

a) The Consultant Team to be identified with the purposes of the evaluation must include the following:

i. Consultant (Proponent): Structural Engineering Consultant
   - In-house Senior Team Leaders:
     - Project Manager
     - Structural Engineer
   - In-house Engineering Team Members:
     - Two (2) Structural Engineer with Heritage Masonry experience

ii. Structural Engineer Sub-Consultant Firm (if required to substitute for in-house Senior Team Leader and Engineering Team Members)
   - Senior Team Leader:
     - Structural Engineer
   - Engineering Team Members:
     - Two (2) Structural Engineer with Heritage Masonry experience

b) Information required:

i. Name of proponent
ii. Copy of proponents Certificate of Authorization issued by Professional Engineers of Ontario. If the Certificate is not provided with the proposal, it must be provided within two (2) days of request from the Contracting Authority.
iii. Names and roles of key personnel to be assigned to the project per Section a) above.
iv. For the Senior Team Leaders and Engineering Team Members indicate current professional license status and affiliation, and/or how you intend to meet the Ontario professional licensing requirements.
v. 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).

c) The Project Manager must have a minimum 10 years of experience managing projects of equivalent scope and depth on fast-track schedules.
d) The Structural Engineer who as Senior Team Leader will supervise and lead each discipline must be a senior Engineer with a minimum 10 years of experience in masonry inspection, analysis, design, and construction projects.
e) Engineering Team Members are to have a minimum of 5 years of relevant masonry experience.
f) The format for submission of the Team Identification information is provided in Appendix A.

g) Additional information listed in paragraphs above to be provided on separate sheets under Appendix A.

3.1.3. Declaration/Certifications Form

a) Proponents must complete, sign and submit the following:

i. Appendix B, Declaration/Certifications Forms

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 Similar Projects

a) Describe the Proponent's experience and details of the work performed as the prime consultant specifically related to heritage masonry restoration projects.
b) Select three (3) masonry projects completed within the last ten (10) years that were either a heritage masonry rehabilitation project or a full restoration project.
c) Information that should be supplied:
i. Clearly indicate how each project is comparable and relevant to the projects described in this Request for Proposal (RFP).
ii. Provide brief project description and intent.
iii. Discuss design philosophy or design approach to meet the intent, design challenges and resolutions.
iv. List details of engineering design and project management work performed.
v. Budget control and management: contract price and final construction cost – explain variation.
vi. Project schedule control and management: initial schedule and revised schedule – explain variation.
vii. Indicate key personnel who were involved in the project delivery that are now proposed for involvement in the projects covered by this RFP.

viii. Provide Client references - name, address, phone and email address of client contact at working level - references may be checked by the Contracting Authority.

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 involved entities in each project.

3.2.2. Achievements of Senior Team Leaders to be Assigned to this Project

a) Describe the experience and performance of Senior Team Leaders to be assigned to this project regardless of their past association with the current proponent or sub-consultant firm.

b) This is the opportunity to emphasize their strengths and expertise directly related to masonry, to recognize their past responsibilities and achievements.

c) Provide information for each of the following Senior Team Leaders:

i. Project Manager

ii. Structural Engineer

iii. Only identify Senior Team Leaders who will be carrying out the engineering or management work on this project.

d) **<u>Information that should be supplied for each Senior Team Leader:</u>**

i. Relevant masonry experience and expertise,

ii. Number of years of relevant experience in the rehabilitation and restoration of masonry structures,

iii. Role, responsibility and details of involvement of the individual in relevant past projects.

3.2.3. Achievements of Engineering Team Members to be Assigned to this Project:

a) Describe the expertise and performance of engineering team members to be assigned to this project regardless of their past association with the current proponent firm.

This is the opportunity to emphasize the strengths and expertise of individuals on the team supporting the Senior Team Leaders on this

project, as directly related to masonry structures, to recognize their past responsibilities and achievements.

i. Provide information for two (2) Engineering Team Members for evaluation, (i.e., Structural Engineer with Heritage Masonry experience). The actual Consultant Team for the project may include more staff, but only two (2) Structural Engineering team members will be evaluated in this proposal.

b) Only identify Engineering Team Members who will be carrying out the majority of the engineering work on this project.

c) <u>Information that is to be supplied for each Engineering Team Member:</u>

i. Relevant masonry experience and expertise,
ii. Number of years relevant experience,
iii. Role, responsibility and details of involvement of the individual in relevant past projects.

3.2.4. Understanding the Project Milestones and Schedule

a) The proponent should demonstrate capability to perform the services and meet project challenges and milestones by providing a plan of work.
b) Information must be provided for the entire project site.

c) <u>Information that should be supplied:</u>

i. Scope of Services - as defined in the Required Services (RS) Sections of this RFP. List and elaborate on any services that need to be added, modified, expanded, etc. in the opinion of the Proponent;
ii. Work Plan - detailed breakdown of work tasks and deliverables;
iii. Project Schedule - proposed major milestones schedule, which falls within the schedule constraints established in the RS Sections;
iv. Risk management strategy and key items to be considered for the project site.

3.2.5. Understanding the Consultant Team Personnel Requirements

a) The proponent should demonstrate the capacity and capability to perform the services and meet the tight pre-tender period schedule constraints for the entire project site.

b) Quantity of proponent's personnel assigned for each individual week, per discipline and per seniority level to be demonstrated in a tabular format.
c) If additional qualified personnel is available to work concurrently, and therefore reduce the number of weeks required to deliver Construction Documents, the proponent may reflect this in the table.

d) <u>Table format and information that should be supplied:</u>

i. Present table on a single side of one 11"x17" sheet;
ii. Row titles are to be used to describe the function/discipline/seniority of Team Members assigned to work during this period;
iii. In each cell of the table, fill in quantity of person-days to be assigned to complete the work within the designated delivery dates.

3.2.6. Design Approach

a) The proponent should elaborate on unique aspects for the sites that could be considered major challenges in order to illustrate their design approach to developing an economical, durable and easily maintained rehabilitation design that allows for fast track construction using innovative design details and construction staging to deliver these projects strictly within the schedule.

b) <u>Information that should be supplied:</u>

i. Describe proposed fast track design plan with design philosophy, materials, construction methods, and other techniques and methodology that will be implemented to ensure that the locks are repaired or rehabilitated during the indicated construction timeframe.
ii. Describe the major challenges and how a team approach will be applied to meet 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 table to establish Technical Ratings:

Criterion	Weight Factor	Rating	Weighted Rating
3.2.1 Achievements of Proponent on Similar Projects	**1.0**	**0 - 10**	**0 – 10**
3.2.2 Achievements of Senior Team Leaders to be Assigned to this Project	**1.5**	**0 - 10**	**0 – 15**
3.2.3 Achievements of Engineering Team Members to be Assigned to this Project	**1.5**	**0 - 10**	**0 – 15**
3.2.4 Understanding the Project Milestones and Schedule	**2.0**	**0 - 10**	**0 – 20**
3.2.5 Understanding the Consultant Team Personnel Requirements	**2.0**	**0 - 10**	**0 - 20**
3.2.6 Design Approach	**2.0**	**0 - 10**	**0 – 20**
Technical Rating	**10.0**		**0 - 100**

3.4. GENERIC EVALUATION TABLE

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

NON RESPONSIVE	INADEQUATE	WEAK	ADEQUATE	FULLY SATISFACTORY	STRONG
0 point	**2 points**	**4 points**	**6 points**	**8 points**	**10 points**
Did not submit information that 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 an excellent understanding of the requirements.
	Weaknesses cannot be corrected	Generally doubtful that weaknesses can be corrected	Weaknesses can be corrected	No significant weaknesses	No apparent weaknesses

	Proponent do not possess qualifications and experience	Proponent lacks qualifications and experience	Proponent has an acceptable level of qualifications and experience	Proponent is qualified and experienced	Proponent is highly qualified and experienced
	Team proposed is not likely able to meet requirements	Team does not cover all components or overall experience is weak	Team covers most components and to likely meet requirements	Team covers all components - some members have worked successfully together	Strong team - has worked successfully together on comparable projects
	Sample projects not related to this requirement	Sample projects generally not related to this requirement	Sample projects generally related to this requirement	Sample projects directly related to this requirement	Leads in sample projects directly related to this requirement
	Extremely poor, insufficient to meet performance requirements	Little capability to meet performance requirements	Acceptable capability, should ensure adequate results	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 (60) points out of the hundred (100) points available as specified above.

No further consideration to be given to proponents not achieving the pass mark of sixty (60) points.

SRE 4 PRICE OF SERVICES

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of sixty (60) 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 amount will be set aside and receive no further consideration.

The remaining price proposals are rated as follows:

a) The lowest price proposal receives a Price Rating of 100
b) 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.

c) On the rare occasion 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:

Rating	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 to be approached in order to finalize the details of a contractual agreement 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 SUBMISSION 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.

