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

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

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

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

Proposal To: Public Works and Government Services Canada

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

Proposition aux: Travaux Publics et Services Gouvernementaux Canada

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

Comments - Commaintaires

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

Title - Sujet
Brighton Road Swing Bridge

Solicitation No. - N° de l'invitation	**Date**
EQ754-170012/A	2016-05-31

Client Reference No. - N° de référence du client
R.059792.204

GETS Reference No. - N° de référence de SEAG
PW-$PWL-035-2161

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
PWL-6-39002 (035)	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2016-07-12

Time Zone
Fuseau horaire
Eastern Daylight Saving Time EDT

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

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Woodhall, Lauren	pwl035

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(416) 512-5873 ( )	(416) 512-5862

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
PWGSC-TPSGC
Joseph Shepard Building 32
4900 Yonge Street
Toronto, ON
M2N 6A6

Instructions: See Herein

Instructions: Voir aux présentes

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

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

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

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

Signature **Date**

Canada

REQUEST FOR PROPOSAL (RFP)

TABLE OF CONTENTS

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

SUPPLEMENTARY INSTRUCTIONS TO PROPONENTS (SI)

SI1 INTRODUCTION

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

2. This is a single phase selection process. The nature of the requirement and the anticipated limited number of response by the industry leads PWGSC to believe that this approach will not unduly force a large number of firms to expend an overall unreasonable amount of effort in response to PWGSC.

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

SI2 PROPOSAL DOCUMENTS

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

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

2. The following are the proposal documents:

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

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

   (c) Project Brief;

   (d) the document entitled "Doing Business with A&E";

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

   (f) selected existing photos, drawings and reports contained in the compressed "zip" file (Appendix F)

   (g) the document entitled "Team Identification Format"

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

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

3. Submission of a proposal constitutes acknowledgment that the Proponent has read and agrees to be bound by these documents.

SI3 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 [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 (GI1), Integrity Provisions – Proposal, **section 3b**.

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

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

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

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

The Proponent must provide the Contracting Authority with a completed Federal Contractors Program for Employment Equity - Certification (see Appendix B -

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

SI6 - WEBSITES

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

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

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

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

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

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

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

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

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

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

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

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

TERMS, CONDITIONS AND CLAUSES

AGREEMENT

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

   (a) the Front Page and this Agreement clause;
   (b) the General Terms, Conditions and Clauses, as amended, identified as:
   R1210D (2016-04-04), General Condition (GC) 1 - General Provisions – Architectural and/or Engineering Services
   R1215D (2016-01-28), General Condition (GC) 2 - Administration of the Contract – Architectural and/or Engineering Services
   R1220D (2015-02-25), General Condition (GC) 3 - Consultant Services
   R1225D (2015-04-01), General Condition (GC) 4 - Intellectual Property
   R1230D (2016-01-28), General Condition (GC) 5 - Terms of Payment – Architectural and/or Engineering Services
   R1235D (2011-05-16), General Condition (GC) 6 - Changes
   R1240D (2011-05-16), General Condition (GC) 7 - Taking the Services Out of the Consultant's Hands, Suspension or Termination
   R1245D (2016-01-28), General Condition (GC) 8 - Dispute Resolution – Architectural and/or Engineering Services
   R1250D (2015-02-25), General Condition (GC) 9 - Indemnification and Insurance
   Supplementary Conditions
   Agreement Particulars
   (c) Project Brief;
   (d) the document entitled "Doing Business with A&E";
   (e) the document entitled "Heritage Canals and Engineering Works CADD Standards;
   (f) the completed "Team Identification" document;
   (g) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
   (h) the proposal, the Declaration/Certifications Form and the Price Proposal Form.

2. The documents identified above by title, number and date are hereby incorporated by reference into and form part of this Agreement, as though expressly set out herein, subject to any other express terms and conditions herein contained.

   The documents identified above by title, number and date are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is

available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual

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

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

SUPPLEMENTARY CONDITIONS (SC)

SC1 SECURITY REQUIREMENT

There is no security requirement applicable to this Agreement.

SC2 FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - DEFAULT BY THE CONSULTANT

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

AGREEMENT PARTICULARS

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

PROJECT BRIEF (PB)

Description of Project (PD)

PD 1 Project Information
PD 2 Project Identification
PD 3 Project Background
PD 4 Existing Documentation
PD 5 Project Objectives
PD 6 Scope of Work
PD 7 Consultant Services

Project Administration (PA)

PA 1 Project Administration
PA 2 Project Team
PA 3 Authorities, Submissions, Review and Approval Process
PA 4 Invoicing and Payments

Required Services (RS)

RS 1 Analysis of Project Scope of Work
RS 2 Management of Consultant's In-House and External Resources (Sub-Consultant/Specialist) and Services
RS 3 Investigations, Studies and Reports
RS 4 Estimating and Cost Planning
RS 5 Risk Management and Quality Management
RS 6 Design Concept
RS 7 Design Development
RS 8 Construction Documents, Pre-Tender Construction Cost Estimate, Risk Management Plan and Project Schedule
RS 9 Tender Call, Bid Evaluation & Construction Contract Award
RS 10 Construction and Contract Administration
RS 11 Resident Site Services During Construction
RS 12 Post Construction Services

PROJECT BRIEF (PB)

DESCRIPTION OF PROJECT (PD)

Public Works and Government Services Canada (PWGSC) intends to retain a firm of civil/structural bridge engineers with a multi-disciplinary team of engineers for the provision of services required for this project.

PD 1 PROJECT INFORMATION

1.1	**PWGSC Project Title:**	**Replacement of Brighton Road Swing Bridge**
1.2	**Location of the Project:**	Trent Severn Waterway, Murray Canal, 1204 County Road 64, Brighton, Ontario.
1.3	**PWGSC Project Numbers:**	R.059792.204
1.4	**Client / User:**	Trent-Severn Waterway, Ontario Waterways Unit Parks Canada Agency
1.5	**PWGSC Project Team:**	Atif Suhail, Project Manager, Andrew Werblinski, Design Manager

PD 2 PROJECT IDENTIFICATION

2.1 Overview

1. The services of a bridge engineering firm will be required to undertake the full planning; site inspection and investigations; evaluation of bridge to be rehabilitated/upgraded, conceptual design and design development; preparation of construction documents; technical assistance during tender and post tender period; construction and contract administration services; resident engineering services during construction; inspection and commissioning services; and post-construction services for the replacement of the swing bridge. Additionally, rehabilitation or replacement of the existing Canal shore walls at this site is required.
2. The completed bridge shall satisfy the User Department requirements and meet current Canadian Highway Bridge Design Code (CHBDC) standards and Transportation Association of Canada (TAC) standards, unless otherwise accepted by the PWGSC Project Manager and the User Department. The design and construction of the bridge must be conducted in an efficient, expedient and economical manner, all within the specified time limitations.

3. The selected engineering firm will provide a full consulting team including the required expertise in swing bridges: structural engineering, mechanical engineering, electrical/controls engineering, transportation engineering, geotechnical engineering, hydraulics specialist, cost specialist, underwater inspections and surveys and any other specialists, as necessary to complete the project.

2.2 User Department

1. The User Department, referred to throughout the Project Brief, is Parks Canada Agency.
2. The Trent-Severn Waterway of the Parks Canada Agency (PCA) meanders 386 kilometers along Central Ontario and mainly consists of many locks, bridges and dams. The Trent-Severn Waterway is designated as a National Historic Site. Additional information can be found at: http://www.pc.gc.ca/eng/lhn-nhs/on/trentsevern/index.aspx

2.3 Site Description and Condition

1. The Brighton Road Swing Bridge spans across the Murray Canal and is part of the Trent-Severn Waterway, with civic address of 1204 County Road 64. County road 64 is a two lane road that crosses the bridge to connect the Town of Brighton and the City of Quinte West.
2. Structure Description:
   a) The bridge was constructed in 1947 by the Central Bridge Company.
   b) The bridge is composed of two 44.6m long riveted steel pony trusses with 9 panels of approximately 5.0 m length each. Lateral centre-centre of pony trusses is approximately 7.0m.
   c) The bridge deck is a 6.5m wide nail laminated timber deck with wood curbs and an asphalt wearing surface, supported by steel stringers and steel floor beams which in turn connect to the bottom panel points of the two side trusses.
   d) It is an equal arm type swing bridge pivoting 90 degrees about a center pintle with 8 balance wheels.
   e) The bridge currently carries two sub-3.1m wide lanes of traffic.
   f) The existing posted speed in the vicinity of the bridge is 60 km/hr.
   g) The swing bridge is supported by a concrete-topped stone masonry center pivot pier and concrete-topped stone masonry abutments. The rest piers are aligned with the center pivot pier, and are of the same concrete-over-masonry construction. There are rock-filled wood cribbing infill sections topped with concrete in-between the pivot pier and the two rest piers, forming an elongated swing pier.
   h) There is no dedicated passageway for cyclists or pedestrians.

i) Since July 2011 the load limit posting is Maximum Gross Vehicle Weight of 9 Tonnes.

3. Fluid Hydraulic System:

a) The present fluid power hydraulics system was installed in the 1960's.

b) The fluid hydraulic system is comprised of:

i) Two main swing cylinders located on the center pivot pier, which are used to swing the bridge;

ii) Hydraulic end wedges;

iii) The pump and hydraulic fluid reservoir and distribution system is located in the bridge control building.

4. Electrical and Control System:

a) The bridge electrical system was installed in the 1960's. The control system has since been upgraded to a PLC system.

b) The electrical system is comprised of:

i) Electrical panel and distribution system located in the operator's control Cabin;

ii) Buried electrical lines;

iii) Limit switches for the controls of the hydraulic cylinders and jacks, and locking pin cylinders, navigation lights;

iv) Traffic control lights and gates.

5. Condition of Bridge:

a) McCormick Rankin was retained in 2010 to complete a Recapitalization Study of this bridge. The report was completed August 2010. From the 2010 Recapitalization study the main findings of the visual inspection were:

i) Severe corrosion and thinning of the floor beams. Critical members were identified.

ii) Light to medium corrosion of truss members. Critical members were identified.

iii) Medium transverse cracking in the asphalt pavement.

iv) Localized disintegration and wide cracking of concrete abutments.

v) Severe disintegration and erosion of concrete and exposure of rebar on the center pier.

vi) Undermining of shore walls with one section in an unstable condition.

vii) The approaches to the bridge have sharp radius curves, reducing vehicle speeds as they cross the bridge.

viii) There are no traffic barriers on the bridge, there are only short traffic barriers leading to the bridge and no energy attenuators on the barrier ends.

ix) The mechanical, hydraulic and electrical systems do not meet the requirements of the CHBDC and require replacement.

x) The Canal walls are severely deteriorated, with large voids and areas of instability. It is additionally noted that a portion of the Canal wall has subsequently collapsed in 2015.

2.4 Construction Budget Indicative Estimates

1. The construction cost, exclusive of HST, is estimated to be CAD $8 Million
2. This figure does not include PWGSC Project Management fees, administration costs, and consultant fees.

2.5 Assignment and Commitment of Adequate Resources to meet Project Requirements:

1. Assign and commit appropriate number of specialist and sub-consultant resources and personnel representing appropriate levels of qualifications, expertise, experience and availability throughout the entire scope of required services in order to complete and deliver the project within the schedule constraints listed. If unavoidable delays are experienced, assign additional personnel and resources, as may be required, to catch up to the schedule and deliver final construction documents on time.
2. Submit a Complete Team Identification chart, including reporting structure and responsibilities, to Departmental Representative for review. Project personnel shall correspond to those identified in the RFP Submission Requirement Evaluation section for the purpose of evaluation. Team Identification is to include individual's name, position/role, area of and percentage of work time that can be devoted to this project.

2.6 Schedule

1. Project schedule constraints:

   a) The completion of construction and successful commissioning of the Brighton Road replacement Swing Bridge and of the Canal wall repairs is to occur no later than **May 4th, 2018**.

   b) On-site construction work requiring cessation of vehicular and/or marine traffic is to begin on **November 15th, 2017** at the earliest. Preparatory site and non-site works that do not interfere with normal navigational season canal/crossing operations may begin prior to October 10th, 2016.

   c) All necessary final construction documents accepted by the D.R. and issued "For Construction" are to be submitted for tendering no later than **May 17th, 2017**.

   d) Initial on-site investigative and testing works, if required, may be performed earlier, but only if approved well in advance by

authorities having jurisdiction, and upon receipt of written acceptance to perform such work from D.R.

2. Concept, Design, Tender and Construction phases to be carried out as required to deliver projects on time.

3. Work on the bridge is to be planned in co-ordination with the waterway navigation season and minimum navigation requirements, such that no interruption in navigation occurs.

4. Work is to be designed and planned so that the minimal duration of road and bridge closures are required.

5. Fixed Schedule:

Milestone	Date
Final construction documents "Issued for Construction":	May 17, 2017
Earliest start of work affecting navigation in channel:	November 15, 2017
Completion of construction and commissioning:	May 4, 2018

6. The Consultant is to prepare a detailed network diagram in accordance with the above milestone listing for review as part of the deliverables identified in the Required Services (RS) section.

7. Obtaining any required licensing, certification, authorization, or temporary permits is not to delay the delivery of signed and sealed final accepted construction documents to the Departmental Representative beyond the dates stated in PD 2.6.5.

PD 3 PROJECT BACKGROUND

3.1 Project Constraints

1. General Constraints

   a) *Navigation Season* – Parks Canada's navigation season typically starts Victoria Day weekend and ends Thanksgiving weekend. Work on the Bridges must not disrupt navigation in the main channel of the Trent Severn Waterway. Estimated Navigation Season for 2018 is May 18th to November 15. Estimated Navigation Season for 2017 is May 19 to November 15.

   b) *Maintenance Period* – Parks Canada's maintenance period before and after navigation season is typically a few weeks on the Trent Severn Waterway. It is preferable that work not disrupt maintenance activities during this period. Parks Canada to confirm actual maintenance period at this site.

c) *Limited Construction Period* – refer to PD 2.6.5 in this Project Brief.

d) *Construction Schedule* - On-time project delivery is a high priority to the success of this project. An extension of the construction period longer than specified is expected to have significant negative socio-economic and political impact to the residents and surrounding communities. Effective scheduling is highly important and must be given priority consideration. Refer to Required Services sections of this Project Brief.

e) *Environmental Assessment* - An Environmental Assessment (EA) screening report is required as per Canadian Environmental Assessment Agency (CEAA). PWGSC Environmental Services will produce a report with input/assistance from the Consultant, Departmental Representative, and PCA representatives. All EA constraints shall be incorporated in the design and applied to the construction stage.

f) Refer to RS Sections for other general constraints, including constraints for structural steel and concrete construction.

2. Specific Constraints:

a) *Road Traffic and Road Closure* - The closure of this high volume municipal/county road poses significant negative impact to local residents and passing commuters, and is to be avoided. All interruptions to traffic require the completion of a traffic control plan, per Book 7 of Ontario Traffic Manual, acceptable to the local municipalities. Any road closure and detour must be coordinated with the municipalities of Quinte West and Brighton, and pre-approved by the Departmental Representative. Parks Canada has committed to provide temporary means of crossing the canal at the site during the construction period. Refer to Required Services sections of this Project Brief for temporary vehicle traffic crossing options.

b) *Temporary Pedestrian Crossing* - Parks Canada has committed to provide a temporary pedestrian crossing over the canal during the period of construction. The quantity of pedestrian traffic crossing the bridge is low so only the same level of service is to be included in the temporary pedestrian traffic crossing options. Refer to Required Services sections of this Project Brief.

c) *Adjacent Property Lots* - There may be limited and/or restricted access to adjacent lands not owned by Parks Canada in the immediate vicinity to the work site. The Consultant may be required to investigate, coordinate, or aid in the negotiations to enter into an agreement for temporary use or lease of these lands.

d) *Parks Canada Land* - Parks Canada owns the land in which the swing bridge is located in addition to areas alongside of the Murray

Canal. However, construction space may be limited for material staging, bridge structure removal and assembly.

e) *Parks Canada Permit* - The project will require a permit under the Navigational Waters Protection Act from Parks Canada only. The process will be initiated by the PWGSC Departmental Representative and will require the Consultant to facilitate the application process by providing project information, submitting required design documents and plans, and coordinating any other activities necessary to obtain the approval(s).

f) *Geotechnical Work* - A geotechnical report is included in the 2010 Recapitalization Report, but it may contain limited information for the design of a new bridge, center pier, and abutments. Additional geotechnical work may be required for these areas, as well as for Canal shore wall repairs.

PD 4 EXISTING DOCUMENTATION

4.1 Existing Documentation - Available to all Proponents

1. Currently Available Documentation:

   a) Site Plan drawing (AutoCad)
   b) Selected photographs of bridge and approaches
   c) Selected files from existing drawings library (tif)

4.2 Access to Documentation for Proponents

1. Available for downloading as part of Appendix_F.zip file attachment on Buy and Sell

4.3 Existing Documentation – To be made Available to Successful Proponent

a) August 2010 Recapitalization Study Report, with Site Plan drawing (AutoCad)
b) October 2013 Traffic Safety Study Report
c) 2015 Survey drawing (AutoCad)
d) June 2015 Inspection letter
e) Swing Statistics from 2003 to 2015
f) Photographs of bridge and approaches
g) Existing Drawings library (tif)

PD 5 PROJECT OBJECTIVES

The overarching goal is to build a safe, efficient bridge as fast as possible, within Parks Canada navigational constraints and with minimal road closures to vehicular and pedestrian traffic.

5.1 Quality

1. Design Principles - General

   a) The Department expects the Consultant to maintain a high standard of bridge design, based upon recognized contemporary design principles. Proven and beneficial innovative solutions are acceptable. All design elements, planning, engineering and commissioning are to be fully coordinated, and consistent in adherence to good design principles and good engineering practice.

   b) The project is to be implemented in an environmentally responsible manner.

   c) Materials, solutions and construction methods shall be commensurate with the type of bridge and the approximate budget. Avoid unproven experimental materials. Take into account the total life-cycle costs and activities for maintenance and operation of the bridge. Life-cycle and materials constraints and goals are described in the Required Services sections of this Project Brief.

   d) The structure shall be of high quality and high performance by ensuring innovative concept development, design and construction while respecting project limitations.

   e) Achieve:

      i) Required strength, durability, overall stability, safety and serviceability with appropriate safeguards against excessive cracking, fatigue, unacceptable deformation, premature corrosion, deterioration of material, undesirable vibration and deflection to extend the overall service life of the bridge.

      ii) A structure that is aesthetically pleasing and harmonious with its environment.

      iii) Minimized long-term maintenance costs through provision of suitable corrosion prevention and durability features. Refer also to the Required Services sections of this Project Brief.

      iv) Design requirements consistent with the latest Canadian Highway Bridge Design Code (CHBDC), standards and practices, and shall incorporate the current state-of-the-art knowledge in the industry.

      v) Ease of implementation, taking into consideration site and project time constraints.

