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

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving PWGSC/TPSGC reception des soumissions
Victory Building/Édifice Victory
Room 310/pièce 310
269 Main Street/269 rue Main
Winnipeg
Manitoba
R3C 1B3
Bid Fax: (418) 566-6167

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 HVAC System Consultant
HVAC Assessment and Replacement, & Carbon Neutral Study

Solicitation No. - N° de l'invitation	**Date**
EW038-230858/A	2022-10-10

Client Reference No. - N° de référence du client
DFO - EW038-230858

GETS Reference No. - N° de référence de SEAG
PW-$PWZ-202-11377

File No. - N° de dossier	**CCC No./N° CCC - FMS No./N° VME**
PWZ-2-45016 (202)	

Solicitation Closes - L'invitation prend fin

at - à 02:00 PM Central Standard Time CST
on - le 2022-11-08 Heure Normale du Centre HNC

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

Address Enquiries to: - Adresser toutes questions à:	**Buyer Id - Id de l'acheteur**
Thompson, Valerie	pwz202

Telephone No. - N° de téléphone	**FAX No. - N° de FAX**
(204) 509-0349 ( )	(418) 566-6167

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
SUITE 100
JASPER AVENUE NW
EDMONTON
Alberta
T5J4C3
Canada

Instructions: See Herein

Instructions: Voir aux présentes

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

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
See Herein – Voir ci-inclus	

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

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

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

Signature **Date**

Issuing Office - Bureau de distribution
Public Works and Government Services Canada - Western Region
Victory Building/Édifice Victory
Room 310/pièce 310
269 Main Street/269 rue Main
Winnipeg
Manitoba
R3C 1B3

Canada

REQUEST FOR PROPOSAL (RFP)

Table of Contents

PART 1 - 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.

4. This bid solicitation allows and encourages proponents to use Canada Post Corporation's (CPC) Connect service to transmit their proposals electronically.

   Due to the nature of the bid solicitation, transmission of proposals by facsimile is not recommended for administrative reasons but offered to proponents to provide an alternative opportunity in case of incompatibility or inability to transmit by CPC Connect service.

   Proponents must refer to GI16 Submission of proposal, and SRE 2 Proposal Requirements, of the bid solicitation, for further information.

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);
General instructions (GI) – Architectural and/or Engineering services – Request for Proposal;

Submission Requirements and Evaluation (SRE);

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

(c) Terms of Reference;

(d) the document entitled "Doing Business with PWGSC Documentation and Deliverables Manual";

(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 valerie.thompson@pwgsc-tpsgc.gc.ca as early as possible. Enquiries should be received no later than 7 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 Canadian Free Trade Agreement (CFTA).

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 Proposal**, **as applicable**, to be given further consideration in the procurement process, the required documentation as per 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

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.

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/corporate/portfolio/labour/programs/employment-equity/federal-contractors.html

Certificate of Commitment to Implement Employment Equity form LAB 1168
https://catalogue.servicecanada.gc.ca/content/EForms/en/Detail.html?Form=LAB1168

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

Code of Conduct for Procurement
https://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/index-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 sanctions
https://www.international.gc.ca/world-monde/international_relations-relations_internationales/sanctions/index.aspx?lang=eng&_ga=2.4399216.2143508984.1600280756-1424234476.1600280756

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

PART 2 - GENERAL INSTRUCTIONS (GI) – ARCHITECTURAL AND/OR ENGINEERING SERVICES – REQUEST FOR PROPOSAL

GI1 Integrity provisions - proposal

1. The *Ineligibility and Suspension Policy* (the "Policy") in effect on the date the bid solicitation is issued, and all related Directives in effect on that date, are incorporated by reference into, and form a binding part of the bid solicitation. The Proponent must comply with the Policy and Directives, which can be found at *Ineligibility and Suspension Policy (https://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html)*.

2. Under the Policy, charges and convictions of certain offences against a Supplier, its affiliates or first tier sub-consultants, and other circumstances, will or may result in a determination by Public Works and Government Services Canada (PWGSC) that the Supplier is ineligible to enter, or is suspended from entering into a contract with Canada. The list of ineligible and suspended Suppliers is contained in PWGSC's Integrity Database. The Policy describes how enquiries can be made regarding the ineligibility or suspension of Suppliers.

3. In addition to all other information required in the bid solicitation, the Proponent must provide the following:

    a. by the time stated in the Policy, all information required by the Policy described under the heading "Information to be Provided when Bidding, Contracting or Entering into a Real Property Agreement"; and

    b. with its bid, a complete list of all foreign criminal charges and convictions pertaining to itself, its affiliates and its proposed first tier sub-consultants that, to the best of its knowledge and belief, may be similar to one of the listed offences in the Policy. The list of foreign criminal charges and convictions must be submitted using an Integrity Declaration Form, which can be found at Declaration form for procurement (https://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html).

4. Subject to subsection 5, by submitting a bid in response to this bid solicitation, the Proponent certifies that:

    a. it has read and understands the *Ineligibility and Suspension Policy (https://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html)*;

    b. it understands that certain domestic and foreign criminal charges and convictions, and other circumstances, as described in the Policy, will or may result in a determination of ineligibility or suspension under the Policy;

    c. it is aware that Canada may request additional information, certifications, and validations from the Proponent or a third party for purposes of making a determination of ineligibility or suspension;

    d. it has provided with its bid a complete list of all foreign criminal charges and convictions pertaining to itself, its affiliates and its proposed first tier sub-consultants that, to the best of its knowledge and belief, may be similar to one of the listed offences in the Policy;

    e. none of the domestic criminal offences, and other circumstances, described in the Policy that will or may result in a determination of ineligibility or suspension, apply to it, its

affiliates and its proposed first tier sub-consultants; and

f. it is not aware of a determination of ineligibility or suspension issued by PWGSC that applies to it.

5. Where a Proponent is unable to provide any of the certifications required by subsection 4, it must submit with its bid a completed Integrity Declaration Form, which can be found at Declaration form for procurement (https://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html).

6. Canada will declare non-responsive any bid in respect of which the information requested is incomplete or inaccurate, or in respect of which the information contained in a certification or declaration is found by Canada to be false or misleading in any respect. If Canada establishes after award of the Contract that the Proponent provided a false or misleading certification or declaration, Canada may terminate the Contract for default. Pursuant to the Policy, Canada may also determine the Proponent to be ineligible for award of a contract for providing a false or misleading certification or declaration.

GI2 Definitions

In this Request for Proposal (RFP), the following words or phrases have the corresponding meaning.

"Applicable Taxes":
The Goods and Services Tax (GST), the Harmonized Sales Tax (HST), and any provincial tax, by law, payable by Canada such as, the Quebec Sales Tax (QST) as of April 1, 2013.

"Consultant Team":
The team of consultants, specialists and sub-consultants, including the Proponent, proposed by the Proponent to perform the services required.

"Key Personnel":
Staff of the Proponent, sub-consultants and specialists proposed to be assigned to this project.

"Price Rating":
A rating assigned to the price component of a proposal and subsequently used to establish a Price Score for inclusion as a percentage of the total score to be established following the evaluation and rating of technical proposals.

"Proponent":
The person or entity (or, in the case of a joint venture, the persons or entities) which submits a proposal. It does not include the parent, subsidiaries or other affiliates of the Proponent, or its sub-consultants.

"PWGSC Evaluation Board":
The board established to evaluate and rate proposals. Board members represent a broad cross-section of professional qualifications and experience.

"Technical Rating":
A rating assigned to the technical component of a proposal in the selection procedure and subsequently used to establish a Technical Score for inclusion as a percentage of the total score.

GI3 Overview of selection procedure

The following is an overview of the selection procedure.

GI3.1 Proposal

1. Proponents submit the "technical" component of their proposal in one section and the proposed price of the services (price proposal) in a second section in accordance with the instructions contained in the proposal documents.

2. The information that Proponents are required to provide is set out in detail elsewhere in the RFP.

3. In response to the RFP, interested Proponents submit a proposal in which they:

    a. indicate whether the proposal is submitted by an individual firm or by a joint venture;

    b. if the proposal is submitted by a joint venture, describe the proposed legal and working relationships of the joint venture and the benefits to be gained by the formation of the joint venture;

    c. identify the prime consultants and key sub consultants and specialists proposed for inclusion in the Consultant Team, and the proposed organizational structure of the Team;

    d. describe the extent to which proposed members of the Consultant Team have successfully performed services for projects comparable to the project which is the subject of the proposal;

    e. identify the professional accreditation, experience, expertise and competence of the Consultant Team and Key Personnel proposed to be assigned to perform the required services.

    f. comply with all other requirements set out in the RFP.

GI3.2 Proposal evaluation and rating

1. Technical components of all responsive proposals are reviewed, evaluated and rated by a Public Works and Government Services Canada (PWGSC) Evaluation Board in accordance with the criteria, components and weight factors set out in the RFP. Upon completion of the evaluation, Technical Ratings are established.

2. Proposals achieving the minimum Technical Score specified in the Submission Requirements and Evaluation section of the RFP are further considered.

3. The price proposals of all responsive proposals are considered 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 opened. This calculation will not be conducted when one or two responsive proposals are received.

4. All price proposals which are greater than 25 percent above the average price will cause their respective complete proposals to be set aside and receive no further consideration.
5. The remaining price proposals are rated as follows:

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

b. The second, third, fourth and fifth lowest prices receive Price Ratings of 80, 60, 40, and 20 respectively. All other price proposals receive a Price Rating of 0.

c. On the rare occasion where two (or more) price proposals are identical, these price proposals receive the same rating and the corresponding number of following ratings are skipped.

d. The Price Rating is multiplied by a predetermined percentage factor to establish a Price Score.

6. A price proposal in excess of any maximum funding limit, when this limit has been set in the Supplementary Instructions to Proponents, may result in disqualification of the complete proposal.

GI3.3 Total score

1. The total overall score (Total Score) assigned to each Proponent's complete proposal is calculated as the aggregate of:

   a. the Technical Score, and
   b. the Price Score.

2. The Proponent receiving the highest Total Score is the first entity that the PWGSC Evaluation Board will recommend for the provision of the required services.

GI3.4 Notification

PWGSC normally expects to advise in writing unsuccessful Proponents within one week after PWGSC has entered into a contractual arrangement with the successful Proponent.

GI4 Procurement Business Number

Proponents are required to have a Procurement Business Number (PBN) before contract award. Proponents may register for a PBN online at *Supplier Registration Information (https://srisupplier.contractscanada.gc.ca/index-eng.cfm?af=ZnVzZWFjdGlvbj1yZWdpc3Rlci5pbnRybyZpZD0y&lang=eng)*.

GI5 Responsive proposals

To be considered responsive, a proposal must meet all of the mandatory requirements set out in the RFP. No further consideration in the selection procedure will be given to a Proponent submitting a non-responsive proposal.

GI6 Completion of submission

The Proponent shall base the proposal on the applicable proposal documents listed in the Supplementary Instructions to Proponents.

GI7 Proposal price

Unless specified otherwise elsewhere in the proposal documents:

a. the price proposal shall be in Canadian currency, and
b. the price proposal shall not include any amount for Applicable Taxes, and
c. the requirement does not offer exchange rate fluctuation risk mitigation. Requests for exchange rate fluctuation risk mitigation will not be considered. All proposals including such provision will render the proposal non-responsive.

GI8 Communications—solicitation period

To ensure the integrity of the competitive bid process, enquiries and other communications regarding the RFP must be directed only to the Contracting Authority identified in the RFP. Failure to comply with this requirement may result in the proposal being declared non-responsive.

To ensure consistency and quality of information provided to proponents, significant enquiries received and their replies will be posted on the Government Electronic Tendering Service (GETS).

GI9 Limitation of submissions

1. A Proponent may not submit more than one proposal. This limitation also applies to the persons or entities in the case of a joint venture. If more than one proposal is received from a Proponent (or, in the case of a joint venture, from the persons or entities), all such proposals shall be rejected and no further consideration shall be given.

2. A joint venture is defined as an association of two or more parties which combine their money, property, knowledge, skills, time or other resources in a joint business enterprise agreeing to share the profits and the losses and each having some degree of control over the enterprise.

3. An arrangement whereby Canada contracts directly with a prime consultant who may retain sub-consultants or specialist consultants to perform portions of the services is not a joint venture arrangement. A sub-consultant or specialist consultant may, therefore, be proposed as part of the Consultant Team by more than one Proponent. The Proponent warrants that it has written permission from such sub-consultant or specialist consultant to propose their services in relation to the services to be performed.

4. Notwithstanding paragraph 3. above, in order to avoid any conflict of interest, or any perception of conflict of interest, a Proponent shall not include in its submission another Proponent as a member of its consultant team, as a sub-consultant or specialist consultant.

5. Any joint venture entered into for the provision of professional services or other services must be in full compliance with the requirements of any provincial or territorial law pertaining thereto in the Province or Territory in which the project is located.

GI10 Licensing requirements

1. Consultant Team members and Key Personnel shall be, or be 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 or Territory in which the project is located.

2. By virtue of submission of a proposal, the Proponent certifies that the Proponent's Consultant Team and Key Personnel are in compliance with the requirements of subsection 1 above. The Proponent acknowledges that PWGSC reserves the right to verify any information in this regard and that false or erroneous certification may result in the proposal being declared non-responsive.

GI11 Rejection of proposal

1. Canada may reject a proposal where any of the following circumstances is present:

    a. the Proponent has been declared ineligible for selection, following unsatisfactory performance in a previous project as determined in accordance with the department's performance review procedures;

    b. an employee, sub-consultant or specialist consultant included as part of the proposal has been declared ineligible, for selection for work with the department in accordance with the performance review procedure referred to in paragraph 1.(a), which would render the employee, sub-consultant or specialist consultant ineligible to bid on the requirement, or the portion of the requirement the employee, sub-consultant or specialist consultant is to perform;

    c. the Proponent is bankrupt or where, for whatever reason, its activities are rendered inoperable for an extended period;

    d. evidence, satisfactory to Canada, of fraud, bribery, fraudulent misrepresentation or failure to comply with any law protecting individuals against any manner of discrimination, has been received with respect to the Proponent, any of its employees, any sub-consultant or any specialist consultant included as part of the proposal;

    e. evidence satisfactory to Canada that based on past conduct or behavior, the Proponent, a sub-consultant, a specialist consultant or a person who is to perform the Services is unsuitable or has conducted himself/herself improperly;

    f. with respect to current or prior transactions with the Government of Canada,

        i. Canada has exercised its contractual remedies of taking the services out of the consultant's hands, suspension or termination for default with respect to a contract with the Proponent, any of its employees, any sub-consultant or any specialist consultant included as part of the proposal;

        ii. Canada determines that the Proponent's performance on other contracts, including the quality of the services provided and the quality and timeliness of the delivery of the project, is sufficiently poor to jeopardize the successful completion of the requirement being bid on.

2. Where Canada intends to reject a proposal pursuant to subsection 1.(f), the Contracting Authority will so inform the Proponent and provide the Proponent ten (10) days within which to make representations, before making a final decision on the proposal rejection.

GI12 Not applicable

Not applicable

GI13 Insurance requirements

The successful Proponent shall be required to obtain and maintain Professional Liability and Commercial General Liability insurance coverage in accordance with the requirements set out elsewhere in the proposal documents.

GI14 Joint venture

1. A joint venture is an association of two or more parties who combine their money, property, knowledge, expertise or other resources in a single joint business enterprise, sometimes referred as a consortium, to bid together on a requirement. Proponents who bid as a joint venture must indicate clearly that it is a joint venture and provide the following information:

    a. the name of each member of the joint venture;
    b. the Procurement Business Number of each member of the joint venture;
    c. the name of the representative of the joint venture, i.e. the member chosen by the other members to act on their behalf, if applicable;
    d. the name of the joint venture, if applicable.

2. If the information is not clearly provided in the proposal, the Proponent must provide the information on request from the Contracting Authority.

3. The proposal and any resulting contract must be signed by all the members of the joint venture unless one member has been appointed to act on behalf of all members of the joint venture. The Contracting Authority may, at any time, require each member of the joint venture to confirm that the representative has been appointed with full authority to act as its representative for the purposes of the bid solicitation and any resulting contract. If a contract is awarded to a joint venture, all members of the joint venture will be jointly and severally or solidarily liable for the performance of any resulting contract.

GI15 Composition of Consultant Team

By submitting a proposal, the Proponent represents and warrants that the entities and persons proposed in the proposal to perform the required services will be the entities and persons that will perform the services in the fulfillment of the project under any contractual arrangement arising from submission of the proposal. If the Proponent has proposed any person in fulfillment of the project who is not an employee of the Proponent, the Proponent warrants that it has written permission from such person (or the employer of such person) to propose the services of such person in relation to the services to be performed.

GI16 Submission of proposal

GI16.1 Submission of proposal

1. Canada requires that each proposal, at solicitation closing date and time or upon request from the Contracting Authority, be signed by the Proponent or by an authorized representative of the Proponent. If a proposal is submitted by a joint venture, it must be in accordance with section GI14.

2. It is the Proponent's responsibility to:

a. submit a proposal, duly completed, in the format requested, on or before the solicitation closing date and time set;

b. send its proposal only to the Bid Receiving Unit of Public Works and Government Services Canada (PWGSC) specified below, by the date and time indicated on page 1 of the bid solicitation.

   In the case of submission of a hard copy proposal, send its proposal only to:

   Bid Receiving – Public Works and Government Services Canada
   Room 310 – 269 Main Street
   Winnipeg, MB R3C 1B3

   In the case of submission by CPC Connect, see instructions in GI16.2.1 below.

   In the case of submission by Facsimile, see instructions in GI16.2.2 below.

c. obtain clarification of the requirements contained in the RFP, if necessary, before submitting a proposal;

d. ensure that the Proponent's name, return address, the solicitation number and description, and solicitation closing date and time are clearly visible on the envelope or the parcel(s) containing the proposal; and

e. provide a comprehensive and sufficiently detailed proposal that will permit a complete evaluation in accordance with the criteria set out in this RFP.

3. The technical and price components of the proposal must be submitted in separate sections in accordance with the instructions contained in the proposal documents.

4. Timely and correct delivery of proposals to the office designated for receipt of proposals is the sole responsibility of the Proponent. PWGSC will not assume or have transferred to it those responsibilities. All risks and consequences of incorrect delivery of proposals are the responsibility of the Proponent.

5. Proposals and supporting information may be submitted in either English or French.

6. Canada will make available Notices of Proposed Procurement (NPP), bid solicitations and related documents for download through the Government Electronic Tendering Service (GETS). Canada is not responsible and will not assume any liabilities whatsoever for the information found on websites of third parties. In the event an NPP, bid solicitation or related documentation would be amended, Canada will not be sending notifications. Canada will post all amendments using GETS. It is the sole responsibility of the Proponent to regularly consult GETS for the most up-to-date information. Canada will not be liable for any oversight on the Proponent's part nor for notification services offered by a third party.

GI16.2 Transmission by CPC Connect or facsimile

1. CPC Connect

a. Proposals may be submitted by using Canada Post Corporation's (CPC) Connect service (https://www.canadapost.ca/web/en/products/details.page?article=epost_connect_send_a):

The only acceptable email address to use with CPC Connect for responses to this bid solicitation issued by PWGSC regional offices is:

ROReceptionSoumissions.WRBidReceiving@pwgsc-tpsgc.gc.ca

Note: Proposals will not be accepted if emailed directly to this email address. This email address is to be used to open an CPC Connect conversation, as detailed in b., or to send proposals through an CPC Connect message if the proponent is using its own licensing agreement for CPC Connect.

b. To submit a proposal using CPC Connect service, the Proponent must either:

   i. send directly its proposal only to the specified PWGSC Bid Receiving Unit, using its own licensing agreement for CPC Connect provided by Canada Post Corporation; or
   ii. send as early as possible, and in any case, at least six business days prior to the solicitation closing date and time (in order to ensure a response), an email that includes the bid solicitation number to the specified PWGSC Bid Receiving Unit requesting to open an CPC Connect conversation. Requests to open an CPC Connect conversation received after that time may not be answered.

c. If the Proponent sends an email requesting CPC Connect service to the specified Bid Receiving Unit in the bid solicitation, an officer of the Bid Receiving Unit will then initiate an CPC Connect conversation. The CPC Connect conversation will create an email notification from Canada Post Corporation prompting the Proponent to access and action the message within the CPC Connect conversation. The Proponent will then be able to transmit its proposal afterward at any time prior to the solicitation closing date and time.

d. If the Proponent is using its own licensing agreement to send its proposal, the Proponent must keep the CPC Connect conversation open until at least 30 business days after the solicitation closing date and time.

e. The bid solicitation number should be identified in the CPC Connect message field of all electronic transfers.

f. It should be noted that the use of CPC Connect service requires a Canadian mailing address. Should a Proponent not have a Canadian address, they may use the Bid Receiving Unit address specified in the solicitation in order to register for the CPC Connect service.

g. For proposals transmitted by CPC Connect service, Canada will not be responsible for any failure attributable to the transmission or receipt of the proposal including, but not limited to, the following:

   i. receipt of a garbled, corrupted or incomplete proposal;
   ii. availability or condition of the CPC Connect service;
   iii. incompatibility between the sending and receiving equipment;
   iv. delay in transmission or receipt of the proposal;
   v. failure of the Proponent to properly identify the proposal;
   vi. illegibility of the proposal;
   vii. security of proposal data; or
   viii. inability to create an electronic conversation through the CPC Connect service.

h. The Bid Receiving Unit will send an acknowledgement of the receipt of proposal document(s) via the CPC Connect conversation, regardless of whether the conversation was initiated by the supplier using its own license or the Bid Receiving Unit. This acknowledgement will

confirm only the receipt of proposal document(s) and will not confirm if the attachments may be opened nor if the content is readable.

i. Proponents must ensure that they are using the correct email address for the Bid Receiving Unit when initiating a conversation in CPC Connect or communicating with the Bid Receiving Unit and should not rely on the accuracy of copying and pasting the email address into the CPC Connect system.

j. A proposal transmitted by CPC Connect service constitutes the formal proposal of the Proponent and must be submitted in accordance with section GI16.1.

2. Facsimile

a. Proposals may be submitted by facsimile.

The only acceptable facsimile number for responses to bid solicitations issued by this PWGSC regional office is:

Bid Facsimile number: 418-566-6167

b. For proposals transmitted by facsimile, Canada will not be responsible for any failure attributable to the transmission or receipt of the faxed proposal including, but not limited to, the following:

i. receipt of garbled, corrupted or incomplete proposal;
ii. availability or condition of the receiving facsimile equipment;
iii. incompatibility between the sending and receiving equipment;
iv. delay in transmission or receipt of the proposal;
v. failure of the Proponent to properly identify the proposal;
vi. illegibility of the proposal; or
vii. security of proposal data.

c. A proposal transmitted by facsimile constitutes the formal proposal of the Proponent and must be submitted in accordance with section GI16.1.

GI17 Late submissions

1. PWGSC will return or delete proposals delivered after the stipulated solicitation closing date and time, unless they qualify as a delayed proposal as described in GI17.2. For late proposals submitted using means other than the Canada Post Corporation's CPC Connect service, the physical proposal will be returned. For proposals submitted electronically, the late proposal will be deleted. As an example, proposals submitted using Canada Post Corporation's CPC Connect service, conversations initiated by the Bid Receiving Unit via the CPC Connect service pertaining to a late proposal, will be deleted. Records will be kept documenting the transaction history of all late proposals submitted using CPC Connect.

2. A proposal delivered to the specified bid receiving unit after the solicitation closing date and time but before the contract award date may be considered, provided the proponent can prove the delay is due solely to a delay in delivery that can be attributed to the Canada Post Corporation (CPC) (or national equivalent of a foreign country). Private courier (Purolator Inc., Fedex Inc., etc.) is not considered to be part of CPC for the purposes of delayed proposals.

a. The only pieces of evidence relating to a delay in the CPC system that are acceptable to PWGSC are:

i. a CPC cancellation date stamp;
ii. a CPC Priority Courier bill of lading;
iii. a CPC Xpresspost label;

that clearly indicates that the proposal was sent the day before the solicitation closing date.

b. The only pieces of evidence relating to a delay in the CPC Connect service provided by CPC system that are acceptable to PWGSC is a CPC CPC Connect service date and time record indicated in the CPC Connect conversation history that clearly indicates that the proposal was sent before the solicitation closing date and time.

3. Misrouting, traffic volume, weather disturbances, labour disputes or any other causes for the late delivery of proposals are not acceptable reasons for the proposal to be accepted by PWGSC.
4. Postage meter imprints, whether imprinted by the Proponent, the CPC or the postal authority outside Canada, are not acceptable as proof of timely mailing.

GI18 Not applicable

GI19 Acceptance of proposal

1. Canada may accept any proposal, or may reject any or all proposals.
2. In the case of error in the extension or addition of unit prices, the unit price will govern.
3. While Canada may enter into an agreement or contractual arrangement without prior negotiation, Canada reserves the right to negotiate with Proponents on any procurement.
4. Canada reserves the right to cancel or amend the RFP at any time.

GI20 Legal capacity

The Proponent must have the Legal capacity to contract. If the Proponent is a sole proprietorship, a partnership or a corporate body, the Proponent must provide, if requested by the Contracting Authority, a statement and any requested supporting documentation indicating the laws under which it is registered or incorporated together with the registered or corporate name and place of business. This also applies to Proponents submitting a proposal as a joint venture.

GI21 Debriefing

Should a Proponent desire a debriefing, the Proponent should contact the person identified on the front page of the RFP within 15 working days of the notification of the results of the solicitation. The debriefing will include an outline of the strengths and weaknesses of the submission, referring to the evaluation criteria. The confidentiality of information relating to other submissions will be protected. The debriefing may be provided in writing, by telephone or in person.

GI22 Financial capability

1. Financial capability Requirement: The Proponent must have the financial capability to fulfill this requirement. To determine the Proponent's financial capability, the Contracting Authority may, by written notice to the Proponent, require the submission of some or all of the financial information detailed below during the evaluation of proposals. The Proponent must provide the following information to the Contracting Authority within fifteen (15) working days of the request or as specified by the Contracting Authority in the notice:

    a. Audited financial statements, if available, or the unaudited financial statements (prepared by the Proponent's outside accounting firm, if available, or prepared in-house if no external statements have been prepared) for the Proponent's last three fiscal years, or for the years that the Proponent has been in business if this is less than three years

(including, as a minimum, the Balance Sheet, the Statement of Retained Earnings, the Income Statement and any notes to the statements).

b. If the date of the financial statements in (a) above is more than five months before the date of the request for information by the Contracting Authority, the Proponent must also provide, unless this is prohibited by legislation for public companies, the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement), as of two months before the date on which the Contracting Authority requests this information.

c. If the Proponent has not been in business for at least one full fiscal year, the following must be provided:

   i. the opening Balance Sheet on commencement of business (in the case of a corporation, the date of incorporation); and

   ii. the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests this information.

d. A certification from the Chief Financial Officer or an authorized signing officer of the Proponent that the financial information provided is complete and accurate.

e. A confirmation letter from all of the financial institution(s) that have provided short-term financing to the Proponent outlining the total of lines of credit granted to the Proponent and the amount of credit that remains available and not drawn upon as of one month prior to the date on which the Contracting Authority requests this information.

f. A detailed monthly Cash Flow Statement covering all the Proponent's activities (including the requirement) for the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Proponent's major sources and amounts of cash and the major items of cash expenditures on a monthly basis, for all the Proponent's activities. All assumptions made should be explained as well as details of how cash shortfalls will be financed.

g. A detailed monthly Project Cash Flow Statement covering the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Proponent's major sources and amounts of cash and the major items of cash expenditures, for the requirement, on a monthly basis. All assumptions made should be explained as well as details of how cash shortfalls will be financed.

2. If the Proponent is a joint venture, the financial information required by the Contracting Authority must be provided by each member of the joint venture.

3. If the Proponent is a subsidiary of another company, then any financial information in 1. (a) to (e) above required by the Contracting Authority must be provided by the ultimate parent company. Provision of parent company financial information does not by itself satisfy the requirement for the provision of the financial information of the Proponent, and the financial capability of a parent cannot be substituted for the financial capability of the Proponent itself unless an agreement by the parent company to sign a Parental Guarantee, as drawn up by Public Works and Government Services Canada (PWGSC), is provided with the required information.

4. Financial Information Already Provided to PWGSC: The Proponent is not required to resubmit any financial information requested by the Contracting Authority that is already on file at PWGSC with the Contract Cost Analysis, Audit and Policy Directorate of the Policy, Risk, Integrity and Strategic Management Sector, provided that within the above-noted time frame:

    a. the Proponent identifies to the Contracting Authority in writing the specific information that is on file and the requirement for which this information was provided; and
    b. the Proponent authorizes the use of the information for this requirement.

    It is the Proponent's responsibility to confirm with the Contracting Authority that this information is still on file with PWGSC.

5. Other Information: Canada reserves the right to request from the Proponent any other information that Canada requires to conduct a complete financial capability assessment of the Proponent.

6. Confidentiality: If the Proponent provides the information required above to Canada in confidence while indicating that the disclosed information is confidential, then Canada will treat the information in a confidential manner as permitted by the *Access to Information Act (https://laws-lois.justice.gc.ca/eng/acts/A-1/)*, R.S.., 1985, c. A-1, section 20(1) (b) and (c).

7. Security: In determining the Proponent's financial capability to fulfill this requirement, Canada may consider any security the Proponent is capable of providing, at the Proponent's sole expense (for example, an irrevocable letter of credit from a registered financial institution drawn in favour of Canada, a performance guarantee from a third party or some other form of security, as determined by Canada).

8. In the event that a proposal is found to be non-compliant on the basis that the Proponent is considered not to be financially capable of performing the subject requirement, official notification shall be provided to the Proponent.

GI23 Performance evaluation

Proponents shall take note that the performance of the Consultant during and upon completion of the services shall be evaluated by Canada. The evaluation includes all or some of the following criteria: Design, Quality of Results, Management, Time and Cost. Should the Consultant's performance be considered unsatisfactory, the Consultant may be declared ineligible for future contracts. The form PWGSC-TPSGC 2913-1 (https://www.tpsgc-pwgsc.gc.ca/app-acq/forms/2913-1-eng.html), SELECT - Consultant Performance Evaluation Report, is used to record the performance.

GI24 Proposal costs

No payment will be made for costs incurred in the preparation and submission of a proposal in response to the Request for proposal. Costs associated with preparing and submitting a proposal, as well as any costs incurred by the Proponent associated with the evaluation of the proposal, are the sole responsibility of the Proponent.

GI25 Conflict of interest—unfair advantage

1. In order to protect the integrity of the procurement process, Proponents are advised that Canada may reject a proposal in the following circumstances:

    a. if the Proponent, any of its sub-consultants, any of their respective employees or former employees was involved in any manner in the preparation of the bid solicitation or in any situation of conflict of interest or appearance of conflict of interest;

b. if the Proponent, any of its sub-consultants, any of their respective employees or former employees had access to information related to the bid solicitation that was not available to other Proponents and that would, in Canada's opinion, give or appear to give the Proponent an unfair advantage.

