



**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**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du  
fournisseur/de l'entrepreneur**

**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**

<b>Title - Sujet</b> Rehabilitation of Campbellford & Cr		
<b>Solicitation No. - N° de l'invitation</b> EQ754-171034/A	<b>Date</b> 2016-08-11	
<b>Client Reference No. - N° de référence du client</b> r.076951.836		
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$PWL-035-2199		
<b>File No. - N° de dossier</b> PWL-6-39073 (035)	<b>CCC No./N° CCC - FMS No./N° VME</b>	
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2016-09-21</b>		<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>		
<b>Address Enquiries to: - Adresser toutes questions à:</b> Woodhall, Lauren		<b>Buyer Id - Id de l'acheteur</b> pwl035
<b>Telephone No. - N° de téléphone</b> (416) 512-5873 ( )		<b>FAX No. - N° de FAX</b> (416) 512-5862
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> Campbellford Dam 11 and Lock 13 & Crowe Bay Dam 12 and Lock 14 Trent-Severn Waterway, Southern Sector Trent Hills, ON		

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

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## REQUEST FOR PROPOSAL (RFP)

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## **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, 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;

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- (d) the document entitled "Doing Business with Public Works and Government Services Canada" (Appendix D);
  - (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" (Appendix A);
  - (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 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.

### SI4 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).

### SI5 CERTIFICATIONS

#### 1. Integrity Provisions – Declaration of Convicted Offences

In accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Proponent must **provide with its bid, as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2016-04-04), General instructions 1 (G11), 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](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list

([http://www.labour.gc.ca/eng/standards\\_equity/eq/emp/fcp/list/inelig.shtml](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](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" 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](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list during the period of the Agreement.

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

### SI6 - WEBSITES

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

Employment Equity Act

<http://laws-lois.justice.gc.ca/eng/acts/E-5.401/index.html>

Federal Contractors Program (FCP)

[http://www.labour.gc.ca/eng/standards\\_equity/eq/emp/fcp/index.shtml](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>

N° de l'invitation - Solicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No. / N° VME - FMS

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#### 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>

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## TERMS, CONDITIONS AND CLAUSES

### AGREEMENT

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

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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.



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## **PROJECT BRIEF (PB)**

### **Project Requirements (PR)**

- PR 1 Project Information**
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- PR 5 Project Constraints**
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- RS 4 Quality Management**
- RS 5 Estimating and Cost Planning**
- 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 Design Services During Construction**
- RS 12 Construction and Contract Administration**
- RS 13 Resident Site Services During Construction**
- RS 14 Post Construction Services**

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## **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**

- |                                      |   |
|--------------------------------------|---|
| <b>1.1 PWGSC Project Title:</b>      | <b>Rehabilitation of Campbellford and Crowe Bay Dams and Locks</b>  |
| <b>1.2 Location of the Projects:</b> | <b>SITE A – Campbellford Dam 11 and Lock 13<br/>Trent Severn Waterway, Southern Sector<br/>Lock 13 - Campbellford<br/>6199 County Rd 50<br/>Trent Hills, Ontario</b><br><br><b>SITE B – Crowe Bay Dam 12 and Lock 14<br/>Trent Severn Waterway, Southern Sector<br/>Lock 14 - Crowe Bay<br/>900 County Rd 38<br/>Trent Hills, Ontario</b> |
| <b>1.3 PWGSC Project Numbers:</b>    | <b>R.076951.830 (Site A)<br/>R.076951.930 (Site B)</b>  |
| <b>1.4 PWGSC Project Team:</b>       | <b>Atif Suhail, Project Manager<br/>James Scarlett, Design Manager</b>  |
| <b>1.5 Client Department:</b>        | <b>Parks Canada Agency (PCA),<br/>Ontario Waterways Unit,<br/>Trent-Severn Waterway</b>   |
| <b>1.6 Client Project Numbers:</b>   | <b>30025768 (Site A)<br/>30025848 (Site B)</b>  |

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## **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 dams, locks and associated structures at the Campbellford Dam 11 and Lock 13 and the Crowe Bay Dam 12 and Lock 14 located on the Trent-Severn Waterway.
2. Implementation of this project is intended to be carried out through a Construction Management / General Contractor (CM/GC) arrangement (hereafter referred to as the Construction Manager) providing design assist services during the design phase and acting as General Contractor and Constructor during construction for all sites identified herein and as defined in this Project Brief. PWGSC will retain the Construction Manager through a separate Agreement. The documents during design phase may be advanced in stages to allow multiple tendering and construction packages in order to enhance cost and delivery objectives.
3. A Prime Consultant will be engaged to undertake the contract administration, residential site services during construction and post construction phases for all sites identified herein and as defined in this Project Brief.
4. The Consultant shall work in collaboration with the Construction Manager, the Prime Consultant, the project team and all stakeholders through the Departmental Representative.

### **2.2 Client Department**

1. The Client Department is the Trent-Severn Waterway, Ontario Waterways Unit of the Parks Canada Agency (PCA).
2. The Trent-Severn Waterway is an example of large-scale functional arrangement at a civil engineering work. The nearly 400 kilometre-long natural and human-made waterway crosses central Ontario linking Georgian Bay to the Bay of Quinte. The waterway's character-defining elements include many functional arrangement elements such as: the route of the waterway; the unity and completeness of the waterway, its engineering structures (locks, canal cuts, dams, bridges, etc.) and buildings that support it, and the special cultural landscapes it has generated; the disposition and relationship of the waterway's constructed elements to their surroundings; and the legibility of the cultural landscapes and patterns between and among the constructed elements.
3. The Trent-Severn Waterway is designated as a National Historic Site. Additional information can be found in the Statement of Commemorative

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Integrity for the Trent Severn Waterway and at:  
<http://www.pc.gc.ca/eng/lhn-nhs/on/trentsevern/index.aspx>.

## **2.3 Project Objectives**

1. SITE A - Campbellford Dam 11 and Lock 13
  - .1 The primary objective at Campbellford Dam 11 and Lock 13 is a comprehensive rehabilitation of the main dam, lock and associated structures to rectify specific deficiencies identified in the 2013 Dam Safety Review (DSR) and replace existing sluices with mechanized vertical gates to reduce the risk of dam failure to a reasonable level by increasing the dam discharge capability in accordance with the level planned upstream at Crowe Bay Dam 12.
2. SITE B - Crowe Bay Dam 12 and Lock 14
  - .1 The primary objective at Crowe Bay Dam 12 and Lock 13 is a comprehensive rehabilitation of the main dam, lock and associated structures to rectify specific deficiencies identified in the 2013 Dam Safety Review and convert the overflow spillway into mechanized vertical gates to reduce the risks of dam failure due to overtopping to a level as low as possible given site characteristics and capacity of dams downstream.
3. SITES A & B
  - .1 For both sites, the projects must be conducted in an efficient, expedient, economical and environmentally responsible manner that respects the mandate of Parks Canada and the Commemorative Integrity of the Trent-Severn Waterway National Historic Site. The primary recommended conservation approach when a project involves cultural resources (ref. Standards and Guidelines for the Conservation of Historic Places in Canada / PDF version online: <http://www.historicplaces.ca/media/18072/81468-parks-s+g-eng-web2.pdf>) is minimal impact on heritage value and character-defining elements of an historic place.

## **2.4 Construction Cost**

1. The construction costs, exclusive of HST, are estimated to be:
  - .1 SITE A - Campbellford Dam and Lock 13: CAD \$21 Million
  - .2 SITE B - Crowe Bay Dams and Lock 14: CAD \$18 Million
2. These figures do not include PWGSC Project Management and Engineering fees, administration costs, or Consultant fees.

## 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. Tender ready Construction Documents are required by November 1, 2017 at the latest.
5. Latest allowable Construction Contract Award Date is April 2, 2018.
6. Substantial completion date for construction at both sites to be no later than November 1, 2019.
7. Post Construction Services continue until at least Dec 1, 2020, at which time Consulting project will end.
8. Milestones are of additional importance to coordinate with the hydro component of the project in order for materials required to be incorporated into the construction are delivered on time and to enable completion of the hydro component shortly following the substantial completion of the project. Demolition and construction of the Lock wall to prepare for the Hydro components should be scheduled as the first deliverable of the project if possible.
9. Schedule for SITE A – Campbellford Dam 11 and Lock 14.

### SITE A - Campbellford Dam 11 and Lock 13

<u>Milestone</u>	<u>Date</u>
Final Design Development Report	July 4 2017
<b>Tender Ready Construction Documents</b>	<b>Nov 1 2017</b>
Construction Tender Documents posted on BuyandSell.gc.ca	Jan 2 2018
Contract Award	Apr 2, 2018
<b>Certificate of Substantial Completion (SC)</b>	<b>Nov 1 2019</b>
Record Drawings (SC+3 months)	Feb 2 2020

10. Schedule for SITE B – Crowe Bay Dam 12 and Lock 14

### SITE B – Crowe Bay Dam 12 and Lock 14

<u>Milestone</u>	<u>Date</u>
Headrace Bridge Inspection, Evaluation and Concept Report	Dec 1, 2016

<b>Headrace Bridge Repair Construction Documents</b>	<b>Mar 1 2017</b>
Headrace Bridge Repair Posted on BuyandSell.gc.ca	May 1 2017
Headrace Bridge contract award	Aug 1 2017
<b>Headrace Bridge Repair Completed</b>	<b>Mar 30 2018</b>
Final Design Development Report	July 4 2017
<b>Tender Ready Construction Documents</b>	<b>Nov 1 2017</b>
Construction Tender Documents Posted on BuyandSell.gc.ca	Jan 1 2018
Construction Contract Award	Apr 2, 2018
<b>Certificate of Substantial Completion (SC)</b>	<b>Nov 1 2019</b>
Record Drawings (SC+3 months)	Feb 2 2020

## 2.6 Background Information

1. Background Information SITE A - Campbellford Dam 11 and Lock 13
  - .1 Dam 11 Campbellford
    - 1) Dam 11 is a concrete gravity structure, built in 1910 and rehabilitated with two mechanized radial gates in 1976. Its purpose is to regulate water to maintain the navigation water level on the Trent-Severn Waterway. The dam also provides regulation for hydropower generation in the watershed. The current configuration of the dam consists of four timber stoplog spillways, an overflow spillway and two radial gates, in addition to two blocked sluices. The overall dam length is 142 m. The overall height of the dam is 11.2 m from bedrock to the top of the dam deck. By convention for the Trent-Severn Waterway, sluice numbering starts at the lock. Sluice 1 is the rightmost (west) sluice.
    - 2) Dam 11 is a cultural resource of Other Heritage Value (formerly known as Level II cultural resources). It is located next to Lock 13. Dam 11 is valued for its role in in-land water transportation, water management and the evolutionary development of the Trent-Severn Waterway. The dam contributes to the working assemblage of engineering structures that make the TSW an operational system of through-navigation.
    - 3) The timber stoplog spillways consists of four, single gain, 7.62 m wide spillways, with 12 logs per sluice. The overflow spillway consists of a flat crest overflow spillway divided by four piers supporting the dam deck. The two radial gates are 15.24 m in width and are electrically operated. In addition to the above, there are two blocked sluices. One sluice, at the west end of the concrete dam is permanently closed by a concrete wall. The second closed sluice, between the overflow spillway and radial gates is closed with steel

- stoplogs and no permanent mechanism of removing these is available currently.
- 4) The concrete dam is owned and operated by Parks Canada Agency.
  - 5) The Seymour Generating Station, forebay and intake are controlled by Ontario Power Generation (OPG). The headrace bridge that provides access to the concrete dam is owned by OPG.
  - 6) Three embankment dams are also appurtenant to the main dam. These earth fill dams are located at the left and right approaches to the lock, between the Trent River and the powerhouse intake canal and to the west of the powerhouse intake canal. The length of these structures is as follows:
    - a. Lock Upper Approach Canal Left Embankment 560 m
    - b. Right Concrete Core Earth Embankment 120 m
    - c. Left Earth Embankment Dam 310 m
  - 7) Due to the poor condition of the concrete and earth dams the dam was given an overall "poor" condition rating. Based on the preliminary classification and poor condition rating the dam was included in the Mitigating Measures for High Risk Dams in Ontario report. A DSR was subsequently undertaken for this dam.
  - 8) The DSR rated the dam as a High B consequence structure with an IDF of 3,600 cms. The dam did not satisfy the Parks Canada Directive for Dam Safety for the following reasons:
  - 9) - Components of the dam are not stable under certain load conditions; and
  - 10) - The dam cannot pass the IDF and is significantly overtopped at IDF inflows.
  - 11) The DSR indicated that it would not be feasible to pass the IDF given site characteristics and restrictions. Considering the inadequacies of the dam's discharge capacity, the DSR recommended to rehabilitate the stop log sluices in order to increase the capacity to at least that of the upstream Crowe Bay Dam. Though that would not make Campbellford Dam able to discharge the IDF, it would at least bring it to the same level as Crowe Bay Dam. It is pointless to increase Campbellford Dam's discharge beyond that of Crowe Bay Dam, as a failure at Crowe Bay would cause one at Campbellford. Further increases in discharge at Campbellford should reflect those done at Crowe Bay Dam.
  - 12) An option analysis study (CIMA) at Crowe Bay dam indicated that the discharge capacity could be increased to a level representing the 650 year return period (1370 cms) by converting the overflow spillway to vertical gates. Site