2. Design Codes, Standards and Regulations

   a) The standards, codes and specifications to be used for the design and construction of the bridge shall be the latest edition of the following (including all amendments, supplements and revisions thereto):

i) CAN/CSA-S6 Canadian Highway Bridge Design Code, and Commentary
ii) AASHTO LRFD Bridge Design Specifications and Interim Revisions
iii) AASHTO LRDF Movable Highway Bridge Design Specifications and Interim Revisions
iv) AASHTO Movable Bridge Inspection, Evaluation and Maintenance Manual
v) AASHTO Manual for Bridge Evaluation with Interim Revisions
vi) NCHRP Inspection and Management of Bridges with Fracture-Critical Details
vii) American Iron and Steel Institute (AISI) Handbook of Steel Drainage & Highway Construction Products
viii) Applicable electrical and mechanical Codes and Regulations
ix) Ontario Traffic Control Manual
x) Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads
xi) National Building Code of Canada
xii) Transport Canada - Navigable Waters Protection Act
xiii) Department of Fisheries and Oceans - Fisheries Act
xiv) Canada and Provincial Occupational Health and Safety Regulations
xv) Fire Commissioner of Canada Standards
xvi) Canada Labour Code, Part II
xvii) Provincial and Municipal Traffic Acts and Regulations
xviii) Federal and Provincial Environmental Regulations

b) The CAN/CSA-S6 Canadian Highway Bridge Design Code is the primary code that will be used for design with appropriate live load levels. Design to a live load of CL-625-ONT. Design, analyze and evaluate to the latest update of the CHBDC 2014, and the Commentary to CHBDC 2014. Also, refer to Required Services sections of this Project Brief.

c) The Consultant has the option of consulting other design codes and is expected to utilize new and innovative developments in structural engineering whenever they appear appropriate in accordance with good engineering practice, but must provide documented evidence of suitability satisfactory to the PWGSC Project Manager.

5.2 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, economic and societal impact of every decision made for the project. The general areas of focus and in accordance with ASHRAE 90.1 and C2000 standards include:

   a) Energy efficiency and conservation,
   b) Greenhouse gas emissions reduction,
   c) Water management and conservation,
   d) Pollution prevention,
   e) Product selection and resource conservation,
   f) Site conservation (protection and preservation of valued natural site features),
   g) Environmentally friendly maintenance procedures and products.

5.3 Waste Management

1. A waste management program must be implemented for all construction phases.

2. Ensure conformance with pertinent recommendations of Environmental Assessment Report(s), if applicable.

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.

5.4 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.

5.5 Risk Management

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

5.6 Health and Safety

1. PWGSC, recognizes the responsibility to ensure the health and safety of all persons on Crown construction projects and the entitlement of the public, federal employees and private sector workers to the full protection afforded them by occupational health and safety regulations.
2. In keeping with the responsibility and in order to enhance health and safety protection for all individuals on federal construction sites, PWGSC will voluntarily comply with the applicable provincial/territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.

PD 6 SCOPE OF WORK

6.1 Project Scope

1. Replacement of the swing bridge superstructure, including widening and new sidewalk.
2. Replacement of entire span drive, hydraulics, bearing and end lift systems.
3. Replacement of entire bridge and approach electrical system, signalization and controls system, with possible inclusion of the control house.
4. Repair and/or replace the swing bridge concrete abutments, piers, and canal walls, as required.
5. Replacement of existing approach traffic barriers, and gates.
6. Review and possible replacement of existing transportation and safety signage and signalization related to swing bridge.
7. Design of temporary roadway and pedestrian walkway over canal for public use during construction period.

6.2 Structural / Bridge Engineering Work

1. Review site conditions.
2. Review existing drawings and reports, with respect to all code requirements affecting this project. Implement as required, with the exception of accepted non-conformances.
3. Coordinate work with local municipalities, counties and all agencies having jurisdiction.
4. Assign appropriate quality and quantity of resources and personnel to ensure on-time completion of all project stages, achieving high-quality end results at all times.
5. Manage resources and services.

6. Provide specialized cost estimating and planning.
7. Provide risk management and quality management.
8. Review the structural design and member/material conditions of the canal walls and bridge superstructures, deck and floor system, and substructures for the purpose of understanding the current bridge operation and identifying any issues that may impact bridge replacement and canal wall rehabilitation/replacement designs.
9. Conceptualize bridge design options to replace and/or rehabilitate/upgrade the existing bridge, as required. Analyze the options in terms of time for construction, durability, ease of construction, ease of maintenance, cost, aesthetics and environmental impacts.
10. Provide environmental impact assessment input during design and required monitoring during construction.
11. Obtain geotechnical services and data required to determine all geotechnical design parameters.
12. Provide conceptual design report.
13. Conduct preliminary and final design, and construction administrative services for the replacement of the bridge, equipment and services, and for canal walls rehabilitation/replacement.
14. Prepare construction contract documents and assist in the tendering of the construction contracts.
15. Complete all work, meeting or exceeding most stringent federal and provincial design codes and standards.
16. Provide site resident services during construction.
17. Develop and implement inspection, quality control and commissioning programs.
18. Submit all project documentation, including As-Built Record Documentation and Operations Manual.
19. Provide support during one-year post-construction period.

6.3 Civil Engineering Work - Transportation

1. Prepare traffic control plan in accordance with Transportation Association of Canada (TAC) and Ministry of Transportation (MTO) to ensure the safe detour of vehicles away from the construction area and ensure its incorporation in the plans and specifications.
2. Evaluate and recommend any work required on the approaches to the bridge. If needed, coordinate with municipal/county engineers to address design requirements, and meet applicable codes and standards, unless

otherwise accepted by the PWGSC Project Manager and User Department.

3. Design of transition area between approach traffic gates, barriers and bridge traffic barriers.
4. Provide full construction engineering services including quality assurance during construction.
5. Upgrade approach signage, signalization and structures to meet traffic requirements.

6.4 Materials and Testing Engineering Work

1. Provide full quality assurance testing and analysis services.
2. Provide non-resident construction support.
3. Provide resident engineering construction services.
4. Provide support during post-construction period.

6.5 Mechanical Engineering

1. Develop, evaluate, recommend, and design modern swing bridge mechanisms and hydraulic systems, or rehabilitation/upgrades to existing systems. The design shall be in conformance with User Department standards, which are currently being developed.
2. All mechanical systems to be in accordance with the CHBDC.
3. Develop an inspection and commissioning program.

6.6 Electrical/Controls Engineering

1. Develop, evaluate, recommend and implement a new design and/or upgrades to the existing electrical systems, including bridge electrical system and controls, traffic control system, traffic gate system, bridge power distribution, etc. The design shall be in conformance with User Department standards, which are currently being developed.
2. All electrical systems to be in accordance with the CHBDC and the Canadian Electrical Code.
3. Develop an inspection and commissioning program.

6.7 Environmental

1. The Consultant will be required to participate/assist with the preparation of the Environmental Assessment Screening.
2. Consultant is to include the mitigation measures identified in the Environmental Assessment Screening Report (EA), if required, in the

design, and tender package documents. Consultant may add other environmental issues and concerns based on their expertise.

6.8 Geotechnical

1. Review site conditions.
2. Review existing drawings and reports, with respect to geotechnical background information.
3. Visit the site to become familiar with all conditions that may impact the geotechnical evaluation for new design or strengthening of substructures/foundations.
4. Review, analyze and report the geotechnical characteristics that may affect the design and operation of a replacement bridge structure.
5. Conduct additional geotechnical investigations, as required, during the development of the conceptual and final designs.

6.9 Work Not Included

1. Not included in the Consultant Services are:
   a) The preparation of the EA Screening Report for bridge replacement/rehabilitation.
   b) Coordination with other federal, provincial, or local authorities not listed as having jurisdiction in this project, unless otherwise indicated elsewhere in the Project Brief.

PD 7 CONSULTANT SERVICES

1. The Prime Consultant shall be responsible for mobilization, co-ordination and direction of all Consultant Team members and their activities.
2. The Consultant Team shall be comprised of appropriately qualified professional and technical personnel with relevant expertise and extensive experience, and shall be capable of providing the services identified in the Required Services (RS) section of this Project Brief in a timely manner.
3. The following Required Services (RS) are the overall Consultant Services required to deliver this project:

   RS 1 Analysis of Project Scope of Work
   RS 2 Management of Consultant's In-House and External Resources (Sub-Consultant/Specialist) and Services
   RS 3 Investigations, Studies and Reports
   RS 4 Estimating and Cost Planning
   RS 5 Risk Management and Quality Management
   RS 6 Design Concept
   RS 7 Design Development

RS 8 Construction Documents, Pre-Tender Construction Cost Estimate, Risk Management Plan and Project Schedule
RS 9 Tender Call, Bid Evaluation & Construction Contract Award
RS 10 Construction and Contract Administration
RS 11 Resident Site Services During Construction
RS 12 Post Construction Services

4. The Consultant Team for this project must be capable of providing the following services:

a) Administrative
b) Project Management
c) Regulatory Analysis, Planning, Design, and Development
d) Site Analysis, Planning, Design, and Development
e) Civil/Structural Engineering - swing and fixed Bridges
f) Mechanical Engineering – swing bridges
g) Electrical/Controls Engineering – swing bridges
h) Transportation/Traffic Engineering
i) Geotechnical
j) Hydraulics
k) Materials Testing
l) Environmental
m) Waste Management
n) Surveying
o) Underwater Inspections/Surveys
p) Cost Planning, Life Cycle Costing, Estimating and Control
q) Risk Management
r) Quality Management
s) Sustainable Design

PROJECT ADMINISTRATION (PA)

PROJECT ADMINISTRATION

PA 1 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. The Departmental Representative is the liaison amongst and between the Consultant, PWGSC and the Client Department.
3. PWGSC administers the project and exercises continuing control over the project during all phases of development. Unless directed otherwise by the Departmental Representative, the Consultant obtains all Federal and Provincial permits, requirements and approvals necessary for the work.

1.2 Lines of Communication

1. Unless otherwise arranged by the PWGSC Project Manager, the Consultant shall communicate with the PWGSC Project Manager only.
2. Formal contact between the Consultant and the User Department Representatives shall be through the PWGSC Project Manager.
3. Direct communication between members of the Consultant Team and between the Consultant and the Contractor on routine matters is required to enable the discussion, coordination and resolution of technical issues. However, no communication shall alter the terms of the project scope, budget or schedules unless directed in writing by the Contracting Authority.
4. During construction tender call PWGSC conducts all correspondence with bidders and makes the contract award.
5. Consultant shall not advise the client/users in any matter without obtaining guidance and written pre-approval from PWGSC.
6. Consultant shall not respond to requests for project related information or questions from the municipalities/counties or the public. Such inquiries are to be directed to the PWGSC Project Manager.

1.3 Media

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

2. During the project, the Consultant shall not produce, submit, publish or cause to be published any information about, involving or pertaining (directly or indirectly) to the sites, structures, design and construction of the bridge site, without obtaining prior written approval to do so from the Departmental Representative.

1.4 General Project Deliverables

1. Unless otherwise specified in the Required Services (RS) sections, and where deliverables and submissions include summaries, reports, network diagrams, drawings, plans, specifications, engineering design briefs, structural analysis models, structural evaluations, 3D BrIM models, etc. submit deliverables as follows:

   a) Hard copies: one (1)
   b) Electronic format:
      i) one (1) copy editable original format. The electronic deliverables are to be created using Microsoft, AutoCAD (Drawings, Sketches, etc.), and Tekla (3D BrIM models) applications. Bridge structural analysis models (including all loads, load cases, material, member, etc. data) and results are to be submitted in both the original analysis software format, and in the S-Frame v.11 format.
      ii) one (1) copy editable PDF format. The electronic deliverables to be provided in editable Adobe Acrobat PDF format, which is to include Bookmarks of chapters and sections of the documents for ease of navigation.
      iii) Editable versions of images. Each image (photo, graphic, video, sketch or drawing) used in reports is to be provided in original editable format.
   c) Drawings to be generated and distributed in AutoCAD format and using the layering and file transfer protocols as prescribed in the 'Doing Business with A&E', and the "Heritage Canals and Engineering Works CADD standards supplement".
   d) Specification to be prepared using the National Master Specification format, as referred to in Appendix "Doing Business with A&E".

1.5 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. 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.

2. Acceptances indicate 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.

3. The acceptance does not relieve the Consultant of professional and legal responsibilities for the work and compliance with the contract.

4. PWGSC acceptances do not prohibit rejection of work which 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.

5. Acceptances by the Client / Users and other agencies and levels of government must be obtained by PWGSC Project Manager to supplement PWGSC acceptances. The Consultant shall assist the Departmental Representative in securing all such acceptances and adjust/revise all documents/designs as required by such authorities when securing acceptance.

1.6 Coordination with Sub-Consultants / Specialists

The Consultant shall:

1. Throughout all phases of the project, assume responsibility for coordinating the work of all in-house personnel and Sub-consultants/ Specialists retained by the Consultant and by the PWGSC Project Manager.

2. Ensure clear, accurate and ongoing communication of concept design, non-conformances, budget, risks and scheduling issues, including changes, as they relate to the responsibilities of all Sub-consultants and Specialists from initial concept design reviews to closure reports.

3. Coordinate input for the Departmental Representative's Risk Management Plan.

4. Coordinate the Quality Assurance / Quality Control process ensuring submissions of Sub-consultants and Specialists are complete and signed-off by the designated independent reviewer. See Required Services (RS) sections for constraints regarding independent reviewers.

5. Ensure Sub-consultants and Specialists provide adequate site investigation and/or site inspection services and attend all required meetings.

1.7 Co-ordination with Contractor

The Consultant shall:

1. Not enter into the area of responsibility of the Contractor's superintendent.
2. Not make any changes that will affect scope/budget/schedule without prior written approval from the Departmental Representative.

1.8 Project Response/Delivery Time

1. It is a requirement of this project that the key personnel of the Consultant and all 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 all sub-consultants or specialist firms are to respond to inquiries within one (1) business day.
3. All submissions to the Consultant Team are to be reviewed and commented by the Consultant and the independent reviewer, and returned signed "Accepted" and dated, all within three (3) business days of their receipt. One (1) electronic copy of all returned submissions and of the corresponding Quality Control sign-offs is to be provided to PWGSC at the same time.
4. Project schedule limitations and specific delivery dates are specified in the PD 2 section. These constraints shall be achieved, unless otherwise accepted by the PWGSC Project Manager in writing.

1.9 Meetings

1. Unless otherwise specified in the Required Services (RS) sections, the Departmental Representative shall arrange meetings generally every two weeks throughout the entire project development and implementation period, for all members of the Project Team, including representatives from:
   a) Public Works and Government Services Canada;
   b) Consultant Team;
   c) Contractor and Sub-contractors, during the construction stage.
2. During design development, tender preparation, and tendering phases:
   a) Attend the meetings,
   b) Record the issues and decisions, and
   c) Prepare and distribute minutes within two (2) working days of the meeting.
   d) Meetings will be held at PWGSC offices, 2720 Riverside Drive, Ottawa, Ontario, or at the Consultant's office if so requested by the Departmental Representative.
3. During construction and implementation:

a) Advise the Contractor to hold, and attend the meetings;
b) Cooperate and coordinate with the Contractor, record the issues and decisions, and prepare and distribute minutes within two (2) working days of the meeting;
c) Kick off meeting will be held at PWGSC offices, 2720 Riverside Drive, Ottawa, Ontario, or at the Consultant's office if so requested by the Departmental Representative. Progress meetings will be held at the site offices.

1.10 Health and Safety

1. General Requirements:

a) Develop written Site-Specific Health and Safety Plan (SSHSP) based on hazard assessment prior to beginning any field work and continue to implement, maintain, and enforce plan through all phases of the project.
b) The SSHSP needs to cover all activity of the Consultant Team (consultant personnel, sub-consultant, specialists and contractors).
c) Any underwater inspection will require a separate Site Specific Health and Safety Plan for the diving work, which together with a copy of the Ministry of Labour Dive Notice and copies of divers' Certifications shall be submitted to the Departmental Representative. Use of underwater ROV equipment is preferred, if equivalent or better results can be achieved.
d) The Consultant shall incorporate in his SSHSP and abide by any additional constraint or safety requirement imposed by PWGSC and/or Parks Canada for accessing and using Parks Canada property or part thereof.
e) Coordinate field work with Parks Canada activity on or adjacent to the project site. Initial requests are to be channeled through the Departmental Representative. A minimum 72-hour notice is required.
f) Provide all required Personal Protective Equipment, equipment and material as required to meet the intent of the safety requirement set in the SSHSP, or as required by the Federal and Provincial Occupational Health and Safety Legislation.
g) The Consultant shall be responsible for all of their Team and for government employees on site, and for protection of general public adjacent to site, to the extent that they may be affected by conduct of the field work.
h) 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 advisable for reasons of health or safety. The Departmental Representative may also stop work for health and safety considerations.

i) During the Construction Phase of the project, incorporate into the SSHSP and abide with any additional constraints or safety requirements imposed by the Contractor.

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

k) Reference Codes and Standards:

i) Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended;

ii) Canada Labour Code;

iii) Ontario Diving Regulations No. 629/74 and CSA Diving Operations and CSA Standard Z275.04-12. Competency standard for diving, hyperbaric chamber, and remotely operated vehicle operations.

iv) NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites;

v) Workplace Safety and Insurance Act, 1997,

vi) Book 7 of the Ontario Traffic Manual,

vii) Municipal statutes and authorities.