2. The experience acquired by a Proponent who is providing or has provided the goods and services described in the bid solicitation (or similar goods or services) will not, in itself, be considered by Canada as conferring an unfair advantage or creating a conflict of interest. This Proponent remains however subject to the criteria established above.

3. Where Canada intends to reject a proposal under this section, the Contracting Authority will inform the Proponent and provide the Proponent an opportunity to make representations before making a final decision. Proponents who are in doubt about a particular situation should contact the Contracting Authority before bid closing. By submitting a proposal, the Proponent represents that it does not consider itself to be in conflict of interest nor to have an unfair advantage. The Proponent acknowledges that it is within Canada's sole discretion to determine whether a conflict of interest, unfair advantage or an appearance of conflict of interest or unfair advantage exists.

GI26 Limitation of liability

Except as expressly and specifically permitted in this RFP, no Proponent or Potential Proponent shall have any claim for any compensation of any kind whatsoever in relation to this RFP, or any aspect of the procurement process, and by submitting a proposal each Proponent shall be deemed to have agreed that it has no claim.

GI27 Code of Conduct for Procurement—proposal

The *Code of Conduct for Procurement (https://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html)* provides that Proponents must respond to bid solicitations in an honest, fair and comprehensive manner, accurately reflect their capacity to satisfy the requirements set out in the bid solicitation and resulting contract, submit bids and enter into contracts only if they will fulfill all obligations of the Contract. By submitting a bid, the Proponent is certifying that it is complying with the *Code of Conduct for Procurement.* Failure to comply with the *Code of Conduct for Procurement* may render the bid non-responsive.

GI28 Bid Challenge And Recourse Mechanisms

(a) Several mechanisms are available to potential Proponents to challenge aspects of the procurement process up to and including contract award.

(b) Canada encourages Proponents to first bring their concerns to the attention of the Contracting Authority. Canada's Buy and Sell website, under the heading "Bid Challenge and Recourse Mechanisms" contains information on potential complaint bodies such as:

- Office of the Procurement Ombudsman (OPO)
- Canadian International Trade Tribunal (CITT)

(c) Proponents should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Proponents should therefore act quickly when they want to challenge any aspect of the procurement process.

PART 3 – 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;
   the General Terms, Conditions and Clauses, as amended, identified as:

R1210D	2021-12-02	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	2018-06-21	General Condition (GC) 5 - Terms of Payment – Architectural and/or Engineering Services
R1235D	2011-05-16	General Condition (GC) 6 – Changes
R1240D	2018-06-21	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
R1650D	2017-11-28	General Condition (GC) 9 - Indemnification and Insurance
Supplementary Conditions		
Agreement Particulars		

   (b) Terms of Reference;
   (c) the document entitled "Doing Business with PWGSC Documentation and Deliverables Manual";
   (d) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
   (e) the proposal, the Declaration/Certifications Form and the Price Proposal Form.

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

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

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

(a) any amendment or variation in the Agreement that is made in accordance with the terms and conditions of the Agreement;
(b) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
(c) this Agreement clause;
(d) Supplementary Conditions;
(e) General Terms, Conditions and Clauses;
(f) Agreement Particulars;
(g) Terms of Reference;
(h) the document entitled “Doing Business with PWGSC Documentation and Deliverables Manual”;
(i) the proposal.

PART 4 - SUPPLEMENTARY CONDITIONS (SC)

SC1 SUPPLEMENTARY CONDITIONS

There are no supplementary conditions which apply to the Agreement.

SC2 SECURITY REQUIREMENT

There is no security requirement applicable to this Agreement.

SC3 LANGUAGE REQUIREMENTS

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

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

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

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

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

SC4 DURATION OF THE CONTRACT

The consultant shall perform and complete the services described in the project statement **by the estimated date to be determined at award.**

PART 5 – SUBMISSION REQURIEMENTS AND EVALULATION (SRE)

SRE 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

An 'Overview of the selection procedure' can be found in General instructions 3 (GI3), Overview of selection procedure.

1.2 Calculation of Total Score

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

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

SRE 2 PROPOSAL REQUIREMENTS

2.1 Proposal via CPC Connect service

This bid solicitation allows and encourages proponents to use the CPC Connect service provided by Canada Post Corporation to transmit their proposal electronically.

If the Proponent chooses to submit its proposal electronically through CPC Connect service, Canada requests that the Proponent submits its proposal in accordance with section GI16, Submission of proposal, of the General Instructions. The CPC Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

Canada requests that the proposal be gathered per separate electronic document (attachment) as follows:

Section I: Technical Proposal;

Section II: Price Proposal.

The electronic attachment should be labelled with the name of the section and the Solicitation Number.

If the Proponent is simultaneously providing copies of its proposal using multiple acceptable delivery methods, and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through CPC Connect service, the wording of the electronic copy provided through CPC Connect service will take precedence over the wording of the other copies.

2.2 Proposal in Hard Copies

If the Proponent chooses to submit its proposal in hard copies, Canada requests that the Proponent submits its proposal in separately bound sections as follows:

Section I: Technical Proposal (submit one (1) bound original plus four (4) bound copies)

Section II: Price Proposal (submit one (1) bound original) in a separate sealed envelope.)

Double-sided submissions are preferred.

2.3 Proposal by Facsimile

Due to the nature of the bid solicitation, proposals transmitted by facsimile is not recommended for administrative reasons but offered to proponents to provide an alternative opportunity in case of incompatibility or inability to transmit by CPC Connect service.

If the Proponent submits its proposal by facsimile, Canada requests that the following sections be clearly identified and separated in the proposal:

Section I: Technical Proposal

Section II: Price Proposal

2.4 Requirement for Proposal Format

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

- Paper (or page) 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
- 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") papers (or pages) 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

2.5 Specific Requirements for Proposal Format

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

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

- Covering letter
- Cover page
- Tab/Dividers used to solely identify the sections of the proposal, provided they are free of all other text and/or graphics
- 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 a Mechanical Engineering firm, 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 territorial law in the Northwest Territories.

3.1.2 Consultant Team Identification

The consultant team to be identified must include the following:

Proponent (prime consultant)	Mechanical Engineering
Key Sub-consultants / Specialists	Electrical Engineering Structural Engineering Environmental Engineering Architectural Services Thermography specialist Commissioning specialist Cost Estimating specialist

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 General instructions 9 (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 General instructions 1 (GI1), Integrity Provisions – Proposal**, section 3a.**

3.2 RATED REQUIREMENTS

3.2.1 Achievements of Proponent on Projects

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

Select a **maximum** of 2 projects undertaken within the last 10 years. Joint venture submissions are not to exceed the maximum number of projects. Only the first 2 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 General instructions 2 (GI2) Definitions) must possess the knowledge on the above projects. Past project experience from entities other than the Proponent will not be considered in the evaluation unless these entities form part of a joint venture Proponent.

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

3.2.2 Achievements of 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 2 projects undertaken within the last 10 years per key sub consultant or specialist. Only the first 2 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

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 proposals corresponding to responsive proposals which have achieved the pass mark of fifty (50) points will be considered 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.

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 General instructions 16 (GI16) Submission of proposal. Proponents may choose to introduce their submissions with a cover letter.

- ☐ Team Identification - see typical format in Appendix A
- ☐ Declaration/Certifications Form - completed and signed - form provided in Appendix B
- ☐ Integrity Provisions – Required documentation – **as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3a.**
- ☐ Integrity Provisions - Declaration of Convicted Offences – **with its Proposal, 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 General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3b.**
- ☐ Proposal
- ☐ Front page of RFP
- ☐ Front page(s) of any solicitation amendment
- ☐ Price Proposal Form completed and submitted in a separate section.

For hard copy Proposal:

- ☐ Proposal - one (1) original plus 4 copies
- ☐ Price Proposal Form – only one (1) Price proposal Form completed and submitted in a separate envelope

For CPC Connect Proposal:

- ☐ Proposal - one (1) electronic document attached to the message
- ☐ Price Proposal Form – one (1) Price proposal Form completed and submitted in a separate electronic document attached to the message

PART 6 - 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.

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 – Mechanical Engineer):

Firm or Joint Venture Name:

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

Rôle	Nom de la firme	Noms des personnes clés	Licence(s) professionnelle(s) ou accréditations

II. Key Sub Consultants / Specialists:

Electrical Engineer (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Structural Engineer (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Environmental Engineer (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Architectural Services (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Thermography specialist (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Commissioning specialist (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

Cost Estimating specialist (if not a joint venture)

Firm Name

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

Role	Name of Firm	Name of Key Individuals	Professional Licence(s) or Accreditations

APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title	Architectural and Engineering Services, Hay River, North West Territories, DFO-CCG HVAC Assessment and Replacement, & Carbon Neutral Studies

Name of Proponent		**Street Address**	
Telephone number:		**Mailing Address**	
Fax number:			
Proponent's Proposed Site or premises Requiring Safeguard Measures (refer to SI? Security Requirement): *Street number / name* *Unit/Suite/Apartment number* *City, Province / Territory* *Postal Code*			N/A
Email Address:			
Procurement Business Number:			

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

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.

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: 2019-01 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.

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:

Name

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

E-mail: _____

The above certifications should be completed and submitted with the proposal, but may be submitted afterwards as follows: if the above certifications are 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 above certifications within the time frame provided will render the proposal non-responsive.

APPENDIX C - PRICE PROPOSAL FORM

INSTRUCTIONS:

- Complete this Price Proposal Form and submit in accordance with the instructions in this solicitation;
- Price Proposals are not to include Applicable Taxes;
- PROPONENTS SHALL NOT ALTER THIS FORM

Project Title: Architectural and Engineering Services, Hay River, North West Territories, DFO-CCG HVAC Assessment and Replacement, & Carbon Neutral Studies

Name of Proponent: _____

The following will form part of the evaluation process

REQUIRED SERVICES

Fixed Fee R1230D (2018-06-21) GC 5 - Terms of Payment – Architectural and/or Engineering Services

SERVICES	FIXED FEE
MAXIMUM FIXED FEES Rquired Services	**$.....**

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSE

TOTAL FEE FOR REQUIRED SERVICES **$..... GST extra**

The following will NOT form part of the evaluation process

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

DISBURSEMENTS

At cost without allowance for mark-up or profit, supported by invoices/receipts - see clause R1230D (2018-06-21), GC 5 - Terms of Payment– Architectural and/or Engineering Services, section GC5.12 Disbursements:

Specify	Enter Limit
Travel Costs	$20,000.00

MAXIMUM AMOUNT FOR DISBURSEMENTS	**$20,000.00 GST included**

THE FOLLOWING HOURLY RATES MAY BE USED FOR FUTURE CONTRACT AMENDMENTS

Principals		
	Name(s)	**Hourly rate**
1	**[insert name]**	**$.....**
2		**$.....**
3		**$.....**
4		**$.....**
5		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**
x		**$.....**

Staff		
	Name(s)	**Hourly rate**
1	**[insert name]**	**$.....**
2		**$.....**
3		**$.....**
4		**$.....**
5		**$.....**
6		**$.....**
7		**$.....**
8		**$.....**
9		**$.....**
10		**$.....**
11		**$.....**
12		**$.....**
13		**$.....**
14		**$.....**
15		**$.....**

END OF PRICE PROPOSAL FORM

APPENDIX D - DOING BUSINESS WITH PWGSC DOCUMENTATION AND DELIVERABLES MANUAL

Attached

APPENDIX E - TERMS OF REFERENCE

Attached

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

Canada

Respect ◆ Integrity ◆ Excellence ◆ Leadership

Serving GOVERNMENT, Serving CANADIANS.

Architectural & Engineering Services

TERMS OF REFERENCE

Hay River HVAC Assessment and Replacement, & Carbon Neutral Studies

For:

Department of Fisheries and Oceans (DFO)

42043 Mackenzie Hwy
Hay River Northwest Territories

June 2, 2022

www.pwgsc-tpsgc.gc.ca

TABLE OF CONTENTS:

1 PROJECT DESCRIPTION

1.1 GENERAL

1.1.1 PURPOSE OF THE TERMS OF REFERENCE (TOR)

.1 Public Works & Government Services Canada (PWGSC) requires the services of a mechanical engineering firm (Consultant), acting as the Prime Consultant with a multi-disciplinary team of sub-consultants for the delivery of services required for this HVAC Assessment, Carbon Neutral Study and Replacement project.

1.1.2 THE TOR AND THE DOING BUSINESS WITH PWGSC DOCUMENTATION AND DELIVERABLES MANUAL

.1 The TOR describes the project specific requirements, services and deliverables while the *Doing Business with PWGSC Documentation and Deliverables Manual* outlines the standards and procedures for construction documents, cost estimating and project scheduling.

.2 Document precedence:

.1 In the event of a document conflict the TOR takes precedence.

1.1.3 PROJECT INFORMATION

Project Information	
Project Title:	Hay River HVAC Assessment, Carbon Neutral Studies and Replacement
Project Address:	42043 Mackenzie Hwy. Hay River NT X0E 0R9
Solicitation Number: *[if new solicitation]*	
Contract Number: *[if existing Standing Offer Agreement]*	
PWGSC Project Number:	R.118166.001
PWGSC Contracting Officer:	
PWGSC Departmental Representative:	Shaun Hughes

1.2 BACKGROUND INFORMATION

1.2.1 USER DEPARTMENT

.1 The User Department referred to throughout the TOR is Department of Fisheries and Oceans (DFO).

.2 DFO's mission is to ensure Canada's aquatic ecosystems and fisheries are sustainable and economically successful.

.3 The Department of Fisheries and Oceans Canada (DFO) manages Canada's fisheries and safeguards its waters. The Canadian Coast Guard (CCG) is a special operating agency within DFO. It is responsible for services and programs that contribute to the safety, security and accessibility of Canada's waterways.

1.2.2 USER DEPARTMENT'S NEED

.1 The Department of Fisheries and Oceans Canada (DFO) requires an assessment and subsequent life cycle replacements of the HVAC system, in each of the eight facilities at the Hay River Coast Guard Base site, Northwest Territories.

.2 The existing HVAC systems are old and the assessment will support a decision between repairing and continuing to operate the current systems vs replacing the systems if they are not able to meet the latest functional and Greening government requirements, compliance with modern code requirements by the Authority Having Jurisdiction (AHJ), and ASHRAE standards.

.3 The Government of Canada is committed to achieving a near carbon neutral portfolio by 2050, more specifically achieving at least 90% greenhouse gas (GHG) emission reduction compared to 2005 levels.

.1 In consideration of this, DFO have an opportunity to complete Carbon Neutral Study (CNS) reports in parallel with this HVAC assessment.

.4 DFO also requires an assessment of hazardous materials such as asbestos in the areas affected by HVAC upgrades in each of the eight buildings.

1.2.3 Existing Conditions

.1 The HVAC systems in eight (8) buildings at the DFO Hay River site are older and do not meet current efficiency and operational requirements.

.1 Boilers have been replaced recently but are experiencing occasional shut-downs without reason.

.2 Additional information on the buildings' systems are available in the building condition reports.

.3 The buildings requiring HVAC Assessment, Carbon Neutral Studies, hazardous material assessment, and upgrade or replacement of mechanical systems are:

.1 Administration Building (built 1984)

.1 The Administration building has a single storey with a crawlspace foundation and is 462 m².

.2 The building has an indoor air handler, with a humidifier and a dx cooling unit set on the roof. There is a hot water heating system supplied by two high efficiency, propane fired boilers installed in 2018, and a pneumatic temperature control system.

.2 Fish Management Complex (built 1974)

.1 The facility has two storeys with a crawlspace foundation. The Fish Management Complex contains 1,164 m².

.2 Mechanical The building is heated by a hydronic heating system with boilers, pumps and distribution piping. There is an HVAC system serving the second floor with air conditioning.

.3 Carpenter Shop (built 1968)

.1 The building is a single level with slab on grade foundation and 318 m².

.2 Heat is provided by a high efficiency hot water boiler with pumps, piping and accessories. There is a heating air handler and baseboard radiation. The painting area has a ventilation system.

.3 The building has a dust collection system.

.4 Flammable Storage (built 1989)

.1 The facility is a single level with crawlspace foundation. The Flammable Storage facility contains 138 m².

.2 The building heat is provided by a high efficiency hot water boiler with pumps, piping and accessories. Heat is distributed by unit heaters and an in-floor heating system.

.5 Helicopter Operations (built 1974)

.1 The facility is a single storey with a concrete slab foundation. The Helicopter Operations / General Storage building contains 174 m² of floor space.

.2 The building heat is provided by electric unit heaters.

.6 DFO Storage Warehouse (built 1996)

.1 The facility is a single story with a slab foundation. The RSER / DFO Storage Warehouse building contains 372 m².

.2 The building is heated by propane fired unit heaters, and does not have any plumbing services. There is a shop compressed air system.

.7 Store/Maintenance Shop (built 1968)

.1 The building is a single storey with crawlspace foundation renovated in 1991. The Stores / Maintenance Shop contains 804 m².

.2 The building is heated by a hydronic heating system with boilers, pumps and distribution piping.

.3 There is an HVAC system serving the first and second floor office areas. There is also a waste oil boiler with piping connecting to the heating water system.

.8 Welding/Maintenance Shop (built 1985)

.1 This is a single-storey, 287 m² building used for welding and buoy maintenance activities. The building is located in the Hay River Navaids Storage Compound (a.k.a. Buoy Yard).

.2 Heating is provided by one (1) Clean Burn, Model CB 350 CTB, used oil boiler. The heating medium is hot water. The used oil boiler is to remain, and a new propane-fired boiler should be installed in parallel.

.3 There is an exhaust system in the building.

.4 Propane service is available on site.

.5 Controls consist of an electric system that was installed by a local electrical contractor.

.6 Assumed 120 volts branch circuit (load and quantity unknown) of unknown ampacity and panel to each boiler.

1.2.4 CHALLENGES AND CONSTRAINTS

.1 All site visits must be arranged through the Departmental Representative.

.1 Visits to the Work site may be affected by Territorial Public Health measures implemented as a result of the COVID-19 pandemic. Access may be restricted or completely prohibited at any time and alternate means of gathering the information relevant to the design may be required.

.2 The Consultant will be required to become familiar with the project site and obtain local information as required.

.3 The project will be implemented in Phases; refer to the Schedule in article 1.6 and article 1.10.

.1 At any time, PSPC reserves the right to cancel the project and not proceed with successive phases. If that situation occurs, the consultant will only be compensated for the completed phases or partial completion of a phase in progress.

.4 Consultant's key personnel must be available to respond to emergencies within 48 hours.

.5 An escort will be required at all times.

.6 Indoor storage is available in summer and outdoor storage for shipping containers in the yard all year.

.7 Site visits, workshops and on site evaluations will be carried out during normal working hours, when the site is fully occupied and operational.

.8 The project scope must be tailored to meet the User Department's budget. Diligent cost estimating and cost control is required.

1.2.5 HAZARDOUS MATERIALS

.1 No hazardous materials have been identified at this site.

.1 Identification and construction documentation for remediation of hazardous materials are included in the scope of work.

1.3 OUTLINE OF WORK

1.3.1 GENERAL

.1 The project requires HVAC Assessments at each of the eight (8) buildings on the site to investigate and confirm existing conditions, capacity, efficiency, and conformance with user requirements, government greening priorities, and ASHRAE and related standards.

.2 The consultant is to perform hazardous material assessments for the presence of asbestos related to areas where HVAC work will be undertaken.

.3 A separate standalone CNS report for each of the eight (8) buildings on the site is to be carried out. Included in these CNS reports will be an assessment of energy use and GHG emissions, and development of four (4) design options to provide best value for the Crown. Evaluate options to determine the cost and GHG emission reduction potential of each design option.

.4 Based on the findings of the HVAC Assessments and Carbon Neutral Studies, selected options will be developed to tender ready construction documentation (phase 2) and tendered for construction (phase 3).

.5 The project will be implemented in phases as noted in the schedule, article 1.6 and also refer to article 1.10.

1.3.2 HVAC and Hazardous Material Assessments Work

.1 The required assessments are listed as follows:

.1 Review and comment on all equipment, components, and systems that relate to the HVAC systems. These include but not limited to boilers, humidifiers, condensing units, air handlers, ductwork, exhaust systems, hot water heating, perimeter heat system and controls and instrumentation.

.2 Assess and identify locations and quantities of hazardous materials (asbestos) in the HVAC system.

.3 Investigate heating; cooling and humidity efficiency (conformance with ASHRAE standards 55, 62, and 90.1).

.4 Investigate smoke evacuation.

.5 Investigate zoning and air balancing based on current layouts.

.6 Assess suitability with regard to the GOC Greening Strategies.

.7 Review options for installing or upgrading automated building controls.

.8 Investigate on site (each building), review and comment on all existing electrical equipment, panels, components, and wiring methods and systems that relate to the HVAC operations and controls.

.9 Create as-is HVAC system, electrical and control detail drawings (to scale) to be used for system assessment, evaluation and design assistance.

.10 Develop a series of options for each facility, including cost estimates to support DFO decision process.

1.3.3 Carbon Neutral Study

.1 The Treasury Board Secretariat (TBS) of Canada has developed and is the custodian of the "Greening Government Strategy." The Greening Government Strategy, a mandatory cabinet directive, is designed to support the Government of Canada's transition to net-zero carbon and climate-resilient operations. The Strategy recognizes that our collective response to climate change requires action to:

.1 Reduce GHG emissions; and,

.2 Increase resiliency of assets, services, and operations to adapt to the changing climate.

.2 The Greening Government Strategy indicates that all major building retrofits, including significant energy performance contracts, require a GHG reduction life-cycle cost analysis to determine the optimal GHG savings.

.3 PSPC has developed guidelines for the evaluation and recommendation of projects which have an impact on the GHG emissions associated with their real property portfolio. The guideline is central to the undertaking of this CNS.

.4 The guideline is titled "PSPC Guideline – Project GHG Options Analysis Methodology" and is commonly referred to as "The Methodology". (Appendix A)

.5 The purpose of the CNS component is to identify the technologies and strategies available, and determine the investment required, to reduce carbon emissions from the direct and indirect burning of fossil fuels used as an energy source in existing building operations. To meet the intention of DFO to achieve their goals for carbon emissions reductions, the CNS will need to be at least innovative, if not bold, in providing engineering solutions, while maintaining the owner's operational requirements, safe environments, and the ability to fulfill DFO's mandate. Any solutions must be technically and financially feasible for each of the Options analyzed. The CNS will enhance the federal identity with respect to sound environmental stewardship and fiscal responsibility of its existing building infrastructure.

.6 PSPC and DFO are committed to the principles of sustainable design that result in significant carbon emissions reduction from the operations of existing buildings. Applying modern principles to existing buildings has both risks and challenges and the objective of the CNS is to identify these by incorporating the current capital plans into the Option analysis. The existing building's energy consumption, which result in GHG emissions, must be optimized through an integrated design approach with all disciplines. It must also meet the performance requirements listed throughout this document.

.7 PSPC and DFO have created this document in an effort to outline the requirements and expectations of CNS reports. In general, the purpose of a CNS is to identify opportunities to significantly reduce the buildings' energy consumption and resulting GHG emissions. The proposed changes should also aim to significantly reduce the energy costs for the buildings. The requirements listed throughout this document, including all referenced documents, must be met for the CNS reports.

1.3.4 Energy Modelling and Simulation

.1 *Canada's Greenhouse Gas Quantification Requirements - Greenhouse Gas Reporting Program - December 2021 - V5.0* located in Appendix B provides emission factors for fuel, biomass, electricity and district heating and district cooling. These emission factors should be used to calculate the GHG emissions of project options.

1.3.5 HVAC Design and Replacement & supporting Infrastructure

.1 Using the selected options, develop design and construction documentation for the replacement of HVAC equipment and, to the extent that they support the new HVAC, any supporting architectural, structural and electrical infrastructure, to achieve desired energy efficiency.

.1 Architectural to support new HVAC elements, including openings in walls, floors, ceilings, installing sealants and fire stopping, and replacement of various building finishes.

.2 Structural shall include any intervention to existing building structural systems or enforcement to support HVAC elements.

.3 Electrical shall include but not limited to electrical system condition, panel sizes and spaces and capacities, branch circuits sizes, breakers sizes, branch circuits and feeder, wiring methods, equipment manufacturers, existing actual connected or estimated panel load capacities.

.2 Include specifications and drawings for remediation of hazardous materials in the construction documentation.

.3 Support the DR with tendering and construction and post construction as set out in part 2 of the TOR.

1.4 OBJECTIVES

1.4.1 GENERAL GOALS

.1 Review the lifecycle and system replacement set out in the Asset Overview report.

.2 Consider the User Department functional and operational requirements of the HVAC systems and supporting building infrastructure, considering the usage of each building, location and climatic conditions, in addition to considering requirements for ease of maintenance and parts replacement, code compliance, environmentally sustainability and efficiency.

.1 Appropriateness of the real property solution for its use and location;

.2 Economic viability of the real property solution considered and/or developed;

.3 Successful incorporation of environmentally sustainable solutions;

.4 Maintenance and development of effective and efficient facilities;

.5 Appropriate incorporation of innovations within the project delivery and solutions, and;

1.4.2 ENVIRONMENTAL / SUSTAINABLE DEVELOPMENT

.1 Use sustainable design principles to the greatest extent possible considering the limited scopes.

.2 Ensure that an appropriate level of energy efficiency and ease of local maintenance are considered by studying applicable options and presenting them to the Departmental Representative and DFO for final decisions.

.3 Environmental impact of materials is to be considered throughout both material and infrastructure life cycles, including sourcing and eventual disposal.

.4 Management of construction and demolition waste will be an essential component of this project.

1.4.3 PROJECT DELIVERY

.1 Project delivery will be Design-Bid-Build.
.2 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 Obtain written authorization from the Departmental Representative before proceeding from one project milestone to another.
.4 Coordinate all services with the Departmental Representative.
.5 Establish and maintain a Project Management Plan.
.6 Maintain continuity of key personnel and a dedicated working team for the life of the project.
.7 Deliver the project to be within:
  .1 The Budget established during preliminary project approval, and;
  .2 The Project Milestones in this TOR.
.8 Conduct Quality Assurance reviews during the Project Milestones, including the application of Value Engineering principles during the design of all complex systems.

1.4.4 CARBON NEUTRAL STUDY OBJECTIVE

.1 The objective is to analyze, evaluate, and determine the scope and investment required to achieve the various, energy, and GHG emission reduction targets. The feasibility for inclusion of resilient, restorative and regenerative solutions will be considered and integrated across all options (in support of high level goals). Option 3 will demonstrate the greatest potential of solutions based on these principles.
  .1 Baseline:
    .1 For the purposes of determining the life cycle cost for the baseline, it will be defined as the cost to operate the energy consuming systems and complete maintenance replacements of components over the analysis period. All anticipated costs will be included such as operation and maintenance costs, replacement costs (assuming like-for-like replacements), salvage value, etc. Review the current BMP (Building Management Plan) and existing BCR (Building Condition Report) and use the information collected on site to anticipate future repair and replacement costs.
    .2 The baseline will be defined as the current configuration and operation of the facility calibrated to utility data. The differential savings realized in stepping from Option 1 to 2, 1 to 3, and 1 to 4 as determined using the calibrated baseline model as a starting place will be used as inputs to the Life Cycle Cost Analysis (LCCA).
    .3 In the case where an existing major project is already occurring in the building (densification, mechanical/electrical/envelope upgrade, etc.) an adjusted baseline may need to be established to account for the changes that will occur.
  .2 Option 1: Minimum Departmental Standard

.1 Compliance with DFO's policy and framework on occupational health and safety;

.2 The proposed option will have an energy performance that exceeds the latest version of the NECB by at least 24%; and,

.3 Conforms to the Government of Canada's heritage conservation standards and guidelines (where applicable).

.3 Option 2: Cost Neutral over 40 Years:

.1 Exceeds Option 1 requirements; and,

.2 Evaluate and bundle all measures that improve the energy performance and reduce GHGs emitted by the facility, and that show a cost neutral Net Present Value (NPV) on the incremental cost (compared to Option 1), when calculated over a 40-year lifecycle for the project. Energy conservation strategies will be prioritized over fuel switching and on-site renewable energy generation.

.4 Option 3: Maximum Carbon Reduction

.1 Exceeds Option 2 requirements; and,

.2 Carbon neutral/positive. Evaluate the energy measures required for the building to reduce carbon emission to as close to zero as possible, excluding the use of carbon offsets or renewable energy credits. Energy conservation strategies will be prioritized first to minimize building energy loads followed by the use of non/low GHG emitting energy sources and on-site carbon free renewable energy generation capacity. The result of Option 3 will define the maximum site potential with respect to carbon reduction potential measured against the project baseline.

.3 In addition to aggressive energy conservation measures and typical renewable energy generation, and campus/district energy systems, conduct a detailed investigation of new clean technologies and strategies.

.4 Include, as a minimum, a detailed life-cycle costing and risk analysis. Study the opportunities listed above as well as three other emerging technologies to be identified by the consultant. Once these investigations have been completed, the measures that were considered, but were rejected will be listed in a Section in the Report titled 'Measures Consider but Rejected.' Provide validation as to why these measures were not viable in a short narrative or table. This will not be just limited to new clean technologies and strategies, but for all other measures.

.5 Option 4: Optimized Hybrid

.1 This option will be an optimized combination of Options 2 and 3 above.

.2 This fourth option will be an optimized solution that provides the best value to Canada. This option may have a slightly negative NPV over the lifecycle of the project (when comparing the incremental cost to Option 1), but will have significantly more GHG emission savings and/or have other benefits. This option

may not achieve the carbon reduction realized in Option 3, but be an option that removes some of the less cost-effective measures. Use experience and expertise to determine a fiscally responsible hybrid option that provides the best value to Canada.

.2 CNS options will provide costing for various levels of improvement to the buildings. The PM in consultation with DFO, will advise which option will be selected.

1.4.5 General Services

.1 Provide a fixed fee for all consulting services required to complete the scope of work required for this project.

.2 Provide a full Consultant Team including, but not limited to, the following specialist services:

- .1 Professional/Registered Engineering Services:
  - .1 Mechanical Engineering (Prime), including:
    - .1 Mechanical Systems Optimization: Plumbing, HVAC, etc.
    - .2 HVAC control specialist;
    - .3 Building modelling and Energy simulation specialist
  - .2 Electrical Engineering, including:
    - .1 Electrical Systems Optimization: Primary and secondary distribution systems, panel and switch boards, lighting, etc.
  - .3 Structural Engineering including:
    - .1 Consideration of impacts resulting from proposed measures/options/scenarios;
  - .4 Environmental Engineering, including:
    - .1 Hazardous material specialist
- .2 Professional/Registered Architectural Services, including
  - .1 Architectural elements supporting HVAC upgrades, i.e., openings in walls, floors, ceilings, installing sealants and fire stopping, and repair/ replacement of building finishes.
- .3 Thermography specialist
- .4 Commissioning Specialist; Consulting team professionals may function as the Commissioning Authority.
- .5 Cost Estimating specialist; Certified by the Canadian Institute of Quantity Surveyors.

