



RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

Proposal To: Public Works and Government Services Canada

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

Proposition aux: Travaux Publics et Services Gouvernementaux Canada

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

Comments - Commentaires

Title - Sujet Runway Rehabilitation	
Solicitation No. - N° de l'invitation ET025-190514/A	Date 2018-06-13
Client Reference No. - N° de référence du client TC	
GETS Reference No. - N° de référence de SEAG PW-\$PWU-023-11388	
File No. - N° de dossier PWU-8-41034 (023)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-07-27	Time Zone Fuseau horaire Mountain Daylight Saving Time MDT
F.O.B. - F.A.B. Specified Herein - Précisé dans les présentes Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input checked="" type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Taylor (RPC), Ian	Buyer Id - Id de l'acheteur pwu023
Telephone No. - N° de téléphone (780) 566-9487 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CANADA Transport Canada Churchill Airport Churchill Manitoba ROB 0E0 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Delivery Required - Livraison exigée See Herein	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

REQUEST FOR PROPOSAL (RFP)

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Declaration/Certifications Form (Appendix B)

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Submission Requirements and Evaluation (SRE)

Terms of Reference

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 (2017-08-17), General instructions (GI) – Architectural and/or Engineering services – Request for Proposal;
Submission Requirements and Evaluation (SRE);

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

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

- (b) the general terms, conditions and clauses, as amended, identified in the Agreement clause;
- (c) Terms of Reference;
- (d) the document entitled "General Procedures and Standards";

-
- (e) any amendment to the solicitation document issued prior to the date set for receipt of proposals; and
 - (f) the proposal, Declaration/Certifications Form and Price Proposal Form.
3. Submission of a proposal constitutes acknowledgment that the Proponent has read and agrees to be bound by these documents.

SI3 QUESTIONS OR REQUEST FOR CLARIFICATION

Questions or requests for clarification during the solicitation period must be submitted in writing to the Contracting Authority named on the RFP - Page 1 at e-mail address ian.taylor@pwgsc-tpsgc.gc.ca as early as possible. Enquiries should be received no later than 5 working days prior to the closing date identified on the front page of the Request for Proposal. Enquiries received after that date may not be answered prior to the closing date of the solicitation.

SI4 CANADA'S TRADE AGREEMENTS

This procurement is subject to the provisions of the North American Free Trade Agreement (NAFTA), the World Trade Organization - Agreement on Government Procurement (WTO-AGP) and the Canada-European Union Comprehensive Economic and Trade Agreement (CETA)

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 (2017-08-17), 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 available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html>).

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.

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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)

<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html>

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 (2017-08-17), 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 (2017-11-28), General Condition (GC) 9 - Indemnification and InsuranceSupplementary Conditions
Agreement Particulars
 - (c) Terms of Reference;
 - (d) the document entitled "General Procedures and Standards";
 - (e) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
 - (f) the proposal, the Declaration/Certifications Form and the Price Proposal Form.
2. The documents identified above by title, number and date are hereby incorporated by reference into and form part of this Agreement, as though expressly set out herein, subject to any other express terms and conditions herein contained.

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

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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) Terms of Reference;
 - (h) the document entitled "General Procedures and Standards";
 - (i) the proposal.

SUPPLEMENTARY CONDITIONS (SC)

SC1 SUPPLEMENTARY CONDITIONS

There are no supplementary conditions which apply to the Agreement.

AGREEMENT PARTICULARS

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

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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.

I. Prime Consultant (Proponent - Airfield Electrical and Visual Aid Engineer):

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

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

.....
.....
.....
.....
.....

II. Key Sub Consultants / Specialists:

Structural Engineer

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

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

.....
.....
.....
.....
.....

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Civil Engineer

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

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

.....
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.....
.....
.....

Geotechnical Engineer

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

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

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Topographical Surveyor

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

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

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Cost Estimator

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

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

.....
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APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title: Churchill Airfield Runway Lighting Rehabilitation

Name of Proponent: _____

Street Address: _____ **Mailing Address:** _____

Telephone Number: () _____

Fax Number: () _____

E-Mail: _____

Procurement Business Number: _____

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

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.

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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.

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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.

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APPENDIX C - PRICE PROPOSAL FORM

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

PROPOSERS SHALL NOT ALTER THIS FORM

Project Title: Churchill Airfield Runway Lighting Rehabilitation

Name of Proponent:

The following will form part of the evaluation process:

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

SERVICES	FIXED FEE
Preliminary Design Service	\$.....
Design Service	\$.....
Tender Service	\$.....
Construction Service	\$.....
Resident Site Rep. Service	\$.....
Commissioning Service	\$.....
Post Construction Service	<u>\$.....</u>
MAXIMUM FIXED FEES	\$.....



GENERAL PROCEDURES & STANDARDS

For Professional & Design Services

MMXI Edition

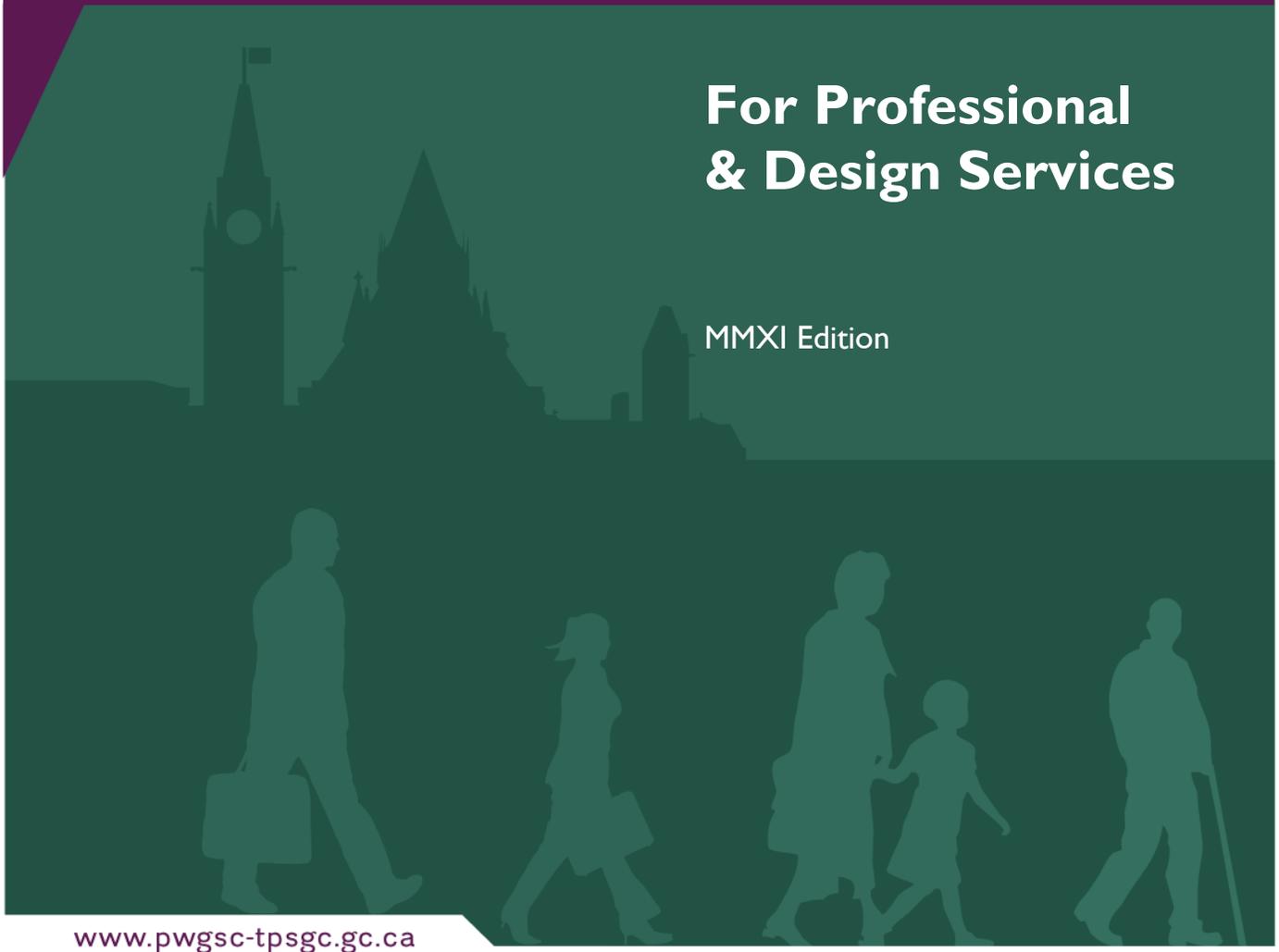




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I INTRODUCTION

I.1 GENERAL PROCEDURES AND STANDARDS

I.1.1 GENERAL

- .1 These PWGSC *General Procedures and Standards* (P&S) have been developed to:
 - .1 Facilitate the development of a rational, well-documented design process; and
 - .2 Ensure compliance with federal government standards, PWGSC Policies and Treasury Board directives.

I.1.2 HARMONIZATION WITH THE TERMS OF REFERENCE (TOR)

- .1 The P&S document must be used in conjunction with the TOR, as the two documents are complimentary.
- .2 The TOR describes project-specific requirements, services and deliverables while the GP&S document outlines with minimum standards and procedures common to all projects.
- .3 In the case of a conflict between the two documents, the requirements of the TOR override this document.

I.2 PROJECT DELIVERY

I.2.1 GENERAL REQUIREMENTS

- .1 The project delivery requirements outlined in this section are applicable to the design and construction of all PWGSC projects in Western Region, unless otherwise indicated in the TOR.
- .2 Under the direction of the Consultant, the Consultant team shall provide fully integrated and coordinated professional and design services for the delivery of a project, in accordance with the requirements in the TOR and as contained herein.
- .3 The Consultant must:
 - .1 Obtain written authorization from the Departmental Representative before proceeding from one phase of work to the next phase of a project;
 - .2 Coordinate all services with the Departmental Representative;
 - .3 Deliver each project utilizing best practices in support of User Department needs, respecting the approved financial budget, schedule, scope, quality energy budget;
 - .4 Establish a cohesive functional partnership and open communication between all members of the project delivery team throughout all phases of the project life;
 - .5 Ensure that the Consultant team has an in-depth understanding and collective 'buy-in' of the project requirements, scope, budget and scheduling objectives, working constructively to build a collaborative and cooperative team approach with knowledgeable and timely input and contribution by all project team members, including representatives from PWGSC and the User Department;
 - .6 Conduct rigorous quality assurance reviews during the design and construction phases, including the application of value engineering principles during the design of all complex systems;
 - .7 Provide a written response to all PWGSC comments included in Quality Assurance reviews conducted throughout the design of the project;
 - .8 If any alterations are required during the development of the design, analyse the impact on all project components and resubmit for approval before proceeding further;
 - .9 Establish and maintain a change control procedure for scope changes;



- .10 Ensure that an experienced Project Architect or Project Engineer is assigned to each project, who shall be responsible for the production, coordination and delivery of all design and construction documents for all project disciplines;
- .11 Prepare a continuous risk identification and management program employing effective methodologies to ensure construction safety as well as claims avoidance;
- .12 Provide continuous and comprehensive documentation of the project at all stages of the project implementation;
- .13 Ensure continuity of key personnel and maintain a dedicated working team for the life of the project;

1.2.2 SERVICE DELIVERY FOR ALL PROJECTS

- .1 For all projects, the Consultant shall:
 - .1 Deliver the project to be within;
 - .1 The established construction budget,
 - .2 The key milestones, according to the established project schedule.
 - .2 Ensure that each Consultant team member:
 - .1 Understands the project requirements, for seamless delivery of the required services;
 - .2 Functions as a cohesive partnership with open communication between all members of the project delivery team throughout all phases of the project life;
 - .3 Function as an integrated and focused team with an in-depth understanding and collective 'buy-in' of the project requirements, scope, budget and scheduling objectives.
 - .3 Provide;
 - .1 Full co-ordination of services with other consultants engaged by PWGSC,
 - .2 A continuous risk management program to address the risks associated specifically with this project, including construction safety and claims avoidance issues.
 - .4 Deliver the work in a professional manner during all phases of the project, employing best practices for budget, schedule, quality, and scope management;
 - .5 Maintain continuity of key personnel and maintain a dedicated working team for the life of the project.

1.2.3 SERVICE DELIVERY (BUILDINGS)

- .1 For Building projects, where an Architectural firm is the Prime Consultants, the Consultant team shall, as a minimum, adhere to the standards of services outlined in the "Canadian Handbook of Practice for Architects - Volume 2 Management" (latest edition) distributed by the Royal Architectural Institute of Canada (RAIC).

1.2.4 SERVICE DELIVERY (ENGINEERING)

- .1 For Engineering projects, where an Engineering firm is the Prime Consultants, the Consultant team shall adhere to the standards of services established by the Professional Engineering Association in the Province or Territories where the project is located.

1.3 PROCUREMENT OF GOODS AND SERVICES

1.3.1 PUBLIC PROCUREMENT

- .1 Public procurement by Canada is legislated and guided by a number of international and national trade agreements, and acts, as well as policies, directives, and guidelines provided by the Treasury Board Secretariat (TBS) and PWGSC.



- .2 There is one over-arching principle for all PWGSC procurement activities: Integrity. Subordinate to this are guiding principles, which provide the framework for PWGSC procurement process.
- .3 For further information refer to the following web link;
 - .1 <http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html>

1.3.2 INTEGRITY AND GUIDING PRINCIPLES

- .1 PWGSC procurement processes will be open, fair and honest.
- .2 Client Service:
 - .1 PWGSC will make every reasonable effort to satisfy the operational requirements of its clients, while obtaining the best value in each procurement process.
- .3 National Objectives:
 - .1 PWGSC procurement activities will advance established government policies, within the limits imposed by international trade obligations.
- .4 Competition:
 - .1 PWGSC procurement will be competitive, with specific exceptions.
- .5 Equal Treatment:
 - .1 PWGSC must ensure that all potential bidders of a particular requirement are subject to the same conditions.
- .6 Accountability:
 - .1 PWGSC is accountable for the integrity of the contracting process.



2 REQUIRED SERVICES STANDARDS

2.1 GENERAL

- .1 Where Services are called for in the project specific TOR, the standards outlined in the following articles apply.

2.2 COST MANAGEMENT

2.2.1 GENERAL

- .1 The following provides a general indication of the information needed by the Consultant's cost estimator to prepare specific classifications of estimates.
- .2 These are the minimum requirements only and should be supplemented where additional information exists or is warranted.
- .3 Construction cost estimates are to be prepared and submitted to PWGSC at various stages during the design process.
- .4 In addition to the Consultants' estimate, PWGSC may have independent estimates performed to compare with the Consultant estimate.

2.2.2 TREASURY BOARD (TB) SUBMISSIONS

- .1 Projects that are subject to TB approval are normally submitted twice.
 - .1 The first submission is for Preliminary Project Approval (PPA) at Pre-Design or Schematic Design stage of a project and must include an Indicative Estimate for the cost of the work.
 - .2 The second submission is for Effective Project Approval (EPA) at the completion of Design Development or Pre-Tender stage of a project and must include a Substantive Estimate for the cost of the work.
- .2 The Treasury Board estimate definitions are:
 - .1 Indicative Estimate;
 - .1 A low quality, order of magnitude estimate that is not sufficiently accurate to warrant TB approval as a Cost Objective.
 - .2 Substantive Estimate;
 - .1 An estimate which is of sufficiently high quality and reliability as to warrant TB approval as a Cost Objective for the project phase under consideration.
 - .2 It is based on detailed systems and component design, taking into account all project objectives and deliverables.
- .3 TB Terminology:
 - .1 Constant dollar estimate;
 - .1 This is an estimate expressed in terms of the dollars of a particular base fiscal year.
 - .1 It includes no provision for inflation.
 - .2 Cash flows over a number of fiscal years may also be expressed in constant dollars of the base year including no allowance for inflation in the calculation of costs.
 - .2 Budget-year (BY) dollar estimate:
 - .1 Budget year dollars is also be referred to as Nominal dollars or Current dollars.
 - .1 This is an estimate based on costs arising in each FY of the project schedule.
 - .2 It is escalated to account for inflation and other economic factors affecting the period covered by the estimate.
 - .2 The costs and benefits across all periods should initially be tabulated in budget year dollars for thee following reasons:



- .1 First; this is the form in which financial data are usually available,
- .2 Second; adjustments, such as tax adjustments, are accurately and easily made in budget year dollars,
- .3 Finally; working in budget-year dollar enables the analyst to construct a realistic picture over time, taking into account changes in relative prices.

2.2.3 CLASSES OF ESTIMATES

- .1 PWGSC applies a detailed, four level, classification using the terms Class A, B, C and D.
- .2 Apply these estimate classifications at the project stages as defined in the TOR.
- .3 For projects required to be submitted to TB for approval:
 - .1 An Indicative Estimate shall be at least a class 'D'; and
 - .2 A Substantive Estimate shall be at least a class 'B'.

2.2.4 CLASS 'D' (INDICATIVE) ESTIMATE

- .1 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 of all the options being considered.
- .2 Submit Class 'D' cost estimates in elemental analysis format, in accordance with the 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.
- .3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.
- .4 The level of accuracy of a class D cost estimate shall be such that no more than a 20% design contingency allowance is required.

2.2.5 CLASS 'C' ESTIMATE

- .1 Based on a comprehensive list of requirements and assumptions, including a full description of the preferred Schematic Design option, construction experience, design experience and market conditions, this estimate must be sufficient for making the correct investment decision.
- .2 Submit Class 'C' cost estimates in elemental analysis format, in accordance with the 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.
- .3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.
- .4 The level of accuracy of a class C cost estimate shall be such that no more than a 15% design contingency allowance is required.

2.2.6 CLASS 'B' (SUBSTANTIVE) ESTIMATE

- .1 Based on design development drawings and outline specifications, which include the preliminary 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.
- .2 Submit Class 'B' cost estimates in both elemental analysis format and trade divisional format, in accordance with the latest edition issued by the Canadian Institute of Quantity Surveyors.
- .3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.
- .4 The level of accuracy of a class 'B' cost estimate shall be such that no more than a 10% design contingency allowance is required.

2.2.7 CLASS 'A' (PRE-TENDER) ESTIMATE



- .1 Based on completed construction drawings and specifications prepared prior to calling competitive tenders, this estimate must be sufficient to allow a detailed reconciliation and/or negotiation with any contractor's tender.
- .2 Submit Class 'A' cost estimates in both elemental analysis format and trade divisional format, in accordance with the latest edition issued by the Canadian Institute of Quantity Surveyors.
- .3 Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.
- .4 The level of accuracy of a class 'A' cost estimate shall be such that no more than a 5% design contingency allowance is required.

2.3 SCHEDULE MANAGEMENT

2.3.1 SCHEDULER

- .1 The Scheduler shall provide a Project Planning and Control Schedule for the project, for the purpose of Planning, Scheduling, Progress Monitoring (Time Management), during all the design phases up to the construction procurement phase.
- .2 A qualified Scheduler, with experience commensurate with the complexity of the project, is required to develop and monitor the project schedule during the design process.
- .3 The Scheduler shall adhere to good industry practices for schedule development and maintenance, as recognized by the Project Management Institute (PMI).
- .4 PWGSC presently utilizes the Primavera Suite software and Microsoft Project for its current Control Systems and any software used by the consultant should be fully integrated with either of these programs, using one of the many commercially available software packages.

2.3.2 PROJECT SCHEDULE

- .1 A Detailed Project Schedule is a schedule developed in reasonable detail to ensure adequate Time Management planning and control of the project.
- .2 Project Schedules are used as a guide for the planning, design and implementation phases 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).
- .3 When building a Project Schedule, the Consultant must consider:
 - .1 The level of detail required for control and reporting;
 - .2 The reporting cycle shall be monthly, unless otherwise identified in the Terms of Reference;
 - .3 What is required for reporting in the Project Teams Communications Plan; and
 - .4 The nomenclature and coding structure for naming of scheduled activities, which must be submitted to the Project Manager for acceptance.

2.3.3 MILESTONES

- .1 The Major Milestones are standard Deliverables and Control Points within NPMS and are required in all schedule development.
- .2 These Milestones will be used in Time Management Reporting within PWGSC as well as used for monitoring project progress using Variance Analysis.
- .3 Milestones may also be external constraints such as the completion of an activity, exterior to the project, affecting the project.

2.3.4 ACTIVITIES

- .1 All activities will need to be developed based on:
 - .1 Project Objectives;
 - .2 Project Scope;



- .3 Milestones;
- .4 Meetings with the project team; and
- .5 The scheduler's full understanding of the project and its processes.
- .2 Subdivide the elements down into smaller more manageable pieces that organize and define the total scope of work in levels that can be scheduled, monitored and controlled.
 - .1 This process will develop the Activity List for the project.
- .3 Each activity will describe the work to be performed using a verb and noun combination (i.e. Review Design Development Report).
- .4 These elements will become activities, interdependently linked in the Project Schedule.

2.3.5 SCHEDULE REVIEW AND APPROVAL

- .1 Once the scheduler has identified and properly coded all the activities to the acceptance of the Project Manager, the activities are then sorted into a logical order and appropriate duration are applied to complete the schedule.
- .2 The scheduler, together with the Project Team, can then analyze the schedule to see if the milestone dates meet the project timelines and then adjust the schedule accordingly by modifying durations or changing logic.
- .3 When the schedule has been satisfactorily prepared, the scheduler can present the detailed schedule back to the Project Team for acceptance and application as the project baseline.
- .4 There may be several iterations before the schedule meets with the Project Teams agreement and the critical project timelines.
- .5 The final agreed version must be copied and saved as the baseline to monitor variances during the design process.

2.3.6 SCHEDULE MONITORING AND CONTROL

- .1 Once Baseline, the schedule can be better monitored, controlled and reports can be produced.
- .2 Monitoring is performed by, comparing the baseline activities completed 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.
- .3 There will be several schedules generated from the analysis of the baseline schedule as outlined in the Required Services Sections of the TOR.
- .4 Each updated schedule reflects the progress of each activity to date, any logic changes, both historic and planned, projections of progress and completion indicating the actual start and finish dates of all activities being monitored.
- .5 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 in accordance with the TOR.
- .6 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.
 - .1 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.