2. Submittals

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

i) Results of site specific safety hazard assessment,

ii) Mitigation and precaution measures that will be implemented as a result of safety and health risk of hazard analysis for site tasks and operations,

iii) Consultant's Team Safety Communications Plan,

iv) 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 Parks Canada Emergency Response requirements and procedures provided by Departmental Representative.

b) In addition to the SSHSP the following documents shall also be submitted:

i) A copy of the Consultant Team WSIB Clearance Certificates.

ii) 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,

c) 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.

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

PA 2 THE PROJECT TEAM

2.1 General Organization

1. It is the intent of PWGSC that this project be organized, managed and implemented in a collaborative manner. The Project Management Team 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 throughout this Project Brief. Under the leadership of the PWGSC Project Manager, all Project Team members are responsible for establishing and maintaining a professional and cordial relationship.

2.2 Project Team Organization

1. The Project Team refers to the representatives, both federal and private, involved in delivering and coordinating the project.

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

1. PWGSC Project Manager:
   a) is accountable for the expenditure of public funds and delivery of the project in accordance with terms accepted by the Treasury Board;
   b) is responsible for the day-to-day management of the project;
   c) 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 User Department Representative:
   a) The User Department Representative will play several critical roles for the successful implementation of the project, as follows:
      i) Ensure and 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;
      ii) Ongoing responsibility to ensure Functional Program requirements are met, and are communicated in a timely manner to the PWGSC Project Manager.

PA 3 AUTHORITIES, SUBMISSIONS, REVIEW AND APPROVAL PROCESS

3.1 Federal Government Authority/Jurisdiction

1. The following are authorities having Federal Government jurisdiction over the project:
   a) Public Works and Government Services Canada: Contracting authority and project delivery.
   b) Parks Canada Agency: Functional design requirements, approvals and standards.
   c) Parks Canada Agency: Navigable Waters Protection Act.
   d) Department of Fisheries and Oceans: Fisheries Act.
   e) Environment Canada: Canadian Environmental Assessment Act and Canadian Environmental Protection Act.

3.2 Submissions, Reviews, and Approvals

1. The Departmental Representative will review work in progress on a continuing basis. Submissions, reviews and formal presentations are required for design and project acceptance in accordance with those outlined elsewhere in this Project Brief. Below is a list of Federal Authorities that will require presentations and submissions for approval:
   a) PWGSC;
   b) Parks Canada Agency, if and as requested by the PWGSC Project Manager.
2. The frequencies of meetings indicated elsewhere in this Project Brief are estimates. They will be affected by the project stage, issues and requirements for decisions and approvals. The Consultant will be required to attend all additional meetings as needed, and to make presentations to satisfy Authorities as identified.
3. Reviews by PWGSC Departmental Representative(s) and others:
   a) Purpose of review and acceptance:
      i) Program, investigations, concept, analysis, design, and quality assurance;
   b) Submission format:
      i) Reports, drawings and specifications, models, oral presentation;
   c) Submission schedule:
      i) Submissions are reviewed when complete submission has been forwarded to the Departmental Representative;
   d) Expected turnaround time:
      i) 3 to 5 working days;
   e) Number of submissions:
      i) As stipulated in this Project Brief, plus any follow-up reviews.

4. Other Authorities Having Jurisdiction

   a) Although the Federal Government does not formally recognize jurisdiction at other levels of government, voluntary compliance with the requirement of these other Authorities is a requirement unless otherwise directed by the Departmental Representative.
   b) Codes, regulations, by-laws and decisions of authorities having jurisdiction shall be observed.
   c) In cases of overlap, the most stringent will apply. The Consultant shall identify and report to the PWGSC Project Manager other jurisdictions appropriate to the project.
   d) Unless otherwise directed by the Departmental Representative, PWGSC will voluntarily comply with the applicable Provincial Construction Acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations. Consultant shall identify and report to the PWGSC Project Manager all unavoidable non-conformances.

PA 4 INVOICING AND PAYMENTS

1. Further to R1230D GC 5.3 Payment to the Consultant, the payment schedule during the pre-construction stage (RS 1 to 9) of the project will be on the basis of deliverables, as described in this Section. Progressive monthly payments between deliverables will be permitted.
2. Payment for work completed in other Required Services (RS 10 to 12) will be on time-basis, as described in this Section issued upon receipt of monthly invoicing.
3. Deliverables are defined as those listed and implied in the Required Services (RS) sections.
4. For processing of invoices, include the following information on each invoice for payment:

   a) PWGSC project number;
   b) Invoicing period with dates;
   c) Work done to justify invoice (short narrative) for services provided;
   d) Summary of costs, separately for each Required Service performed, as follows:

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

80% of Agreed fees (0.8x4) = (7) Fees + HST = Total

90% of Agreed fees (0.9x4) = (8) Fees + HST = Total

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

5. The value of As-built Record Documentation is established as 10% of the total value of the consulting fees calculated on a Fixed Fee basis.

6. Consultant shall additionally take into account the following invoicing requirements:

   a) Monthly billing is to be used up to 80% of total contract value for each individual Required Service (RS) separately;
   b) 10% of total contract value for each RS shall be invoiced separately, and only following a written acceptance of all Deliverables for that RS by the PWGSC Project Manager;
   c) The remaining 10% of total contract value for each RS shall be invoiced separately and only following a written acceptance of As-Built Record Documents by the PWGSC Project Manager.

REQUIRED SERVICES (RS)

REQUIRED SERVICES:

The overarching goal is to build a safe, efficient bridge as fast as possible within Parks Canada navigational constraints and with minimal road closures to vehicular and pedestrian traffic.

Services shall be provided in accordance with the requirements identified and/or implied elsewhere in this Project Brief including but not limited to the requirements identified in 'Doing Business with A&E' attached to this Project Brief.

RS 1 Analysis of Project Scope of Work:

1.1 Review available existing documentation. PWGSC will provide a DVD disk with documents currently available. Determine what other required information is missing and inform the PWGSC Departmental Representative (D.R.), who will attempt to procure it from external sources. If the missing information is not obtainable, but is necessary to proceed with the project, prepare a list of additional information to be acquired, and submit it promptly to the D.R. for review. All provided documents shall be returned to the D.R. immediately following the completion of the project.

1.2 Currently Available Documentation:

a) August 2010 Recapitalization Study Report, with Site Plan drawing (AutoCad)
b) October 2013 Traffic Safety Study Report
c) 2015 Survey drawing (AutoCad)
d) June 2015 Inspection letter
e) Swing Statistics from 2003 to 2015
f) Photographs of bridge and approaches
g) Existing Drawings library (tif)

1.3 Submit a Site Specific Health and Safety Plan and an Environmental Protection Plan for all required Consultants for review by D.R.

1.4 Visit the site to perform visual reconnaissance and site review, surveys, and measurements, meet bridge maintenance and operations staff, and obtain local information applicable to design and construction.

1.5 Submit Quality Management Plan (including samples of Quality Control Sign-Off Sheets for both design and construction phases), Initial Project Schedule and Initial Risk Assessment Plan for review by D.R. Project Schedule and Risk Management Plan are to be updated and re-submitted to D.R. every two (2) weeks. All Quality Assurance/Quality Control Sign-off Sheets (signed by independent senior engineer reviewers who are not part of the Consultant Project Team) pertaining to both in-house and

external Consultant/Specialist work are to be submitted to the D.R. on an ongoing basis.

RS 2 Management of Consultant's In-House and External Resources and Services

2.1 The Consultant shall perform all pertinent project management functions necessary for proper management of all services being provided, including (but not limited to): management of its own in-house personnel, co-ordination of services between disciplines, management of sub-Consultants'/Specialists' services, and similar general management tasks.

RS 3 Investigations, Studies and Reports:

3.1 Additional investigations, studies and tests needed to complete the scope of work may include, but not be limited to:

a) Geotechnical and underwater investigations to aid with replacement/extension of pivot pier and possibly rest piers, and rehabilitation/extension/replacement of abutments and canal walls;
b) Underwater 3D multi-beam bathymetry scan of the full length of the walled Canal at the bridge, and underwater survey of damages to all four Canal walls to aid in developing and designing appropriate wall repairs and dewatering methods.
c) Detailed topographical survey to guide project design and implementation, including designation of temporary bridge location, staging areas and construction site access.
d) Heritage Recording of the existing bridge, center pier, abutments, mechanisms, etc. for Cultural Resource Management of the User Department.
e) Investigation/localization/review of Bell Canada duct bank crossing the canal and switchbox, both located west of the bridge, to preclude issues during design and construction of replacement bridge.

3.2 Program the scope and schedule, and submit breakdown of all costs associated with the proposed investigations/studies/tests, clearly indicating if on-site works require temporary roadway and/or navigation closure(s). With the assistance of the Consultant, PWGSC will seek approval from authorities having jurisdiction. Upon receiving written acceptance to proceed from the PWGSC D.R., perform only the accepted additional studies, investigations and/or tests.

3.3 Assist PWGSC, as required, in completing an Environmental Assessment Study and implement its findings into the design, schedule and risk assessment.

3.4 Prepare Reports of all findings and submit to D.R. for review and comments no later than ten (10) business days following completion of field work.

3.5 Inspection and investigation work, if and as required, shall be carried out in accordance with: the current PWGSC Bridge Inspection Manual (BIM) 2010, the current Canadian Highway Bridge Design Code (CHBDC), AASHTO Movable Bridge Inspection Evaluation and Maintenance Manual, and other Codes and Standards, as required.

3.6 The inspection and investigation of specialized components of bridges (structural, mechanical, electrical, control system, hydraulics, cables, hoist systems, etc.), shall be carried out by specialized, experienced and licensed engineers, and shall be coordinated and integrated with the inspections of other structural components of the bridge in a manner that minimizes impact on bridge operations and general public.

RS 4 Estimating and Cost Planning

4.1 The Consultant shall provide cost consulting services by a Cost Estimating Specialist with expertise specific to fixed and movable bridge construction and de-construction in Ontario, from the commencement of project concept design through to construction completion, including the preparation of complete estimates for all construction trades. The estimates are to consider escalation, inflation, markets, contingency costs, etc.

4.2 The specialist responsible for estimating and cost planning shall attend all pertinent project meetings throughout the design phases and be prepared to present and substantiate the estimates directly to the Departmental Representative.

RS 5 Risk Management and Quality Management

5.1 The Consultant shall provide support to the D.R. in identifying risks and managing them throughout the project life cycle, from the commencement of project concept design through to construction completion.

5.2 A risk management strategy is essential to the project management at PWGSC. Such a strategy combines project planning, design development planning, procurement planning and implementation planning. Implement "Doing Business with A&E" Risk Management strategies and requirements, including "Definitions" and "Checklist".

5.3 Risk Management Process:

a) Identify risk events based on past experience and using proposed checklist or other available lists;
b) Qualify/quantify probability of risk event (Low, Medium, High) and their impact (Low, Medium, High);

c) Prioritize risk events;
d) Develop risk response, including but not limited to risk avoidance, transfer, mitigation and acceptance;
e) Implement risk controls and risk response strategies as required.

5.4 The Consultant shall plan, formalize and write a complete and thorough Project Quality Management/Assurance Plan (QA), and implement and manage Project Quality Control (QC), including QC of all services and QC of construction, throughout the project life cycle, from the commencement of project concept design through to construction completion.

5.5 QC of services shall be performed by independent specialists, who shall be senior specialist engineers who are not part of the Consultant Project Team, and who may or may not be employees of the firms forming the Consultant Team.

5.6 Submit all QC Sign-Off Sheets to the D.R. on an on-going basis, as work progresses.

5.7 Once per week, on the same day of the week, confirm to the D.R. in writing that design work progress is on-track and on-schedule.

5.8 Project Quality Assurance and Quality Control are essential to the project management at PWGSC.

RS 6 Design Concept

6.1 The Consultant is to explore various design options and analyze them against identified priorities and program objectives. Within this process:

a) and in its earliest stages, all initially considered options are to be presented, complete with annotated hand sketches, order of magnitude cost estimates, initial estimates for construction time, possible implementation challenges and a list of unavoidable non-compliances to codes, standards and regulations, to the D.R. during the initial Design Concept meeting;
b) following this meeting, up to three options in each of the structural, mechanical and electrical/controls disciplines are to be recommended, selected, developed further, matched for compatibility with other disciplines' concepts, evaluated and compared to each other in sufficient detail and clarity to recommend a single preferred option for Design Development stage.
c) Investigate and report viable conceptual designs for all necessary temporary works (full design by the Contractor), as well as concepts regarding viable staging, storage and construction site areas.

6.2 Organize, initiate, conduct and produce minutes (for D.R.'s review and acceptance) of video-conference meetings using WebEx software, and/or

face-to-face meetings, every two weeks throughout the Design Concept stage. At all times, ensure that all pertinent members of the Consultant Team are participating in these meetings, including Sub-consultants' and other Specialists' project personnel. During the meetings, the Consultant Team is to at minimum:

a) recap progress achieved to date and work remaining to be completed;
b) submit an updated schedule for the entirety of Design Concept work, and compare it to the schedule submitted during the previous meeting;
c) present progress achieved since the previous meeting;
d) summarize any difficulties/complications encountered, as well as the resolution options submitted to the D.R. during the period in-between current and previous meetings. Advise of any outstanding decisions in this regard;
e) summarize new and revised concepts, directions of investigation/evaluation, etc submitted to the D.R. during the period in-between current and previous meetings. Advise of any outstanding decisions in this regard;
f) recap status of previously submitted Requests For Information (RFIs) generated by all parties. Advise of any outstanding decisions in this regard;
g) advise the D.R. in advance of unavoidable Team member changes;
h) submit goals to be achieved in the following two weeks.

6.3 Submit to D.R. the design concept(s) documents for review at the initial Design Concept meeting, at 50%, 99% and 100% complete stages in sufficient detail to illustrate the design concept(s) and to demonstrate compliance with the Project requirements.

6.4 Consider all design issues beyond the bridge structure itself, which may need to be addressed, and which could include unavoidable non-conformances, repair methods for canal walls, piers and abutments, bridge controls, electrical, mechanical, hydraulic, signage, lighting, approaches, traffic, site safety, etc.

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

6.6 For up to three conformant and most appropriate bridge replacement options, each consisting of best matched structural+mechanical+electrical/controls concepts, and a single canal

walls repair option recommended by the Consultant and accepted by the D.R. for detailed Design Concept analysis:

a) adequately demonstrate that options adhere to the project objectives and constraints;
b) submit a Concept Report adequately supported by graphs, lists, tables, drawings, sketches, plans, sections, and perspective views. Ensure that that the Executive Summary section is suitably written for high-level decision makers to have all pertinent and necessary information ;
c) include Class C Construction Cost Estimates, a Cost Plan , a Project Risk Management Plan and updated Project Schedule to confirm the feasibility of the Project;
d) include a list of unavoidable non-conformances;
e) include options analysis, complete with 75-year life cycle cost analysis;
f) submit QA/QC documentation for this portion of work;
g) submit copies of all design concept documents in two (2) hard copies, a complete electronic PDF version, as well as photographs in native JPEG, and drawings in native AutoCad 2015 versions.

6.7 Overall project Objectives/Goals:

a) Complete Swing bridge superstructure replacement, with as much as possible CHBDC-compliant and TAC-compliant, two-lane swing bridge including a pedestrian/bicyclist sidewalk;
b) Achieve time-to-first-major-repair of 35 years minimum;
c) Type and shape of the replacement superstructure may not be required to be sympathetic with the existing superstructure's "look", but one of the structural concept options will be required to be for a sympathetic look with a modern and innovative design. Inform the D.R. at the outset of the concept investigation of other swing bridge configurations that could result in significant time and/or cost savings, reliability, durability, life expectancy, or increased public safety;
d) Replacement bridge superstructure, with possible exception of the bridge deck, is to be constructed in structural steel, with detailing that is naturally and significantly less corrosion-prone than the existing built-up member truss configuration;
e) Adjust the elevation, widen and re-surface the approaches, only if and as necessary, and provide a pedestrian sidewalk on approaches;
f) Provide new pintle, balance wheels and rail, live and jacking supports, rest supports, span locks, travel restraints, etc.;
g) Provide new mechanical, hydraulic, electrical and control equipment and wiring/piping as required for 75-year bridge life expectancy and low-maintenance, trouble-free operation. Propose

at least two fully automatic operation/control alternatives, with at least one based on PLC controls. Meet PCA standards currently in preparation;

h) Modify the Control House or build a new one, as required. Choose best position on site if a new Control House is necessary;

i) Provide traffic gates, signs, signalization, lighting, etc. as required to meet PCA standards currently in preparation;

j) Full lengths of canal walls, east and west of the bridge and on both north and south banks of the canal are to be fully rehabilitated. Investigate appropriate methods of necessary repairs to achieve time-to-first-major-repair of 50 years minimum. Initially, also investigate and compare time/schedule and cost benefits, if any, of full or partial replacement of the 4 canal walls;

6.8 Overall project constraints:

a) Construction is to take place during the Winter 2017/18, during the period specified;

b) Vehicular traffic across the canal must continue throughout the construction period. Provide either a temporary canal-fill roadway, or provide a temporary bridge and abutments, complete with all required signalization. Provide a temporary pedestrian crossing jointly or separately from the temporary 2-lane roadway. Provide access roadway/sidewalk to the temporary structure(s). Provide time to construct, time to de-construct and cost analyses for both options;

c) The temporary vehicular and pedestrian crossing(s) (bridge or canal infill) are to be installed either prior to, or at the latest coincide with the completion of, the existing bridge demolition.

