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Place du Portage, Phase III  
Core 0B2 / Noyau 0B2  
Gatineau, Québec K1A 0S5  
Bid Fax: (819) 997-9776

**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**

THIS DOCUMENT CONTAINS A SECURITY  
REQUIREMENT

**Vendor/Firm Name and Address**

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

**Issuing Office - Bureau de distribution**

Consultant Services Division/Division des services  
d'experts-conseils  
L'Esplanade Laurier  
4th floor, East Tower  
140 O'Connor Street  
Ottawa  
Ontario  
K1A 0S5

<b>Title - Sujet</b> TECHNICAL ADVISOR SERVICES	
<b>Solicitation No. - N° de l'invitation</b> EJ078-200154/A	<b>Date</b> 2019-09-06
<b>Client Reference No. - N° de référence du client</b> 20200154	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$FE-181-77692	
<b>File No. - N° de dossier</b> fe181.EJ078-200154	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2019-10-23</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Bergevin, Carl	<b>Buyer Id - Id de l'acheteur</b> fe181
<b>Telephone No. - N° de téléphone</b> (343) 549-0747 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> PWGSC The Taxation Headquarters Buildings 875 Heron Road Ottawa, Ontario Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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

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Title of Project – titre du projet  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

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# REQUEST FOR PROPOSAL (RFP)

THIS PROCUREMENT CONTAINS A  
SECURITY REQUIREMENT

## 875 HERON ROAD REHABILITATION PROJECT – TECHNICAL ADVISOR

SOLICITATION DATE: SEPTEMBER 6, 2019

CONTRACTING AUTHORITY:

CARL BERGEVIN  
CARL.BERGEVIN@TPSGC-PWGSC.GC.CA

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REQUEST FOR PROPOSAL (RFP)**

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## SYNOPSIS OF PROJECT

PWGSC is preparing to rehabilitate and modernize a Crown owned office complex at 875 Heron Road, in the City of Ottawa, Ontario. PWGSC plans to undertake the work through a Public-Private Partnership (P3) model. This partnership will undertake the financing, design, construction and, potentially, the long-term maintenance of the facility.

The services of a Technical Advisor (TA) are required to provide various architectural, engineering and related services to PWGSC in support of the P3 Consortium procurement and delivery which will be described in detail in this document. The TA will support two phases of the project as summarized here and detailed in Required Services sections RS GA and RS 1-2.

Phase I includes collecting and reviewing the existing project documentation, conducting technical studies, developing a schematic design, creating Class C cost estimates, supporting the development of the procurement options analysis conducted by the Financial Advisor (FA), coordinating National Capital Commission (NCC) and Federal Heritage Building Review Office (FHBRO) approvals, and developing Project Specific Output Specifications and other Project Agreement schedules to be included in the P3 Consortium RFP.

Phase II involves assisting PWGSC during the P3 Consortium procurement process, including attendance at proponent meetings, responding to proponent questions, drafting amendments to procurement documents, participating in the proposal evaluations, support in the drafting of the Project Agreement and Commercial Close.

Optional services will include Phase III and Phase IV as well as the possibility to support the inclusion of long-term maintenance and facilities management services in the P3 model also form part of this opportunity. The PWGSC project team has received approval to pursue the Project using a Design-Build-Finance (DBF) procurement model. If it is determined that the DBFM is the optimal model following a Value-for-Money (VfM) analysis, and the project team obtains the requisite approvals, the TA will be required to provide services related to maintenance and facilities management, as described in greater detail below in the Project Brief.

Phase III involves assisting PWGSC during the design and construction of the facility by the P3 Consortium, including **reviewing the design documents and carrying out PWGSC's monitoring and oversight responsibilities during construction**, addressing deficiencies and commissioning.

Phase IV is the post-construction which includes overseeing the P3 Consortium in the creation of closeout documents, occupancy of the building and verification of the performance of building systems. The duration of the TA contract is dependent on a one-stage or two-stage construction implementation strategy, described in section PD 6. The Project duration is anticipated to be approximately ten and a half years, from February 2020 to July 2030, in the approved two-stage construction implementation strategy. If a one-stage construction implementation strategy is approved, the Project duration is anticipated for a period of approximately eight and a half years, from February 2020 to July 2028.

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SUPPLEMENTARY INSTRUCTIONS TO PROPONENTS (SI)

**SI 1 INTRODUCTION**

1. Public Works and Government Services Canada (PWGSC) intends to retain an individual consultant 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 responses 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. Proponents should note that a Conflict of Interest/Unfair Advantage clause will be included in any and all future solicitations for work related to the 875 Heron Road Rehabilitation Project - P3 Consortium Project. The wording of such clause is anticipated to be similar to the following:
  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.

Proponents, any of their Sub-Consultants, and any of their subcontractors, advisors, Consultants or representatives should therefore be aware of the possibility of being precluded from submitting a bid or being proposed as a sub-contractor/sub-Consultant on subsequent contracts. In addition, any of their Sub-Consultants, and any of their subcontractors, advisors, Consultants or representatives should be aware of the possibility of

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being deemed as ineligible for the purpose of participating in solicitations for future design and construction services related to the aforementioned project, including but not limited to the solicitation for the future 875 Heron Road Rehabilitation Project - P3 Consortium project.