1.5 SCHEDULE

1.5.1 General

.1 Deliver the project to be finalized in accordance with the project milestone listing identified below.

.2 Prepare a Project Schedule in accordance with the milestone list.

1.5.2 ANTICIPATED MILESTONE DATES

Project Phase	Milestone Completion Date	Number of Weeks
Phase 1		
Consultant Contract Award		
Phase 1A – Pre-Design Assessment and Options Analysis		6 weeks
PWGSC Quality Assurance Review .1 Include work shop 1 and 2 .1 Add multiple deliverables and PSPC and DFO reviews (2 weeks for each review)		2 weeks
Phase 1B – Carbon Neutral Studies		16 weeks
Phase 2		
50% Construction Documents	TBD	6 weeks
PWGSC Quality Assurance Review	TBD	2 weeks
99% Construction Documents	TBD	6 weeks
PWGSC Quality Assurance Review (including AutoCAD files)	TBD	2 weeks
100% Construction Documents		
PWGSC Quality Assurance Review	TBD	
Tender Documents	TBD	2 weeks
Phase 3		
Construction Tender Award	TBD	6 weeks
Substantial Performance (including: Commissioning Completion and Interim Commissioning Report)	TBD	52 weeks
Final Completion (including: Standard Operating Procedures; Final Inspection and Acceptance)	TBD	8 weeks
Post Construction (including: Final Certificate of Completion; Record Documents; O&M Manual; Commissioning Manual and Standard Operating Manual; Warranty Deficiency List)	TBD	4 weeks
Post Construction (including: Final Warranty Review Report; Final Commissioning Manual and Standard Operating Manual)	TBD	40 weeks

1.6 COST

1.6.1 ESTIMATED CONSTRUCTION COST

.1 The Estimated Construction Cost is anticipated at this time to be $3,300,000, based on costing in the Asset Overview Report.

.1 The Estimated Construction Cost does not include soft costs such as project management fees, administrative costs, Consultant fees, completion of CNS reports, risk allowance, escalation or GST and is in 'Budget-Year (Current)' dollars.

1.7 EXISTING DOCUMENTATION

1.7.1 AVAILABLE FOR THE CONSULTANT

.1 Limited as-built drawings and Operation & Maintenance Manuals will be available at the start of the Pre-Design phase. The Consultant will be responsible for verifying the accuracy of the information incorporated into the design.

.2 Site drawings are in AutoCAD (dwg) format.

.1 The drawings will require modifications by the Consultant.

.2 The drawings will require the Consultant's verification of all critical dimensions and features

.3 Hay River Asset Overview Report for the CCG Base – dated December 2019.

.4 Energy bills for energy analysis are available for review upon request.

.5 Hay River BCR dated March 2000.

.6 Real Property Sustainability Handbook.

.7 Appendix A - Project GHG Options Analysis Methodology- November 2020 Update -FINAL

.8 Appendix B - Canada's Greenhouse Gas Quantification Requirements - Greenhouse Gas Reporting Program - December 2021 - V5.0

.9 Appendix C - PSPC - Carbon Neutral Study Process flow

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.

.3 The Consultant is responsible for verifying the accuracy of the information incorporated into the final design.

1.8 CODES, ACTS, STANDARDS, REGULATIONS

1.8.1 GENERAL

.1 In addition to Territorial and Municipal Acts, Codes, By-laws and Regulations appropriate to the area of concern, the following Codes, Acts, Standards and Guidelines are applicable to this project (in the event of a conflict between codes, the more stringent shall take precedence):

.1 NRC National Building Code of Canada 2015;

.2 NRC National Fire Code of Canada 2015;

.3 NRC National Plumbing Code of Canada 2015;

.4 NRC National Energy Code of Canada for Buildings 2017;

.5 The Canada Labour Code (CLC);
.6 The Canada Occupational Health and Safety Regulations;
.7 PSPC Guideline – Project GHG Options Analysis Methodology;
.8 Canada's Greenhouse Gas Quantification Requirements - Greenhouse Gas Reporting Program - December 2021 - V5.0
.9 PWGSC Mechanical Document (MD) Standards;
.1 The Departmental Representative will provide electronic copies on request.

.2 At the start-up meeting the Departmental Representative will provide additional codes and standards unique and not published by the Federal Government.

.3 The Authorities Having Jurisdiction (AHJ) on this project are:
.1 The local municipal AHJs.
.2 Treasury Board of Canada Secretariat, accessed through the Departmental Representative;
.3 DFO Departmental Fire Protection Coordinator as identified in the Treasury Board of Canada Secretariat Fire Protection Standard;
.4 Other AHJs as defined by the User Department.

.4 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 Be versed with the legislation and requirements that are unique to Federal Government buildings in Canada;
.1 Standard Operation Procedures to meet CLC.
.2 Be versed with the legislation and requirements that are unique to Federal Government projects tendered through Public Works and Government Services Canada.

1.9 OPTIONAL TERMINATION OF CONSULTANT AGREEMENT OR PROJECT DELAY.

1.9.1 GENERAL

.1 The remaining scope of work listed below is optional and is at the client's (DFO) discretion if they wish to continue on to this next portion of work.

1.9.2 CONTRACT PHASING

.1 The Contract for this project will be awarded in three phases. Which have been broken down below. The Consultant is to provide pricing for each phase up front based on the information provided and the estimated construction costs listed in Section 1.7.
.1 Phase 1A: Pre-Design Service – HVAC Assessment And Options Analysis.
.2 Phase 1B: Carbon Neutral Study Reports
.3 Phase 2: Design – This phase will include all work up until the end of construction documentation, and conclude when tender ready documents are complete.

.4 Phase 3: Construction Phase – This phase will include all work from tender through to the warranty review.

1.9.3 CONTRACT AWARD

.1 When the contract is initially awarded it will be for Phase 1A and Phase 1B only with the client reserving the right to continue with the remaining work.

.2 Should the client decide to continue on to Phase 2 and 3, the Consultant fees can be renegotiated at these times once the full scope has been defined through the activities of Phase 1A and 1B. Once the scope has been clearly defined and the pricing for Phase 2 and 3 have been agreed on, then these additional Phases will be awarded via a Consultant Contract addendum.

2 REQUIRED SERVICES

2.1 GENERAL REQUIREMENTS

2.1.1 SERVICES

.1 Phase 1A – Pre-Design including HVAC Assessment and Options Analysis

.2 Phase 1B – CNS Reports.

.3 Phase 2 – Design: Construction Documents.

.4 Phase 3 – Construction: Tendering (to assist the Departmental Representative), Construction Support, Post Construction.

2.2 PROJECT REVIEW AND ACCEPTANCE

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 QUALITY ASSURANCE REVIEWS, ACCEPTANCE AND PRESENTATIONS

.1 Each submission at each Project Milestone is subject to reviews by the Departmental Representative, the User Department, PWGSC Architecture and Engineering Centre of Expertise (AECOE) and other project stakeholders.

.2 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.

.3 At each submission:

.1 Review submissions to be posted on AutoDesk BIM 360 Docs) in searchable PDF format;

.2 Expected turnaround time for each review is ten (10) working days;

.3 The Consultant Team will receive review comments in the form of an editable MS Word document or MS Excel document;

.1 Provide a single coordinated written response within five (5) working days of receiving review comments;

.2 The purpose of this review is information and awareness for PWGSC and not quality control for the Consultants. The Consultant Team must employ their own quality control program and remain fully responsible for the design and services provided.

2.3 RISK MANAGEMENT

2.3.1 CONTEXT

.1 The Departmental Representative prepares the Risk Management Plan.

.2 Assist the Departmental Representative with the identification of risk items and factors arising from the technical requirements of the project.

2.4 COMMISSIONING SERVICE

2.4.1 GENERAL

.1 The purpose of the Commissioning Service is to certify that a fully functioning project, meeting the Owner's Project Requirements (OPR), is

delivered to the User Department through appropriate design and construction verifications.

.2 Commissioning (Cx) is an integral part of the Consultant's required services.

.1 Required Cx activities and deliverables are listed within each project phase service.

.3 Participation in commissioning is based on the project scope, complexity and risk.

.4 Provide commissioning service on the basis of CAN/CSA Z320-11.

2.4.2 SCOPE AND ACTIVITIES

.1 Refer to Pre-Design to Post-Construction Services for Commissioning scope and activities.

2.4.3 DELIVERABLES

.1 Refer to Pre-Design to Post-Construction Services for commissioning deliverables.

2.5 COST MANAGEMENT SERVICE

2.5.1 GENERAL

.1 In addition to the cost estimating requirements in the *Doing Business with PWGSC Documentation and Deliverables Manual* include the following cost management services:

.1 Cost estimates and Consultant billing are also required to be broken down by fiscal year (i.e. April 1 - March 31);

.2 Include a cost breakdown for commissioning activities in all cost estimates.

2.5.2 DELIVERABLES

.1 Three (3) cost estimates.

.2 Refer to Articles 2.6, 2.7, and 2.9 Pre-Design, and Construction Document Services for cost estimate deliverables.

2.6 PHASE 1A – PRE-DESIGN SERVICE – HVAC ASSESSMENT AND OPTIONS ANALYSIS

2.6.1 GENERAL

.1 The Pre-Design Report demonstrates the Consultant's understanding of the scope and readiness to commence the Work and consolidate the scope of the design.

.2 In the options analysis, explore, develop and compare options for increased efficiencies, operational effectiveness, and potential areas of optimization, performance verification, preliminary cost analysis and alternatives.

.3 Facilitate the recommendation of one (1) option for each building's HVAC system for further detailed development and evaluation during the design.

.1 Establishes the Basis of Design (BOD) to confirm completeness of response to User Department requirements - refer to Definition.

.4 The Pre-Design Report will be utilized as the benchmark project control document to monitor progress of the project.

2.6.2 Scope and Activities

.1 Participate in meetings, prepare agenda, minutes and decision logs.

.2 Visit the project site, meet with building operations staff, analyze site conditions and document any conditions that will impact project delivery and design.

.3 Assess existing HVAC systems:

- .1 Review existing reports, documents and material related to the project, including the functional and all other requirements identified in this TOR;
- .2 Document information available on the existing buildings including;
  - .1 Services (including propane service, HVAC, electrical, building automation, etc.),
  - .2 Special construction and demolition.
- .3 Assess and document locations and quantities on existing floor plans of hazardous materials (asbestos) in the HVAC systems for each of the eight buildings.
- .4 Document any variance between provided documents and existing site conditions;
  - .1 Revise record drawings as required.

.4 Confirm project goals and objectives including;

- .1 All the program information and project requirements to identify any conflicts or potential additional Work and indicate the impact on project scope, schedule and costs;
- .2 All additional information that will be required to deliver the project;
- .3 Preliminary summaries of regulatory and statutory requirements, AHJ, codes, regulations and standards;
- .4 Include air filtration and any new COVID-19 requirements;
  - .1 As a consequence of public health orders implemented due to the recent COVID-19 pandemic, ASHRAE has updated their Position Document on Infectious Aerosols to include COVID-19 Statements. ASHRAE has also compiled a Guide to the COVID-19 Pages infographic with available resources to assist in the design of building systems while considering public health orders. Consider the guidance provided by ASHRAE along with the changing public health orders in preparation of this pre-design report.
- .5 Sustainable development strategies;
  - .1 Proposed policy for the project to minimize environmental impacts consistent with the project objectives and economic constraints, including;
    - .1 Real Property Sustainability strategies to be applied to the project;

.5 Prepare an options analysis documenting the review and analysis of distinct multi-disciplinary options for the HVAC system in each building.

.1 Develop, for the Departmental Representative's Acceptance, the evaluation parameters.

.2 Conduct design option feasibility studies exploring possible technical and environmental strategies which are viable and have potential for development.

Provide energy simulation of the proposed design options including estimated annual energy cost, expected energy savings and GHG reduction (over status quo) associated with the option

.6 Architectural

.1 Carry out Building Code Review

.2 Provide an architectural design synopsis, describing any related architectural Work in sufficient detail for assessment and Acceptance by the Departmental Representative.

.3 Analyze architectural components to facilitate the mechanical pre-design options.

.4 Indicate on floor plans location and extent of architectural work.

.7 Mechanical Engineering:

.1 Take into considerations architectural and electrical building components for each of the building analysis options.

.2 Analyse optional mechanical schemes;

.1 Conduct a Life Cycle Cost Analysis (LCCA) over 25 years and estimate the GHG emissions (CO2e) savings for each option;

.1 Evaluate the performance, condition, remaining useful life, etc. of the various building components in order to present an accurate comparison of the proposed options,

.2 Indicate the time frame (year) that the NPV becomes positive for each of the options,

.3 Refer to the ASHRAE Handbook – HVAC Applications latest edition for expectations on how to complete LCCA,

.4 LCCA must include (at minimum) capital costs (Class D), available incentives, resulting carbon price, O&M costs, energy & utility costs, salvage value and/or disposal costs, and residual value at year 25.

.5 Use the following parameters in the LCCA calculation:

.1 Discount/Interest rate: 2.5%;

.2 Maintenance inflation rate: 1.9%;

.3 Utility escalation rate: 2%;

.4 Construction inflation rate: 2.5% (confirm the appropriateness of this value with recent market conditions and forecasts).

.3 Confirm Operational and Maintenance (O&M) requirements, including staffing, differentiated by:

.1 Code requirements;

.2 Failure modes / risks, and;

.3 Priorities appropriate to the complexity and size of the facility.

.4 Provide a schedule of requirements, listing:

.1 Rooms and the mechanical building services to be provided including unique or specialized equipment.

.1 Provide narratives associated with the manner in which the proposed mechanical service and systems compare with the user/occupant requirements.

.8 Electrical Engineering

.1 Provide an electrical design synopsis, describing any related electrical Work in sufficient detail for assessment and Acceptance by the Departmental Representative.

.1 Include a site wide BMS with BACnet for HVAC with the main terminal in the Administration building.

.2 Prepare floor plans indicating locations and sizes of:

.1 Major electrical equipment and distribution centres which support the HVAC systems.

.9 Structural Engineering

.1 Include for the review and analysis of structural engineering requirements for the mechanical options analysis, including, but not limited to, coring, cutting, patching, lintels, and structural stands or supports, etc.

.1 Indicate locations of such work on floor plans.

.10 Include requirements related to architectural and electrical and structural engineering in the summary of options and any costs related to this work.

.11 Analyze each option for compliance with the project functional and technical requirements in the approved Pre-Design report.

.12 Develop and include a Basis of Design (BOD) narrative for each option – refer to the Definition.

.13 Confirm compliance with applicable codes, acts and regulations for each option. If applicable, present alternate solutions for consideration by both the Departmental Representative and the AHJ.

.14 Identify and document risks for each option and recommend corrective measures.

.15 Prepare a Project Procedures Plan – refer to Definition.

.1 Commentary on the Departmental Representative's:

.1 Preliminary Cost Estimate;

.2 Preliminary Schedule (including Commissioning);

.3 Risk Management Plan.

.16 Provide a Class D Cost Estimate outlining the cost for each option for each building's HVAC system.

.1 CSC/CSI UniFormat™ 2010;

.2 Indicative (+/- 20%-25%), Uniformat™ Level 2 detail is required.

.3 Basis of Estimate (BOE).

.17 Initiate the Commissioning (Cx) Process;
- .1 Develop the Owner Project Requirements (OPR) - refer to Definition.
- .2 Confirm the extent of Cx requirements;
- .3 Define the Commissioning Team;
- .4 Develop a project specific design phase Commissioning Plan. Refer to Definition.

.18 Recommend one (1) HVAC option for each building to proceed to Design Development (DD).

.19 Obtain the Departmental Representative's Acceptance of the recommended options.

2.6.3 DELIVERABLES

.1 Pre-Design Report including HVAC Assessment and Options Analysis documenting the Pre-Design Scope and Activities
- .1 Revise as required.
- .2 Provide one (1) electronic searchable PDF copy on BIM 360.
- .3 It is expected that the work in Phase 1A and Phase 1B is completed in parallel. Deliverables are to be submitted as they are completed (i.e. without waiting for the completion of Phase 1B).

.2 Provide a written response to the PWGSC Pre Design Quality Assurance (QA) review.

2.7 PHASE 1B – CARBON NEUTRAL STUDIES

2.7.1 GENERAL

.1 Follow a holistic, integrated design process. Consult applicable areas of expertise on the project team, and key DFO and external stakeholders through a combination of team meetings and workshop sessions to accomplish the following:
- .1 Establishment and management of an inter-disciplinary team;
- .2 Engagement of the DFO project team throughout the entire study process;
- .3 Establishment of common vision and priorities supporting the various performance requirements;
- .4 Energy simulation on design options and objective information on system performance;
- .5 Provision of subject specialists to provide consultation;
- .6 Collaboration with the DFO facility manager to verify existing building conditions.
- .7 Use of appropriate performance assessment tool(s);
- .8 Use of a facilitator to initiate and stimulate discussions; and,
- .9 Use of team workshops/partnering sessions.

.2 Whole-building energy modeling is required such that the interactive effect of all energy efficiency measures can be cost-effectively analyzed to help achieve the required savings.

.3 Each of the four (4) options required are to consider new and emerging products, services and technologies such as those supported through the Innovative Solutions Canada program.

.4 Although separate CNS reports are requested for each of the eight (8) buildings, consider the buildings' sites in their analysis which may include consideration of district heating systems, shared photovoltaics or geothermal systems, centralized BAS systems, etc.

2.7.2 Scope & Analysis

.1 Achieving these goals will be challenging: evaluate available technology, not in isolation but in concert, with their entire multidisciplinary team.

.2 Historically one of the most cost effective ways to achieve energy and GHG savings is to include a holistic review of all building systems rather than simply identifying under-performing elements. The intent is to optimize the performance of the systems in a variety of conditions (heating, cooling, shoulder seasons, etc.) and to leverage the use of controls and dynamic modulation (advanced algorithms in the sequence of operations).

.3 Complete a detailed analysis of the existing building and systems. The level of analysis is to be at least consistent to an ASHRAE Level 3 energy audit, considering the significant investment that will be required. The latest version of ASHRAE Standard 90.1 and/or the National Energy Code of Canada for Buildings (NECB) will be used as a minimum energy performance for lighting, ventilation, heating, cooling, indoor air quality, thermal insulation, controls, etc.

.4 Review the potential for improving the controls hardware (controllers, actuators, sensors, control valves, VFDs, etc.) and the sequences of operation. This is not a requirement for complete recommissioning of the existing systems, but reviewing the control strategies and technologies in place with the goal of identifying areas for improvement / optimization. Ask questions such as (but not limited to):

.1 Does the equipment (chillers, boilers, coils etc.) achieve the expected performance? How can the system be optimized to achieve the expected performance throughout the year?

.2 Should specific equipment be replaced to allow for better control or to optimize the system? For instance, could the temperature of the chilled water be increased or the temperature of the hot water be decreased if coils, radiators, terminal units and/or heat exchangers were replaced? How can the temperature and flow be optimized using dynamic modulation?

.3 Can we implement demand based control strategies such as pressure and temperature reset and/or other controls strategies to reduce motor speeds on hydronic and VAV systems? Do controllers require upgrades to optimize performance?

.4 Is there an opportunity to improve thermodynamic equilibrium in the buildings by transferring heat from the cooling system to the heating system?

.5 For instance, does the volume of fresh air justify a heat wheel, heat pipe, run around loop (with or without a heat recovery chiller, heat pump)?

.6 Does the building have simultaneous heating and cooling? If so, could heat be recovered from the cooling system through a heat recovery chiller or other technology rather than rejecting it to the atmosphere (even in free cooling mode)?

.5 Where geo-exchanged is considered as a replacement for the primary heating/cooling plant, consideration to a hybrid plant will be given. Undertake a sensitivity analysis considering hybrid system implementation cost vs. hybrid system operating cost to establish the optimal geo-exchange capacity where additional investment begins to achieve diminishing returns.

.6 Review the following typical measures and measure categories for applicability. It is not expected that the entire list be applicable to every building but mandatory items have been indicated as such below. If measures are discarded, report how that determination was made. All discarded measures (either identified below or included) will be listed as "measures considered but not included in detailed analysis" within the CNS report.

.1 Enhanced Envelope System

.1 The use of an enhanced envelope to minimize the building energy needs for heating and cooling (MANDATORY);

.2 High performance glazing to reduce thermal losses (MANDATORY);

.3 Air sealing – ensuring a high-quality continuous air barrier (MANDATORY);

.4 Fixed window shades/canopies;

.5 Green roof / vertical wall; and,

.6 Utilidors and floors insulation (MANDATORY).

.2 HVAC System

.1 Revised building zoning – space planning;

.2 Energy recovery using multiple technologies including enthalpy wheels, energy recovery chillers, waste heat from electrical vault, heat pump energy redistribution etc. (MANDATORY);

.3 Ventilation system improvements (MANDATORY);

.4 Heating plant improvements (MANDATORY);

.5 Humidification improvements;

.6 Natural ventilation, operable windows;

.7 Water cooled VRF for heating and cooling and DHW generated from recovered heat from VRF system;

.8 Demand control ventilation;

.9 Radiant heating/cooling (active and/or passive);

.10 Advanced ventilation air and pressurization control;

.11 Underfloor displacement ventilation;

.12 Solar thermal energy and/or air source/ground source heat pumps;
.13 Specific energy efficient ventilation options for laboratories, like variable air volume fume hoods with occupancy control and runaround heat recovery loop.

.3 Plumbing System
- .1 High performance service water heating systems including solar thermal;
- .2 Drain water heat recovery;
- .3 Rain water harvesting / cistern;
- .4 Living machine to filter grey and black water;
- .5 Reduction of water use;
- .6 Use of greywater; and,
- .7 Reduction of drainage discharge.

.4 Electrical System
- .1 Demand management, load shedding;
- .2 Measures to reduce and optimize occupant plug load in the building; and,
- .3 Battery storage to off-set (shed) peak loads.

.5 Lighting System
- .1 LED technology – interior and exterior;
- .2 Daylighting and dimming control;
- .3 Photo-luminescent exit signage (where applicable and code-viable);
- .4 Solar lighting;
- .5 Task lighting; and,
- .6 Addressable lighting for occupant-customized lighting needs.

.6 Building Automation System
- .1 Significant upgrades in controls to take advantage of dynamic modulation capabilities and new technology;
- .2 Occupant sensors and/or other Internet of Things devices to adapt building systems to actual building loads;
- .3 BAS integrated energy metering; and,
- .4 Deployment of information displays for building performance feedback to operators and for tenant awareness.

.7 Alternative Energy Systems
- .1 Solar power (photovoltaic, building integrated and thermal);
- .2 Biofuel and/or biomass;
- .3 Hydrogen/Fuel Cell (for back-up power and/or in a combined heat and power arrangement);
- .4 Wind power, and;
- .5 Small Modular Reactors (nuclear).

.8 GHG Mitigation Systems
- .1 GHG Avoidance Technologies; and,

.2 GHG Capture/Sequestration Technologies.

.7 Ensure that all recommendations (related to measures and options) are consistent with applicable legislation and government-wide policies, directives and standards, comply with the National Building Code, the National Fire Code of Canada and provincial, territorial and municipal building and fire codes, meeting the more stringent of these requirements, and, if there is conflict among them, advise PSPC and DFO and recommend an appropriate course of action for acceptance.

.1 All policies, directives, codes and standards should be applied using the most recent version/release.

2.7.3 Carbon Neutral Study Process Flow

.1 Follow the PSPC 'Carbon Neutral Study: Process Flow Diagram' as a delivery roadmap, as presented in Appendix C.

.2 A collaborative work with DFO project team is necessary throughout the whole process to ensure and maintain alignment with the project's objectives.

.3 The Carbon Neutral Study: Process Flow identifies the requirement for micro-deliverables. While formal, formatted micro-deliverables are not expected, the intent is that the content developed and submitted at the milestones identified in the Process Flow will form part of the 50% and 75% major deliverables and will therefore not require additional time and effort to prepare. In some cases, the process results in a rapid check-point to ensure the information is reasonable and corresponds to the operational realities of the building(s). These checks should be implemented as part of the frequent communications we expect from an integrated and collaborative approach. The micro-deliverables should be presented in a simple format to enable a quick review by the stakeholders, including building technicians.

.4 The intent of the micro-deliverables is to reduce the likelihood of receiving incomplete or incorrect submissions at the 50% and 75% deliverables that would require significant rework by the consultant.

2.7.4 Software and Tools

.1 Ensure the use of pre-approved software and tools where noted throughout this scope of work.

.2 All energy models which will be submitted as deliverables will be created for and combatable with IES-VE, EnergyPlus, eQUEST, or CAN-QUEST

.1 Should the Consultant wish to propose an alternative modeling software, submit a comparative analysis between the pre-approved and proposed to formalize their request to make use of an alternative software package or approach.

.2 If an alternate package is proposed, it must be proposed, justified, and approved during the question period of this TOR to ensure all prospective consultants are aware of the allowance.

.3 Where geo-exchange recommendations are being considered, make estimated performance and loop field size/capacity determinations utilizing an appropriate software package or approach.

2.7.5 MEETINGS

.1 Chair and minute a Project initiation meeting which will include at a minimum:

- .1 Discussion and confirmation of overarching study vision;
- .2 Discussion and confirmation of project schedule and milestones;
- .3 Discussion of potential conflicts, challenges and, concerns;
- .4 Discussion and confirmation of study process;
- .5 Discussion of DFO/PSPC/Consultant coordination;
- .6 Discussion and confirmation of project communication strategy; and
- .7 Handover of all available building drawings, reports, utility and interval data, etc.

.2 Chair and minute all bi-weekly meetings throughout the duration of the study which will include at a minimum:

- .1 Regular updates on the progress of the study as it relates to the PSPC 'Carbon Neutral Study (CNS): Process Flow Diagram' as a delivery roadmap as presented in Appendix C;
- .2 Regular sub-consultant meetings between PSPC, DFO, the Consultant, and all subs who are welcomed to attend at the Consultant's discretion will take place;
- .3 Review risks and issues;
- .4 Review DFO's and PSPC's feedback on presented micro deliverables; and,
- .5 Seek clarifications and direction.

.3 Conduct technical review meetings that will cover, but not be limited to the energy model development, evaluation of the measures being considered, the evaluation process, the financial analysis, etc.

.4 Establish and maintain direct lines of communications throughout the project between the Consultant and the PSPC and DFO Technical Review Team (which will be determined at the project initiation meeting but will include the following resources as and when applicable):

- .1 Senior Energy Level;
- .2 Energy Manager;
- .3 Sustainability Manager; and
- .4 Building Energy Committee Members.

.5 All questions that are raised during the bi-weekly meetings or through email correspondence will be:

- .1 Documented;
- .2 Assigned to a lead person, responsible for determining the response or tracking down the information committed to; and
- .3 Given a target deadline date, establishing when the response is expected to be delivered.

2.7.6 WORKSHOPS

.1 Organize and chair the following two (2) Workshops (at a minimum). Workshops to be held remotely via MS Teams. Each workshop is to include the Project Team, Owner/Investor, Facility Management, COE and other key DFO personnel, Occupant Representatives and external stakeholders. The two stipulated workshops will include:

.1 Workshop 1: A full day charrette to review/refine/confirm goals/priorities and discuss possible evaluation criteria and brainstorm on the project's potential measures. Integrate feedback from workshop participants into the study. The first workshop is to be after the site visits and initial analysis are complete. Present understanding of the building and findings.

.2 Workshop 2: A workshop to review/refine proposed measures/options, SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, identify priority strategies and confirm sequencing of events (preferred scenarios). The second workshop is to be before the 75% report has been issued for review.

2.7.7 MICRO-DELIVERABLES

.1 Submit micro deliverables as defined in the 'Carbon Neutral Study (CNS): Process Flow Diagram', see Appendix C

.2 Ensure that an adequate quality control process is in place and applied to each micro deliverable prior to submission for PSPC and DFO review.

.1 PSPC and DFO will not be responsible for providing extensive edits. Micro deliverables which are determined to contain errors will be returned to the consultant.

.3 The following micro deliverables have been identified for submission:

.1 Draft Table of Contents (TOC):

.1 The TOC will be modeled after the minimum TOC list found in Article 2.7.14.6.3.

.2 Utility analysis and benchmarking;

.3 Site review summary report;

.4 Workshop #1 summary report and presentation materials;

.5 Baseline model input summary;

.6 Potential ECM list;

.7 Model calibration summary report;

.8 Base case cost assumptions and measure by measure LCCA; and,

.9 Workshop #2 summary report and presentation materials.

2.7.8 DOCUMENT REVIEW

.1 Conduct an in-depth review of available documentation.

.2 Current Building Management Plan (BMP) will be considered when developing baseline for Option comparison.

.1 All pre-planned projects will be considered. Deviation from the planned program of work, is to be clearly noted, analyzed and discussed.

.3 As-built/as-constructed drawings (when available) will be reviewed. Where the as-found condition deviates from the documented condition, the as-found condition will be used.

.4 Review the appropriate Community Based Investment Strategy (CBIS) where available to obtain specific strategic direction.

.1 CBIS may not be available for all Federal Properties. Where CBIS is not available, it is not required that the Consultant develop one as part of this project.

.5 Make document requests upon project award.

.6 List all documents reviewed in the study report and include relevant observations and highlights.

2.7.9 Site Investigation

.1 Undertake a site investigation and gather data consistent with the requirements defined for ASHRAE Level 3 energy auditing.

.2 Confirm the accuracy of all data collected or obtained through interviews of DFO Facility Management personnel.

.3 Coordinate site requirements including the provision of all site access permits and work plans.

.1 Schedule a site visit a minimum of three weeks in advance, or as instructed by the PSPC Project Manager.

2.7.10 Energy and Carbon Analysis

.1 Produce and energy model to assess and confirm feasibility of the building systems and sustainability strategies listed above or others identified. The detailed energy model will be produced using IESVE, Energy Plus, eQUEST, CAN-QUEST, or approved equivalent. Buildings not requiring detailed models will use custom spreadsheet analysis or other methods using acceptable engineering calculations. The following criteria shall be met:

.1 The software used is compliant with ASHRAE Standard 140;

.2 Model will be of a level of sophistication to determine the feasibility of each of the recommendations for the purpose of this study;

.3 The baseline energy model will be a model of the existing building and setup. Where this scope of work is being applied to a project that is looking at possibly increasing the occupancy load, the energy modeller will setup a model with the existing building systems along with the increased occupancy loads for comparison purposes;

.4 Each energy savings measure will be modelled with cost and savings evaluated independently and as a whole package;

.5 Modeling efforts are to assume that a number of iterations of the model will be required to analyze the various options considered to achieve the desired performance; and,

.1 The model is calibrated consistent with the requirements established in the current revision of ASHRAE 14. Select the status quo period and use available interval data for seasonal calibration checks.