- ☐ Team Identification - see typical format in Appendix A
- ☐ Declaration/Certifications Form - completed and signed - form provided in Appendix B
- ☐ Integrity Provisions - Required Documentation – **as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per R1410T (2016-04-04), General Instructions 1 (GI1), Integrity Provisions – Proposal, **Section 3a.**
- ☐ Integrity Provisions - Declaration of Convicted Offences – **with its bid, as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per R1410T (2016-04-04), General Instructions 1 (GI1), Integrity Provisions – Proposal, Section 3b.
- ☐ Proposal - one (1) original plus three (3) copies
- ☐ Front page of RFP- completed and signed
- ☐ Front page(s) of any solicitation amendment – completed and signed

In a separate envelope:

- ☐ Price Proposal Form - one (1) completed and submitted in a separate envelope using form provided in Appendix C
  - submitted in a separate sealed envelope clearly marked "Price Proposal", and listing the Proponent firm's name

APPENDIX A

TEAM IDENTIFICATION FORMAT

APPENDIX A - TEAM IDENTIFICATION FORMAT

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

The Consultant and other members of the 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.

Fill in all spaces provided on the form.

I. Consultant (Proponent) – Structural Engineer:

Firm or Joint Venture Name: .....
.....
.....

Key Individuals and provincial professional licensing status and/or professional accreditation:

Senior Team Leaders:

Project Manager:
.....
Structural Engineer:
.....

Engineering Team Members:

Structural Engineer with Heritage Masonry experience:
.....

Structural Engineer with Heritage Masonry experience:
.....

II. Key Sub Consultants/Specialists (if not listed under Consultant):

Structural Engineer:

Firm Name: .....
.....
.....

Key Individuals and provincial professional licensing status and/or professional accreditation:

APPENDIX A - TEAM IDENTIFICATION FORMAT (CONT'D)

Senior Team Leader:

Structural Engineer:

……

Engineering Team Members:

Structural Engineer with Heritage Masonry experience:

……

Structural Engineer with Heritage Masonry experience:

……

Resident Site Representative:

Although an individual does not need to be identified at this time, note that the Resident Site Representative shall be a qualified Civil Engineering Technologist or Engineer; have a minimum of five (5) years of recent pertinent experience in providing Resident Inspection Services during construction on projects involving assets similar to the one covered in this Project.

Additional Information to be provided:

i. Name of proponent, and name of Structural Engineer sub-consultant, if used.
ii. Copy of proponents Certificate of Authorization issued by Professional Engineers Ontario. If the Certificate is not provided with the proposal, it must be provided within two (2) days of request from the Contracting Authority
iii. Names and roles of key personnel to be assigned to the project per Section i) above.
iv. For the Senior Team Leaders, Engineering Team Members indicate current professional license status and affiliation, and/or how you intend to meet the Ontario professional licensing requirements.
v. 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).

APPENDIX B

DECLARATION/CERTIFICATIONS FORM

APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title:

Name of Proponent:

Street Address: **Mailing Address:**

Telephone Number: ( )

Fax Number: ( )

E-Mail:

Procurement Business Number:

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

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

Federal Contractors Program for Employment Equity - Certification

I, the Proponent, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada to declare a proposal non-responsive, or to declare a consultant in default, if a certification is found to be untrue, whether during the proposal evaluation period or during the contract period. Canada to have the right to ask for additional information to verify the Proponent's certifications. Failure to comply with any request or requirement imposed by Canada may render the proposal non-responsive or constitute a default under the contract.

For further information on the Federal Contractors Program for Employment Equity visit Employment and Social Development Canada (ESDC)-Labour's website.

Date:_____(YY/MM/DD) (If left blank, the date to be deemed to be the bid closing date.)

Complete both A and B.

A. Check only one of the following:

( ) A1. The Proponent certifies having no work force in Canada.

( ) A2. The Proponent certifies being a public sector employer.

( ) A3. The Proponent certifies being a federally regulated employer being subject to the *Employment Equity Act*.

( ) A4. The Proponent certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

( ) A5. The Proponent has a combined work force in Canada of 100 or more employees; and

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

( ) A5.1. The Proponent certifies already having a valid and current Agreement to Implement Employment Equity (AIEE) in place with ESDC-Labour.

OR

( ) A5.2. The Proponent certifies having submitted the Agreement to Implement Employment Equity (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

( ) B1. The Proponent is not a Joint Venture.

OR

( ) B2. The Proponent is a Joint Venture and each member of the Joint Venture must provide the Contracting Authority with a completed Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the General Instructions)

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

Former Public Servant (FPS) - Certification

Contracts awarded to 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 awarded to FPS, proponents must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of proposals is completed, Canada will inform the Proponent of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the proposal non-responsive.

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 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 payable to the *Canada Pension Plan Act*, R.S., 1985, c.C-8.

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

Former Public Servant in Receipt of a Pension

As per the above definitions, is the Proponent a FPS in receipt of a pension?
YES ( ) NO ( )

If so, the Proponent must provide the following information, for all FPS in receipt of a pension, as applicable:

(a) name of former public servant;
(b) date of termination of employment or retirement from the Public Service.

By providing this information, proponents agree that the successful Proponent's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

Work Force Adjustment Directive

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 of 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 adjustment 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 Applicable Taxes.

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

Name of Proponent:

DECLARATION:
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:_____.

Telephone 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

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

proposal, the Contracting Authority will inform the Proponent of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within the time frame provided will render the proposal non-responsive.

APPENDIX B – ANNEX A – INTEGRITY PROVISIONS – REQUIRED DOCUMENTATION

Board of Directors

In accordance with the Integrity provisions—proposal of R1410T GI1 (2016-04-04), Proponents are required to provide a list of their Board of Directors before contract award. Proponents are requested to provide this information in their bid.

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

Director Name - _____ Title:_____

APPENDIX C

PRICE PROPOSAL FORM

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 Applicable Taxes.

PROPONENTS SHALL NOT ALTER THIS FORM

Project Title:

Name of Proponent:

The following will form part of the evaluation process:

REQUIRED SERVICES

Fixed Fee (R1230D (2016-01-28), GC 5 - Terms of Payment – Architectural and/or Engineering Services)

SERVICES		FIXED FEE
RS 1	Management of Consulting Services	$.....
RS 2	Analysis of Project Scope of Work	$.....
RS 3	Estimating and Cost Planning	$.....
RS 4	Risk Management	$.....
RS 5	Quality Management	$.....
RS 6*	Investigations, Studies and Reports (Services)	$.....
RS 7	Design Concept	$.....
RS 8	Design Development	$.....
RS 9	Construction Documents	$.....
RS 10	Tender Call, Bid Evaluation and Construction Contract Award	$.....
RS 13	Post Construction Services	$.....

MAXIMUM TOTAL FIXED FEES **$.....**[1]

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

Time Based Fee (R1230D (2016-01-28), GC 5 - Terms of Payment– Architectural and/or Engineering Services)

SERVICES	ESTIMATED HOURS Column A	HOURLY RATES** Column B	**TIME BASED FEE** Columns AxB
RS 11 Construction and Contract Administration***	3000	$.....	$.....
RS 12 Resident Site Services During Construction***	3300	$.....	$.....

TOTAL ESTIMATED TIME BASED FEES **$ ……..** [2]

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

***Payment to be based on actual hours spent.

Disbursements

At cost without allowance for mark-up or profit, supported by invoices/receipts - see clause R1230D (2016-01-28), GC 5 - Terms of Payment– Architectural and/or Engineering Services, section GC5.12 Disbursements:

RS 6*	Investigations, Studies and Reports	
	Topographical and Bathymetric Survey	$.....
	Geotechnical Field Work	$.....
	Materials Sampling and Testing	$.....
	Sub-TOTAL DISBURSEMENTS	**$.....**

MAXIMUM TOTAL AMOUNT FOR DISBURSEMENTS $..... [3]

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

Notes:

*RS 6: Consultant's time to carry out investigations, studies and prepare reports to be billed as Fees. Costs for carrying out fieldwork, typically through sub-consultants or specialized service providers to be billed as Disbursements.

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

Maximum Total Fixed Fee	$.....[1]
Total Estimated Time Based Fees	$.....[2]
Maximum Total Amount for Disbursements	$.....[3]
Total Evaluated Fee (1+2+3)	$.....

END OF PRICE PROPOSAL FORM

APPENDIX D – DOING BUSINESS WITH PWGSC

See attached.

APPENDIX E – HERITAGE CANALS AND ENGINEERING WORKS CADD STANDARDS SUPPLEMENT

See attached.

APPENDIX F – SELECTED EXISTING PHOTOS AND ILLUSTRATIONS, DRAWINGS AND REPORTS

See attached .zip file containing photos

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Last updated: April 8, 2013

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

This document must be used in conjunction with the Terms of Reference (TOR), 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.

SECTION 2 PWGSC NATIONAL CADD STANDARD

Drawings shall be in accordance with PWGSC National CADD Standards and Canadian Standards Association (CSA) B78.3.

Refer to:
http://www.tpsgc-pwgsc.gc.ca/biens-property/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.

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://sacc.pwgsc.gc.ca/sacc/query-e.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 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. 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.pwgsc.gc.ca/cgsb
- ANSI standards: http://www.ansi.org
- ASTM Standards: http://www.astm.org
- ULC standards: http://www.ulc.ca
- General reference of standards: http://www.cssinfo.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 [_____].