- 
- restrictions at Crowe Bay prevent further reasonable increase beyond that level.
- 13) The CIMA report also evaluated the modification and mechanization of the existing stop log sluices at Campbellford Dam 11 to increase reliability and capacity using a lower sill elevation. The CIMA study did not include the non-operable sluices. By including the non-operable sluices in the rehabilitation program it should be possible to marginally exceed the capacity discharged from Crowe Bay as recommended in the DSR but with high sill elevations than recommended in the CIMA report which are considered too low due to upstream bathymetry.
- 14) This project was subsequently initiated to mechanize 4 sluices and one or both of the non operable sluices, and reduce risk of dam failure due to overtopping at extreme floods. Other recommended improvements identified in the DSR report were included in the project scope.
- 15) Considerable additional background material is provided in the DSR.
- .2 Lock 13 Campbellford
- 1) The lock associated with Campbellford Dam, Lock 13, is also a concrete gravity structure equipped with manual upper gates and mechanized lower gates. The lock is a single chamber of 53.3 m long by 10 m wide. The depth of the lock, from coping to floor is 10.8 m. Lock 13 was rehabilitated in 2004, where new wagon valves and refurbished rails were installed and again in fall 2005, where the hydraulic system was installed on the downstream gates.
- 2) Lock 13 is a cultural resource of Other Heritage Value (formerly known as Level II cultural resources). It is valued for its role in in-land water transportation, water management and the evolutionary development of the Trent-Severn Waterway. The lock contributes to the working assemblage of engineering structures that make the TSW an operational system of through-navigation.
- 3) The DSR report contains additional information and photos for Lock 13. Concrete deterioration at the lock and approach walls is not widespread but repairs and rehabilitation are required to improve asset conditions and extend service life of these structures.
- .3 .Dam 11 and Lock 13 - Campbellford
- 1) The key elements contributing to the heritage value of the Campbellford dam and lock 13 include:



- a. Their in-situ location on the Trent-Severn Waterway
- b. Their continued functional use
- c. The use of concrete as material for the Dam
- d. Their overall form and massing
- e. Their contribution to the integrity of the cultural landscape as a component of the working assemblage of engineering structure

## 2. Background Information SITE B - Crowe Bay Dam and Lock 14

### .1 Dam 12 Crowe Bay

- 1) Dam 12 (Crowe Bay) was originally constructed in 1911. In 1985 there was a major rehabilitation with the installation of five vertical mechanized gates with no other work on remaining components of the dam. No other upgrades were made to this structure to date.
- 2) Dam 12 is not a cultural resource (identified as "Other" in the former Cultural Resource Inventory prepared for the TSW in 1994-95). The CRM Policy does not apply to resources that are determined "not to be cultural resources" (NCR). However, the dam represents an important aspect of both the canal's and the region history. It is also an integral part of the TSW landscape evolution and structuration. It exemplifies a form of innovative and adaptive water management technology used originally on the Trent-Severn Waterway. The dam contributes to the working assemblage of engineering structures that make the TSW an operational system of through-navigation.
- 3) Due to the poor condition of the overflow spillway the dam was given an overall "poor" condition rating. Based on the preliminary classification and poor condition rating the dam was included in the Mitigating Measures for High Risk Dams in the Parks Canada Agency report for Ontario. A DSR was subsequently undertaken for this dam.
- 4) The DSR rated the dam as a High B consequence structure with an IDF of 3,600 cms. The dam did not satisfy the Parks Canada Directive for Dam Safety for the following reasons:
  - a. components of the dam are not stable under certain load conditions;
  - b. the dam cannot pass the IDF; and
  - c. is significantly overtopped at IDF inflows.
- 5) The DSR determined that it would require 22 vertical gates (versus 5 currently existing) and a length of 300 m (versus existing length of 158 m) to pass the IDF. The option analysis recommended the addition of vertical gates at the overflow spillway component of the existing dam. Replacing

- the overflow component with four 10 m wide vertical gates set to the sill elevation of the other existing gates could increase the discharge capacity to a return period of 650 years (1370 cms). This was deemed to be the most reasonable approach to improve capacity. This recommended option 1B to be investigated further; however, there is flexibility with the final concept option selection.
- 6) It is important to note that the sluice training wall at the east sluice, proposed in the Options Analysis Report, is a public safety consideration related to gate automation.
- .2 Lock 14 Crowe Bay
- 1) Lock 14 was constructed in 1911. Numerous upgrades and repairs were undertaken at this lock:
- in 1936 a concrete cutoff wall was constructed offset from the left (east) side of the lock;
  - in 1939 the east lock wall was substantially reconstructed;
  - in 1967 the upper concrete sill was repaired;
  - in 1973 the lower apron (downstream of lower gates) was repaired;
  - in 1981 the lower sill was repaired;
  - in 1990 there was a rehabilitation of the lock including installation of a hydraulic system on the downstream gates;
  - in 2007 new wagon valves and refurbished rails were installed.
- 2) Lock 14 is a cultural resource of Other Heritage Value (formerly known as Level II cultural resources). The Lock is valued for its role in in-land water transportation, water management and the evolutionary development of the Trent-Severn Waterway. The lock contributes to the working assemblage of engineering structures that make the TSW an operational system of through-navigation. Within the context of its landscape patterns, little has changed since the station began operations. This site contains an archaeological resource (timber slide from 1844, OHV). Enhancing the historic character is the fact that the surrounding landscape features at this site remains relatively free from modern development.
- 3) Recent photos taken of the valve shafts and tunnels indicate where there are some problem areas with concrete and mechanical components. The concrete deterioration of the walls is not widespread.
- .3 Headrace Dam Bridge

- 1) The headrace bridge is a single lane, three-span reinforced concrete slab-on-grade structure constructed in 1908.
  - 2) The bridge provides a service road access to the lock and pedestrian access to the Lock.
  - 3) The structure also serves as a stop log dam to dewater the intake to the power dam.
  - 4) Structural drawings of the bridge are available.
  - 5) A visual detailed inspection report was completed in 2012. The bridge structural condition was rated "3" (poor) and the functional rating was "4" (fair).
  - 6) The bridge load capacity has not been evaluated to determine existing vehicle capacity for construction access or other future use.
- .4 Dam 12 and Lock 14 – Crowe Bay
- 1) The key elements contributing to the heritage value of Dam 12 and Lock 14 include:
    - a. Their in-situ location on the Trent-Severn Waterway
    - b. Their continued functional use
    - c. Their overall form and massing
    - d. their contribution to the integrity of the cultural landscape as a component of the working assemblage of engineering structures

## **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. The Consultant shall take into account the total life-cycle costs and activities for maintenance and operation of the dams and locks. Life-cycle and materials constraints and goals are described in the Required Services sections of this Project Brief.

### **3.2 Sustainable Development**

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 societal 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. The 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.

### **3.5 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 Section 6 Risk Management of "Doing Business with Public Works and Government Services Canada".

### **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. The Consultant shall identify and report to the PWGSC Project Manager all unavoidable non-conformances.
2. The 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**

1. The Consultant is to provide information and review documentation to support Cultural Resources Management.
2. The 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 dams, locks and cultural landscapes located at Campbellford and Crowe Bay. To ensure that the project managers and design consultants planning interventions on the Trent Severn Waterway have guidance with respect to cultural resource management, the consultant will be 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 Trent Severn Waterway NHS.

### **3.8 Environmental Protection**

1. The Consultant is to provide information and review documentation to support the development of Environmental Impact Assessment documents. One of the primary information requirements will be the identification of potential for change in the distribution and characteristic of the flow below the dam and the subsequent effect on the fish community due to changes of the dam discharge systems.
2. The Consultant is to review and update Environmental Protection requirements in the contract documents to suit this project and PWGSC or Client Department requirements.

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EQ754-171034  
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PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

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### **3.9 Quality Assurance / Quality Control**

1. The Consultant is to develop a 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.

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## **PR 4 SCOPE OF WORK**

### **4.1 General**

1. The scope of work is based on the 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.

### **4.2 Scope of Work SITE A - Campbellford Dam 11 and Lock 13**

1. Install mechanized sluices:
  - .1 The goal at Campbellford Dam is to increase the discharge capacity to slightly exceed or equal the discharge from Crowe Bay Dam 12 by evaluating options and recommending solutions including:
    - 1) Reconstructing the four timber stop log spillways as mechanized gates;
    - 2) Reconstructing the steel stop log sluice as a mechanized gate;
    - 3) Reconstructing the concreted spillway as a mechanized gate if required to satisfy discharge requirements or allow for water diversion during construction.
  - .2 The 2015 Option Analysis Report for Campbellford Dam and Crowe Bay Dam focused on only mechanizing the four timber stop log sluices at Campbellford. The report proposed considerably lower sill elevations to meet the requirement which had several disadvantages. This project expands the scope to include mechanization of the steel stop log sluice and the concreted sluice to meet the discharge objective to achieve the discharge requirements of a 650 year return period (1370 cms), while setting sill elevations at more desirable elevations.
2. Construct new retaining wall downstream of dam's East pier
  - .1 Analyze increase in flow and risk of erosion to shoreline downstream of dam as a result of the mechanization of the east sluices.
  - .2 Extend concrete retaining wall downstream of dam's east pier to protect against shoreline erosion.
  - .3 Retaining wall to be designed to resist flow from overtopping of earth embankments above.
3. Rehabilitate overflow spillway:
  - .1 The overflow spillway is in poor conditions and requires concrete repairs to improve its condition to good.
4. Concrete repairs and stabilization measures to Dam



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- .1 Carry out concrete repairs to dam to improve dam condition to good.
    - .2 Execute stabilization measures to concrete dam to address stability deficiencies identified in the DSR.
  5. Replacement of the pedestrian catwalk on dam with a vehicle deck:
    - .1 The pedestrian catwalk that crosses the overflow spillway is to be replaced with a deck capable of allowing access to the radial gates from the east approach for maintenance activities by service vehicles and cranes.
  6. Rehabilitation of Earth Embankments:
    - .1 There are three concrete core earth embankment dams at Campbellford that require rehabilitation to improve condition and resistance to overtopping.
    - .2 Rehabilitate the left embankment earth dam to improve its condition to good with an increased crest elevation (of approximately 0.43m) to match that of the concrete deck (154.5m geodetic);
    - .3 Rehabilitate the right earth embankment to improve its condition to good with an increased crest elevation (of approximately 0.43m) to match that of the concrete deck (154.5m geodetic);
    - .4 Rehabilitation of the lock upper approach left canal earth embankment to improve its condition to good with an increased crest elevation (of approximately 0.43 m) to match that of the concrete deck (154.5 m geodetic) from the right earth embankment to the left upper concrete lock approach wall;
    - .5 All these dams are considered in poor condition due to extensive vegetation growth and erosion and are in need of general rehabilitation and repair to improve their conditions from poor to good.
    - .6 Stability of the earth embankments was generally considered acceptable with the exception of overtopping at IDF levels. The overtopping concern will be addressed through improvements to discharge capacity and the proposed increase in crest elevation to 154.53 m to match the elevation of the concrete dam deck. This increase in elevation will force water to flow over the long concrete headrace walls leading to the power plant before the earth dams are threatened. Concrete walls are better able to withstand overflow and this approach is considered reasonable to reduce risk to the earth dams from overtopping failure.
    - .7 Vegetation: Prepare a vegetation plan for the earth dam rehabilitation to include restoration with appropriate native and naturalized vegetation requiring minimal maintenance that would promote an early successional native habitat.
  7. Lock 13 Rehabilitation



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- .1 Concrete repairs to improve overall asset condition of lock to good;
  - .2 There are deficiencies in the lock as identified in the DSR and previous inspections.
  - .3 Perform an assessment of concrete conditions through inspection, coring and testing and the development of repair and rehabilitation options. It is anticipated that that this work will include refacing or partial replacement of lock structures to achieve 50 year life.
  - .4 Scope to include inspection and repair of sluice tunnels, shafts and mechanical systems as required. The Consultant is to propose options for level of intervention required.
  - .5 Incorporate modifications to lock wall to allow for installation of proposed hydro power generation initiative.
8. Hydro Power Generation at Lock 13
- .1 Consultant to incorporate changes to the lock structure during rehabilitation to allow for the installation of a turbine for power generation.
  - .2 Client Department and a third party are currently investigating a potential project to install turbines in select lock structures. This project will be confirmed in June of 2016.
  - .3 The design requirements for this section of the lock will be provided to the Consultant during the conceptual design phase for inclusion in the rehabilitation work. All mechanical and electrical requirements for installation of the turbine will be provided by the third party with the turbine is to be supplied and installed by the third party following completion of the lock rehabilitation. Protection at intake for aquatic species will part of design requirement
  - .4 The hydro project is proposed to be located at the lower (downstream) valve and tunnels located in the lower quarter of the lock structure. Only the East side of the lock (opposite of the lock station) is being proposed for a turbine installation. The lower gate will be provided by the third party. Additional upstream or offsite components may also be required and will be supplied by the third party following completion of the lock structure.
9. Upstream and downstream lock approach wall repairs
- .1 Repair of upstream and downstream lock concrete approach walls to improve their condition to good and increase service life beyond 25 years;
  - .2 The DSR identified isolated condition deficiencies to both the upstream and downstream approach walls. The objective is to repair or rehabilitate these walls to extend their service life beyond 25 years. It is not envisioned that these walls would be demolished and reconstructed.
10. Public Safety Measure Improvements

- .1 Public safety and operator enhancements are to be based on CDA Guidelines and Parks Canada Agency practice and standards.
- .2 The dam deck is currently closed to the public. This general arrangement will be maintained for the rehabilitated structure and public safety measures must be designed for this accommodation. The measures will include but are not necessarily limited to:
  - 1) Installation of permanent (considering ice loads) safety boom upstream of the dam. Boom positioning will be constrained by existing private homes upstream of dam and will have to terminate at PCA property;
  - 2) Upgrade of signs throughout the dam using PCA templates including signs to public to stay out of operation area of the dam;
  - 3) Installation of post mounted audible alarm on the dam to warn the public in downstream hazard area of gate adjustments. Measure will include sign installation at various locations so public knows the meaning of the alarm (see additional comments on gate automation)
  - 4) Enhancement of handrails and fencing to better prevent public access to the dam.
- 11. Back-up Generator and UPS Installation
  - .1 Installation of a back-up power generator with uninterrupted power supply controls integrated into all dam control systems to provide automatic backup power for gate operations and gate heaters in the event of power outages.
- 12. Mechanical Radial Gate Repairs
  - .1 Carry out minor repairs to existing mechanical radial gates as recommended in the DSR.