- .7 At each submission or deliverable stage, provide an updated schedule and exception report.

2.4 RISK MANAGEMENT

2.4.1 CONTEXT

- .1 The Departmental Representative prepares the Risk Management Plan.
- .2 The Departmental Representative may ask for assistance from the Consultant Team for identification of risk items and factors arising from the technical requirements of the project.

2.5 WASTE MANAGEMENT

2.5.1 PROTOCOL

- .1 The Construction, Renovation, and Demolition (CRD) Non-hazardous Solid Waste Management Protocol to which PWGSC is bound, provides direction on the undertaking of non-hazardous solid waste management actions on projects.
 - .1 The protocol is designed to meet the federal requirements, provincial/territorial policies and the objectives of the PWGSC Sustainable Development Strategy (SDS).
- .2 The contractor must implement a solid waste management program.
- .3 Contractors must be instructed to plan for extra project time when implementing CRD waste diversion initiatives.
 - .1 Added labour costs can be recuperated and waste management costs savings can be achieved through reduced tipping fees, avoided haulage costs, and the sale of reusable and recyclable materials.

2.5.2 CONSULTANT RESPONSIBILITIES

- .1 Research and investigate hazardous waste disposal strategies in context of the project and make recommendations.
- .2 Include in the contract documents, a requirement for the contractor to develop a waste reduction and management plan during the construction of this project.
- .3 Identify, on the site plan where large (garbage) bins shall be stored, as well as easy disposal truck access/exit to/from same, to assist the Contractor in reducing waste or re-cycling of materials on and off site.

2.6 TECHNICAL REPORTS

2.6.1 PURPOSE

- .1 This section provides direction and standards for the preparation of reports delivered to PWGSC during all the various stages of project delivery and for specific services such as investigations, studies, analysis, strategies, audits, surveys, programs, plans, etc.
- .2 Technical Reports are official government documents, which are typically used to support an application for approval or to obtain authorization or acceptance and as such they must:
 - .1 Be complete, clear and professional in appearance and organization, with proper reference to related parts and contents in the report;
 - .2 Clearly outline the intent, objectives, process, results and recommendations;
 - .3 Present the flow of information and conclusions in a logical, easy to follow sequence;
 - .4 Be in written narrative, graphic, model (traditional and / or computer generated), and photographic format, which can be web enabled;
 - .5 Ensure that all pages are numbered in sequence; and
 - .6 Be printed double-sided, if hard copies are produced.

2.6.2 STANDARDS FOR PWGSC TECHNICAL REPORTS

- .1 Standard practice for the organization of technical reports requires:



- .1 A cover page, clearly indicating the nature of the report, the date, the PWGSC reference number and who prepared the report;
 - .2 A Table of Contents;
 - .3 An Executive Summary;
 - .4 The body of the report is to be structured such that the reader can easily review the document and locate, respond to and /or reference related information contained elsewhere in the report;
 - .5 Appendices used for lengthy segments of the report, supplementary and supporting information and / or for separate related documents.
- .2 The report content must:
- .1 Ensure that the executive summary is a true condensed version of the report following the identical structure, including only key points and results / recommendations requiring review and / or approval;
 - .2 Use a proper numbering system (preferably legal numbering), for ease of reference and cross-reference;
 - .1 The use of 'bullets' is to be avoided.
 - .3 Use proper grammar, including using complete sentences, in order to ensure clarity, avoid ambiguity and facilitate easy translation into French, if required;
 - .1 The use of undefined technical terms, industry jargon and cryptic phrases are to be avoided.
 - .4 Be written as efficiently as possible, with only essential information included in the body of the report and supporting information in an appendix if needed.

2.6.3 PRE-DESIGN REPORT CONTENT

- .1 Administrative aspects to be included (but not limited to) are:
 - .1 Quality management process for the consultant team;
 - .2 Confirmation that all necessary pre-design documentation required for this project is available and confirmation that the information is still current and up-to-date.
- .2 Regulatory Analysis aspects to be included (but not limited to) are:
 - .1 Preliminary summary of regulatory and statutory requirements, authorities having jurisdiction, and codes, regulations, and standards.
- .3 Program Analysis aspects to be included (but not limited to) are a review and analysis of:
 - .1 Functional program, User Department reports and studies, Space data sheets, Work stations, offices, common areas and commercial space requirements, Laboratories, Data Room requirements, etc.
- .4 Site Analysis aspects to be included (but not limited to) are a review and analysis of:
 - .1 Site features and restrictions (i.e. landscape features, topographical feature, climatic influences, setback requirements, easements, existing buildings, and / or structures.);
 - .2 Subsurface, geotechnical analysis of soils;
 - .3 Municipal infrastructure, subsurface and above grade services, including capacities and limitations (i.e. storm water drainage, fire protection, domestic water, power, telecommunications,);
 - .4 Historical/archaeological features, previous uses;
 - .5 Environmental features including sustainable design opportunities.
- .5 Building Analysis aspects to be included (but not limited to) are a review and analysis of:
 - .1 Substructure, including foundations and basement(s), parking;
 - .2 Shell, including superstructure, interior structural systems, exterior enclosure, roofing;
 - .3 Interiors, including interior construction, stairs, interior finishes;



- .4 Services, including conveying (elevators, escalators), plumbing, HVAC, fire protection, electrical, telecommunications, building automation;
- .5 Equipment and furnishings;
- .6 Special construction and demolition, materials abatement.
- .6 Budget, Schedule, and Risk Analysis aspects to be included (but not limited to) are:
 - .1 Updated Class 'D' estimate and revised schedule;
 - .2 Analysis of risk implications and preliminary mitigation strategies.
- .7 Sustainable Development Strategies
 - .1 Proposed policy for the project to minimize environmental impacts consistent with the project objectives and economic constraints, including:
 - .1 Recommendations on Sustainable Development Design standards to be applied to the project;
 - .2 Achievable levels for LEED® or Green Globes certification;
 - .3 Preliminary sustainability targets for water and energy use, waste reduction etc.
 - .2 Environmental impacts and application of the Canadian Environmental Assessment (CEA) Act.

2.6.4 SCHEMATIC DESIGN REPORT CONTENT

- .1 Standard practice for the organization of technical reports requires:
 - .1 Executive Summary;
 - .2 Regulatory Analysis;
 - .1 Preliminary building code analysis,
 - .2 Preliminary zoning analysis,
 - .3 Fire and life safety strategy, and
 - .4 Preliminary standards analysis.
 - .3 Program Analysis;
 - .1 Updated Functional Program requirements,
 - .2 Preliminary horizontal and vertical zoning diagrams,
 - .3 Spatial relationship diagrams,
 - .4 Facilities services strategy,
 - .5 Basic area calculations and analyses.
 - .4 Site Analysis;
 - .1 Drawings, renderings and supporting 3D visualization illustrating the building and site,
 - .2 Site features and restrictions (i.e. landscape features, topographical features, climatic influences, setback requirements, easements, existing buildings and/or structures etc.),
 - .3 Subsurface features,
 - .4 Municipal infrastructure, subsurface and above grade services, including capacities and limitations (i.e. storm water drainage, fire protection, domestic water, power, telecommunications etc.),
 - .5 Historical site features,
 - .6 Archaeological features,
 - .7 Environmental features including sustainable design strategies (i.e. storm water management, landscaping etc.).
- .2 Building Analysis and Design Options;
 - .1 Architectural,



- .1 Prepare a site plan indicating relationships, landscape concept, building outlines, main accesses, roadways, vehicular and pedestrian traffic patterns,
 - .2 Provide building plans, showing relative disposition of main accommodation areas, circulation patterns, floors, horizontal and vertical space relationships, mechanical / electrical shafts,
 - .3 Include elevations, sections and typical wall details for the building envelope,
 - .4 Provide perspectives and / or 3D visualization diagrams, and
 - .5 Calculate the gross building area and provide a net area summary of all accommodation areas required.
- .2 Civil,
- .1 Describe the overall impact on the site systems infrastructure,
 - .2 Verify of all site services information,
 - .3 Provide a site plan showing the existing building, proposed site services, building service connections, site drainage, roads, parking and sidewalks, and
 - .4 Include a preliminary analysis of the impact on existing systems, where contributing to existing sewer lines.
- .3 Structural / Seismic,
- .1 Describe the potential impact on the existing building structure and include any required structural modifications and /or upgrades,
 - .2 Provide a general description of structures, including systems considered and benefits/disadvantages,
 - .3 Include design loads for all load cases, and
 - .4 Prepare concept drawings of structural systems proposed, including typical floor plans, foundations, lateral systems and explanatory sketches.
- .4 Mechanical Engineering,
- .1 Provide narratives describing the following,
 - .1 Overview,
 - .2 Code & Standards Considerations & Concerns,
 - .3 Potential Energy Conservation Measures,
 - .4 Description of three distinct mechanical options including,
 - .1 Narratives of each option,
 - .2 Discussion of advantages and disadvantages of each,
 - .3 System schematics sufficient to describe each option,
 - .4 Preliminary energy analysis for each,
 - .5 Discussion of recommendations.
- .5 Electrical Engineering,
- .1 Provide an electrical design synopsis, describing the electrical work in sufficient detail for assessment and acceptance by the Departmental Representative,
 - .1 Include feasibility and economic studies of proposed systems complete with cost figures and loads, and in accordance with Sustainable Development requirements.
 - .2 Prepare a site plan showing the location of electrical and telecommunication service entrances.
 - .3 Prepare floor plans indicating locations and size of,
 - .1 Major electrical equipment and distribution centres,
 - .2 Telecommunications rooms, closets and major conduits,



- .4 Provide Normal and Emergency power distribution details, including a diagram showing the distribution up to distribution centres on each floor,
- .5 Indicate typical lighting concepts for the interior and exterior environments,
- .6 Indicate typical ceiling (or floor) distribution systems for lighting, power and telecommunications, and
- .7 Provide concept descriptions of Fire alarm and Security systems.
- .3 Commissioning;
 - .1 Provide preliminary commissioning plan.
- .4 Cost Management;
- .5 Schedule Management;
- .6 Furniture / Equipment;
 - .1 Prepare a Furniture Recommendation Report based on the Functional Program and on parameters developed in conjunction with the Departmental Representative and the Client / User. Report to include an examination of the following;
 - .1 Procurement process and requirements,
 - .2 Furniture type and layout,
 - .3 Panel screen height,
 - .4 Power requirements,
 - .5 Finishes.
 - .2 Recommendations are to take into consideration current inventory of furniture and reflect the client's vision, functional requirements, proposed planning alternatives, space allocation and project budget.
 - .3 Prepare a Class 'C' cost estimate for refurbishment of existing furniture and / or the purchase of new furniture and equipment.
 - .4 Document scheduling requirements for refurbishment of existing furniture and / or the procurement of new furniture and equipment.
- .7 Budget;
 - .1 Class 'C' Estimates for each option.
- .8 Schedule;
 - .1 Milestone project schedule including allowances for reviews and approvals for each stage of the project life cycle.
- .9 Risk Analysis;
 - .1 Report on any deviations that may affect cost or schedule and recommend corrective measures.
- .10 Sustainable Development Strategies;
 - .1 Indicate how each option can meet the sustainability targets, and
 - .2 Provide energy simulations of the proposed design options, including estimated annual energy cost as predicted by using current energy cost for the appropriate area.
- .11 Response to PWGSC Quality Assurance Report ; and
- .12 Project Log tracking all approved major decisions including those affecting changes to project scope, budget and schedule.

2.6.5 DESIGN DEVELOPMENT REPORT CONTENT

- .1 Executive Summary
- .2 Regulatory Analysis
 - .1 Preliminary building code analysis;



- .2 Preliminary zoning analysis;
- .3 Fire and life safety strategy;
- .4 Preliminary standards analysis
- .3 Program Analysis
 - .1 Updated Functional Program requirements
 - .2 Preliminary horizontal and vertical zoning diagrams;
 - .3 Facilities services strategy;
 - .4 Basic area calculations and analyses;
- .4 Site Analysis
 - .1 Drawings, renderings and supporting 3D visualization illustrating the building and site,
 - .2 Site features and restrictions (i.e. landscape features, topographical features, climatic influences, setback requirements, easements, existing buildings and/or structures etc.);
 - .3 Subsurface features;
 - .4 Municipal infrastructure, subsurface and above grade services, including capacities and limitations (i.e. storm water drainage, fire protection, domestic water, power, telecommunications etc.);
 - .5 Historical site features;
 - .6 Archaeological features;
 - .7 Environmental features including sustainable design strategies (i.e. storm water management, landscaping etc.);
- .5 Building Analysis and Design Options
 - .1 Architectural
 - .1 Prepare a site plan showing the building and Infrastructure items including the following:
 - .1 Pedestrian, vehicular, security, delivery service access,
 - .2 Provide floor plans of each level (including the roof) showing all accommodation required, including all necessary circulation areas, stairs, elevators, and ancillary spaces anticipated for service use. Indicate building grids, modules, and key dimensions.
 - .3 Provide reflected ceiling plans of ceilings with special features.
 - .4 Show elevations of all exterior building facades indicating all doors and windows, accurately sized and projected from the floor plans and sections.
 - .1 Clearly indicate levels for grade, all floors, ceilings, roof and penthouse levels.
 - .5 Develop cross-sections through the building to show floor levels, room heights, inner corridor elevations, etc.
 - .6 Identify primary architectural materials proposed for the exterior and interior of the building, including choice of finishes.
 - .7 Provide plans and preliminary details for millwork, built-in furniture and lab casework.
 - .8 Provide detail sections of walls with special design features requiring illustration and explanation at this stage, such as firewalls, acoustical barriers, security partitions, isolation or separation of laboratory spaces, etc.
 - .9 Special construction and demolition, including heritage conservation and rehabilitation requirements, hazardous materials abatement,
 - .10 Provide sections and details for any spaces requiring acoustic security.
 - .1 Include STC ratings for doors, transfer ducts and other assemblies
 - .2 Civil



- .1 Further refine site plans showing site services and building service connections referenced to proposed building outlines, site access roads and sidewalks, including existing and proposed grades and drainage improvements.
- .2 Indicate locations of manholes (complete with invert elevations), valves, and fire hydrant locations.
- .3 Identify proposed pipe sizes and slopes, where applicable, and include pipe invert elevations at building foundation.
- .4 Identify, by means of Design Summary Sheets, pipe capacity and estimated flows for storm and sanitary sewers. Where contributing to an existing sewer, include analysis of impact on existing systems.
- .5 Provide Hydraulic Analysis of any relevant alterations to existing water distribution system in the vicinity of the proposed building to confirm anticipated maximum available fire flow. Calculate and compare site flows to building site fire flow.
- .6 Provide typical trench and related details, including profiles of below grade services.
- .3 Structural
 - .1 Provide drawings indicating modifications to existing structure and new structural systems, structural materials, cladding details, fireproofing methods and other significant or unusual details.
 - .2 Indicate all design loads, e.g. dead and live loads on all plans with atypical loads marked. Live loads to include localized seismic, wind and snow.
 - .3 Provide brief design calculations including outputs from computerized analysis.
- .4 Mechanical
 - .1 Provide narratives describing the following
 - .1 Overview
 - .2 Code & Standards Analysis
 - .3 Site Services & Utilities
 - .4 Fire Protection Systems
 - .5 Plumbing Systems
 - .6 Heating Systems
 - .7 Cooling Systems
 - .8 Ventilation Systems
 - .9 Exhaust Systems
 - .10 Insulation
 - .11 Humidification Systems
 - .12 Acoustic and sound control measures
 - .13 Controls
 - .14 Energy Conservation Measures & Energy Analysis & Report
 - .2 Provide system schematics for heating water, chilled water, ventilation and plumbing systems.
 - .3 Provide catalogue cut sheets of representative equipment for each type of component to be used on the project.
 - .4 Provide preliminary layout drawings showing locations of all major components.
 - .5 Provide brief design calculations including outputs from computerized analysis.
- .5 Electrical
 - .1 Update the electrical design synopsis for the selected option. Provide data on the total connected load, the maximum demand and diversity factors, and the sizing of the emergency load.



- .2 Elaborate on proposed emergency power scheme and provide preliminary installation details for any emergency generator installation.
 - .3 Indicate metering locations on distribution diagram.
 - .4 Provide typical lighting, power and telecommunication system details for all workspaces.
 - .5 Include lighting design and control schemes for typical lighting arrangements.
 - .6 Elaborate on exterior lighting scheme. Provide typical fixture concepts.
 - .7 Provide a fire alarm riser diagram.
 - .8 Indicate security system major conduit requirements on floor plans.
 - .9 Provide typical security system details (conduit and boxes) that will be included on construction drawings.
 - .10 Provide brief design calculations including outputs from computerized analysis.
- .6 Sustainable Development Strategies:
- .1 Indicate how each option can meet the sustainability targets
 - .2 Provide energy simulations of the proposed design options, including estimated annual energy cost as predicted by using current energy cost for the appropriate area,
 - .7 Response to PWGSC Quality Assurance Report

2.7 CODES, ACTS, STANDARDS, REGULATIONS

2.7.1 GENERAL

- .1 The Codes, Acts, Standards and Guidelines listed in the following articles, may apply to this project. The Consultant must identify and analyse the applicable documents in the Code Analysis.
- .2 In all cases the most stringent Code, standard and guideline shall apply.

2.7.2 PWGSC DOCUMENTS AVAILABLE FROM PWGSC PROJECT MANAGER:

- .1 PWGSC Fit-Up Standards: Technical Reference Manual;
- .2 Public Works and Government Services MD Standards – Departmental Representative to provide on request;
 - .1 MD 15000; Environmental Standards for Office Accommodation,
 - .2 MD 15116-2006; Computer Room Air conditioning Systems,
 - .3 MD-15126; Laboratory HVAC (currently in draft form),
 - .4 MD 15128; Laboratory Fume Hoods: Guidelines for owners, design professionals and maintenance personnel – 2008,
 - .5 MD 15129; Guidelines for Perchloric Acid fumehoods and their exhaust systems – 2006,
 - .6 MD 15161; Control of Legionella in Mechanical Systems - 2006,
 - .7 MD 250005; Energy Monitoring and Control Systems Design Guidelines - 2009,
- .3 PWGSC Best Practice; Prescribing indoor humidity levels for Federal Buildings - 2006,
- .4 Public Works and Government Services Commissioning Standards and Guidelines,
- .5 PWGSC Commissioning Manual CP-I version 2006.

2.7.3 CODES AND REGULATIONS:

- .1 The NRC National Building Code of Canada 2010;
- .2 The NRC National Fire Code of Canada, 2010;
- .3 The NRC National Plumbing Code of Canada 2010;
- .4 The NRC Model National Energy Code for Buildings 2011;
- .5 CSA C22.1-09, Canadian Electrical Code Part I Safety Standard for Electrical Installations and CE Code Handbook. Amendments for Provinces;



- .6 Canadian Code for Preferred Packaging;
- .7 National Electrical Manufacturers Association (NEMA);
- .8 Electrical and Electronic Manufacturers' Association of Canada (EEMAC);
- .9 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE) - ANSI/IEEE C62.41-1991, Surge Voltages in Low-Voltage AC Power Circuits;
- .10 American Society for Testing and Materials (ASTM);
- .11 ASTM F 1137-00(2006), Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners;
- .12 The Canada Labour Code;
- .13 <http://laws.justice.gc.ca/en/L-2/>
- .14 The Canada Occupational Health and Safety Regulations;
- .15 <http://laws.justice.gc.ca/eng/SOR-86-304/index.html>
- .16 All other Territorial and Municipal Acts, Codes, By-laws and regulations appropriate to the area of concern.

2.7.4 STANDARDS AND GUIDELINES PRODUCED BY THE GOVERNMENT OF CANADA:

- .1 Standards and Directives of the Treasury Board (TB):
 - .1 <http://www.tbs-sct.gc.ca/pol/index-eng.aspx?tree=standard>
 - .2 <http://www.tbs-sct.gc.ca/pol/index-eng.aspx?tree=directive>
 - .3 And including:
 - .1 Accessibility Standard for Real Property,
 - .1 <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12044>
 - .2 Fire Protection Standard.
 - .1 <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316>
- .2 Labour Canada's, Fire Commissioner of Canada Standards;
 - .1 http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/index.shtml.
 - .2 And including,
 - .1 FC-301 Standard for Construction Operations, June 1982,
 - .2 FC-302 Standard for Welding and Cutting, June 1982,
 - .3 FC-311 Standard for Record Storage, May 1979.
 - .4 FC-403 Fire Protection Standard for sprinkler Systems, November 1994
- .3 The Standards and Guidelines for the Conservation of Historic Places in Canada
 - .1 www.historicplaces.ca;
- .4 Labour Canada's, Technical Documents;
 - .1 http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/guidelines/index.shtml
 - .2 And Including,
 - .1 Fire Protection for Information Technology Facilities and Equipment.
- .5 Canadian Food Inspection Agency's Containment Standard for Facilities Handling Plant Pests.
- .6 Public Health Agency of Canada's Laboratory Biosafety Guidelines, 3rd Edition,
- .7 Canadian Council of Animal Care's Guidelines on: Laboratory Animal Facilities – Characteristics, Design and Development.

2.7.5 HEALTH CANADA STANDARDS AND GUIDELINES:

- .1 Guidelines for Canadian Drinking Water Quality – Sixth Edition – 1996;
- .2 Guidelines for Canadian Drinking Water Quality – Summary Table – Dec 2010;



- .3 Guidance for Providing Safe Drinking Water in Areas Of Federal Jurisdiction – Version I – 2005;
- .4 The Canadian Council of Ministers of the Environment (CCME) ;
- .5 Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME, 2003);
- .6 Canada – Wide Strategy for the Management of municipal Waste Water Effluent;
- .7 The Canadian Environmental Protection Act (CEPA, 1999);
- .8 The Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, published in Canada Gazette Part II on June 12, 2008 (Registration SOR/2008-197).