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 systems). Substantiation and/or justification will be required.

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 EMCS systems 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 can only be estimated (eg. earth work) and 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".

Sample of Unit Price Table:

> The Unit Price Table designates the Work to which a Unit Price Arrangement applies.
>
> (a) The Price per Unit and the Estimated Total Price must be entered for each Item listed.
>
> (b) Work included in each item is as described in the referenced specification section.

Item	Specification Reference	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity	Price per Unit GST/HST extra	Estimated Total Price GST / HST extra
					TOTAL ESTIMATED AMOUNT Transfer amount to subparagraph 1)(b) of BA03	

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 "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 A.

14 Regional Guide
The Consultant should contact the Project Manager to obtain the region's requirements for Division 01 or other short form specifications as might be appropriate. For example, it is required in the National Capital Region that regional Section 01 00 10 - General Instructions be used on all projects.

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.

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. 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.

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 and no any information that will 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: Number drawings in sets according to the type of drawing and the discipline involved as follows (The requirements of SECTION 2 PWGSC NATIONAL CADD STANDARD will supercede these requirements, where warranted).

During the Design Phase of the project each submission and review 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.

Discipline	Drawing
Demolition	D1, D2, etc.
Architectural	A1, A2, etc.
Civil	C1, C2, etc.
Landscaping	L1, L2, etc.
Mechanical	M1, M2, etc.
Electrical	E1, E2, etc.
Structural	S1, S2, etc.
Interior Design	ID1, ID2, etc.

8 **Presentation Requirements:** Present drawings in sets comprising the applicable demolition, 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. Blue prints are acceptable for document submissions at 33%, 66% and 99% stages. 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 next to the plan sheets or at the back 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, stamped and signed.

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.

DOCUMENTATION

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.

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 is for bidding purposes only and do not require to be signed and sealed. See Appendix 'D' and Appendix 'E'.

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% 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% 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

1 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.

1.1 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.

1.2 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.

1.3 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.

1.4 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.

1.5 Standard Submissions

At each submission 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);

1.6 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.
Work Breakdown Structure (indent tree):

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.

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

Last updated November 21, 2012

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.			
1b Sections have been included for all work identified on drawings and sections edited.			
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.			

6 Specifications Materials			
6a The method of specifying materials uses recognized standards. Actual brand names and model numbers are not specified.			
6b Materials are specified using standards and performance criteria (if not, the correct form of acceptable materials has been used).			
6c Identify if non-restrictive, non-trade name “prescription” or “performance” specifications are used.			
6d Indicate if a list of acceptable materials have been used.			
6e The term “Acceptable Manufacturers” is not used.			
6f No sole sourcing has been used.			
6g If sole sourcing has been used, the correct wording has been used and a justification provided to RPCD for the sole sourced products.			
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 plans and specification sections with the correct number of pages and correct drawing titles and section names.			
14 Regional Guide Specifications			
14a General Instructions is included (Section 01 00 10 in the NCA).			

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.			
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 Architectural and Engineering Drawings have been stamped and signed by the design authority.			
6b The project quantity and configuration, dimensions and construction details are included.			
6c References to future work and elements not in contract do not appear or are kept to an absolute minimum and clearly marked.			

I confirm that the plans and specifications have been thoroughly reviewed and that the items listed above have been addressed or incorporated. I acknowledge and accept that by signing, I am certifying that all items noted above have been addressed.

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 00 10 - General Instructions

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
Last updated April 22, 2008

Project No: _____ **Index**
Page 1 of ___

DRAWINGS AND SPECIFICATIONS

DRAWINGS:

SPEC NOTE: List all Drawings by number and title.

C-1	Civil
L-1	Landscaping
A-1	Architectural
S-1	Structural
M-1	Mechanical
E-1	Electrical

SPECIFICATIONS:

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

DIVISION	SECTION	NO. OF PAGES
DIVISION 01	01 00 10 - General Instructions.....	xx
	01 14 25 - Designated Substances Report.....	xx
	01 35 30 - Health and Safety.....	xx
DIVISION 23	23 xx xx	
DIVISION 26	26 xx xx	

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 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).

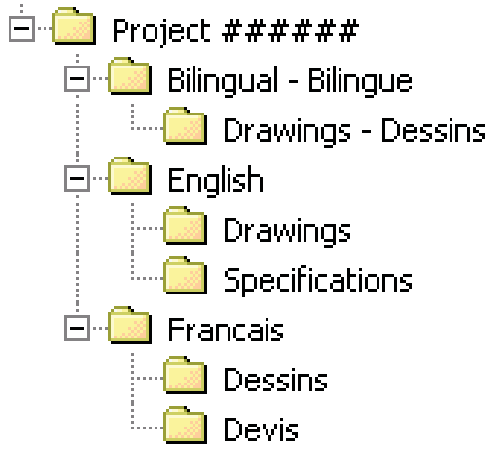
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction. 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.

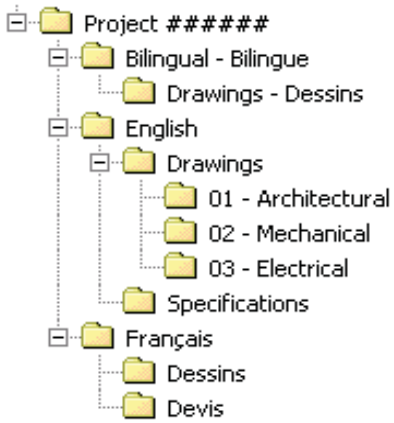
1.2 4th Tier Sub-Folders for Drawings

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

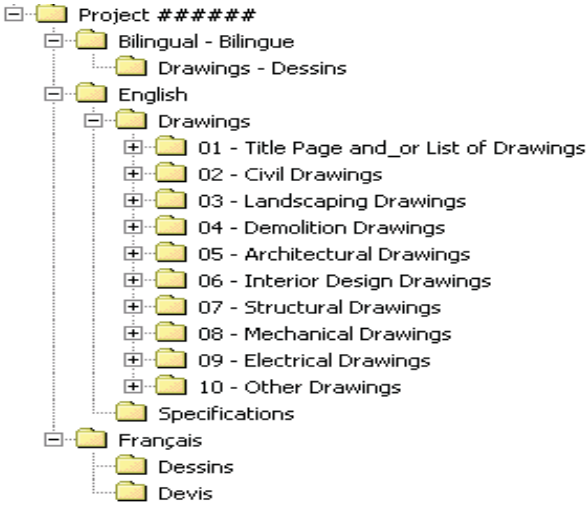
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders.

Note: 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 drawings:



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:

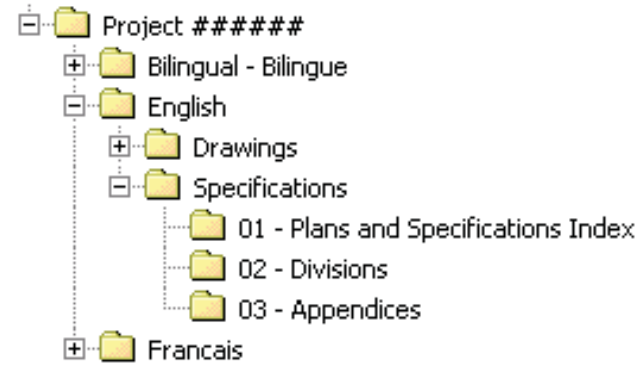
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the 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

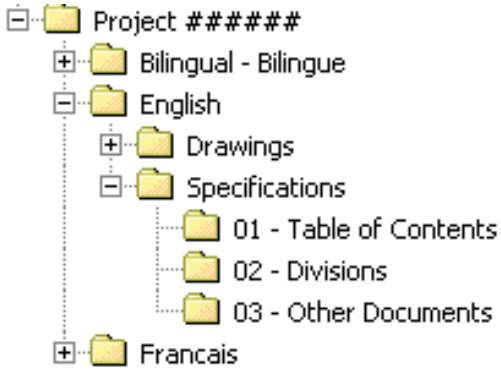
The "*Specifications*" and "*Devis*" folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.

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.