#### **4.3 Scope of Work SITE B – Crowe Bay Dam and Lock 14**

- 1. Mechanization of Overflow Spillway
  - .1 Increase the discharge capacity of the dam by evaluating options and recommending solutions to replace the overflow spillway with mechanized gates.
  - .2 The DSR for this site identified a significant deficiency with respect to discharge capacity at this site and recognized that it would not be feasible to modify the dam to achieve the standard based IDF. Subsequently it was determined in an 2015 Option Analysis Report that the discharge capacity could be increased to a return period of 650 years by replacing the overflow component with four vertical gates with 10 m clear span set to a sill elevation of the existing gates.

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- .3 This was deemed the most reasonable approach to improve capacity. The recommended Options 1B solution will form the likely basis of this scope component; however, there is flexibility on option selection. The final option selection or modification of options will be determined at the design concept stage. Note that the sluice training wall shown in the Option drawings is a public safety consideration related to gate automation.
2. Construction of new Retaining Wall Downstream of Dam
- .1 The mechanization of the overflow spillway could result in an increase of flow and erosion along the shoreline between the dam and lock during flood conditions.
- .2 The objective is to protect against shoreline erosion by extending the concrete pier wall downstream to mitigate erosion concerns.
- .3 Furthermore this length of the canal component is at risk from overtopping and erosion with a resultant loss of material that supports the approach wall and lock at extreme floods.
- .4 The objective of this scope component is to protect against shoreline erosion and provide support to the embankment fill to reduce loss of supporting fill material in the rare event of embankment over toping due to severe flood.
- .5 This wall to be designed to resist overtopping.
3. Modification of Embankment to resist overtopping
- .1 Modification of site embankment and walls between lock 14 and the dam to resist IDF overflow conditions to a reasonable level considering the effect of new gates on IDF levels and short circuiting of flood flows around the entire site.
- .2 The DSR indicated that it is not feasible to achieve IDF at this site. Therefore measures are to be undertaken to reduce risk associated with overtopping and resulting dam failure at extreme floods above the 650 year return assuming the spillway is converted to four mechanical gates. These measures will need to be developed during the design process but would entail permitting overtopping at reinforced areas while cutting off other areas to susceptible overtopping failure. Note that these measures would be designed to a reasonable upper limit that includes consideration of area topography.
- .3 The anticipated measures could entail:
- 1) Rehabilitation or modification of upstream west approach walls and lock walls to resist overtopping at IDF elevations.
  - 2) Construction of new retaining wall downstream of dam along lock embankment.
  - 3) Construction of a short cutoff wall from just downstream of the lower lock gate to tie into the new retaining wall downstream of the dam.

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- 4) Construction of a cut off wall from the left downstream lower lock gate to the power plant
  - 5) Design of new slope protection to tolerate overtopping and contain backfill material during overtopping.
4. Lock 14 rehabilitation and repairs
    - .1 Carry out concrete repairs or other works to improve overall asset conditions to good.
    - .2 There are deficiencies in the lock identified in the DSR and previous inspections. This scope component will entail additional assessment of concrete conditions through inspection, coring and testing and development of rehabilitation options. It is anticipated that this work will including concrete refacing and crack repairs.
    - .3 Scope to include inspection and repair of sluice tunnels, shafts and mechanical systems as required. There was considerable leakage into this lock during its last de-watering. This will need to be addressed as part of the concrete repairs or grouting.
  5. Repair of upstream and downstream approach walls
    - .1 The DSR identified isolated deficiencies to both the upstream and downstream approach walls. The objective is to repair or rehabilitate these walls to improve their condition to good and extend their service life beyond 25 years. It is not envisioned that these walls would be demolished and reconstructed.
  6. Public Safety Measures
    - .1 Public safety and operator enhancements are to be based on CDA Guidelines and Parks Canada Agency practice and standards.
    - .2 The dam deck is currently open to the public with the exception of the operation equipment that is isolated by guardrails. This general arrangement will be maintained for the rehabilitated structure and public safety measures must be designed for this accommodation. The measures will include but are not necessarily limited to:
    - .3 Installation of permanent (considering ice loads) safety boom upstream of the dam. Boom positioning will be constrained by existing private homes upstream of dam and will have to terminate at PCA property;
    - .4 Upgrade of signs throughout dam using PCA templates including signs to public to stay out of operation area of the dam;
    - .5 Installation of post mounted audible alarm on dam to warn public in downstream hazard area of gate adjustments. Measure will include sign installation at various locations so public knows meaning of alarm (see addition comments on gate automation)
    - .6 Conversion of downstream guardrail along deck and ends of dam to a public access standard

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- .7 Installation of gate at operation deck entrance to restrict public access to gate mechanics and upstream side of dam
  - .8 Modification of gate at dam deck to allow pedestrian access but prevent vehicle access
  - .9 Installation of new vehicle gates to prevent public vehicles entering access lane
  - .10 Installation of handrails and fencing along new tailrace wall due to fall hazard.
7. Back-up Generator and UPS Installation
- .1 Installation of a back-up power generator with uninterrupted power supply controls integrated into all dam control systems to provide automatic backup power for gate operations and gate heaters in the event of power outages.
8. Headrace Bridge Evaluation and Repairs
- .1 Perform a visual inspection of bridge deck, superstructure, and piers including under water components to confirm results of 2012 inspection.
  - .2 Propose required repairs and upgrades to meet requirements as a site access bridge and improve condition rating from poor to good.
  - .3 This single lane headrace bridge is used for pedestrian and service vehicle access to the lock. Public vehicle access not permitted.
  - .4 This bridge will likely be used as part of the construction site access plan.
  - .5 The scope of work for this component to entail:
    - 1) Inspection of bridge deck, bridge piers (underwater) and bridge super structure
    - 2) A structural analysis to determine the load classification for the structure.
    - 3) Propose repairs, if required, to allow use of bridge at full highway loading during construction and after project.
    - 4) Piers will require repair, however the aim is to undertake any required pier repairs without de-watering using tremie concrete.
    - 5) Propose bridge repair concept and bridge repair design documents. Upon approval develop separate construction contracting documents for repair of Bridge in advance of main dam rehabilitation work.
9. Automation of dam gates
- .1 Automation of dam gates to reduce risk associated with sudden shutdown of power plant.
  - .2 The DSR assessed the risk associated with sudden shutdown of the generating station. The DSR concluded it would take about 5 hours from sudden power plant shut down to overtop the dam with

- gates closed and discharge only over the overflow spill way. This problem will be compounded as the spillway is converted to vertical gates.
- .3 To mitigate this risk the proposed scope is to install automatic gates to bypass flow in the event of a partial or full station shutdown.
  - .4 The required infrastructure and logic control are existing onsite. A modification is required to make the connection between the vertical gate control and the station PLC. This automation plan will require agreement and cooperation with the power plant operator.
  - .5 There is considerable public risk associated with gate automation. The area immediately downstream is popular for sun bathing and recreation. Gate automation processes will need to incorporate warning sirens and incremental gradual gate opening so the public has adequate time to move from the hazard area.
  - .6 A training wall along the most east sluice to protect the public from the new automated gate outflows, as proposed in the Options Analysis Report, should also be considered.
10. Minor repairs to existing mechanical gate pilasters
- .1 Implement minor repairs to deteriorated vertical gate pilasters above the deck as recommended in the DSR.

#### 4.4 Investigations and Engineering Studies

1. The following investigations and reports are the minimum required in order to quantify the project scope and design requirements.
2. SITE A – Campbellford Dam 11 and Lock 13
  - 1) Dam and Lock Inspections
    - a. Visual Inspections to confirm details and condition of structures and mechanical/electrical systems.
    - b. Concrete coring to develop dam and lock rehabilitation and/or repair options
  - 2) Water Management Study
    - a. Determination of optimum approach to satisfy discharge requirements including not only the functional timber stop log sluices but also the steel stop log sluice and concrete sluice. Main objective will be to establish common and reasonable sill elevation considering all sluices. Note that the CIMA Option Analysis report did not consider the steel stop log sluice and concrete sluice. The CIMA analysis proposed low sill elevation. Therefore a higher and more practical sill elevation could be established if the other sluices are mechanized and become operational. This study would also develop discharge rating curves considering accepted sill elevations for the



sluices, the contribution of the headrace walls as emergency spillway capacity, and the higher earth embankment crest elevations.

- 3) Development of Construction Access, Staging, and Cofferdam Plans and Parameters
  - a. As the major construction effort will take place in the center of the dam/lock, 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:
  - b. Construction of a temporary bridge over upper lock approach canal or lock. This approach will only be permitted during non-navigation period unless a temporary lift or swing bridge is installed to permit navigation.
  - c. Access over the headrace bridge and onto temporary rock fill work areas. The headrace bridge is owned by OPG. Client Department to make arrangements for use of headrace bridge during construction and confirm its load classification.
  - d. Construction work areas downstream are to be staged to permit adequate discharge throughout project. For example, activation of the concreted sluice to increase discharge capacity followed by work on currently active sluices may be required to meet diversion requirements. This diversion and construction staging plan will need to be developed during the design process.
- 4) Topographical and Bathymetric Survey
  - a. Consultant to obtain topographical and bathymetric information for the site structures and river bottom through 3D Realtime Sonar, LiDAR and Surveys supplemented by diving Inspections.
  - b. Surveys should extend minimum 100m upstream and 100m downstream of the dam and capture additional zones where flow characteristics will be impacted by the new gates in order to assess environmental impacts.
  - c. This work includes the determination of sediment profile upstream dam especially in areas where new vertical gates are proposed.
  - d. Survey results to be used during design to develop provisions to address sediment release during construction, commissioning and operations that may have an environmental impact due to changes in intake characteristics.
- 5) Geotechnical and Materials Investigations

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- a. Carry out geotechnical investigations to confirm information on bedrock properties and elevation for related Dam work and for cofferdam construction.
  - b. Carry out materials investigations to confirm the properties and condition of existing concrete and determine the suitability for refacing and limitations to work.
- .2 SITE B – Crowe Bay Dam 12 and Lock 14
- 1) Headrace bridge structural capacity assessment for use for construction access and recommended repairs.
  - 2) Comprehensive lock inspection and concrete coring to develop lock rehabilitation or repair option including mechanical systems.
  - 3) Development of Construction Staging, Access and Cofferdam Plans and Parameters - As the major construction effort will take place in the center of the dam/lock, construction access and staging will be a major project component. Possible access options include:
    - a. Construction of a temporary bridge supported on concrete piers downstream of the existing dam leading to a contractor staging area. The contractor staging area would likely be a rock fill elevated pad above downstream water levels design at the appropriate flood elevations.
    - b. Access over the headrace bridge and then over the canal across a temporary bridge to the staging area. This option to be a swing or lift bridge to facilitate navigation if construction is anticipated to occur during navigation periods.
  - 4) Topographical and Bathymetric Survey
    - a. Consultant to obtain topographical and bathymetric information for the site structures and river bottom through 3D Realtime Sonar, LiDAR and Surveys supplemented by diving Inspections.
    - b. Surveys should extend minimum 100m upstream and 100m downstream of the dam and capture additional zones where flow characteristics will be impacted by the new gates in order to assess environmental impacts.
    - c. This work includes the determination of sediment profile upstream dam especially in areas where new vertical gates are proposed.
    - d. Survey results to be used during design to develop provisions to address sediment release during construction, commissioning and operations that may have an environmental impact due to changes in intake characteristics.



- 5) Geotechnical and Materials Investigations
  - a. Carry out geotechnical investigations to confirm information on bedrock properties and elevation for related Dam work and for cofferdam construction.
  - b. Carry out materials investigations to confirm the properties and condition of existing concrete and determine the suitability for refacing and limitations to work.