d) The replacement bridge is to be substantially fabricated before removal of temporary bridge or of infill crossing begins. Delivery of the ready-to-install replacement bridge shall coincide with the completion of removals;

e) Conform to User Department requirement that no approach roadway re-alignment is to be considered for this project;

f) Bottom portions of new bridge's main superstructure trusses, or of other projecting main load-carrying longitudinal elements, are to be shielded from splashing action generated by passing vehicles;

g) Provide crash-tested traffic barriers independent of main trusses and other projecting main load-carrying longitudinal elements. Match position with new barriers on approaches. Provide bicycle barriers on the sidewalk;

h) Deck is to be of the "closed" type, and is to have adequate slopes in at least one direction, but preferably in both. As much as possible, deck drainage is not to be directed towards the gaps between deck ends and the abutments. Approaches should

likewise not drain towards that gap. Drain pipes, if used, are to be minimum 150mm diameter PVC or ABS, with 2x45 degree elbows forming all 90 degree vertical turns. Horizontal drain turns are to be avoided;

i) Maintain the current clear navigation channel width of 17 metres on the south channel, and encroach on the north channel, if and as necessary, to achieve the required bridge widening. Minimize the north channel encroachment. Any encroachment into or narrowing of the present width of the north channel will require Parks Canada Agency approval, which will be secured by the Departmental Representative. If PCA does not approve the proposed encroachment, the Consultant is to investigate and develop alternative design widths and/or approaches to achieving bridge widening;

j) Swing piers' center will probably have to be shifted northward significantly to accommodate the required bridge widening and the restriction on south navigational channel width. As a result, provide a new pivot pier and investigate the adequacy of existing rest piers for a northward extension (instead of full replacement). Investigate and report to the D.R. if an alternative to shifting the location of the center pivot location exists and is seen as feasible and beneficial to this project;

k) Position the sidewalk on the most appropriate (for pedestrian traffic) side of the replacement bridge. The direction of rotation of the new swing bridge is to be determined in consequence of the position of the sidewalk, such that the sidewalk is on the north side of the new bridge in its swung-open position;

l) Due to the likely shift of the new bridge pivot pier center, the replacement bridge may be designed either as an equal-arm, or an unequal-arm with counterweight. An equal-arm swing bridge may require a new north abutment. Consider and provide time to construct, time to erect and cost analyses for both options;

m) Investigate both abutments for adequacy to support any new, heavier loads. Replace if necessary, or re-face/repair stonework and concrete over the full height and width of all 3 exposed sides on each abutment;

n) The composition and construction of the 4 canal walls on each side of bridge abutments is unknown, but suspected to be: wood cribbing on bedrock, overlay of stone masonry on cribbing, masonry topped with concrete capping. Underwater inspections are to be conducted to determine the best method of wall repairs or replacement. Wall repairs on south side of the canal cannot result in narrowing of the south navigation channel, while encroachment on the north channel is to be kept to an absolute minimum, with preference for no encroachment;

o) Existing canal wall and center pier cribwork sections are to be continually sprayed with water when construction area within the canal is dewatered. Re-flood the area immediately once dewatering is no longer required;

p) Constraints for structural steel construction:
   - i) Use high strength steel, if necessary to make the above-roadway superstructure visually "slender" and appealing;
   - ii) All steel and steel anchors in contact with concrete are to be hot-dip galvanized to 700g/sq.m.;
   - iii) Main bridge trusses are to be shop-coated with a 3-coat state-of-the-art bridge coating system approved by Ministry of Transportation (MTO). The color of the bridge is to be determined by the User Department, and will be provided to the Consultant by the D.R.;
   - iv) All below-deck structural steel elements not forming an integral/inseparable part of main trusses are to be hot-dip galvanized and unpainted, except if an Orthotropic Steel Deck (OSD) is selected, in which case they are to be shop-coated with the same coating system as the trusses and the OSD. Pivot girder(s) are to be hot-dip galvanized and at least a complete base coat of the paint system is to be fully applied over the newly galvanized surfaces strictly within 12 hours of the galvanization process. Certification of this maximum permissible paint-over-galvanization delay is required. Mid and top coats are to be applied over the base coat within delays recommended by the coating system manufacturer;
   - v) All bolted steel connections are to be sealed with mastic sealant bead placed on all sides of the mating surfaces except the downward facing side. Mastic is to be applied over the completed coating system, and only once the system has cured. Visible seal beads are to be then touched up to match the color of the bridge structure;
   - vi) The replacement bridge is to be fully assembled and coated in the fabrication shop, with the geometry and dimensions verified and certified. Delivery to site in a fully assembled state is preferred, but other options are to be explored by the Consultant in the Concept Design stage, if deemed beneficial to the project;
   - vii) A Level 3 NACE inspector is to perform adequate inspections to be able to accept and certify all surface preparation and coating operations of structural steel;
   - viii) Use only hot-dip galvanized bolts for all bolted connections.

q) Constraints for reinforced concrete construction:

i) Use only hot-dip galvanized, or GFRP reinforcing bars of appropriate tensile strength, tensile modulus, tensile strain, bond strength and longitudinal coefficient of thermal expansion. All anchors and embedments are to be hot-dip galvanized. No cutting of galvanized items is permitted;

ii) Concrete mix is to comply with C-XL exposure class, except that: maximum water-cement ratio is to be 0.35. The mix is to have very good workability, adequately high fly ash (type F) or silica fume content, air content is to be category 1. Except for mass concrete, the mix is to have two different lengths of PVA (PolyVinyl Alcohol) fibres added into the truck barrel on site in the following concentrations: type compatible with NyconPVA RF4000-30mm long at 0.23% volume, and type compatible with NyconPVA RFs400-18mm long at 0.23% volume. Ensure that a PVA fibre manufacturer's representative instructs all necessary personnel in approved methods, procedures and timing for introducing and mixing PVA fibres in the concrete mix. The manufacturer's representative shall be present on site for the first day of concrete placement to witness, trouble-shoot and accept the fibre-related procedures, such that the desired results are consistently achieved for all concrete placing throughout the project;

iii) All concrete re-facings and additions are to be a minimum of 300mm thick;

iv) In all cases a 10-day long wet curing of concrete is required;

v) Design and provide adequate concrete temperature control for mass concrete casts;

vi) The time elapsed between plant production and on-site placing end-time for each truck load is to be STRICTLY recorded and controlled. Under no circumstances allow placing of concrete that is more than 1h45min. (105 minutes) old since cement was combined with water and aggregates. Reduce the permissible time between batching and complete discharge to 1h15min. (75 minutes) when ambient air temperature exceeds 25 degrees Celsius. All concrete not satisfying these time limits is to be rejected. A report of all concrete deliveries and the corresponding batching time and placing end time is to be produced on a daily basis and submitted to the D.R.;

vii) Provide and implement direct communication between the Contractor and the batching plant during all concrete placement operations such that concrete delivery trucks: a) do not wait to discharge concrete at site, and b) do not arrive late causing a delay in monolithic concrete cast.

viii) For monolithic and mass concrete casts, place concrete in a continuous operation until the section is completed. Ensure appropriate concrete placing rate which ensures that each layer is placed while the previous layer is soft or plastic, such that the two adjacent layers become monolithic by penetration of vibrators, and precludes formation of cold joints.

ix) Limit concrete temperature at placing to not less than 10 degrees Celsius and not more than 20 degrees Celsius at all times.

6.9 Recommend a single Preferred Conceptual Option for Design Development consideration in writing to the D.R.

RS 7 Design Development

7.1 The Consultant is to, after acceptance of the Design Concept documents and after receiving a written directive to proceed from the D.R., prepare and:

a) refine the approved Preferred Conceptual Design Option to a level of detail which will facilitate preparation of Class B Cost Estimates, updated Cost Plan, updated Risk Management Plan, updated Project Schedule, Updated Construction QA/QC Plan, design and design documents, and list of Code and TAC non-conformances;

b) submit to the Departmental Representative, design development documents in sufficient detail to fully define the size, intent, character, schedule, cost of the entire Project, and associated risks and means of their mitigation;

c) submit an updated and refined Construction Cost Estimate based on the design development documents, an updated Cost Plan, Project Risk Management Plan and Project Schedule, as well as QA/QC documentation for this portion of design work;

d) if and as required, submit updated concept designs for temporary works and concepts for staging, storage and construction site areas;

e) submit design drawings, notes and calculations to demonstrate appropriate work progress at 50% completion stage of Design Development;

f) submit two (2) hard copies and a complete PDF version of all design development documents at 99% and 100% completion stages;

g) implement all D.R.'s comments and directions following each submission;

h) submit all final design development documents in two (2) hard copies, a complete electronic PDF version, as well as photographs in native JPEG, and drawings in native AutoCad 2015 versions.

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

7.3 Drawings shall include a table of all structural steel members, elements and connections, each identified by unique number, with corresponding factored and unfactored design forces and moments calculated in accordance with CHBDC provisions. The same numbering system shall clearly identify all these members, elements and connections on drawing plans, sections and elevations.

7.4 Project meetings are to be organized, conducted and minutes taken at the same frequency and with the same submissions defined in RS6 Design Concept article 6.2.

7.5 Overall project goals and constraints are as specified in Design Concept RS Section.

RS 8 Construction Documents, Pre-Tender Construction Cost Estimate, Risk Management Plan and Project Schedule

8.1 All completed and final, issued "For Construction", drawings and specifications, as well as the accompanying Class A Construction Cost Estimates, Cost Plan, Construction Risk Management Plan, Construction Schedule and Construction Quality Assurance/Control Plan shall be submitted no later than the date specified in PD 2.7 Schedule.

8.2 The Consultant is to, after acceptance of the Design Development documents by the Departmental Representative and after receiving a written directive to proceed, prepare and:

a) submit construction drawings and specifications to demonstrate appropriate work progress at 50% completion stage of Construction Documents preparation;
b) submit two (2) hard copies and a complete PDF version of all for-construction documents at 99% and 100% completion stages;
c) implement all D.R.'s comments and directions following each submission;
d) submit an updated and refined 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 at each specified stage of completion. All documents prepared by Sub-consultants and other external specialists shall be reviewed, corrected as necessary, and signed "Reviewed and Accepted" by the Prime Consultant prior to their submission to the D.R.;

e) submit all final documents signed and sealed by specialist Professional Engineers licensed in the Province of Ontario and issued "For Construction" in two (2) hard copies, a complete electronic PDF version, as well as photographs in native JPEG, and drawings in native AutoCad 2015 versions without engineering seals and signatures;

f) submit a comprehensive Final Engineering Design Brief signed and sealed by Professional Engineers licensed in the Province of Ontario referencing applicable design Codes and Guides throughout, in a PDF format for PWGSC archiving and future reference purposes.

8.3 Project meetings are to be organized, conducted and minutes taken at the same frequency and with the same submissions defined in RS6 Design Concept article 6.2.

8.4 Overall project goals and constraints are as specified in Design Concept RS Section.

RS 9 Tender Call, Bid Evaluation and Construction Contract Award

9.1 Tender Call:

a) The Consultant is to, after acceptance of the final submission of the construction documents by the Departmental Representative, provide one (1) complete electronic set of the accepted "For Construction" drawings in AutoCad 2015 format digitally signed and sealed by specialist Professional Engineers licensed in the Province of Ontario, suitable for reproduction only, one (1) set of same drawings in PDF format, and two (2) sets of the approved "For Construction" specifications signed and sealed by specialist Professional Engineers licensed in the Province of Ontario: one electronic set in MS Word format to be suitable for reproduction and the other set to be properly bound and covered as required by the Contracting Authority.

b) Upon request, the Consultant is to:

i) provide the Departmental Representative with information required for interpretation and clarification of the construction documents;

ii) assist in the evaluation and approval of equivalent alternative materials, methods and systems;

iii) attend job or site showings as required.

9.2 Bid Evaluation and Construction Contract Award:

a) The Contracting Authority shall be responsible for public posting of tender documents and arranging for the receipt of bids and awarding of the Construction Contract.

b) The Consultant shall, on request review and evaluate the bids received for the construction of the Project, and advise on their relative merits and/or shortcomings.

RS 10 Construction and Contract Administration

10.1 Construction Schedule

a) The Consultant shall:
   i) as soon as practical after the award of the Construction Contract, request from the Contractor a detailed construction schedule, and, after review for conformity with the Project Schedule and implementation of necessary adjustments, forward an annotated, dated, signed "Reviewed and Accepted" by the Consultant, construction schedule to the D.R. in an electronic format;
   ii) monitor and report to the D.R. the progress of the construction, or lack thereof, on a weekly basis;
   iii) immediately notify the D.R. of any known and anticipated delays which may affect the completion date of the Project, and in conjunction with the Contractor propose delay mitigation measures, complete with associated costs;
   iv) keep accurate records of the causes and duration of all delays, and update the Risk Management Plan as required.

b) Consultant shall evaluate and provide advice to the D.R., and the D.R. shall consider all requests from the Contractor for time extensions, and shall issue directions to the Contractor and the Consultant.

10.2 Construction Safety

a) All construction projects performed by the Contractor are subject to federal and provincial regulations.

b) The Contractor must provide Site Specific Health and Safety Plans in accordance with the contract; this will include emergency response plans, fire plans, etc. The Consultant is to review, provide comments and ensure that these plans are adequate and are adhered to at all times.

10.3 Construction Meetings

a) The Consultant shall:
   i) advise the Contractor to hold and attend construction meetings as required by the Construction Contract;
   ii) advise the D.R. of the dates and times of the proposed meetings;
   iii) attend all such meetings;

iv) maintain a record of the proceedings of such meetings and provide the Departmental Representative with a copy thereof within a maximum of five (5) working days of the meeting.

10.4 Clarification and Interpretation

a) The Consultant shall promptly provide clarifications and interpretations of the construction documents in written and/or graphic form, to the Contractor, with a copy to the D.R., for the proper execution and progress of the construction as and when necessary;

b) The Consultant shall not make any changes that will affect scope/budget/schedule without prior written approval from the D.R.

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

a) The Consultant shall:

i) specify in the construction documents the shop drawings, materials data sheets/information and temporary works designs that are to be submitted by the Contractor;

ii) review in a timely manner the shop drawings/designs/materials submissions provided by the Contractor to determine conformity with the general concept and intent of the construction documents and indicate to the Contractor such conformance with the general concept or lack thereof. Provide comments to and request re-submissions from the Contractor, as necessary;

iii) within five (5) business days of receipt, provide the D.R. with a signed "Reviewed and Accepted" and dated electronic copy of all submissions when such conformity is confirmed.

10.6 Testing and Inspection

a) The Consultant shall:

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

ii) specify in the construction documents and implement the Construction Quality Management Plan, recommend quality assurance testing to be undertaken during construction, evaluate the results and advise the Departmental Representative accordingly. On projects requiring coating of structural steel members/elements/components, comprehensive services of a Level 3 NACE-accredited Painting Inspector shall be retained by the Consultant in a manner assuring proper quality of base preparation and of coating system application;

iii) request the Contractor to take remedial action when observed material or construction fails to comply with the

requirements of the Construction Contract, and immediately advise the D.R.;

iv) specify in the construction documents material, product and performance testing to be undertaken by the Consultant with the assistance from the Contractor, including Commissioning of all replacement bridges and of existing bridges that have undergone major repairs that may affect their operation;

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

vi) Provide environmental monitoring and enforcement during construction.

10.7 Site Visits by the Design Engineers

a) The Consultant' design engineers shall:

i) conduct periodic visits to the site to determine, on an adequate sampling basis but not less frequently than twice each month, whether construction work is in conformity with the discipline's construction documents, industry standards and good practice. The design engineer in each engineering discipline is to perform these site visits only when work affecting/pertaining to their discipline is being conducted on site;

ii) record and report to the D.R. on the progress, non-conformities and deficiencies observed during each site visit, and provide the Contractor with written progress reports and lists of deficiencies observed;

iii) recommend the action(s) to be taken;

iv) assist PWGSC in ensuring prompt implementation by the Contractor of all remedial actions which have been accepted by the D.R. in writing, and issue a written confirmation of their completion to the D.R. and to the Contractor.

10.8 Changes to Construction Contract

a) The Consultant shall:

i) submit to the D.R. for approval all requests and recommendations for changes to the Construction Contract, as well as their implications;

ii) obtain quotations from the Contractor for contemplated changes, review the prices for acceptability and fairness, assess the effect on construction progress and completion date, and submit recommendations to the D.R.

b) The Departmental Representative shall issue Change Orders for all approved changes.

10.9 Contractor's Progress Claims

a) The Consultant shall:
   i) request from the Contractor a cost breakdown of the Construction Contract Award Price in detail appropriate to the size and complexity of the Project, or as may otherwise be specified in the Construction Contract, and submit the cost breakdown to the D.R. prior to the Contractor's first progress claim;
   ii) examine progress claims in a timely manner and, if acceptable, certify the progress claims for work completed and materials delivered pursuant to the Construction Contract, and submit them to the D.R. for approval and processing;
   iii) if the construction is based on unit prices, measure and record the quantities of labour, materials and equipment involved for the purpose of certifying progress claims.

10.10 Substantial Completion of the Project

a) The Consultant shall:
   i) review the construction with the D.R. and the Contractor, and record all unacceptable and incomplete work detected;
   ii) request from the Contractor, review for completeness and adequacy, and provide the D.R. with, all Operation and Maintenance Manuals and any other documents or items to be provided by the Contractor, in accordance with the Construction Contract;
   iii) prepare and submit to the D.R. for approval and processing, and as a basis for payment to the Contractor, a Certificate of Substantial Completion as required by the Construction Contract, together with supporting documents properly signed and certified.

10.11 Commissioning

a) The Consultant shall develop the specification and plan for commissioning of every new/replacement movable bridge, as well as for existing bridges that have undergone major repairs/rehabilitation work that may affect their operation. The Consultant is to provide commissioning services to verify that the department's functional requirements are correctly interpreted during the design and construction stages, and that the structures operate consistently, under all normal load conditions and in all operating positions;
b) Additionally, for movable bridges the scope of commissioning is to include the first seasonal start-up following completion of construction;
c) Consultant is required to develop a complete commissioning plan and specification, to be incorporated into the construction tender

documents, which will detail how the commissioning is to proceed and how it will be evaluated;

d) A Commissioning Report describing the commissioning work performed, evaluating overall success of commissioning, describing interim difficulties, failures and repairs/replacements implemented, is to be submitted to the D.R. for review;

e) The Commissioning Report is to be accepted by the D.R. before the Consultant issues the final Certificate of Completion.

10.12 As-Built Record Drawings

a) For complete bridge replacement projects, As-Built Record Documentation shall include a 3D Bridge Information Model (BrIM) in an electronic format native to Tekla Structures software. The BrIM model is to be created using Industry Foundations Classes (IFC) in accordance to ISO 16739, ISO 29481 and ISO 12006-3 Standards, as well as with processes, specifications and recommendations from BuildingSmart International (www.buildingsmart_tech.org).

b) The Consultant shall, before issuing the final Certificate of Completion:

i) prepare and provide the Departmental Representative with a complete set of as-built record drawings, and 3D BrIM model as the case may be, of the type and number as specified;

ii) verify that record drawings are suitable for digital storage and retrieval, incorporating all recorded changes to the original working drawings based on as-built prints, drawings and other information provided by the Contractor, together with change orders and site instructions;

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

10.13 Final Completion of the Project

a) The Consultant shall:

i) advise the D.R. in writing that the construction has been completed in general conformity with the Construction Contract and the Approved Design;

ii) complete the first seasonal start-up commissioning and submit the final Commissioning Report to the D.R.;

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

RS 11 Resident Site Services During Construction

11.1 The Resident Site Representative shall be intimately familiar with the Project drawings, specifications, general concept of the design and execution of works, as well as with all pertinent details and requirements of construction, sequencing, methodologies, etc., as well as with the Safety Plans, Project Schedule, Risk Management Plan, Construction Quality Management Plan, Cost Estimates, etc., such that potential and avoidable Contractor site errors, deficiencies, schedule delays, safety concerns are corrected and risks mitigated in advance and at all times.