2.7.6 STANDARDS AND GUIDELINES:

- .1 Air Conditioning and Refrigeration Institute (ARI);
- .2 American Conference of Governmental Industrial Hygienists (ACGIH, Industrial Ventilation Handbook);
- .3 Air Diffusion Council (ADC);
- .4 Air Movement and Control Association (AMCA);
- .5 American Association of State Highway and Transportation Officials (AASHTO) Standards
- .6 American National Standards Institute (ANSI);
- .7 ANSI/AIHA Z9.5, Laboratory Ventilation;
- .8 .1 ANSI/NEMA C82.1-04, Electric Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast;
- .9 .2 ANSI/NEMA C82.4-02, Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps;
- .10 ANSI/TIA/EIA-606- Administration Standard for the Telecommunications Infrastructure of Commercial Buildings;
- .11 ANSI Z358.1, Emergency Eyewash and Shower Equipment;
- .12 American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), including but not limited to;
 - .1 ASHRAE Laboratory Design Guide,
 - .2 ASHRAE Standards and Guidelines,
 - .3 ASHRAE Applications Handbook – 2007,
 - .4 ASHRAE HVAC Systems and Equipment Handbook – 2008,
 - .5 ASHRAE Fundamentals Handbook – 2009,
 - .6 ASHRAE Refrigeration Handbook – 2010,
 - .7 ASHRAE 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size – 2007,
 - .8 ANSI/ASHRAE 55, Thermal Environmental Conditions for Human Occupancy – 2004,
 - .9 ANSI/ASHRAE 62.1, Ventilation for Acceptable Indoor Air Quality – 2010,
 - .10 ASHRAE 90.1, Energy Efficient Design of New Buildings – 2010,
 - .11 ASHRAE 105: Standard Method of Measuring and Expressing Building Energy Performance,
 - .12 ASHRAE 110, Method of Testing Performance of Laboratory Fume Hoods,
 - .13 ASHRAE 111; Practices for Measurement, Testing, Adjusting and Balancing of Building HVAC&R Systems,
 - .14 ASHRAE 114; Energy Management Control Systems Instrumentation, and
 - .15 ASHRAE 135; BACnet: A Data Communication Protocol for Building Automation and Control Networks.
- .13 Asphalt Institute Standards for Hot Mix;



- .14 American Society of Mechanical Engineers (ASME);
- .15 American Society for Testing and Materials (ASTM);
- .16 American Water Works Association (AWWA) Standards;
- .17 American Welding Society (AWS);
- .18 Associated Air Balance Council (AABC);
- .19 Canadian Standards Association;
- .20 CSA A23.3-04 (2010) Design of Concrete Structures;
- .21 CSA B51-09 Boiler, pressure vessel and pressure piping Code;
- .22 CSA B52-05 Mechanical Refrigeration Code;
- .23 CSA B64-01 Backflow Preventers and Vacuum Breakers;
- .24 CSA B139-09 Installation Code for Oil Burning Equipment;
- .25 CSA B149.1-10 Natural Gas and Propane Installation Code;
- .26 CSA B651-04 Accessible Design for the Built Environment;
- .27 CSA C22.2 No. 41-07 Grounding and Bonding Equipment;
- .28 CSA S16-09 Design of Steel Structures;
- .29 CSA Z204-1994 Guideline for Managing Indoor Air Quality in Office Buildings;
- .30 CSA Z320-11 Building Commissioning Standard & Check Sheets;
- .31 CSA Z316.5-94, Fume Hoods and Associated Exhaust Systems;
- .32 CAN/CSA-23.1-04 and CAN/CSA-A23.2-04 Concrete materials and methods of concrete construction; and Methods of test and standard practice for concrete CAN/CSA-C22.2 No. 214-94 "Communications Cables";
- .33 CAN/CSA-C22.3 No.3-[98(R2007)], Electrical Co-ordination;
- .34 CAN/CSA-B651-04(R2010), Accessible Design for the Built Environment;
- .35 CAN3 C235-[83(R2010)], Preferred Voltage Levels for AC Systems, 0 to 50,000 V;
- .36 CAN/CSA-T528-93, "Design Guidelines for Administration of Telecommunications Infrastructure in Commercial Buildings", Canadian Standards Association;
- .37 CAN/ULC – S524-06 Standard for the Installation of Fire Alarm Systems;
- .38 CAN/ULC – S537-04 Fire Alarm System Verification Report;
- .39 CAN/ULC – S102-07 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies;
- .40 CAN/ULC – S102.2-07 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
CAN/ULC SI 12-M90 (R2001) Standard Methods of Fire Test of Fire-Damper Assemblies;
- .41 CAN/ULC SI 15-05 Standard Method of Fire Tests of Fire stop Systems;
- .42 International Mechanical Code – Latest Version;
- .43 Institute of Boiler and Radiation, Hydronic Institute (IBR);
- .44 Manufacturers Standardization Society of Valve and Fitting Industry (MSS);
- .45 National Fire Protection Association (NFPA), including:
 - .1 NFPA 10; Standard for Portable Fire Extinguishers – 2010,
 - .2 NFPA 13; Standard for Installation of Sprinkler Systems – 2010,
 - .3 NFPA 14; Standard for Installation of Standpipe and Hose Systems – 2010,
 - .4 NFPA 24: Standard for the Installation of Private Fire Service Mains and Their Appurtenances-2010,
 - .5 NFPA 30; Flammable and Combustible Liquids Code,
 - .6 NFPA 45; Standard on Fire Protection for Laboratories Using Chemicals,
 - .7 NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting-2007.



- .46 SEFA 1.2, Scientific Equipment & Furniture Association;
- .47 Sheet Metal and Air Conditioning Contractors National Association (SMACNA);
- .48 Transportation Association of Canada (TAC) Guide for Canadian Roads;
- .49 Manual of Uniform Traffic Control Devices (MUTCD);
- .50 Telecommunications Industry Association (TIA);
 - .1 Commercial Building Telecommunications Cabling Standard TIA/EIA-568,
 - .1 Part 1: General Requirements, TIA/EIA-568-B.1,
 - .2 Part 2: Balanced Twisted Pair Cabling Components, TIA/EIA-568-B.2,
 - .3 Addendum 1 - Transmission Performance Specification for 4-pair 100 Ohm Category 6 Cabling, TIA/EIA-568-B.2-1,
 - .4 Optical Fibre Cabling Components Standards, TIA/EIA-568-B.3.
 - .2 ANSI/TIA/EIA-569-A Commercial Building Standards for Telecommunications pathways and spaces,
 - .3 Pathways and Spaces, ANSI/TIA/EIA-569-B,
 - .4 Telecommunications Infrastructure Standard for Data centers TIA-942,
 - .5 J-STD-607-A Commercial Building Grounding and - Bonding Requirements for Telecommunications.
- .51 Underwriters' Laboratories of Canada (ULC);
- .52 ULC/CSA Approval is required for all electrical and mechanical equipment.

2.7.7 STANDARDS AND GUIDELINES FOR TRANSPORTATION

- .1 Canadian Highway Bridge Design Code
- .2 Transportation Association of Canada - Manuals, Guides and Handbooks.

2.8 COMMISSIONING PROCESS

2.8.1 GENERAL

- .1 This section summarizes the PWGSC commissioning process, the requirements and associated roles and responsibilities as they relate to the various phases in the delivery of a project.
- .2 It is to be used as a guide in further developing the commissioning plan, specification and related documents for a project.
- .3 Commissioning is not a replacement for good design and construction practices.
 - .1 It requires coordinated efforts on the part of all parties involved in the Project.
- .4 The Commissioning overlaps the design phase through construction and into the operation phase.
- .5 The PWGSC Commissioning Manual CP.1 4th edition, November 2006, is available for free download at the following site:
 - .1 <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/tech/miseenservice-commissioning/manuel-manual-eng.html>
- .6 The PWGSC Commission Manual CP.2 – Commissioning Glosary is available for free download at the following site:
 - .1 <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/tech/miseenservice-commissioning/manuel-manual-b-eng.html>
- .7 “Commissioning” is a quality assurance process, in which the functional requirements of the Owner/occupant and the operational requirements of facility management are proven to function as intended.



- .8 The “commissioning process” is a planned program of quality management and information transfer that extends through all phases of a project’s development and delivery, up to and including the warranty period.
- .9 The process consists of a series of checks and balances to ensure that the work is designed, installed and proven to operate as intended.
- .10 Commissioning has two main components, functional and operational.
 - .1 The functional component deals with:
 - .1 Security, Health (indoor air quality) and occupant safety;
 - .2 Comfort (temperature, relative humidity, ventilation, air flow patterns, air purity and well being);
 - .3 Cost-effectiveness of design; and
 - .4 Systems and equipment supporting Owner’s functional requirements.
 - .2 The operational component deals with:
 - .1 Operation and Maintenance (O&M) issues; e.g., design review with a particular concern for the operation and maintenance of the systems today and in the future, when repairs are required;
 - .2 Performance evaluation of systems and equipment;
 - .3 Accessibility to O&M Documentation; and
 - .4 Review of the training plan against the current needs now and in the future.

2.8.2 COMMISSIONING PLAN

- .1 The Commissioning Plan will typically be developed by the Contractor through his own Commissioning Agent.
- .2 The Commissioning Plan is the project-specific document and which describes the process for verifying that all built works meet the Investor’s requirements within the limits of the working documents.
- .3 It is essential that the Consultant provide specifications that detail requirements for all submittals and testing in each Specification Section in order for the Contractor to properly prepare a complete Commissioning Plan.
- .4 The Commissioning Plan will be reviewed and accepted by the Departmental Representative prior to commencement of construction.
- .5 The Commissioning Plan may require periodic update throughout design.

2.8.3 COMPONENT VERIFICATION

- .1 Component verification sheets (CV) sheets are developed by the Consultant and incorporated in the contract documents to ensure the facility is an operating entity and meets the requirements as described in the Agreement.
- .2 The CV sheets are intended to monitor and track the supply and shop drawing requirements associated with each component. The *Consultant* must verify that the components being installed in the built works are acceptable to their design and the approved shop drawings.
- .3 The commissioning process requires the documentation of all the components installed as part of a system that will have performance verification testing conducted.
- .4 Sample CV sheets for various types of components are to be provided by the Consultant in Div 01.

2.8.4 SYSTEM & INTEGRATED SYSTEM TESTING

- .1 The “performance verification tests” (PVTs) are developed by the Design-Builder to ensure the facility is an operating entity and meets the requirements as described in the Agreement.



- .2 The PVTs are intended to demonstrate the functional performance of the systems & integrated system during the various modes of operation, against the design intent. Each test must be uniquely identified and reflected in the contractor's commissioning schedule.
- .3 Once the contract has been awarded the Design-Builder must monitor the sub-contractor's process to help ensure the timely completion of these tests. The Design-Builder must witness each test. The Design-Builder must provide final certification of the test results. After an acceptable review of the test document, the PWGSC Commissioning Specialist will recommend to the Departmental Representative the acceptance or rejection of the test results.
- .4 Sample PVT sheets for various types of system are to be provided by the Consultant in Div 01.

2.8.5 TEST REQUIREMENTS

- .1 Each CV or PVT shall be uniquely named, numbered and categorized by discipline.
- .2 Tests shall define:
 - .1 Test Purpose;
 - .2 System design narrative;
 - .3 Test Prerequisites;
 - .4 Testing Procedures;
 - .5 Test Comments; and
 - .6 Test Sign-off Block.
- .3 System Performance Verifications Tests
 - .1 These tests have prerequisites that are to be completed and approved prior to conducting the tests, which, may include but are not limited to:
 - .1 CV and PVT sheets developed and accepted,
 - .2 Contractor proving start-up and tests,
 - .3 Manufacturers start-ups,
 - .4 Consultant has certified testing, adjusting & balancing (TAB) results, per TAB specification.
 - .1 TAB work must be completed and approved prior to the control system Pts.
 - .5 Associated control device calibrations and physical point verifications are completed and approved.
 - .1 Note, control system end to end checks to be completed and approved prior to the control system PVTs.
 - .6 Other specified deliverables, i.e. factory test reports, O&M submissions, etc.
 - .7 System performance tests associated with the integrated systems under test,
 - .8 Integrated System Performance Verifications,
 - .9 Fire alarm verifications.

2.8.6 COMMISSIONING (EVALUATION) REPORT

- .1 The Commissioning (Evaluation) Report must provide:
 - .1 An executive summary,
 - .2 Completed CV and PVT sheets,
 - .3 A complete assessment of the project,
 - .4 Lessons learned from this project and any necessary recommendations,
 - .5 Variances between the actual and planned levels of performance,
 - .6 An evaluation of the validation and acceptance process and of the commissioning phase.

2.8.7 OVERVIEW OF ROLES AND RESPONSIBILITIES



- .1 The following provides a general overview of the roles, responsibilities and implementation of the commissioning process. The commissioning process is a logical sequence of verifications from component verifications through to system & integrated system, performance verification testing.
- .2 At completion of the commissioning process all results are documented and audited for acceptance.

2.8.8 MAJOR TASKS AND RESPONSIBILITIES

- .1 Schematic Design and Design Development Phase:
 - .1 Consultant;
 - .1 Develop commissioning strategy,
 - .2 Develop preliminary commissioning plan.
 - .2 Construction Documentation Phase:
 - .1 Consultant;
 - .1 Complete the final commissioning plan,
 - .2 Specify the Commissioning requirements in Div 01 and provide sample Commissioning CV and PCT sheets in Div 01 for Bidders purposes,
 - .3 Develop project specific CV and PVT sheets.
 - .3 Construction Phase:
 - .1 Consultant;
 - .1 Monitor and report on contract commissioning activities,
 - .2 Finalize development of job specific CV and PVT sheets,
 - .3 Review and certify component verification sheets as they are completed by the Contractor, and
 - .4 Review commissioning schedule
 - .2 Contractor;
 - .1 Comply with the requirements in the Specifications,
 - .2 Complete the component verification,
 - .3 Conduct the equipment system start-up and proving, and
 - .4 Develop the commissioning schedule, reflecting the PVTs.
 - .4 Commissioning Phase
 - .1 Consultant
 - .1 Witness all system and integrated systems tests,
 - .2 Review and certify commissioning test results,
 - .3 Track and compile all commissioning documentation submitted by the contractor and confirm that all commissioning tasks are completed,
 - .4 Incorporate all commissioning documentation into a preliminary commissioning report and recommend interim acceptance.
 - .5 Identify “deferred” commissioning tests due to seasonal constraints, etc.
 - .2 Contractor
 - .1 Comply with the requirements in the specifications,
 - .2 Conduct the system testing, and
 - .3 Conduct the integrated system testing.
 - .5 Operating Phase
 - .1 Consultant
 - .1 Provide advice and recommendations for fine tuning, if required,
 - .2 Witness “deferred” commissioning tests,



- .3 Review and certify “deferred” systems test results,
- .4 Incorporate deferred system test results and all other commissioning documentation into a final commissioning report with an executive summary recommending final acceptance.
- .2 Contractor
 - .1 Address warranty issues,
- .6 Evaluation Phase
 - .1 Consultant
 - .1 Provide advice and recommendations during the final evaluation.

2.9 CONSTRUCTION DOCUMENTS

2.9.1 PURPOSE

- .1 This section provides direction in the preparation of construction contract documents (namely specifications, drawings and addenda) for PWGSC.
- .2 Drawings, specifications and addenda must be complete and clear, in order that a contractor can prepare a bid without guesswork. Standard practice for the preparation of construction contract documents requires that:
 - .1 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.
 - .2 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.
 - .3 Addenda are changes to the construction contract documents or tendering procedures, issued during the tendering process.

2.9.2 PRINCIPLES FOR PWGSC CONTRACT DOCUMENTS

- .1 PWGSC’s contract documents are based on common public procurement principles.
- .2 PWGSC does not use Canadian Construction Document Committee (CCDC) documents.
- .3 The construction contract and the terms and conditions are prepared and issued by PWGSC, along with all other related bidding and contractual documents.
 - .1 For more detailed information, the clauses are available on the following web site:
 - .2 <http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>
 - .3 Any questions should be directed through the PWGSC Project Manager.

2.9.3 QUALITY ASSURANCE

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

2.9.4 ADDENDA

- .1 Format
 - .1 Prepare addenda using the format shown in Appendix ‘C’.
 - .2 No signature type information is to appear.
 - .3 Every page of the addendum (including attachments) must be numbered consecutively.
 - .4 All pages must have the PWGSC project number and the appropriate addendum number.
 - .5 Sketches shall appear in the PWGSC format, stamped and signed.
 - .6 No Consultant information (name, address, phone #, consultant project # etc.) may appear in the addendum or its attachments (except on sketches).
- .2 Content



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

2.9.5 SUBMISSIONS

- .1 For each construction document submission, the Consultant shall provide:
 - .1 A completed and signed Checklist for the Submission of Construction Documents (See Appendix 'B')
 - .2 Original specification; printed one side on 216 mm x 280 mm white bond paper.
 - .3 Index, as per Appendix 'C'
 - .4 Reproducible original drawings; sealed and signed by the design authority.
 - .5 Addenda (if required), as per Appendix 'D;' (to be issued by PWGSC)
- .2 Tender information:
 - .1 Include a description of all units and estimated quantities to be included in unit price table.
 - .2 Include a list of significant trades including costs.
 - .1 PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.
 - .3 Government Electronic Tendering System (MERX):
 - .1 Consultants shall 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.
 - .2 The electronic copy of drawings and specifications is for bidding purposes only and do not require to be signed and sealed.

2.9.6 PWGSC ROLE

- .1 PWGSC shall provide:
 - .1 General and Special Instructions to Bidders
 - .2 Bid and Acceptance Form
 - .3 Standard Construction Contract Documents

2.10 SPECIFICATIONS

2.10.1 GENERAL

- .1 In preparing project specifications, the Consultant must use the current edition of the National Master Specification (NMS) in accordance with the "NMS User's Guide".

2.10.2 NATIONAL MASTER SPECIFICATION (NMS)

- .1 In preparing project specifications, the Consultant must use the current edition of the National Master Specification (NMS) in accordance with the "NMS User's Guide".
- .2 The NMS is a master construction specification available in both official languages, which is divided into 48 Divisions (Masterformat 2004) and is used for a wide range of construction and/or renovation projects.
- .3 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 of conflict and ambiguity.

2.10.3 SPECIFICATION ORGANIZATION

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



- .3 For specifications not included in the NMS, but required for the project, follow the number and title recommendations of Masterformat 2004
- .4 Number each page and start each Section on a new page
- .5 Bind specifications
- .6 Include Division I, edited to PWGSC requirements.
- .7 Note: Consultant's name is not to be indicated in the specifications..

2.10.4 TERMINOLOGY

- .1 Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect.
- .2 "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.
- .3 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.
- .4 Specifications must permit bidders to calculate all quantities and bid accurately.
 - .1 If quantities are impossible to identify (i.e. cracks to be repaired) give an estimated quantity for bid purposes (unit prices).
- .5 Ensure that the terminology used throughout the specifications is consistent and does not contradict the applicable standard construction contract documents.

2.10.5 DIMENSIONS

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

2.10.6 STANDARDS

- .1 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.
- .2 Canadian standards should be used wherever possible.

2.10.7 SPECIFYING MATERIALS

- .1 The practice of specifying actual brand names, model numbers, etc., is against departmental policy except for special circumstances.
- .2 The method of specifying materials shall be by using industry recognized standards.
- .3 If the above method cannot be used and where no standards exist, specify by a non-restrictive, non-trade name "prescription" or "performance" specifications.
- .4 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
- .5 Include all known materials acceptable for the purpose intended, and in the case of equipment, identify by type and model number.

2.10.8 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 The term "Acceptable Manufacturers" must not be used, as this restricts competition and does not ensure the actual material or product will be acceptable.
 - .1 A list of words and phrases that should be avoided is included in the NMS User's Guide.
- .2 Listing of acceptable products or materials is to be an exception, due to a unique specification or for the purpose of assisting bidders in identifying lesser known potential products or materials.



- .3 For exceptions, provide justifiable reasons for listing products and materials and submit to the *Departmental Representative* for acceptance.
- .4 When authorized to list acceptable products or materials, list all, with a minimum of three (3), trade names of products and materials acceptable for the intended purpose.

2.10.9 ALTERNATE PRODUCTS AND MATERIALS

- .1 Alternates must be approved by addendum issued by the *Departmental Representative* in accordance with Instructions to bidders.
- .2 Review applications for approval of alternate products and materials and provide recommendations to the *Departmental Representative*.
- .3 Compare products/materials to specifications. Do not compare product-to-product or material-to-material.

2.10.10 SEPARATE AND ALTERNATE PRICES

- .1 Do not include Separate or Alternate Pricing .

2.10.11 SOLE SOURCING

- .1 Sole sourcing for materials and work may be used for proprietary systems (i.e. fire alarm systems, EMCS systems).
- .2 Substantiation and/or justification will be required.
- .3 Prior to including sole source materials and/or work, the Consultant must contact the Departmental Representative to obtain the approval for the sole sourcing.

2.10.12 UNIT PRICES

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

2.10.13 CASH ALLOWANCES

- .1 Construction contract documents should be complete and contain all of the requirements for the contractual work.
- .2 Cash allowances are to be used only under exceptional circumstances (i.e. utility companies, municipalities), where no other method of specifying is appropriate.
- .3 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.

2.10.14 WARRANTIES

- .1 It is the practice of PWGSC to have a 12-month warranty and to avoid extending warranties for more than 24 months.
- .2 When it is deemed necessary to extend a warranty beyond the 12 month period provided for in the General Conditions of the contract, obtain approval from the Project Manager.
- .3 Delete all references to manufacturers' guarantees.

2.10.15 SCOPE OF WORK

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

2.10.16 SUMMARY AND SECTION INCLUDES

- .1 In Part -I All Sections; do not use (delete):
 - .1 "Summary" and
 - .2 "Section Includes."

2.10.17 RELATED SECTIONS

- .1 In Part I All Sections; do not use (delete)

2.10.18 INDEX



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

2.10.19 HEALTH AND SAFETY

- .1 Confirm with the Project Manager to determine if there are any instructions to meet regional requirements.

2.10.20 EXPERIENCE AND QUALIFICATIONS

- .1 Remove experience and qualification requirements from specification sections.