#### 4.5 Project Deliverables

1. SITE A – Campbellford Dam 11 and Lock 14
  - .1 Analysis of Project Scope of Work Report
  - .2 Plan and Schedule for Investigations and Studies;
  - .3 Topographical and Bathymetric site plans with 3D point cloud;
  - .4 Dam Inspection report including;
    - 1) Main Dam 11
    - 2) Three Earth Embankment Dams
    - 3) Mechanical Systems
    - 4) Electrical Systems
  - .5 Report on vertical mechanical gate concept design options, dam rehabilitation options and hydraulic assessment including;
    - 1) determination of sill elevation to satisfy discharge requirement with stage discharge assessment (including graphs) to IDF floods in order to determine amount of overtopping at IDF flows considering capacity of new gates
    - 2) overflow contribution of headrace concrete walls
    - 3) evaluation/confirmation of proposed earth embankment crest elevation to reduce risk
    - 4) Minor repairs to radial gates
    - 5) New generator and UPS
    - 6) Class C estimates
    - 7) Report on the potential for change in the distribution and characteristic of the flow below the dam and the subsequent effect on the fish community due to changes of the dam discharge systems. This would include flow, water velocity, depth and water distribution. The information in this report is required to assess the most important environmental impact of the project – a changed downstream environment.
  - .6 Report investigating access, staging, water diversion and cofferdam options that recommends a plan and provides parameters for Contractor to follow including possibility of a temporary bridge across the lock or upper lock approach channel and possible load restrictions on OPG spillway headrace bridge with class C estimates,

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- .7 Report of Lock Inspection and Concrete Test Results with lock rehabilitation/repair concept design and Class C estimates
  - .8 Report of Lock modifications to incorporate hydro project requirements and Class C estimates.
  - .9 Public Safety Improvement Recommendations with Class C estimates
  - .10 Preliminary Design Report and Class B Estimates for all project components;
  - .11 Information required for Environmental Detailed Impact Assessment for both construction mitigations and the overall project;
  - .12 Presentations to Client, Management, Authorities having jurisdiction and Public;
  - .13 Tender ready Construction Documents and Class A estimate;
  - .14 Construction Documents marked "Issued For Construction"
  - .15 Feedback and Amendments during Tendering
  - .16 Review of Shop Drawings and submittals
  - .17 Review of As-built drawings
  - .18 Review of Operation and Maintenance manuals.
  - .19 Design and Construction Report;
  - .20 Warranty Inspection reports, Initial and Final
2. SITE B – Crowe Bay Dam12 and Lock 14
- .1 Analysis of Project Scope of Work Report
  - .2 Plan and Schedule for Investigations and Studies;
  - .3 Topographical and Bathymetric site plan and 3D point cloud;
  - .4 Report of Headrace Bridge inspection, load classification, repair concept design with Class C estimates;
  - .5 Dam Inspection report including;
    - 1) Main Dam 12
    - 2) Earth Embankment dams;
    - 3) Mechanical Systems
    - 4) Electrical Systems
  - .6 Report on vertical mechanical gate concept design options, dam rehabilitation options and hydraulic assessment including;
    - 1) determination of sill elevation to satisfy discharge requirement with stage discharge assessment (including graphs) to IDF floods in order to determine amount of overtopping at IDF flows considering capacity of new gates
    - 2) Class C estimate
    - 3) Report on the potential for change in the distribution and characteristic of the flow below the dam and the subsequent effect on the fish community due to changes of the dam discharge systems. This would include flow, water velocity, depth and water distribution. The information in this report is

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- required to assess the most important environmental impact of the project – a changed downstream environment
- .7 Report on concept design of retaining wall to resist overtopping at IDF level with class C estimate;
  - .8 Report with concept design for slope protection and cut-off measures to mitigate overflow protection from overtopping at unprotected areas;
  - .9 Report investigating access, staging, water diversion and cofferdam options that recommends a plan and provides parameters for Contractor to follow;
  - .10 Report on concrete test results and lock rehabilitation concept design with Class C estimates;
  - .11 Report and concept designs with Class C estimates for public safety measure enhancements;
  - .12 Public Safety Improvement recommendations with Class C Estimates
  - .13 Preliminary Design and Class B Estimates for all project components;
  - .14 Information for Environmental Detailed Impact Assessment including construction mitigations and the overall project;
  - .15 Presentations for Client, Management, Agencies with jurisdiction and Public;
  - .16 Tender Ready Construction Documents and Class A estimate;
  - .17 Construction Documents marked "Issued For Construction";
  - .18 Feedback and Amendments during Tendering
  - .19 Reviewed Shop Drawings and Submittals
  - .20 Review of As-Built drawing
  - .21 Review of Operation and Maintenance manuals.
  - .22 Design and construction report;
  - .23 Warranty Inspection reports, Initial and Final

#### 4.6 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. Consultant is encouraged to combine teleconferences, meetings and presentations for both sites or hold them back-to-back.
4. Anticipated number of meetings for budgeting purposes is shown in table below:

Project Phase	Anticipated Number of Meetings for each site			
	Teleconference	In-Person PWGSC Office Ottawa	In-Person PCA Office Peterborough	In-Person On Site
RS1 & RS2 Start-up, Document Review and Analysis of Project Requirements	2	1	1	1
RS 6 Investigations	2	1	1	1
RS 7 Design Concept	2	1	1	0
RS 8 Design Development	2	2	1	0
RS 9 Construction Document Development	4	2	1	0
RS 10 Tender/Bid/Award	2	0	0	1
RS 11 Design Services During Construction	12	1	1	36
RS 14 Post Construction Services	2	0	0	2
Urgent Problem Solving Issues	12	4	2	12

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## 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 Trent Severn Waterway 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 Trent Severn Waterway.
- .2 The maintenance period typically lasts a few weeks before and a few weeks after the navigation season on the Trent Severn Waterway.
- .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 The consultant is responsible for identifying and adhering to any additional construction restrictions including Ministry of Natural Resources restrictions and Department of Fisheries and Oceans.
- .2 The restricted period for in-water work is from March 15 to July 15 inclusive.
- .3 The breeding bird timing restriction for no vegetation removal works is from March 31 and August 27 for Zone C2.
- .4 Critical habitat has been identified for Blanding's Turtle and Eastern Musk Turtle for both project areas (see attached map). Design should avoid impacts to individual species and critical habitat wherever possible. Tree removal should not include decaying logs where possible, or should be restored once construction is complete. If design will affect identified critical habitat, rationale of alternatives considered prior to impacting this habitat must be documented. Activities likely to cause destruction to critical habitat are described in the federal recovery strategy, available online at: [http://www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=2900](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=2900) and:

[http://www.sararegistry.gc.ca/document/default\\_e.cfm?documentID=2901](http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=2901)

- .5 While no other species at risk have been identified in direct proximity of the project areas, Northern Map Turtle, Snapping Turtle, Milk Snake, Barn Swallow, Common Nighthawk and Butternut and have been noted as possible species at risk in the vicinity.
- 4. Construction Schedule
  - .1 Construction to occur between April 2018 and March 2020.
  - .2 All work to be substantially complete by November 1, 2019.
- 5. Permits
  - .1 The Consultant is responsible for identifying and securing all permits and approvals required for the work including a permit under the Navigational Waters Protection Act from Transport Canada (TC).
- 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 are to be included in Contract Documents
- 7. Environmental Assessment
  - .1 The proposed project will require a Detailed 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 For the Rehabilitation of Campbellford and Crowe Bay Dams and Locks, 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 will be required to incorporate mitigation from the CRIA into final design documents.

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9. Client Department Property
    - .1 The Client Department owns the property on which the structures are located.
    - .2 Construction space is limited but construction activities, access and staging areas are to be restricted to Client Department Property unless otherwise indicated.
    - .3 The Consultant is to coordinate through the 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 adequate discharge at full flow capacity throughout construction.
    - .2 The Consultant is to develop parameters related to cofferdams, dewatering plans and water diversions required for the project.
  11. Availability of Staff to Implement Project
    - .1 Consultant is to ensure sufficient availability of staff, especially at early stage of deliverables, to complete this project by the required schedule.

## **5.2 Constraints SITE A – Campbellford Dam 11 and Lock 13**

1. Property Issues
  - .1 The Consultant is to coordinate through the Client Department to make arrangements for access over the Ontario Power Generation (OPG) Headrace Bridge and confirm load classification with OPG.
2. Water Management
  - .1 At this site the Consultant must include provisions in the design and construction documents to maintain required flow for duration of project including spring freshet.
  - .2 Rock fill work platform and downstream access to be set at elevations to allow continuous work at full discharge levels
3. Access Bridge
  - .1 The OPG Headrace Bridge may not have the capacity to support construction vehicles if used for construction access.
  - .2 Service vehicle access across the headrace to the gates must continue throughout the construction period.
4. Concrete Condition at Lock

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

5. Hydro Development

- .1 Project delays will have financial implications to the third party hydro development

### 5.3 Constraints SITE B – Crowe Bay Dam and Lock 14

1. Property Issues

- .1 The Consultant is to coordinate through the Client Department to make arrangements for access over the Ontario Power Generation (OPG) Headrace Bridge and confirm load classification with OPG.

2. Water Management

- .1 At this site the Consultant must include provisions in the design and construction documents to maintain required flow for duration of project including spring freshet.
- .2 Rock fill work platform and downstream access to be set at elevations to allow continuous work at full discharge levels
- .3 There is considerable leakage into the lock during drawdown that must be included in the water management plan for the lock rehabilitation.
- .4 Overtopping of embankments occurs at extreme flood events (650 year return period) allowing potential for bank erosion.

3. Downstream Capacities

- .1 If concurrent studies at downstream dams projects (i.e. Ranney Falls) indicate that capacity enhancements are not feasible, the scope of this project may be reduced to three new mechanical sluices versus four in order to reduce the risk of accidental discharge loading. This would increase design rework cost but lower construction costs

4. Access Bridge

- .1 The Headrace Bridge may not have the capacity to support construction vehicles if used for construction access.
- .2 Design of a temporary bridge may be required over upper lock approach canal or over lock for construction access from the West.

5. Concrete Condition at Lock

- .1 It is assumed that lock concrete will be adequate for concrete refacing. If complete demolition and reconstruction of the wall in



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part of whole is required it could delay the project and impact access to dam.

6. Hydro Development

- .1 Project delays will have financial implications to the third party hydro development

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## PR 6 EXISTING DOCUMENTATION

### 6.1 Existing Documentation

1. Existing documentation will be made available for review by the successful Consultant after the project start-up meeting.
2. Site A - Campbellford Dam 11 and Lock 13:
  - .1 Existing Reports:
    - 1) Dam Safety Review – Campbellford Bay Dam and Lock 13, AECOM, Feb 2016
    - 2) Campbellford and Crowe Bay Dams Option Analysis, CIMA, Oct 2015
    - 3) Trent River Watershed Hydro-Technical Study, AECOM, May 2011
    - 4) 1969: Department of Transport, Marine Works – Canals Division, Trent Canal System: Dam 11 Boreholes - Tender (Drawing T11-32903) – Geotechnical Investigation Dam 11.
    - 5) 1975: Indians and Northern Affairs – Trent Canal System: Dam 11 Reconstruction (Drawings T22-34501 and T22-34502).
    - 6) 1976: Rehabilitation of Dam 11 including the installation of mechanized roller gates (Indians and Northern Affairs – Trent Canal System Dam 11 Reconstruction - Tender (Drawings T11-32901 to T11-32929 and T40- 961 (1975))).
    - 7) 2004: Installation of new wagon valves and refurbished rails at Lock 13 (Reference 62).
    - 8) 2005: Rehabilitation of Lock 13 including the installation of a hydraulic system on the downstream gates (Reference 62).
  - .2 Existing Drawings:
    - 1) Dam 11 – Boreholes at Dam, T22-34501 and T22-34502 (1969).
    - 2) Dam 11 – 1975 March (10-722) Dam No 11 Reconstruction (1975)
    - 3) Allen West (Canada) Ltd, T13-50001, T13-50002, T23-13646, T40-72913 and T40-72914.
    - 4) Art Wire & Iron (1972) Co Ltd, T40-72906 to T40-72912.
    - 5) As built, T11-329a01 to T11-329a29 and T11-32927a.
    - 6) Canadian Machinery Corp, T23-13601 to T23-1313645 and T40-72915.
    - 7) Pre-Con Company, T40-72901 to T40-72905.
    - 8) Tender, T11-32901 to T11-32929 and T40-961
    - 9) Dam 11 – Dam 11 at Lock 13 Minor Repairs, T11-26101 to T26103.
    - 10) Dam 11 – Dam 11 at Lock 13 Originals, T11-26104, T11-26105 and T11-249013 to T11-249016.