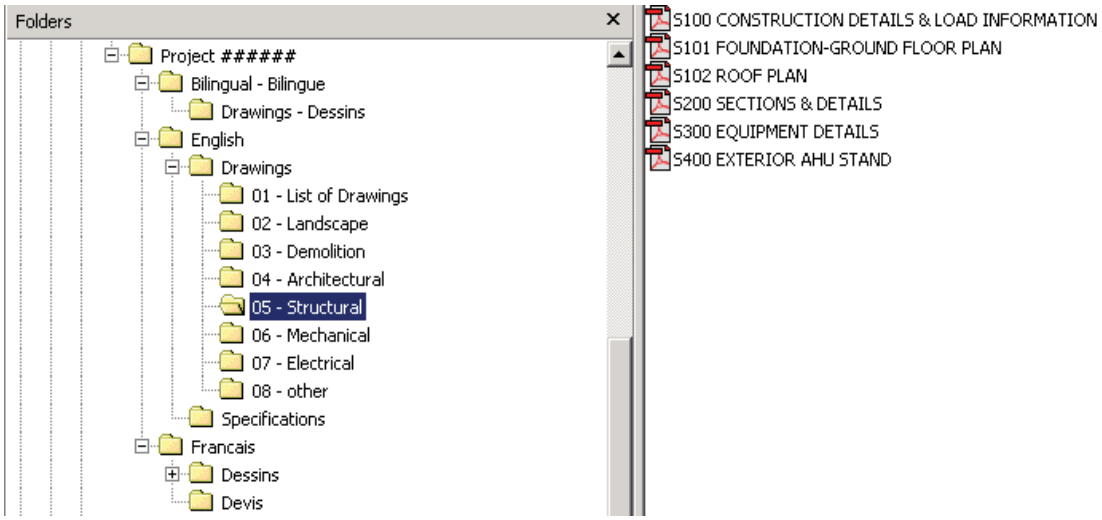
  ## - Y

  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

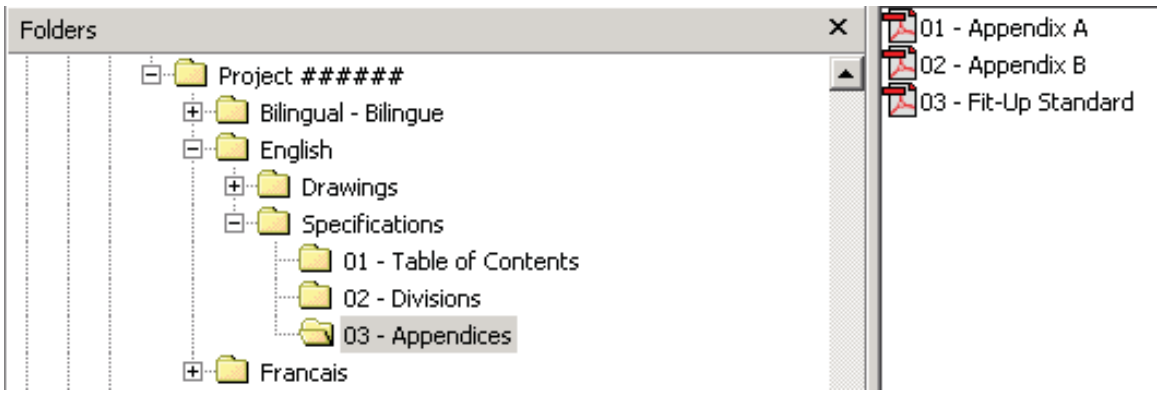
Where:

= 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. 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. 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. 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. 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.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.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.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.

Heritage Canals and Engineering Works CADD Standards

Supplement to:

PWGSC National CADD Standard
and
CADD Guidelines for Consultants,
PWGSC - Ontario Region

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada
Heritage Canals and Engineering Works
Canaux historiques et travaux d'ingénierie
Jan. 2015

TABLE OF CONTENTS

INTRODUCTION

The Ontario Region, part of Public Works and Government Services Canada, maintain professional and technical services that support service management and service delivery in the areas of operations and maintenance, planning, design, renovation and construction of federal facilities. The Heritage Canals and Engineering Works (HCEW) group, of the Ontario Region, is one such service provider. HCEW provides specialized expertise in project delivery, structural engineering and heritage conservation.

This PWGSC CADD Standard Supplement – Heritage Canals and Engineering Works (HCEW), is to ensure consistent contract drawings, and uniform requirements for design deliverables. These standards must be read in conjunction with the PWGSC National CADD Standard and the CADD Guidelines for Consultants, PWGSC - Ontario Region. These documents can be found online or can be obtained from the contact person listed below

This document is intended as a guide to the creation of drawings associated with structural projects for HCEW only.

For information on this document, please contact:

David Rowan
Senior Engineering, Design Technologist | Ingénieur Principale, Dessin Technologie
Heritage Canals & Engineering Works | Canaux historiques et travaux d'ingénierie
Professional and Technical Services | Services professionnels et techniques
Ontario Region | Région de l'Ontario
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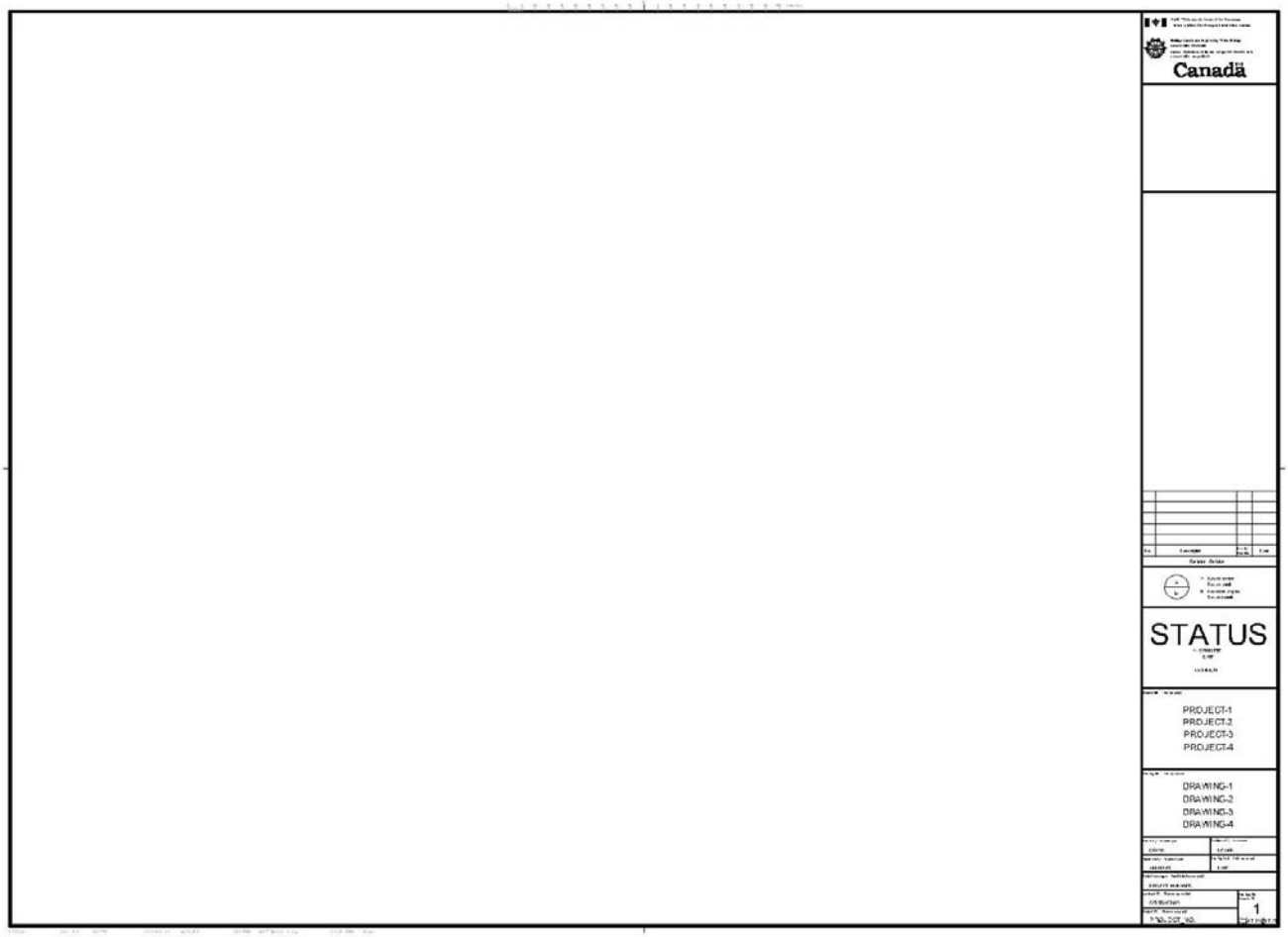
1.1 Contract Drawing Frame

A contract-drawing frame is available with the PWGSC National CADD Standards. This frame shall be used on all contract drawing sheets with the exception of the cover page. See Figure 1.

Figure 1



1.1.1 Drawing Number

The drawing number is a three digit number used to identify each drawing within the drawing package. The first drawing in the set (typically the cover sheet) will be numbered 000 and all subsequent drawings will be numbered sequentially and increase by one.

In a major multi-disciplinary project the project coordinator may decide to number the drawings sequentially but also give a block of numbers for each discipline such that the roadway drawings would be numbered starting from 100, the structural drawings would start at 200, the electrical starting at 300 etc… Other similar methods may be used providing the drawing set is numbered in a logical fashion.

Do not confuse the drawing number with the sheet number. For information about the sheet number, see Section 1.2.3.