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

11.3 The Resident Site Representative shall:

a) assist in carrying his construction and contract administration duties;
b) inspect all phases of the work in progress, for the purpose of bringing to the attention of the Contractor, after confirming with both the Consultant and the D.R., any discrepancies between the work, the contract documents, the schedule and accepted construction procedures and practices;
c) assist PWGSC in ensuring prompt implementation by the Contractor of all remedial actions which have been accepted by the D.R. in writing, and issue a written confirmation of their completion to the Consultant, to the D.R. and to the Contractor;
d) maintain and submit to D.R. a detailed and descriptive daily log of all inspections, observations, work progress, equipment and workers, material quantities, site conditions, and of unexpected occurrences on site, and additionally, on a consistent day of each week, electronically issue a weekly summary report, which is to include pertinent photographs and be prepared in the format to be acceptable to the D.R., to the Consultant and to the D.R.;
e) prepare any other reports or surveys as may be required to provide complete information to D.R. ;
f) verify quantities of materials received and record work progress through photographs (digital files to be submitted to PWGSC)
g) Provide environmental monitoring and enforcement during construction.

RS 12 Post Construction Services

12.1 The Consultant shall continue to provide inspection, trouble-shooting, problem-solving and construction contract warranty(ies) review/assistance services, on as-needed basis, for a period of one (1) calendar year

following the date of issuance of the final Certificate of Completion by the D.R.

12.2 The Consultant shall prepare a list of, review, accept and ensure that all end-of-construction deliverables from the Contractor, including but not limited to warranties and operations manual(s), have been submitted in specified quantities and format to the D.R.

12.3 The Consultant shall also submit closure reports generally comprising of the following Record Documents:

a) Introduction:
   i) Project history;
   ii) Scope of work;
   iii) Design development;
   iv) Tendering process and award of contract

b) Project Implementation:
   i) Start - up meeting;
   ii) Final work plan, risk management plan, construction cost breakdown and schedule of work;
   iii) Field testing and quality control;
   iv) Change orders and site instructions

c) Issues and difficulties encountered during implementation:
   i) Delays in the work;
   ii) Review of claims

d) Operations and monitoring program:
   i) Inspections;
   ii) Studies;
   iii) Monitoring work;

e) Conclusion and Summary, including a Certificate of General Conformance.

f) List of Appendices:
   i) Contract specifications;
   ii) Contract drawings;
   iii) Heritage Recording Report for the existing bridge sub-structures and superstructure;
   iv) Accepted shop drawings, materials data, and contractor's design documents;
   v) Contractor's final schedule;
   vi) List of subcontractors and suppliers;
   vii) Digital photographs;
   viii) Digital As-built Record Drawings and Specification, with 3D BrIM on a USB drive or DVD disk where required;
   ix) Geotechnical, materials, testing reports, if applicable;
   x) Environmental considerations report;
   xi) Bi-weekly progress summaries;
   xii) Progress meetings and minutes;

xiii) Quality assurance and quality control (services quality control sign-off sheets, materials testing, water quality, specified materials, commissioning report, etc.);
xiv) Health and safety;
xv) Operations and Maintenance Manual;
xvi) Warranties;
xvii) Any other report related to the project

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

SUBMISSION REQUIREMENTS AND EVALUATION (SRE)

SUBMISSION REQUIREMENTS AND EVALUATION

SRE 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

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

1.2 Calculation of Total Score

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

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

SRE 2 PROPOSAL REQUIREMENTS

2.1 Requirement for Proposal Format

The following proposal format information 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 should 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 and containing print
g) 279mm x 432 mm (11" x 17") fold-out sheets for spreadsheets, organization charts etc. will be counted as one page per side containing print
h) The order of the content of the proposals should follow the order established in the Request for Proposal SRE section

2.2 Specific Requirements for Proposal Format

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

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

a) Covering letter
b) Cover page
c) Tab/Dividers

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 in 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 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 shall include the following, except that Mechanical and Electrical/Controls engineers need only be listed once (either under In-house or Sub-consultant category):
   i) Prime Consultant (Proponent): Civil/Structural Engineering Consultant
      - In-house Senior Team Leaders:
        - Project Manager
        - Civil/Structural Engineer
        - Mechanical Engineer (In-house)
        - Electrical/Controls Engineer (In-house)

- In-house Engineering Team Members:
    - List six (6) Engineering Team members, two team members for each of Structural, Mechanical and Electrical/Controls disciplines.

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 Mechanical Engineers (Sub-Consultant)
    - Two 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.

iii) Names and proposed roles of key personnel to be assigned to the project per Section b) above.

iv) For each of the Senior Team Leaders and Engineering Team Members indicate:
- current company affiliation and
- current professional license status in Ontario, or if not licensed, then licensure in a different jurisdiction, and 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 15 years of experience managing Canadian bridge projects of equivalent scope and depth.

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 15 years of experience in steel truss swing bridge inspection, analysis, design, and construction projects. Within the 15 years of experience, 5 years of the experience must be within Canada.

f) The Engineering Team Members, who will be performing the majority of the engineering work, are to have a minimum 5 years relevant swing and fixed steel truss bridge experience.

g) The format for submission of the Team Identification information is provided in Appendix A.

h) All additional information listed in paragraphs above shall 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 – List of Names

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.

1.2 RATED REQUIREMENTS

3.2.1 Achievements of Proponent on similar Projects

a) Describe the Proponent's experience and details of work performed as prime consultant specifically on short to medium span steel swing bridge projects and steel truss bridge projects.

b) Select Two (2) steel swing bridge projects (at least one with truss superstructure) completed within the last ten (10) years, that were either major rehabilitation projects or full replacement projects. The projects must have been completed within the stated timeframe.

c) Information that should be supplied:
   i) Clearly indicate how each project is comparable and relevant to the project described in this Request for Proposal (RFP). Focus solely on the swing-bridge portion of multi-span projects.
      1) For projects located outside of Canada, Proponents are to clearly demonstrate comparability/relevancy of projects and firm's ability to design and produce construction documents to Canadian codes and standards by addressing:
         - comparability and differences of bridges' design with respect to Canadian Codes and Standards
         - understanding and use of the metric system of measurement versus the "imperial" system by structural, mechanical and electrical/controls engineering and drafting personnel
         - differences between bridge construction industry abroad and in Canada
         - provide dates when bridge/structural, mechanical and electrical/controls engineers who will be designated to sign and seal the construction documents were most

recently holders of a temporary professional license in Ontario. For on-going current licensure with Professional Engineers Ontario indicate: "current".

ii) Provide brief project description and intent.

iii) Describe employed design philosophy or design approach to meet the intent and describe specific design challenges.

iv) List details of structural, mechanical and electrical/controls engineering design and project management work performed.

v) Provide engineering fees per discipline and final construction cost – swing bridge portion only.

vi) Provide project schedule for swing bridge portion only. Include the start and end date of design, and the 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 a Client reference for each project - name, address, current phone number and current email address of client contact at working level - references may be checked.

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 leading and supervising design teams on swing and fixed truss bridge projects, and to recognize their past responsibilities and achievements.

b) Provide information for each of the following Senior Team Leaders:
   i) Project Manager
   ii) Civil/Structural Engineer
   iii) Mechanical Engineer
   iv) Electrical/Controls Engineer

c) Only identify Senior Team Leaders who will be carrying out supervisory/lead engineering and/or management work on this project.

d) Information that should be supplied for each Senior Team Leader:
   i) Current professional accreditation and eligibility for professional licensure in Ontario,
   ii) Relevant (steel swing bridges) experience and expertise – details of work performed,
   iii) Number of years of relevant bridge experience,
   iv) Role, responsibility and details of leadership/supervisory 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 or sub-consultant firm. This is the opportunity to emphasize the strengths and expertise of individuals supporting the Senior Team Leaders on this project and performing the majority of analytical and design work, as directly related to swing and fixed truss bridges, and to recognize their past responsibilities and achievements.

b) Provide information for six (6) Engineering Team Members for evaluation, two (2) per discipline (i.e., Civil/Structural Engineer, Mechanical Engineer, Electrical/Controls Engineer). The actual Consultant Team for the project is likely to include more staff, but only include six (6) Engineering team members for evaluation in this proposal.

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

d) Information that is to be supplied for each Engineering Team Member:

i) Current professional accreditation and eligibility for professional licensure in Ontario,

ii) Relevant (steel swing bridges) experience and expertise – details of work performed,

iii) Number of years of relevant bridge experience,

iv) Role, responsibility and details of analytical and design work performed by the individual in relevant past projects

3.2.4 Understanding the Project Milestones and Schedule

a) The proponent is to demonstrate capability to perform the services and meet project challenges and milestones by providing a plan of work.

b) Information that is to 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;

ii) Work Plan - detailed breakdown of work tasks and deliverables;

iii) Project Schedule - proposed major milestones schedule, which falls within the schedule constraints established in PD 2.6.5;

iv) List of key risk items and risk management strategy to be considered.

3.2.5 Understanding the Consultant Team Personnel Requirements

a) The proponent is to demonstrate the capacity and capability to perform the services and meet the design period schedule constraints by providing personnel assignment quantities for the periods designated for the Investigations, Concept, Design & Construction Documents stages (pre-tender work). Delivery dates of complete Construction Documents are stated in PD 2.6.5.

b) Quantity of proponent's personnel assigned to this project, for each individual week, per discipline and per seniority level is to be demonstrated in a tabular format.

c) Table format and information to be supplied:

i) Present the table on one 11"x17" sheet;

ii) Table is to have the following columns: one for row titles, and others representing each of the weeks of pre-tender Consultant Team work schedule;

iii) Row titles are to describe the function/discipline/seniority of Team Members assigned to work during the pre-tender period. Example: Overall Project Manager; Structural Team Lead; Structural Senior Engineers; Structural Intermediate Engineers, CAD Technicians; Mechanical Team Lead, and so on for all other disciplines/specializations working during this period;

iv) 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.

3.2.6 Design Approach

a) The proponent is to elaborate on unique aspect of this site that could be considered major challenges or opportunities in order to illustrate their design approach to developing an economical, durable and easily maintained bridge design that allows for fast track construction using innovative design details and construction techniques/staging to deliver this project strictly within the stipulated schedule.

b) Information that is to be supplied:

i) Describe proposed design plan with design philosophy, materials, construction methods, and other techniques and methodology that will be implemented to ensure that the bridge is replaced and canal walls rehabilitated/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 allow for opportunities to accelerate construction work.

iii) List all Material/Product and Performance Testing that will be performed at the site, and which is included in the

corresponding Disbursements portion of the Proponent's Price Proposal.

iv) Describe the major challenges or opportunities, and how the team's design approach will be applied to meet them.

3.3 EVALUATION AND RATING

3.3.1 Technical Rating

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

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

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.

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

3.4 GENERIC EVALUATION TABLE

3.4.1 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

4.1.1 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.

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

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

4.1.4 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.
d) The Price Rating is multiplied by the applicable percentage to establish the Price Score.

SRE 5 TOTAL SCORE

5.1.1 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

5.1.2 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.

5.1.3 In the case of a tie, the proponent submitting the lower price for the services will be selected.

SRE 6 SUBMISSION REQUIREMENTS - CHECKLIST

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

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

Team Identification - see typical format in Appendix A

Declaration/Certifications Form - completed and signed - form provided in Appendix B

Integrity Provisions – Required documentation – **as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3a.**

Integrity Provisions - Declaration of Convicted Offences – **with its bid, as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3b.**

Proposal - one (1) original plus three (3) copies

Front page of RFP

Front page(s) of any solicitation amendment

In a separate envelope:

Price Proposal Form - one (1) completed and submitted in a separate envelope using form provided in Appendix C

- submitted in a separate sealed envelope clearly marked "Price Proposal", and listing the Proponent firm's name

APPENDIX A - TEAM IDENTIFICATION FORMAT

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

The prime consultant and other members of the Consultant Team shall be, or eligible to be, licensed, certified or otherwise authorized to provide the necessary professional services to the full extent that may be required by provincial or territorial law.

Fill in all spaces provided on the form, except that Mechanical and Electrical/Controls personnel is to be listed only once, either under Prime Consultant or under Sub-consultant.

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

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

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

<u>Senior Team Leaders:</u>

Project Manager:
.....
Civil/Structural:
.....
Mechanical:
.....
Electrical/Controls:
.....

<u>Engineering Team Members:</u>

Civil/Structural:
.....
Civil/Structural:
.....
Mechanical:
.....
Mechanical:
.....
Electrical/Controls:
.....

Electrical/Controls:
.....

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

III. Resident Site Representative

Although an individual does not need to be identified at this time, note that the Resident Site Representative shall have satisfactorily performed all the functions required of this position as listed in the Project Brief on at least one (1) previous bridge construction project of similar (or larger) scope and type.

Additional Information to be provided:

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.
iii) Names and roles of key personnel to be assigned to the project per Section a) above.

iv) For the Senior Team Leaders, Engineering Team Members indicate current professional license status and affiliation, and/or how you intend to meet the Ontario professional licensing requirements.

v) In the case of a joint venture identify the existing or proposed legal form of the joint venture (refer to R1410T General Instructions to Proponents, GI9 Limitation of Submissions).

APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title:

Name of Proponent:

Street Address: **Mailing Address:**

Telephone Number: ( )

Fax Number: ( )

E-Mail:

Procurement Business Number:

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

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

Federal Contractors Program for Employment Equity - Certification

I, the Proponent, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada 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

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

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

OR

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

B. Check only one of the following:

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

OR

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

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

Former Public Servant (FPS) - Certification

Contracts awarded to former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts awarded to FPS, proponents must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of proposals is completed, Canada will inform the Proponent of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the proposal non-responsive.

Definitions

For the purposes of this clause,

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

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

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

"pension" means a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c.C-17, the *Defence Services Pension Continuation Act*, 1970, c.D-3, the *Royal Canadian Mounted Police Pension Continuation Act*, 1970, c.R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c.R-11, the *Members*

of Parliament Retiring Allowances Act, R.S., 1985, c.M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c.C-8.

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

Former Public Servant in Receipt of a Pension

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

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

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

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

Work Force Adjustment Directive

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

If so, the Proponent must provide the following information:

(a) name of former public servant;
(b) conditions of the lump sum payment incentive;
(c) date of termination of employment;
(d) amount of lump sum payment;
(e) rate of pay on which lump sum payment is based;
(f) period of lump sum payment including start date, end date and number of weeks;
(g) number and amount (professional fees) of other contracts subject to the restrictions of a work force adjustment program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is $5,000, including Applicable Taxes.

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

Name of Proponent:

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

....
name signature
.....
title
I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

....
name signature
.....
title
I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

....
name signature
.....
title
I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

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

Telephone Number: ( ) _____ Fax Number: ( ) _____

E-mail: _____

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

APPENDIX C - PRICE PROPOSAL FORM

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

PROPONENTS SHALL NOT ALTER THIS FORM

Project Title:

Name of Proponent:

The following will form part of the evaluation process:

REQUIRED SERVICES

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

SERVICES		FIXED FEE
RS 1	Analysis of Project Scope of Work	$.....
RS 2	Management of Consultant's In-House and External Resources and Services	$.....
RS 3	Investigations, Studies and Reports (Services)	$.....
RS 4	Estimating and Cost Planning	$.....
RS 5	Risk Management and Quality Management	$.....
RS 6	Design Concept	$.....
RS 7	Design Development	$.....
RS 8	Construction Documents, Pre-Tender Construction Cost Estimate, Risk Management Plan and Project Schedule	$.....
RS 9	Tender Call, Bid Evaluation and Construction Contract Award	$.....
RS 10	Construction and Contract Administration	$.....
RS 11	Resident Site Services During Construction	$.....
	MAXIMUM FIXED FEES	**$.....**[1]

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

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

RS 12 Post Construction Services*	ESTIMATED HOURS Column A	HOURLY RATES** Column B	TIME BASED FEE Columns AxB
Project Manager	30	$.....	$.....
Civil/Structural Engineer	30	$.....	$.....
Mechanical Engineer	30	$.....	$.....
Electrical/Controls Engineer	30	$.....	$.....
MAXIMUM TIME BASED FEES			**$.....**[2]

*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.

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:

(specify and enter limit)

RS 3	Investigations, Studies and Reports	$.....
RS 10	Construction and Contract Administration	
	NACE Inspector	$.....
	Material/Product and Performance Testing	$.....

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

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

Hourly Rates (for Evaluation Purposes)

The Estimated Hours provided below are for evaluation purposes only. While the resulting Time Based Fee 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.

RS 10 Construction and Contract Administration – In excess of construction period duration stated in PD 2.6.5* **	ESTIMATED HOURS Column A	HOURLY RATE** Column B	TIME BASED FEE Columns AxB
Civil/Structural Design Engineer	16	$.....	$.....

RS 11 Resident Site Services During Construction – In excess of construction period duration stated in PD 2.6.5* **	ESTIMATED HOURS Column A	HOURLY RATE** Column B	TIME BASED FEE Columns AxB
Full-time Site Representative	80	$.....	$.....

** All inclusive hourly rate is applicable to both normal working hours and any other shift work as required.
***Payment will be based on actual hours spent.

TOTAL ESTIMATED TIME BASED FEES **$.....[4]**

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

Total Fixed Fee	$.....[1]
Total Time Based Fee	$.....[2]
Disbursements	$.....[3]
Hourly Rates (for Evaluation Purposes)	$.....[4]
Total Evaluated Fee	$.....

END OF PRICE PROPOSAL FORM

APPENDIX D – DOING BUSINESS WITH A&E

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

Canada

Respect • Integrity • Excellence • Leadership

Serving GOVERNMENT, Serving CANADIANS.