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- 11) Dam 11 – Dam No. 11 AS BUILT, T11-26104.
  - 12) Lock 13 - 1987 August 20 Standard Lock Gate without Butterfly Valve (1987), T41-43201.
  - 13) Lock 13 – Lock 13 Originals, T16-19002, T16-19301 to T16-19303, T20-22407 to T20-22412b and T20-22501 to T20-22503.
  - 14) Dam 11 and Lock 13 – Plan of Dam No 11 & Lock No 13, T20-22501 and T20-22501a.
- .3 Drawings prepared for the 2016 DSR:
- 1) 001: Campbellford Area - General Plan View.
  - 2) 002: Location Plan – Campbellford Lock 13 and Dam 11.
  - 3) 003: Dam 11 and Lock 13 – Plans and Elevations.
  - 4) 004: Dam 11 and Lock 13 – Sections.
  - 5) 005: Right Earth Embankment – Plan & Section.
  - 6) 006: Left Earth Embankment – Plan & Section
  - 7) The elevations in the drawings produced as part of the DSR were based on the various drawings received from PWGSC/PCA and from the surveys performed on site by AECOM in 2013. All elevations on the DSR drawings are on the geodetic datum. It should be noted that some adjustments have been performed between the elevations from the former drawings and the last survey. First because the hydraulic structures were modified following the repairs; secondly because constant differences have been noted between the old drawings, the rehabilitation drawings and the new surveys. The origin of this difference could be explained by the vertical datum different in each drawing. To account for the discrepancy, a correction factor (to convert from one system to the other) was determined.
- .4 Property records plans:
- 1) Client Department owns considerable property at this site and property records plans will be made available as required.
3. Site B - Crowe Bay Dam and Lock 14:
- .1 Existing Reports
- 1) Draft Dam Safety Review – Crowe Bay Dam and Lock 14, AECOM, (Sep 2013)
  - 2) Public Safety Around Dams Risk Assessment Report, AECOM, (Aug 2015)
  - 3) Headrace Dam Bridge at Crowe Bay Visual Detailed Inspection Report, Delcan (Mar 2012)
  - 4) Campbellford and Crowe Bay Dams Option Analysis, CIMA, Oct 2015

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- 5) Trow Ltd. (Reference 66) – Geotechnical Investigation Dam 12, Lock 14 (1982)
  - 6) Trow Ltd. (Reference 67) – Geotechnical investigation Dam 12, Lock 14 (1983)
  - 7) Trent River Watershed Hydro-Technical Study, AECOM, (May 2011)
- .2 Existing drawings
- 1) Dam 12 – Campbellford 10-884 (COTSCA 83 R76).
  - 2) Dam 12 – Soundings North of Dam 12 (COTSCA 85 R42).
  - 3) Dam 12 – Rehabilitation, As Built, T41-38101 to T41-38126, (1984).
  - 4) Dam 12 – Steel Plates for Gains, T11-217, (1984).
  - 5) Dam 12 and Lock 14 – Chain Link Fencing Upstream Face of Dam 12, T40-724, (1975).
  - 6) Dam 12 – Deck Replacement, T40-81901 to T40-81903, T40-82101 and T40-82102, (1972).
  - 7) Dam 12 – Lubrication Schedule, T41-425, T41-425a, (1987).
  - 8) Dam 12 – Headrace Dam & Bridge at East End, As Built, T11-25111.
  - 9) Dam 12 – Original, As Built, T11-132 (1920)
  - 10) Lock 14 – Cut-Off Wall, As Built, T32-105, (1936).
  - 11) Lock 14 – East Wall Repairs, T20-22305 and T32-1101 to T32-1104, (1939).
  - 12) Lock 14 – Upper Sill Details, T20-22302, (1967).
  - 13) Lock 14 – Lower Apron Restoration, T40-907, (1973).
  - 14) Lock 14 – Layout Plan, As Built, T20-16302.
  - 15) Lock 14 – Plan Elevations, T20-23204.
  - 16) Lock 14 – As Built, T20-16301, T20-16302, T20-22304a, b, T20-23202 and T22-399a,b,c, (1915).
  - 17) Lock 14 – Line Wiring Diagram & Schematic Hydraulic Valves Locks #1, 2, 6, 10, 13, 14, T13-13901, (1964).
  - 18) Lock 14 – Clearing and Grubbing, As Performed, T20-22503.
  - 19) Lock 14 – Schematic Hydraulic Circuit – T40-841, (1971).
  - 20) Lock 14 – Layout, T40-867, (1972).
  - 21) Lock 14 – Position of Concrete Pad for Hydraulic Unit, T40-15206, (1971).
  - 22) Lock 14 – Mechanization of Locks 3 & 14, T40-75301 to T40-75305, (1971).
  - 23) Lock 14 – Control Building, T40-81201 to T40-81204, (1972).
  - 24) Lock 14 – Mechanization, Gates 1 & 2, Valves 2 & 4, T40-87801, T40-87802, (1973).
  - 25) Lock 14 – Original, As Built, T11-16201, T11-16202, T20-12707, T20-23201, T20-23203 to T20-23205,

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- .3 26) T22-105a,b,c, T22-106a,b,c,d,e, T24-11501.  
Drawings prepared for the 2013 DSR:  
1) DSR Dwg 001: General Plan View  
2) DSR Dwg 002: Location Plan – Crowe Bay Dam 12 and Lock 14.  
3) DSR Dwg 003: Dam 12 - Plan, Elevation and sections.  
4) DSR Dwg 004: Lock 14 - Plan, Elevation and sections.
- .4 Property records plans:  
1) Client Department owns considerable property at this site and property records plans will be made available as required.

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## **PROJECT ADMINISTRATION (PA)**

### **PROJECT ADMINISTRATION**

#### **PR 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 is 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.

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## 1.5 General Project Deliverables

1. Submit site specific deliverables separately for each site unless directed otherwise by the Departmental Representative.
2. Unless otherwise indicated, submit draft versions of final reports for review and acceptance prior to submission of final report.
3. Submit draft versions of presentation materials for review and acceptance prior to submission of final presentation materials.
4. 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 the 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".
5. 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.



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- .4 Submit one (1) copy of construction documents in electronic file 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 document.
    - 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 to be provided in original editable format.
    - 5) Specialized files such as those used for structural evaluations to be provided in their original file format.
  - .6 Provide one (1) DVD or USB with all electronic files at the end of project.
6. Submissions from 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 the 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 the 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 number 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 2155 Ashburnham Drive, Peterborough, Ontario.
9. During Construction and implementation, participate in teleconferences and attend meetings to be held on-site as requested by the 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 are 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 the Departmental Representative.
- .2 In addition to the SSHSP the following documents are 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.

## PR 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 the 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.

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## **PR 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 Transport Canada: 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.



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2. Formal presentations are required for design and project approvals with the 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 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
<b>RS 2 Analysis of Project Scope of Work</b>				
Detailed Project Schedule	x	x	x	x
Analysis of Project Scope of Work Report	x	x	x	x
Updated Class 'D' Estimate	x	x		
<b>RS 7 Design Concept</b>				
Initial Design Concept (Options) Report	x	x	x	x
Design Concept Report	x	x	x	x
Class 'C' Estimate(s)	x	x		
<b>RS 8 Design Development</b>				
Design Development Reports	x	x	x	x
Class 'B' Estimate(s)	x	x		
<b>RS 9 Construction Documents</b>				
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	

## PR 4 INVOICING AND PAYMENTS

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

N° de l'invitation - Sollicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

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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.

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## **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 and apply to all projects sites referred to in the Project Requirements (PR) section of this Project Brief.

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 Minutes for meetings related to Construction and Contract Administration during construction to be prepared by others.

#### **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.

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- .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 by others to 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.

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- 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 were 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 cost consulting services to be performed by a Professional Quantity Surveyor (PQS) with knowledge and expertise specific to Dams and Locks related to their rehabilitation, demolition and construction in Ontario.
- 3.2 Provide quantity estimates, cost estimates, detailed cost breakdowns, life cycle costing, cash flow planning, contingency estimating, value analysis and cost reduction strategies to support options being evaluated for the Construction project and for the selected final design.
- 3.3 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 is 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,

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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 the proposed checklist or other available lists;
2. qualify/quantify probability of risk event (Low, Medium, High) and its 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 QC sign-off sheets are to be completed and attached to each submittal during the project to confirm QC 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.



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- 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 It is PWGSC's intention that the Contractor be directed to make use of a Quality Control Administrator (QCA) and a Quality Verification Engineer (QVE) for Contractor's review and stamping of all submissions and proposed procedures and review of Quality Control inspections and materials testing carried out by the Contractor.
- 5.8 Incorporate approved QA/QC plan into the Construction documents.
- 5.9 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 the terms of reference for each individual study and investigation.
- 6.2 Obtain written authorization of the 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.

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- 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 the 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 a minimum of three (3) design options 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 an Initial Design Concept (Options) 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 three (3) options, following the Design Concept meeting, by each of the applicable structural, mechanical and electrical/controls 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 the option adheres 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 a Class "C" Construction Cost Estimate;
- .4 include a list of unavoidable non-conformances;
- .5 include options analysis, complete with 100-year life cycle cost analysis;

- 7.3 Meetings during the Design Concept stage are to occur for each project deliverable listed. During the meetings, the Consultant Team is to at a minimum:

1. recap progress achieved to date and work 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's review and acceptance.

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- 7.4 Submit the design concept documents for review in sufficient detail to illustrate the design concept 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 temporary structures, staging areas, safety, etc. are also to be considered.
- 7.7 Provide environmental technical advice to complete a Detailed Environmental Impact Assessment coordinated by Parks Canada and PWGSC. The environmental mitigations identified are to be included in the specifications and drawings as requirements.
- 7.8 Provide technical advice for a 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 single Preferred Concept Design Option for Design Development consideration at each Site in writing to the Departmental Representative.
- 7.10 Design Concept Deliverables:
- .1 Initial Design Concept Report with Three (3) design options
  - .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 the 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, and 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 a) 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 1.4 subsection 2.
- 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.

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- 8.6 Final design to be all-inclusive, except for temporary works during construction to be designed by the Contractor. The design documents are 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 are 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 the Departmental Representative's 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 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.

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- 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 replies 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 Public Works and Government Services Canada - 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 will 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 advise 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 Design Services During Construction**

- 11.1 Obtain written authorization from the Departmental Representative before proceeding with the services related to Design Services during Construction.

11.2 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 the 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. Inspect the completed work, provide list of deficiencies after substantial completion to be addressed prior to issuance of final Certificate of Completion;
10. 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 (O&M) manuals, have been submitted in specified quantities and format to the Departmental Representative.
11. review and provide feedback on Contractor's marked-up Record Drawings for preparation of as-built Record Drawings and Final Record Drawings;
12. edit CADD files to incorporate Contractor's as-built markups to generate and submit final as-built record drawings;
13. review and comment on O&M Manuals.

11.3 Design Services During Construction Deliverables

1. Updated Drawings and Specifications "Issued for Construction"
2. Site Inspection Letter Reports
3. Responses to Contractor's submittals
4. Site Instructions to Contractor
5. Technical details for CCNs and COs

6. List of deficiencies to be addressed for final Certificate of Completion
7. Comments on Contractor's O&M Manuals
8. Feedback on Contractor's marked-up "as-built" Record Drawings
9. Letter report on the review of Contractor's end-of-construction deliverables
10. Final As-built Record drawings

## **RS 12 Construction and Contract Administration**

### **12.1 Construction and Contract Administration Services to be provided by others.**

1. Co-operate and communicate with Construction and Contract Administration personnel.

## **RS 13 Resident Site Services During Construction**

### **13.1 Resident Site Services during construction to be provided by others.**

1. Co-operate and communicate with Resident Site Services personnel.

## **RS 14 Post Construction Services**

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

### **14.2 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.**

### **14.3 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.

### **14.4 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

14.5 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

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pwl035  
N° CCC / CCC No./ N° VME - FMS

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## **SUBMISSION REQUIREMENTS AND EVALUATION (SRE)**

- SRE 1 General Information
- SRE 2 Proposal Requirements
- SRE 3 Submission Requirements and Evaluation
- SRE 4 Price of Services
- SRE 5 Total Score
- SRE 6 Submission Requirements – Checklist

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## **SUBMISSION REQUIREMENTS AND EVALUATION (SRE)**

### **SUBMISSION REQUIREMENTS AND EVALUATION**

#### **SRE 1 GENERAL INFORMATION**

##### **1.1 Reference to the Selection Procedure**

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

##### **1.2 Calculation of Total Score**

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

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

#### **SRE 2 PROPOSAL REQUIREMENTS**

##### **2.1 Requirement for Proposal Format**

- 2.1.1 The following proposal format information should be implemented when preparing the proposal.
- a) Submit one (1) bound signed original plus three (3) bound copies of the proposal
  - b) Paper size to be - 216mm x 279mm (8.5" x 11")
  - c) Minimum font size – 11 point Arial, or equivalent
  - d) Minimum margins - 12 mm left, right, top, and bottom
  - e) Double-sided submissions are preferred
  - f) One (1) 'page' means one side of a 216mm x 279mm (8.5" x 11") sheet of paper formatted as described above
  - g) 279mm x 432 mm (11" x 17") fold-out sheets for spreadsheets and organization charts will be counted as one page per side
  - h) 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**

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

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

- 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
- 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 REQUIREMENTS**

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 **Civil/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 required Mechanical and Electrical/Controls Engineers are to be identified as either in-house specialists of the proponent, or employees of a single Mechanical/Electrical sub-consultant.
- b) The Consultant Team to be identified for the purposes of the evaluation to include the following, except that Mechanical and Electrical/Controls engineers need only be listed once (either under In-house or Sub-consultant category):
  - i) Consultant (Proponent): Civil/Structural Engineering Consultant
    - In-house Senior Team Leaders:
      - Project Manager
      - Civil/Structural Dam Engineer
      - Mechanical Engineer (In-house)
      - Electrical/Controls Engineer (In-house)
    - In-house Engineering Team Members:
      - List six (6) Engineering Team members, two (2) team members for each discipline: Civil/Structural, Mechanical and Electrical/Controls.