Examples of drawing number in a typical structural drawing set:

000	Cover Sheet
100	General Arrangement
101	Abutment Removals
102	Abutment Repairs
103	Girder Removals and Repairs
104	Deck Removals
105	Deck Repairs
106	Sections and Details I
107	Sections and Details II
108	Standard Details I
109	Standard Details II
200	Electrical Plan
201	Electrical Removals
202	Electrical Details
300	Mechanical Plan
301	Mechanical Removals
302	Mechanical Details

1.1.2 Sheet Number

The sheet number area is broken into two parts (left and right). It's purpose is to define each drawings sequential order in the drawing set and the total number of sheets in the set.

The left side represents the number of the drawing sheet within the set and the right side represents the total number of drawing sheets in the set.

Once a project is nearing completion and you can be relatively assured that no more drawings will be added, you can begin the task of numbering the sheets.

The sheets are numbered beginning with the cover sheet (sheet number 0) and progress sequentially, increasing by one, to the last sheet.

1.1.3 Professional Seal

A professional seal and signature is required on Tender and Construction Issue drawings and any addendums or change orders. An electronic facsimile of a professional seal and signature is not acceptable. Only original printed copies will be accepted with professional stamp and signature.

1.1.4 Revisions

There are several stages a set of contract drawings go through from their inception until they are issued for as-built status. During the design and construction phases the drawings are issued at various stages and the history of the drawings are recorded in the revision area of the drawing frame.

A revision may refer to a type of drawing issue (tender, construction, as-built) or a type of drawing change (addendum or change order). See below for more details on each type of revision.

Each revision is given a number in the revision history beginning at one and incrementing by one for each subsequent revision. The number for each revision does not have to match on every drawing in the package (ie. the tender issue might be revision number three on one drawing and revision five on another).

Revisions shall be made to the digital CADD files only and a new set of drawings distributed as required. Hand drawn modifications are not permitted.

1.1.4.1 Drawing Issue

During the course of any project, the drawings are issued at a series of milestones dictated by the type and scale of the project. The milestones may include but are not limited to the following;

- Issued for Client Review (may also include a percentage of completeness)
- Issued for Approval
- Issued for Tender
- Issued for Construction
- As-Built

It is not necessary to put a triangle around the revision number for drawing issues. The initials that accompany a revision are to identify the project manager that initiated the change.

1.1.4.2 Drawing Change

A drawing change refers to a change to any or all of the contract drawings and is recorded only on the drawing(s) that are affected by the change.

After the tender issue and before the construction issue, any changes to the drawings that may affect the bidding process, are issued as addendums and logged as such in the revision area. If the changes don't affect the bidding process, there is no need to record the changes in the revision history, unless it is a change you want to specifically draw the contractor's attention to once the drawings are issued for construction.

After the construction issue and before the as-built issue, any changes to the drawings are issued as change orders and logged as such in the revision area of each drawing that is affected by the change order.

Drawing changes are identified by an octagon (or triangle) shape around the revision number, dated and briefly described in revision area. Revision octagon and number shall also be placed adjacent to the area on the drawing that was revised.

Should a drawing change be applicable to a large isolated portion of the drawing, a revision cloud can be used to surround the affected area and an octagon placed next to the cloud.

If the revision is general in nature and affects most of the drawing, you can put 'General Revision' in the revision history and, in this case, it is not necessary to put an octagon next to the areas on the drawing that are affected by the change.

Examples:

PLAN AND PROFILE 1

NO.	REVISIONS	BY	DATE
1	ISSUED FOR UTILITY CIRCULATION	S.T.P.	31/04/2007
2	ISSUED FOR MOE APPROVAL	S.T.P.	12/05/2007
3	ISSUED FOR TENDER	S.T.P.	05/08/2007
4	CD #4 REVISED	S.T.P.	26/06/2007
5	REVISED INV. MH NO. 3	S.T.P.	27/06/2007
6	ISSUED FOR CONSTRUCTION	S.T.P.	04/07/2007

PLAN AND PROFILE 2

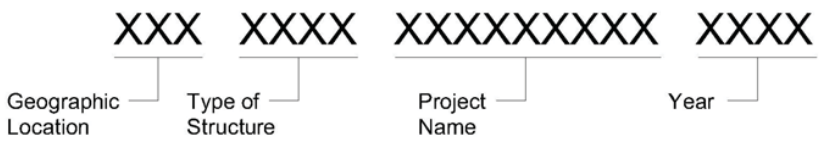
NO.	REVISIONS	BY	DATE
1	ISSUED FOR UTILITY CIRCULATION	S.T.P.	31/04/2007
2	ISSUED FOR MOE APPROVAL	S.T.P.	12/05/2007
3	ISSUED FOR TENDER	S.T.P.	05/08/2007
4	RADIUS ADJUSTMENT - STA. 1+145	S.T.P.	26/06/2007
5	ISSUED FOR CONSTRUCTION	S.T.P.	04/07/2007

1.1.5 Plotting of Filename, Path, Date, and Time

Filename, path, date, and time are to appear on lower left corner of title block, outside of drawing frame. All submitted drawings shall include up-to-date plot date information.

1.2 Folder Structure

Design files related to a particular project should reside in a unique folder. The folder should consist of four distinct fields as follows.



Geographic Location Field **XXX** xxxx xxxxxxxxx xxxx

The geographic location field represents the general geographical location of the project (ie. R for Rideau Canal, T for Trent Waterway, SSM for Sault Ste. Marie, etc…). This field can be one to three characters long or, in the case of a fort, may be omitted.

Type of Structure Field xxx **XXXX** xxxxxxxxx xxxx

The type of structure field describes the type of structure (ie. Lock, Dam, Bridge, Weir, etc..) and typically ranges from three to six characters.

Project Name Field xxx xxxx **XXX XXXXX** xxxx

The third field consists of the project title.

Year Field xxx xxxx xxxxxxxxx **XXXX**

The fourth field is the year the project was initiated.

Examples: **R Lock Jones Falls 2010**
T Dam Swift Rapids 2000
SSM Lock Repairs 2010

1.2.1 Sub Folders

A copy of the CADD files should be saved, in a separate sub-folder, as a record of each submission. Typical submissions are at the following stages of design; Preliminary Review, Tender, Construction and As-Built issues. Sub-folders should be identified with the corresponding submission type (ie. \Tender).

Example:

\\ Lock at Jones Falls 2010\Tender\105063-000-Cov.dgn
\105063-base.dgn
\105063-009-det2.dgn

…\Construction\105063-000-Cov.dgn
\105063-base.dgn
\105063-009-det2.dgn

…\As-Builts\105063-000-Cov.dgn
\105063-base.dgn
\105063-009-det2.dgn

1.2.2 PDF Files

Although CADD files must be saved in their native file format, HCEW recognizes that there are many advantages to PDF files and as such may also require PDF versions of the contract drawings.

If PDF files are required, then the following guidelines shall be adhered to.

- Plotted to scale.
- On B1 (707x1000mm) sheet.
- Able to be opened with Adobe Acrobat 5.0.
- Line styles and weights same as hard copies.

1.2.3 Drawing Clean Up

Before saving the CADD file for a major milestone, the files shall be purged and all unnecessary data (working lines etc…) shall be deleted. Ideally, only the title block and the data within should remain.

Also, the drawings shall not contain any electronic signatures or hyperlinks.

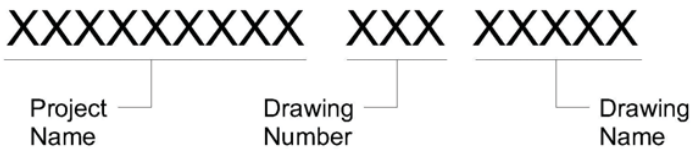
1.2.4 File Delivery

When CADD files are saved for major milestones, the references and all other supporting files, sketches and images shall be placed in the same folder as the contract drawing files. The folder name shall reflect the milestone for which it is being submitted.

1.3 CADD File Naming Conventions

The CADD file name contains distinctive naming fields to easily identify the project name, drawing number and drawing name.

The project manager will supply field one; fields two and three are filled in by the CADD operator that creates the file, using the following procedure :



Project Name Field **XXXXXXXXX** xxx xxxxx

The project name field is populated with the name of the project, shortened or abreviated, as required.

Drawing Number Field xxxxxxxxx **XXX** xxxxx

The drawing number field is populated with the drawing number as found in the title block in the Dwg. No box. See Section 1.1.1 for a description of the drawing number.

Drawing Name Field xxxxxxxxx xxx **XXXXX**

The drawing name is user-defined information pertaining to area, scope or content of the drawing. See the lists below for some common drawing name abbreviations.

The drawing name may include a number representing the number of drawings in a series of similar drawing types (i.e. **s&d3** where the 3 represents the third sections and details drawing). Where only one drawing of a given type exists, do not include a digit.