.2 Ensure current operating set-points and operational parameters (mass flow, etc.) are not varied to achieve a calibrated state.

.6 Calibration of this model must be issued during the last past three (3) years according to:

.1 Daily power profile of the building (kW);

.2 Daily electric energy consumption (kWh);

.3 Daily natural gas energy consumption (kWh);

.4 All other available daily energy consumption types (ekWh), including but not limited to the following:

.1 Chilled Water;

.2 Hot Water;

.3 Steam;

.4 Fuel Oil; and,

.5 Diesel.

Note: Include other energy types where present and regularly utilized by the building. The Energy Manager will assist in confirming implacability.

.5 Report on calibration highlights as described in Article 2.7.14.3.1.8. The following table will be included in the calibration report.

Baseline Calibration to (note CY or FY) Utility Data	Monthly Calibration Tolerance		Hourly Calibration Tolerance		Complies with ASHRAE 14 (Y/N)
	MBE (%)	CV(RMSE) (%)	MBE (%)	CV(RMSE) (%)	
ASHRAE 14:2014 Tolerance	-	-	-	-	-
Electricity Consumption	-	-	-	-	-
Peak Electrical Demand	-	-	-	-	-
Natural Gas Consumption	-	-	-	-	-
Other(s) Consumption	-	-	-	-	-

.2 Include all calculations and simulation inputs/outputs/printouts in an appendix for all major components/systems/major end-uses. So that it is apparent as to any assumptions made when quantifying potential savings.

.3 Undertake a parametric analysis of options for the determination of the final make-up of each of the study options. To that end, options will be developed without pre-determined engineering judgement or prejudice.

.4 Report all assumption and limitations associated with each analytical step within the CNS report.

.5 System by system reports, demand profiles, consumption profiles by major end-use, etc.

.1 Major end-use reports will accurately represent the energy distribution to each piece of equipment, group of equipment, or system. The following major end-use categories will be included at a minimum:

.1 Space Heating;

.2 Space Cooling;

.3 Fan Energy;

.4 Pump Energy;

.5 Humidification;
.6 Interior Lighting;
.7 Exterior Lighting;
.8 Conveyance (elevators and escalators);
.9 Service Hot Water;
.10 Process Loads (data centre, etc.); and,
.11 Plug Loads.

Use the following table format to report major end-use comparison between Options.

Major End-Use Category	Baseline (Current Operations)	Option 1	Option 2	Option 3	Option 4
	(GJ/m^2/year)	(GJ/m^2/year)	(GJ/m^2/year)	(GJ/m^2/year)	(GJ/m^2/year)
Space Heating					
Space Cooling					
Fan Energy					
Pump Energy					
Humidification					
Interior Lighting					
Exterior Lighting					
Conveyance (elevators/escelators)					
Service Hot Water					
Process Loads (data centre, etc.)					
Plug Loads					
Total					

Where major end-use category includes energy from multiple sources (i.e. natural gas and electricity), report the proportion of each energy source.
Note: Where other significant major end-uses are present (or the listed end-uses are calculated to be insignificant) modify the major end-use category list to be relevant and accurate.

.6 Software packages used will not limit the energy and GHG savings options that can be investigated and analyzed (see Articles 2.7.2.6 and 2.7.2.7 for non-exhaustive lists of features to be analyzed). The study deliverables will include a description of any customization of the energy model or software in sufficient detail to allow an informed third party to understand the nature and implications of the customization.

.7 Include with the final report submission, an electronic copy of all spreadsheets (in Microsoft Excel format) and other calculations (including energy modelling files) created and/or used in preparation of the report. Include an electronic copy of all simulation files as a deliverable, and the model will be owned by PSPC/DFO.

2.7.11 Life Cycle Costing Analysis (LCCA)

.1 Energy modelling will be coupled with various financial analyses to determine the cost effectiveness of each recommendation (measure). Complete simple payback and net present value (NPV) calculations for each measure. Present GHG emission savings for each measure. Complete a detailed LCCA, over a period of 40 years, for each measure and for the overall options (~~Status Quo~~ Baseline, Option 1, Option 2, Option 3, and Option 4). Evaluate the performance, condition,

remaining useful life, etc. of the various building components in order to present an accurate comparison to the proposed options. Indicate the time frame (year) that the NPV becomes positive for each of the Options.

.1 It is not the intent of this project to have the consultant undertake to conduct a new or update an existing Building Condition Assessment. Utilize existing documentation as a basis for the work. Where observations in the field differ from that which is documented, rely on observations to over-ride the data provided (which may be out of date).

.2 Complete a separate detailed financial analysis comparing Option 1 to Options 2, 3 and 4, as described in Article 1.4.4. This analysis is to accurately present the variance in NPV and benefits of Options 2, 3 and 4 over Option 1.

.3 Refer to Chapter 37 of ASHRAE Handbook – HVAC Applications (2015) and NIST Handbook 135 for more con on how to complete LCCA which is in line with PSPC standards.

.4 Life cycle costing must include, but not be limited to:

.1 Capital costs including all hard and soft costs;

.1 Costing accuracy will be within +/- 25% (Class D).

.2 Available incentives;

.3 Operating and maintenance costs (including anticipated repairs and replacement of equipment);

.4 The following information to be provided to the Consultant by PSPC/DFO:

.1 Energy Conversion and GHG emission factors (electricity, natural gas, etc.);

.2 Utilities rates (electricity, natural gas, water, etc.);

.3 LCCA escalation rates;

.5 A fixed shadow carbon price of $300/tonne, as per required by TBS's Greening Government Strategy.

.6 Residual value and/or disposal cost of building equipment or systems at the end of life and at the last year of analysis (year 40).

.5 When accounting for the price increase of utilities, only known approved increases will be accounted for in the LCCA, unless otherwise stated in the project "Requirements Document". All other information required such as discount rate, escalation rates, etc. for the LCCA will be provided by PSPC/DFO.

.6 An Appendix detailing each energy efficiency measure, and all supporting documentation is to be included. It must list each potential energy efficiency measure describing the proposed scope of work, notes and instructions for its design, recommendation on equipment selection and commissioning requirements. This appendix will include supporting calculations, presented in a table format, including energy modeling screenshots/printouts used in determining the energy savings.

2.7.12 Measure and Options Descriptions

.1 Ensure each measure is described in sufficient detail to convey to the reader the scope of each evaluated measure. Descriptions will include, but not necessarily be limited to:
- .1 Scope of the measure;
- .2 Major equipment included in the measure;
- .3 Implementation strategy (including limitations, if any) applicable to the specific measure;
- .4 Assumptions used to analyze the measure;
- .5 Critical performance attributes;
- .6 Other measures/systems which are interrelated and/or dependent for successful operation;
- .7 Sensitivity to climate change.

.2 Ensure that each measure is described in sufficient detail to convey to the reader the full interconnected scope of the selection of measures which make up the option. Descriptions will include, but not necessarily be limited to:
- .1 A full list of the measures which make up the option;
- .2 A narrative on the interdependencies of measures included in the option;
- .3 Implementation strategy (including limitations, if any) applicable to the option as a whole;
- .4 A table summarizing key performance attributes derived from the energy model;
  - .1 Implementation Cost ($);
  - .2 Life Cycle Cost (LCC) ($);
  - .3 Differential (compared to baseline) Implementation Cost ($);
  - .4 Differential LCC (compared to baseline) ($);
  - .5 Thermal Energy Demand Index (TEDI) (ekWh/m2);
  - .6 Total Energy Utilization Index (TEUI) (ekWh/m2);
  - .7 Energy Savings (GJ);
  - .8 Energy Savings (%);
  - .9 GHG Savings (tCO2e); and,
  - .10 GHG Avoided (%).
  - .11 The above noted attributes will be presented within the report in appropriate sections using the following table format:

Option Attribute	Option 1	Option 2	Option 3	Option 4
Implementation Cost ($)				
Life Cycle Cost (LCC) ($)				
Differencial Implemenation Cost ($)	n/a			
Differencial LCC ($)	n/a			
Thermal Energy Demand Index (TEDI) (ekWh/m^2)				
Total Energy Utilization Index (TEUI) (ekWh/m^2)				
Energy Savings (GJ)				
Energy Savings (%)				
GHG Savings (tCO_2e)				
GHG Savings (%)				

- .5 Include a cumulative cash flow figure for each of he evaluated options. The figure will include the following:
  - .1 Cumulative cash flow; and,

.2 NPV.

.3 Present an Options Summary Table in the Executive Summary of the 50%, 75%, and 100% report.

.4 Undertake and complete a Strengths, Weakness, Opportunities, and Threats (SWOT) analysis applicable to each of the four (4) specified options.

.1 The SWOT analysis will tie each option back to the overarching study objective;

.2 The SWOT analysis will consider the specific and unique implementation requirements applicable to the deployment of the option as a whole;

.3 The SWOT analysis will consider input sought from stakeholders participating in the project workshops; and,

.4 The SWOT analysis will consider the outcome of the Risk Assessment undertaken on each of the options.

.5 Summarize their SWOT analysis findings in tabular format using a table similar to the example below:

Strengths	Weaknesses
Opportunities	**Threats**

.6 Integrate the results of the SWOT analysis into the measure and option descriptions as well as the final recommendations.

2.7.13 THERMOGRAPHY

.1 Undertake a thermography evaluation of the building envelope and roof that will encompass the entire building or all the buildings for the entire complex to determine overall performance and identify deficiencies which can be addressed as measures for consideration unless provided by DFO. The evaluation will include the following key components:

.1 Thermo-bridge identification; and,

.2 Infiltration/exfiltration identification.

.1 Quantification may be obtained through blower door test if required and approved by DFO as a scope amendment.

.2 The thermography evaluation will be undertaken by a suitably certified Level II professional.

.3 The thermography evaluation will be undertaken once acceptable building pressurization methodologies have been determined by all key and relevant project stakeholders.

.4 Provide the thermography evaluation report as an Appendix to the CNS report.

2.7.14 DELIVERABLES

.1 **Project Schedule:**

.1 Issue a project schedule incorporating all milestones and deliverables listed in this TOR, using the schedule in Article 1.6.2 as a guideline.

.2 **Meeting/Workshop Agendas/Minutes**

.1 Bi-weekly Meetings

.1 Provide agendas a minimum of two (2) days prior to the scheduled meeting.

.2 Provide summary notes in the form of meeting minutes no more than one (1) week following each meeting.

.2 Workshops

.1 Provide draft agendas a minimum of two (2) weeks prior to the scheduled meeting/workshop.

.1 PSPC/DFO to provide review comments for incorporation prior to issuance to workshop attendees.

.2 Submit and issue the final agenda to workshop attendees at least one (1) week prior to the scheduled event.

.3 Provide summary notes in the form of a Workshop Summary Report defined in Article 2.7.14.3 of this TOR.

.3 **Micro-Deliverables**

.1 Submit the following micro deliverables throughout the study:

.1 Expected Useful Life (EUL) of Existing Equipment/Systems

.2 Draft Table of Contents (TOC)

.3 Utility Analysis and Benchmarking

.4 Site Review Summary

.5 Baseline Model Input Summary

.6 Workshop #1 Summary Report including but limited to:

.1 Final workshop agenda;

.2 Summary of discussion;

.3 Summary of decisions/actions;

.4 Presentation material;

.5 Scratch notes; and,

.6 Attendance list.

.7 Potential Measure List

.8 Baseline Model Calibration Report

.1 Submit a calibration report summarizing calibration hypotheses for the reference building model. The reference year for the calibrated model will be chosen as per the method outlined in latest version of ASHRAE 14.

.2 Consumption results per source/system;

.1 Include the major end-use breakdown consistent with the breakdown described in Article 2.7.10.5.1

.9 Individual Measure LCCA Summary Table with relevant metrics (energy savings per source, GHG emissions reduction, operational cost savings, capital cost, life cycle cost over 40 years).

.10 Options Analysis Summary Table with relevant metrics (energy savings, GHG emission reduction, operational cost savings, capital cost, life cycle over 40 years, net present value).

.11 Workshop #2 Summary Report including but limited to:

.1 Final workshop agenda;

.2 Summary of discussion;

.3 Summary of decisions/actions;

.4 Presentation material;

.5 Scratch notes; and,

.6 Attendance list.

.4 **Thermographic Summary Report**

.1 Submit a Thermography Study Summary report including but not limited to the following report elements:

.1 Both infrared and visible spectrum images of each analyzed element;

.1 Where pressurization conditions were varied the infrared and visible spectrum images are to cover the full range of the investigation.

.2 It's findings;

.3 It's impact in the improvements proposed; and,

.4 Conclusions made.

.5 **Comment Log**

.1 Maintain a comment log and provide formal response to all DFO and PSPC commentary. The log will be maintained for comments received on major deliverables submittals; 50%, 75%, and 99% reports.

.2 The log will be maintained in Microsoft Excel and include the following minimum elements:

.1 Comment Discipline (Mechanical, Electrical, Energy, Architectural, Structural, Sustainability, etc.);

.2 Comment Author;

.3 Comment Author Organization (PSPC, DFO, etc.);

.4 Comment response/rebuttal.

.3 Provide an updated comment log no more than five (5) business days following receipt of review commentary.

.6 **Draft Report**

.1 Submit a separate standalone CNS report for each of the eight (8) buildings on the site.

.2 Integrate the content submitted as designated micro-deliverables into the appropriate draft release of the report consistent with the CNS process defined by the Process Flow Diagram included in Appendix C of this TOR.

.3 Include the following Table of Contents (TOC) sections in the CNS Report;

.1 Executive Summary
.2 Introduction
.3 Methodology
.4 Existing Building Description
.5 Utility Analysis and Benchmarking
.6 Efficiency Measure Development
.7 Design Option Development
.8 Measure and Option Analysis
.9 Conclusions and Recommendations

Note: The Executive Summary will include a brief summary of all sections/elements of the report. It is fully expected that the Executive Summary in this context will be between 5 and 10 pages in length. The Executive Summary will be used as a key document by DFO to obtain project approval and funding.

.4 Provide Appendix documentation to supplement the study report. Appendix content will include but will not necessarily be limited to the following:

.1 Provide an Appendix detailing each energy efficiency measure as described above. This document must include the projected energy savings and GHG reduction (with detailed tables, model outputs, screenshots and figures), describe in detail the measure schematically, basis of design equipment recommendations, and implementation notes.
.2 Provide a summary of the existing control system (BAS/BMS) (set points, strategies, sequences of operation, etc. as an appendix). This should be consistent with the assumptions and inputs used in creating the calibrated model.
.3 Include the energy model calibration report as an Appendix to the report.
.4 Include the site assessment report as an Appendix to the report.
.5 Include all presentation materials along with written commentary summarizing each Workshop as an Appendix to the report.
.6 Include all cost consultant reporting as an Appendix to the report.
.7 Include the detailed LCCA tables in an Appendix to the report.
.8 Include the Thermography Study Summary report as an appendix to the report.

.9 Include applicable reference material (equipment cut sheets, etc.) as an Appendix to the report.

.10 Include a master measure and option summary sheet as an Appendix to the report.

Note: All Appendices will be referenced in the main body of the report.

.5 Provide, as a deliverable in PDF format and Microsoft Word/Excel format, all the above mentioned information in the form of a formal report. Draft reports will also be submitted in electronic format (Microsoft Word) to allow for efficient review/commenting/tracking of changes/comments, etc. All units in the report must be in International System of Units format (SI). Because some energy modeling tools and engineering spreadsheets use other units (Imperial System), some of the information in the appendices (supporting calculations/information) can be provided in either format.

.6 Upon receipt of each deliverable, PSPC would target to review to the submission within ten (10) business days at which time the Consultant will have five (5) business days to execute the requested edits and resubmit to PSPC for final approval and release for Stakeholder review:

.1 Submit 50% draft report;

.1 The 50% draft report will include content from all of the identified micro-deliverables.

.2 Facilitate a brief presentation (preferably through MS Teams) to present the 50% draft report, and field and respond to questions and queries.

.2 Submit 75% draft report; and,

.1 The 75% draft report will include content from all of the identified micro-deliverables

.2 The 75% draft report will include content in all of the defined Appendices.

.3 The 75% draft report will include descriptions, supporting materials and results for all four (4) defined options.

.4 Facilitate a brief presentation (preferably through MS Teams) to present the 75% draft report, and field and respond to questions and queries. Present changes from the 50% draft report during this presentation.

.3 Submit 99% draft report.

.7 Final Report

.1 Submit the final report including all completed appendices having address ALL DFO and/or PSPC comments, requests for clarification, instruction, and revisions.

.2 The final CNS report must be sealed and signed by a Professional Engineer registered in the province/territory/location of the project.

.3 The report issued by the Consultant and labelled final will ONLY be considered final when accepted by DFO and PSPC as final.

.8 Final Results Presentation

.1 Provide a summary presentation of results following the submission of the 100% CNS report.

2.7.15 Comparison and Overlap with HVAC Pre-design Report in Article 2.6

.1 Compare the HVAC option recommended in the Pre-Design Report with the Options analysis in the CNS report to determine best value to the Crown. Although some duplication of work is inevitable between the scopes of work in Articles 2.6 and 2.7, it is expected that the Consultant efficiently complete the work and deliverables as requested.

2.8 OPTIONAL TERMINATION OF CONSULTANT AGREEMENT OR PROJECT DELAY

2.8.1 General

.1 Upon completion of the Phase 1A (Pre-Design Service) and Phase 1B (Carbon Neutral Studies) PWGSC reserves the right to terminate the Consultant Agreement or delay the start of Phase 2 (Detailed Design) and Phase 3 (Construction Services) for up to one year.

2.9 PHASE 2 – CONSTRUCTION DOCUMENTATION SERVICE

2.9.1 General

.1 Develop the selected design option prepared and approved in the Pre Design and options analysis stage. This is to include; drawings and other documents to describe the scope, quality and cost of the project in sufficient detail to facilitate design approval.

.1 Confirm code compliance,

.2 Develop the necessary construction documents required to tender the approved design.

.2 Finalize all major design components, technical criteria and performance objectives, cost estimates schedule and codes/standards regulatory compliance.

.1 Confirm that the design continues to support the project specific objectives documented in the Pre-Design Service.

.3 Integrate all components and systems, including architectural, structural, mechanical and electrical and automated Building Controls.

2.9.2 Scope and Activities

.1 Participate in meetings, prepare agenda, minutes and decision logs.

.1 Present updates and supporting analysis within project meetings.

.2 Prepare one (1) tender package coordinated with all disciplines, and including all buildings.

.3 Prepare construction documents in accordance with the Doing Business with PWGSC Documentation and Deliverables Manual.

.1 Finalize designs according to the Budget and schedule;

.1 Coordinate the Work, including scope changes required to remain within Budget,

.2 Non-compliances may require revisions to the contract documents at the Consultants cost,

.3 Include air filtration design to address COVID 19 requirements;

.1 As a consequence of public health orders implemented due to the recent COVID-19 pandemic, ASHRAE has updated their Position Document on Infectious Aerosols to include COVID-19 Statements. ASHRAE has also compiled a Guide to the COVID-19 Pages infographic with available resources to assist in the design of building systems while considering public health orders. The consultant is expected to consider the guidance provided by ASHRAE along with the changing public health orders in their preparation of this pre-design report.

.4 Include specifications and drawings for remediation of hazardous materials in the construction documentation.

.5 Include a site wide BMS with BACnet for HVAC with the main terminal in the Administration building.

.4 Provide a cost breakdown by unit rate and/or trade for review of bids and comparison with the successful Contractor's cost breakdown.

.5 Update the project schedule.

.6 Establish a quality control process for the construction and contract administration stage.

.7 Analyze the constructability of the project and advise on the construction phasing process and duration.

.8 Update the BOD and OPR.

.9 Develop commissioning construction documentation complete with verification forms using National Master Specifications (NMS) Division 01 specifications including:

.1 An updated Cx Plan with detailed commissioning strategies, Cx forms/check sheets and training requirements;

.2 Cx forms and verification check sheets ready for commissioning of specific components, equipment, systems and integrated systems specific to the project;

.1 Component verification (Static Verification),

.2 Installation verification,

.3 Start-up,

.4 Systems verification test,

.5 Integrated system functional performance verification for dynamic operation, and;

.6 Cx issue log.

.3 Expected design performance parameters;

.1 Observed performance including any indication of whether or not this performance is acceptable, and;

.2 Design Engineer of Record date and signatures along with those performing and witnessing the test.

.10 Provide written response to PWGSC comments at 50%, 99% and 100% completion review stages and integrate comments into the final construction documents.

.11 Participate in the Risk Management process.

.12 Include in the contract documents, a requirement for the contractor to develop a waste reduction and management plan during the construction of this project.

2.9.3 DELIVERABLES

.1 Include items listed in the "Scope and Activities" section above, the *Doing Business with PWGSC Documentation and Deliverables Manual* and items listed below.

.2 50% complete Construction Documents (minimum requirements):

.1 Architectural:

.1 Develop an architectural design synopsis (BOD) for the selected CNS/mechanical option for each building, and must include the following:

.1 Overview

.2 Building Code review;

.3 Design considerations of the impacts resulting from the selected CNS/mechanical option.

.1 Plans, elevations, sections and details for architectural components, and

.4 continue to consider potential for staging, complimentary systems, energy efficiency, compliance with codes and standards and contribution to the selected CNS/mechanical option.

.2 Mechanical:

.1 Develop the mechanical design synopsis (BOD) for the selected option include the following;

.1 Overview,

.2 Code and Standards Analysis,

.3 Site Services and Utilities,

.4 Heating Systems,

.5 Cooling Systems,

.6 Ventilation Systems,

.1 COVID-19 air filtration requirements.

.7 Exhaust Systems,

.8 Insulation,

.9 Humidification Systems,

.10 Controls, and;

.11 Energy Conservation Measures and Energy Analysis Report.

.2 Provide system schematics for heated water, chilled water and ventilation;

.3 Provide catalogue cut sheets of representative equipment for each type of component to be used on the project;

.4 Provide layout drawings showing locations and sizing of all major components and systems such as:

.1 Ventilation, cooling and heating systems showing locations, and all major equipment layouts in mechanical rooms;

.5 Provide brief design calculations including outputs from computerized analysis.

.1 Update the energy analysis for each building.

.3 Electrical:

.1 Update the electrical design synopsis for the selected options. Provide data on the total connected load, the maximum demand and diversity factors and the sizing of the emergency load;

.2 Indicate metering locations on a distribution diagram;

.3 Provide design calculations including outputs from computerized analysis.

.4 Include a site wide BMS with BACnet for HVAC with the main terminal in the Administration building.

.4 Structural Engineering:

.1 Develop the structural design synopsis (BOD) for the selected option including the following;

.1 Provide structural calculations and details to suit the mechanical equipment selections,

.2 Develop specifications for materials and execution related to structural building interventions.

.5 Continue to review all applicable statutes, regulations and by-laws in relation to the design of the project and conduct a detailed code analysis to demonstrate compliance.

.1 If there are non-compliance issues, develop alternative solutions to support the design and submit for approval to the AHJ.

.6 Analyse the Constructability of the project and advise on the construction phasing process and duration.

.7 Updated project schedule;

.8 Construction Drawings and Specifications;

.1 All drawing sheets and specification sections required for tendering to be included in this submission.

.9 Corresponding directly to the Preliminary Project Description PPDFormat™, prepare a Class B Cost Estimate, breaking out costs for each building:

.1 CSC/CSI UniFormat™ 2010;

.2 Substantive (+/- 10%), Uniformat™ Level 4 detail is required;

.3 Basis of Estimate (BOE).

.10 One (1) complete set in electronic searchable PDF on BIM 360.

.3 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 and a written response to the PWGSC 50% review;
.2 Class A Cost Estimate;
  .1 CSC/CSI UniFormat™ 2010;
  .2 Substantive (+/- 5%), Uniformat™ Level 5 detail and MasterFormat™ is required;
    .1 Show breakdown for each building
  .3 Basis of Estimate (BOE).
.3 Updated project schedule;
.4 Construction Drawings;
  .1 Drawings should reflect 99% completeness as a complete design without any incomplete drawings (as if ready for tendering).
.5 Complete Specifications;
  .1 Including all required sections coordinated with the drawings;
  .2 Bidders' price breakdown form (for submission at tender closing), and;
  .3 Commissioning specifications, including forms applicable to Pre-Functional verification (Static Verification, installation & start-up) and Functional Performance Verification Testing (operational and dynamic).
.6 One (1) complete set in electronic searchable PDF on BIM 360.
  .1 Include drawings in both DWG and PDF formats for review by PWGSC.

.4 Final (100%) Construction Documents ready for tendering:
.1 Incorporate all revisions required by the review of the previous submission and a written response for the PWGSC 99% review;
.2 The submittal includes:
  .1 Signed and sealed documents:
    .1 One (1) complete set in electronic searchable PDF on BIM 360.
  .2 Updated project schedule, and;
  .3 Construction Drawings & Specifications as per the *Doing Business with PWGSC Documentation and Deliverables Manual* except as follows:
.3 The Consultant must confirm in writing that:
  .1 The documents are ready to be issued for tender,
  .2 The checklist in the *Doing Business with PWGSC Documentation and Deliverables Manual* 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.

2.10 PHASE 3 – TENDER SERVICE

2.10.1 GENERAL

.1 Support the Departmental Representative with the tender.

.2 The Contract Authority for this project is the PWGSC Real Property Contracting (RPC) branch.

.3 Tendering will use the Public Works and Government Services internet procurement system (https://buyandsell.gc.ca).

2.10.2 SCOPE AND ACTIVITIES

.1 Apply for Building /utilities (HVAC and electrical) Permits (as required) from the municipality of Hay River/ AHJ along with the supporting documentation for a permit application. The Contractor will be responsible for all other permits.

.1 Note that if the installation of an HVAC system requires a ducting design alteration, both an HVAC permit and an electrical permit is required

.2 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 the Departmental Representative;

.3 Attend one (1) on site bidder's conference;

.4 If PWGSC decides to re-tender the project, or any specific tender package, provide full services to the Departmental Representative, and;

.5 During Bid Review and Analysis assist the Departmental Representative as required by analysing and reconciling any differences between pre-tender estimates and submitted bids.

2.10.3 DELIVERABLES

.1 Addenda.

.2 Written responses to all questions.

.3 Bid analysis and/or recommendations.

2.11 PHASE 3 – CONSTRUCTION SUPPORT SERVICE

2.11.1 GENERAL

.1 Support the Departmental Representative with the construction phase and confirm that the quality, Budget and schedule meet the project requirements.

2.11.2 SCOPE AND ACTIVITIES

.1 The Consultant shall share all project information with PWGSC:

.1 All material specifications, mixes and test results shall be turned over to the Departmental Representative for future maintenance by PWGSC and others.

.2 General Services:

.1 Prepare minutes and report on project and construction site meetings;
.2 Review contractor submissions;
.3 Update the project log tracking with approved major decisions, including those impacting project scope, Budget and schedule;
.4 Provide required documentation in order to obtain the building and utility permits;

.3 Construction & Contract Administration:
.1 Provide bi-weekly field reviews and as required to fulfill the Consultant's professional obligations to monitor the construction activities throughout the construction period and keep the Departmental Representative informed of Work progress;
.1 Reject unsatisfactory Work;
.2 Provide written reports for field reviews;
.2 Furnish supplemental instructions to the Contractor with reasonable promptness or in accordance with a schedule for such instructions agreed to by PWGSC and the Contractor;
.3 Provide additional drawings to clarify, interpret or supplement the contract documents;
.4 Review and comment on various documents such as the Contractor's Progress Claims and all information impacting schedules;
.5 Offer timely technical advice on all disputes and claims between PWGSC and the Contractor;
.6 Identify need for special tests, inspections and additional Work, and;
.7 Assist the Departmental Representative to prepare the Certificate of Substantial Performance and provide sign-off.

.4 Cost Services:
.1 Evaluate change orders, claims, Work completed and cash flow;
.2 Determine the amounts owing to the Contractor based on Work progress and certify payments to the Contractor.

.5 Changes to the Work:
.1 Assist the Departmental Representative in preparing Contemplated Change Notices (CCNs) and Change Orders (COs) to be issued by the Departmental Representative.

.6 Review, witness, verify test, approve and sign off all commissioning submittals for performance parameters before test and after test including:
.1 All factory test reports and data;
.2 Installation, start-up and Testing, Adjusting and Balancing (TAB);
.3 Components, systems and integrated systems based checks;
.4 Cx forms and verification checklists, process and procedures specific to components, systems and different levels of integration between systems;

.5 Cx schedule;
.6 Deferred, seasonal and re-test system deficiency;
.7 Review and assist with O&M and Owner Training Manual;
.8 Oversee and Document Functional Performance Testing;
  .1 Follow up on testing issues as required.
.9 Update the Cx Issues Log;
.10 Conduct field reviews complete with Cx site reports verifying components and systems being commissioned in accordance with the OPR and the BOD;
.11 Chair Cx Team meetings and report progress on a bi-weekly basis complete with minutes for distribution;
.12 Provide verification of final reports upon completion of the entire project;
.13 Lead and facilitate the Cx Team's Interim Acceptance Report sign-off, and;
.14 Engineer(s) of Record Letter of Acceptance.

2.11.3 Deliverables

.1 Meeting minutes.
.2 Bi-weekly field review and work progress reports (including construction photographs).
.3 Reviewed shop drawings, test reports/certificates and other submissions.
.4 Clarifications, Supplemental Instructions, Contemplated Change Notices and Change Order Recommendations.
.5 Reviewed and certified Contractor Progress Claims.
.6 Comments to Contractor Schedule, and Change Orders.
.7 Completed Certificate of Substantial Performance.
.8 Standard Operating Procedures - refer to the Definition.
.9 Interim Commissioning Report - refer to the Commissioning Report Definition.

2.12 PHASE 3 – POST CONSTRUCTION SERVICE

2.12.1 General

.1 Support the Departmental Representative in obtaining all final documents required for project Close-out (refer to the "Project Milestones" definition).

2.12.2 Scope and Activities

.1 Project Close-out Services:
  .1 Revise documentation to reflect all changes, revisions and adjustments after completion of commissioning;
  .2 Prepare and submit electronic record drawings (AutoCAD format as per the *Doing Business with PWGSC Documentation and Deliverables Manual* requirements) and specifications based on Contractor's marked-up 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 Finalize the Commissioning Manual;

.1 Oversee, follow up and ensure any deficiencies not completed by the Contractor are completed;

.2 Resolution of any warranty issues on commissioned systems during the warranty period;

.3 Provide ongoing consultation with the construction teams in support of their project closeout activities and submittals related to systems and assemblies commissioning specific deliverables in compliance to the Commissioning Plan, Commissioning Specifications and Owner's Project Requirements (OPR);

.4 Finalize the Commissioning Report based on;

.1 Final Cx Plan and associate testing and verification documents,

.2 Final Cx issues Log,

.3 Post occupancy changes,

.4 Deferred commissioning,

.5 Information not available or incomplete at Interim Acceptance.