- ii) Mechanical/Electrical Sub-Consultant Firm (if required to substitute for in-house Senior Team Leaders and Engineering Team Members)
  - Senior Team Leaders:
    - Mechanical Engineer (Sub-Consultant)
    - Electrical/Controls Engineer (Sub-Consultant)
  - Engineering Team Members:
    - Two (2) Mechanical Engineers (Sub-Consultant)
    - Two (2) Electrical/Controls Engineers (Sub-Consultant)
- c) Information required:
  - i) Name of proponent, and name of Mechanical/Electrical/Controls 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 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).
- d) The Project Manager must have a minimum ten (10) years of experience managing Canadian projects of equivalent scope and depth on fast-track schedules.
- e) The Civil/Structural Engineer, the Mechanical Engineer and the Electrical/Controls Engineer who as Senior Team Leaders will supervise and lead each discipline must be senior Engineers with a minimum ten (10) years of experience in dam inspection, analysis, design, and construction projects.
- f) The Engineering Team Members are to have a minimum five (5) years relevant dam project experience.
- g) The format for submission of the Team Identification information is provided in Appendix A.
- h) 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 dam projects and earth embankment projects.
- b) Select Three (3) dam projects completed within the last ten (10) years, that were either major rehabilitation projects or full replacement projects.
- c) Information that should be supplied:
  - i) Clearly indicate how each project is comparable and relevant to the two 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) Provide engineering fees per discipline and final construction cost.
  - vi) Provide project schedule. Include start and end date of construction.
  - vii) Indicate key personnel who were involved in project delivery that are 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.

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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.  
This is the opportunity to emphasize their strengths and expertise directly related to dam projects, to recognize their past responsibilities, and achievements.
- b) Provide information for each of the following Senior Team Leaders:
  - i) Project Manager
  - ii) Civil/Structural Dam Engineer
  - iii) Mechanical Engineer
  - iv) Electrical/Controls Engineer
- c) Only identify Senior Team Leaders who will be carrying out the Engineering and/or management work on this project.
- d) Information that should be supplied for each Senior Team Leader:
  - i) Relevant dam project experience and expertise,
  - ii) Number of years of relevant experience,
  - 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 dam projects, to recognize their past responsibilities, and achievements.
  - i) Provide information for six (6) Engineering Team Members for evaluation, two (2) for each discipline: Civil/Structural Dam Engineers, Mechanical Engineers and Electrical/Controls Engineers. The actual Consultant Team for the project may include more staff, but only include six (6) 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) Information that be supplied for each Engineering Team Member:
  - i) Relevant dam 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 to be provided for only one Site - SITE B: Crowe Bay Dam.
- c) Information that should be supplied:
  - 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, for this site
  - ii) Work Plan - detailed breakdown of work tasks and deliverables for this site
  - iii) Project Schedule - proposed major milestones schedule, which falls within the schedule constraints established in the RS Sections for this site
  - iv) Risk management strategy and key items to be considered for this 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 both Sites.
- b) Quantity of proponent's personnel assigned for each individual week, per discipline and per seniority level is 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) Table format and information that should be supplied:
  - i) Present table on a single side of one 11"x17" sheet;
  - ii) Row titles are to describe the function/discipline/seniority of Team Members assigned to work during this period;
  - iii) In each cell of the table, fill in the quantity of person-days to be assigned to complete the work within the designated delivery dates for each site.

#### 3.2.6 Design Approach

- a) The proponent should elaborate on unique aspects of these two sites that could be considered major challenges in order to illustrate their design approach to developing an economical, durable and

easily maintained dam design that allows for fast track construction using innovative design details and construction staging to deliver these two projects strictly within the schedule.

b) Information that should be supplied:

- 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 dams are repaired or replaced during the indicated construction timeframe.
- ii) The design plan will be evaluated in terms of being able to present a creative design and construction approach that will minimize the closure period to vehicular and pedestrian traffic over the canal and allow for opportunities to accelerate construction work.
- iii) 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
<b>Technical Rating</b>	<b>10.0</b>		<b>0 - 100</b>

To be considered further, proponents must achieve a minimum Technical Rating of sixty-five (65) points out of the hundred (100) points available as specified above.

**No further consideration will be given to proponents not achieving the pass mark of sixty-five (65) points.**

### 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 will 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 which could be evaluated	Lacks complete or almost complete understanding of the requirements.	Has some understanding of the requirements but lacks adequate understanding in some areas of the requirements.	Demonstrates a good understanding of the requirements.	Demonstrates a very good understanding of the requirements.	Demonstrates 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 will 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

## **SRE 4 PRICE OF SERVICES**

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of sixty-five (65) points will be opened upon completion of the technical evaluation.

An average price is determined by adding all the price proposals together and dividing the total by the number of price proposals being opened.

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

The remaining price proposals are rated as follows:

- 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 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.

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## 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



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pwl035  
N° CCC / CCC No./ N° VME - FMS

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## APPENDIX A - TEAM IDENTIFICATION

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## APPENDIX A - TEAM IDENTIFICATION FORMAT

The Consultant and other members of the Consultant Team to 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, except that Mechanical and Electrical/Controls personnel is to be listed only once, either under Consultant or under Sub-consultant.

### I. Consultant (Proponent) – Civil/Structural Engineer:

Firm or Joint Venture Name: .....

.....

.....

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

#### Senior Team Leaders:

Project Manager: .....

Civil/Structural Dam: .....

Mechanical: .....

Electrical/Controls: .....

.....

#### Engineering Team Members:

Civil/Structural Dam: .....

Civil/Structural Dam: .....

Mechanical: .....

Mechanical: .....

Electrical/Controls: .....

Electrical/Controls: .....

.....

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## APPENDIX A - TEAM IDENTIFICATION FORMAT (CONT'D)

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

#### Mechanical/Electrical/Controls

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

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

#### Senior Team Leaders:

Mechanical:

.....

Electrical/Controls:

.....

#### Engineering Team Members:

Mechanical:

.....

Mechanical:

.....

Electrical/Controls:

.....

Electrical/Controls:

.....

Additional Information to be provided:

- Name of proponent, and name of Mechanical/Electrical/Controls sub-consultant, if used.
- 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.
- Names and roles of key personnel to be assigned to the project per Section a) above.
- 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.

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- 
- e) 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).

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## APPENDIX B - DECLARATION/CERTIFICATIONS FORM

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## APPENDIX B - DECLARATION/CERTIFICATIONS FORM

**Project Title:**

**Name of Proponent:**

**Street Address:**

**Mailing Address:**

**Telephone Number: (    )**

**Fax Number: (    )**

**E-Mail:**

**Procurement Business Number:**

<b>Type of Organization:</b>  _____ Sole Proprietorship  _____ Partnership  _____ Corporation  _____ Joint Venture	<b>Size of Organization:</b>  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 will declare a proposal non-responsive, or will 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 will 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 will 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

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## 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)



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## 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 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.

N° de l'invitation - Solicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

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## APPENDIX C - PRICE PROPOSAL FORM

N° de l'invitation - Solicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

## 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.

PROPOSERS SHALL NOT ALTER THIS FORM

**Project Title:**

**Name of Proponent:**

---

**The following will form part of the evaluation process:**

---

### REQUIRED SERVICES

#### Fixed Fees

(R1230D (2016-01-28), GC 5.2 – Terms of Payment – Architectural and/or Engineering Services)

SERVICES	FIXED FEE
Site A – Cambellford Dam	
RS 1A Management of Consulting Services	\$.....
RS 2A Analysis of Project Scope of Work	\$.....
RS 3A Risk Management	\$.....
RS 4A Quality Management	\$.....
RS 5A Estimating and Cost Planning	\$.....
RS 6A* Investigations, Studies and Reports	\$.....
RS 7A Design Concept	\$.....
RS 8A Design Development	\$.....
RS 9A Construction Documents	\$.....
RS 10A Tender Call, Bid Evaluation and Construction	\$.....
RS 11A Design Services During Construction	\$.....
RS 14A Post Construction Services	<u>\$.....</u>
<b>TOTAL FIXED FEES SITE A</b>	<b>\$.....</b>

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PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

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## APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

### Site B – Crowe Bay Dam

RS 1B	Management of Consulting Services	\$.....
RS 2B	Analysis of Project Scope of Work	\$.....
RS 3B	Risk Management	\$.....
RS 4B	Quality Management	\$.....
RS 5B	Estimating and Cost Planning	\$.....
RS 6B*	Investigations, Studies and Reports	\$.....
RS 7B	Design Concept	\$.....
RS 8B	Design Development	\$.....
RS 9B	Construction Documents	\$.....
RS 10B	Tender Call, Bid Evaluation and Construction	\$.....
RS 11B	Design Services During Construction	\$.....
RS 14B	Post Construction Services	<u>\$.....</u>

**TOTAL FIXED FEES SITE B** \$.....

**MAXIMUM FIXED FEES (SITE A + SITE B)** \$.....<sup>1</sup>

---

## APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

### 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:

Site A –                      Campbellford Dam

RS 6A	Investigations, Studies and Reports	
	Topographical and Bathymetric Survey	\$.....
	Geotechnical Field Work	\$.....
	Materials Sampling and Testing	\$.....

**TOTAL DISBURSEMENTS SITE A**                      **\$.....**

Site B –                      Crowe Bay Dam

RS 6B	Investigations, Studies and Reports	
	Topographical and Bathymetric Survey	\$.....
	Geotechnical Field Work	\$.....
	Materials Sampling and Testing	\$.....

**TOTAL DISBURSEMENTS SITE B**                      **\$.....**

**MAXIMUM AMOUNT FOR DISBURSEMENTS (SITE A + SITE B) \$.....<sup>2</sup>**

### 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.

## APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

### Time Based Fees (for Evaluation Purposes)

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

The Estimated Hours provided below are for evaluation purposes only.

While these Time Based Fees will not form part of the awarded contract value, the Hourly Rate may be used for future contract amendments should the services below be required beyond the stated construction period duration.

#### Site A – Cambellford Dam:

<b>RS 11A Design Services_During Construction – In excess of stated construction period duration**</b>	<b>ESTIMATED HOURS</b> Column A	<b>HOURLY RATE***</b> Column B	<b>TIME BASED FEE</b> Columns AxB
Full-time Site Representative	40	\$.....	\$.....

**TOTAL TIME BASED FEES SITE A**

**\$.....**

#### Site B – Crowe Bay Dam:

<b>RS 11B Design Services_During Construction – In excess of stated construction period duration**</b>	<b>ESTIMATED HOURS</b> Column A	<b>HOURLY RATE***</b> Column B	<b>TIME BASED FEE</b> Columns AxB
Full-time Site Representative	40	\$.....	\$.....

**TOTAL TIME BASED FEES SITE B**

**\$.....**

\*\*Payment will be based on actual hours spent. Travel time and/or expenses will not be reimbursed separately (Refer to R1230D (2016-01-28), GC 5.12 – Disbursements).

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

**TOTAL TIME BASED FEES (SITE A + SITE B)**

**\$.....<sup>3</sup>**



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N° CCC / CCC No./ N° VME - FMS

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## APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

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### TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

Total Fixed Fee	\$..... <sup>1</sup>
Maximum amount for Disbursements	\$..... <sup>2</sup>
Total Time Based Fees	\$..... <sup>3</sup>
Total Evaluated Fee (1+2+3)	\$.....

---

END OF PRICE PROPOSAL FORM

N° de l'invitation - Solicitation No.  
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N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No. / N° VME - FMS

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## **APPENDIX D - DOING BUSINESS WITH PUBLIC WORKS AND GOVERNMENT SERVICES CANADA (PWGSC)**



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Canada



Respect • Integrity • Excellence • Leadership

Serving  
**GOVERNMENT,**  
Serving  
**CANADIANS.**

# Doing Business with Public Works and Government Services Canada (PWGSC)



[www.pwgsc-tpsgc.gc.ca](http://www.pwgsc-tpsgc.gc.ca)

Last updated: April 8, 2013

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### **Appendices**

Appendix 'A'	Checklist for the Submission of Construction Documents
Appendix 'B'	Sample Addendum Format
Appendix 'C'	Sample Index for Drawings and Specifications
Appendix 'D'	User Manual on Directory Structure and Naming Conventions Standards for Construction Tender Documents on CDROM, dated May 2005
Appendix 'E'	Basic Reference Guide on Converting Construction Drawings into Portable Document Format (PDF), dated May 2005

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## **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.

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## **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.

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## **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>

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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
<b>TOTAL ESTIMATED AMOUNT</b>						
<b>Transfer amount to subparagraph 1)(b) of BA03</b>						

## 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



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## **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 m<sup>2</sup> 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 m<sup>2</sup> 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:**



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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.