Typical drawing name abbreviations for reference files are as follows:

base - Base Information
utility - Utility Information

Typical drawing name abbreviations for contract drawing files are as follows:

Cov - Cover
GA - General Arrangement
Stage - Construction Staging Plan
Rem - Removals
Found - Foundation Layout
FtgDim - Footing Dimensions
FtgReinf - Footing Reinforcement
Abut - Abutment
NAbut - North [West] Abutment
NWW - North [West] Wingwall
SEAbut - South [East] Abutment
SWWall - South [East] Wingwall
wwall - Wingwalls/Retaining Walls
PierDim - Pier Dimensions
PierReinf - Pier Reinforcement
Brg - Bearings
BmDim - Beam Dimensions
BmReinf - Beam Reinforcing
BmDet - Beam Details
DeckDim - Deck Dimensions
DeckReinf - Deck Reinforcing
DeckDet - Deck Details
S&D - Sections and Details
Jnt - Joint Details
BWall - Barrier Wall Details
Rail - Railing Details
Appro - Approach Slab Details
Slope - Slope Paving Details
Stand - Standard Details
Elec - Electrical
Quant - Quantity Sheet
Land - Landscaping

Examples of valid filenames :

Crystal Lake - 107 - NWW.dgn	Crystal Lake, drawing number 107, North West Wingwall drawing
Ft. Henry - 102 - S&D3.dgn	Fort Henry, drawing number 102, Sections and Details, 3rd drawing of type
Redstone Lake - base.dgn	**R**edstone Lake, Base drawing, reference file
Maria St. - 101 - GA.dgn	Maria St., drawing number 101, General Arrangement drawing
Jones Falls - 102 - PierDim.dgn	Jones Falls, drawing number 102, Pier Dimensions drawing

1.3.1 Reference Files

Reference files are CADD files that have been externally attached to another file (ie. the data is not part of the contract drawing file but is loaded each time the contract drawing file is opened), do not have title blocks and are not contract drawings on their own but do provide project data to other contract drawings.

Typically, data in a reference file is drawn at a scale of one and there is no limit to the size of the drawing area (ie. there is no title block to constrain the drawing area). The graphic elements are drawn once and then referenced into various contract-drawing files as required.

Depending on the scope of the project, there may be multiple reference files with data separated by discipline and/or by the type of data, such as, base mapping, utilities, removals and proposed construction.

When new milestone folders are created, all files including reference files should be copied into each folder.

References must not conceal other references within them. In other words a nest depth of one is the maximum that shall be permitted.

1.3.1.1 Making Reference Files Portable

When project files are moved or copied to another location (ie. delivered to the HCEW), the folder path will inevitably change and the reference file path will be incorrect, resulting in a reference file that can't be loaded. To avoid this problem, follow these instructions.

Choose the "no path" option in the "path type" box when loading the reference.

1.3.2 Drawing File Layout

Drawing files are the electronic originals of the plotted contract drawings. Paper space layouts can be thought of as virtual sheets of paper, which are printed to produce hard-copy contract drawings. Using paper space to layout the contract drawing is generally recognized as the current industry standard for CADD drawing creation.

Design details are prepared as full size views, thus maintaining the geometric integrity of the design model (no scaling will be permitted). Data from model space is brought into the paper space layout via scaled layout view ports or as external references from other drawing files.

An optional, although less preferred alternative involves the preparation of contract drawings utilizing model space only. However, in either case the geometric integrity of the design model should be maintained (scaling of the design model elements to suit intended plot scale should be avoided).

Regardless of which method is used, it is important that the following guidelines be followed.

Paper space Layouts

- In AutoCAD, insert the full size drawing sheet (including drawing frame and titleblock) at 0,0 in paperspace with zero rotation at a scale of 1:1 or use a prepared template.
- Use custom viewport scales for any views that are to be plotted at a different scale.
- All annotations and dimensioning must be done in the model space, the general notes however, can be placed directly on the paper space layout.
- Although multiple layouts can be created on a single drawing during the design phase, only one layout per Autocad file will be allowed upon final delivery to HCEW.

Model space only

Although it is less desirable, model space only drawings may be accepted at this time provided the following;

- In AutoCAD, insert the full size drawing sheet (including drawing frame and titleblock) at 0,0 in model space at the desired scale with zero rotation or use a prepared template.
- All annotations and dimensioning must be done in model space.

1.4 Layers

Layers are used to sort the data into logical groups based on common properties such as line weight or line type and/or what the entity represents in the real world.

The goal of any layering system is to create a balance between complexity and flexibility. The more complex a layering system is, the less efficient it will be and may actually be counter productive. The more flexible a system is (ie. fewer levels), the less data separation there will be and consequently it may be less intuitive for other users.

A list of typical structural levels can be found below. The levels in the list shall be sufficient for most projects but on occasion additional levels may be required. If additional levels are required, the following standards must be adhered to for the creation of the levels.

1.4.1.1 Layer Management

There are two types of data to be considered when creating levels, primary data and supporting data. The difference between the two is quite significant in the complexity and number of levels required. See below for an explanation of primary and supporting data.

There are also two techniques used to separate data, regardless of whether it is primary or supporting data. The first technique is to have data placed on levels with all property settings set to ‘bylevel’ and would require additional levels for data requiring different settings. The second technique is to have all

similar data on the same level and allow for data to have different colour (weight) and line style assignments.

Regardless of which technique is used, the separating of data should be done in a logical manner that facilitates the creation of the drawing and the effort of dividing the data must not exceed the benefits gained.

1.4.1.1.1 Primary Data

Primary data is data that is required to be separated by what it represents in the real world and can be identified on the graphic screen without resorting to annotations. Line weights, line styles and colour are not a consideration when determining if data is primary or not.

An example of primary data in a structural drawing may be data in a base plan or data representing various utilities.

1.4.1.1.2 Supporting Data

Supporting data is data that is not required to be separated by what it represents in the real world but rather by its properties such as line weight and line style or based on the requirement to group similar elements to simplify the drafting process (ie. have fewer levels).

Typically, all of the drawing elements contained in the various sections and details that comprise a set of structural drawings can be considered as supporting data and thus be placed on levels to define similar properties only, rather than separate levels to define what the elements represent.

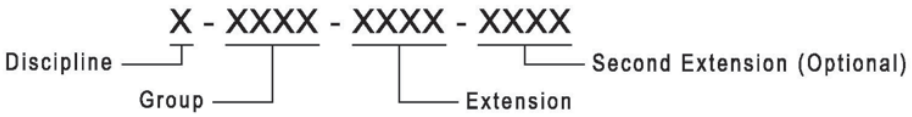
For example, drawing elements such as annotations, dimensions, line work, hatching etc. can be considered supporting data and separated accordingly; There would be a general text level, a general dimension level and a general hatching level etc. (ie. S-GEN-TEXT, S-GEN-DIM, S-GEN-HAT-0.25 etc…).

Similarly, general line work contained in the various sections and details do not need to be tied to a level defining what it represents, but rather viewed simply as general lines that are grouped according to their plotted line weight and/or line style (ie. S-GEN-LINE-0.25, S-GEN-LINE-0.50 etc…).

In some situations however, such as where better visibility control is required (freezing and thawing of levels), a mixed approach to level management may be used such that some elements are separated by what they represent and others grouped by their element properties.

1.4.1.2 Layer Naming Convention

The level structure consists of four fields separated by hyphens.



Discipline Field **X**-xxxx-xxxx-xxxx

The discipline field identifies the discipline responsible for the data on that level. The discipline designator is a one-character field.

In some cases the data is not applicable to any one discipline, such as a title block or a section marker. In these cases a 'G' for general may be used in the discipline field.

B	Bridge / Dam / Lock
G	General
C	Civil
S	Structural

Group Field x-**XXXX**-xxxx-xxxx

The group field identifies general groups of data relevant to each discipline.

G-TBLK	General-Titleblock
C-ROAD	Civil -Road
S-CONT	Structural-Contour

Extension Field x-xxxx-**XXXX**-xxxx

The extension field more precisely identifies the data from that of the group field.G-TBLK-TEXT
General-Titleblock-Text

C-ROAD-CURB	Civil-Road-Curb
S-CONT-MAJR	Structural-Contour-Major

Second Extension Field x-xxxx-xxxx-**XXXX**

The second extension field is optional and further categorizes the data, if necessary.

G-TBLK-TEXT-LOGO	General-Titleblock-Text-Logo
C-ROAD-CURB-FACE	Civil-Road-Curb-Face
S-CONT-MAJR-TEXT	Structural-Contour-Major-Text

1.4.1.3 Level Colours and Weights

Level colour shall be used to define the line weight. The following is a list of acceptable colours and their corresponding colour number and line weight. Other colours may be used in rare cases when more data

separation by colour is required to aide in the drafting process such as for visual separation on the graphic screen.

Colour	Colour Number	Line Thickness (mm)	Colour Setting
Red	1	0.20mm	Black
Yellow	2	0.35mm	Black
Green	3	0.50mm	Black
Cyan	4	0.70mm	Black
Blue	5	1.0mm	Black
Magenta	6	0.20mm	Black
Dark Grey	8	0.13mm	Black
Light Grey	9 (30% screen)	0.20mm	Black
Grey	250 to 255	0.20mm	Use Object Colour
All Others	Varies	0.20mm	Black

1.5 Annotation Scaling

Annotation scaling is a feature that allows for annotations to be displayed, at the desired size, in a paper space view port, regardless of the scale of the view port.

Annotation scaling shall be used for all dimensions and annotations.