2.10.21 PREQUALIFICATION

- .1 Do not include in the specification any mandatory contractor and/or subcontractor prequalification requirements that could become a contract award condition.
- .2 If a prequalification process is required, contact the Project Manager.
- .3 There should be no references to certificates, transcripts or license numbers of a trade or subcontractor being included with the bid.

2.10.22 CONTRACTING ISSUES

- .1 Specifications describe the workmanship and quality of the work.
 - .1 Contracting issues should not appear in the specifications.
- .2 Division 00 of the NMS is not used for PWGSC projects.
- .3 Remove all references within the specifications, to the following:
 - .1 General Instructions to Bidders
 - .2 General Conditions
 - .3 CCDC documents
 - .4 Health and Safety requirements
 - .5 Priority of documents
 - .6 Security clauses
 - .7 Terms of payment or holdback
 - .8 Tendering process
 - .9 Bonding requirements
 - .10 Insurance requirements
 - .11 Alternative and separate pricing
 - .12 Site visit (Mandatory or Optional)
 - .13 Release of Lien and deficiency holdbacks

2.11 DRAWINGS

2.11.1 GENERAL

- .1 Drawings shall be in accordance with PWGSC Western CADD Standards and CSA B78.3.
- .2 Refer to:
 - .1 <http://www.tpsgc-pwgsc.gc.ca/cdao-cadd/ouest-western/tm-toe-eng.html>
 - .2 The above link is subject to change
 - .3 The Consultant shall check with the Project Manager to ensure that the link is current.
- .3 Download and use the Toolkit which includes drawing border templates, layer utility and drawing standards checker.

2.11.2 TITLE BLOCKS

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

2.11.3 DIMENSIONS

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

2.11.4 TRADE NAMES



- .1 Trade names on drawings are not acceptable.
- .2 Refer to SECTON 2.3, SPECIFICATIONS; 2.3.6 Specifying Materials for specifying materials by trade name.

2.11.5 SPECIFICATION NOTES

- .1 No specification type notes are to appear on any drawing.

2.11.6 TERMINOLOGY

- .1 Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect.
- .2 "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.
- .3 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", may not be indicated on the drawings or in the specifications as this promotes inaccurate and inflated bids.
- .4 Specifications & drawings must permit bidders to calculate all quantities and bid accurately.
- .5 If quantities are impossible to identify (i.e. cracks to be repaired) give an estimated quantity for bid purposes (unit prices).
- .6 Ensure that the terminology used throughout the drawings & specifications is consistent and does not contradict the applicable standard construction contract documents.

2.11.7 INFORMATION TO BE INCLUDED

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

2.11.8 DRAWING NUMBERS

- .1 Number drawings in sets according to the type of drawing and the discipline involved as follows:
 - .1 The requirements of SECTION 2 PWGSC NATIONAL CADD STANDARD will supersede these requirements, where warranted.
- .2 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.

2.11.9 PRINTS



- .1 Print with black lines on white paper.
- .2 Blue prints are acceptable for document submissions at stages outlined in the TOR.
- .3 Confirm with Departmental Representative the size of prints to be provided for review purposes.

2.11.10 BINDING

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

2.11.11 LEGENDS

- .1 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.

2.11.12 SCHEDULES

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

2.11.13 NORTH POINTS

- .1 On all plans include a north point.
- .2 Orient all plans in the same direction for easy cross-referencing.
- .3 Wherever possible, lay out plans so that the north point is at the top of the sheet.

2.11.14 DRAWING SYMBOLS

- .1 Follow generally accepted drawing conventions, understandable by the construction trades, and in accordance with PWGSC publications.



3 PROJECT ADMINISTRATION

3.1 GENERAL REQUIREMENTS FOR ALL PROJECTS

- .1 The administration requirements outlined in this section are applicable to all PWGSC projects in Western Region, unless otherwise indicated in the TOR.
- .2 “Project Team” refers to key representatives involved in this project.
- .3 All team members must maintain a professional, cordial and collaborative relationship.

3.2 LANGUAGE

- .1 Construction documents must be prepared in English.

3.3 MEDIA

- .1 The Consultant shall not respond to any media inquiry.
- .2 Direct all media requests to the Departmental Representative.

3.4 PROJECT MANAGEMENT

3.4.1 GENERAL

- .1 Public Works and Government Services Canada administers the project on behalf of Canada and exercises continuing control over the project during all phases of development.
- .2 This project is to be organized, managed and implemented in a collaborative manner.
- .3 The PWGSC project management team, the Consultant, the Contractor and the User Department teams are to work cooperatively at every stage of the design and construction process in order to assure the creation of a successful and meaningful work of architecture.
- .4 Under the leadership of the PWGSC Departmental Representative, all team members are responsible for establishing and maintaining a professional and cordial relationship.

3.4.2 NATIONAL PROJECT MANAGEMENT SYSTEM

- .1 PWGSC uses the National Project Management System (NPMS) for management of its building projects in order to align with the Federal Government approvals processes. Refer to the PWGSC NPMS web site for more details.
- .2 <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/index-eng.html>
- .3 This GP&S document speaks to services that are normally provided by the professional during the Project Delivery Phase of the NPMS.

3.4.3 DESIGN STAGE

- .1 Pre-design Process
 - .1 The purpose of this phase is to analyze all project requirements including codes, regulations, programming, sustainability, cost, time management and risk to demonstrate a full understanding of the project
 - .2 The approved deliverable will become the formal project work plan and will be utilized throughout the project to guide the delivery.
- .2 Schematic Design Process
 - .1 The purpose of this phase is to explore three distinctly different design options and to analyze them against the project requirements.
 - .2 The Schematic Design will be in sufficient detail to illustrate and communicate the project characteristics.
 - .1 Provide a detailed review and analysis of the project requirements including all updates and amendments to ensure all requirements are fully integrated into the Schematic Design.



- .2 Out of this process the Schematic Design will be accepted and authorization to proceed to Design Development will be based on the accepted Schematic Design.
- .3 The *Departmental Representative*, in concert with others shall choose one option to be further developed.
 - .1 Although the *Consultant* is required to identify a preferred option, the *Departmental Representative* may select another option.
 - .2 The approved deliverable will become the formal project work plan and will be utilized throughout the project to guide the delivery.

3.4.4 IMPLEMENTATION STAGE

- .1 Design Development Process
 - .1 The purpose of this phase is to further develop the design option selected for refinement at the Schematic Design stage.
 - .2 The Design Development documents consist of drawings and other documents to describe the scope, quality and cost of the project in sufficient detail to facilitate design approval, confirmation of code compliance, detailed planning of construction and project approval.
 - .3 This design will be used as the basis for preparation of construction documents.
 - .4 The approved deliverable will become the formal project work plan and will be utilized throughout the project to guide the delivery.
- .2 Commissioning Process
 - .1 “Commissioning” is a quality assurance process, in which the functional requirements of the Owner/occupant and the operational requirements of facility management are tested, verified and proven to function as intended.
 - .2 Commissioning deliverables occur at various phases throughout the project as detailed in section 2.8.
 - .3 Commissioning shall be in accordance with the PWGSC Commissioning Manual CP.1 (2003).
- .3 Construction Document Process
 - .1 The purpose of this phase is to translate design development documents into construction drawings and specifications, for use by the contractor to determine a cost for the work and to construct the building.
- .4 Contract Procurement Process
 - .1 The purpose of this phase is to obtain and evaluate bids/proposals from qualified contractors to construct the project, as per the Construction Contract Documents and to award the construction contract according to government regulations.
- .5 Construction Contract Administration Process
 - .1 The purpose of this phase is to implement the project in compliance with the Construction Contract Documents and to direct and monitor all necessary or requested changes to the scope of work during construction, commissioning and closeout.

3.4.5 CLOSEOUT STAGE

- .1 Post Construction Process
 - .1 The purpose of this phase is to ensure the orderly completion and recording of all aspects of the work during the construction and liaise with the Public Works And Government Services Canada and other agencies as appropriate to close out the project.

3.4.6 ENGINEERING PROJECTS



- .1 Refer to the project specific TOR where the stages for an Engineering Project differs slightly.

3.5 LINES OF COMMUNICATION

- .1 In general, communications will be through the Departmental Representative, unless directed otherwise.
 - .1 This includes formal contact between the Consultant, the Contractor, the PWGSC Project Team and the User Department.
- .2 Direct communication between members of the PWGSC Project Team on routine matters may be required for resolution of technical issues.
 - .1 However, this shall not alter project scope, budget or schedules, unless confirmed in writing by the Departmental Representative.
- .3 During construction tender call, PWGSC will conduct all correspondence with bidders and award the contract.

3.6 MEETINGS

- .1 The Departmental Representative will arrange meetings throughout the project, with representatives from:
 - .1 The User Department;
 - .2 PWGSC
 - .3 The Consultant team; and
 - .4 The Contractor (during the construction phase)
- .2 Standing agenda items shall include:
 - .1 Project Schedule,
 - .2 Cost,
 - .3 Risk,
 - .4 Quality,
 - .5 Health and safety

3.7 CONSULTANT RESPONSIBILITIES

- .1 The “Consultant Team” includes the Consultant’s staff, sub-consultants and specialists.
 - .1 This team must maintain its expertise for the duration of the project.
 - .2 The team must include qualified registered architectural and engineering professionals, with extensive relevant experience, capable of providing all required services.
 - .3 Team members may be qualified to provide services in more than one discipline.
 - .4 The Consultant may expand the team to include additional disciplines.
- .2 The Consultant is responsible for:
 - .1 Obtaining Departmental Representative acceptance for each project phase before proceeding to the next phase.
 - .2 Accurately communicating design, budget, and scheduling issues to staff, sub-consultants and specialists.
 - .3 Co-ordinating input for the Departmental Representative’s Risk Management Plan
 - .4 Co-ordinating the quality assurance process and ensuring that submissions of sub-consultants are complete and signed-off by reviewers;
 - .5 During the design phases:
 - .1 Attend meetings,
 - .2 Record the issues and decisions,
 - .3 Prepare and distribute minutes within two working days of the meeting,



- .4 Ensure all meetings are green i.e. using electronic documents or double-sided hard copies and
- .5 Ensure sub-consultants attend required meetings.
- .6 During the construction phase:
 - .1 Attend meetings and provide site inspection services
 - .2 Ensure sub-consultants provide site inspection services and attend required meetings.
- .3 The Consultant is responsible for:
 - .1 Coordinating and directing the work of all team activities, sub-consultants and specialists
 - .2 Preparing a design that meets project requirements.
 - .3 Obtaining approvals on behalf of the Departmental Representative from the User and other levels of government such as provincial and municipal governments
 - .1 The Consultant shall adjust the documentation to meet the requirements of these authorities.

3.8 PWGSC RESPONSIBILITIES

- .1 Administration
 - .1 PWGSC administers the project and exercises continuing control over the project during all phases of development.
 - .2 The following administrative requirements apply during all phases of the project delivery.
- .2 Reviews
 - .1 PWGSC will review the work at various stages and reserves the right to reject unsatisfactory work at any stage.
 - .2 If later reviews show that earlier acceptances must be withdrawn, the Consultant shall re-design and re-submit at no extra cost.
- .3 Acceptance
 - .1 PWGSC acceptance of submissions from the Consultant simply indicates that, based on a general review, the material complies with governmental objectives and practices, and meets overall project objectives
 - .2 Acceptance does not relieve the Consultant of professional responsibility for the work and for compliance with the contract.
- .4 PWGSC Project Management
 - .1 The Project Manager assigned to the project is the Departmental Representative.
 - .2 The Departmental Representative is directly responsible for:
 - .1 The progress and administration of the project, on behalf of PWGSC
 - .2 Day-to-day project management and is the Consultant's single point of contact for project direction.
 - .3 Providing authorizations to the Consultant on various tasks throughout the project.
 - .3 Unless directed otherwise by the Departmental Representative, the Consultant obtains all Federal approvals necessary for the work.
- .5 PWGSC Professional & Technical Resources Team
 - .1 Provides professional advice and quality assurance reviews of consultant deliverables by Architectural and Engineering professional disciplines.
 - .2 Offers expert technical advice on related project issues, such as functional programming, options analysis, risk management, cost planning, scheduling, contract interpretation, specifications, terms of reference, commissioning, claims management, project delivery approach and project compliance.



- .3 Participates regularly in design phases and may attend (during construction), contractor meetings and conduct field reviews on behalf of the Departmental Representative.
- .4 Provides a Design Manager for the project, who will coordinate the services of the Professional & Technical Resources Team through the Departmental Representative;
 - .1 The Design Manager is the assembler and coordinator of the Resources Team of Architects, Engineers, Interior Designers, Project Planners, Cost Planners and Commissioning Specialists, all with specific areas of expertise.
- .6 PWGSC Commissioning Specialist represents the Departmental Representative's interests in the commissioning process for buildings by:
 - .1 Providing technical advice on O&M matters, operational criteria and quality assurance on the commissioning process throughout the project life cycle;
 - .2 Coordinating and overseeing internal PWGSC commissioning activities during all project phases to ensure that O&M concerns are addressed;
 - .3 Working closely with the Consultant, the Consultant's Commissioning Manager, the Contractor, and the Departmental Representative for Commissioning activities and,
 - .4 Reviews all documentation and reported results relative to commissioning throughout the project delivery.

3.9 USER DEPARTMENT RESPONSIBILITIES

- .1 The User Department Project Leader
 - .1 Is accountable for the expenditure of public funds and delivery of the project in accordance with terms accepted by the Treasury Board
 - .2 Reports to senior User Department executive management
 - .3 Will play several critical roles for the successful implementation of the project, as follows:
 - .1 Coordinate the quality, timing and completeness of information and decisions relating to issues related to the functional performance of the facility;

3.10 REVIEW AND APPROVAL BY PROVINCIAL AND MUNICIPAL AUTHORITIES

- .1 The federal government generally defers to provincial and municipal authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.
- .2 Municipal authority review
 - .1 The purpose of this review is information and awareness;
 - .2 Submissions will be reviewed at the completion of specific phases as outlined in the Required Services Section of the TOR.

3.11 BUILDING PERMITS AND OCCUPANCY PERMITS

- .1 The Consultant will support the Contractor in applying for building permits by providing the required documentation.
 - .1 These documents will be submitted at phases as requested by the municipal authorities.
 - .2 The Consultant will negotiate and resolve building permit related issues.
- .2 The Consultant shall support the Contractor in its application for an occupancy permit and coordinate the resolution of all outstanding issues relating to the permit.
- .3 The Contractor shall pay for the permits on behalf of PWGSC.

3.12 TECHNICAL AND FUNCTIONAL REVIEWS

- .1 This includes both COE reviews and User Department reviews.



- .1 The Purpose of these reviews is technical and functional quality assurance;
 - .2 Submissions will be reviewed at the completion of specific phases as outlined in the Required Services Section of the TOR.
- .2 HRSDC Reviews of building projects
- .1 The purpose of these reviews is for fire protection, health and life safety;
 - .2 Submissions will be reviewed at the completion of specific phases as outlined in the Required Services Section of the TOR.



APPENDIX A CHECKLISTS

A.1 CHECKLIST FOR THE SUBMISSION OF CONSTRUCTION DOCUMENTS

AI.1 TITLE BLOCK

Project Title:		Date:
Project Location:		Project Number:
Consultant's Name:		Contract Number:
PWGSC PM:	Review Stage:	

AI.2 STANDARDS & GUIDELINES

ITEM	Checked by:	Progress Submission	Pre-Tender or Tender Ready Submission	Comments:
1. General				
The design meets the requirements of;				
.1	National Building Code - 2005			
.2	National Fire Code - 2005			
.3	National Plumbing Code - 2005			
.4	Canada Labour Code			
.5	NFPA 10 - Standard for Portable Fire Extinguishers - 2002			
.6	NFPA 13 - Standard for the Installation of Sprinkler Systems - 2007			
.7	NFPA 14 – Standard for the Installation of Standpipe and Hose Systems - 2003			
2. Treasury Board				
The design meets the requirements of;				
.1	Chapter 3-6: Fire Protection Standard for Correctional Institutions. http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=13580			
.2	Chapter 3-2: Fire Protection Standard for Design & Construction. http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=13581			
.3	Fire Protection Standard for Electronic Data Processing			



Equipment. http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=13582				
<p>3. HRSDC Fire Protection Engineer Standards</p> <p>The design meets the requirements of;</p>				
.1 Federal Fire Protection Standards. http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/index.shtml				
.2 FC-403 Standard for Sprinkler Systems. http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/403/page00.shtml				
.3 FC-311-M Standard for Record Storage. http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/311/page00.shtml				
<p>4. Labour Canada Standards</p> <p>The design meets the requirements of;</p>				
.1 Canada Labour Code. http://laws.justice.gc.ca/en/L-2/				
.2 Canada Occupational Health and Safety Regulations. http://laws.justice.gc.ca/eng/SOR-86-304/index.html				
.3 Movable Storage Units Standard. http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/guidelines/mobile.shtml				
<p>5. ASHRAE Standards</p> <p>The design meets the requirements of;</p>				
.1 ANSI/ASHRAE 55 – 2004 Thermal Environmental Conditions for Human Occupancy				
.2 ASHRAE 62.1 – 2007 – Ventilation for Acceptable Indoor Air Quality				
.3 ASHRAE Applications Handbook				
.4 ASHRAE Fundamentals Handbook				



<p>6. PWGSC MD Standards</p> <p>The design meets the requirements of;</p>				
.1	MD 15116 – Computer Room Air Conditioning Systems - 2006			
.2	MD 15128 – Minimum Guidelines for Laboratory Fume Hoods – March 2004			
.3	MD 15129 – Perchloric Acid Fume Hoods - 2006			
.4	MD 15161 – Guidelines for the control of Legionella in mechanical systems			
.5	MD 250005 – Energy Monitoring and Control Systems Design Guidelines - 2009			

AI.3 SPECIFICATIONS – ALL DISCIPLINES

ITEM	Checked by:	Progress Submission	Pre-Tender or Tender Ready Submission	Comments:
<p>1. General</p> <p>The Specifications meet the requirements of;</p>				
.1	The NMS Users Guide. .			
.2	Masterformat 2004			
.3	The current edition of the NMS database			
.4	Deletion of “Related Sections” and “Section Includes” throughout.			
.5	PWGSC GCs for projects tendered through PWGSC			
.6	Consistent use of CCDC or other for privately tendered projects.			
.7	Non-proprietary Specifications.			
.8	Being completely edited with removal of all square choice brackets and Spec Notes.			
.9	Including all relevant Sections as evident by the by the scope of work indicated by the drawings.			
.10	Not referring to the Tender Submission (Contract B)			
.11	Use of command imperative style of language.			
.12	Formatting in either the NMS			



	1/3 - 2/3 page format or the Construction Specifications Canada full page format.				
.13	Each Section starting on a new page and the Project Number, Section Title, Section Number and Page Number show on the header of each page only.				
.14	Specification headers not including date or consultant's name.				
.15	Departmental Representative being used throughout instead of Engineer, PWGSC, Owner, Consultant or Architect. (That is; the contractual entity)				
.16	Non use of notations such as: "verify on site", "as instructed", "to match existing", "example", "equal to", "equivalent to" and "to be determined on site by".				
.17	Dimensions being provided in metric only.				
.18	Indicating the latest edition of all references noted in Part 1 of each Section and that un-used reference Standards are deleted.				
.19	No bolding of text.				
.20	Use of Western Regions standard payments procedures clause.				

AI.4 DRAWINGS GENERAL – ALL DISCIPLINES

ITEM	Checked by:	Progress Submission	Pre-Tender or Tender Ready Submission	Comments:
1. General				
The Drawings meet the requirements of;				
.1 PWGSC Western Region AutoCAD drafting standards.				
.2 Using the "toolkit" and the "drawing checker".				
.3 All dimensions in SI. No dual dimensioning has been used.				
.4 Providing a north arrow.				
.5 Providing a legend on all relevant sheets.				
.6 Indicating grid lines on all				



	sheets.				
.7	Using standard scales. (1:50, 1:100 etc.)				
.8	Cross referencing and detailing is consistent.				
.9	No Specifications on drawings.				
.10	All notes being written in the command imperative style of speech.				
.11	Not naming the "Contractor" or "sub trades" in the notes.				
.12	Numbering all rooms on all floor plans.				
.13	Using appropriate line weights to differentiate new versus existing versus demolition.				
.14	Using font sizes and types following PWGSC drafting standards.				
.15	Providing separate drawings for demolition and new work.				
.16	Drawing acceptance by the FPE of HRSDC.				

AI.5 DRAWINGS - DISCIPLINE SPECIFIC

ITEM	Checked by:	Progress Submission	Pre-Tender or Tender Ready Submission	Comments:
1. Architectural The Drawings meet the requirements of;				
.1 Providing a Building Code Analysis.				
.2 Indicating fire separations and firewalls and rating.				
.3 Providing a complete site plan with all related details.				
.4 Providing a fully detailed reflected ceiling plan showing lighting, diffusers, sprinkler heads, etc.				
.5 Wall sections being coordinated with the structural and other disciplines drawings.				
.6 Building elevations showing all mechanical and electrical ancillaries.				
.7 Sub surface drainage being shown on the foundation plans and coordinated with all other disciplines.				