Doing Business with A&E

www.pwgsc-tpsgc.gc.ca

Last updated: Apr 8, 2013

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

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

SECTION 2 PWGSC NATIONAL CADD STANDARD

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

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

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

SECTION 3 GUIDE TO PREPARATION OF CONSTRUCTION DOCUMENTS FOR PWGSC

1 Purpose

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

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

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

2 Principles of PWGSC Contract Documents

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

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

3 Quality Assurance

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

SPECIFICATIONS

1 National Master Specification

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

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

2 Specification Organization

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

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

3 Terminology

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

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

4 Dimensions

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

5 Standards

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

- CSA standards: http://www.csa.ca
- CGSB standards: http://www.pwgsc.gc.ca/cgsb
- ANSI standards: http://www.ansi.org
- ASTM Standards: http://www.astm.org
- ULC standards: http://www.ulc.ca
- General reference of standards: http://www.cssinfo.com

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

6 Specifying Materials

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

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

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

Acceptable Materials: set up the paragraph format as follows:

Acceptable Materials:

1. ABC Co. Model [_____].
2. DEF Co. Model [_____].
3. GHI Co. Model [_____].

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

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

Sole Sourcing: Sole sourcing for materials and work can be used for proprietary systems (ie. fire alarm systems, EMCS systems). Substantiation and/or justification will be required.

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

"Designated Contractor

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

Wording for the sole source of EMCS systems should be in Part 1 as

"Designated Contractor

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

and in Part 2 as "Materials

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

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

"Acceptable materials

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

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

7 Unit Prices

Unit prices are used where the quantity can only be estimated (eg. earth work) and the approval of the Project Manager must be sought in advance of their use.

Use the following wording:

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

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

Sample of Unit Price Table:

The Unit Price Table designates the Work to which a Unit Price Arrangement applies.

(a) The Price per Unit and the Estimated Total Price must be entered for each Item listed.

(b) Work included in each item is as described in the referenced specification section.

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

8 Cash Allowances

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

9 Warranties

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

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

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

Delete all references to manufacturers' guarantees.

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

11 Summary and Section Includes in Part -1 General of Section
Do not use "Summary" and "Section Includes."

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

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

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

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

16 Designated Substances Report
Include "Section 01 14 25 - Designated Substances Report"

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

Subsurface investigation report(s)

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

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

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

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

18 Experience and Qualifications

Remove experience and qualification requirements from specification sections.

19 Prequalification and Pre-award submissions

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

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

20 Contracting Issues

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

Remove all references within the specifications, to the following:

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

DRAWINGS

1 Title Blocks

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

2 Dimensions

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

3 Trade Names

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

4 Specification Notes

No specification type notes are to appear on any drawing.

5 Terminology

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

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

6 Information to be included

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

7 Drawing Numbers: Number drawings in sets according to the type of drawing and the discipline involved as follows (The requirements of SECTION 2 PWGSC NATIONAL CADD STANDARD will supercede these requirements, where warranted).

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

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

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

9 **Prints:** Print with black lines on white paper. Blue prints are acceptable for document submissions at 33%, 66% and 99% stages. Confirm with Project Manager the size of prints to be provided for review purposes.

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

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

12 **Schedules:** Where schedules occupy entire sheets, locate them next to the plan sheets or at the back of each set of drawings for convenient reference. *See CGSB 33-GP-7 Architectural Drawing Practices for schedule arrangements.*

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

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

ADDENDA

1 Format

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

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

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

2 Content

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

DOCUMENTATION

Translation

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

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

Consultant shall provide:

- Per construction document submission, a completed and signed Checklist for the Submission of Construction Documents. See Appendix 'A'.
- Specification: originals printed one side on 216 mm x 280 mm white bond paper.
- Index: as per Appendix 'C'
- Addenda (if required): as per Appendix 'B' (to be issued by PWGSC).
- Drawings: reproducible originals, sealed and signed by the design authority.
- Tender information:
  - Including a description of all units and estimated quantities to be included in unit price table.
  - Including a list of significant trades including costs. PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.
  - Government Electronic Tendering System (MERX): Consultants to provide an electronic true copy of the final documents (specifications and drawings) on one or multiple CD-ROM in Portable Document Format (PDF) without password protection and printing restrictions. The electronic copy of drawings and specifications is for bidding purposes only and do not require to be signed and sealed. See Appendix 'D' and Appendix 'E'.

PWGSC shall provide:

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

SECTION 4 CLASSES OF CONSTRUCTION COST ESTIMATES USED BY PWGSC

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

Class 'D' (Indicative) Estimate:

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

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

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

Class 'C' Estimate:

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

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

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

Class 'B' (Substantive) Estimate:

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

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

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

Class 'A' (Pre-Tender) Estimate:

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

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

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

SECTION 5 TIME MANAGEMENT

1 Time Management, Planning, and Control

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

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

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

1.1 Schedule Design

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

When building a Control System you must consider:

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

1.2 Schedule Development

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

Work Breakdown Structure

When developing the schedule the consultant needs to use PWGSC standards and practices. Two basic requirements are the National Project Management System

(NPMS) and a Work Breakdown Structure (WBS), structured supporting the NPMS (Levels 1-4).

The WBS is as follows:

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

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

Major and Minor Milestones

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

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

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

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

Activities

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

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

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

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

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

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

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

Project Logic

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

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

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

Activity Duration

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

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

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

Activity List

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

Milestone List

A Milestone List identifies all project Major and Minor milestones.

Master Schedule

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

Detailed Project Schedule

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

1.3 Schedule Review and Approval

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

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

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

1.4 Schedule Monitoring and Control

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

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

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

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

Progress Reports

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

The Progress Report includes:

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

Narrative reporting begins with a statement on the general status of the project followed by a summarization of delays, potential problems and project status criticality, any

potential delays, outstanding issues and concerns and options for dealing with any serious planning and scheduling issues.

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

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

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

Exception Report

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

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

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

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

1.5 Standard Submissions

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

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

1.6 Schedule Outputs and Reporting Formats

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

Progress Reports

Paper Size: Letter

Paper Format: Portrait

Title Format: Project Title; Report Type; Print Date; Data Date; Revision Block

Body Text: Narratives for each report to match other reports generated in the D.S.S.

Variance Report Columns: Activity ID, Activity Name, Planned Finish, Revised Finish, Variance, Activity % Complete,

Criticality Report Columns: Activity ID, Activity Name, Duration, Start, Finish, Activity % Complete, Total Float.

Exception Reports

Paper Size: Letter
Paper Format: Portrait
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Body Text: Narrative to match other reports generated in the D.S.S.

Paper Size: Letter
Paper Format: Landscape
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Columns: Activity ID, Activity Name, Duration, Remaining Duration, Start, Finish, Total Float.
<u>Work Breakdown Structure (indent tree):</u>

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

Activity Lists

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

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

Milestone Lists

Paper Size: Letter
Paper Format: Portrait

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

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

Master Schedule (Bar Chart)

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

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

Detailed Project Schedules (Bar Chart)

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

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

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

Last updated November 21, 2012

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

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

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

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

Item	**Verified by:**	**Comments:**	**Action By:**
Drawings:			
1 Title Blocks			
1a The PWGSC title block is used.			
2 Dimensions			
2a Dimensions are provided in metric only.			
3 Trade Names			
3a Trade names are not used.			
4 Specification Notes			
4a There is no specification type notes.			
5 Terminology			
5a The term Departmental Representative is used instead of Engineer, PWGSC, Owner,			

Consultant or Architect.			
5b Notations such as: “verify on site”, “as instructed”, “to match existing”, “example”, “equal to”, “equivalent to” and “to be determined on site by” are not used.			
6 Information to be included			
6a Architectural and Engineering Drawings have been stamped and signed by the design authority.			
6b The project quantity and configuration, dimensions and construction details are included.			
6c References to future work and elements not in contract do not appear or are kept to an absolute minimum and clearly marked.			

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

Consultant's Representative: _____

Firm name: _____

Signature:_____ Date: _____

APPENDIX 'B' - Sample of Addendum

Last updated April 22, 2008

ADDENDUM No. _____

Project Number: _____

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

DRAWINGS

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

1 A1 Architectural

.1

SPECIFICATIONS

SPEC NOTE: indicate section number and title.

1 Section 01 00 10 - General Instructions

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

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

2 Section 23 05 00 - Common Work Results - Mechanical

.1 Add new article (x) as follows:

APPENDIX 'C' - Sample of Index

Last updated April 22, 2008

Project No: _____

Index
Page 1 of ___

DRAWINGS AND SPECIFICATIONS

DRAWINGS:

SPEC NOTE: List all Drawings by number and title.

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

SPECIFICATIONS:

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

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

APPENDIX 'D'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005

Last Updated: June 3, 2008

Version 1.0

PREFACE

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

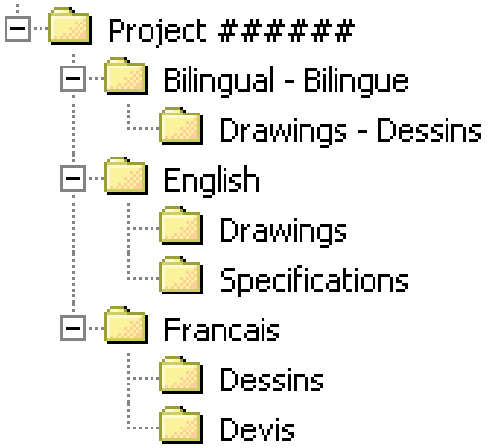
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction.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

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

1. DIRECTORY STRUCTURE

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

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



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

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

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

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

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

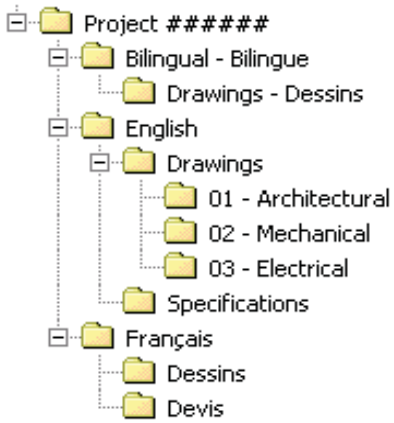
1.2 4th Tier Sub-Folders for Drawings

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

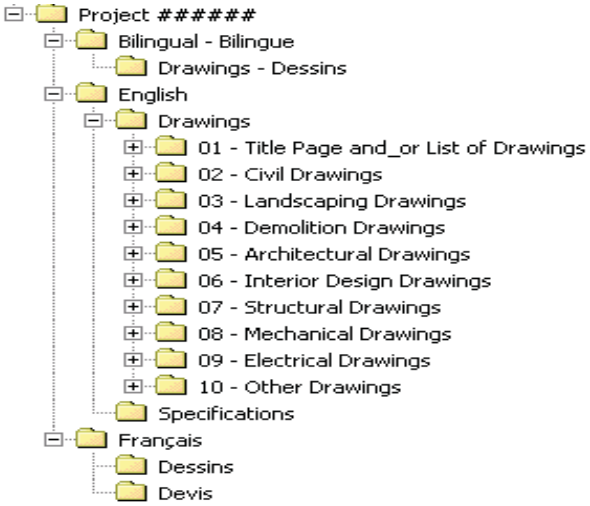
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders.

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

Examples of 4th Tier sub-folders for drawings:



or



1.2.1 Naming Convention

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

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

- Y

Where:

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

Y = The title of the folder

Example: 03 – Mechanical

For the "*Drawings - Dessins*" folder:

- Y - Z

Where:

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

Y = The English title of the folder

Z = The French title of the folder

Example: 04 - Electrical - Électricité

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

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

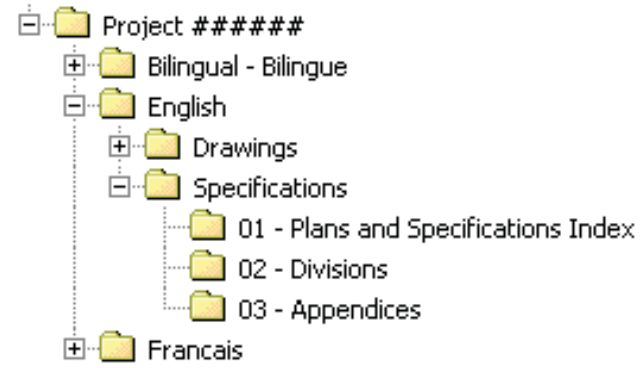
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the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

1.3 4th Tier Sub-Folders for Specifications

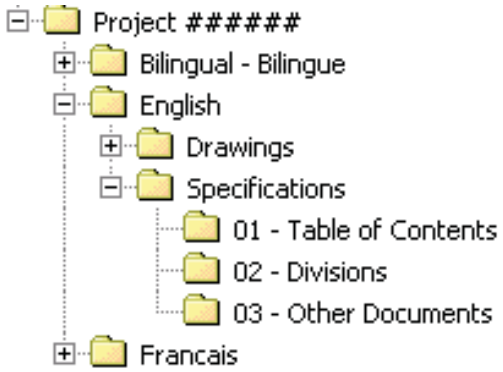
The "*Specifications*" and "*Devis*" folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.

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

Examples of 4th Tier sub-folders for specifications:



or



1.3.1 Naming Convention

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

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

- Y

Where:

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

Example: 02 – Divisions

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

It is essential to ensure that the order of the elements of the specifications on the CD-ROM be exactly the same as in the hard copy. GETS will sort each element of the specifications for both

screen display and printing as per the following rules:

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

2. NAMING CONVENTION FOR PDF FILES

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

2.1 Drawings

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

X### - Y

Where:

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

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

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

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

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

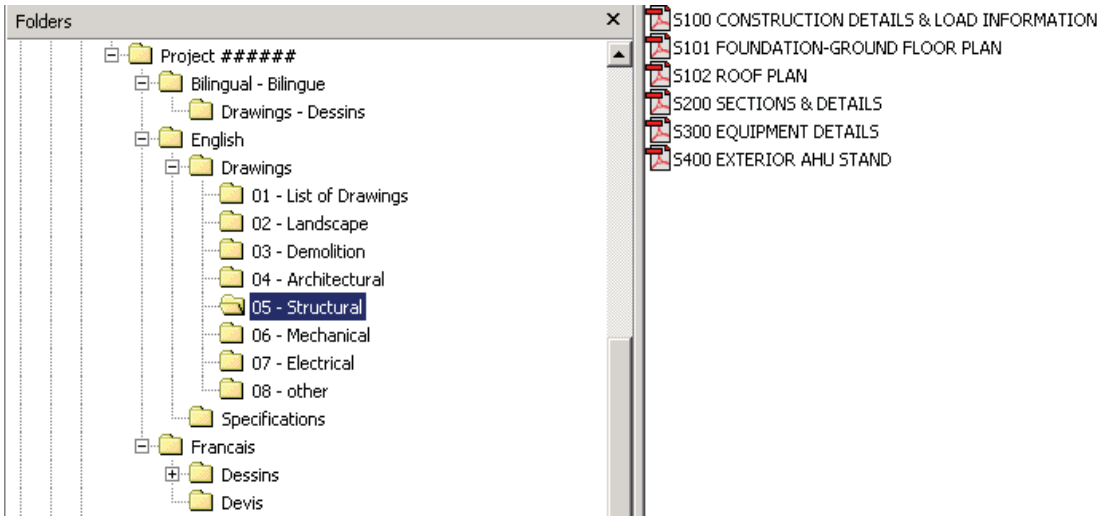
  ## - Y

  Where:

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

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

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



2.2. Specifications

Each Specifications Division must be a separate PDF file and all pages contained in each PDF file must have the same physical size (height, width). The Plans and Specifications Index must

also be a separate PDF file. If there are other documents that are part of the Specifications (e.g. Appendix or other) these are to be separate PDF files as well.