1.6 Dimension Styles

Dimension styles must adhere to the following standards:

- Standard dimension annotations shall be in millimeters and shall use the same unit setting throughout the contract set, with the following exceptions; stations, elevations and site plan dimensions, may be shown in metres.
- Use automatic dimensioning (associative dimensioning) wherever possible. An exception to this rule may be made when using dimensions for reinforcing steel detailing, although it is not preferred.
- All dimensioning shall be done in model space with annotation scaling turned on.
- Use filled arrowhead as the terminator for dimensions and leaders. The arrowhead must keep a length to width ratio of 3:1 (standard size of 3mm long x 1mm wide at a scale of 1:1).

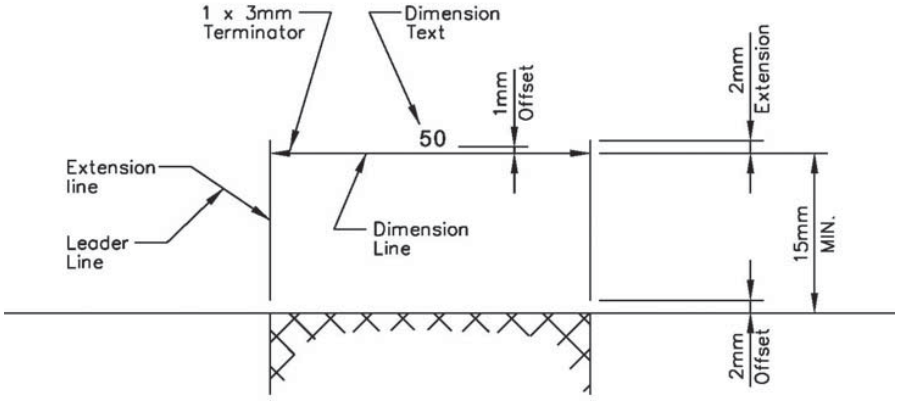
- The name given to additional styles must follow the naming convention outlined in Section 3.5.1 of the PWGSC National CADD Standards.
- All dimensions shall have the same size text as outlined in Section 1.3.6.1.
- Angular dimensions shall be expressed in decimal degrees.
- Line weight for all dimension elements, except annotations, shall be set to 0.20mm or colour red.

1.6.1 Guidelines for Dimensioning

The following are some basic guidelines to consider when dimensioning features for construction contract drawings: (for a more in-depth review, refer to CAN/CSA B78.2-86 – *Dimensioning and Tolerancing of Technical Drawings.)*

Dimension variables (dimension style settings) should be set to provide the following: (see diagram below);

- The primary dimension text should appear above and be aligned with the dimension line. A gap of approximately 1mm should be provided between the dimension line and the text.
- A 2mm gap should be provided between the end of the extension line and its origin.
- The extension line should 2mm beyond the dimension line (extension).
- Standard terminator to be a filled arrowhead with a length to width ratio of 3:1 (arrow head size for scale of 1 to be 3mm long by 1mm wide)
- Line weight of extension lines, dimension lines, leader lines and terminators to be 0.20mm



- Each element or element feature should only be dimensioned once and that dimension should be placed on the view that most clearly shows that element or feature. No more dimensions than are necessary to fabricate a particular element should be provided.
- Extensions that cross other dimension lines should be broken.

- Every effort should be made to avoid crossing dimension lines and is accomplished by placing the shortest dimensions close to the object and the overall dimension more remotely. (When crossing of a dimension line by a object line is unavoidable, neither line should be broken except to avoid interference with an arrowhead.

- As a general rule, dimension lines shall be placed outside a view using extension lines. On occasion however, dimension lines may be placed within a view and referenced to the object outline, in order avoid the use of long extension lines.

- Leader lines should be kept as short as is practical, not cross other lines and terminate with an arrowhead touching the feature (or closed dot when referencing a surface within a feature) and a 3mm long horizontal adjacent to the text.

All leader annotations to be left justified.

1.6.1.1 Dimension Scale

The following table illustrates the dimension scale factor for various standard drawing scales.

Dimension Scale																	
Drawing Scale	**1:1**	**1:5**	**1:10**	**1:20**	**1:25**	**1:30**	**1:50**	**1:75**	**1:100**	**1:125**	**1:150**	**1:200**	**1:250**	**1:300**	**1:400**	**1:500**	**1:750**
DIMENSION SCALE	1	5	10	20	25	30	50	75	100	125	150	200	250	300	400	500	750

1.7 Text Style and Size

True Type Arial shall be used for all drawings. Standard text sizes are listed below and the text sizes must be uniformly applied throughout the entire project.

A cell for centerline and plate symbols has been provided in the cell library for your convenience.

1.7.1 Text Sizes (Heights)

The range of standard text heights is available in Section 1.3.6.3. These sizes are based on soft conversions of the standard Leroy® Lettering System used in manual drafting and are cross-referenced in the following table for legacy purposes. The standard text height for typical annotations and dimensions on full size plots shall be 2.5mm. The minimum text height for drawings requiring half-size reproductions shall not be smaller than 2.0mm.

The following are examples of text sizes, as measured on a plotted full size drawing, for various applications:

Major Headings	5.0mm
Sub Headings	3.5mm
Notes and Dimensions	2.5mm

Existing Site Annotations 2.0mm

All text is to be uppercase with the exception of unit abbreviations (i.e. mm, m etc.). Condensed or extended versions of the font shall not be used and no customization of the font will be accepted. This however, does not preclude the application of "fitted text" or a minor adjustment in text width to suit a special requirement.

1.7.2 Text Style Naming Convention

When placing text on a drawing, minor changes to the settings may be required from one text element to the next. One method to make this process easier is to create text styles with preset settings and change to the appropriate style before placing the text.

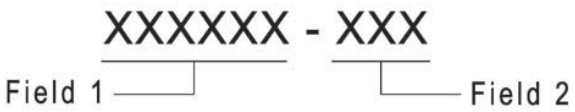
For example, if text at a plotted height of 2.5mm is required for some text elements but a plotted text height of 3.5mm is required for others, then two separate styles could be created with these preset settings.

The following guidelines shall be used for naming the text style(s) regardless of what method is used in creating the text.

Standard text style designations are used to define the appearance of text and are based on a combination of various text attributes or characteristics. Basic text style attributes for parent text styles include:

- Text font
- Height (product of design model scale factor X plotted height)
- Width factor (Microstation defaults to the same value as height)
- Justification (default to centre left justification)
- Italics

Standard text styles designations will conform to the following naming convention:
Do not leave spaces before or after the hyphen.



Field 1 **XXXXXX** – xxx

Field one is a six character field and is assembled as AAAABB such that :

AAAA	HCEW designation.
BB	Plotted text height for full size drawing (i.e. 25 indicates a text height of 2.5mm on the hard copy)

Field 2 xxxxxx – **XXX**

Scale factor (This is an optional modifier when, for example, layouts have been used and multiple scales are required or in a single scale environment, the drawing scale can be shown). The optional modifier would not be necessary if Annotation Scaling is utilized.

Examples of valid dimension style names:

HCEW25 Text height of 2.5mm.
HCEW35S Text height of 3.5mm, sloped text.
HCEW25-100 Text height of 2.5mm, scale of 1:100.
HCEW25S-50 Text height of 2.5mm, scale of 1:50, sloped text.

1.7.3 Text Heights and Text Style Designations

Plotted Text Height (mm)*	Leroy® Lettering Guide No.	Font	Text Style Designation (vertical text)
1.5**	60	TT Arial	HCEW15-*xx*
2.0	80	TT Arial	HCEW 20- *xx*
2.5	100	TT Arial	HCEW 25- *xx*
3.0	120	TT Arial	HCEW 30- *xx*
3.5	140	TT Arial	HCEW 35- *xx*
4.5	175	TT Arial	HCEW 45- *xx*
5.0	200	TT Arial	HCEW 50- *xx*
6.0	240	TT Arial	HCEW 60- *xx*

*plotted text height for full size (24x36) plots

**1.5mm text height should only be used when absolutely necessary, as it may not be readable on half size reductions.

This font contains an italics style, which can be activated in Microstation by clicking the italics box under Element – Text Style – General tab.

1.8 Blocks

When blocks are placed, the properties (level, colour, linestyle and weight) of the data can be affected in various ways. How they are affected depends on the properties of the data when the block was created and the system settings when the block was placed.

For consistency, all blocks shall be created using the guidelines outlined in the PWGSC National CADD Standards section 3.3.

1.8.1 Block Library

A structural block library is included with this manual, containing blocks of commonly used elements. The blocks in this library are provided for consistency among all projects and must be used when required.

A drawing file has been created, called **Structural Blocks.dwg**, with all the blocks attached.

1.8.2 Sections and Elevations

Sections and elevations are used to provide more details of an element on a drawing. Section and elevation markers use the same symbol but are designated as one or the other by the label used for the detailed element; see examples below. The symbol and labels blocks are provided in the structural block library.