.8	Accessibility conforming to CAN/CSA 651-04.				
.9	Coordination of door, finish, hardware schedules in conjunction with fire separations and other disciplines.				
.10	All conflict points identified by BIM have been resolved.				
2. Structural					
The Drawings meet the requirements of;					
.1	Ensuring that General Notes provide additional information that is NOT covered in Specifications.				
.2	Remove all information that is or should be covered by the Specifications.				
.3	Note loads used for design.				
.4	PWGSC policy of using general product descriptions, not proprietary product names followed.				
.5	Table of Abbreviations used provided.				
.6	Section bubbles properly cross referenced.				
.7	Coordination with all other disciplines.				
3. Mechanical					
The Drawings meet the requirements of;					
.1	Separate drawings for Plumbing, HVAC, Fire Suppression, etc.				
.2	Provision for humidification with a clean source of water and no standing water				
.3	Provision of separate HVAC zoning for each unique thermal zone.				
.4	Providing Ventilation to ASHRAE 62.1.				
.5	Meets all requirements of ASHRAE 62.1, Section 5.				
.6	All thermostats are wall mounted.				
.7	The building and systems and equipment meeting all requirements of Section 5 of ASHRAE 62.1.				
.8	Conformance to ASHRAE 55 for;				
.1	Operative				



temperature .2 Air motion .3 Radiant Temperature Asymmetry .4 Draft .5 Vertical Temperature Difference .6 Floor Surface Temperature .7 Temperature Variations with Time .8 Cyclic Variations .9 Drifts and Ramps				
.9 Providing building cross-sections at all key locations showing clearances for the mechanical installation and access for maintenance.				
.10 Providing sufficient access to mechanical equipment for maintenance.				
.11 Providing mechanical schematics showing design pressure and temperatures as well as all instrumentation and control points labels.				
.12 Design complies with all referenced PWGSC MD Standards.				
.13 Equipment schedules on the drawings coordinate and agree with the Book Specifications.				
.14 Duct attenuation is designed to conform to the STC requirements shown on the architectural drawings.				
.15 Coordination with all other disciplines.				
4. Electrical The Drawings meet the requirements of;				
.1 Separate drawings for Lighting, Power, Fire Alarm System, Communication and Data, Security & CCTV etc.				
.2 Verification and acceptance of the Grounding condition for this project.				
.3 The Overcurrent and Short Circuit Study and confirming all components are fully coordinated.				
.4 The Arch-Flash Study and confirming all components are fully coordinated.				
.5 Providing Arch protection				



	warning signs and labeling.				
.6	Providing lighting Levels in accordance with the National Building Code and IESNA recommendations.				
.7	Not using Armored Cable. Using Armored Cable will be allowed only for jumping from one light fixture to the other in a distance up to 3m.				
.8	Providing identification for each circuit including: .1 Name .2 Voltage, .3 Phase, .4 Amps, .5 Circuit-s .6 Fed from Panel, Destination.				
.9	The Voltage Drop Calculation for each circuit and conformance to CEC requirements.				
.10	Providing phase load and total load for each panel and ensuring proper balance of the Electrical System.				
.11	Coordination with all other disciplines.				
5. Civil					
The Drawings meet the requirements of;					
.1	The design criteria. (e.g. design vehicle for surface structures, design period and other data for WM.WW, SW and other systems including data and calculations showing design requirements and provided capacities)				
.2	The reference standards. (e.g. minimum service connection pipe or minimum WM size, etc have been used for municipal works, name the local authority whose standards are used.)				
.3	Indicating existing sub-grade soil properties and strength that has been used for the design is indicated on drawings or in a report.				
.4	Indicating Bench Marks used for the Topographic Survey are shown with Northing, Easting and elevation data.				
.5	Indicating the Final				



	Geometric layout for existing and new infrastructures and facilities including centerline of all access roads and pipes. The data provided includes Northing and Easting of all points including start and end point and for all other points wherever there is change in direction, and all horizontal curve data				
.6	Providing typical X-sections for all structures, including type, thickness of various materials for pavement structures, and pipe diameter, material types and thickness and SDR values.				
.7	Providing design grades and slopes.				
.8	Providing details for all infrastructures and facilities indicating all works and type of materials and all geometrics and dimensions..				
.9	Coordination with all other disciplines.				



APPENDIX B SPECIFICATION TOC STANDARDS

B.1 GENERAL

B.1.1 SPECIFICATIONS

.1 List all Divisions, Sections (by number and title) and number of pages.

B.1.2 DRAWINGS

.1 List all Drawings by number and title.

B.2 SAMPLE OF TABLE OF CONTENTS

Project No:	Table of Contents	Index
R.xxxxxx		Page I of xx

SPECIFICATIONS:

- .3
- .4
- No. Pages
- .5 Division 01 – GENERAL REQUIREMENTS
- .6 01 11 00 – Summary of Work xx pages
- .7 01 14 00 – Work Restrictions xx pages
- .8 01 29 00 – Payment Procedures xx pages
- .9 Division 02 – EXISTING CONDITIONS
- .10 ETC.
- .11

DRAWINGS:

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



APPENDIX C ADDENDUM FORMAT STANDARD

C.1 SAMPLE OF ADDENDUM FORMAT

CI.1 DRAWINGS

- .1 Indicate drawing number and title, then list changes or indicate revision number and date, and re-issue drawing with addendum.

CI.2 SPECIFICATIONS

- .1 Indicate section number and title.
- .2 List all changes (i.e. delete, add or change) by article or paragraph

Project Title:	Addendum No:
Project Location:	Project Number:
Consultant's Name:	Date:
The following changes in the bid documents are effective immediately. This addendum will form part of the contract documents	
Drawings	
1 AI Architectural	
Specifications	
1 Section 01 00 10 - General Instructions	
.1 Delete article (xx) entirely.	
.2 Refer to paragraph (xx) and revise "xxx", to read "xxxx"..	
2 Section 23 05 00 - Common Work Results - Mechanical	
.1 Add new article (x.xx) as follows:	



APPENDIX D DIGITAL TENDER DOCUMENTS STANDARDS

D.1 CONVENTION STANDARDS FOR TENDER DOCUMENTS

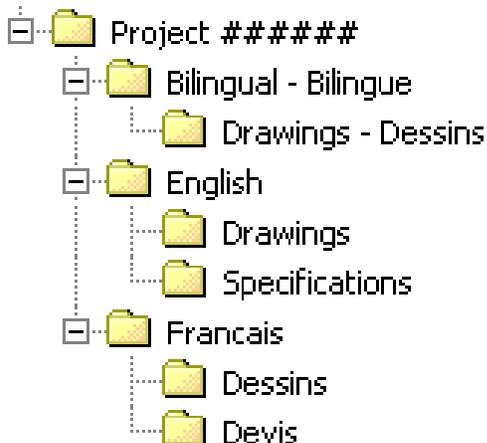
DI.1 USER MANUAL

- .1 Refer to the User manual on directory structure and naming convention standards for construction tender documents on CD ROM.
 - .1 Issued by: Real Property Contracting Directorate, PWGSC,
 - .2 Version 1.0, May 2005.

DI.2 PREFACE

- .1 The Government of Canada (GoC) has committed to move towards an electronic environment for the majority of the services it offers.
- .2 This covers the advertisement and distribution of contract opportunities, including construction solicitations.
- .3 As a result, it is now necessary to obtain a copy of construction drawings and specifications (in PDF format *without* password protection) on one or multiple CD-ROM to facilitate for the GoC the transfer of the construction drawings and specifications electronically to the Government Electronic Tendering System (GETS).
- .4 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.
- .5 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.
- .6 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.
- .7 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.

DI.3 DIRECTORY STRUCTURE



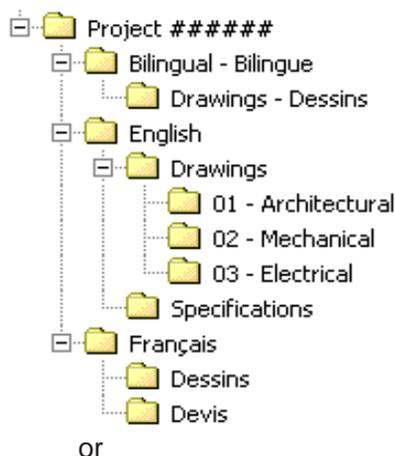


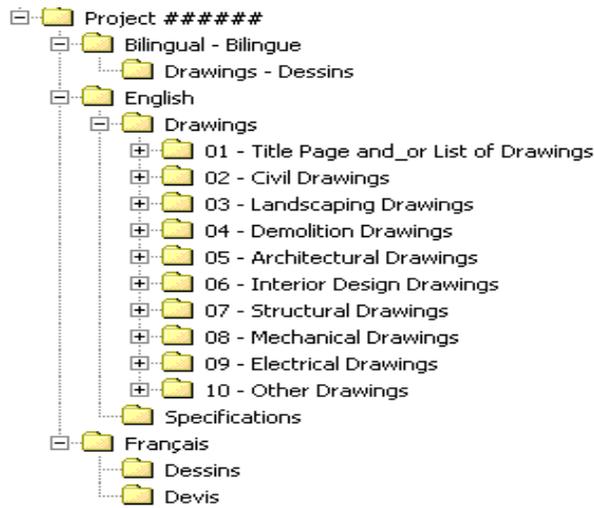
DI.4 1ST, 2ND AND 3RD TIER SUB-FOLDERS

- .1 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:
- .2 The following important points are to be noted about the Directory Structure:
 - .1 The “Project #####” folder is considered the 1st Tier of the Directory Structure where ##### represents each digit of the Project Number.
 - .2 The Project Number must always be used to name the 1st Tier folder and it is always required.
 - .3 Free text can be added following the Project Number, to include such things as a brief description or the project title;
- .3 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;
- .4 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.
- .5 IMPORTANT NOTE:
 - .1 The applicable elements of the Directory Structure (1st, 2nd and 3rd Tier folders) are always required and cannot be modified.

DI.5 4TH TIER SUB-FOLDERS FOR DRAWINGS

- .1 The “Drawings – Dessins”, “Drawings” and “Dessins” folders must have 4th Tier sub-folders created to reflect the various disciplines of the set of drawings.
- .2 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.
- .3 Note:
 - .1 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.
- .4 Examples of 4th Tier sub-folders for drawings:





DI.6 NAMING CONVENTION - 4TH TIER DRAWINGS

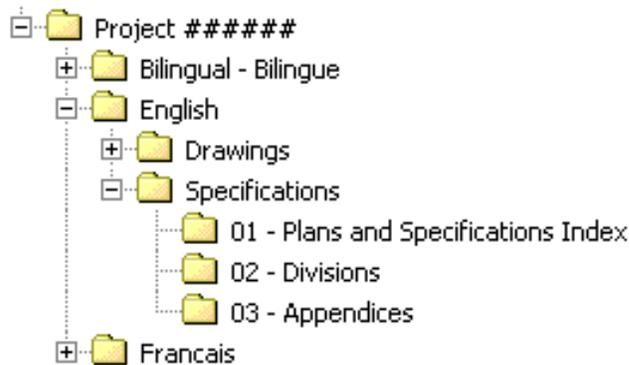
- .1 The 4th Tier sub-folders for drawings must adhere to the following standard naming convention.
 - .1 For the “Drawings” and “Dessins” folders:
 - 1 ## - Y, Where:
 - 1 ## = A two digit number ranging from 01 to 99 (leading zeros must be included)
 - 2 Y = The title of the folder
 - 2 Example: 03 – Mechanical
 - .2 For the “Drawings - Dessins” folder:
 - 1 ## - Y – Z, Where:
 - 1 ## = A two digit number ranging from 01 to 99 (leading zeros must be included)
 - 2 Y = The English title of the folder
 - 3 Z = The French title of the folder
 - 2 Example: 04 - Electrical – Électricité
- .2 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.
- .3 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:
 - .1 The alphanumerical sorting is done on an ascending order;
 - .2 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...);
 - .3 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



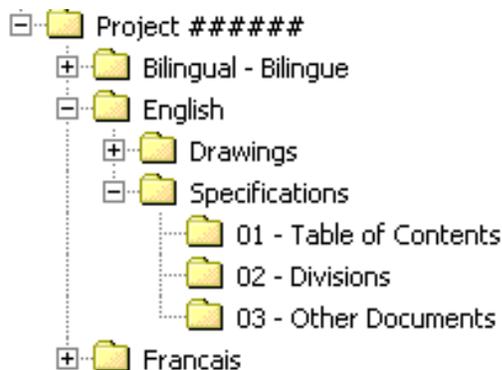
(i.e. Drawing A001 will be printed before Drawing A002, Drawing M02 before Drawing M03, etc...).

DI.7 4TH TIER SUB-FOLDERS FOR SPECIFICATIONS

- .1 The “Specifications” and “Devis” folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.
- .2 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.
- .3 Examples of 4th Tier sub-folders for specifications:



or



DI.8 NAMING CONVENTION - 4TH TIER SPECIFICATIONS

- .1 The 4th Tier sub-folders for specifications must adhere to the following standard naming convention.
 - .1 For the “Specifications” and “Devis” folders:
 - 1 ## - Y, Where:
 - 1 ## = A two digit number ranging from 01 to 99 (leading zeros must be included)
 - 2 Y = The title of the folder
 - 2 Example: 02 – Divisions
 - .2 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.



- .3 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:
- .4 The alphanumerical sorting is done on an ascending order;
 - .1 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...);
 - .2 Each specifications PDF file within each sub-folder will also be sorted alphanumerically.
 - 1 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...).

DI.9 NAMING CONVENTION FOR PDF FILES

- .1 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.

DI.10 DRAWINGS

- .1 Each drawing must be a separate single page PDF file.
- .2 The naming convention of each drawing must be:
 - .1 X### - Y, Where;
 - 1 X = The letter or letters from the drawing title block ("A" for Architectural or "ID" for Interior Design for example) associated with the discipline,
 - 2 ### = The drawing number from the drawing title block (one to three digits),
 - 3 Y = The drawing name from the drawing title block (for bilingual drawings, the name in both English and French is to appear).
 - .2 Example; A001 - First Floor Details.
- .3 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.
- .4 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).
- .5 The following important points about drawings are to be noted:
 - .1 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.
 - 1 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);
 - .2 If drawing PDF files are included in the "Bilingual - Bilingue" folder, these cannot be included as well in the "English" and/or "Français" folders;
 - .3 If drawings not associated with a particular discipline are not numbered (Title Page or List of Drawings for example), these will be sorted alphabetically.
 - 1 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

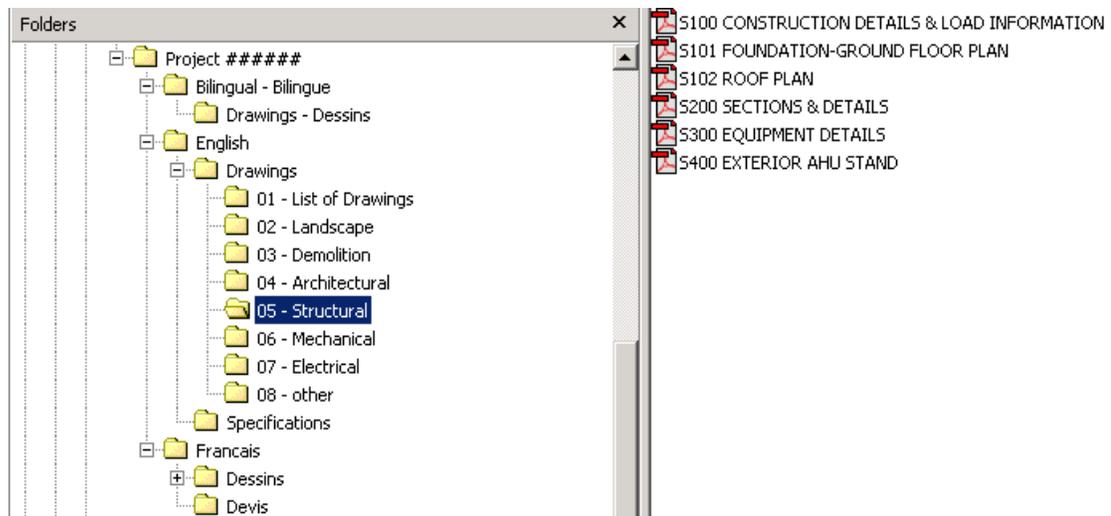


hard copy set, the drawings are to be named as per the following standard convention when converted in PDF format to ensure proper display and printing order.

- 1 ## - Y, Where:
 - 1 ## = A two digit number ranging from 01 to 99 (leading zeros must be included)
 - 2 Y = The name of the drawing
- 2 Example:
 - 1 01 - Title Page
 - 2 02 - List of Drawings

- .4 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.

DI.11 EXAMPLE OF A 4TH TIER DRAWINGS SUBFOLDER’S CONTENT:



DI.12 SPECIFICATIONS

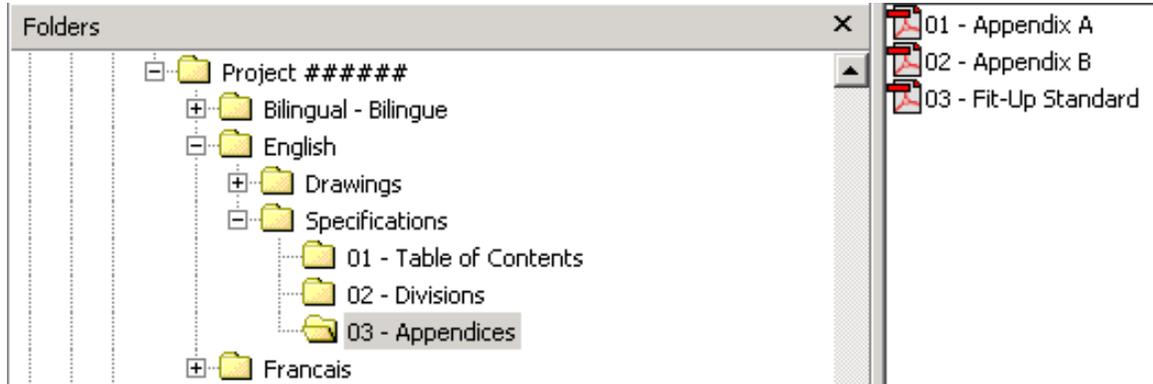
- .1 Each Specifications Division must be a separate PDF file and all pages contained in each PDF file must have the same physical size (height, width).
- .2 The Plans and Specifications Index must also be a separate PDF file.
- .3 If there are other documents that are part of the Specifications (e.g.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

DI.13 DOCUMENTS OTHER THAN SPECIFICATIONS DIVISIONS

- .1 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:
 - .1 ## - Y, Where:
 - 1 ## = Two digit number ranging from 01 to 99 with leading zeros required
 - 2 Y = Name of the document
 - .2 Example: 01 - Plans and Specifications Index



DI.14 EXAMPLE OF A SUB-FOLDER CONTENT (SUB-FOLDER OTHER THAN “DIVISIONS”):



DI.15 SPECIFICATIONS DIVISIONS

- .1 The Specifications Divisions must be named as follows:
 - .1 Division ## - Y, Where:
 - 1 Division ## = The actual word “Division” followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)
 - 2 Y = Name of the Specifications Division as per CSC/CSI MasterFormat™
 - .2 Example: Division 05 – Metals
- .2 The following important point about specifications is to be noted:
 - .1 The Numbering of the Divisions cannot be altered from CSC/CSI MasterFormat™ even if some Divisions are not used in a given project.
 - 1 For example, Division 05 will always remain Division 05 even if Division 04 is not used for a given project.

DI.16 EXAMPLE OF A “DIVISIONS” SUB-FOLDER CONTENT:





DI.17 CD-ROM LABEL

- .1 Each CD-ROM is to be labelled with the following information:
 - .1 Project Number;
 - .2 Project Title;
 - .3 Documents for Tender;
 - .4 CD X of X.
- .2 Example:
 - .1 Project 123456;
 - .2 Repair Alexandra Bridge;
 - .3 Documents for Tender;
 - .4 CD 1 of 1.



APPENDIX E PDF CREATION STANDARDS

E.1 CONVERTING CONSTRUCTION DRAWINGS INTO PDF

E1.1 REFERENCE GUIDE

- .1 Refer to the basic reference guide on converting construction drawings into portable document format (PDF), Issued by Real Property Contracting Directorate. PWGSC, Version 1.0, May 2005.

E1.2 PREFACE

- .1 Portable Document Format (PDF) is the standard format for documents that are posted on the Government Electronic Tendering System (GETS).
- .2 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.
- .3 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.
- .4 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.
 - .1 It actually should not take any longer than it would take to create a plot file or to send a drawing to a printer.
 - .2 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.
 - .3 The conversion of specifications is not covered in this basic reference guide since it does not require any special configuration or setting.
- .5 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.
 - .1 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.

E1.3 PRINTER DRIVERS

- .1 Adobe Acrobat provides two different printer drivers that are able to convert CADD drawing into PDF format, Acrobat PDF Writer and Acrobat Distiller.
- .2 Before creating a PDF file from a CADD drawing, a choice must be made as to which one will be used.
- .3 Acrobat PDF Writer is a non-PostScript printer driver that works best with documents that don't contain complex graphics.
- .4 Acrobat Distiller is a PostScript printer driver that works best with documents that contain PostScript fills, Encapsulated PostScript (EPS) graphics, or other complex elements.
- .5 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.



EI.4 PRINTER CONFIGURATION

- .1 Before converting a CADD drawing to PDF, an Acrobat printer configuration file for the PDF paper size needs to be created.
- .2 This function can be done in the CADD software rather than using a custom paper size defined for the Acrobat distiller feature.
- .3 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.
- .4 The configuration can then be re-used to simplify the conversion process for future files that use the same page size.
- .5 As an alternative, although not recommended, a custom-defined size can be created in Acrobat Distiller in the *properties* menu.

EI.5 CREATING PDF FILES

- .1 Once the printer configuration has been done in the CADD software, open Acrobat Distiller and make the necessary settings in the *preferences* and *job options* sub-menu.
 - .1 Ensure that the page size match the sheet size selected in the CADD software to create the file.
 - .2 Particular settings can be saved under different names for future use.
- .2 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.
- .3 A progress bar will show during the conversion and the newly converted PDF file should open up and be displayed for verification.

EI.6 PDF FILES SETTINGS

- .1 Security
 - .1 Adobe Acrobat contains security features that can be used to secure the files by restricting any changes to the files.
 - .2 Since the files will be posted on MERX and will be used for printing copies, the files must not be password protected and must allow printing.

EI.7 DRAWING ORIENTATION

- .1 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.

EI.8 FONT TYPE

- .1 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.

EI.9 RESOLUTION

- .1 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).

EI.10 SCALE

- .1 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.

EI.11 SCANNING



- .1 Scanning is not recommended and should be done only when the drawing is not available electronically.
- .2 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.
- .3 It is recommended that each scanned drawing be opened and verified to ensure that the resolution, scale and border are of an acceptable quality.