.5 Coordinate deferred commissioning for those systems that have been functionally tested and/or turned over where re-testing and commissioning is required;

.6 Certify that all installations have been completed and function in accordance with the Cx Plan, OPR and the Consultant’s Basis of Design (BOD);

.7 As per the Commissioning Plan, ensure that all completed operating and maintenance manuals, warranties, guarantees and other required submittals are turned over to the Departmental Representative.

.2 Warranty Services:

.1 Participate in warranty inspections with the Departmental Representative and Contractor;

.2 Provide a warranty deficiency list;

.1 Monitor and certify correction of deficiencies before expiry of warranties.

2.12.3 Deliverables

.1 Warranty Deficiency List.

.2 Final Certificate of Completion.

.3 Record Documents:

.1 One (1) electronic searchable PDF copy of each record document on BIM 360;

.2 One (1) copy of each record drawing in AutoCAD - DWG file format.

.1 Refer to the *Doing Business with PWGSC Documentation and Deliverables Manual* for AutoCAD drawing requirements and standards.

.4 Operations and Maintenance Manual(s):
- .1 Three (3) hard copies.
- .2 One (1) electronic searchable PDF copy on BIM 360.

.5 Final Commissioning Manual (signed) - refer to the Definition.

.6 Final Systems Operation Manual (signed) - refer to the Definition.

.7 Final Warranty Review Report.
- .1 Final certification of installation and warranty from manufacturers.
- .2 Sign-off on Warranty.

3 PROJECT ADMINISTRATION

3.1 GENERAL REQUIREMENTS

.1 The administration requirements outlined in this section are applicable to all PWGSC projects in the Western Region, unless otherwise indicated in the TOR.

3.2 LANGUAGE

.1 Construction documents must be prepared in English and French.

.2 Except for tender documents, all documents must be prepared in English. Tender documents, including all documents published during the tender period (e.g. Addenda, RFI, etc.) must be prepared in both English and French.

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 PWGSC administers the project on behalf of Canada and exercises continual control over the project during all phases of development.

.2 The PWGSC project management team, the Consultant Team, 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 project.

3.5 LINES OF COMMUNICATION

.1 All communications will be through the Departmental Representative, unless directed otherwise.

.1 This includes formal contact between the Consultant Team, 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

3.6.1 GENERAL

.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, and;
  .5 Health and Safety.
.3 Project Start-up Meeting:
  .1 Shall be arranged and facilitated by the Departmental Representative, and;
  .2 Includes the PWGSC AECOE Design Manager, User Department Representatives and the Consultant Team.

3.6.2 DESIGN PHASE 1:

.1 Bi-weekly meetings with PWGSC and the Consultant Team will normally be held via teleconference.

3.6.3 DESIGN PHASE 2:

.1 Bi-weekly meetings with PWGSC and the Consultant Team will normally be held via teleconference.

3.6.4 TENDER PHASE

.1 Attend one (1) on site bidder's conference.

3.6.5 CONSTRUCTION PHASE:

.1 Bi-weekly meetings with PWGSC, User Department, the Consultant Team and the Contractor will take place via teleconferences.
  .1 There will be a site meetings for the following activities:
    .1 Substantial Performance.

3.7 CONSULTANT RESPONSIBILITIES

.1 The Consultant Team includes the Consultant's staff, sub-consultants and specialists.
  .1 This team must maintain the same, or better, level of expertise, as presented in their proposal, for the duration of the project;
  .2 The team must include qualified registered architectural and engineering professionals with extensive relevant experience and who are capable of providing all required services;
    .1 Professional registrations / certifications must remain current.
  .3 Team members may be qualified to provide services in more than one discipline, and;
  .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 Coordinating input for the Departmental Representative's Risk Management Plan, and;

.4 Developing and coordinating a comprehensive quality assurance process to ensure that submissions are accurate, complete and meet TOR requirements.

3.7.2 DESIGN PROJECT MILESTONES

.1 Attend meetings.

.2 Record the issues and decisions.

.3 Prepare and distribute minutes within two (2) working days of the meeting.

.4 Ensure sub-consultants attend all required meetings.

3.7.3 CONSTRUCTION PROJECT MILESTONE

.1 Record the meeting issues and decisions.

.2 Prepare and distribute minutes within two (2) working days of the meeting.

.3 Attend meetings and provide site inspection services;

.4 Ensure sub-consultants provide site inspection services and attend all required meetings.

.5 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, and;

.3 Obtaining approvals on behalf of the Departmental Representative from the User Department 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

3.8.1 ADMINISTRATION

.1 PWGSC administers the project and exercises continual control over the project during all phases of development.

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

3.8.2 REVIEWS

.1 PWGSC will review the Work at various stages and reserves the right to reject unsatisfactory Work at any stage.

3.8.3 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 or compliance with the contract.

3.8.4 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, and;

.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.

3.8.5 PWGSC ARCHITECTURE AND ENGINEERING CENTRE OF EXPERTISE (AECOE)

.1 Provides advisory services and Quality Assurance Reviews of Consultant deliverables.

.2 Participates regularly in design and construction Project Milestones and may attend meetings as and when required.

.3 Provides a Design Manager for the project who will coordinate the services of AECOE.

3.9 USER DEPARTMENT RESPONSIBILITIES

3.9.1 USER DEPARTMENT PROJECT LEADER

.1 Is accountable for the expenditure of public funds and delivery of the project in accordance with the terms accepted by the Treasury Board.

.2 Reports to the senior User Department executive management.

.3 Will play several critical roles for the successful implementation of the project, including:

.1 Coordination of 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 TERRITORIAL AND MUNICIPAL AUTHORITIES

.1 The federal government generally defers to provincial/territorial 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 for information and awareness;

.2 Submissions will be reviewed at the completion of specific phases as outlined in Part 2 of this TOR.

3.11 BUILDING PERMITS AND OCCUPANCY PERMITS

.1 The Consultant will review plans with the permit authority as early as necessary to assure smooth project development but no later than 50% Contract Documents. Consultant will advise and assist administration of any necessary permit fees.

.2 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.

.3 The Consultant shall support the Contractor in its application for an Occupancy Permit and coordinate the resolution of all outstanding issues related to the permit.

.4 The Contractor shall pay for the permits on behalf of PWGSC.

3.12 TECHNICAL REPORTS

.1 Technical Reports are official government documents, which are used to support an application for approval or to obtain authorization or Acceptance. Technical Reports 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 Have all pages are numbered in sequence, and;

.6 Be printed double-sided, if hard copies are produced.

.2 Standard practice for the organization of technical reports include:

.1 A cover page, clearly indicating the nature of the report, the date, the PWGSC project number and who prepared the report;

.2 A Table of Contents;

.3 An Executive Summary;

.1 A true condensed version of the report following the identical structure, including only key points and results/recommendations requiring review and/or approval;

.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 easily;

.5 Appendices are to be used for lengthy segments of the report, supplementary and supporting information and/or for separate related documents.

.3 The report content must:

.1 Use a proper numbering system (preferably legal numbering), for ease of reference and cross-reference;

.1 The use of ‘bullet points’ are to be avoided.

.2 Use proper grammar, including using complete sentences, for clarity, to 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.

.3 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.

.4 Use proper grammar, including using complete sentences, for clarity, to avoid ambiguity and facilitate easy translation into French, if required.

4 DEFINITIONS

4.1 PURPOSE

4.1.1 DOCUMENT DEFINITIONS:

.1 Definition of words and phrases in the Terms of Reference (TOR), and *Doing Business with PWGSC – Documentation and Deliverables Manual* to:

.1 Expand the detail associated with the services and deliverables addressed in the above Documents, and;

.2 Provide a clear understanding of the project scope, procedures, and quality performance requirements.

4.2 DEFINITIONS

4.2.1 ACCEPTANCE

.1 A formal action taken by an assigned person with authority (contractual or otherwise) to declare some aspect of the project is permitted to proceed.

4.2.2 BASE BUILDING

.1 As per Government of Canada Workplace Fit-Up standards.

4.2.3 BASIS OF DESIGN (BOD)

.1 Refer to CSA Z320 Article 3, Definitions.

.1 For further detail refer to ASHRAE 202, Article 8 – Basis of Design, Article 8.2 – Requirements.

.2 A dynamic narrative document throughout the Project Milestones, recording the rationale for decisions and confirming to the Project Team design conformance to the ideas, concepts and criteria considered important to the owner as contained in the Owner Project Requirements (OPR) - for OPR see Definition;

.1 As the Consultant BOD also outlines the intended systems for the project, the Consultant's Cx Process Manager/Cx Authority, using a compliance evaluation/tracking matrix, confirms the BOD's compliance to the OPR.

.3 Documents the primary thought processes and assumptions behind design and implementation decisions.

.4 Text and graphics are organized to facilitate future use as a building reference document.

.1 The O&M Manual describes "what" components/systems have been selected, the BOD describes "why" and "how" the design achieves the performance requirements of the OPR, and;

.2 BOD and OPR are components of the Cx Manual.

.1 OPR - refer to Definition for further information.

.5 Includes:

.1 A Summary:

.1 Project's conceptual framework;

.2 Compliance with OPR statement (including new Owner directives);
.3 Compliance with the Functional Program, and;
.4 Rationale for decisions made throughout the specific Project Milestone.

.2 Design assumptions, such as:
.1 Anticipated future changes not included in the project, and;
.2 Selected assembly and system performance requirements.

.3 A Uniformat™ Level 3 detail narrative description and statement on the purpose of the selected components, assemblies, systems and methods – see PPDFormat™ Definition, including:
.1 Areas served by the respective components, assemblies and systems, and;
.2 Illustrations of system configurations, including single line and plan drawings of each system.

.4 Design options and analysis considered during the:
.1 Life Cycle Costing and Value Engineering workshops, and;
.2 Development of sustainable features and strategies.

.5 Calculations and option analysis matrixes, organized by discipline, including:
.1 Connected or related loads and system capacities, and;
.2 Design criteria and the applicable codes/standards used in the calculations.

.6 Special features or unique supply items/sources, general control strategies, sequences, and reset schedules, such as:
.1 Building components and connectivity;
.2 Seasonal switch-over procedures, and;
.3 Emergency procedures during a fire condition, power or equipment failure, including:
.1 Reference to Standard Operating Procedures requirements and definition.

.7 Interfaces with existing systems, and;
.8 Maintenance issues.

4.2.4 Basis of Estimate (BOE)

.1 A "living" document throughout the project design, construction process and project life cycle.
.2 Provides a framework for progress monitoring and reporting.
.3 Prepared and updated to facilitate the understanding, assessment and validation of the estimated value breakdowns, independent of any other supporting documentation.
.4 Includes:
.1 Level of consensus between concurrent/third party estimates;
.2 Estimate methodology;
.3 Basis of pricing - cost data sources, and allowances;

.4 Description of information obtained and used in the estimate including the date received; such as, background supporting material – Scope, Description of mark-up & add-ons, etc.
.5 Notable assumptions, exclusions and inclusions;
.6 Listing of items/issues carrying notable risks;
.7 Opportunities, and any deviations from standard practices;
.8 Record of pertinent communications and agreements that have been made between the estimator and other project stakeholders;
.9 Major changes relative to previous estimates; in tabular or spreadsheet format, including;
.1 Cost reconciliation and cost variance with detail narrative, and;
.10 Significant market events that may have an effect on the costs.

.5 With the last submission include:
.1 Variances related to:
.1 Change Orders;
.2 Work Package estimate, and;
.3 Estimate Construction Cost.
.2 And, any additional relevant information.
.1 Attachments – price quotes from suppliers, guidelines-principles that are used to guide estimates, bottom-up estimates, parametric estimates-details to generate estimates, analogous estimate-details of the historical project used, third party estimates, analysis-details of any analysis, validations & approvals.

.6 Detailed Elemental Cost Estimates; must be itemized separately to Material, Labour and Equipment Cost.
.7 Refer also to the "Cost Estimate" Definition.

4.2.5 BUDGET

.1 Developed using Cost Estimates and the Project Schedule.
.2 Provides a view of how much the project is estimated to cost both in total and periodic terms.
.3 Determines the cost performance baseline for use in cost management variance analysis such as, determining earned performance value.
.4 Is aligned with funding limits to confirm funding availability/appropriation.
.5 Also refer to - Estimated Construction Cost definition.

4.2.6 "CANADA", "CROWN"/"HER MAJESTY"

.1 Her Majesty the Queen in right of Canada.

4.2.7 COLLABORATIVE PROJECT DELIVERY

.1 The Collaborative Project Delivery approach promotes and facilitates knowledge collaboration between design and construction professionals and subject matter experts to create optimal design and construction solutions and methodologies in order to achieve an appropriate, timely and fiscally responsible Quality project delivery.

.1 Recognizes that project success is tied to all Project Team members' success in the integrated process.

.1 The Collaborative Project Delivery process starts at the Pre-Design with Departmental Representative as Lead Partnering Session and the Consultant, as Lead, project start-up meeting early in Schematic Design.

.1 Collaborative Project Delivery is an interactive process which continues throughout the project life cycle.

.2 Joint Project Team goals include:

.1 Ownership and focus on Quality including, Owner Project Requirements (OPR), Basis of Design (BOD) as well as Budget and schedule performance;

.2 Focus on optimizing the design and construction as a whole to fulfill the PWGSC Quality expectations;

.3 Mutual support for the project procedures and management;

.4 Leveraging Value Engineering, Life Cycle Costing and commissioning skills, and;

.5 Creation of an innovative learning environment.

4.2.8 Commissioning Authority

.1 Refer to the:

.1 Commissioning Process Manager (CPM) Definition for description of Cx Authority and part of the Consultant Team;

.2 CSA Z 320, Article 3 Definitions for Third Party description;

.3 TOR for the requirement of a Cx Authority as a part of the Consultant Team membership or of an independent third party Cx Authority to be separately engaged by PWGSC.

4.2.9 Commissioning Evaluation Report

.1 A Cx Manual component.

.2 Includes a debriefing report, with aspects such as:

.1 A complete assessment of the project;

.2 Lessons learned;

.3 Variances between the actual and planned levels of performance;

.4 A listing of components and systems not commissioned and the reasons;

.5 Recommended follow-up actions including Re-commissioning.

4.2.10 Commissioning (Cx) Manual

.1 Deliverable by Consultant's Cx Process Manager/Cx Authority.

.2 Contains the following:

.1 Updated Owner Project Requirements (OPR);

.2 Updated Basis of Design (BOD);

.3 Updated Commissioning Plan;

.4 Static Verification, start-up and Functional Performance Testing reports;

.5 Commissioning Report;

.6 User and operator training reports;
.7 Occupancy and operations evaluation reports;
.8 All relevant project reports and correspondence, and;
.9 Recommendations for Re-commissioning and frequency by equipment type and system.

.3 Requires Cx Process Manager/Cx Authority sign-off at a Construction Contract Substantial Performance and Completion (final) milestones.

4.2.11 Commissioning (Cx) Plan

.1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
.2 Refer to CSA Z320 Article 4.2.3 Commissioning Plan.
  .1 For further detail refer to the following ASHRAE 202 Articles:
    .1 Article 7 – Commissioning Plan, Article 7.2 – Requirements;
    .2 Article 10 – Design Review, Article 10.2 – Requirements;
    .3 Article 11 – Commissioning Submittal Review – Article 11.2 Requirements;
    .4 Article 15 – Training, Article 15.2 Requirements.
.3 A dynamic document throughout the project life cycle.
.4 Outlines a Plan to execute the scope of Work.
  .1 The ongoing Plan development is carried out through iterative reviews, workshops, and meetings to ultimately become the complete plan including construction and occupancy milestones of the project.
.5 "Design Phase" (Pre-Design) Cx Plan:
  .1 Cx Plan is based on the Programming, OPR and Acceptance of risk and Budget;
    .1 Outlines a preliminary execution plan including activities, Cx Team roles and responsibilities, schedules and deliverables for pre design and subsequent design and BOD ultimately be updated and completed during the construction and occupancy milestones.
.6 "Design Phase" (Schematic Design, Design Development and Construction Documents) Cx Plan:
  .1 Cx Plan is updated to address the remaining Project Milestones including construction documentation, construction and occupancy. The Cx Plan includes;
    .1 Detailed tasks, roles and responsibilities, schedule, work flow processes and a list of the systems to be commissioned, and;
    .2 Coincides with the design documents such as the specifications so that the Commissioning Team is clear on the goals and process.
    .3 Refer to CSA Z320 Article 4.3. – Design Phase, Article 4.3.1, General.
      .1 For further detail refer to ASHRAE 202, Article 10 Design Review – Article 10.2 Requirements.
.7 "Construction Phase" Cx Plan:

.1 During the Construction milestone, the updated Cx Plan continues to outline the Cx Team's roles and responsibilities, implementation of issues resolution protocol, the procedures and forms for documenting commissioning activities and the schedules for commissioning activities, reporting and deliverables.

.2 Refer to CSA Z320 Article 4.4 – Construction Phase, Article 4.4.1, General.

.1 Add the following requirements:

.1 Cx schedule, and Installation start-up lists.

.2 For further detail refer to ASHRAE 202, Article 11 Commissioning Submittal Review –Article 11.2 Requirements.

4.2.12 Commissioning (Cx) Process

.1 Refer to CSA Z320 Article 4, Commissioning Process.

.2 A dynamic document throughout the project life cycle.

.3 The process by which the design and construction documents (plans, sections, specifications, BOD, etc.) are confirmed to be consistent with each other; includes the commissioning requirements and the OPR.

.4 During the Cx design reviews the Consultant is ultimately responsible for the project design and final decisions regarding the design expected performance.

.1 Supporting the Cx Process may also be the Consultant's Commissioning Process Manager/Cx Authority to lead the Cx Team in the design and implementation of the Process that may involve, for example either;

.1 A third party Cx Provider company, procured by PWGSC) or,

.2 A Contractor's Cx Agent.

4.2.13 Commissioning Process Manager (CPM)

.1 Cx functional entity:

.1 May also be identified as Cx Authority entity.

.2 Member of the Consultant Team.

.3 Overall functional responsibilities is to lead the Commissioning Team in the:

.1 Design of the Commissioning Process so that it begins with commissioning of individual components and progresses to commissioning the complete integrated building system as a whole, and;

.2 Update of the BOD and OPR during design and construction.

.4 Dependent the requirement for independence from the design and construction management, the CPM may include the functional role and be identified as a functional Commissioning Authority entity in, for example, the Cx Plan Specification, article - Roles and Responsibilities of the Cx Team:

.1 Regarding "independent Commissioning Authority" requirements, refer to Canada Green Building Council (CGBC).

.5 Requires a unique combination of engineering, design fundamentals and building operations knowledge including: energy systems design, installation and operation, commissioning planning and process management, hands-on field experience with energy systems performance, interaction, start-up, balancing, testing, troubleshooting, operation and maintenance procedures, and energy systems automation and controls.

.6 Responsible for Cx deliverables, such as:

.1 Sequencing;

.2 Means and methods;

.3 Verification of installation and performance to BOD and OPR;

.4 Documentation and related sign-offs, and;

.5 Manuals.

.7 Cx Process Manager/Cx Authority, unless otherwise stated, will only make recommendations, and observations during the design review.

4.2.14 Commissioning Record Checklist

.1 Refer to CSA Z320 Article 4.9, Final Documentation.

.1 Add to Article 4.9.3, Additional Commissioning Documentation, the following requirements:

.1 Certificate of Interim Acceptance;

.2 Final Certificate of Completion;

.3 Deferred Cx Test Report;

.4 System and Environmental Check Reports e.g. Storage Tanks;

.5 Final Cx Report;

.6 Cx Evaluation Report, and;

.7 Final Standard Operation Procedures.

.2 Cx Record Checklist outlines the deliverables to be assembled and updated over the course of the Design, Construction and Delivery Close Out.

.3 Cx Record Checklist may include sections such as:

.1 Commissioning Plan;

.2 Commissioning Schedule;

.3 Owner’s Project Requirements (OPR);

.4 Basis of Design (BOD);

.5 Project Team, complete with functional entity titles;

.6 Design QA Review compiled reports;

.7 Project Issues/Resolutions Logs;

.8 Cx Issues/Resolutions Logs;

.9 Commissioning meeting minutes;

.10 Commissioning specifications;

.11 Commissioning forms and check sheets;

.12 Commissioning site reports;

.13 Coordination drawings;

.14 Testing and inspection procedures;
.15 System start-up plans;
.16 Construction Checklists;
.17 Inspection reports;
.18 Test reports;
.19 Commissioning test certifications;
.20 Training plans;
.21 Training documentation – electronic and hard copy;
.22 Deferred testing documentation;
.23 Post-construction review/re-inspection report;
.24 Systems Manual;
.25 Operations and Maintenance Manual; and
.26 Re-commissioning Manual.

4.2.15 Commissioning Report

.1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
.2 A Cx Manual Component (at Construction Contract Substantial Performance and Completion – final/post Warranty) milestone.
  .1 Requires CPM/Cx Authority sign-off and Consultant verification at Substantial Performance and Completion.
.3 The Cx Report (at Substantial Performance) is based on:
  .1 Final BOD and OPR;
  .2 System components list requiring commissioning;
  .3 Final performance verification forms and check sheets: component, systems and integrated systems - design values to actuals;
    .1 Static, installation, start-up, functional performance and integrated system verification;
  .4 All commissioning site review reports;
  .5 Commissioning issue logs and progress reports;
  .6 Final training sessions;
  .7 Post occupancy changes;
  .8 Deferred commissioning; and
  .9 Current information not available or incomplete at Interim Acceptance/Substantial Performance.
.4 A Final Commissioning Report (prior to end of Warranty Period), which includes:
  .1 Final Cx Evaluation Report;
  .2 Updated Cx Report from Substantial Performance;
  .3 Post-Occupancy test results and evaluations; and
  .4 Updated Issues/Resolutions Log – highlighting documented Cx resolutions.
.5 All progressive/interim Acceptances requiring all Project Team members to sign-off.

4.2.16 Commissioning Risk Assessment

.1 Deliverable by Consultant's Cx Process Manager/Cx Authority.

.2 The Cx Risk Assessment aligns the rigor of the Commissioning Process with the following 2 risk items associated with Architectural and Engineering systems:

.1 Building: The function and performance; and

.2 Deliverables: The deficiencies, such as, inaccurate as-built documentation, ineffective owner/occupant training, lack of documented system performance testing, and lack of comprehensive systems manuals.

.3 The Cx Risk Assessment is often summarized in a matrix and accompanied by a basis of assessment narrative.

.4 The premise of the Cx Risk Assessment is to identify:

.1 Building type and the intended use as a guide for Cx risk associated with the intended building systems; and

.2 How the performance of each system will affect the performance of all other systems, and how non-performance in the building may have a negative impact on function and operational confidence.

4.2.17 Commissioning Scope

.1 Facilitated deliverable by Consultant's Cx Process Manager/Cx Authority.

.2 Conducted by a Cx Team.

.3 An integrated developmental process for determining the level of Cx effort based on the scope, rigor, OPR, building operation and function, including:

.1 Cx prioritization; and

.2 Cx Risk Assessment.

4.2.18 Commissioning Team (Cx Team)

.1 The objective of the team is to encourage interdisciplinary collaboration to confirm the Cx Process is completed and the facility criteria has been achieved.

.2 Cx Team composition is first identified and defined at the Pre-Design milestone, followed by an integrated development of a Cx Process and the assignment of the Cx roles and responsibilities and corresponding services and deliverables.

.3 Size and membership varies depending on the project size, complexity and phase of design and construction.

.4 Team make-up may consist of a:

.1 Departmental Representative – including PWGSC Cx Manager;

.2 User Department – O&M Personnel;

.3 Consultant(s) (dependant on the TOR, including Consultant's Cx Authority);

.4 Contractor's Agent; and

.5 Contractor's Agencies.

4.2.19 Contractor's Commissioning Agencies

.1 To be identified as the in the specifications as the "Contractor's Sub-Contractor Commissioning Agency/Agencies" (CS-CCxA) functional entity/entities, in the Cx Plan Specifications, article - Roles and Responsibilities of the Cx Team. Includes Agencies, such as:

.1 Installing contractor/sub-contractor;

.2 Equipment manufacturers, such as, elevators, emergency generators;

.3 Specialist Cx Agency, Cx Work outside the scope or expertise of other Cx Agencies, Work such, as environmental space condition, air quality; and

.4 TAB Agency, such as adjusting flow rated and pressure related to ducted air and hydronic systems, fans and pumps.

.2 Available for emergency and troubleshooting service during the first year of occupancy and modification outside the responsibilities of the O&M personnel.

4.2.20 Contractor's Commissioning Agent

.1 Responsibilities are distinct from the Contractor's site supervisor.

.2 To be identified in the specifications (Cx Plan Section, article – Roles and Responsibilities of the Cx Team,) as the "Contractor's Commissioning Agent" (CCxA) functional entity.

.3 Responsible for the implementation of all commissioning activities required by the specifications, including demonstrations, training, testing, preparation and submission of testing reports.

.4 Available for emergency and troubleshooting service during the first year of occupancy and modification outside the responsibilities of the O&M personnel.

4.2.21 Constructability

.1 The extent to which the design of the building facilitates the ease of construction, which is subject to the overall requirements for the completed building project.

.2 The effective and timely integration of construction knowledge into the conceptual planning, design, construction, and field operations of a project to achieve project goals and building performance at the optimal level by:

.1 Implementing a Quality project delivery process which also meets the project objectives in the best possible time and accuracy at the most cost-effective levels; and

.2 A balance of various project, environmental and market constraints.

4.2.22 Construction Checklist – Checks and Tests

.1 Also known as Contractor's Cx "systems readiness checklist".

.2 Confirms specified equipment is provided, undergone Static Verification, properly installed, initially Started-up and checked out in preparation for full operation and Functional Performance Testing.

.3 Refer to CSA Z320 Article 4.4 – Construction Phase.

.1 Add to Article 4.4.2 – Pre-construction the following requirements:
  .1 Cx schedule, and Installation start-up lists.

4.2.23 Consultant

.1 Architectural/Interior Design/Engineering firm acting in the capacity of Prime Consultant and professional of record for the provision of services described in the TOR.
  .1 The Consultant manages and coordinates the Consultant Team (refer to Definition).

4.2.24 Consultant Team

.1 The Consultant (architectural/interior design/engineering firm and Prime Consultant) and their sub-consultants including professionals and advisors with whom PWGSC has contracted to provide other services described in this TOR.

4.2.25 Cost Estimate

.1 Refer to the *Doing Business with PWGSC Documentation and Deliverables Manual*, Section 3 - Cost Estimates for further Cost Estimate details.
.2 Cost Estimate as compared to the Budget – see Definition.
.3 Estimates cost of the Work associated with the overall project at each Project Milestone, and tender packages, Division 01 General Requirements and other supporting activities within the project lifecycle.
.4 Cost breakdown estimating is formatted as per PPDFormat™ and MasterFormat™ National Master Specifications:
  .1 During Schematic Design (SD) – Uniformat™ Level 3 detail;
    .1 For further detail refer to Preliminary Project Description (PPD/PPDFormat™) Definition.
  .2 During Design Development (DD) – as per Uniformat™ Level 4 detail;
    .1 For further detail refer to Preliminary Project Description (PPD/PPDFormat™) Definition, and;
  .3 During Construction Documentation (CD) – as per Uniformat™ Level 5 detail and as per MasterFormat™ - Divisional and Sectional details;
    .1 National Master Specifications (NMS) is the basis for construction specifications.
.5 For all Cost Estimates include the Basis of Estimate (BOE) – refer to Definition.

4.2.26 Constant Dollar Estimate

.1 This is an estimate expressed in terms of the dollars of a particular base fiscal year.
.2 It includes no provisions for inflation.
.3 Cash Flow 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.

.1 For Current Dollar Estimates – see Definitions.

4.2.27 Current Dollar Estimate

.1 Budget Year Dollars is also to be referred to as Nominal dollars.

.2 An estimate based on costs arising in each Fiscal Year (FY - ending March 31) of the project schedule.

.3 Escalated to account for inflation and other economic factors affecting the period covered by the estimate.

.4 Costs and benefits across all periods should initially be tabulated in Budget Year Dollars for the following reasons:

.1 It is the form in which financial data is usually available;

.2 Tax adjustments are accurately and easily made in Budget year dollars; and

.3 It enables during analysis, the construction a realistic picture which takes into account changes in relative prices.

.5 Constant Dollar Estimate – see Definitions.

4.2.28 Departmental Representative (DR)

.1 The person designated in the Contract, or by written notice to the Contractor/Consultant, to act as the Departmental Representative for the purposes of being a Contract entity.

4.2.29 Estimated Construction Cost

.1 The Budget identified in the TOR or subsequently in writing by the Departmental Representative:

.1 Also stated as "Cost Estimate".

4.2.30 Facility Turnover

.1 Refer to CSA Z320 Article 4.7, Facility Turnover Activities.

.1 Add to Article 4.7 the following review requirements:

.1 Review signatories, client/stakeholder, of a document agreeing to accept project outcomes and/or on the condition that all recorded deficiencies are to be addressed as appended;

.1 Facility Turnover Activities are required where the project or part of the project ("partial interim occupancy") is being turned over.

4.2.31 Fit-Up Standards

.1 Space and cost (funding) allocation and workplace configuration and furnishing as per Framework for Office Accommodation and Accommodation Services – Government of Canada Workplace Fit-Up Standards, GCworkplace Design Guide and the GCworkplace Space Planning Workbook.

.1 Departmental Representative will provide electronic copies.

4.2.32 Functional Performance Testing

.1 Refer to CSA Z320 Article 4.5, Functional Performance Testing.

.1 For further detail refer to ASHRAE 202, Article 13 Issues and Resolution Documentation – Article 13.2 Requirements.

.1 Review Functional Performance Testing data entry in the Issues and Resolutions log according to ASHRAE 202, Section 13, including:

.1 Tests at peak load conditions as identified in the Cx Plan.

4.2.33 Functional Program

.1 May be included in the RFP or may be a Pre-Design deliverable stating the end state functional and operational goals.

.1 The term "Functional Programming" is only one component of a "Programming" service which may also include technical programming, Master Schedules and program requirement cost estimates.

.2 Functional Programming documentation and supporting templates (e.g. questionnaires, workshops) are included in the GCworkplace documents for office accommodation projects (fit-ups).

.2 Defines the design problem by determining the details for achieving the goals. Goals may include, but are not limited to, design considerations regarding:

.1 Architecture/Interior Design: Area needs, adjacencies, circulation, acoustics, health and safety, personnel forecasts, user characteristics, organizational structure, Budget and costs and project schedule;

.2 Engineering: HVAC, plumbing, electrical, security, and communications.