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## **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

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(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 than 2 update cycles, with exception of activities not yet defined in a "Rolling Wave".

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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**

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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.

There 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

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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);

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## **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.

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## **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



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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

<b>Date:</b>		
<b>Project Title:</b>	<b>Project Location:</b>	
<b>Project Number:</b>	<b>Contract Number:</b>	
<b>Consultant's Name:</b>	<b>PWGSC Project Manager:</b>	
<b>Review Stage:</b>		
66%	99%	100%

Item	Verified by:	Comments:	Action by:
<b>Specifications:</b>			
<b>1 National Master Specifications</b>			
<b>1a</b> The current edition of the NMS has been used.			
<b>1b</b> Sections have been included for all work identified on drawings and sections edited.			
<b>2 Specification Organization</b>			
<b>2a</b> Either the NMS 1/3 - 2/3 page format or the Construction Specifications Canada full page format is used.			
<b>2b</b> Each Section starts on a new page and the Project Number, Section Title, Section Number and Page Number show on each page.			
<b>2c</b> Specification date and consultant's name are not indicated.			
<b>3 Terminology</b>			
<b>3a</b> The term Departmental Representative is used instead of Engineer, PWGSC, Owner, Consultant or Architect.			
<b>3b</b> 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.			
<b>4 Dimensions</b>			
<b>4a</b> Dimensions are provided in metric only.			
<b>5 Standards</b>			
<b>5a</b> The latest edition of all references quoted is used.			

<b>6 Specifications Materials</b>			
<b>6a</b> The method of specifying materials uses recognized standards. Actual brand names and model numbers are not specified.			
<b>6b</b> Materials are specified using standards and performance criteria (if not, the correct form of acceptable materials has been used).			
<b>6c</b> Identify if non-restrictive, non-trade name "prescription" or "performance" specifications are used.			
<b>6d</b> Indicate if a list of acceptable materials have been used.			
<b>6e</b> The term "Acceptable Manufacturers" is not used.			
<b>6f</b> No sole sourcing has been used.			
<b>6g</b> If sole sourcing has been used, the correct wording has been used and a justification provided to RPCD for the sole sourced products.			
<b>7 Unit Prices</b>			
<b>7a</b> Unit prices are used only for work that is difficult to estimate.			
<b>8 Cash Allowances</b>			
<b>8a</b> Indicate if cash allowances have been used.			
<b>9 Warranties</b>			
<b>9a</b> Indicate if warranties extend more than a 12 or 24 months period.			
<b>9b</b> Manufacturers guarantees are not indicated.			
<b>10 Scope of Work</b>			
<b>10</b> No paragraphs noted as "Scope of Work" are included.			
<b>11 Summary and Section Includes</b>			
<b>11a</b> In part 1 of section, paragraphs "Summary" and "Section Includes" are not used.			
<b>12 Related Sections</b>			
<b>12a</b> The list of related sections and appendices are coordinated.			
<b>13 Index</b>			
<b>13a</b> The index shows a complete list of plans and specification sections with the correct number of pages and correct drawing titles and section names.			
<b>14 Regional Guide Specifications</b>			
<b>14a</b> General Instructions is included (Section 01 00 10 in the NCA).			

<b>15 Health and Safety</b>			
<b>15a</b> Section 01 35 29.06 - Health and Safety Requirements is included.			
<b>16 Designated Substances Report</b>			
<b>16 a</b> Section 01 14 25 - Designated Substances Report is included.			
<b>17 Subsurface Investigation Reports</b>			
<b>17a</b> Subsurface Investigation Reports are included in Division 31.			
<b>18 Experience and qualifications</b>			
<b>18a</b> Experience and qualification requirements do not appear in the specification sections			
<b>19 Pre-qualifications</b>			
<b>19a</b> 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.			
<b>20 Contracting Issues</b>			
<b>20a</b> Contracting issues do not appear in the specifications.			
<b>20b</b> Division 00 of the NMS is not used.			
<b>21 Quality Issues</b>			
<b>21a</b> 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:
<b>Drawings:</b>			
<b>1 Title Blocks</b>			
<b>1a</b> The PWGSC title block is used.			
<b>2 Dimensions</b>			
<b>2a</b> Dimensions are provided in metric only.			
<b>3 Trade Names</b>			
<b>3a</b> Trade names are not used.			
<b>4 Specification Notes</b>			
<b>4a</b> There is no specification type notes.			
<b>5 Terminology</b>			
<b>5a</b> The term Departmental Representative is used instead of Engineer, PWGSC, Owner,			

Consultant or Architect.			
<b>5b</b> 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.			
<b>6 Information to be included</b>			
<b>6a</b> Architectural and Engineering Drawings have been stamped and signed by the design authority.			
<b>6b</b> The project quantity and configuration, dimensions and construction details are included.			
<b>6c</b> References to future work and elements not in contract do not appear or are kept to an absolute minimum and clearly marked.			

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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: \_\_\_\_\_

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## 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** \_\_\_\_\_

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## DRAWINGS AND SPECIFICATIONS

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### 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.

<u>DIVISION</u>	<u>SECTION</u>	<b>NO. OF PAGES</b>
		<div></div>
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	



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## 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

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## 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).

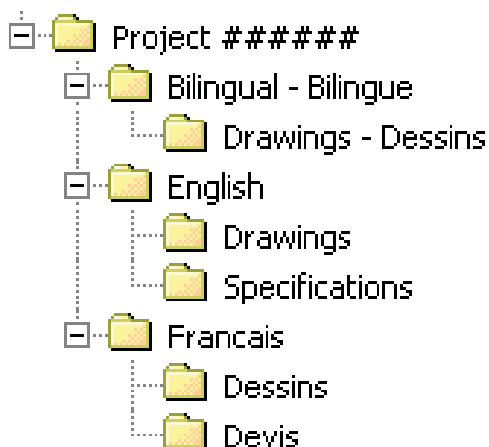
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction. 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 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> 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 1<sup>st</sup> Tier of the Directory Structure where *#####* represents each digit of the Project Number. The Project Number must always be used to name the 1<sup>st</sup> 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 2<sup>nd</sup> Tier of the Directory Structure. The folders of the 2<sup>nd</sup> 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 3<sup>rd</sup> Tier;
- The “*Drawings - Dessins*”, “*Drawings*”, “*Specifications*”, “*Dessins*” and “*Devis*” folders are considered the 3<sup>rd</sup> Tier of the Directory Structure. The folders of the 3<sup>rd</sup> 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 3<sup>rd</sup> Tier folder in each document.

**IMPORTANT:**

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

### 1.2 4<sup>th</sup> Tier Sub-Folders for Drawings

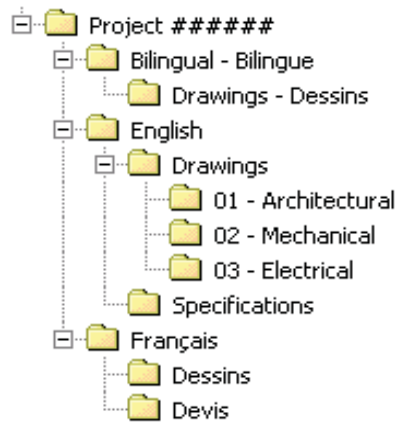
The “*Drawings – Dessins*”, “*Drawings*” and “*Dessins*” folders must have 4<sup>th</sup> Tier sub-folders created to reflect the various disciplines of the set of drawings.

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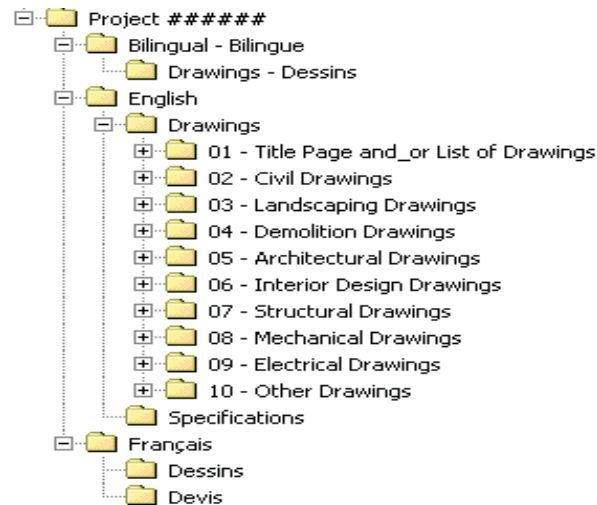
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the “Drawings – Dessins”, “Drawings” and “Dessins” folders.

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 4<sup>th</sup> Tier sub-folders for drawings:



or



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### 1.2.1 Naming Convention

The 4<sup>th</sup> 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 4<sup>th</sup> 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:

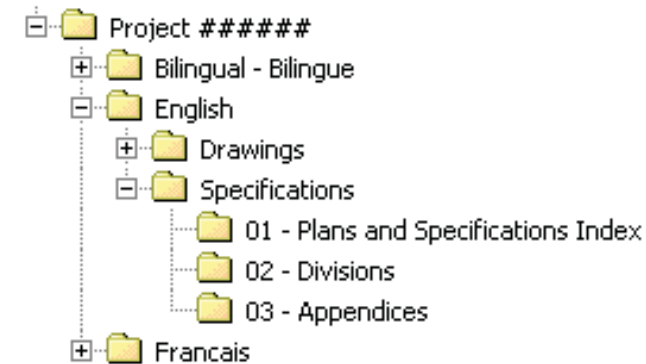
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the 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 4<sup>th</sup> Tier Sub-Folders for Specifications

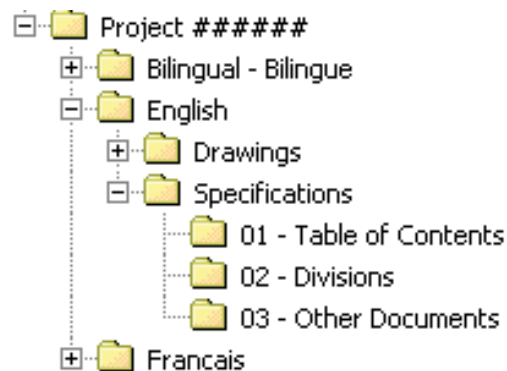
The “*Specifications*” and “*Devis*” folders must have 4<sup>th</sup> Tier sub-folders created to reflect the various elements of the specifications.

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 4<sup>th</sup> Tier sub-folders for specifications:



or



### 1.3.1 Naming Convention

The 4<sup>th</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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:

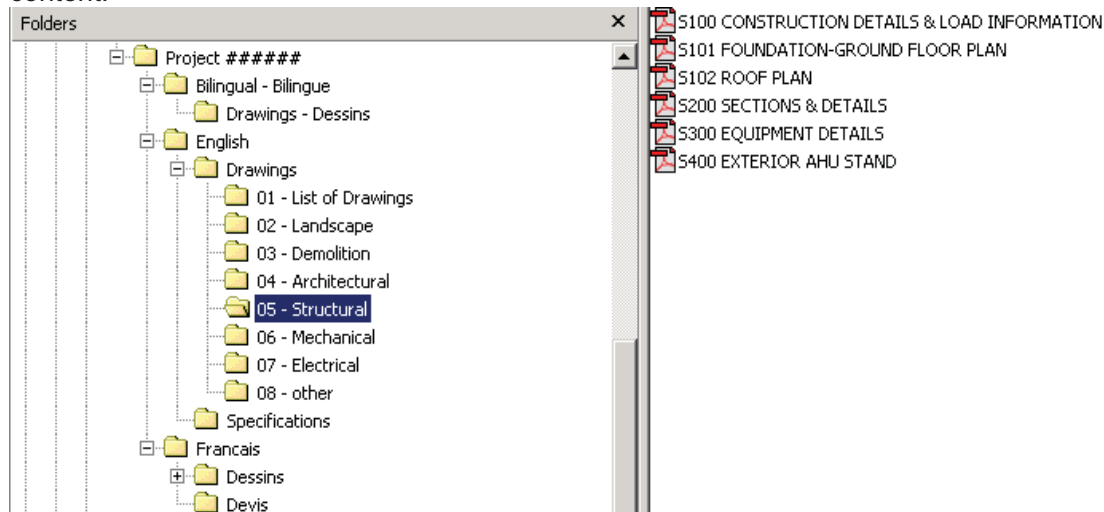
## = A two digit number ranging from 01 to 99 (leading zeros must be included)

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 4<sup>th</sup> 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:

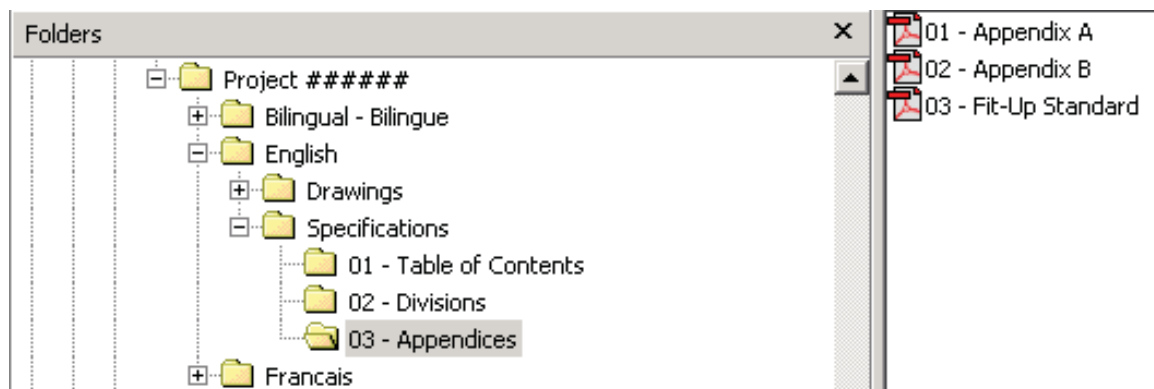
## - Y

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™**

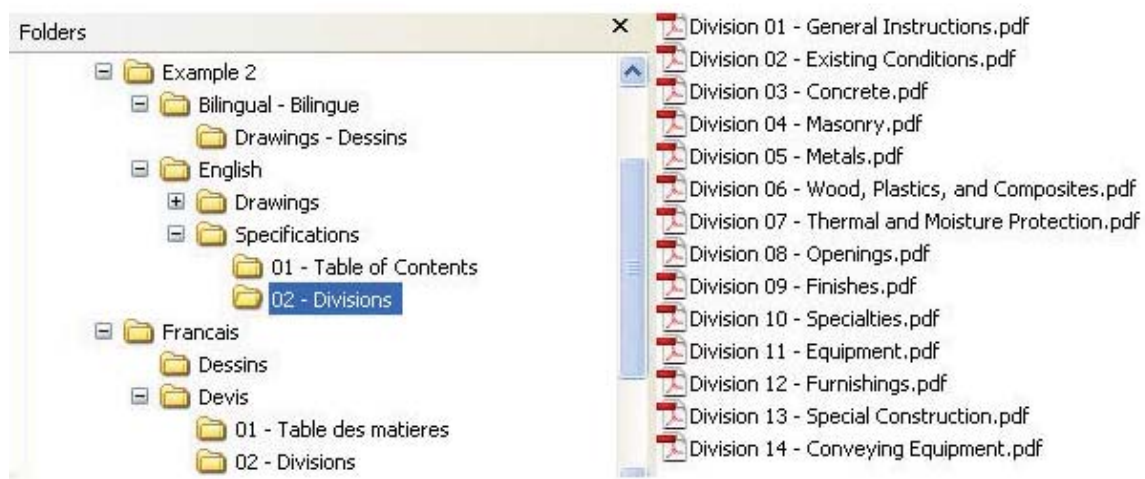
Example: Division 05 – Metals



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 REFERENCE GUIDE ON CONVERTING CONSTRUCTION DRAWINGS INTO PORTABLE DOCUMENT FORMAT (PDF)**

**Issued by:**  
**Real Property Contracting Directorate**  
**PWGSC**

May 2005 Last Updated: May 3, 2005

Version 1.0

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## **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 be 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 through 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](http://www.adobe.com).

N° de l'invitation - Solicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

---

## **APPENDIX E - Heritage Canals and Engineering Works CADD Standards Supplement**



# Heritage Canals and Engineering Works CADD Standards

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





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## APPENDIX A - ABBREVIATIONS, ACRONYMNS AND TERMS





## 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:

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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

The figure shows a standard contract drawing frame. It consists of a large rectangular area for the drawing, and a vertical title block on the right side. The title block contains the following information:

- Canada** logo and text.
- STATUS** section with a table for project status.
- PROJECT** section with a table for project details.
- DRAWING** section with a table for drawing details.
- REVISIONS** section with a table for revision details.
- APPROVALS** section with a table for approval details.

Project	Project Name	Project Number	Project Date
PROJECT-1	PROJECT-1	PROJECT-1	PROJECT-1
PROJECT-2	PROJECT-2	PROJECT-2	PROJECT-2
PROJECT-3	PROJECT-3	PROJECT-3	PROJECT-3
PROJECT-4	PROJECT-4	PROJECT-4	PROJECT-4

Drawing	Drawing Name	Drawing Number	Drawing Date
DRAWING-1	DRAWING-1	DRAWING-1	DRAWING-1
DRAWING-2	DRAWING-2	DRAWING-2	DRAWING-2
DRAWING-3	DRAWING-3	DRAWING-3	DRAWING-3
DRAWING-4	DRAWING-4	DRAWING-4	DRAWING-4

Revision	Revision Description	Revision Date
1	1	1

Approval	Approval Name	Approval Date
1	1	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



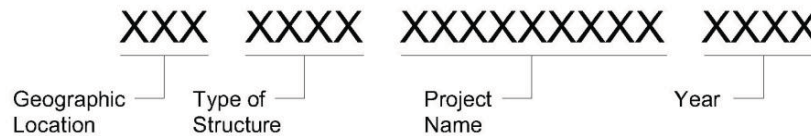


### 1.1.5 Plotting of Filename, Path, Date, and Time

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 XXXXXXXXXXXX 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 XXXXXXXXXXXX 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 XXXXXXXXXXXX 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.

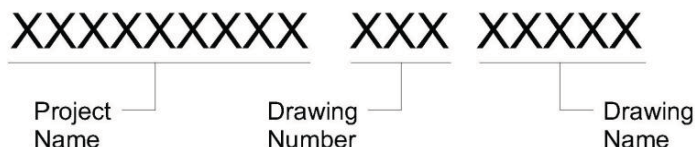
## 1.3 CADD File Naming Conventions

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

XXXXXXXXXX XXX XXXXX

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

### Drawing Number Field

XXXXXXXXXX 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

XXXXXXXXXX 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:

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





Examples of valid filenames :

<b>Crystal Lake - 107 - NWW.dgn</b>	Crystal Lake, drawing number 107, North West Wingwall drawing
<b>Ft. Henry - 102 - S&amp;D3.dgn</b>	Fort Henry, drawing number 102, Sections and Details, 3 <sup>rd</sup> drawing of type
<b>Redstone Lake - base.dgn</b>	Redstone Lake, Base drawing, reference file
<b>Maria St. - 101 - GA.dgn</b>	Maria St., drawing number 101, General Arrangement drawing
<b>Jones Falls - 102 - PierDim.dgn</b>	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...).

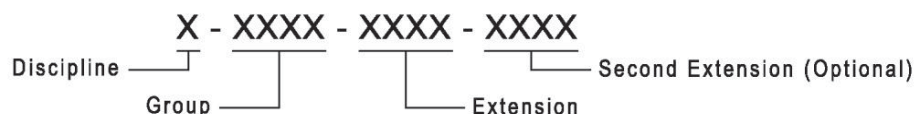
In some situations however, such as where better visibility control is required (freezing and thawing of levels), a mixed approach to level management may be used such that some elements are separated by what they represent and others grouped by their element properties.





### 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).





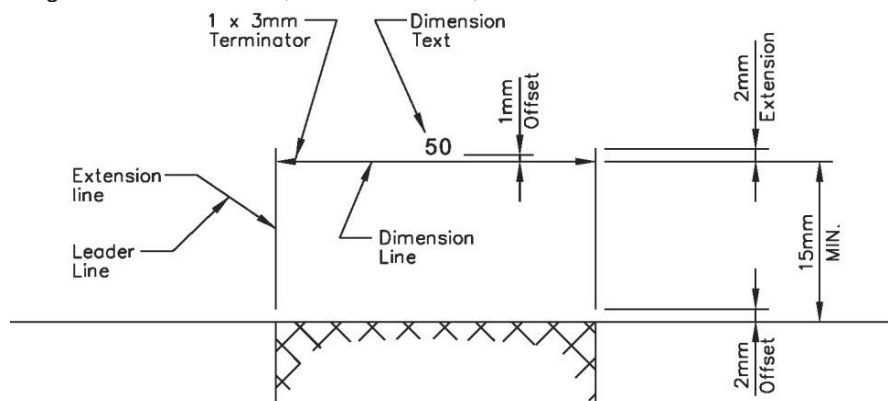
- The name given to additional styles must follow the naming convention outlined in Section 3.5.1 of the PWGSC National CADD Standards.
- All dimensions shall have the same size text as outlined in Section 1.3.6.1.
- Angular dimensions shall be expressed in decimal degrees.
- Line weight for all dimension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

XXXXXX - XXX  
Field 1      Field 2

**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:

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

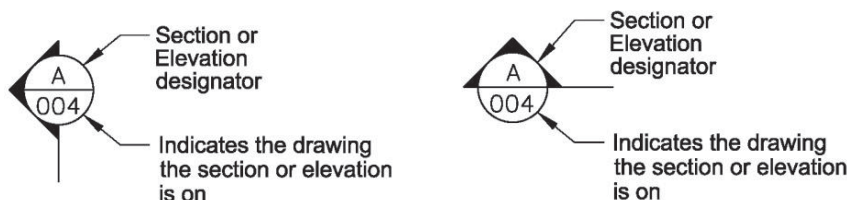
### 1.8.2.1 Symbol

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

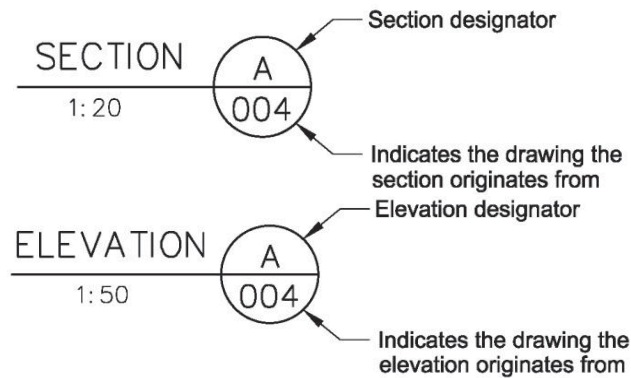
Labels are placed below the section or elevation to cross-reference it with the symbol on the drawing from where the section or elevation was taken.

- 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.

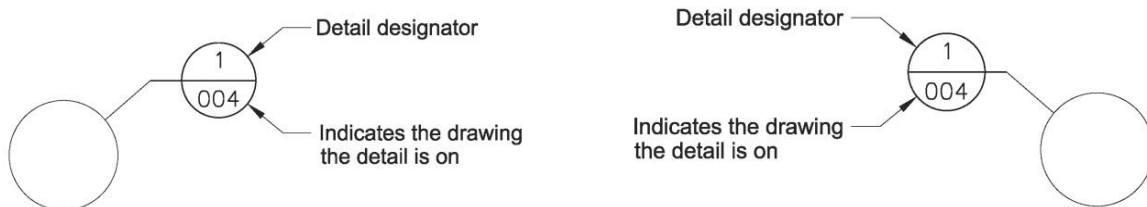
Details are shown using a symbol to delineate where the detail is taken from and a label to designate the actual detail. The symbol and labels are provided in the structural block library.

#### 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 draw 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.

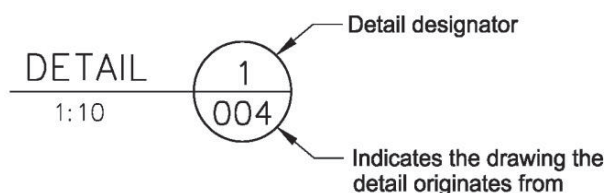
- The top half of the label shall be populated using numeric characters from '1' to '99'.





- 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-Built**s' 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 printed drawings, with signature and date to be applied.
.xls	MicroSoft Excel file
.zip	PkZip compressed archive file



N° de l'invitation - Solicitation No.  
EQ754-171034  
N° de réf. du client - Client Ref. No.  
R.076951.830 / R.076951.930

N° de la modif - Amd. No.  
File No. - N° du dossier  
PWL-6-39073

Id de l'acheteur - Buyer ID  
pwl035  
N° CCC / CCC No./ N° VME - FMS

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## **APPENDIX F - Selected Existing Photos, Illustrations and Drawings**



## **Appendix F – Table of Contents**

### **Photos - Campbellford Dam 11 and Lock 13**

Photo 1: Aerial Photo View Upstream

Photo 2: Aerial Photo View Downstream

Photo 3: Aerial Photo Access Routes and Work Platforms

Illustration 1: Hydro Power Proposal

### **Drawings – Campbellford Dam 11 and Lock 13**

DSR 001: Campbellford Area - General Plan View

DSR 002: Location Plan – Campbellford Lock 13 and Dam 11

DSR 003: Dam 11 and Lock 13 – Plans and Elevations

DSR 004: Dam 11 and Lock 13 – Sections

DSR 005: Right Earth Embankment – Plan & Section

DSR 006: Left Earth Embankment – Plan & Section

C-CF-02: Option 2 – Steel stop logs and Vertical Steel Gates

### **Photos – Crowe Bay Dam 12 and Lock 14**

Photo 4: Aerial Photo View Upstream

Photo 5: Aerial Photo Access Routes and Work Platforms

### **Drawings – Crowe Bay Dam 12 and Lock 14**

DSR 001: General Plan View

DSR 002: Location Plan – Crowe Bay Dam 12 and Lock 14.

DSR 003: Dam 12 - Plan, Elevation and sections.

DSR 004: Lock 14 - Plan, Elevation and sections.

C-CB-1B: Option 1B - Steel Stop Logs and Vertical Steel Gates