EI.12 FINAL CHECKLIST

- .1 When the drawing file has gone through the PDF conversion, it is recommended to open it and verify the following:
 - .1 That the sheet size displayed is what was intended to be created (the size is viewable in the lower left corner of the drawing);
 - .2 That the orientation of the sheet is correct;
 - .3 That the line types, line weights and fonts match the CADD drawing.
 - .4 That the PDF file is in black and white;
 - .5 That each drawing is a single PDF file;
 - .6 That the PDF file is not password protected and printable.
- .2 If all the items are verified, the PDF file is useable.

EI.13 ADDITIONAL INFORMATION

- .1 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 F DEFINITIONS

F.1 TERMINOLOGY

TERMS	DESCRIPTION
As-builts/Record Drawings	See Record Drawings
Base Building	Refers to the building shell, as opposed to the tenant fit-up. It includes finished floors, exterior walls, interior core, finished ceilings with lighting, and other building systems for the planned general use of the building. Generally, the work for the base building is separate from the work for tenant-fit-ups
Circulation	Space used, primarily by people, to move from one area to another. It includes major as well as secondary aisles.
Client	A term that refers to the client, the client department or user department
Co-location	Placing items together for better organization
Consultant	The word refers both to an individual consultant, or a consultant team. The consultant is generally selected by PWGSC using a Request for Proposal.
Contractor	The company, organization or firm who is responsible for the construction of the project
Consolidation	Reducing the number of co-located items by placing them in a common floor facility to eliminate duplication of space.
Constant dollar estimate	This is an estimate expressed in terms of the dollars of a particular base fiscal year.
Cost Specialist	Refers to the cost estimating, planning and control team or an individual performing these functions.
Current dollar estimate	Refer to: <i>budget year dollars</i>
Budget-year dollars	This is an estimate based on costs arising in each FY of the project schedule, which is escalated to account for inflation and other economic factors affecting the period covered by the estimate Budget year dollars is also be referred to as Nominal dollars or Current dollars
Departmental Representative	The person designated in the contract, or by written notice to the Consultant or Contractor, to act for PWGSC for the purposes of the contract. It can also be a person designated in writing by the Departmental Representative to act on his/her behalf. In most cases, the PWGSC Project Manager is the Departmental Representative
EMV	Expected monetary value of risk event (i.e. cost or saving to the project if risk event occurs)



Final Certificate of Completion	A document issued by the Project Manager after the final inspection by the Project Acceptance Board. The final payment to the Contractor by PWGSC is based on the final certificate of completion
Final Inspection	The inspection performed by the Project Acceptance Board after project completion and after correction of deficiencies identified during Interim Inspection
Fit-up for initial occupancy	The preparation of accommodation for initial occupancy, in accordance with the federal Fit-up Standards. This fit-up may include alternations to the base building and its building systems.
Fit-up of existing space for reuse, Refit	Work required to alter space previously occupied by one organization to meet the requirements of a different organization.
Fit-Up Cost Limits	The funding limits for the fit-up of office accommodation. The limits are based on the average cost per useable square meter, for fit-up elements in specific urban centres across Canada, and are updated from time to time. The limits do not include soft costs or items funded by clients or under base building costs.
Fit-Up Items	Components that are installed removed or relocated to prepare the space for occupancy. They include partition walls, doors, frames, hardware, counters and cabinetry, modifications to base building systems, etc. as detailed in the Fit-up standards. Some base building components are included in consultant scope of work, such as the flooring and the ceiling finishes or telecommunications spaces and related environmental controls.
Focus Group	Group sessions held to establish qualitative requirements. They are most effective at the strategic planning level. They are used primarily to translate the Client Department's mission statement into organizational requirements and to assess planning alternatives
Full-time equivalent.	It measures of labour utilization in the federal government which approximates the actual number of persons "employed" by the government for carrying out the unit of work
Functional space equation	Identifies space requirements (in usable m ²) by group along with summary of the total space required for all groups.
Gross Space	The total floor space
High risk	A project (or element of a project) may be assessed as high risk if one or more hazards exist in a significant way and, unless mitigated, would result in probable failure to achieve project objectives
Impact	The result of the occurrence of an event on the project either positive or negative (i.e. a schedule delay as a result of late delivery of a piece of equipment may have a high negative impact on a project; increased access to a construction site due to early departure of occupants in an office space may have positive



	<p>impact on a project).</p> <p>The Impact of individual Risk Events can be qualified as low, medium, high or quantified in terms of time, cost (immediate cost or in-service cost (O&M)) or performance.</p>
Interim Certificate of Completion	The certificates issued by Project manager following the Interim Inspection. Interim payment to the Contractor by PWGSC is based on the interim certificates. This payment takes place of a regular progress claim.
Interim Inspection	The inspection performed by the Project Acceptance Board after substantial completion of the project. A list of deficiencies is prepared, and subject to the Contractor's agreement to correct these, the Project Manager accepts the work and prepares the interim certificates
LEED®	Leadership in Energy & Environmental Design; an environmental rating system
Low risk	A project (or element of a project) should be assessed as low risk if hazards do not exist or have been reduced to the point where routine project management control should be capable of preventing any negative effect on the attainment of project objectives
Medium risk	A project (or element of a project) may be assessed as medium risk if some hazards exist but have been mitigated to the point that allocated resources and focused risk management planning should prevent significant negative effect on the attainment of project objectives
National Project Management System	The system used by PWGSC for management of its projects. It replaces the earlier Project Delivery System (PDS).
PI Forms	Product Information forms; used in commissioning documentation
Probability	The likelihood that an event will occur (i.e. Low, Medium, High)
Project Acceptance Board	A team assembled by the Project Manager to perform interim and final inspections of the Client Department's improvements.
PV Forms	Performance Verification forms; used in commissioning documentation
Record drawings	Drawings used to record field deviations, dimensional data, and changes or deviations from the 'Construction Document-Issued for Construction'. They indicate the work as 'actually' installed. They are also called as-builts
Rentable Space	Usable space plus space occupied by columns, convectors, elevator lobbies and washrooms. It also includes some common base building areas such as telephone and janitorial closets.
Request for Proposal	The document used for requesting consultant services. It includes the Terms of Reference as well as other contracting documents



Risk management	The art and science of identifying, analysing, and responding to risk factors throughout the life of a project and in the best interests of its objectives
Risk Event	A discrete occurrence that may affect the project for better or worse (i.e. late delivery of a piece of equipment is a “risk event” that may cause a schedule delay)
Scheduler	Refers to the Time Scheduler; also referred to as Time Specialist
Space Equation	A spreadsheet that reflects the Client’s organizational structure, functional requirements, and proposed planning alternatives. It is used to determine the total usable area required to accommodate the following: Open and enclosed workstations/worksettings; Support space; Special purpose space circulation factor; Building loss factor; Total population; and Total space required; and Summary by group
Space Optimization	Maximizing the utilization of space.
Special Purpose Spaces	Non-standard spaces required to accommodate activities that are essential to departmental programs. This space is often not suitable for conversion to office accommodation because of its special requirements. Examples include: laboratories, health units or clinics, meeting or training complexes which serve outside groups, processing space, departmental libraries, gymnasiums, warehouses, file or storage areas not allowed by the PWGSC Fit-Up Standards, trade shops, mailrooms, computer training rooms, cash offices and similar spaces requiring special service and security features and hearing rooms.
Support Space	Space for typical office support functions not included in workstation or circulation space but necessary for office operation. The Fit-Up Standards identify specific sizes and ratios for kitchenette / recycling centre / lunchroom / resource areas, shared equipment spaces, meeting rooms, quiet / touch down rooms, printer stations, reception / mail drop / waiting / display areas and coat / storage closets. Limited allowances for “Other” support spaces including non-dedicated workstations, storage rooms, LAN rooms, breakout rooms, interview rooms, training rooms, reading rooms etc. are also identified in the Fit-Up Standards.
Terms of Reference	A document prepared by PWGSC when requesting Consultant services, which forms part of the RFP and is also included in the Consultant Agreement with PWGSC.
Universal Footprint	One standard module which can be multiplied to accommodate



	all office functions including workstations, support space and special purpose space
Usable space, “Walk-on” Space	The space, in M ² , that is actually usable by the occupant. Measurement calculations do not include columns and convectors, building service areas and accessory areas.
Worksettings	Common work areas that support both collaboration and privacy. They include: teaming areas, non-dedicated workstations, privacy nooks, resource areas and multipurpose areas.
Workstations	An enclosed or open area dedicated for the use of individual employees.

F.2 ACRONYMS

ACRONYM	DESCRIPTION
A&E	Architecture & Engineering
AHJ	Authorities Having Jurisdiction
AMP	Asset Management Report
ASAE	American Society of Agricultural Engineers
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASPE	American Society of Plumbing Engineers
BCC	Building components and connectivity
BCR	Building Condition Report
BMM	Building Maintenance Manual
CAD	Computer aided drawing
CCDC	Canadian Construction Document Committee
CBIP	Commercial building incentive program
COE	PWGSC Centre of Expertise
EMCS	Energy Monitoring & Control System
EPA	Effective Project Approval
FHBRO	Federal Heritage Building Restoration Office
FOBS	Federal Office Building Standards (PWGSC)
FTE	Full-time equivalent
HCP	Heritage Conservation Program
HRSDC	Human Resources and Skills Development Canada
IT/MM	Information Technology/Multi-media
MMS	Maintenance management system
NBC	National Building Code
NCA	National Capital Area;
NCR	National Capital Region;
NFBC	National Farm Building Code
NGMA	National Greenhouse Manufacturers' Association
NMS	The National Master Specification used by PWGSC



NPMS	National Project Management System
OAA	Ontario Association of Architects
O&M	Operation and Maintenance
P&S	General Procedures and Standards
PA	Project administration
PI	Product Information
PD	Project Description
PM	Project Manager
PV	Performance verification
PWGSC	Public Works and Government Services Canada
RAIC	Royal Architectural Institute of Canada
RAS	Requirements and Standards
RS	Required Services
RSR	Resident site services
RPCD	Real Property Contracting Directorate
TOR	Terms of Reference

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PWU-8-41034

Buyer ID - Id de l'acheteur
pwu023
CCC No./N° CCC - FMS No/ N° VME

SUBMISSION REQUIREMENTS AND EVALUATION

- 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 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

An 'Overview of the selection procedure' can be found in R1410T General instructions to Proponents (GI3).

1.2 Calculation of Total Score

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

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

- Submit one (1) bound original plus one electronic copy on a data storage device of the proposal
- Paper size should be - 216mm x 279mm (8.5" x 11")
- Minimum font size - 11 point Times or equal
- Minimum margins - 12 mm left, right, top, and bottom
- Double-sided submissions are preferred
- One (1) 'page' means one side of a 216mm x 279mm (8.5" x 11") sheet of paper
- 279mm x 432 mm (11" x 17") fold-out sheets for spreadsheets, organization charts etc. will be counted as two pages.
- The order of the proposals should follow the order established in the Request for Proposal SRE section

2.2 Specific Requirements for Proposal Format

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

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

- Covering letter
- Table of Contents
- Consultant Team Identification (Appendix A)
- Declaration/Certifications Form (Appendix B)
- Integrity Provisions – Required Documentation
- Front page of the RFP
- Front page of revision(s) to the RFP
- Price Proposal Form (Appendix C)

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

SRE 3 SUBMISSION REQUIREMENTS AND EVALUATION

3.1 MANDATORY REQUIREMENTS

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

3.1.1 Licensing, Certification or Authorization

The proponent shall be an Airfield Electrical and Visual Aid Engineer, licensed, 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 in the province of Manitoba.

3.1.2 Consultant Team Identification

The consultant team to be identified must include the following:

Proponent (prime consultant)	Airfield Electrical and Visual Aid Engineer
Key Sub-consultants / Specialists	Structural Engineer
	Civil Engineer
	Geotechnical Engineer
	Topographical Surveyor
	Cost Estimator

If the proponent proposes to provide multidisciplinary services that might normally be provided by a sub-consultant, this should be indicated here.

Information required - name of firm, key personnel to be assigned to the project. For the prime consultant indicate current license and/or how you intend to meet the provincial or territorial licensing requirements. In the case of a joint venture identify the existing or proposed legal form of the joint venture (refer to R1410T General instructions to Proponents, GI9 Limitation of submissions).

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

3.1.3 Declaration/Certifications Form

Proponents must complete, sign and submit the following:

- Appendix B, Declaration/Certifications Form as required.

3.1.4 Integrity Provisions – Required documentation

In accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Proponent must provide, **as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2017-08-17), General instructions 1 (G1), Integrity Provisions – Proposal, **section 3a**.

3.2 RATED REQUIREMENTS

3.2.1 Achievements of Proponent on Projects

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

Select a **maximum** of 3 projects undertaken within the last 10 years. Joint venture submissions are not to exceed the maximum number of projects. Only the first 3 projects listed in sequence will receive consideration and any others will receive none as though not included.

Information that should be supplied:

- clearly indicate how this project is comparable/relevant to the requested project.
- brief project description and intent. Narratives should include a discussion of design philosophy / approach to meet the intent, design challenges and resolutions.
- budget control and management - i.e. contract price & final construction cost - explain variation
- project schedule control and management - i.e. initial schedule and revised schedule - explain variation
- client references - name, address, phone and fax of client contact at working level - references may be checked
- names of key personnel responsible for project delivery
- awards received

The Proponent (as defined in R1410T General instructions to Proponents, G12 Definitions) must possess the knowledge on the above projects. Past project experience from entities other than the Proponent will not be considered in the evaluation unless these entities form part of a joint venture Proponent.

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

3.2.2 Achievements of Key Sub-consultants and Specialists on Projects

Describe the accomplishments, achievements and experience either as prime consultant or in a sub-consultant capacity on projects. If the Proponent proposes to provide multi-disciplinary services which might otherwise be performed by a sub-consultant, this should be reflected here.

Select a **maximum** of 3 projects undertaken within the last 10 years per key sub consultant or specialist. Only the first 3 projects listed in sequence (per key subconsultant or specialist) will receive consideration and any others will receive none as though not included.

Information that should be supplied:

- clearly indicate how this project is comparable/relevant to the requested project.
- brief project description and intent. Narratives should include a discussion of design philosophy / approach to meet the intent, design challenges and resolutions.
- budget control and management
- project schedule control and management
- client references - name, address, phone and fax of client contact at working level - references may be checked
- names of key personnel responsible for project delivery
- awards received

3.2.3 Achievements of Key Personnel on Projects

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

Information that should be supplied for each key personnel:

- professional accreditation
- accomplishments/achievements/awards
- relevant experience, expertise, number of years experience
- role, responsibility and degree of involvement of individual in past projects

3.2.4 Understanding of the Project:

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

Information that should be supplied:

- The functional and technical requirements
- Broader goals (federal image, sustainable development, sensitivities)
- The relationship between this commission and any earlier studies completed for PWGSC
- Significant issues, challenges and constraints
- Project schedule and cost. Review schedule and cost information and assess risk management elements that may affect the project
- The Client User's philosophies and values

3.2.5 Scope of Services:

The proponent should demonstrate capability to perform the services and meet project challenges and to provide a plan of action.

Information that should be supplied:

- Scope of Services - detailed list of services
- Work Plan - detailed breakdown of work tasks and deliverables
- Project schedule - proposed major milestone schedule
- Risk management strategy

3.2.6 Management of Services:

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

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

Information that should be supplied:

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

3.2.7 Design Philosophy / Approach / Methodology

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

Information that should be supplied:

- Design Philosophy / Approach / Methodology
- Describe the major challenges and how your team approach will be applied to those particular challenges.

3.3 EVALUATION AND RATING

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

Criterion	Weight Factor	Rating	Weighted Rating
Achievements of Proponent	2.0	0 - 10	0 - 20
Achievements of Key Sub-consultants / Specialists	1.0	0 - 10	0 - 10
Achievements of Key Personnel on Projects	2.0	0 - 10	0 - 20
Understanding of the Project	1.5	0 - 10	0 - 15
Scope of Services	1.0	0 - 10	0 - 10
Management of Services	1.0	0 - 10	0 - 10
Design Philosophy / Approach / Methodology	1.5	0 - 10	0 - 15
Technical Rating	10.0		0 - 100

Generic Evaluation Table

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

	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

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

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

SRE 4 PRICE OF SERVICES

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of fifty (50) points will be opened upon completion of the technical evaluation. When there are three or more responsive proposals, an average price is determined by adding all the price proposals together and dividing the total by the number of price proposals being opened. This calculation will not be conducted when one or two responsive proposals are received.

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

The remaining price proposals are rated as follows:

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

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

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Buyer ID - Id de l'acheteur
pwu023
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SRE 5 TOTAL SCORE

Total Scores will be established in accordance with the following:

Rating	Possible Range	% of Total Score	Score (Points)
Technical Rating	0 - 100	90	0 - 90
Price Rating	0 - 100	10	0 - 10
Total Score		100	0 - 100

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

SRE 6 SUBMISSION REQUIREMENTS - CHECKLIST

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

Please follow detailed instructions in R1410T General instructions to Proponents, G116 Submission of proposal, as amended in SI2 Proposal documents. 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 (2017-08-17), General instructions 1 (G11), 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 (2017-08-17), General instructions 1 (G11), Integrity Provisions – Proposal, **section 3b.**
- Proposal - one (1) original plus an electronic copy on a data storage device
- 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, not to be included on electronic copy



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Engineering Services

TERMS OF REFERENCE

Churchill Airfield Runway Lighting Rehabilitation Churchill, Manitoba

For:
Transport Canada

May 25 2018

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1 PROJECT DESCRIPTION

1.1 GENERAL

1.1.1 SERVICES

- .1 Public Works and Government Services Canada (PWGSC) requires the services of an Airfield Electrical and Visual Aid Engineering Consultant acting in the capacity of the coordinating engineer of record, together with a multi-disciplinary team of sub-consultants for the provision of service required for Churchill Airfield Runway Lighting Rehabilitation, Churchill Manitoba.

1.1.2 THE PWGSC GENERAL PROCEDURES AND STANDARDS DOCUMENT (GP&S)

- .1 The Terms of Reference (TOR) document must be used in conjunction with the GP&S, as the two documents are complimentary.
- .2 The TOR describes project-specific requirements, services and deliverables while the GP&S document outlines with minimum standards and procedures common to all projects.
- .3 In the case of a conflict between the two documents, the requirements of the TOR override the GP&S Document.

1.1.3 PROJECT INFORMATION

Project Information	
Project Title:	Churchill Airfield Runway Lighting Rehabilitation
Project Address:	Churchill Airport, Churchill, Manitoba
Solicitation Number:	ET025-190514/A
PWGSC Project Number:	R.095823.001
PWGSC Contracting Officer:	
PWGSC Departmental Representative:	

1.2 BACKGROUND INFORMATION

1.2.1 NEED & GOALS

- .1 Transport Canada operates the Churchill Airport and is responsible for the airport facilities. The existing airfield lighting/visual aids, and its associated infrastructure, are in poor condition and needs rehabilitation.
- .2 The project scope includes all new equipment, conduits, ducts, secondary cables, transformers, and pull pits (all airfield lighting) as well as, but not limited to, the following:
 - .1 Runways 15-33
 - .1 Remove and replace with new:
 - .1 High intensity edge lights
 - .2 Runway end/threshold lights

- .3 PAPI on Runway 15 and Runway 33 Approach, to suit new aircraft or most critical design standard
- .4 New concrete bases and foundations, as well as reinstalling RIL (LEDs) on Approach 15
- .5 Complete SSALR system, including all towers and bases on Approach 33
- .2 Reinstall runway guard LED lights on Taxiway A
- .2 Runways 07-25
 - .1 Remove and replace with new:
 - .1 Medium intensity edge lights
 - .2 End/threshold lights
 - .3 PAPI, as well as new Approach, to suit new aircraft or most critical design standard
 - .4 RIL on Approach 25
- .3 Taxiway A and Taxiway B
 - .1 Remove and replace with new high intensity edge lights
- .4 Apron 1
 - .1 Remove and replace with new medium intensity edge lights
 - .2 Remove and replace flood lights. Provide new pole wiring and controls including common photocell and hand, off, auto control (existing underground power feeders to remain).
- .5 Apron 2 and Taxiway C
 - .1 Construct new edge lights
- .3 Investigate the following existing conditions:
 - .1 Wind Direction Indicators, including access, bases and foundations. Provide recommendations.
 - .2 All airfield lit signs, including bases and foundations. Provide recommendations.
- .4 The project will require replacement of all underground and over-ground equipment and infrastructure, including ducts, pre-manufactured pull pits, anchor stakes, light towers, and windsock posts (including foundations).
- .5 All new electrical system and edge light spacing to be in accordance with TP-312 (5th Edition) and the 2018 Canadian Electrical Code.
- .6 Utilize LED technology extensively.
- .7 At Runways 15-33, the PAPI design to include the minimum distance from threshold for 737-400 aircraft or the most stringent requirements.
- .8 Provide load calculations for all systems, including all new LED lighting and arctic heater light kits.

1.2.2 USER DEPARTMENT

- .1 The User Department referred throughout the TOR is Transport Canada.

1.2.3 EXISTING CONDITIONS/TECHNICAL ASSESSMENT

- .1 The Runways' (07-25 and 15-33) lighting and electrical systems were upgraded in 1990/2000 based on the TP-312E 4th Edition.

- .2 Crosswind Runway 07-25: 1220 x 30 meters (4000 x 100 feet), gravel surface; non-precision approach, medium intensity edge lights, PAPI on 07 and 25, two wind direction indicators, and runway indicator lights (strobes) on 25 (only).
- .3 Primary Runway 15-33: 2805 x 49 meters (9200 x 160 feet), CAT I approach, high intensity edge lights, two wind direction indicators, reduced visible operations. Runway 15 is a non-precision approach PAPI while there is no PAPI on 33.
- .4 The severe environment (salt air, extreme wind, cold) has deteriorated all surface-mounted equipment including runway edge, end, and approach lights, wind cones, and PAPIs.
- .5 Many of the existing underground duct system, installed in 1983, are damaged. Eleven known sections, 427 meters (1400 feet) are not re-usable: were installed to TP-312 3rd Edition (not to current spacing), contain several frost heaving pull pits, and contain various damaged lids.
- .6 The existing constant current regulators (CCR) include:
 - .1 Four (4) 20 kW (Westinghouse) were installed in 1983, two for Runway 15-33's edge lights and two for Runway 33 High Intensity Approach (SSALR). These CCRs (primary) are fed a high voltage cell at 2400 volts AC and will need to be removed and replaced with the appropriate size and fed (primary) from a new low voltage 208 volt AC source.
 - .2 Ferroresonant regulators type (ADB) are to be reused:
 - .1 One (1) 7.5 kW for Runway 07-25's medium intensity edge lights
 - .2 One (1) 4.0 kW for the taxiways/aprons' edge lights
 - .3 Three (3) 4.0 kW for the PAPI system
- .7 High water table and poor drainage near end of Runway 15.