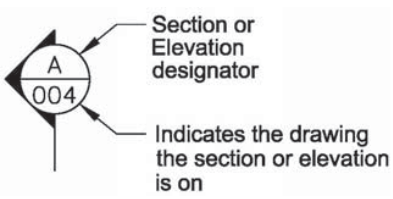
1.8.2.1 Symbol

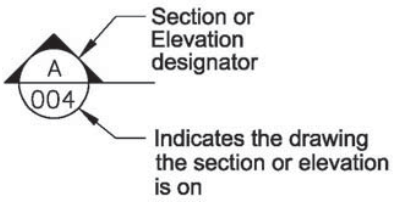
Sections shall be preferably looking up and to the left or in a direction of increasing chainage. Elevations shall be looking in the direction of the intended elevation.

If the section or elevation is not taken in a continuous straight line from the end of the symbol, then a second symbol shall be placed at the other end of the intended section or elevation. A line shall then be drawn between the two symbols to delineate the path of the section or elevation (the line between the two marks may be cut to show only the area(s) where the section path deviates).

- The top half of the symbol shall be populated using uppercase alpha characters from ‘A’ to ‘Z’ (omit letters ‘I’ and ‘O’).
- The bottom half of the symbol shall be populated with the drawing number (field three only) of the drawing where the section or elevation is located.

Examples :



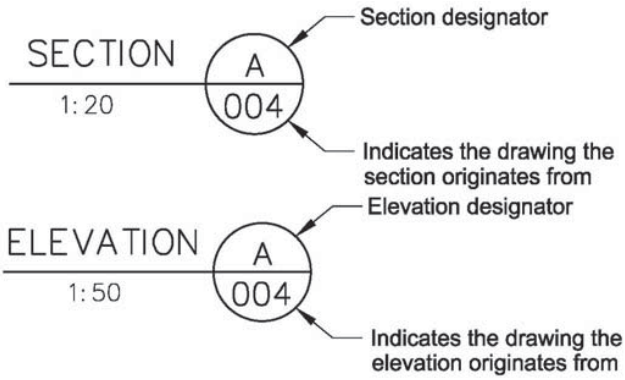


1.8.2.2 Label

Labels are placed below the section or elevation to cross-reference it with the symbol on the drawing from where the section or elevation was taken.

- The top half of the label shall be populated using uppercase alpha characters from ‘A’ to ‘Z’ (omit letters ‘I’ and ‘O’).
- The bottom half of the label shall be populated with the drawing number (field three only) of the drawing where the section or elevation is taken from.

Examples :



1.8.3 Details

Details are used to further define an element on the drawing but differ from sections and elevations in that they are shown in the same view as the master element, show more detail and are often shown at a smaller scale.

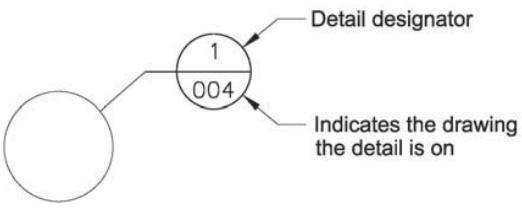
Details are shown using a symbol to delineate where the detail is taken from and a label to designate the actual detail. The symbol and labels are provided in the structural block library.

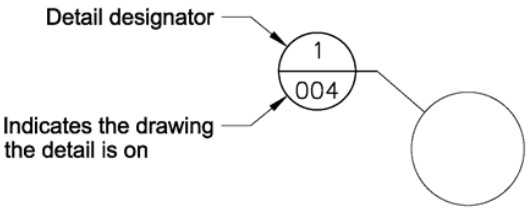
1.8.3.1 Symbol

Details shall be delineated using a circle to define the area to be detailed and a detail symbol shall be placed close to the circle with a line to drawn to connect the two.

- The top half of the detail symbol shall be populated using numeric characters from ‘1’ to ‘99’.
- The bottom half of the detail symbol shall be populated with the drawing number (field three only) of the drawing where the detail is located.

Examples :





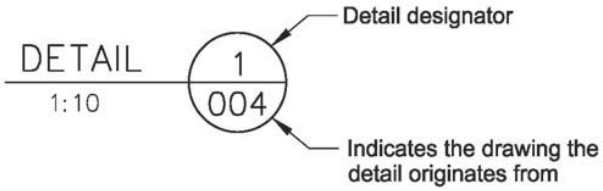
1.8.3.2 Label

Labels are placed below the detail to cross-reference it with the symbol on the drawing from where the detail was taken.

- The top half of the label shall be populated using numeric characters from ‘1’ to ‘99’.

- The bottom half of the label shall be populated with the drawing number (field three only) where the detail is taken from.

Example :



1.9 Patterns or Hatching

Custom Autocad hatch patterns are not to be used as they could pose a problem with drawing translation or drawing portability.

1.10 Element Offset Distances

All elements of a drawing must be kept a minimum distance away from any other element in order for the plotted drawing to be legible. The following table has minimum distances for elements of various line weights and is included as a guideline only.

STANDARDS			SCALE OF DRAWING																
COLOUR	PEN SIZE	TYPE	1:1	1:5	1:10	1:20	1:25	1:30	1:50	1:75	1:100	1:125	1:150	1:200	1:250	1:300	1:400	1:500	1:750
GREY	.13	LINE - LINE	0.3	1.5	3	6	7.5	9	15	22.5	30	37.5	45	60	75	90	120	150	225
RED	.20	LINE - LINE	0.4	2	4	8	10	12	20	30	40	50	60	80	100	120	160	200	300
YELLOW	.35	LINE - LINE	0.5	2.5	5	10	12.5	15	25	37.5	50	62.5	75	100	125	150	200	250	375
GREEN	.50	LINE - LINE	0.6	3	6	12	15	18	30	45	60	75	90	120	150	180	240	300	450
CYAN	.70	LINE - LINE	0.8	4	8	16	20	24	40	60	80	100	120	160	200	240	320	400	600
		LINE – REINFORCING DOT	1.2	6	12	24	30	36	60	90	120	150	180	240	300	360	480	600	900
		REINFORCING DOT - DOT	1.8	9	18	36	45	54	90	135	180	225	270	360	450	540	720	900	1350
CYAN-GREEN	.70 - .50	LINE - LINE	0.7	3.5	7	14	17.5	21	35	52.5	70	87.5	105	140	175	210	280	350	525
CYAN-YELLOW	.70 - .35	LINE - LINE	0.65	3.25	6.5	13	16.25	19.5	32.5	48.75	65	81.25	97.5	130	162.5	195	260	325	487.5
GREEN-YELLOW	.50 - .35	LINE - LINE	0.55	2.75	5.5	11	13.75	16.5	27.5	41.25	55	68.75	82.5	110	137.5	165	220	275	412.5
YELLOW-RED	.35 - .20	LINE - LINE	0.45	2.25	4.5	9	11.25	13.5	22.5	33.75	45	56.25	67.5	90	112.5	135	180	225	337.5

Examples:

At a scale of 1:10, a red line must be 4 units from any other red line.
At a scale of 1:25, a green line must be 17.5 units away from any other cyan line.
At a scale of 1:50, a yellow line must be 22.5 units away from any other red line.
At a scale of 1:100, a reinforcing dot must be 120 units away from any other cyan line and 180 units from any other reinforcing dot.

AS-BUILT DRAWINGS

Based on definitions in Section 1.4, final drawing revision/submission shall be known as **'As-Builts'** and engineer's seal and signature is not required. By definition 'Record Drawings' require the assertion of accuracy and seal from the project Engineer, which is not the usual process for HCEW.

As-builts should be submitted within six months of completion of contract.

2.0 Definitions

From CSA Draft Seed Document – Mapping of underground utility infrastructure, May 2007

As-Built Drawing

Documentation created by or based solely on information provided by a third party that reflects the installed, constructed, or commissioned conditions of a device, machine, equipment, apparatus, structure, system, or other outcome of an engineering project. Since the engineer has not verified that the information is complete or accurate, as-built drawings must not be sealed.

2.1 Procedure

All construction work, particularly any changes from the proposed work shall be recorded on a print of the contract drawings, by the assigned site supervisor. These marked-up prints are to be submitted to the project manager immediately upon completion of the project.

Within six months of the completion of the project, the following changes shall be made to the CADD files:

- All field changes to be recorded.
- professional seals to be removed.
- As-built marked in the revision list.
- As-built to be stamped on cover sheet.

See Section 1.6 for submission requirements

2.2 Submission

- Fill in revision for As-Built submission.
- Plot mylar hard copy of the full as-built contract set.
- Submit CD (consultant) or path (internal) with complete listing of digital drawings.
- Stamp the cover sheet with as-built in bottom right corner.

APPENDIX A
ABBREVIATIONS, ACRONYMS AND TERMS

The following abbreviations, acronyms and terms are used throughout these standards:

CADD	Computer Aided Design and Drafting
Consultant	Liaison / Representative of Company under contract to the PWGSC
CSA	Canadian Standards Association
.pdf	Adobe Acrobat file
Professional Seal	Stamp designating professional eligibility, applied manually to original prited drawings, with signature and date to be applied.
.xls	MicroSoft Excel file
.zip	PkZip compressed archive file