.3 One of Three Program Levels of effort are use based on complexity and risk:

.1 Level 1 Program is used for small, relatively simple or repetitive types of projects where the standard requirements are well understood, includes;

.1 A summary of required useable spaces, along with net areas and general notes outlining specific space requirements;

.2 The approximate gross useable area required to accommodate the program;

.3 A description, in general terms, of the relationships between spaces and groups of spaces, in sufficient detail to commence the Schematic Design Stage;

.2 Level 2 Program is used for larger projects with some degree of complexity, includes;

.1 A summary of required useable spaces, along with net areas;

.2 An outline of specific technical and functional requirements for each space;

.3 The approximate gross area required to accommodate the program, determined by developing component diagrams;

.4 Relationship diagrams indicating adjacencies and flow patterns between spaces and groups of spaces, and;

.3 Level 3 Program is used for major projects and projects with a high degree of complexity, includes;

.1 A qualitative (functional) and quantitative (net area and gross area) description of all required spaces;

.2 Detailed Program Areas including;

.1 Net useable area requirements for each space;

.2 Component Gross area requirements for all component groups, and;

.3 Gross Area Summary needed to accommodate the program;

.3 An outline of specific Technical Requirements, indicating general Architectural, Structural, Mechanical, Electrical and Security systems applicable to the entire building and/or to each similar space types;

.4 Room / Space Data Sheets, indicating specific requirements for each space type not covered in the technical requirements;

.5 Space Concept Plans, associated with each Space Data Sheet, indicating all fixed equipment and any special features;

.6 Component (Group or Department) concept planning diagrams indicating required relationships between all spaces in each component group;

.7 Component Relationship Diagrams, indicating relationships between all component groups;

.8 A Demonstration plan (to scale) to confirm that:

.1 Net to gross area ratios are reasonable; and

.2 Component group relationships can reasonably be achieved either within the established gross building area for new buildings or within the limitations of the building floor plate(s) for existing buildings.

.9 Mechanical Schematic Zoning and Directional Air Flow Diagrams for laboratory projects.

.4 Program Level selection and the associated level of detail is also determined by the Cx complexity and risk, providing further supporting information to the OPR development.

4.2.34 Interim Acceptance

.1 Refer to CSA Z320 Article 4.6, Interim Acceptance.

.1 Add to Article 4.6 (i) the following requirements:

.1 System Operations Manual and Standard Operating Procedures, including;

.1 Normal and emergency mode of operations, and;

.2 Life and Safety Compliance Report.

.2 Interim Acceptance will be synonymous with Substantial Completion as per GC's of the Construction and Consultant Contract.

4.2.35 Issues/Resolution (I/R) Log

.1 The I/R Log contains description of project issues and/or variances ranging from specifics such as with the Owner Project Requirements (OPRs) to general design and construction and related processes and deliverables.

.1 On an ongoing basis the log maintains the status of current/ongoing and resolved issues;

.2 Issues are identified and tracked as encountered during all design phases, construction and operations of the facility.

.2 I/R Log is also included as an item in:

.1 The meeting Design and Construction agenda; and

.2 The monthly construction phase report on the Cx Plan.

.3 For more information on what needs to be documented also refer to ASHRAE Guideline, The Commissioning Process.

4.2.36 Life Cycle Costing (LCC)

.1 LCC methodology, used during investment analysis and planning, design, construction and procurement, employs a comprehensive economic comparison of competing options.

.2 Comparison of competing options is to be made between ideas similar in nature that are designed to satisfy the same basic function or set of functions.

.3 LCC interpretation, as related to competing options assessment.

.1 The sum of the present values that are associated with investment costs, capital costs, installation costs, energy costs, operating costs, maintenance costs, and disposal costs, over the lifetime of the project.

.4 Refer to industry standard practices for measuring life cycle costs of the building and building systems such as, ASTM Standards.

.5 Also refer to Value Engineering (Assessment) Definition.

4.2.37 Master Schedule (Master Project Schedule)

.1 Refer to the Doing Business with PWGSC Documentation and Deliverables Manual.

4.2.38 Move Plan

.1 Identifies move tasks, dependencies, and task duration.

.2 Explores potential move optimization and risk minimization.

.3 Includes:

.1 Phasing, specific timeline/Gantt chart, order and process for relocations, hoteling (office) and final moves;

.2 Security protocols for interim and final moves;

.3 Drawings showing;

.1 All project furniture including new and reused, loose furniture, filing systems, equipment and appliances,

.2 Electrical and data services connections to furniture and interconnected panels (separate from electrical construction drawings).

.4 Swing space and interim storage requirements.

4.2.39 Move Process

.1 Requires coordination with the User Department's processes and protocols, including:

.1 Move specific resources and a Roles and Responsibilities matrix;
.2 Move activities and logistics associated with;
  .1 Pre-Move - supply of boxes, packing, data labeling requirements, etc.
  .2 Move Day - preventative operational downtime logistics,
  .3 Post Move – unpacking and walkthroughs, and
  .4 IT Moves – equipment/infrastructure disconnect/reconnect.
.3 Meeting Schedule;
.4 Checklists;
.5 Occupational Health and Safety as per the Canada Labour Code; and
.6 Compliance with the Contractor's site specific safety plan.

4.2.40 Operation and Maintenance Manual(s) (O&M)

.1 Developed throughout the project lifecycle.
.2 Produced by the Construction Manager/Contractor and is part of the Collaborative Project Delivery integrated process and is supported by the Consultant and Departmental Representative.
.3 Requires Cx Process Manager sign-off at contract Substantial Performance.
.4 Prepared using product information report forms/data provided by Subcontractors, Own Forces and information from other sources as required.
.5 Refer to NMS Division 01 General Requirements document for further detail.

4.2.41 Owner Project Requirements (OPR)

.1 Refer to CSA Z320 Article 3, Definitions.
  .1 For further detail refer to ASHRAE 202, Article 6 - Owner's Project Requirements, Article 6.2 – Requirements.
.2 Developed by the Consultant, in consultation with "the Owner" - PWGSC/User Department, during the Pre-Design Project Milestone.
.3 Text and graphics are organized to facilitate future use as a building reference document.
  .1 BOD and OPR are components of the Cx Manual.
.4 A dynamic document throughout the project lifecycle that defines the Owner's values and end goals; their ideas, concepts and end state quantifiable and measurable performance benchmarks/criteria by usage, by systems and/or by occupancy classification associated with topics such as:
  .1 Project Program – pertinent Functional (Space) Program extracts, such as;
    .1 Basic facility data (such as, area, number of stories Occupancy and construction type(s)), user/area usage schedules, restrictions and limitations, expandability, flexibility and durability (life span).

.2 Environmental and Sustainability Goals including;
  .1 LEED® certification, CO_2 monitoring, and resource reuse.
.3 Energy Efficiency Goals including;
  .1 Measures affecting lighting and HVAC energy efficiency such as orientation shading, ventilation and renewable power.
.4 Indoor Environmental Quality Requirements regarding;
  .1 Lighting, temperature and humidity, acoustics, air quality, ventilation and filtration, controls adjustability, after hour's accommodations, natural daylighting, ventilation and views.
.5 Equipment and system Expectations, such as;
  .1 Levels of quality, reliability, flexibility, maintenance, complexity and target efficiencies, building system technologies regarding manufactures, acoustics, vibration, degree of integration, automation and functionality for controls load shedding and demand and response energy management.
.6 Building Occupant and O&M Personnel Expectations;
  .1 Building operation description and by whom and at what capability, level of training and orientation for occupants and O&M staff.
.7 Cx Process Manager Information;
  .1 Name of Agency/Firm and contact person(s) and address name, address and personnel contact.

.5 Starting with the Pre-Design project milestone the OPR is the foundation of the Commissioning Process - an integral part of Commissioning and future Re-Commissioning.
  .1 Working through the various other Project Milestones is supported by the BOD documenting that the various decisions, concepts, designs, calculations, and product selections to meet the OPR.

4.2.42 Partnering Session Workshop(s)

.1 Partnering is used in the architecture, engineering and construction industry and is intended to assist Project Teams with setting goals, resolving disputes and improving project outcomes.
.2 Workshop(s) are facilitated by the Consultant or designate. Participants include the Owner/User Department, Project Team and other stakeholders. Initial workshops establish relationships and ground rules, and then draw out essential client needs and design requirements.
.3 Topics include, but are not limited to:
  .1 Role and responsibilities matrix;
  .2 Rules of engagement;
  .3 Communication plan;
  .4 Project status, goals, objectives, elements, scope, funding, and preliminary schedule;
  .5 Deliverables plan;
  .6 Measures of percentage complete and delivered;
  .7 Issues tracking and documentation systems;

.8 Project risks and the initial Risk Management Plan;

.9 Review of existing available documentation and project site conditions;

.10 Schedule of biweekly (or as otherwise determined by the Departmental Representative) project and milestone meetings; and

.11 Communication and document control plan.

4.2.43 Permits and Fees

.1 Refer to the Contract Documents, General Conditions (GCs).

4.2.44 Preliminary Project Description (PPD/PPDFormat™)

.1 PPDFormat™ is a guideline document published by the Construction Specification Institute (CSI).

.1 A tool to evaluate the design practicality during the design phase.

.2 The guide assists with an appropriate level of documenting qualitative and quantitative descriptions of "functional elements" – Elements and their respective Elemental Components, systems and assemblies comprising the project during the Schematic Design (SD) and Design Development (DD) Project Milestones.

.1 Associated deliverables are integral documents of the SD and DD Reports.

.3 PPD is organized using the Uniformat™ hierarchical structure and corresponding Level of Detail (LoD) - levels 1–5.

.1 Elemental and Elemental Components LoD breakdowns parallel preliminary project cost estimating formats, providing corresponding quantitative cost estimates per functional element, elemental component and related qualitative descriptions.

.2 The Consultant and Departmental Representative are to agree on the LoD based on the required accuracy of the Cost Estimate to secure funding, manage cash flow or address risk.

.4 LoD may also be dependent on factors such as:

.1 How PPD may be used to throughout the design and documentation process to provide for opportunities, such as;

.1 Tracking decision progressions during design options development and final selection of preferred/optimum solution;

.2 Function elements complexities, and;

.3 Design decisions progression, such as, designing from the exterior into the interior.

.2 Preferred delivery format during the SD and DD Project Milestones is the "Outline Format Full Page Example" on page number 25 of the PPDFormat™ Guide.

.1 The Outline Format facilitates design progression tracking throughout the design phase Project Milestones.

.3 With reference to the "Outline Format Full Page Example" and the outlined Element Levels, the LoD during the SD and DD Project Milestones is as follows:

.1 SD, Level 3 detail, complete with a "Description" article providing a generic description of the Level 3 functional element supported by a Basis of Design narrative may also be substantiated by the OPR;

.1 Corresponding, per Level 3 detail, Cost Estimate – Class 'C', +/- 15%.

.2 DD, Level 4 detail, complete with a "Description" article providing a generic description of the functional element supported by a Basis of Design narrative may also be substantiated by the OPR;

.1 Corresponding, per Level 4 detail, Cost Estimate – Class B, +/- 10%.

.4 Construction Documents, Level 5 detail:

.1 While Levels 1-4 may be defined in PPDFormat™ for Levels 5 and beyond, UniFormat™ 2010 considers these Levels discretionary requiring user definition;

.2 Level 5 detail includes, as per "Outline Format Full Page Example", the following articles:

.1 Functional Requirements addressing Element overall requisite including;

.1 Performance Requirements of the assembly that are quantifiable, measurable and,

.2 Design Requirements that, for example, may affect cost or be related to design quality regarding aesthetic, utility, performance or impact, but are not directly component attributes.

.2 Components, a parts listing making up the functional element, complete with attributes that are prescriptive and/or performance based;

.1 Each Component is accompanied by a corresponding MasterFormat™ Section number to be the basis for Construction Documentation (CD) specifications.

.3 Additional outline headings to be considered include;

.1 Alternates, for consideration of their effect on cost or schedule,

.2 Material/equipment Location Schedules,

.3 Workmanship and Fabrication requirements affecting cost,

.4 Reports associated with Codes, fire and zoning searches.

.3 Corresponding, per Level 5 detail, Cost Estimate – Class 'A', +/- 5%.

4.2.45 Project Procedures Plan

.1 A dynamic and evolving Plan to establish how the design, construction and closeout process will be structured to deliver projects on time and within budget and scope.

.2 A measure against which performance is evaluated and success is judged.

.3 Includes items such as:

.1 Organization and communication charts;

.2 Master Project Schedule complete with a detailed Work Breakdown Structure;

.3 Quality Management Plan, a procedures and documentation plan to determine for example documentation completeness and suitability, testing, inspection and submissions requirements;

.4 Construction procurement options and /or number and sequence of tender packages;

.5 Contracting/procurement strategies, bid packaging description, bidders' cost breakdowns;

.6 Site mobilization;

.7 Swing space;

.8 Commissioning Plan;

.9 Commissioning Issues Log;

.10 Project Decision Log;

.11 Risk issues log;

.12 Record management plan (including e-mails) establishing procedure regarding collection recording, tracking, access and storage.

4.2.46 Project Milestones

.1 Pre-Design (PD)

.1 The Consultant Required Service includes activities such as:

.1 Analyse the Departmental Representative's information as may be presented at the time of Solicitation and the Project Start-up meeting; and

.2 Confirm, that based on the provided information, the Consultant is prepared to proceed with the Design Contract with regards to schedule, Cost Estimate, scope of Work and quality;

.1 Prior to proceeding with the design, the Consultant and the Departmental Representative may discuss additional services from the Consultant or Specialty Consultants,

.2 The TOR may pre-establish additional services, such as providing,

.1 OPR, and,

.2 Programming,

.3 Pre-Design documentation become the project delivery guiding documents, utilized throughout the project life cycle.

.2 Final Deliverable:

.1 Pre-Design Report.

.3 Progressive Deliverables, such as:

.1 OPR;

.2 Functional Program; and

.3 Response to PWGSC QA reviews.

.2 Schematic Design (SD)

.1 The Consultant Required Service includes activities such as:

.1 Based on the project criteria established during PD, facilitate and provide conceptual design related documents, as per the pre-established number of required distinction options, to facilitate a decision on the preferred and/or optimum solution to proceed to Design Development;

.1 Submit the analysis the different design options against the Owner's Project Requirements (OPR) and Functional Program (FP).

.2 Provide SD documents such as drawings, reports, and other documentation or media to illustrate general scope, scale and relationships of project components, including;

.1 Plan form and massing;

.2 Site plan and appearance of the project in relation to orientation, topography, land use and utilities;

.3 Preliminary selection of assemblies, systems and load calculations;

.4 Approach to structural, mechanical and electrical systems, and

.5 Elemental and Elemental Component descriptions and Cost Estimates to PPDFormat™, Uniformat™ respective Levels of Detail as agreed upon with the Departmental Representative for the development the Preliminary Project Description PPD);

.1 Preliminary Project Description (PPD/PPDFormat™) – refer to Definition for further detail.

.2 Final Deliverable:

.1 Schematic Design Report.

.3 Progressive Deliverables, such as:

.1 Updated BOD and OPR;

.2 Cx Plan; and

.3 Response to PWGSC QA reviews.

.3 Design Development (DD)

.1 The Consultant Required Service includes activities such as:

.1 Based on the SD design option selected, facilitate and provide documentation to define and describe all aspects of the project, with the purpose that all that remains is the formal Construction Documentation;

.2 Resolve any issues/coordination carried over from SD, refine design and coordinate all discipline details and finalize spatial, functional and operational performance requirements to minimize risk of modifications during Construction Documentation;

.3 Provide DD documents such as drawings, reports, and other documentation or media to illustrate and define the design concept in terms of, such as;
- .1 Siting;
- .2 Plan form and massing;
- .3 Character and materials;
- .4 Structural, mechanical and electrical systems, and;
- .5 Elemental and Elemental Component descriptions and Cost Estimates to Uniformat™ Level of Detail 4;
  - .1 Refer to Preliminary Project Description (PPD/PPDFormat™) Definition for further detail;
- .6 Preliminary modeling and simulations (such as energy analysis and daylight simulation), and;
- .7 Cx Plan and Cx construction cost including testing procedures and check sheets/forms (as per CAN/CSA Z320) associated with;
  - .1 Static Verification;
  - .2 Start-up, and;
  - .3 Functional Performance Testing.

.2 Final Deliverable:
- .1 Design Development Report.

.3 Progressive Deliverables, such as:
- .1 Updated BOD and OPR;
- .2 Cx Plan, and;
- .3 Response to PWGSC QA reviews.

.4 Construction Documentation:
- .1 Refer to *Doing Business with PWGSC Documentation and Deliverables Manual*.

.5 Tender:
- .1 The Consultant Required Service includes activities such as;
  - .1 Provide assistance and advisory services as may be necessary to the Departmental Representative in, obtaining a competitive bid and in awarding a construction contract.
- .2 Deliverables, such as;
  - .1 Addenda;
  - .2 Written responses to questions, and
  - .3 Bid analysis and/or recommendations.

.6 Construction:
- .1 The Consultant Required Services includes activities such as;
  - .1 Provide assistance and advisory contract administration services to the Departmental Representative to administer the construction contract as set out in the general conditions of the contract for construction;

.1 The Consultant is not an "Agent" of the Crown nor responsible for Contractor's performance.
.2 Act as Departmental Representative's professional advisor in interpreting the contract documents;
.3 Consult on the Contractor's performance, and;
.4 Review the construction.
.2 Deliverables;
.1 Multiple deliverables as per;
.1 Consultant's contract general conditions, and;
.2 TOR specified Deliverables.
.7 Close Out:
.1 The Consultant Required Service includes activities such as;
.1 Provide assistance in the use and occupancy of the facility.
.2 Assist and advise Departmental Representative with;
.1 The Contractor's performance and guarantees documentation;
.2 Prior to the 12 month warranty period, review defects or deficiencies observed by the Departmental Representative;
.1 Compile items that require the Contractor's attention to complete the terms of the Contract.
.2 Final Deliverable;
.1 Year End Warranty Review – defect status.
.3 Progressive Deliverables, such as;
.1 Lessons learned.

4.2.47 Project Team

.1 Typically includes entities, such as:
.1 Departmental Representative,
.2 Consultant Team;
.3 Independent third parties also in contract with PWGSC, and;
.4 User Department and Operational personnel.

4.2.48 PWGSC Commissioning Manager (PWGSC Cx Mgr)

.1 Government commissioning liaison amongst all project stakeholders and reports to the Departmental Representative.
.2 Undertakes Quality Assurance Reviews of Cx submissions.

4.2.49 Quality

.1 The degree to which the Work meets or exceeds the Project requirements and expectations.

4.2.50 Quality Assurance (QA) Reviews

.1 PWGSC QA Reviews are an advisory service to the Project Team and stakeholders where respective submission/deliverable accountabilities remain in effect as per contractual conditions or other forms of commitment.

.1 The Consultant remains professionally accountable for the design validation and verification required of the Project Milestone submissions during the project life cycle.

.2 QA Reviews, supported by commentary, conclude with a risk assessment associated with Quality of design and documentation deliverables, and include:

.1 Parameters to confirm at the onset of a review whether deliverables are appropriately scoped and detailed with respect to current Project Milestones or phase/progressive submissions.

.3 QA Reviews focus on Quality Indicators (QI) parameters associated with Design Quality Indicators (DQI) and Quality Deliverable Indicators (QDI).

.4 Design Quality Indicators (DQI):

.1 3 Aspects of DQI:

.1 Functionality – design utility;

.2 Build Quality – design performance, and;

.3 Impact – project contextual interactivity (such as cultural, market, environmental conditions/factors):

.1 Project impact on context, and vice versa;

.2 Context impact on project.

.2 Each DQI Aspect is considered against Good Design Protocols, such as;

.1 Creativity and Technical Competence;

.2 Functional Suitability;

.3 Whole-of-Life Performance;

.4 Health, Safety and Security;

.5 Inspiring and Attractive;

.6 Appropriate Innovation, and;

.7 Sustainable and Enduring.

.3 As each DQI Aspect is considered against Good Design Protocols, each Aspect is also assessed against the same Characteristics such as:

.1 Conceptual Integrity;

.2 Functionality;

.3 Operability;

.4 Constructability, and;

.5 Claims Prevention.

.5 Quality Deliverable Indicators (QDI):

.1 Focus on documentation delivery.

.1 Submitted documentation is assessed against 6 characteristics:

.1 Clarity;

.2 Completeness;

.3 Compliance;

.4 Consistency;

.5 Correctness, and;
.6 Decision Traceability.

4.2.51 Quality Management Plan

.1 Quality Management goal is to assure:
- .1 Design Quality;
  - .1 Confirmation design satisfies the Project Requirements,
  - .2 Complementary design principles,
  - .3 Planning/layout efficiency,
  - .4 Accuracy, adequacy, conformance to standards of practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and function as per the TOR.
- .2 Construction Quality;
  - .1 Construction preparation – review schedule and check points,
  - .2 Follow-up of inspection and testing to confirm on-going performance compliance,
  - .3 Final acceptance.
- .3 Management Quality;
  - .1 Management assignments,
    - .1 Managers associated with design, project and construction,
    - .2 Quality process reporting and resolution forums,
    - .3 Decision making protocols.
  - .2 Document control,
  - .3 Risk management program.

4.2.52 Recommissioning Manual

.1 Deliverable by Consultant's Cx Process Manager/Cx Authority.
.2 Refer to CSA Z320 Article 4.9.4, Recommissioning manual.

4.2.53 Risk Management Plan

.1 Departmental Representative (DR) initiates and maintains a PWGSC RM Program.
.2 The objective of the Plan is to develop a methodology to improve risk management by:
- .1 Establishing risk policies to confirm acceptable levels of non-compliance as per DR Risk Management Plan;
- .2 Focusing on external and internal risk parameters, and;
- .3 Articulating an approach/framework to identifying risk and its impact in advance and managing the risk with the goal of reducing, transferring or avoiding risk where appropriate.

.3 Program and Plans are collaboratively monitored and amendments are proposed to the DR by the Project Team as required for an effective project delivery.

4.2.54 Standard Operating Procedures

.1 Systems Operations Manual component.

.2 Procedures are to meet the Canada Labour Code requirement of "every employer" (User Department) by way of "a qualified person to set out, in writing, instructions for operations, inspections, testing, clearing and maintenance" of various components, systems and integrated systems.
  .1 Updated throughout the building lifecycle for continued safety and consistent Work practices.
  .2 Capable of being the basis for the development of Departmental policies.
.3 Includes site specific:
  .1 Equipment, chemicals and other concerns such as life safety compliance, emergency provisions/procedures, security, access, sustainability and the environment.
  .2 Series of flow charts designed to model the actions, activities and network of interconnected activities associated with systems and related operations and maintenance.

4.2.55 Static Verification

.1 Refer to CSA Z320 Article 4.4.4, Static Verification.
  .1 Add to Article 4.4.4 the following review requirements:
    .1 Review select equipment certificated of authenticity (such as, circuit breakers).

4.2.56 Sub-Project

.1 User Department/Departmental Representative project Work completed by a Departmental Service Provider requiring a coordinated delivery in a main capital Works project, for example:
  .1 IT Works, Furniture delivery and installation;
.2 If Work takes place in the same space and time as capital Works then capital Work's health and safety plan governs Sub-Project Work.

4.2.57 Systems

.1 Refer to CSA Z320 Article 5, Specific systems.
  .1 Require confirmation of other systems, such as those that may relate to, for example:
    .1 Civil Engineering;
      .1 CSA Z320 currently considers related systems outside the building foot print and therefore not included in the Standard;
    .2 Sound Masking;
      .1 As part of CSA Article, 5.1.3.4, Interior Space, Functional Performance Testing;
    .3 Duct Pressure Tests and Indoor Air Quality (IAQ) Tests;
      .1 As part of CSA Article, 5.4.3.4, Mechanical Systems, Functional Performance Testing.

4.2.58 Systems Operations Manual (Systems Descriptions/Systems Manual)

.1 Developed throughout the project lifecycle.
.2 Refer to CSA Z320 Article 3, Definitions.

.3 Extend the CSA Definition to include in emergency conditions as a mode of operation.

.4 Normally produced by the Construction Manager/Contractor and as part of the Collaborative Project Delivery integrated process with Support by the Consultant and Departmental Representative.

.1 Requires Cx Process Manager sign-off at contract Substantial Performance.

.5 Standard Operating Procedures document is a component of the Systems Operations Manual – see Definition.

4.2.59 UniFormat™

.1 A uniform, hierarchical classification structure of construction systems and assemblies.

.1 Current version – CSI/CSC Uniformat™, 2010 edition.

.2 UniFormat™ organizational structure also guides the development and delivery of:

.1 Cost estimates – refer to Definition for further detail and;

.2 PPDFormat™, Preliminary Project Descriptions during the design phase – refer to Definition for further detail.

.3 Alphanumeric designations followed by MasterFormat™ followed by the line item.

4.2.60 Value Engineering (VE)

.1 Value Engineering (Assessment) methodology, as related to competing options assessment, emphasizes the return-on-investment aspect of decision making in terms of LCC to maintain or improve the desired levels of capability and performance during planning, design, construction and procurement.

.1 When the options satisfy the required function, then the best value option is to be identified by comparing the first costs and life-cycle costs of each alternative.

.2 Refer to industry standard practices for value methodologies associated with buildings and building systems such as, SAVE and ASTM Standards.

.3 Also refer to Life-Cycle Costs definition.

4.2.61 Work

.1 Refer to Contract Documents: General Conditions (GCs).

4.2.62 Work Breakdown Structure (WBS)

.1 Integral to schedules and project execution plans.

5 APPENDICES

5.1 APPENDIX A – PSPC GUIDELINE – PROJECT GHG OPTIONS ANALYSIS METHODOLOGY

5.2 APPENDIX B – CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING PROGRAM – DECEMBER 2021 – V5.0

5.3 APPENDIX C – PSPC CARBON NEUTRAL STUDY: PROCESS FLOW

---------- END ----------

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Guideline - Project GHG Options Analysis Methodology

www.pspc-spac.gc.ca

November 26, 2020

The Federal Sustainable Development Strategy (FSDS) 2016-19 and the Greening Government Strategy: A Government of Canada Directive (GGS) emphasize that reductions in greenhouse gas (GHG) emissions are a Government of Canada priority. Therefore, PSPC must consider GHG emission reductions when evaluating design options for projects. This guideline describes a methodology to evaluate project options based on their GHG emission reductions opportunity. The methodology was developed to incorporate greenhouse gas emissions reduction and their financial impact into Real Property Investment Decisions.

Project leaders are to consult with the Greening Government Directorate within the Technical Services Service Line (TSSL) of Real Property Services (RPS) at the beginning of Investment Analysis Report (IAR) development for each project. RPS TSSL's Greening Government Directorate (RPS TSSL GGD) will determine if the GHG options analysis should be undertaken as part of the writing of the IAR. Alternatively, RPS TSSL GGD could determine that it is more appropriate to do the GHG options analysis within the design, after Expenditure Authority (EA) is received for planning and design. Regardless, RPS TSSL GGD services will be engaged by the project leader to make sure climate change considerations are covered within the IAR. The GHG options analysis was approved for full application by the Real Property Operations Committee in March 2017. IARs that are presented to the Real Property Investment Board (RPIB) or Regional Investment Management Boards (RIMB) for Project Approval must comply with this guideline.

As part of the FSDS, the Government of Canada committed to reducing GHG emissions by 40% by 2030 when compared to the 2005-06 baseline. The GGS sets a reduction of 90% in GHG emissions by 2050, compared to the 2005-06 baseline. In addition, Real Property Services has committed to initiating measures to achieve a carbon neutral portfolio by 2050, with an aspirational target of 2030. All other sustainability commitments and targets, at this time, are unchanged. If and when other sustainability commitments change, this options analysis methodology may require adjustments.

Scope

This guideline is to be followed for projects in Crown-owned buildings. It currently does not apply to leases or sale-lease-back as PSPC does not have operational control of this space. The guideline does apply to the construction of built to lease and lease purchase assets since these facilities are being built specifically for the Government of Canada and PSPC has control over their design.

Energy Modelling and Simulation

This methodology relies on building energy modelling and simulation to estimate the annual energy consumption and GHG emissions of each design option. Building energy modelling and simulation provides the ability to quantify the energy savings, energy cost savings and GHG emission reductions of the energy conservation measures that are considered for each design option. This section provides a background on building energy modelling and simulation.

A building can be considered as a whole system composed of elements that interact with one another. These elements include: building envelope, mechanical systems, lighting, people, plug and other equipment loads and the external environment, including weather and site.

Energy modelling and simulation is a virtual representation of the building, specifically of the elements that make up a building. The energy, air and moisture flows into and out of the building and its elements are considered in order to predict the building's annual energy requirements. Energy modelling and simulation is commonly performed to verify a building's compliance to an energy code and to estimate the building's annual energy consumption, annual energy costs and annual GHG emissions.

A major project is defined as a project that is multi-disciplinary in nature, i.e. the project impacts more than one building element. Newly constructed buildings, acquisitions and major renovations are major projects and thus require that building energy modeling and simulation be done to assess the energy and GHG performance of design options. Building energy modelling and simulation is the only accepted tool that is capable of accounting for the interaction between different building elements and of analyzing multiple energy conservation measures simultaneously. Energy modelling and simulation supports an integrated design process among building professionals: architects designing the building envelope, mechanical and electrical engineers designing the heating, ventilation and air-conditioning (HVAC) and lighting systems, and other members of the design and project teams.

Simple projects are defined as projects that are single-disciplinary, that is they affect one building element in isolation. Because simple projects are non-complex in nature, they do not necessarily require whole building energy modeling and simulation. Examples of simple single-disciplinary projects are the replacement of a pump, small chiller, small boiler or a window replacement project.

Emission Factors

PSPC reports the GHG emissions from its real property operations annually, in accordance with the GGS and the FSDS. PSPC follows the *Federal GHG Accounting and Reporting Guidance* for accounting and reporting GHG emissions. Annex A of the *Federal GHG Accounting and Reporting Guidance* provides emission factors for fuel, biomass, electricity and district heating and district cooling. These emission factors should be used to calculate the GHG emissions of project options.

Environment and Climate Change Canada (ECCC) has provided RPS TSSL GGD with projected future emission factors for electricity based on planned activities and policies by the Provinces and Territories. Project teams should use the projected electricity emission factor for the estimated year of occupancy of the completed project. Alternatively, an average value can be calculated, based on a 40 year lifecycle period, starting on the estimated year of occupancy of the completed project. The latest projection available (the 2040 projected value) can be used to represent years beyond 2040. Finally, if project teams deem it necessary, they can apply the annual projected electricity emission factor throughout the lifecycle, using the projected value for the year 2040 to represent years beyond 2040. Which approach to use is the responsibility of the project team and should be based on what provides accurate GHG accounting. Please refer to question 7 in the Q and A section if more details are required.