1.2.4 CONSTRAINTS AND CHALLENGES

- .1 General
 - .1 The Consultant will be required to become familiar with the project site and obtain local site information as required.
 - .2 All site visits must be arranged through the Departmental Representative.
 - .3 The construction on the project will be performed during full airport operation. Construction will take place over a 2-year period, the first runway under construction while the other runway fully operational until the following year when the first runway will be complete and the 2nd now can be rehabilitated. The Certificate of Interim Completion will be issued once Runway 1 is satisfactorily completed and the Certificate of Substantial Completion will be issued once Runway 2 is satisfactorily completed. Project phasing must be planned to ensure that disruption to the daily operation of the facilities is kept to a minimum and approved by Transport Canada.
 - .4 Environmental conditions must be kept under control during all phases of the work.
 - .5 The project scope must be tailored to meet the User Department's budget. Diligent cost breakdown estimating and cost control is required.
 - .6 The Consultant may be required to obtain security clearances for all his/her firm's personnel as well as any sub-consultants to visit the project site for reasons, such as:

site reviews, attendance for site design meetings, etc. Security clearance checks may include credit checks.

- .7 Environmental restrictions will be confirmed through an independent environmental assessment, which will be provided by Transport Canada. Environmental assessment is to be excluded from this assignment.
- .8 Consultant's key personnel must be available to respond to inquiries within 48 hours.
- .9 Consultant's key personnel must be available to respond to emergencies within 4 hours.
- .2 Technical
 - .1 Relatively short construction season – project construction phased over 2 years.
 - .2 Current rail system to Churchill is out of commission therefore potential increased mobilization cost.

1.2.5 HAZARDOUS MATERIALS

- .1 No hazardous materials have been identified at this site through various audits of this facility.

1.2.6 PROJECT DELIVERY APPROACH

- .1 This project will use a design-bid-build approach.

1.3 SUMMARY OF DESIGN WORK

1.3.1 GENERAL

- .1 The design intent of the project is to rehabilitate all airfield visual aids and associated electrical and structural infrastructure of Runway 15-33, Runway 07-25, Taxiway A, Taxiway B, Taxiway C, Apron 1, and Apron 2. Ensure that the design:
 - .1 Is effective and efficient;
 - .2 Meets current Codes, Standards and guidelines;
 - .3 Optimizes performance of the system;
 - .4 Is designed for ease of maintenance;
 - .5 Minimizes long-term maintenance costs through provision of suitable corrosion prevention and durability features;
 - .6 Uses industry proven materials and avoidance of experimental materials;
 - .7 Is cost effective considering both initial cost and operation & maintenance costs over a life cycle of 25 years;
 - .8 Responds to the operational and functional needs of the users;
 - .9 Incorporates suitable high quality materials into the design that are of high quality, durable and constructed with first-rate industry practice.
- .2 Design to provide and include, but not limited to:
 - .1 Replace all underground equipment – duct, pull pits, cables, anchor stakes to TP-312 5th Edition requirements including light spacing.
 - .2 Utilize LED technology extensively to reduce energy consumption/GHG footprint – all systems at Churchill now available.

1.3.2 ENVIRONMENTAL/SUSTAINABLE DEVELOPMENT

- .1 Transport Canada is committed to sustainable development and has developed a sustainable development strategy (SDS).

- .1 Environmental impact of materials should be considered throughout both product and facility life cycles, including source and eventual disposal.
- .2 Management of construction and demolition waste.

1.3.3 PROJECT DELIVERY

- .1 The design must be tailored to the project budget.
- .2 Services shall be delivered per key milestones indicated in the project schedule.
- .3 Ensure that each Consultant team member understands the project requirements, for seamless delivery of the required services.
- .4 Ensure full co-ordination of services with Airport Manager (APM).
- .5 Provide a quality management plan that includes rigorous quality reviews.
- .6 Provide a continuous risk management program; address the risks associated specifically with this project.

1.4 SUMMARY OF SERVICES AND QUALIFICATIONS

1.4.1 GENERAL SERVICES

- .1 Along with their own services, the prime consultant, Airfield Electrical and Visual Aid Engineer, will provide a full consulting team including the following additional consultant services and specialties:
 - .1 Professional Engineering Services
 - .1 Structural Engineering
 - .2 Civil Engineering
 - .3 Geotechnical Engineering
 - .2 Topographic Surveyor
 - .3 Cost Estimating Specialist.

1.5 SCHEDULE

1.5.1 GENERAL

- .1 The project is to be delivered, ready for acceptance in accordance with the project milestones identified below.
- .2 Completion dates shown are relative to an assumed start date of August 10, 2018.
- .3 Prepare a Project Schedule, in accordance with the milestone list.

1.5.2 ANTICIPATED MILESTONE DATES

Project Phase	Milestone Completion Date
Consultant Contract Award	August 10, 2018
Preliminary Design Phase - Pre-design Report	September 28, 2018
Pre-design Report Review	October 12, 2018
Phase 1: Runway 1 (07-25)	
66% Design Package/Cost Estimate	November 7, 2018
66% Design Package Review	November 23, 2018
99% Design Package/Cost Estimate	December 21, 2018
99% Design Package Review	January 4, 2019
Final Construction Documents	January 18, 2019
RPC Tender Posted	February 5, 2019
Tender Closed	March 5, 2019
Tender Award	March 19, 2019
Supplies/Equipment at Sealift (estimated, TBD)	June 11, 2019
Construction Start (estimated, TBD)	July 9, 2019
Commissioning Completion and Work review	October 1, 2019
Substantial Performance Review and Issue	October 4, 2019
Certificate of Completion Issued	October 31, 2019
Warranty Inspection (10 month)	August 4, 2020
Phase 2: Runway 2 (15-33)	
66% Design Package/Cost Estimate	September 9, 2019 *
66% Design Package Review	September 23, 2019*
99% Design Package/Cost Estimate	October 21, 2019*
99% Design Package Review	November 4, 2019*
Final Construction Documents	November 18, 2019*
RPC Tender Posted	December 10, 2019
Tender Closed	January 14, 2020
Tender Award	January 28, 2020
Supplies/Equipment at Sealift (estimated, TBD)	June 11, 2020
Construction Start (estimated, TBD)	July 9, 2020
Commissioning Completion and Work Review	October 6, 2020

Substantial Performance Review and Issue	October 9, 2020
Certificate of Completion Issued	November 6, 2020
Warranty Inspection (10 month)	September 7, 2021

*** Note: Design of Phase 2 may begin earlier, at Consultant’s discretion, provided the November 18th 2019 deadline for Final Construction Documents is not exceeded.**

1.6 COST

1.6.1 CONSTRUCTION BUDGET

- .1 The construction estimate does not include Project Management fees, administration costs, consultant fees, Risk Allowance, Escalation or GST and is in ‘Budget-Year (Current)’ dollars.
- .2 The construction cost is estimated to be \$3,600,00.00

1.7 EXISTING DOCUMENTATION

1.7.1 AVAILABLE FOR THE CONSULTANT

- .1 Copies of all available documentation will be made available to the Consultant.
- .2 Limited record/as-built electrical and civil drawings are available, in both PDF and CAD formats. The Consultant will be responsible for verifying the accuracy and update all of the

required information to be incorporated into the design. Ensure to include for all underground services including crossings adjacent to new work areas where applicable.

- .3 GP&S Document.

1.7.2 DISCLAIMER

- .1 Reference information will be available in the language in which it is written.
- .2 The documentation may be unreliable and is offered, "As-is" for the information of the Consultant.

1.8 CODES, ACTS, STANDARDS, REGULATIONS

- .1 A listing of Codes, Acts, Standards and Guidelines potentially applicable to this project are contained in the GP&S Document.
- .2 The Authorities Having Jurisdiction (AHJ) on this project are:
 - .1 The local AHJs
 - .2 Transport Canada
- .3 The Consultant must identify, analyze and design the project in accordance with the requirements of all AHJs and all applicable Codes, Acts, Standards and Guidelines and Legislation.
 - .1 The applicability of various Codes, Acts, Standards and Guidelines listed in the GP&S document arise out of direct and indirect references in documents which apply to Federal buildings, such as the Canada Labour Code.
 - .2 The consultant team must be fully versed with the legislation and requirements that are unique to Federal Government buildings in Canada.
 - .3 The consultant team must be fully versed with the legislation and requirements that are unique to Federal Government projects tendered through Public Works & Government Services Canada.
- .4 Transport Canada and NAV Canada standards.

2 REQUIRED SERVICES

2.1 GENERAL REQUIREMENTS

2.1.1 SERVICES

- .1 Preliminary Design Service: to provide a Preliminary Design Report.
- .2 Design Service: to provide construction documents for review at 66%, 99%, 100% (Tender) completion stages.
- .3 Tender Services - to assist the Departmental Representative.
- .4 Construction Support Service.
- .5 Commissioning Service.
- .6 Post Construction Service.

2.2 PROJECT REVIEW AND APPROVAL

2.2.1 GENERAL

- .1 Comply with all applicable laws and regulatory requirements as required by the General Conditions of the Contract.

2.2.2 FEDERAL GOVERNMENT

- .1 The federal authorities having jurisdiction over this project are:
 - .1 Transport and NAV Canada for functional design;
 - .2 Environment Canada for environmental regulations;
 - .3 User Department for project program review; and
 - .4 PWGSC

2.2.3 REVIEWS, APPROVALS AND PRESENTATIONS

- .1 Each submission at each stage of the project is subject to reviews by, the Departmental Representative, the User Department site personnel, the User Department technical experts and the PWGSC Architectural and Engineering Centre of Expertise group.
- .2 For the A&ECoE review at each stage:
 - .1 Review submissions to be posted on Buzzsaw in PDF format and provide two (2) printed copies of drawings;
 - .2 Expected turn-around time for reviews is two (2) weeks;
 - .3 The consultant team will receive review comments in the form of an editable MS Word document or MS Excel document;
 - .4 The consultant shall provide a single coordinated written response to the comments.

2.2.4 MUNICIPAL AUTHORITIES

- .1 The federal government generally defers to municipal authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.
- .2 Municipal authority review:
 - .1 The purpose of this review is information and awareness;
 - .2 Submit construction documents as required to obtain municipal approval.

2.3 PRELIMINARY DESIGN SERVICE

2.3.1 GENERAL

- .1 The Consultant Team will review and analyze all available project information, consult with the Departmental Representative, and deliver a comprehensive Preliminary Engineering Report.
- .2 The Preliminary Engineering Report will consolidate the Scope of the design and will be utilized as the benchmark project control document to monitor progress of the project.

2.3.2 SCOPE AND ACTIVITIES

- .1 Review all available existing material related to the project including requirements identified in the TOR.
- .2 Identify the Authorities Having Jurisdiction (AHJ) and the applicable Codes, regulations and standards.
- .3 Visit the site, analyze site conditions, document any conditions that will impact project delivery & design and report the results to the Departmental Representative;

- .4 Identify any conflicts that will need to be addressed with respect to scope, quality, schedule, and cost.
- .5 Meet with Transport and NAV Canada representatives to discuss and identify and update all functional requirements including the following:
 - .1 Project phasing and OPS plan details. Determine the facilities available, including length of runways and visual and instrument aids for each phase of construction. The OPS plan to include the NOTAM including timelines and authorities. The OPS plan also needs to include the details of barriers paint lines and temporary lighting at night. The completed OPS plan to be approved and signed by the Churchill APM, Transport Canada, and NAV Canada authorities.
 - .2 Design aircrafts
- .6 Identify and verify all AHJ over the codes, regulations and standards that apply to the project.
- .7 Identify and analyze all Codes, Acts, Standards and Guidelines that apply to this project.
- .8 Identify any additional constraints or challenges.
- .9 Identify all additional information that will be needed to deliver the project, including a geotechnical investigation.
- .10 Conduct a survey of the condition of all existing infrastructure, including electrical, structural, and footings. Determine the potential causes of infrastructure premature failures, for example frost heaving, improper connectors, not using premanufactured pull pits, etc. Recommend solutions to eliminate these causes for the new design, recommendations for a design life of minimum 25 years.
- .11 Analyse existing underground condition of ducts (including spares) and cables crossing runways, taxiways, aprons, and roadways. Determine whether adequate to accommodate new replacement cables. Provide recommendations and options.
- .12 Analyse and confirm the project requirements with the Departmental Representative.
- .13 Establish sustainability targets.
- .14 Conduct a digital topographical control survey using Total Station, or an alternative technology deemed superior, as follows:
 - .1 Survey additional larger areas as indicated on drawings.
 - .2 Control to be produced using the 6-degree UTM grid system and geodetic mean sea level datum for all survey positioning. The horizontal datum is to be NAD 83. Tie in to total station survey with a minimum of three (3) geodetic monuments and clearly indicate them on survey drawings. Provide ASCII format file containing information in the following order for each survey point: Point Number, Northing, Easting, Elevation, and Description (as required to identify specific items; abbreviations are acceptable if legend for them is provided).
 - .3 Indicate and define Grid North UTM and True North relative angles.
 - .4 Process horizontal control data using rigorous least squares adjustment program.
 - .5 Conduct topographic survey of Runway 15-33, Runway 07-25, Aprons, and Taxiways including all related electrical and other infrastructure. The survey is to include sufficient

areas and all features to complete the design and construction. The survey is to include the following:

- .1 Runways 15-33 and 07-25:
 - .1 Centrelines, edges of runways, runway edge lights, sufficient area on graded area and both ends of runways. Stations not more than 20m and all corner fillets. Take more dense points, if required, to check runway edge lights vertical alignments.
 - .2 Sufficient points and area beyond threshold of runways for PAPI, SSALR, RIL, etc. of existing and for proposed design of new infrastructures.
 - .3 All utilities crossing the facilities, including all underground or above ground electrical or communication cables and storm drainage pipes and CB and MH with inverts.
 - .4 Aprons and taxiways:
 - .1 Centrelines, edges, and sufficient graded areas and spot elevations not more than 10m from each other and all corner fillets.
 - .5 All CB MH tops and subsurface drainage including invert of all pipes. All other utilities crossing the facilities.
- .6 All lights top and ground, including edge lights, PAPI, RIL, SSALR.
- .7 Pull pits, windsocks, and any other features.
- .8 Prepare a 1:1000 scale AutoCAD drawing of all survey points. Each point to have appropriate survey data attached (i.e. Northing, Easting, Elevation, Description).
 - .1 Join like features (e.g. edge of pavement, centreline, edge lights tops, edge lights bottom, etc.) with lines and indicating break lines for features.
 - .2 Logically assemble and label like features/object data, annotate by colour, and group by layer in the CAD file. Ensure each data point has its associated Point number annotated. Topographical data points and benchmarks are to be placed on exclusive drawing layers. Provide legend describing each point type Description code.
 - .3 Provide contour lines at maximum 0.20m intervals to indicate topographical features on the 1:1000 scale drawings based on the grid elevation data.
 - .4 Surveyed area is to be mapped into a single CAD file only. The CAD file is not to be broken down into separate sub-files joined by match lines. Use "ground" coordinates to create the file.
 - .5 Provide drawing in UTM Ground Coordinates, indicating BMs and scale factor used to calculate Ground Coordinates.
 - .6 Do not use drawing level 0 (zero).
 - .7 Clearly indicate geodetic monuments on the drawing.
 - .8 Prepare vertical profiles of centrelines, edge, and edge lights of runways and taxiways.
- .9 Provide ASCII format files containing information in the following order for each survey point: Point Number, Northing, Easting, Elevation, and Description (as required to

identify specific items; abbreviations are acceptable provided a legend for them is also submitted). Files are to be comma delimited.

- .10 Submittals: Submit the following:
 - .1 One ASCII survey point file in the each of the following formats:
 - .1 UTM "ground" coordinates
 - .2 UTM "grid" coordinates
 - .11 Survey Precision
 - .1 Vertical Precision: the vertical precision is to 5mm for asphalt PCC surfaces and 10mm for gravel and grass surfaces.
 - .2 Horizontal Precision: the horizontal control points are to 1 in 25000.
 - .12 All site work is to be coordinated through the Airport Manager or designated representative of Churchill Airport.
- .15 Conduct a geotechnical investigation, if required, to investigate any infrastructure failures.
- .16 Use pre-manufactured pull pits designed and suitable for Churchill's low temperatures.
- .17 Investigate and evaluate the existing distributions, panels, feeders, enclosures, cells and breakers space, equipment (high and low voltage single line) and room layout for capacities, load balancing, and load calculations (per circuit), configuration to suit new and

future expansion requirements. Include options and related costs for each with the Pre-Design Report.

- .18 Investigate LEDs' vs incandescent lighting systems' cost based analysis, including but not limited to energy, capital cost, distribution, availability, maintenance, and equipment including the required arctic heaters (LED) requirements.
- .19 Include quality construction assurance control methods to ensure installation conforms and meets requirements, including for excavation, compacting, backfilling, equipment, conduits and ducts, cabling, field lighting, etc.
- .20 Locate all existing system lights, signs, systems, ducts, conduits, equipment, and cables and prepare As-Is drawings including all related details.
- .21 Verify ducts and pull pit sizes and their capacities.
- .22 Verify interconnecting distances between FEC and Control Tower.

2.3.3 DELIVERABLES

- .1 A Draft Preliminary Engineering Report that will contain at a minimum:
 - .1 Executive Summary;
 - .2 Necessary sections to document and present the items listed in the Scope and Activities section;
 - .3 Class C cost estimate;
 - .4 Updated schedule;
 - .5 Preliminary Commissioning Plan;
 - .6 Topographic survey data and drawings;
 - .7 Existing infrastructure investigation and condition report, describing the cause of failures and recommendations for new design;
 - .8 Preliminary OPS Plan;
 - .9 Site Plan, including all geometrics indicating scope of work;
 - .10 Specification sections list and index;
 - .11 Typical details for all feature, such as edge lights, PAPI, RIL, etc.
- .2 Final Preliminary Engineering Report with a written response to comments.

2.4 DESIGN SERVICE

2.4.1 GENERAL

- .1 The objective of this stage is to translate the Preliminary Phase findings into construction drawings and specifications for the purpose of tendering.
- .2 The Consultant must obtain written authorization from the Departmental Representative before proceeding with Construction Documents.
- .3 Coordinate with all disciplines.
- .4 As outlined in 2.5.2 Anticipated Milestone Dates, design service to be delivered in two (2) phases.

2.4.2 SCOPE AND ACTIVITIES

- .1 The Consultant shall:
 - .1 Create construction documents in accordance with the General P&S Document;
 - .2 Design according to the budget and schedule;
 - .1 Non-compliances will require revisions to the contract documents.
 - .3 Update the cost estimates;
 - .1 Provide a cost breakdown by unit rate and/or trade for review of bids and comparison with the successful Contractor's cost breakdown.
 - .4 Update the project schedule.
 - .5 Establish a quality control process for the construction and contract administration stage.
 - .6 Participate in review, stakeholder co-ordination and Value Engineering sessions;
 - .7 Update the sustainable design strategy and report on sustainability targets.
 - .8 Update phasing strategy and OPS Plan.
 - .9 Finalize Implementation Plan noting all project constraints.
 - .10 Coordinate the work of various disciplines, including scope changes required to remain within budget.
 - .11 In consultation with Departmental Representative, approve construction materials, processes and specifications considering sustainability and commissioning;
 - .12 Apply a process of continuing cost control, with increasing level of detail during production of contract/construction documents:
 - .1 At each review, prepare an up-to-date estimate demonstrating compliance with the Construction Cost Plan;
 - .2 Non-compliances will require revisions to the contract documents.
 - .13 Prepare a Class B estimate at 66% design and Class A cost estimate at the pre-tender phase, using 100% measured quantities:
 - .1 Provide a cost breakdown by trade for review of bids and comparison with the successful Contractor's cost breakdown.
 - .14 Provide written response to PWGSC comments at 66% and 99% completion review stages and integrate comments into final construction documents.
 - .15 Participate in the risk management processes.
 - .16 Update Project Log tracking approved major decisions.
 - .17 Establish quality control process for construction and contract administration phase.
 - .18 Provide commissioning specifications, Performance Verification Test (PVT) and Component Verification sheet (CV) within applicable sections of the specifications.