2.2.1 Documents other than Specifications Divisions

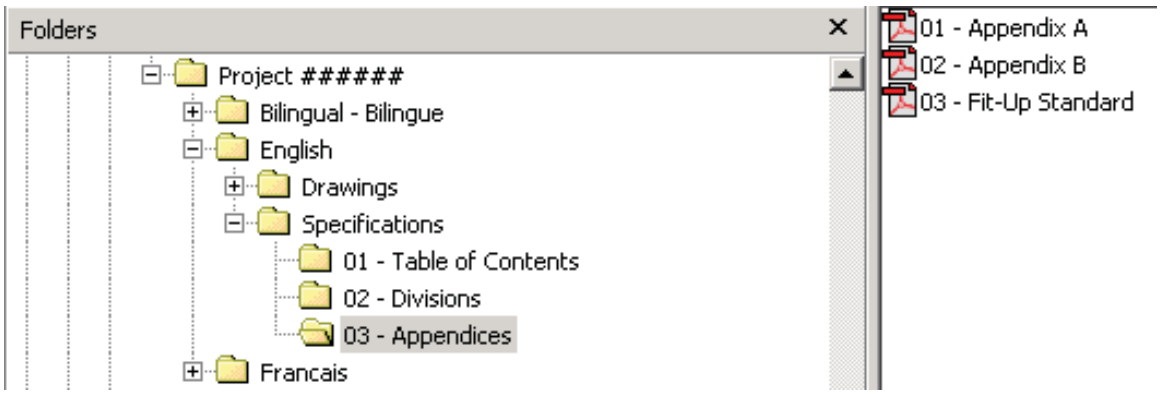
Because PDF files within the Specifications sub-folders are sorted alphanumerically (in ascending order) for both on screen display and printing order, all files that appear in folders other than the "*Divisions*" sub-folder must be named using a number:

- Y

Where:

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

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



2.2.2 Specifications Divisions

The Specifications Divisions must be named as follows:

Division ## - Y

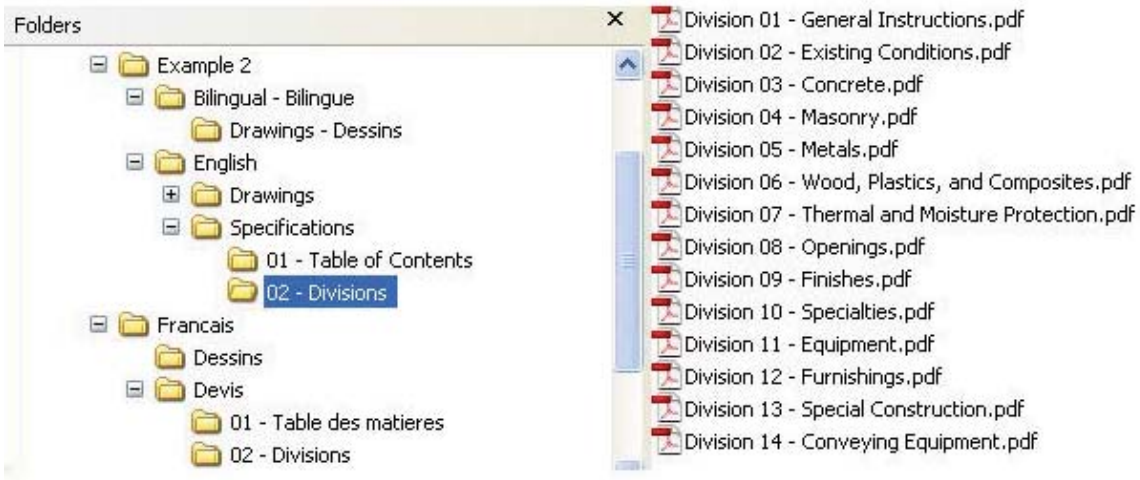
Where:

Division ## =	The actual word "*Division*" followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)
Y =	Name of the Specifications Division as per **CSC/CSI MasterFormat™**
Example:	Division 05 – Metals

The following important point about specifications is to be noted:

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

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



3. CD-ROM LABEL

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

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

Example:

Project 123456 / Projet 123456
Repair Alexandra Bridge / Réparation du pont Alexandra

APPENDIX 'E'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005Last Updated: May 3, 2005

Version 1.0

PREFACE

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

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

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

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

1. PRINTER DRIVERS

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

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

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

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

2. PRINTER CONFIGURATION

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

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

3. CREATING PDF FILES

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

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

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

4. PDF FILES SETTINGS

4.1 Security

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

4.2 Drawing Orientation

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

4.3 Font Type

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

4.4 Resolution

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

4.5 Scale

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

5.SCANNING

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

6.FINAL CHECKLIST

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

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

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

7.ADDITIONAL INFORMATION

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

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

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

SECTION 2 PWGSC NATIONAL CADD STANDARD

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

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

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

SECTION 3 GUIDE TO PREPARATION OF CONSTRUCTION DOCUMENTS FOR PWGSC

1 Purpose

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

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

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

2 Principles of PWGSC Contract Documents

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

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

3 Quality Assurance

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

SPECIFICATIONS

1 National Master Specification

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

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

2 Specification Organization

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

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

3 Terminology

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

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

4 Dimensions

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

5 Standards

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

- CSA standards: http://www.csa.ca
- CGSB standards: http://www.pwgsc.gc.ca/cgsb
- ANSI standards: http://www.ansi.org
- ASTM Standards: http://www.astm.org
- ULC standards: http://www.ulc.ca
- General reference of standards: http://www.cssinfo.com

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

6 Specifying Materials

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

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

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

Acceptable Materials: set up the paragraph format as follows:

Acceptable Materials:

1. ABC Co. Model [_____].
2. DEF Co. Model [_____].
3. GHI Co. Model [_____].

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

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

Sole Sourcing: Sole sourcing for materials and work can be used for proprietary systems (ie. fire alarm systems, EMCS systems). Substantiation and/or justification will be required.

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

"Designated Contractor

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

Wording for the sole source of EMCS systems should be in Part 1 as

"Designated Contractor

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

and in Part 2 as "Materials

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

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

"Acceptable materials

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

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

7 Unit Prices

Unit prices are used where the quantity can only be estimated (eg. earth work) and the approval of the Project Manager must be sought in advance of their use.

Use the following wording:

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

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

Sample of Unit Price Table:

The Unit Price Table designates the Work to which a Unit Price Arrangement applies.

(a) The Price per Unit and the Estimated Total Price must be entered for each Item listed.

(b) Work included in each item is as described in the referenced specification section.

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

8 Cash Allowances

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

9 Warranties

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

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

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

Delete all references to manufacturers' guarantees.

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

11 Summary and Section Includes in Part -1 General of Section
Do not use "Summary" and "Section Includes."

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

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

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

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

16 Designated Substances Report
Include "Section 01 14 25 - Designated Substances Report"

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

Subsurface investigation report(s)

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

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

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

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

18 Experience and Qualifications

Remove experience and qualification requirements from specification sections.

19 Prequalification and Pre-award submissions

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

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

20 Contracting Issues

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

Remove all references within the specifications, to the following:

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

DRAWINGS

1 Title Blocks

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

2 Dimensions

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

3 Trade Names

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

4 Specification Notes

No specification type notes are to appear on any drawing.

5 Terminology

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

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

6 Information to be included

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

7 Drawing Numbers: Number drawings in sets according to the type of drawing and the discipline involved as follows (The requirements of SECTION 2 PWGSC NATIONAL CADD STANDARD will supercede these requirements, where warranted).

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

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

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

9 **Prints:** Print with black lines on white paper. Blue prints are acceptable for document submissions at 33%, 66% and 99% stages. Confirm with Project Manager the size of prints to be provided for review purposes.

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

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

12 **Schedules:** Where schedules occupy entire sheets, locate them next to the plan sheets or at the back of each set of drawings for convenient reference. *See CGSB 33-GP-7 Architectural Drawing Practices for schedule arrangements.*

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

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

ADDENDA

1 Format

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

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

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

2 Content

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

DOCUMENTATION

Translation

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

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

Consultant shall provide:

- Per construction document submission, a completed and signed Checklist for the Submission of Construction Documents. See Appendix 'A'.
- Specification: originals printed one side on 216 mm x 280 mm white bond paper.
- Index: as per Appendix 'C'
- Addenda (if required): as per Appendix 'B' (to be issued by PWGSC).
- Drawings: reproducible originals, sealed and signed by the design authority.
- Tender information:
  - Including a description of all units and estimated quantities to be included in unit price table.
  - Including a list of significant trades including costs. PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.
  - Government Electronic Tendering System (MERX): Consultants to provide an electronic true copy of the final documents (specifications and drawings) on one or multiple CD-ROM in Portable Document Format (PDF) without password protection and printing restrictions. The electronic copy of drawings and specifications is for bidding purposes only and do not require to be signed and sealed. See Appendix 'D' and Appendix 'E'.

PWGSC shall provide:

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

SECTION 4 CLASSES OF CONSTRUCTION COST ESTIMATES USED BY PWGSC

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

Class 'D' (Indicative) Estimate:

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

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

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

Class 'C' Estimate:

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

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

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

Class 'B' (Substantive) Estimate:

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

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

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

Class 'A' (Pre-Tender) Estimate:

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

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

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

SECTION 5 TIME MANAGEMENT

1 Time Management, Planning, and Control

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

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

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

1.1 Schedule Design

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

When building a Control System you must consider:

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

1.2 Schedule Development

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

Work Breakdown Structure

When developing the schedule the consultant needs to use PWGSC standards and practices. Two basic requirements are the National Project Management System

(NPMS) and a Work Breakdown Structure (WBS), structured supporting the NPMS (Levels 1-4).

The WBS is as follows:

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

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

Major and Minor Milestones

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

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

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

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

Activities

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

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

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

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

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

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

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

Project Logic

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

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

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

Activity Duration

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

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

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

Activity List

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

Milestone List

A Milestone List identifies all project Major and Minor milestones.

Master Schedule

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

Detailed Project Schedule

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

1.3 Schedule Review and Approval

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

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

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

1.4 Schedule Monitoring and Control

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

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

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

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

Progress Reports

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

The Progress Report includes:

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

Narrative reporting begins with a statement on the general status of the project followed by a summarization of delays, potential problems and project status criticality, any

potential delays, outstanding issues and concerns and options for dealing with any serious planning and scheduling issues.

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

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

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

Exception Report

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

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

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

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

1.5 Standard Submissions

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

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

1.6 Schedule Outputs and Reporting Formats

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

Progress Reports

Paper Size: Letter

Paper Format: Portrait

Title Format: Project Title; Report Type; Print Date; Data Date; Revision Block

Body Text: Narratives for each report to match other reports generated in the D.S.S.

Variance Report Columns: Activity ID, Activity Name, Planned Finish, Revised Finish, Variance, Activity % Complete,

Criticality Report Columns: Activity ID, Activity Name, Duration, Start, Finish, Activity % Complete, Total Float.

Exception Reports

Paper Size: Letter
Paper Format: Portrait
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Body Text: Narrative to match other reports generated in the D.S.S.

Paper Size: Letter
Paper Format: Landscape
Title Format: Project Title; Report Type; Print Date; Data Date; Revision
Columns: Activity ID, Activity Name, Duration, Remaining Duration, Start, Finish, Total Float.
<u>Work Breakdown Structure (indent tree):</u>

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

Activity Lists

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

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

Milestone Lists

Paper Size: Letter
Paper Format: Portrait

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

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

Master Schedule (Bar Chart)

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

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

Detailed Project Schedules (Bar Chart)

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

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

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

Last updated November 21, 2012

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

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

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

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

Item	**Verified by:**	**Comments:**	**Action By:**
Drawings:			
1 Title Blocks			
1a The PWGSC title block is used.			
2 Dimensions			
2a Dimensions are provided in metric only.			
3 Trade Names			
3a Trade names are not used.			
4 Specification Notes			
4a There is no specification type notes.			
5 Terminology			
5a The term Departmental Representative is used instead of Engineer, PWGSC, Owner,			

Consultant or Architect.			
5b Notations such as: “verify on site”, “as instructed”, “to match existing”, “example”, “equal to”, “equivalent to” and “to be determined on site by” are not used.			
6 Information to be included			
6a Architectural and Engineering Drawings have been stamped and signed by the design authority.			
6b The project quantity and configuration, dimensions and construction details are included.			
6c References to future work and elements not in contract do not appear or are kept to an absolute minimum and clearly marked.			

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

Consultant's Representative: _____

Firm name: _____

Signature:_____ Date: _____

APPENDIX 'B' - Sample of Addendum

Last updated April 22, 2008

ADDENDUM No. _____

Project Number: _____

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

DRAWINGS

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

1 A1 Architectural

.1

SPECIFICATIONS

SPEC NOTE: indicate section number and title.

1 Section 01 00 10 - General Instructions

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

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

2 Section 23 05 00 - Common Work Results - Mechanical

.1 Add new article (x) as follows:

APPENDIX 'C' - Sample of Index

Last updated April 22, 2008

Project No: _____

Index
Page 1 of ___

DRAWINGS AND SPECIFICATIONS

DRAWINGS:

SPEC NOTE: List all Drawings by number and title.

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

SPECIFICATIONS:

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

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

APPENDIX 'D'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005

Last Updated: June 3, 2008

Version 1.0

PREFACE

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

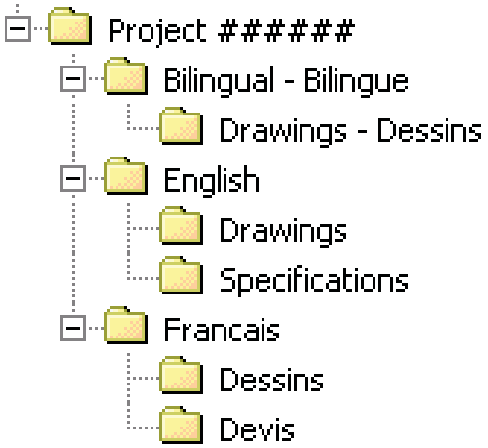
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction.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

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

1. DIRECTORY STRUCTURE

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

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



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

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

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

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

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

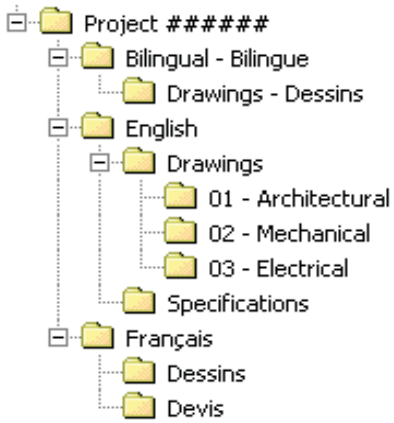
1.2 4th Tier Sub-Folders for Drawings

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

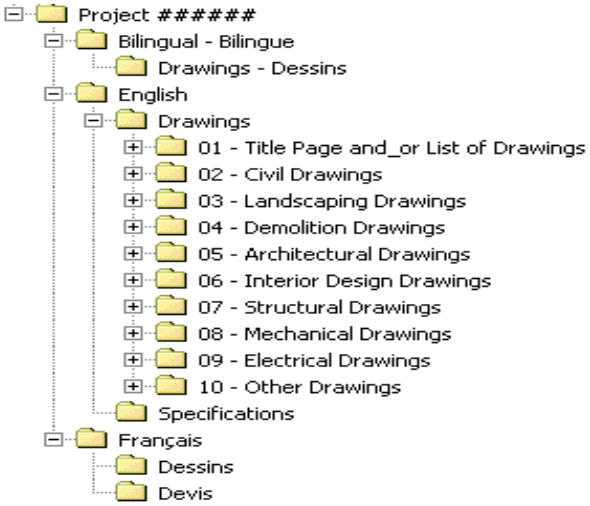
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders.

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

Examples of 4th Tier sub-folders for drawings:



or



1.2.1 Naming Convention

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

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

- Y

Where:

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

Y = The title of the folder

Example: 03 – Mechanical

For the "*Drawings - Dessins*" folder:

- Y - Z

Where:

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

Y = The English title of the folder

Z = The French title of the folder

Example: 04 - Electrical - Électricité

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

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

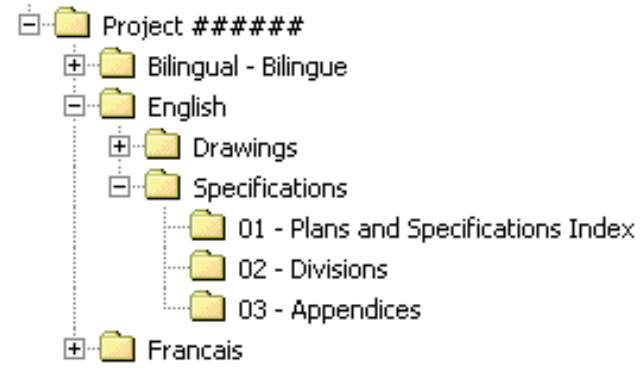
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the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

1.3 4th Tier Sub-Folders for Specifications

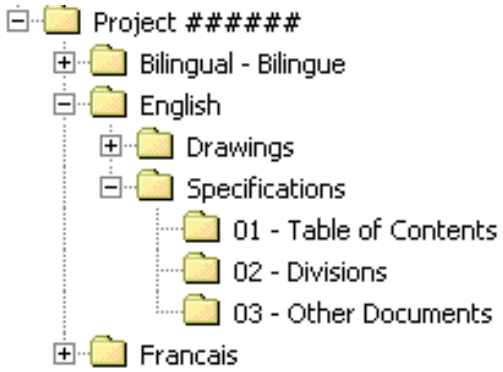
The "*Specifications*" and "*Devis*" folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.

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

Examples of 4th Tier sub-folders for specifications:



or



1.3.1 Naming Convention

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

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

- Y

Where:

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

Example: 02 – Divisions

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

It is essential to ensure that the order of the elements of the specifications on the CD-ROM be exactly the same as in the hard copy. GETS will sort each element of the specifications for both

screen display and printing as per the following rules:

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

2. NAMING CONVENTION FOR PDF FILES

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

2.1 Drawings

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

X### - Y

Where:

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

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

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

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

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

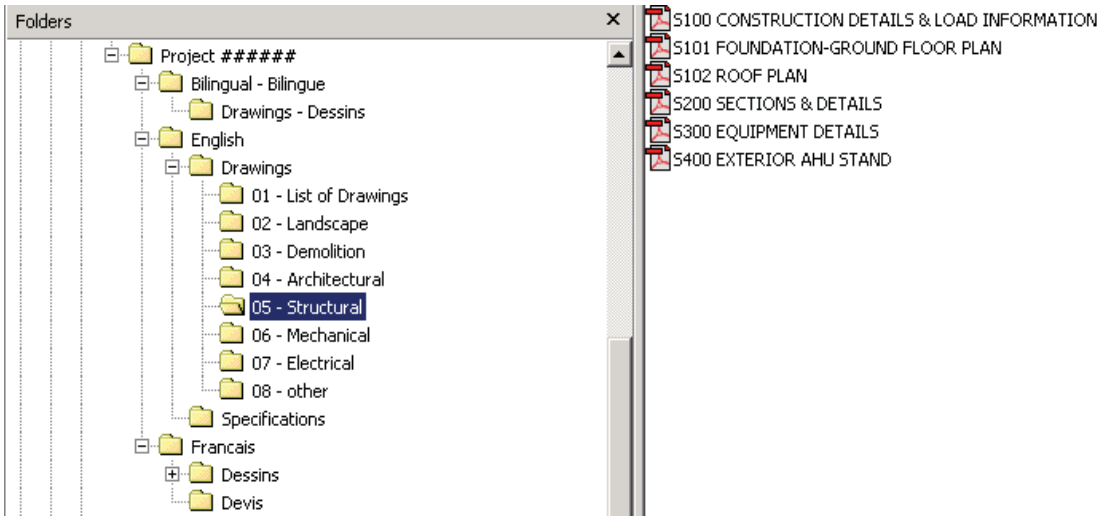
  ## - Y

  Where:

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

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

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



2.2. Specifications

Each Specifications Division must be a separate PDF file and all pages contained in each PDF file must have the same physical size (height, width). The Plans and Specifications Index must

also be a separate PDF file. If there are other documents that are part of the Specifications (e.g. Appendix or other) these are to be separate PDF files as well.