The projected electricity emission factors from ECCC and the emission factors for combustion sources provided in Annex A of the *Federal GHG Accounting and Reporting Guidance* are provided at this link.

Please consult with RPS TSSL GGD to obtain the emission factors for the modernised district energy system in the National Capital Area. Also, please flag to RPS TSSL GGD any project options that include biomass combustion. The federal government has yet to finalize how to properly account for biogenic emissions from the combustion of biomass.

Approach for projects that are single disciplinary (affect one building element in isolation) and non-complex in nature

This approach will apply to projects that are single disciplinary and that have an impact on GHG emissions. For example, the replacement of HVAC equipment (boilers, chillers, etc.). In this case, the consultant will evaluate the energy savings, associated GHG emission savings and net present value (NPV) over 40 years for each analyzed option, compared to the baseline (status quo) option. Among the options that have returns

on investment within 40 years, i.e. a positive incremental NPV over the 40 years, the option that generates the largest GHG emission savings compared to the baseline option will be selected. For an option where the incremental NPV is slightly negative and GHG emission reductions are significant, the option should not be automatically discarded. An energy manager must be consulted to review all of the analyzed options and evaluate which option makes the most financial sense in comparison to GHG emission savings. For example, if there is an option that results in a return on investment that is close to cost-neutral (NPV not positive for all 40 years) but that generates a significant amount of GHG emission savings, it may still be recommended. This recommendation will be based on the importance of the asset for PSPC to meet its goal of a carbon neutral portfolio.

The GGS directive states that a lifecycle cost analysis will use a period of 40 years and a carbon shadow price of $300 per tonne. Shadow carbon pricing is a method of decision analysis that adds a surcharge for carbon dioxide that would be released. Although a carbon shadow price of $300 per tonne is included in the options analysis for decision-making, it is not a cost that will be incurred by the project.

Projects in which the up-front cost of the recommended option is 20% greater than the capital cost of the baseline option (option that would have normally been recommended before the implementation of this methodology) are to be flagged and reviewed by RPS TSSL GGD. This will help determine the impact of the methodology on the capital cost investment required for single disciplinary projects. This requirement may be adjusted or removed in the future once sufficient data is collected to better understand the financial impact these greener options have on funding.

Fuel switching from electricity to a combustion fuel is not permitted at the project level because of PSPC's commitment to purchase 100% of its electricity consumption from clean energy sources by 2025.

Approach for multi-disciplinary projects, new buildings, acquisitions and major renovations

The GGS mandates departments to ensure that all new buildings and major building retrofits prioritize low carbon investments and that investment decisions are based on the total cost of ownership. The application of this guideline ensures that PSPC complies with the GGS requirement.

The GGS also states that all new federal buildings should be constructed to be net-zero carbon, unless a lifecycle cost-benefit analysis indicates that a net-zero carbon ready construction is more feasible. The application of this guideline provides the business case for a net-zero carbon or a net-zero carbon ready design. A net zero carbon ready building is one that could operate as net-zero carbon in the future (for example, no fossil fuel combustion on site).

The GGS states that all major building retrofits require a GHG reduction life-cycle cost analysis to determine optimal GHG emission savings.

The life-cycle cost approach must use a period of 40 years and a carbon shadow price of $300 per tonne. Shadow carbon pricing is a method of decision analysis that adds a surcharge for carbon dioxide that would be released to market prices for projects that involve significant carbon emissions. Although a carbon shadow price of $300 per tonne is included in the options analysis for decision-making, it is not a cost that will be incurred by the project.

The application of this approach is mandatory to all multi-disciplinary projects. It is to be applied to the recommended procurement option and to any other option within 10% of the lifecycle cost of the recommended one. The project leader is to contact TSSL's GGD at the start of the Investment Analysis Report development for guidance on how and when to apply the methodology. TSSL's GGD will advise whether the methodology is to be applied in the IAR and the results incorporated into the project costing before Project Authority (PA)/

Expenditure Authority (EA) is granted. Alternatively, RPS TSSL GGD may advise that the methodology be incorporated within the planning and design after PA and/or EA is granted. A cost allowance, supported and approved by RPS TSSL GGD, will be applied for projects that are not incorporating the methodology into the IAR. The IAR must clearly specify what costs have been included within the PA to account for the reduction of GHG emissions and that amended PA, if required, will be sought with EA for implementation.

Each IAR will analyze the following four design options:

Option 1: Design to Meet Minimum Departmental Commitments (Baseline option)

This option will require the building design to meet the most recent minimum departmental design commitments.

Every project team should reference and provide the design team the "PWGSC – Real Property Sustainability Framework and the Technical Reference for Office Building Design. Table 1 presents the key sustainability and energy performance commitments in the PWGSC – Real Property Sustainability Framework.

Table 1: Project Design and Delivery

Building Project Type	Threshold[1] ($ or m^2)	Assessment Tool & Target	Energy Efficiency Target	Lifecycle Assessment
1. New office buildings	All projects	LEED Gold or 4 Green Globes	28% more energy efficient than NECB performance and/or 35% more energy efficient than the building being replaced.	Athena EIE/EC (>$5M, location restrictions)
2. Other types of newly constructed buildings[2]	All projects	LEED Silver or 3 Green Globes	24% more energy efficient than NECB performance and/or 35% more energy efficient than the building being replaced.	Athena EIE/EC (>$5M, location restrictions)
3. Long-term lease office buildings (including build-to-lease, lease-to-purchase, sale- leaseback)	All projects ≥500 m^2	LEED Gold or 4 Green Globes	24% more energy efficient than NECB performance and/or 35% more energy efficient than the building being replaced.	No
4. Building acquisition	All projects	LEED Silver or 3 Green Globes	24% more energy efficient than NECB performance.	No
5. Buildings undergoing Major Renovations[3]	All projects	LEED Silver or 3 Green Globes	24% more energy efficient than NECB performance.	Athena EIE/EC (>$5M, location restrictions)
6. Space Fit-Up and Retrofits	≥1000 m^2 (Office)	LEED Silver or 3 Green Globes		No

The National Energy Code for Buildings (NECB) referenced in Table 1 refers to the latest edition of the NECB. The energy efficiency targets in Table 1 were established for office buildings. The energy efficiency target to meet the Minimum Departmental requirement may need to be adjusted for projects that have process loads that are atypical of office buildings (for example, buildings with data centres or labs). Building projects that include process loads should be flagged and reviewed by RPS TSSL GGD. A major renovation is defined as

[1] This only includes buildings where PWGSC is the custodian or leases where PWGSC is the lease holder.

[2] This does not include special purpose buildings for which no appropriate green assessment tool is available.

[3] Heritage buildings undergoing major renovations are subject to the Sustainable Heritage Guide

a project that has a construction value greater than 50% of the building's assessed value; the assessed value is based on Payment in Lieu of Taxes (PILT).

The purchase of clean energy via renewable energy certificates (RECs) or carbon offsets is not to be considered as a measure to reduce GHG emissions.

A shadow carbon price of $300 per tonne is applied to determine the lifecycle cost of Option 1 over 40 years.

Option 2: Design to Achieve GHG Emission Reductions that are Cost-neutral (40 years)

Option 2 will meet all of the Departmental commitments in Option 1.

In addition, the consultant will assess measures that improve energy performance and reduce the GHGs emitted by the facility, if the facility were designed to Option 1. Energy modeling and simulations will be performed on bundled measures until the best option is identified. The best option results in a bundle of measures that provides the most GHG savings and has a positive NPV on the incremental cost (compared to option 1), when calculated over the life cycle of the project (40 years to meet GGS requirement). Priority should be given to energy conservation, before fuel switching alternatives are considered for reducing GHG emissions. For example, switching a building component's fuel source from natural gas to electricity in a province with a clean grid will reduce the facility's GHG emissions but will not necessarily improve the building's energy efficiency. The priority should be to reduce the building component's energy use, no matter its fuel source. Once the building energy performance has been optimized, fuel switching and on-site renewable energy generation should be evaluated. The purchase of clean energy via RECs or carbon offsets is not to be considered as a GHG emission reduction measure.

Fuel switching from electricity to a combustion fuel is not permitted at the project level because of PSPC's commitment to purchase 100% of the electricity it consumes from clean energy sources by 2025.

A shadow carbon price of $300 per tonne is applied to determine the lifecycle cost of Option 2 over 40 years.

As Option 2 will lead to a positive, or very close to positive, incremental NPV over the project's lifecycle, it should always be recommended over Option 1 if funding is available. Option 2 provides the Crown the best option for deep GHG emission reductions at no additional cost over the investment horizon.

Option 3: Design to Achieve Maximum GHG Emission Reductions

Option 3 will meet all of the Departmental commitments to sustainability, and environmental performance standards, as identified in Option 1.

In addition, the consultant will evaluate the measures required for the project to reduce the carbon emissions footprint to as close to or beyond carbon neutral as possible, when compared to Option 1. The purchase of clean energy via RECs or carbon offsets is not to be considered. The consultant should focus on reducing the building's GHG emissions through improved energy efficiency first, followed by the selection of less-emitting fuel sources. The production of on-site renewable energy generation should be evaluated and presented.

Fuel switching from electricity to a combustion fuel is not permitted at the project level because of PSPC's commitment to purchase 100% of the electricity it consumes from clean energy sources by 2025.

A shadow carbon price of $300 per tonne is applied to determine the lifecycle cost of Option 3 over 40 years.

This option will provide PSPC with two key pieces of information: (1) the maximum GHG emission reduction potential of the project, and (2) the cost associated with this Maximum GHG Emissions Reduction Design Option. The term Maximum GHG Emission Reductions is used instead of net zero carbon for this design

option because there are some instances where projects will be able to produce on-site renewable power that is greater than the facility's demand. In such a case, power can be exported to the utility grid as a net benefit.

Option 4: Hybrid GHG Emissions Reduction Design

The consultant, in consultation with the PSPC project team (champion, director, leader, manager and Regional Centre of Expertise Specialists) will be asked to evaluate and propose an optimized design option, based on the information collected and calculated in the three options defined above. This hybrid optimized design option balances GHG emissions with construction and building operating costs. The hybrid optimized design option will likely be a newly bundled combination of individual measures that were investigated in Options 2 and 3. The individual measures themselves can be evaluated in terms of cost, cost avoidance, energy savings and GHG emission reductions. The modeling and simulation of different energy conservation/GHG emission reduction measure combinations will be required to determine the combination of measures that provides the best value for the Crown. In other words, the Crown is requesting that the professional consortium use their expertise to determine a fiscally responsible option that optimizes GHG emission reductions versus additional lifecycle costs (compared to Option 1). In most cases, it is expected that this hybrid optimized design will incorporate all of the measures selected for Option 2 and individual conservation measures that were identified in Option 3 that are cost-effective and/or lead to significant GHG emission reductions. The purchase of clean energy via RECs or carbon offsets is not to be considered as a GHG emission reduction measure. A shadow carbon price of $300 per tonne is applied to determine the lifecycle cost of Option 4 over 40 years.

Final Remarks

The project requirements, asset characteristics and its geographical location will dictate what must be included in each design option to provide best value for the Crown. The project options investigated in this methodology provide PSPC with information on the cost and GHG emission reduction potential of each design option. Thus, PSPC can make an informed decision on which project option to recommend, that is the option that provides best value, financially and environmentally, to the Crown.

Frequently Asked Questions

Question 1. What escalation and discount rates should be used in the calculation of net-present-value?

Answer 1. PSPC's Finance and Administration Branch (FAB) publish up to date interest rates and amortization factors on PSPC's intranet. Inflation rates and long-term escalation rates for operations and maintenance (O&M) costs are provided. Please note that the discount rate is equal to the cost of borrowing for the Government of Canada and is a function of the life expectancy of the investment. The discount rate is equal to the annual effective interest rate at year 25. In the future, FAB will provide a longer term discount rate to match the 40 year lifecycle period used for this analysis.

Question 2. Should a carbon charge be included in the lifecycle cost analysis?

Answer 2. Yes. The Greening Government Strategy requires that lifecycle and total cost of ownership assessments incorporate shadow carbon pricing. Shadow carbon pricing is a method of investment or decision analysis that adds a surcharge, for carbon dioxide that would be released, to market prices for projects that involve significant carbon emissions. A shadow carbon price of $300 per tonne is applied in the lifecycle cost analysis. The annual carbon cost is discounted to present dollars when determining the net present value or total lifecycle cost, however the annual carbon cost is not escalated for inflation during the 40 year lifecycle period. Although a carbon shadow price of $300 per tonne is included in the options analysis for decision-making, it is not a cost that will be incurred by the project.

Question 3. Should the residual value of building components be considered in the calculation of Net-Present-Value (NPV)?

Answer 3. Yes. The NPV calculation is done over a 40-year lifecycle and the residual value of building components and equipment at year 40 should be taken into account. This applies to the approach for single disciplinary and multidisciplinary projects.

Question 4. Is there a particular order that the options for the multidisciplinary projects should be investigated?

Answer 4. There is no particular order. However, generally option 1 (design that meets minimum departmental standards) and option 3 (maximum GHG emission reductions) will be developed first since they describe the baseline and maximum potential, respectively, for the project. It is expected that several iterations of bundling measures (which necessitates building simulations and cost analyses for each iteration) will be required to determine option 2 (cost neutral over 25 years). Finally, it is expected that the individual measures investigated in options 2 and 3 will be combined to arrive at option 4 (hybrid optimized design); this will necessitate several iterations of bundling measures.

Question 5. Should fuel switching from electricity to fossil fuel ever be considered?

Answer 5. In some provinces and territories, the emission factor for electricity is greater than the emission factor for a fossil fuel (for example, natural gas). This is the case if the fossil fuel is cleaner than the energy source that is used to generate electricity in the province or territory. Thus, fuel switching from electricity to fossil fuel would reduce GHG emissions. However, fuel switching from electricity to fossil fuel is discouraged as it is forecast that every electrical grid in Canada will be cleaner by 2040. As well, the Government of Canada has made a commitment to purchase 100% of its electricity from clean energy sources, starting in 2025. Therefore, fuel switching from electricity to fossil fuel is discouraged.

Question 6. What energy simulation software tool should be used for multidisciplinary projects to model the building, determine the impact of energy conservation measures and develop the different options?

Answer 6. A whole building hourly energy simulation software tool that complies with *ASHRAE Standard 140-- Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs* should be used. Examples of software tools that are widely used by industry and that comply with ASHRAE Standard 140 include IESVE, eQUEST, CAN-QUEST, OpenStudio/EnergyPlus and Design Builder. The professional performing the energy modelling should have experience with the tool selected and understand the tool's assumptions, validate the inputs provided to the tool and perform quality assurance of simulation results.

Question 7. How do I take into account ECCC's projected electricity emission factors in the calculation of annual GHG emissions?

Answer 7. There are three different ways to account for projected changes in Canada's utility grids when calculating GHG emissions. ECCC provides projected emission factors up to 2040. Depending on the project location, annual electricity emission factors can vary significantly from present day to 2040. For example, the 2020 emission factor for electricity in New Brunswick is 323.0 eCO2/kWh, and drops to 103.9 eCO2/kWh in 2040. In Ontario, the emission factor for electricity ranges from 35.5 eCO2/kWh in 2020 to 43.9 eCO2/kWh in 2040. In Québec, the emission factor for electricity ranges from 0.8 eCO2/kWh in 2020 to 1.8 eCO2/kWh in 2040. Taking into account the variance in emission factor will have a bigger impact on the estimated annual GHG emissions of a project in New Brunswick versus a project in Québec or Ontario. Project teams have three options for electricity emission factors:

(1) use the electricity emission factor projected for the estimated year of occupancy of the completed project;

(2) use the average emission factor for electricity, calculated as the average value over the 40 year lifecycle starting in the year the project is completed;

(3) use the emission factor projected year over year over the 40 year lifecycle.

Note that the projected value for the year 2040 is to be used to represent years beyond 2040.

For a fictitious project completed in 2025, the projected electricity emission factor in 2025 is compared to the average emission factor for 2025-2064, for New Brunswick, Québec and Ontario:

Location	Electricity Emission Factor 2025 eCO2/kWh	Average Electricity Emission Factor 2025-2065 (eCO2/kWh)
New Brunswick	320.6	116.7
Ontario	53.2	43.1
Québec	1.4	1.6

Project teams will use the approach that best represents true GHG emission production and should consult RPS-TSSL-GGD if there is uncertainty in which approach to use.

Worked Example 1. Options analysis for new building construction in Québec

This example provides information on how the Project GHG Options Analysis Methodology was applied to a new building construction in Québec. The Project GHG Options Analysis Methodology was a component of the project's Investment Analysis Report. The analysis defined the different design options available and determined the best value to the Crown, considering capital costs, lifecycle costs and GHG emissions.

A new building construction is a multidisciplinary project requiring that four design options be investigated. As Québec's electricity grid is clean, the maximum GHG emission reductions option for the project is a carbon neutral, or zero carbon, building. The analysis showed that there were in fact three different paths to a zero carbon building. Furthermore, two sub-options were investigated for the hybrid option in order to present a complete picture of different design scenarios.

Table 2 presents the different options investigated by the project team, and is a good example of the information that should be presented to decision makers. Table 2 includes a description of each design option, the capital and lifecycle costs of each design option and the estimated annual GHG emissions of each design option. Table 2 should be used as a template of how to present the results of the GHG Options Analysis in an Investment Analysis Report. The significant energy efficiency measures that are bundled for each option are described, with the significant differences from one option to the next highlighted in bold font (in the description row). The advantages and disadvantages of each design option are also defined by the project team.

The minimum departmental design option 1 sets the baseline to which all of the other options are compared. The cost neutral option 2 results in a lower lifecycle cost than the baseline option, at a minimal $288K incremental capital cost. However, the project team felt that because the building will be in Québec, a carbon neutral building is achievable without a significant increase in cost. In fact, option 3a shows that a carbon neutral building is achievable with a minimal increase in capital cost ($296K) and a decrease in lifecycle cost ($228K). The only difference between option 2 and option 3a is that the natural gas boiler is replaced with an electric boiler. The project team investigated two other options (3b and 3c) to achieve a carbon neutral building, with the goal of improving the building's energy performance and reducing its annual utility costs. Specifically, the building fenestration was changed from double glazed to triple glazed, recognizing that triple glazed windows allow the design to meet the Canadian Green Building Council's (CaGBC) requirement for the Thermal Energy Design Intensity (TEDI). A low TEDI reduces a building's heating and cooling loads and increases occupant comfort. The hybrid design option 4a reduces annual GHG emissions beyond the cost neutral design option 2 but does not lead to a carbon neutral building. The analysis demonstrates that hybrid option 4a is not best value for this project, since carbon neutrality can be achieved at a lower capital cost. Finally, option 4b was investigated to demonstrate the impact of reducing the fenestration to wall ratio to the prescriptive requirement in the National Energy Code for Buildings (NECB) for the building location. Although option 4b leads to a lower incremental capital cost and slightly lower lifecycle cost than option 3b, the project team notes that reducing the fenestration area and access to natural daylight risks reducing occupant wellbeing. Based on the analysis, the project team recommends option 3b, as the incremental capital and lifecycle costs are reasonable to achieve a carbon neutral building that meets CaGBC best practice and addresses occupant comfort.

Table 2: Worked Example - Presentation of Results

Options	1: Design to Meet Minimum Departmental Commitments (Baseline option)	2: Design to Achieve GHG Emission Reductions that are Cost Neutral (40 years)	3: Design to Achieve Maximum GHG Emission Reductions			4: Hybrid GHG Emissions Reductions Design	
			a	Recommended Option b	c	a	b
Description	Condensing natural gas boiler Thermal wheel heat recovery Double glazed fenestration 40% fenestration to wall ratio Envelope insulation meets NECB presriptive requirements 29% better than NECB	Condensing natural gas boiler **Off-peak electric boiler** **Dual core heat recovery** Double glazed fenestration 40% fenestration to wall ratio **Envelope insulation exceeds NECB prescriptive requirements by R4** Free cooling	**Electric boiler** Dual core heat recovery Double glazed fenestration 40% fenestration to wall ratio Envelope insulation exceeds NECB prescriptive requirements by R4 Free cooling	**Electric boiler** Dual core heat recovery **Triple glazed fenestration** 40% fenestration to wall ratio Envelope insulation exceeds NECB prescriptive requirements by R4 Free cooling	**Electric boiler** **Geothermal heat pump** Dual core heat recovery **Triple glazed fenestration** 40% fenestration to wall ratio Envelope insulation exceeds NECB prescriptive requirements by R4 Free cooling	**Option 2** **with geothermal heat pump and triple glazed fenestration**	**Option 3b** **but with 33% fenestration to wall ratio (prescriptive requirement in NECB for building location)**
Annual GHG Emissions (tonnes of CO2e)	130	60	-	-	-	32	-
Initial capital cost	110,000,000 $	110,288,000 $	110,296,000 $	111,021,000 $	111,724,000 $	111,735,000 $	110,738,000 $
Incremental capital cost	- $	288,000.00 $	296,000.00 $	1,021,000.00 $	1,724,000.00 $	1,735,000.00 $	738,000.00 $
Annual energy cost	292,000.00 $	277,000.00 $	306,000.00 $	297,000.00 $	288,000.00 $	274,000.00 $	290,600.00 $
Annual carbon shadow cost	39,000.00 $	18,000.00 $	- $	- $	- $	9,600.00 $	- $
40 year life-cycle cost	123,316,230.96 $	122,380,082.99 $	123,088,702.06 $	123,437,446.12 $	123,764,190.17 $	123,189,903.15 $	122,886,886.33 $
Incremental NPV compared to option 1 (includes escalation and residual value)	- $	936,147.97 $	227,528.90 $	(121,215.16) $	(447,959.21) $	126,327.81 $	429,344.63 $
Increase in lifecycle cost	N/A	-0.76%	-0.18%	0.10%	0.36%	-0.10%	-0.35%
Advantages	-Minimum departmental commitment met	-Best value in terms of energy reductions and energy costs.	-Carbon neutral at an acceptable cost.	-TEDI complies to CaGBC best practice -Better occupant comfort - Carbon neutral at a reasonable cost	-TEDI complies to CaGBC best practice -Better occupant comfort -Exemplary energy performance	-Operational advantage of having 2 energy sources -Exemplary energy performance	-TEDI complies to CaGBC best practice -Better occupant comfort -Reduced capital cost
Disadvantages	-Does not comply to GHG emission reduction commitments.	-Does not comply to PSPC's commitment to achieve a carbon neutral portfolio and to GC Greening Government Strategy.	-Thermal Energy Density Intensity (TEDI) does not comply to CaGBC best practice to achieve carbon neutral and to guidance from Greening Government	-Minor increase in cost	-Higher cost	-High cost of increased energy performance to achieve maximum reduction of GHG emissions	-Negligible reduction in energy costs over 40 years -Reduction of occupant wellbeing because of reduced fenestration area

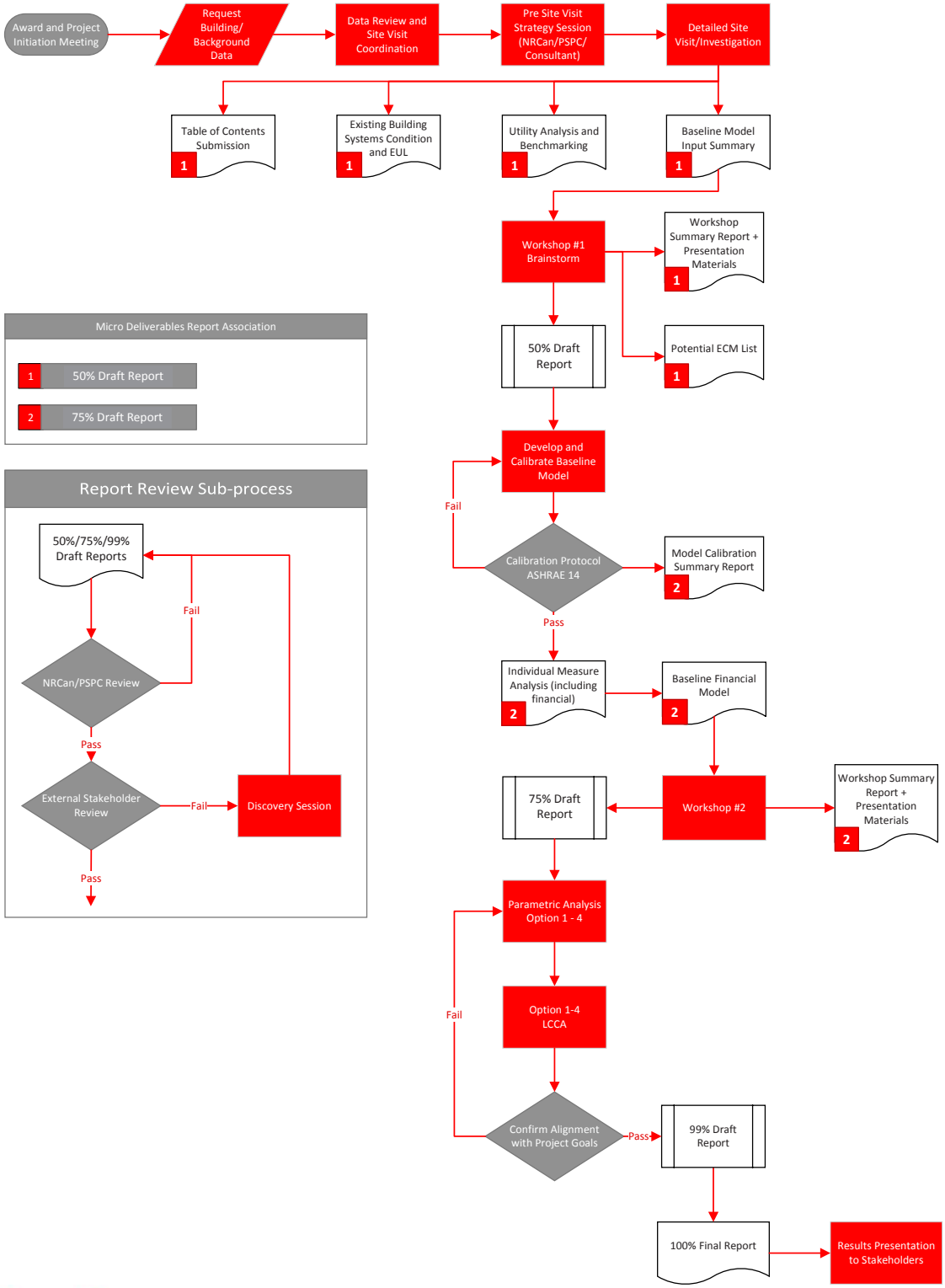
Discount rate:	1.782%
Utility inflation rate:	2.000%
Maintenance inflation rate:	1.900%
Construction inflation rate:	2.400%

Representative rates used in this worked example.

Public Services and Procurement Canada

Carbon Neutral Study (CNS): Process Flow

October 12, 2018



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Documentation and Deliverables Manual

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Contents

Revisions

Version	Date	Description
0.1	August 14, 2017	Draft version for consultation.
1.0	January 12, 2018	Original Issuance

1 General

1.1 Effective Date

January 12, 2018

1.2 Authority

This manual is issued by the authority of the Director General, Technical Services, Real Property Branch (RPB), Public Works and Government Services Canada (PWGSC).

1.3 Purpose

This document provides architectural and engineering (A&E) consultants with the requirements for producing deliverables for PWGSC projects in order to ensure a well-documented design process, and facilitate review by PWGSC staff.

1.4 Scope

This document shall apply to design-bid-build projects undertaken by PWGSC on its own behalf as well as for other government departments (OGDs). It is applicable to all regions of PWGSC and can be supplemented with regional addendum.

1.5 Harmonization with Terms of Reference

This document shall be used in conjunction with the project's Project Brief / Terms of Reference (TOR). In case of a conflict between documents, the requirements of the TOR prevail over those of this document.

1.6 Departmental Name Change

In the fall of 2015, Public Works and Government Services Canada (PWGSC) was renamed Public Services and Procurement Canada (PSPC).

This name change is occurring in a phased approach, and for most documents PSPC should be used. However, all contract documents shall use the legal name Public Works and Government Services Canada (PWGSC) until the name has been changed in legislation.

1.7 Terminology

This document utilizes the following terminology:

- "shall" is used to express a requirement, a provision the Consultant is obligated to meet; "should" is used to express a recommendation; and
- "may" is used to express an option or that which is permissible within the limits of this document.

1.8 Definitions

Addenda: Changes to the construction documents or tendering procedures, issued during the tendering process.

Construction Documents: The drawings and specifications (including addenda).

Drawings: The graphic means of showing work to be done, as they depict shape, dimension, location, quantity of materials and relationship between building components.

Reports: Written account given of a particular matter after thorough investigation or consideration prepared by the Consultant.

Specifications: Written descriptions of materials and construction processes in relation to quality, colour, pattern, performance and characteristics of materials, installation and quality of work requirements.

2 Construction Documents

2.1 General

This section provides direction to Consultant firms on the preparation of construction documents (namely specifications and drawings) to be submitted to PWGSC for real property projects across Canada.

Specifications, drawings, and addenda shall be complete and clear so that contractors can prepare bids without guesswork.

2.1.1 Principles of PWGSC Contract Documents

Contact documents shall be prepared based on common public procurement principles. PWGSC does not use Canadian Construction Documents Committee (CCDC) documents.

PWGSC is responsible for preparing and issuing the construction contract and the terms and conditions as well as all other related bidding and contractual documents. For detailed information, the standard acquisition clauses and conditions commonly used by PWGSC in the contracting process are available on the buyandsell.gc.ca website.

2.1.2 Translation

When bilingual documents are required in the Terms of Reference, all documentation including drawings, specifications, reports as well as all bidder questions shall be in both official languages.

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

2.1.3 Construction Documents Definitions

Unless otherwise indicated in the Project Brief / Terms of Reference, construction document submissions (33%, 50 or 66%, 99%, and 100% / final) shall meet the definitions outlined below. Further discipline based requirements may be included in the TOR.

- 33%: shall demonstrate general intent of design and compliance and alignment with relevant standards. Summary specification required, but not a full specification.
- 50% or 66%: shall show full system, all components, requirements, and lack only minor details on drawings. Specifications shall be well advanced and contain major work and material requirements and lack only minor details.
- 99%: shall be for final review by PWGSC, lacking no detail and complete with a project specific specification.
- 100% (or final): shall address comments by PWGSC as required, signed and sealed by the responsible design professional in compliance with various provincial jurisdiction requirements, ready for tender.

2.1.4 Quality Assurance

It is the sole responsibility of the Consultant firms to undertake their own quality control process and to review, correct, and coordinate their documents (between disciplines). The Consultant shall also ensure the constructability of their design.