2.4.3 DELIVERABLES

- .1 66% complete Construction Documents: This submission incorporates all revisions required by the review of the previous submission, with written responses to PWGSC comments of the previous submittal. Documents to be submitted to the Departmental Representative.
 - .1 Class "B" Estimate.
 - .2 Updated project schedule.
 - .3 Construction Drawings:

- .1 Drawings should reflect 66% completeness with all Plan, Elevation, Details, and Sections shown;
- .2 Updated electrical site plans showing proposed locations of all electrical features such as edge lights, RIL, PAPI, SSALR, etc.
- .3 Refined typical details of all electrical, civil, structural, foundation, and other infrastructures.
- .4 Northing and Easting locations of all lights, signs, windsocks, equipment area pads, structural towers for lights, and all electrical and similar features.
- .5 Northing and Easting for start, end, and all PI of horizontal profiles.
- .6 Design profiles for runways and taxiway edge lights, indicating existing ground grade and proposed design grade of top of lights. Use different station numbers for all profiles. Show all utilities crossing the profiles.
- .7 Curve data for horizontal and vertical design profiles.
- .8 Design and existing grades of any new pads required for relocated systems. Provide similar data for existing pads.
- .9 Design grade of top of all lights and similar features.
- .10 Indicate locations of all features as necessary.
- .11 Use different types of shading to indicate different types of surfaces, such as asphalt, PCC, gravel, grass, etc.
- .12 Use different line types for all utilities.
- .13 New system equipment, not limited to plans, elevations, and cross-section details, including ducts, pull pits, cables (sizes and types), AC power circuits, power panels, trenching, routes. Include sizing and routing.
- .14 Updated single line diagrams, controls, and all wiring riser details.
- .15 Detailed and scaled floor plans, identifying all equipment and sizes including CEC room layout.
- .4 Specifications:
 - .1 Index to specifications;
 - .2 Complete specifications, all sections. Specifications to be thoroughly coordinated with drawings.
- .2 99% complete Construction Documents, fully coordinated as if ready for tender.
 - .1 This submission incorporates all revisions required by the review of the previous submission.
 - .2 The Consultant shall submit documents to the PWGSC Departmental Representative.
 - .3 Ensure to use the term "Departmental Representative" in lieu of the following: Engineer, Consultant, Owner, etc.
 - .4 Under the Quality Control specification section, ensure to specify that all material testing required is for quality control. All quality control testing to be paid for by the Contractor.
 - .5 The submittal shall include:
 - .1 A Class "A" Estimate;
 - .2 A unit price table;

- .3 An updated project schedule;
 - .4 Construction Drawings;
 - .1 Drawings should reflect 99% completeness with a complete design without any unfinished details,
 - .2 Further refined site plans and typical elevations and cross sections and details and where applicable complete Specifications.
 - .5 Specifications should be complete with all sections and thoroughly coordinated with the Drawings and should reflect response to PWGSC written comments of previous submittal.
- .3 Final (100%) Construction Documents ready for tendering.
- .1 This submission incorporates all revisions required by the review of the previous submission.
 - .2 The Consultant shall submit documents to the Departmental Representative and any other Authority having jurisdiction.
 - .3 The submittal shall include:
 - .1 An updated Class 'A' cost estimate;
 - .2 A unit price table;
 - .3 An updated project schedule;
 - .4 Construction Drawings & Specifications;
 - .1 As per the General P&S Document.
 - .5 Response to PWGSC written comments of previous submittal;
 - .6 Advise the Departmental Representative of all issues raised by other officials and all Consultants' responses.
 - .4 The Consultant must confirm in writing that:
 - .1 The documents are ready to be issued for tender;
 - .2 The checklist in the GP&S Document has been reviewed in concert with the requirements of the Consultant Agreement; and
 - .3 A full review and coordination of the Contract Documents are complete and in accordance with professional standard of care.

2.5 TENDER SERVICE

2.5.1 GENERAL

- .1 The object of this phase is to support the Departmental Representative with the tenders.
- .2 The Contract Authority for this project is the Real Property Contracting branch (RPC) of PWGSC.
- .3 As outlined in 2.5.2 Anticipated Milestone Dates, tender service to be delivered in two (2) phases.

2.5.2 SCOPE AND ACTIVITIES

- .1 When requested, the Consultant will be required to:
 - .1 Provide the Departmental Representative with information required by bidders to interpret construction documents.

- .2 Prepare addenda, in response to all questions within two (2) business days during the bidding period and submit to Departmental Representative.
- .3 Attend pre-tender site visits.
- .4 During Bid Review and Analysis, assist the Departmental Representative, as required, by analyzing and reviewing the submitted bid.
- .2 Review the detailed cost breakdown submitted by the low bidder and assist the Departmental Representative in achieving cost savings if required.

2.6 CONSTRUCTION SUPPORT SERVICE

2.6.1 GENERAL

- .1 The object of this phase is to support the Departmental Representative with the construction phases and ensure the quality, budget and schedule of the project.
- .2 As outlined in 2.5.2 Anticipated Milestone Dates, construction support service to be delivered in two (2) phases.

2.6.2 SCOPE AND ACTIVITIES

- .1 The Consultant shall:
 - .1 Share all project information with PWGSC.
 - .2 Turn over all material specifications, mixes, and test results to PWGSC.
- .2 For General Services:
 - .1 Provide electronic copies of all reviewed shop drawings.
 - .2 Prepare record drawings based on the Contractor's As-Builts.
 - .3 Coordinate and provide Operations and Maintenance (O&M) Manual
 - .4 Update the Project Log, tracking approved major decisions (those impacting project scope, budget, and schedule).
 - .5 Prepare and issue a communications protocol and a shop drawing review protocol in consultation with the Departmental Representative.
 - .6 Update sustainability documentation to reflect changes during construction.
- .3 For Site Visits:
 - .1 Provide bi-weekly field reviews as required to fulfil the Consultant's professional obligations to monitor the construction activities throughout the construction period and keep the Departmental Representative (DR) informed of work progress;
 - .1 Reject unsatisfactory work,
 - .2 Provide written reports.
- .4 For Construction and Contract Administration:
 - .1 Provide time management reports, based on the Contractor's submissions and on-site performance.
 - .2 Arrange construction meetings, update the schedule, review detailed cost breakdowns from the Contractor, ensure compliance with labour laws and bylaws, provide

- construction inspection services, provide clarifications, measure work, provide supplemental detail drawings (as required), and examine shop drawings.
- .3 Review work at regular intervals to determine conformity to with the Contract Documents and keep the Departmental Representative informed of progress of the work.
 - .4 Provide meeting minutes of all construction progress meetings attended, either in person or tele/videoconference.
 - .5 Provide the Departmental Representative (DR) with all material specifications, mixes, and tests outside the scope of the Contractor.
 - .6 Review all quality testing reports and provide recommendation for acceptance or rejection for the DR.
 - .7 Review and comment on the Contractor's schedule.
 - .8 Interpret contract documents as required and provide any additional drawings or specifications required to clarify, interpret or supplement Construction Documents.
 - .9 Review, comment and make recommendations on various documents such as Contractor's Progress Claims and updated schedules.
 - .10 Provide timely technical advice.
 - .11 Recommend the amounts owing to the Contractor based on work progress.
 - .12 Conduct inspections and provide recommendations for rejection or acceptance of work.
 - .13 Assist the Departmental Representative to prepare Certificates of Interim and Substantial Completion and provide sign-off.
 - .14 For Changes to the work:
 - .1 Assist the Departmental Representative to prepare CCNs and Cos. CCNs to be issued by the Consultant.
 - .15 For Cost Estimating Services:
 - .1 Evaluate change orders; claims, work completed and cash flow.
 - .2 After issue of contract provide details for evaluating the project's cost performance.
 - .16 For Scheduling Services:
 - .1 Review contractor's monthly schedule report and report findings and recommendations to PWGSC for further discussion with the Contractor.
 - .17 Permits:
 - .1 Assist the Contractor and provide required documentation in order to obtain the building permits.

2.7 RESIDENT SITE REPRESENTATIVE SERVICE

2.7.1 GENERAL

- .1 Provide resident site representative to provide inspection, coordination and monitoring during the construction work.
- .2 As outlined in 2.5.2 Anticipated Milestone Dates, resident site representative service to be delivered in two (2) phases.
- .3 Maintain daily records of all construction work placed that includes:

- .1 Weather conditions, particularly unusual weather relative to construction activities in progress;
 - .2 Major material and equipment deliveries;
 - .3 Daily activities and major work done;
 - .4 Start, stop or completion of activities;
 - .5 Presence of inspection and testing firms, tests taken, results;
 - .6 Unusual site conditions experienced;
 - .7 Significant developments, remarks;
 - .8 Special visitors on-site;
 - .9 Authorities given to Contractor to undertake certain or hazardous works;
 - .10 Environmental incidents;
 - .11 Reports, instructions from Appropriate Authorities Response Actions;
 - .12 Stop work requests by PWGSC.
- .4 Inspect all phases of the work in progress for compliance with the tender documents.
 - .5 Reject unsatisfactory work.
 - .6 Verify quantities of materials received.
 - .7 The Resident Site Representatives shall attend all job-site meetings.
 - .8 Stop the work, or give orders to protect the safety of the workers or Crown property, in emergencies.
 - .9 Provide information regarding job conditions to the Departmental Representative that may impact the project scope, schedule or budget.
 - .10 Notify the Departmental Representative of any potential change orders.
 - .11 Provide evaluation of Change Orders.
 - .12 Prepare and issue CCNs.
 - .13 Convey the Consultant's instructions regarding the required standards of workmanship to the Contractor.
 - .14 Communicate formally with the Contractor in writing via memorandum.
 - .15 Accompany PWGSC representatives on inspections.
 - .16 Prepare weekly reports for the Departmental Representative that includes
 - .1 Progress relative to schedule;
 - .2 Major activities commencing or completed during the week, main activities now in progress;
 - .3 Major deliveries of materials and / or equipment;
 - .4 Difficulties which may cause delays in completion;
 - .5 Materials and labour needed immediately;
 - .6 Cost estimates of work completed and materials delivered (cost plus contracts);
 - .7 Outstanding information or action required by Consultant or PWGSC;
 - .8 Work force;
 - .9 Weather;
 - .10 Remarks;

- .11 Accidents on-site;
- .12 Life safety or building hazards caused by the work.
- .17 .Maintain Site Records that include:
 - .1 Contract and Tender Documents updated with all changes;
 - .2 Approved Shop Drawings;
 - .3 Approved Samples;
 - .4 Site Instructions;
 - .5 Contemplated Change Notices (CCNs);
 - .6 Change Orders (COs);
 - .7 Memoranda;
 - .8 Test and Deficiency Reports;
 - .9 Updated Progress schedule;
 - .10 Correspondence and Minutes of Meetings;
 - .11 Names, addresses, telephone numbers of PWGSC representatives, Consultant, Contractors, and sub-trades key personnel associated with the contract, including home telephone numbers in case of emergencies.
- .18 Follow approved protocol for the security and protection of documents and information held on-site.
- .19 Review the accuracy of as-built marked up drawings kept by the Contractor and report any discrepancies or deficiencies to the Consultant.
- .20 Report if materials and equipment are being incorporated into the project prior to approval of relative shop drawings or samples.
- .21 Assist in the preparation of all deficiency, interim, preliminary, and final reports in collaboration with PWGSC and Consultant representatives.
- .22 Examine all site conditions and methods to be used by the Contractor undertaking hazardous operations
- .23 Inspect the areas where hazardous work is under way to ensure that the Contractor is maintaining the agreed safety standards
- .24 The Resident Site representatives shall not:
 - .1 Authorize deviations from the contract documents;
 - .2 Approve shop drawings or samples;
 - .3 Provide Advice in any matter without obtaining guidance from Departmental Representative;
 - .4 Accept any work or portions of;
 - .5 Enter into the area of responsibility of the Contractor's Field Superintendent;
 - .6 Stop the work unless convinced that an emergency exists as noted above.

2.7.2 DELIVERABLES

- .1 Weekly written reports
- .2 Memoranda issued to the Contractor.
- .3 Other reports such as material quality testing and topographic surveys as may be requested by the Departmental Representative.

- .4 A copy of the Site Representatives Daily log 2.8 Commissioning Service

2.8 COMMISSIONING SERVICE

2.8.1 GENERAL

- .1 The purpose of the Commissioning Service is to ensure that a fully functioning project is delivered to the Client.
- .2 As outlined in 2.5.2 Anticipated Milestone Dates, commissioning service to be delivered in two (2) phases.

2.8.2 SCOPE AND SERVICES

- .1 Integrated and comprehensive commissioning for the project in accordance with the requirements in the P&S document.
- .2 The project will be accepted and the Certificates of Interim and Substantial Completion will be issued only after the Contractor meets the requirements of the GCs and:
 - .1 All test certificates, commissioning reports and commissioning documentation have been approved by the Departmental Representative;
 - .2 Confirm each system control functions and include a detailed function report breakdown;
 - .3 System meets all design requirements;
 - .4 Training details to user have been provided and are sufficient;
 - .5 System has been accepted by user.
 - .6 All material quality control test results have met the material specification and have been accepted by the DR.
 - .7 All built grades have met the design grades and have been accepted by the DR.
- .3 During the Construction Phase:
 - .1 Monitor and report on contract commissioning activities;
 - .2 Review and certify verification sheets as they are completed by the contractor,
 - .3 Review commissioning schedule;
 - .4 Witness all component, system and integrated systems tests;
 - .5 Review and comment on commissioning test results;
 - .6 Provide advice and recommendations for fine tuning;
 - .7 Finalize the Design Intent Report and Client / Users O&M Manual to reflect as-commissioned operation and maintenance of each system.

2.8.3 DELIVERABLES

- .1 Commissioning Plan.
- .2 Commissioning Specifications in Division 01.
- .3 CV Sheets to be executed by the Contractor.
- .4 PVT Sheets to be executed by the Contractor.
- .5 Reports documenting all system components and functions are fully functional.
- .6 All material quality control test results.
- .7 As-built drawings including built grades.

2.9 POST CONSTRUCTION SERVICE

2.9.1 GENERAL

- .1 The purpose of this phase is to support the Departmental Representative in obtaining all final documents required for project close out.
- .2 As outlined in 2.5.2 Anticipated Milestone Dates, post construction service to be delivered in two (2) phases.

2.9.2 SCOPE AND ACTIVITIES

- .1 Project Close-out Services:
 - .1 Revise documentation to reflect all changes, revisions and adjustments after completion of commissioning;
 - .2 Prepare record drawings and specifications based on Contractor's as-builts;
 - .3 Assist the Departmental Representative to prepare the Final Certificate of Completion and provide sign-off;
 - .4 Review the Operations and Maintenance Manual;
 - .5 Prepare all material quality control test reports;
 - .6 Prepare topographic built grade reports;
 - .7 Review the Commissioning Report;
 - .8 Participate in Lessons Learned workshops if requested.
- .2 Warranty Services:
 - .1 Monitor and certify rectification of deficiencies before expiry of warranties;
 - .2 Sign off on the Final Completion of the construction contract;
 - .3 Participate in warranty inspections with Departmental Representative and Contractor;
 - .4 Provide warranty deficiency list;
 - .5 Provide Final Warranty Review report.

2.9.3 DELIVERABLES

- .1 Warranty Deficiency List.
- .2 Final Certificate.
- .3 As-Built and Record Drawings and As-Built Specifications.
- .4 Comments to O&M Manual.
- .5 Signed final Commissioning Manual.
- .6 Sign-off on Warranty.

3 PROJECT ADMINISTRATION

3.1 GENERAL REQUIREMENTS

3.1.1 PWGSC PROCEDURES AND STANDARDS

- .1 In addition to adhering to the general project administration requirements contained in section 2 of the GP&S document, the Consultant shall comply with the project specific requirements in this section.

3.1.2 LANGUAGE

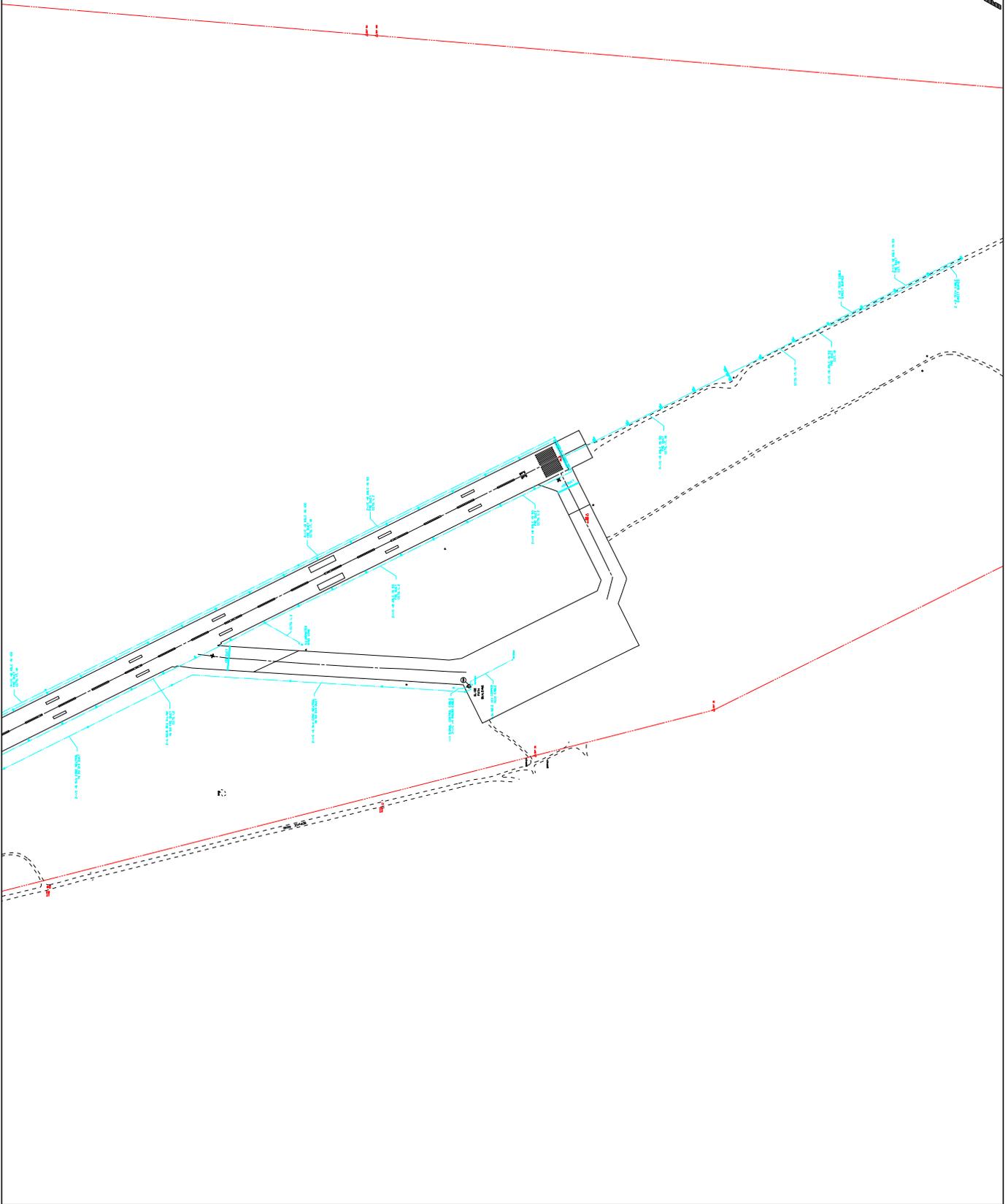
- .1 No variation
- 3.1.3 MEDIA**
 - .1 No variation
- 3.1.4 PROJECT MANAGEMENT**
 - .1 No variation
- 3.1.5 LINES OF COMMUNICATION**
 - .1 No variation
- 3.1.6 CONSULTANT RESPONSIBILITIES**
 - .1 No variation
- 3.1.7 PWGSC RESPONSIBILITIES**
 - .1 No variation
- 3.1.8 USER DEPARTMENT RESPONSIBILITIES**
 - .1 No variation
- 3.1.9 REVIEW AND APPROVAL BY PROVINCIAL AND MUNICIPAL AUTHORITIES**
 - .1 No variation
- 3.1.10 BUILDING PERMITS AND OCCUPANCY PERMITS**
 - .1 No variation
- 3.1.11 TECHNICAL AND FUNCTIONAL REVIEWS**
 - .1 No variation
- 3.2 MEETINGS**
 - .1 General
 - .1 Except as indicated below, endeavour to hold all meetings as Green Meetings (i.e. teleconferences, video conferences, electronic copies of documents where possible, where hard-copies are required provide as double-sided as appropriate, etc.).
 - .2 The Consultant must ensure that all key personnel are personally available to attend meetings as required and respond to inquiries promptly.
 - .3 The Consultant is responsible for minutes of meetings during pre-design, design, and construction.
 - .2 Pre-Design Meetings:
 - .1 Meetings during the Pre-Design Phase will be as follows:
 - .1 Bi-weekly teleconferences;
 - .2 A one day meeting in Churchill (to be scheduled shortly after contract award), coordinated with Consultants' investigative site visit.
 - .3 Design Meetings:
 - .1 Meetings during the Design Phase will be as follows:
 - .1 Bi-weekly teleconferences;
 - .4 Construction Meetings:
 - .1 Meetings during the Construction Phase will be arranged monthly through the duration of the project. Meetings will be as follows:

- .1 Bi-weekly teleconferences;
- .5 Meeting Minutes:
 - .1 The Consultant will be responsible for:
 - .1 Preparing minutes of meetings;
 - .2 Forwarding minutes to the Departmental Representative;
 - .2 These meetings are for the accurate exchange of information;
 - .3 All requests and decisions taken must follow the formal lines of communications.
- .6 If additional meetings involving travel are required, they will be reimbursable for time and travel disbursements. Any additional trips must be approved in advance by PWGSC. Disbursements will be reimbursed at cost without mark-up.

3.3 SITE VISITS

- .1 Fees shall include all accommodation and travel costs related to site visits to fulfill professional obligations.
- .2 **Eleven (11)** site visits required, as outlined:
 - .1 Pre-Design Phase: **1**
 - .2 Design Phases: **2** (one per each Runway)
 - .3 Construction Phase 1 (Runway 1), monitoring of work: **1**
 - .4 Construction Phase 1 (Runway 1), commissioning and Work review (noting of deficiencies), Substantial Performance review: **1** (note 2.5.2 Anticipated Milestone Dates, possible extended stay of 1 week)
 - .5 Construction Phase 1 (Runway 1), Final Review: **1**
 - .6 Construction Phase 1 (Runway 1), Warranty Inspection: **1**
 - .7 Construction Phase 2 (Runway 2), monitoring of work: **1**
 - .8 Construction Phase 1 (Runway 2), commissioning and Work review (noting of deficiencies), Substantial Performance review: **1** (note 2.5.2 Anticipated Milestone Dates, possible extended stay of 1 week)
 - .9 Construction Phase 2 (Runway 2), Final Review: **1**
 - .10 Construction Phase 1 (Runway 2), Warranty Inspection: **1**

APPENDIX A



Scale	1:1000
Date	March 2006
Drawn by	LC
Checked by	LC
Project No.	2005-09-0000-0000-0000
Sheet	2 of 3

CHURCHILL AIRPORT
SITE RECORD PLAN
ELECTRICAL