2.2.1 Documents other than Specifications Divisions

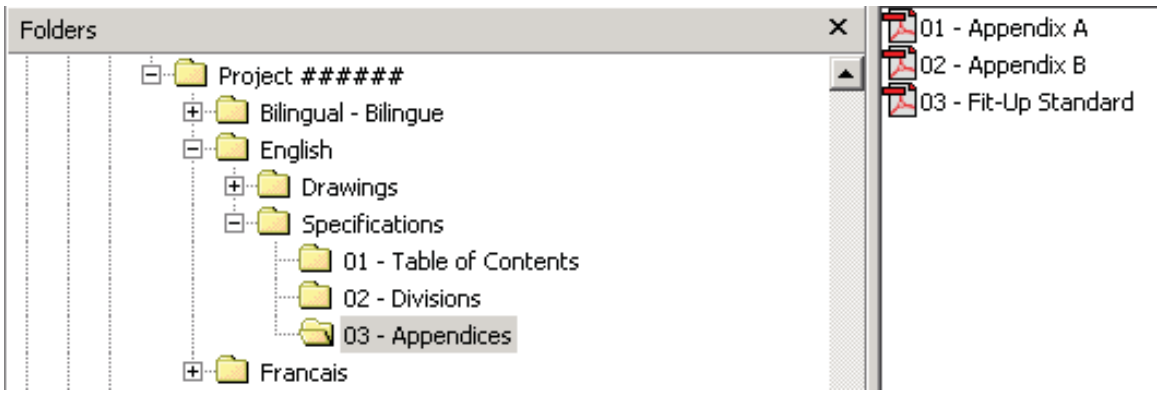
Because PDF files within the Specifications sub-folders are sorted alphanumerically (in ascending order) for both on screen display and printing order, all files that appear in folders other than the "*Divisions*" sub-folder must be named using a number:

- Y

Where:

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

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



2.2.2 Specifications Divisions

The Specifications Divisions must be named as follows:

Division ## - Y

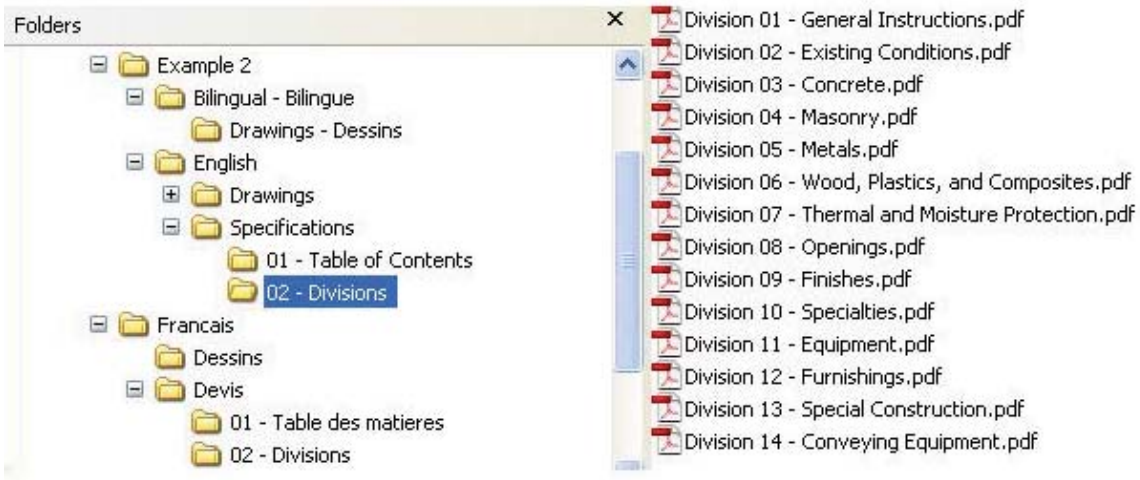
Where:

Division ## =	The actual word "*Division*" followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)
Y =	Name of the Specifications Division as per **CSC/CSI MasterFormat™**
Example:	Division 05 – Metals

The following important point about specifications is to be noted:

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

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



3. CD-ROM LABEL

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

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

Example:

Project 123456 / Projet 123456
Repair Alexandra Bridge / Réparation du pont Alexandra

APPENDIX 'E'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005Last Updated: May 3, 2005

Version 1.0

PREFACE

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

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

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

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

1. PRINTER DRIVERS

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

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

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

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

2. PRINTER CONFIGURATION

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

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

3. CREATING PDF FILES

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

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

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

4. PDF FILES SETTINGS

4.1 Security

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

4.2 Drawing Orientation

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

4.3 Font Type

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

4.4 Resolution

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

4.5 Scale

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

5.SCANNING

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

6.FINAL CHECKLIST

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

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

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

7.ADDITIONAL INFORMATION

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

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

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

Jan. 2015

TABLE OF CONTENTS

INTRODUCTION

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

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

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

For information on this document, please contact:

David Rowan

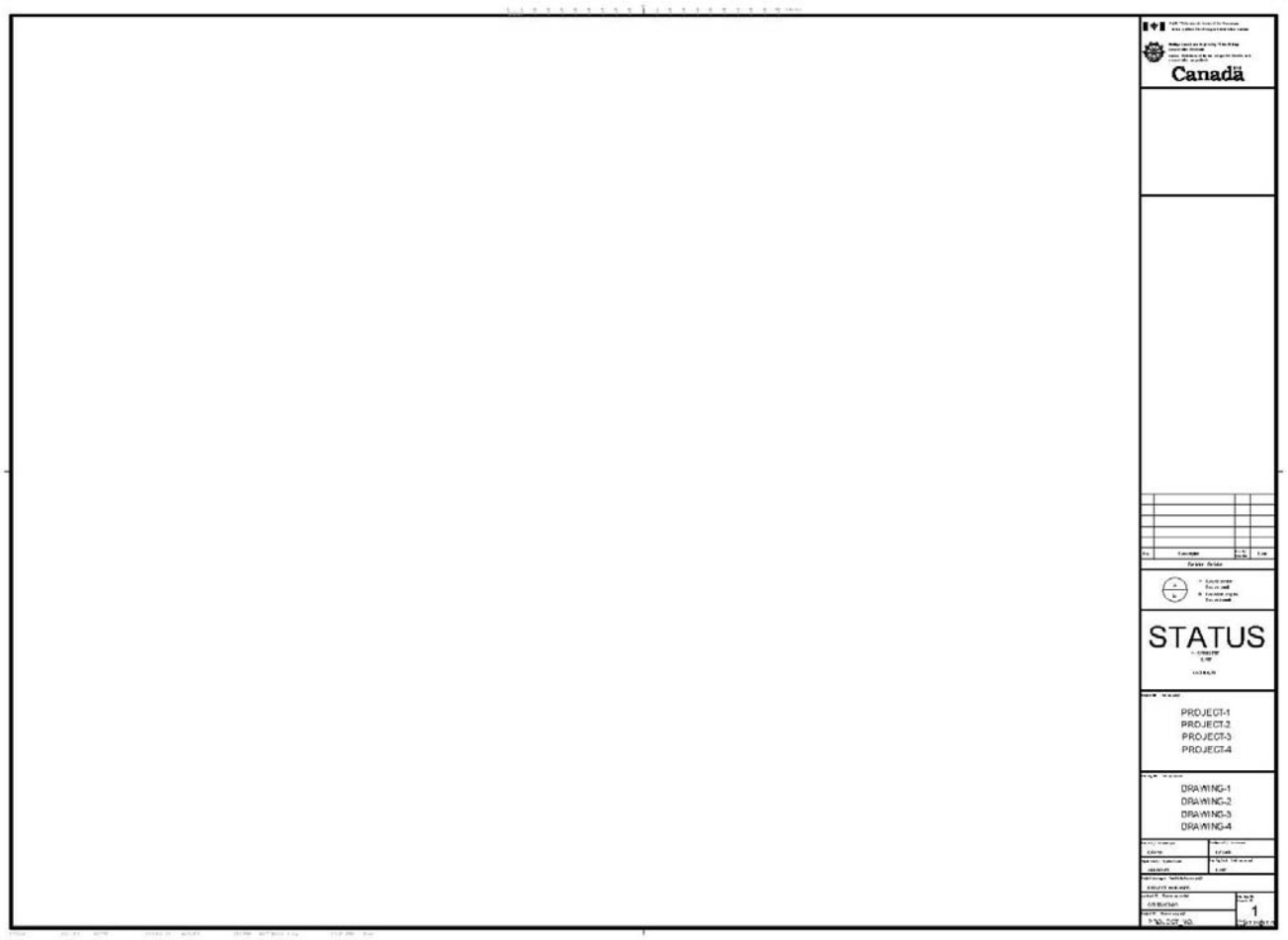
Senior Engineering, Design Technologist	Ingénieur Principale, Dessin Technologie
Heritage Canals & Engineering Works	Canaux historiques et travaux d'ingénierie
Professional and Technical Services	Services professionnels et techniques
Ontario Region	Région de l'Ontario
Public Works and Government Services Canada	Travaux publics et Services Governmentaux Canada

2720 Riverside Drive
Sir Charles Tupper Building, A-wing Level A0
Ottawa ON K1A 0S5
Tel./Tél: 613-736-2972 Fax/Téléc. 613-736-2887
E-mail / Courriel: David.Rowan@pwgsc-tpsgc.gc.ca

1.1 Contract Drawing Frame

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

Figure 1



1.1.1 Drawing Number

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

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

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

Examples of drawing number in a typical structural drawing set:

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

1.1.2 Sheet Number

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

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

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

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

1.1.3 Professional Seal

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

1.1.4 Revisions

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

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

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

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

1.1.4.1 Drawing Issue

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

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

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

1.1.4.2 Drawing Change

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

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

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

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

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

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

Examples:

PLAN AND PROFILE 1

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

PLAN AND PROFILE 2

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

1.1.5 Plotting of Filename, Path, Date, and Time

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

1.2 Folder Structure

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

Geographic Location Field **XXX** xxxx xxxxxxxxx xxxx

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

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

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

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

The third field consists of the project title.

Year Field xxx xxxx xxxxxxxxx **XXXX**

The fourth field is the year the project was initiated.

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

1.2.1 Sub Folders

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

Example:

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

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

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

1.2.2 PDF Files

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

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

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

1.2.3 Drawing Clean Up

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

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

1.2.4 File Delivery

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

1.3 CADD File Naming Conventions

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

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

XXXXXXXXX XXX XXXXX

Project Name — Drawing Number — Drawing Name

Project Name Field **XXXXXXXXX** xxx xxxxx

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

Drawing Number Field xxxxxxxxx **XXX** xxxxx

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

Drawing Name Field xxxxxxxxx xxx **XXXXX**

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

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

Typical drawing name abbreviations for reference files are as follows:

base - Base Information
utility - Utility Information

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

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

Examples of valid filenames :

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

1.3.1 Reference Files

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

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

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

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

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

1.3.1.1 Making Reference Files Portable

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

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

1.3.2 Drawing File Layout

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

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

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

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

Paper space Layouts

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

Model space only

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

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

1.4 Layers

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

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

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

1.4.1.1 Layer Management

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

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

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

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

1.4.1.1.1 Primary Data

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

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

1.4.1.1.2 Supporting Data

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

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

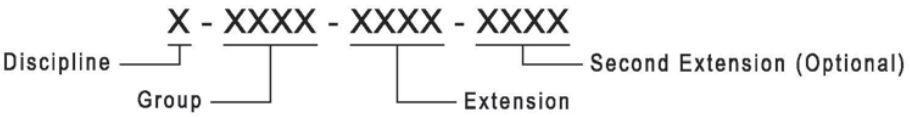
For example, drawing elements such as annotations, dimensions, line work, hatching etc. can be considered supporting data and separated accordingly; There would be a general text level, a general dimension level and a general hatching level etc. (ie. S-GEN-TEXT, S-GEN-DIM, S-GEN-HAT-0.25 etc…).

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

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

1.4.1.2 Layer Naming Convention

The level structure consists of four fields separated by hyphens.



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

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

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

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

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

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

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

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

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

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

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

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

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

1.4.1.3 Level Colours and Weights

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

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

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

1.5 Annotation Scaling

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

Annotation scaling shall be used for all dimensions and annotations.

1.6 Dimension Styles

Dimension styles must adhere to the following standards:

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

- The name given to additional styles must follow the naming convention outlined in Section 3.5.1 of the PWGSC National CADD Standards.

- All dimensions shall have the same size text as outlined in Section 1.3.6.1.

- Angular dimensions shall be expressed in decimal degrees.

- Line weight for all dimension elements, except annotations, shall be set to 0.20mm or colour red.

1.6.1 Guidelines for Dimensioning

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

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

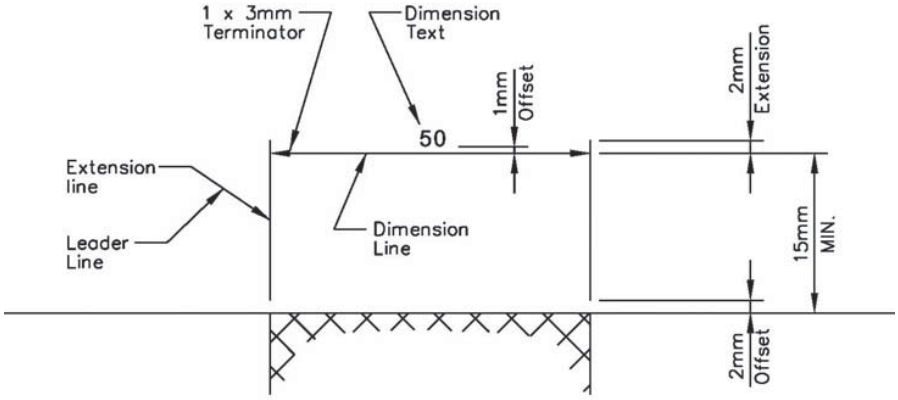
- The primary dimension text should appear above and be aligned with the dimension line. A gap of approximately 1mm should be provided between the dimension line and the text.

- A 2mm gap should be provided between the end of the extension line and its origin.

- The extension line should 2mm beyond the dimension line (extension).

- Standard terminator to be a filled arrowhead with a length to width ratio of 3:1 (arrow head size for scale of 1 to be 3mm long by 1mm wide)

- Line weight of extension lines, dimension lines, leader lines and terminators to be 0.20mm



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

- Extensions that cross other dimension lines should be broken.

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

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

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

All leader annotations to be left justified.

1.6.1.1 Dimension Scale

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

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

1.7 Text Style and Size

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

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

1.7.1 Text Sizes (Heights)

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

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

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

Existing Site Annotations 2.0mm

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

1.7.2 Text Style Naming Convention

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

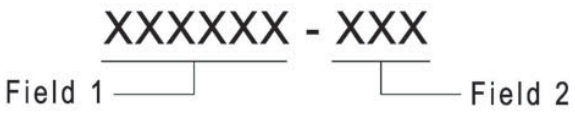
For example, if text at a plotted height of 2.5mm is required for some text elements but a plotted text height of 3.5mm is required for others, then two separate styles could be created with these preset settings.

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

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

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

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



Field 1 **XXXXXX** – xxx

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

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

Field 2 xxxxxx – **XXX**

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

Examples of valid dimension style names:

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

1.7.3 Text Heights and Text Style Designations

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

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

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

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

1.8 Blocks

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

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

1.8.1 Block Library

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

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

1.8.2 Sections and Elevations

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

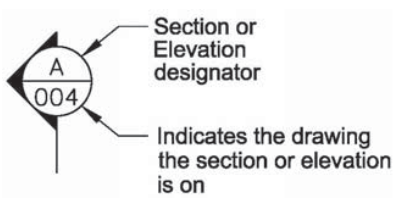
1.8.2.1 Symbol

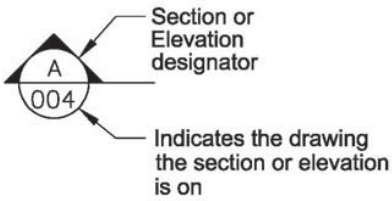
Sections shall be preferably looking up and to the left or in a direction of increasing chainage. Elevations shall be looking in the direction of the intended elevation.

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

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

Examples :



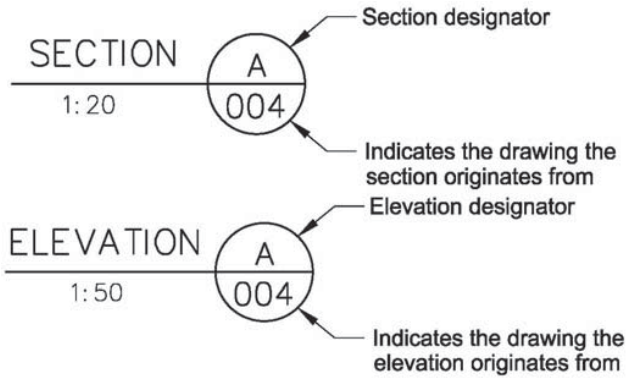


1.8.2.2 Label

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

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

Examples :



1.8.3 Details

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

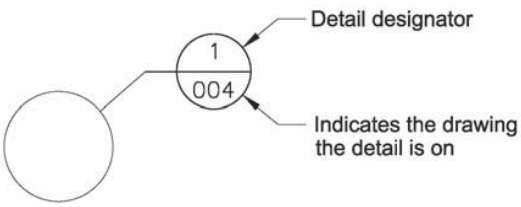
Details are shown using a symbol to delineate where the detail is taken from and a label to designate the actual detail. The symbol and labels are provided in the structural block library.

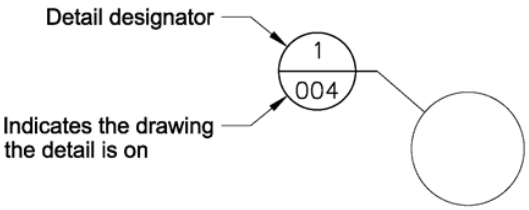
1.8.3.1 Symbol

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

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

Examples :





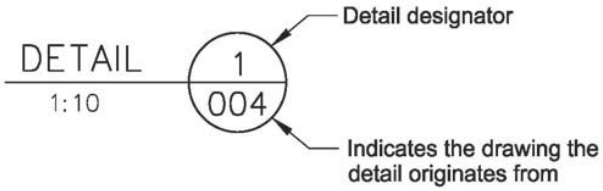
1.8.3.2 Label

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

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

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

Example :



1.9 Patterns or Hatching

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

1.10 Element Offset Distances

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

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

Examples:

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

AS-BUILT DRAWINGS

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

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

2.0 Definitions

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

As-Built Drawing

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

2.1 Procedure

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

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

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

See Section 1.6 for submission requirements

2.2 Submission

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

APPENDIX A
ABBREVIATIONS, ACRONYMS AND TERMS

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

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

APPENDIX F - Selected Existing Photos, Drawings and Reports for bridge site (See attachment)