2.1.5 Quality Assurance Deliverables

For every construction document submission (33 %, 50 % or 66 %, 99 % and 100 %), the Consultant shall provide:

- a completed and signed Checklist for the Submission of Construction Documents (see Appendix A); and
- an index as per Appendix B.

2.1.6 Terminology & Quantities

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

Notations such as “verify on site,” “as instructed,” “to match existing,” “example,” “equal to,” “equivalent to,” and “to be determined on site by Departmental Representative” shall not be indicated in specifications nor in drawings, as such wording promotes inaccurate and inflated bids.

Construction documents shall permit bidders to bid accurately. If a precise quantity is impossible to identify (e.g. cracks to be repaired), then provide an estimated quantity for bidding purposes (to be used in conjunction with unit prices). Ensure that the terminology used throughout construction documents is consistent and does not contradict applicable codes and standards.

2.1.7 Units of Measure

All units of measure within drawings and specifications shall be based on the International System of Units (SI).

2.2 Drawings

2.2.1 General

Drawings shall be prepared in accordance with the *PWGSC National CADD Standard* and the Canadian Standards Association CSA B78.5-93: *Computer-Aided Design Drafting (Buildings)*. Drawing shall also meet the following criteria:

- dimensions shall be in metric only (no dual dimensioning);
- no trade names present on any drawings; and
- no specification-type notes are on any drawing.

2.2.2 Information to be Included

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

2.2.3 Title Blocks and Revision Notes

PWGSC title block shall be used for drawings and sketches (including addenda).

The percent of drawing completion should be included in the revision notes. Revision notes shall be inputted during design development, but cleared for 100% complete drawing (ready for tender).

2.2.4 Drawing Numbers

Drawings should be numbered in sets according to the type of drawing and the discipline involved as indicated in the following table. The requirements of the *PWGSC National CADD Standard* supersede these requirements, where warranted.

Discipline	Drawing
Demolition	D01, D02, etc.
Architecture	A01, A02, etc.
Civil	C01, C02, etc.
Landscaping	L01, L02, etc.
Mechanical	M01, M02, etc.
Electrical	E01, E02, etc.
Structural	S01, S02, etc.
Interior Design	ID01, ID02, etc.

2.2.5 Presentation Requirements

Present the drawings in sets, providing the applicable demolition, site plan, civil, landscaping, architecture, structural, mechanical, and electrical drawings in that order. All drawings should be of uniform standard size.

2.2.6 Legends

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

2.2.7 Schedules and Tables

Where schedules or tables occupy entire sheets, locate them at the back of each set of drawings for convenient reference.

2.2.8 North Arrow

Include a north arrow on all plans. Orient all plans in the same direction for easy cross-referencing. Wherever possible, lay out plans so that the north point is at the top of the sheet.

2.2.9 Drawing Symbols

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

2.2.10 As-Built Drawings

As-built drawings are official record drawings and shall represent as constructed conditions including location and size of equipment, devices, plumbing lines, mechanical and electrical equipment, structural elements etc. As-built drawings shall be updated in CAD, handwritten notes are not acceptable.

2.2.11 Submission Format

Unless otherwise stated in the Terms of Reference, drawing submissions shall be in electronic and hard copy format.

2.2.11.1 Drawing Hard Copy Deliverable Format

Drawing submitted in hard copy shall be:

- printed to scale with black lines on white paper;
- bound with staple or other means into sets, where presentations exceed 50 sheets, the drawings for each discipline may be bound separately for convenience and ease of handling; and
- of a paper size as agreed to with the Departmental Representative.

2.2.11.2 Drawing Electronic Copy Deliverable Format

Drawing submitted electronically shall be provided:

- without password protection or printing restrictions;
- in two formats:
    - PDF/E-1 (in compliance with ISO 24517-1);
    - .dwg format; and
- in accordance with Appendix D.

2.3 Building Information Modelling (BIM)

PWGSC is committed to using non-proprietary or "OpenBIM" standards. As such, the Consultant is not required to use any specific proprietary software format. For the sake of legacy information quality, the Consultant shall use the international standards of interoperability for BIM (IFC) in all cases where models are submitted. Consultants shall to work with software that is compliant to this standard.

Where used, BIM shall not replace the submission requirements outlined by this document. Rather, consultants shall submit models in addition requirements outlined herein.

Where BIM is used, models and modelled information shall be submitted in the following two formats:

- .native (whichever format is native to the Modelling software used by the Consultant);
- .ifc (Industry Foundation Classification – IFC4 – ISO 16739:2013); and

All Modelled Information, and Model Information Exchanges shall conform to:

- Project-specific requirements, such as they are laid out in the Project Execution Plan, Project Documentation and Model Element Table; and
- The project-identified BIM Standards & Guidelines.

Models for electronic submissions shall be organized as per Appendix D.

2.4 Specifications

2.4.1 National Master Specification

Specifications prepared for PWGSC shall follow the most current version of the *National Master Specification* (NMS) format offered by the National Research Council.

The Consultant has overriding responsibility for the content of construction project specifications. For each specification, he or she shall edit, amend, and supplement the NMS template as deemed necessary to produce an appropriate project specification free of conflict and ambiguity. The Consultant should refer to the latest *NMS User's G*uide and *NMS Development Guide* issued by the National Research Council for further guidance on using the NMS.

2.4.2 Index

Specifications shall include an index which list all specification sections, including numbers of pages, as well as the division and section names in the format shown in Appendix B.

2.4.3 Specification Organization

Narrow scope sections describing single units of work should be used for complex work. Broad scope sections may be used for less complex work. The Consultant shall use consistently for the entire specification either the NMS 1/3 page format, the NMS 2/3-page format or the Construction Specifications Canada (CSC) full-page format.

Start each section on a new right hand page and show the PWGSC project number, NMS section title, NMS section number, page number, and specification date on each page. The project title, and Consultant's name are not to be indicated.

2.4.4 Standards

Code and standard references in the NMS may not be up to date, the Consultant shall ensure that the project specification use the current applicable edition of all references quoted.

2.4.5 Specifying Materials

Specifications should make use of generic names in referencing construction materials. The Consultant should refer to the latest version of the *NMS Development Guide* issued by the National Research Council for further details. The term "Acceptable Manufacturers" shall not be used, as this restricts competition and does not ensure the actual material or product will be acceptable.

2.4.5.1 Alternate Products and Materials

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

2.4.5.2 Sole Sourcing

Sole sourcing of materials and/or work is only allowed in exceptional and justifiable circumstances. Prior to including sole source materials and/or work, the Consultant shall contact the Departmental Representative to obtain approval for the sole sourcing. Consultants shall provide proper justification for all individual sole source requirements.

Sole sourcing for materials and work may be required when performing work on existing proprietary systems, such as fire alarm systems, building automation systems (BAS) etc.

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

Designated Contractor

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

Wording for the sole source of building automation system should be in Part 1 as follows:

Designated Contractor

.1 Retain the services of [_____] or its authorized representative to complete the work of all building automation system sections.

Wording for the sole source of building automation system should be in Part 2 as follows:

Materials

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

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

Acceptable Materials

.1 The only acceptable materials are [_____].

2.4.6 Measurement for Payment

The measurement for payment shall be provided in lump sum or unit prices.

2.4.6.1 Unit Prices

Unit prices should only be used in instances where the quantity can only be roughly estimated (e.g. earth work). The approval of the Departmental Representative shall be sought in advance of their use. In each applicable NMS section where unit prices are used, add new or replace paragraph title "Measurement for Payment" with "Unit Prices." and use the following wording:

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

Provide a unit price table, sample shown below, to designate the work to which a unit price arrangement applies. The table shall include:

- the price per unit and the estimated total price for each item listed;
- a complete description of each type of work covered; and
- items as described in the referenced specification section.

Item	Specification Reference	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity	Price per Unit GST/HST extra	Estimated Total Price GST / HST extra
					TOTAL ESTIMATED AMOUNT	

2.4.7 Cash Allowances

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

To include cash allowances, obtain approval from the Departmental Representative in advance, and use Section 01 21 00 – Allowances of the NMS to specify the criteria.

2.4.8 Warranties

The 12-month warranty period specified in PWGSC's standard acquisition clauses and conditions with regard to the contract should typically be retained as is. Extended warranties should only be used where experience has shown that serious defects are likely to appear after expiry of the standard one-year warranty period. When necessary to extend beyond the 12 month warranty period,

use the following wording in Part 1 of the applicable technical sections, under the heading “Extended Warranty”:

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

Where the extended warranty is intended to apply to a particular part of a specification section, modify the previous text as follows:

> For [_____], the 12 month warranty period is extended to [_____] months.

2.4.9 Miscellaneous Requirements

Paragraphs noted as “Scope of Work” shall not be included. Within Part 1 – General of specifications, the paragraphs “Summary” and “Section Includes” shall not be utilized.

2.4.10 Specification Coordination

All sections of the specifications shall be coordinated, including the “Related Sections” portion of specifications and appendices. References to non-existent sections shall not be present within the specifications.

2.4.11 Regional Guide

The Consultant should contact the Departmental Representative to obtain the region’s requirements for Division 01 (General Requirements) or other short-form specifications as appropriate.

2.4.12 Health and Safety

All project specifications are required to include Section 01 35 29 – Health and Safety Requirements. Confirm with the Departmental Representative to determine if there are any instructions to meet regional requirements.

2.4.13 Subsurface Investigation Reports

If required, subsurface investigation report(s) shall be included after Section 31, and the following paragraph added to Section 31:

> Subsurface Investigation Report(s)
>
> .1 Subsurface investigation report(s) are included in the specification following this section.
>
> If the Departmental Representative determines that it is not practical to include the subsurface investigation report(s), alternate instructions will be provided.
>
> Where tender documents are to be issued in both official languages, the subsurface investigation report(s) shall be issued in both languages.
>
> In addition to providing the subsurface investigation report(s), the foundation information required by the current *National Building Code of Canada* (Division C, Part 2, 2.2.4.6) shall be included on foundation drawings.

2.4.14 Prequalification and Pre-Award Submissions

Do not include in the specifications any mandatory contractor and/or subcontractor prequalification or pre-award submission requirements that could become a contract award condition. If a

prequalification process or a pre-award submission is required, contact the Departmental Representative.

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

2.4.15 Contracting Issues

Specifications describe the workmanship and quality of the work and shall not contain any contracting issues. Division 00 of the NMS is not used by PWGSC, except for the Seals page 00 01 07 and the Table of Contents 00 01 10. In specifications, remove all references to the following:

- general instructions to bidders;
- general conditions;
- Canadian Construction Documents Committee (CCDC) documents;
- priority of documents;
- security clauses and clearances;
- terms of payment or holdback;
- the tendering process;
- bonding requirements;
- insurance requirements;
- alternative and separate pricing;
- site visits (mandatory or optional); and
- the release of lien and deficiency holdbacks.

2.4.16 Specification Submission Format

Unless otherwise stated in the Terms of Reference, specification submissions shall be in electronic and hard copy format.

2.4.16.1 Specification Hard Copy Deliverable Format

Specifications submitted in hard copy shall be printed on both sides of 216 mm x 280 mm white bond paper.

2.4.16.2 Specification Electronic Copy Deliverable Format

Specifications submitted electronically shall be:

- provided in PDF/A (in compliance with ISO 19005) format, without password protection and printing restrictions; and
- in accordance with Appendix D.

2.5 Addenda

2.5.1 Format

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

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

No Consultant information (name, address, phone #, Consultant project #, etc.) should appear in addenda or their attachments (except on sketches).

2.5.2 Content

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

Where there are many or major changes to a section or drawing, consider deleting the entire section or drawing and replacing it with a new version.

3 Cost Estimates

3.1 Cost Estimates Submission Formats

3.1.1 Format

Construction cost estimates for projects shall be prepared in the elemental analysis format, which is in accordance with the latest edition issued by the Canadian Institute of Quantity Surveyors (CIQS) for all PWGSC regions excluding Quebec. Within Quebec region the cost estimates shall be prepared in the Uniformat II format.

3.1.2 Contents

All cost estimates shall contain the following:

- introduction narrative complete with an outline description of the cost estimate basis;
- description of information obtained and used in the cost estimate including the date received;
- listing of notable inclusions;
- listing of notable exclusions;
- listing of items/issues carrying significant risk;
- summary of the itemized cost estimate;
- itemized breakdown of cost estimate by elemental analysis for Class B, C, and D; and
- itemized breakdown of costs estimate in both elemental analysis and National Master Specification division format for Class A, including measured quantities, unit rate pricings and amounts for each item of work.

Allowances, if deemed necessary by Consultant, shall contain the following:

- design allowance to cover unforeseen items during design phase;
- escalation allowance for changes in market conditions between the date of the cost estimate and the date tender is called;
- construction allowance to cover unforeseen items during construction; and
- the basis of calculations of the above allowances.

3.2 Classes of Cost Estimates for Construction Projects

PWGSC applies a detailed, four-level classification using the terms Class A, B, C and D. Apply these estimate classifications at the project stages as defined in the TOR. For projects required to be submitted to Treasury Board (TB) for approval: an indicative estimate shall be at least a Class D and a Substantive Estimate shall be at least a Class B.

3.2.1 Class D (Indicative) Estimate

Based upon a comprehensive statement of requirements, an outline of potential solutions and/or functional program, this estimate is to provide an indication of the final project cost that will enable ranking to be made for all the options being considered. This cost estimate shall be prepared in elemental analysis format. The level of accuracy of a Class D cost estimate shall be such that no more than a 20% design allowance is required.

3.2.2 Class C Estimate

Based on schematic/conceptual design and/or comprehensive list of project requirements, this estimate shall be adequately detailed and shall be sufficient for making the correct investment decision. This cost estimate shall be based on measured quantities of all items of work and prepared

in elemental analysis format. The level of accuracy of a Class C cost estimate shall be such that no more than a 15% design allowance is required.

3.2.3 Class B (Substantive) Estimate

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 shall provide for the establishment of realistic cost objectives and be sufficient to obtain effective project approval.

This cost estimate shall be based on measured quantities of all items of work and prepared in elemental analysis format. The level of accuracy of a Class B cost estimate shall be such that no more than a 10% design allowance is required.

3.2.4 Class A (Pre-Tender) Estimate

Based on completed construction drawings and specifications prepared prior to calling competitive tenders, this estimate shall be sufficient to allow a detailed reconciliation and/or negotiation with any contractor's tender submission. This cost estimate shall be based on fully measured quantities of all items of work and prepared in both elemental analysis and Trade division format as per MasterFormat™. The level of accuracy of a Class A cost estimate shall be such that no more than a 5% design allowance is required.

4 Project Schedules

4.1 Schedule Format

Project schedules shall be submitted in the .mpp file extension (compatible with MS Project). The schedule shall include:

- major and minor milestones;
- activities representing discrete elements of work assigned to one person which:
    - are named using verb-noun combination (i.e. Review Design Development Report);
    - contain realistic durations in days;
- project logic linking activities with appropriate relationships finish-start (FS), finish-finish (FF), start-start (SS); and
- Identification of the critical path activities.

4.2 Progress Report

The progress report shall detail the progress of each activity up to the date of the report. It shall also include any logic changes made, both historic and planned; projections of progress and completion; as well as the actual start and finish dates of all activities being monitored.

The contents of each progress report will vary depending on the requirements at each project phase. A progress report should include:

- an executive summary;
- a narrative report;
- a variance report;
- a criticality report;
- an exception report (as required);
- the master schedule with cash flow projections; and
- the detailed project schedule (network diagram or bar charts).

4.2.1 Executive Summary

The executive summary should provide a synopsis of narrative, variance, criticality and exception report, and is not to exceed one page.

4.2.2 Narrative Report

The project narrative shall detail the work performed to date, comparing work progress to planned, and presenting current forecasts. This report should summarize the progress to date, explaining current and possible deviations and delays and the required actions to resolve delays and problems with respect to the Detailed Schedule, and Critical Paths.

4.2.3 Variance Report

The variance report, with supporting schedule documentation, should detail the work performed to date and compare work progress to work planned. It should summarize the progress to date and explain all causes of deviations and delays and the required actions to resolve delays and problems with respect to the detailed schedule and critical paths. The variance report shall be presented in the following format:

Paper size:	Letter
Paper format:	Portrait
Title format:	Project Title, Report Type, Print Date, Data Date, Revision Block
Body text:	Narratives for each report to match other reports
Columns:	Activity ID, Activity Name, Planned Finish, Revised Finish, Variance, Activity % Complete

4.2.4 Criticality Report

The criticality report identifies all activities and milestones with negative, zero, and up to five days' Total Float. It is used as a first sort for ready identification of the critical paths, or near-critical paths, through the entire project. The criticality report shall be presented in the following format:

Paper size:	Letter
Orientation:	Portrait
Title format:	Project Title, Report Type, Print Date, Data Date, Revision Block
Body text:	Narratives for each report to match other reports
Columns:	Activity ID, Activity Name, Duration, Start, Finish, Activity % Complete, Total Float

4.2.5 Exception Report

The exception report shall be provided when unforeseen or critical issues arise. The Consultant shall advise the Departmental Representative and submit the details and proposed solutions in the form of an exception report. The report shall include sufficient description and detail to clearly identify:

- scope changes, including identifying the nature, reason, and total impact of all identified and potential project scope changes affecting the project;
- delays and accelerations, including identifying the nature, reason, and total impact of all identified and potential duration variations; and
- options enabling a return to the project baseline, including Identifying the nature and potential effects of all proposed options for returning the project within the baselined duration.

The exception report shall be provided in the following format:

Paper size:	Letter
Orientation:	Portrait
Title format:	Project Title, Report Type, Print Date, Data Date, Revision
Body text:	Narrative to match other reports

Paper size:	Letter
Orientation:	Landscape
Title format:	Project Title, Report Type, Print Date, Data Date, Revision
Columns	Activity ID, Activity Name, Duration, Remaining Duration, Start, Finish, Total Float

4.2.6 Master Schedule

A master schedule including cash projection shall be provided in the following format:

Paper size:	11X17
Orientation:	Landscape
Columns”	Activity ID, Activity Name, Duration, Activity % Complete, Start, Finish, Total Float
Footer format:	Project Title, Report Type, Print Date, Data Date, Revision Block
Sorting:	Early Start, then Early Finish, then Activity ID based on the WBS.

4.2.7 Detailed Project Schedule

A detailed project schedule shall be provided along with a network diagram or bar charts in the following format:

Paper size:	11X17
Orientation:	Landscape
Columns:	Activity ID, Activity Name, Duration, Activity % Complete, Start, Finish, Total Float
Footer format:	Project Title, Report Type, Print Date, Data Date, Revision Block
Sorting:	Early Start, then Early Finish, then Activity ID based on the WBS.

Appendix A Checklist for the Submission of Construction Documents

Date:	
Project Title:	**Project Location:**
Project Number:	**Contract Number:**
Consultant's Name:	**PWGSC Departmental Representative**
Review Stage (stages may vary at discretion of project team): **33% ☐ 50% or 66% ☐ 99% ☐ 100% ☐**	

Drawings\Design			
Item	**Verified by**	**Explanations**	**Action By**
1 Index			
1a The index shows a complete listing of drawing titles and numbers.			
2 Title Blocks			
2a The title block is as per the *PWGSC National CADD Standard*.			
3 Units			
3a All units of measure are metric.			
4 Trade Names			
4a Trade names are not used.			
5 Specification Notes			
5a There are no specification-type notes.			
6 Terminology			
6a The term “Departmental Representative” is used instead of “Engineer,” “PWGSC,” “Owner,” “Consultant,” or “Architect.”			
6b Notations such as “verify on site,” “as instructed,” “to match existing,” “example,” “equal to,” “equivalent to,” and “to be determined on site by” are not used.			
7 Information to be included			
7a The project quantities, configurations, dimensions, and construction details are included.			
7b References to future work and elements not in the tender documents do not appear or are kept to an absolute minimum and clearly marked.			

Drawings\Design			
Item	**Verified by**	**Explanations**	**Action By**
8 Quality Assurance			
8a Coordination review of the design between various disciplines has been completed by the Consultant.			
8b Constructability review of design has been performed.			
9 Signing and Sealing			
9a Every final drawing bears the seal and signature of the responsible design professional in compliance with various provincial jurisdiction requirements.			

Specifications			
Item	**Verified by**	**Explanations**	**Action by**
1 National Master Specification			
1a The current edition of the National Master Specification (NMS) has been used.			
1b Sections have been included for all work identified on drawings and sections have been edited.			
2 Index			
2a The index shows a complete list of specifications sections with the correct number of pages.			
3 Organization			
3a Either the NMS 1/3- or 2/3-page format or the Construction Specifications Canada full-page format is used consistently for the entire specifications.			
3b Each section starts on a new page and the project number, section title, section number, page number and date is shown on each page.			
3c The Consultant's name is not indicated.			
4 Terminology			
4a The term "Departmental Representative" is used instead of "Engineer," "PWGSC," "Owner," "Consultant," or "Architect."			
4b Notations such as "verify on site," "as instructed," "to match existing," "example," "equal to," "equivalent to," and "to be determined on site by" are not used.			
5 Dimensions			
5a Dimensions are provided in metric only.			
6 Standards			
6a The current edition of all references quoted is used.			
7 Specifications Materials			
7a The method of specifying materials uses recognized standards. Actual brand names and model numbers are not specified.			
7b Materials are specified using standards and performance criteria.			

Specifications			
Item	**Verified by**	**Explanations**	**Action by**
7c Non-restrictive, non-trade name "prescription" or "performance" specifications are used throughout.			
7d The term "Acceptable Manufacturers" is not used.			
7e No sole sourcing has been used.			
7f If sole sourcing has been used, the correct wording has been used and a justification, estimate, and specification have been provided to the Departmental Representative for the sole-sourced products.			
***8* Measurement for Payment**			
8a Unit prices are used only for work that is difficult to estimate.			
9 Cash Allowances			
9a No cash allowances have been used or if they have, approval from the Departmental Representative has been received.			
10 Miscellaneous Requirements			
10a No paragraphs noted as "Scope of Work" are included.			
10b In Part 1 - General of any section, the paragraphs "Summary" and "Section Includes" are not used.			
11 Specification Coordination			
11a The list of related sections and appendices are coordinated.			
12 Health and Safety			
12a Section 01 35 29.06 – Health and Safety Requirements is included.			
***13* Subsurface Investigation Reports**			
13a Subsurface investigation reports are included after Section 31.			
14 Prequalifications			
14a There are no mandatory contractor and/or subcontractor prequalification requirements or references to certificates, transcripts, licence numbers of a trade or subcontractor, or other such documentation or item included in the bid.			

Specifications			
Item	**Verified by**	**Explanations**	**Action by**
15 Contracting Issues			
15a Contracting issues do not appear in the specifications.			
15b Division 00 of the NMS is not used except 00 01 07 (Seals Page) and 00 01 10 (Table of Contents).			
16 Quality Assurance			
16a There are no specification clauses with square brackets "[ ]" or lines "__" indicating that the document is incomplete or missing information.			
17 Signing and Sealing			
17a Every final specification bears the seal and signature of the responsible design professional as required. Seals and signatures shall be shown in NMS section 00 01 07.			

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

Consultant's Representative: _____

Firm name: _____

Signature:_____ Date: _____

Appendix B Drawings and Specifications Table of Contents Template

B.1 General

List all drawings by number and title.

For specifications, list all divisions, sections (by number and title), and the number of pages in each section.

B.2 Sample Table of Contents

Project No: **Table of Contents** **Index**

_____ **Page 1 of ___**

DRAWINGS:

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

SPECIFICATIONS:

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

Appendix C Addenda Formatting Template

C.1 Instructions

To re-issue a drawing with an addendum:

- indicate the drawing number and title; and
- list the changes or indicate the revision number and date.

To re-issue a specification with an addendum:

- indicate the section number and title; and
- list all changes (i.e. deletions, additions, and replacements) by article or paragraph.

The addendum, drawings and specifications should be sent as separate files.

C.2 Sample Addendum

Date: _____

Addendum Number: _____

Project Number: _____

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

DRAWINGS:

1 A1 Architecture
.1

SPECIFICATIONS:

1 Section 01 00 10 – General Instructions
.1 Delete article (xx) entirely.
.2 Refer to paragraph (xx.x),
delete the following: …
and replace with the following: …

2 Section 23 05 00 – Common Work Results - Mechanical
.1 Add new article (x) as follows:

Appendix D Directory Structure and Naming Convention Standards for Construction Tender Documents

D.1 Electronic Submissions

Electronic submittals of drawings, specification and models shall be in the following format unless otherwise specified in the Terms of Reference or instructed by the Departmental Representative:

- On media burned to read only memory (ROM) on either CD-ROM or DVD+R where:
  - CD-ROMs comply with ISO 9660:1988 standards;
  - DVD+Rs are 4.7 GB, single-sided, single-layer and comply with ISO/IEC 17344:2006 standards;
  - media is “closed” upon completion of burning; and
  - media is usable in such a way that files may be accessed and copied from it.

If BIM model size is greater than storage capacity of a DVD, refer to Terms of Reference or contact the Departmental Representative for transmission instructions.

Some projects may require the Consultant to upload files to an electronic system outlined in the Terms of Reference or as instructed by the Departmental Representative.

D.2 Directory Structure

D.2.1 1st Tier Subfolder

The 1st tier of the directory structure shall be “Project ######” where ###### represents each digit of the Project Number. The Project Number must always be used to name the 1st tier folder and it is always required. Free text can be added following the Project Number, to include such things as a brief description or the project title.

D.2.2 2nd Tier Subfolder

The 2nd tier of the directory structure shall consist of: “Bilingual - Bilingue”, “English” and “Français” folders. The folders of the 2nd tier cannot be given any other names since the Government Electronic Tendering System (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 subfolders of the 3rd tier.

D.2.3 3rd Tier Subfolder

The 3rd tier of the directory structure shall consist of: “Drawings - Dessins”, “Drawings”, “Models”, “Specifications”, “Reports”, “Dessins”, “Modèles”, “Devis” and “Rapports”. 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.

D.2.4 4th Tier Subfolder - Drawings

The 4th-tier subfolders for Drawings should reflect the various disciplines of the set of drawings. Because the order of appearance of the subfolders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the subfolders in the “Drawings – Dessins”, “Drawings” and “Dessins” folders. The first subfolder 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.

The 4th tier “Drawings” and “Dessins” folder shall follow the naming convention:

- Y

Where:

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

Y = the title of the folder Example: 03 – Mechanical

For the “Drawings - Dessins” folder:

= Y - Z

Where:

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

Y = the English title of the folder

Z = the French title of the folder

Example:

04 - Electrical – Électrique

The numbering of the 4th tier subfolders is for sorting purposes only and is not tied to a specific discipline. For example, “Architecture” could be numbered 05 for a project where there is four other disciplines before “Architecture” in the set of drawings or 01 in another project where it’s the first discipline appearing in the set.

The order of the drawings shall be the same as in the hard copy set. GETS will sort each drawing for both screen display and printing as per the following rules:

- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the subfolders 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-older will be printed in alphanumerical order before the drawings in the 02 sub- folder etc.);

Each drawing PDF file within each subfolder 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.).

D.2.5 4th-Tier Subfolders for Specifications

The “Specifications” and “Devis” folders must have 4th tier sufolders created to reflect the various elements of the specifications. Because the order of appearance of the subfolders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the subfolders in the “Specifications” and “Devis” folders.

The 4th tier subfolders for specifications must adhere to the following standard naming convention for the “Specifications” and “Devis” folders:

- Y

Where:

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

Y = the title of the folder

Example:

02 – Divisions

Numbering of the 4th tier subfolders is for sorting purposes only and is not tied to an element of the specifications.

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

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

D.2.6 Directory Structure Example

The following is an example of the directory structure for the tender document, refer to previous sections for requirements, and use only sections applicable to the given project:

- Project ######
  - Bilingual – Bilingue
    - Drawings – Dessins
      - 01 - Drawing List – Liste des dessins
      - 02 – Demolition – Démolition
      - 03 – Architecture – Architectural
      - 04 – Civil – Civil
      - 05 – Landscaping - Aménagement paysager
      - 06 – Mechanical – Mécanique
      - 07 – Electrical – Électricité
      - 08 – Structural - Structural
      - 09 – Interior Design – Aménagement intérieur
  - English
    - Drawings
      - 01 - Drawing List
      - 02 – Demolition
      - 03 – Architecture
      - 04 – Civil
      - 05 – Landscaping
      - 06 – Mechanical
      - 07 – Electrical
      - 08 – Structural
      - 09 – Interior Design
      - …
    - Models
    - Specifications
      - 01 – Index
      - 02 – Divisions
      - 03 – Appendices
    - Reports
  - Français
    - Dessins
    - Modèles
    - Devis
    - Rapports

D.3 Naming Convention for PDF Files

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

D.3.1 Drawing File Names

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

X### - Y

Where:

X = the letter or letters from the drawing title block (“A” for Architecture or “ID” for Interior Design for example) associated with the discipline

= the drawing number from the drawing title block (one to three digits)

Y = the drawing name from the drawing title block (for bilingual drawings, the name in both English and French is to appear).

Example:

A001 - First Floor Details

Each drawing that will be located in the appropriate discipline 4th tier subfolders must be named with the same letter (“A” for Architecture Drawings for example) and be numbered. The drawing number used to name the PDF file must match as much as possible the drawing number of the actual drawing (the exception being when leading zeros are required).

The following important points about drawings are to be noted:

- The drawing PDF files within each subfolder are sorted alphanumerically for both displaying and printing. If there are more than 9 drawings in a particular discipline the numbering must use at least two numerical digits (i.e. A01 instead of A1) in order to avoid displaying drawing A10 between A1 and A2. The same rule applies when there are more than 99 drawings per discipline i.e. three digits instead of two must be used for the numbering (for example M003 instead of M03);
- If drawing PDF files are included in the “Bilingual - Bilingue” folder, these cannot be included as well in the “English” and/or “Français” folders;
- If drawings not associated with a particular discipline are not numbered (title page or list of drawings for example), these will be sorted alphabetically. While this does not represent a problem if there is only one drawing in the subfolder, 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.

D.3.2 Specifications

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

D.3.3 Documents Other Than Specifications Divisions

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

- Y

Where:

= Two digit number ranging from 01 to 99 with leading zeros required

Y = Name of the document

Example:

01 – Drawings and Specifications Index

D.3.4 Specifications Divisions

The specifications divisions must be named as follows:

Division ## - Y

Where:

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

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

Example:

Division 05 – Metals

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

D.4 Media Label

The CD-ROM or DVD+R shall be labeled with the following information:

Project Number / Numéro de projet

Project Title / Titre du projet

Documents for Tender / Documents pour appel d’offres

Disk X of/de X

Example:

Project 123456 / Projet 123456

Repair Alexandra Bridge / Réparation du pont Alexandra

Documents for Tender / Documents pour appel d’offres

Disk 1 of/de 1