The wording of the clause deeming a party ineligible is anticipated to be similar to the following:

INELIGIBLE PARTY

1. As a result of their involvement in the Project, the persons named below, their employees, any of their sub-consultants, and any of their subcontractors, advisors, consultants or representatives engaged in respect of this project and any person controlled by, that controls or that is under common control with the Ineligible Party (each an Ineligible Party's affiliate) are not eligible to participate as a Proponent Team member or advisor to the Proponent:
  - Name of ineligible party
  - Name of ineligible party
  - Name of ineligible party
  - Name of ineligible party
2. CANADA may amend the Ineligible Parties list from time to time during the solicitation process.
3. **An Ineligible Party's Affiliate, as defined under section 8. INTEGRITY PROVISIONS - RESPONSE, may be eligible to participate as a Proponent's Team member or advisor to the Proponent, only after it has obtained a written consent from Canada permitting it to participate as a Proponent's Team member or advisor to the Proponent. To obtain consent for an Ineligible Party's Affiliate to participate as a Proponent's Team member or advisor to the Proponent, the Proponent must submit a request for consent to the Contracting Authority that includes the following information:**
  - i. **the full legal name of the Ineligible Party's Affiliate that the Proponent wishes to include on its team or as a Proponent's Team member or advisor to the Proponent;**
  - ii. **information regarding the Ineligible Party's Affiliate's relationship to the Ineligible Party; and;**
  - iii. **a description of the policies and procedures that will be put in place to manage, mitigate or minimize the impact of any potential Conflict of Interest.**

Upon the Contracting Authority's receipt of a Proponent's properly completed request for consent, Canada will, in its sole discretion, make a determination as to whether it considers there to be a real, perceived or potential Conflict of Interest and whether the impact of such real, perceived or potential Conflict of Interest can be appropriately managed, mitigated or minimized. The Proponent will be notified of Canada's decision by means of a consent letter setting out the nature of the consent and the management, mitigation or minimization measures required as a condition of consent. If the Ineligible Party's Affiliate is considered to have a Conflict of Interest the impact of which cannot be properly managed, mitigated or minimized, the Ineligible Party's Affiliate will be added, by Canada, to the Ineligible Parties list by amendment.

SI 2 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



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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 PWGSC.

2. The following are the proposal documents:
- (a) Supplementary Instructions to Proponents (SI);
  - (b) R1410T (2017-08-17), General Instructions (GI) – Architectural and/or Engineering Services – Request for Proposal;  
Submission Requirements and Evaluation (SRE);

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

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

Subsection 3.2. of section GI3, Proposal evaluation and rating of R1410T, incorporated by reference above, is deleted in its entirety and replaced with the following:

APPENDIX F – Submission Requirement and Evaluation (SRE), SRE 4 – Price of Services, incorporated in this document;

- (c) the general terms, conditions and clauses, as amended, identified in the Agreement clause;
  - (d) Project Brief and associated appendices;
  - (e) the document entitled "Doing Business with PWGSC Documentation and Deliverables Manual";
  - (f) the Security Requirements Check List (SRCL);
  - (g) any amendments to the solicitation document issued prior to the date set for receipt of proposals; and
  - (h) 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.

### SI 3 QUESTIONS OR REQUESTS 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 [Carl.Bergevin@tpsgc-pwgsc.gc.ca](mailto:Carl.Bergevin@tpsgc-pwgsc.gc.ca) as early as possible.

Enquiries should be received no later than ten (10) working days prior to the closing date identified on the front page of the Request for Proposal. Enquiries received after that date may not be answered prior to the closing date of the solicitation.

### SI 4 BID SOLICITATIONS DISTRIBUTION

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

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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.

## SI 5 **CANADA'S TRADE AGREEMENTS**

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

## SI 6 **CERTIFICATIONS**

1. Integrity Provisions – Declaration of Convicted Offences  
In accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Proponent must provide with its bid, as applicable, to be given further consideration in the procurement process, the required documentation as per R1410T (2017-08-17), General instructions 1 (G11), Integrity Provisions – Proposal, section 3b.
2. Federal Contractors Program for Employment Equity - Proposal Certification  
By submitting a proposal, the Proponent certifies that the Proponent, and any of the Proponent's members if the Proponent is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html>).

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

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

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

## SI 7 **SECURITY REQUIREMENT**

1. Before award of a contract, the following conditions must be met:
  - (a) the Proponent must hold a valid organization security clearance as indicated in Supplementary Conditions SC1;

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Proponent/Key Sub-Consultants/Specialists (Firms / Joint Venture)	Facility Security Clearance (DOS)	Document Safeguarding (Protected B)
Prime Consultant (Proponent – Architect or Engineer as Technical Advisor)	X	X
Architect	X	
Civil Engineer	X	
Electrical Engineer	X	
IT Engineer	X	
Mechanical Engineer	X	
Sustainable Design Specialist	X	

(b) the Proponent's proposed individuals requiring access to classified or protected information, assets or sensitive work site(s) must meet the security requirement as indicated in Supplementary Conditions SC1 and set out in the following table:

Key Personnel – Appendix A - Senior Resources	Security Clearance (Reliability) at Contract award
Senior Architect	X
Senior Civil Engineer	X
Senior Electrical Engineer	X
Senior Mechanical Engineer	X
Senior IT Engineer	X
Senior Sustainable Design Specialist	X

(c) the Proponent's proposed location of service performance or document safeguarding must meet the security requirement as indicated in Supplementary Conditions SC1;

(d) the Proponent must provide the address(es) of proposed location(s) of service performance or document safeguarding as indicated in the Declaration/Certifications Form.

2. Proponents are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful Proponent to obtain the required clearance will be at the entire discretion of the Contracting Authority.

3. For additional information on security requirements, proponents should refer to the Contract Security Program of Public Works and Government Services Canada (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html> ) website.

To help PWGSC with the verification process, Proponent are being asked to complete Appendix E.

## SI 8 FAIRNESS MONITOR

Canada has engaged RFP Solutions Inc. as Fairness Monitor to monitor this Request for Proposal.

## SI 9 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:

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Employment Equity Act

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

Federal Contractors Program (FCP)

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

Certificate of Commitment to Implement Employment Equity form LAB 1168

<http://www.servicecanada.gc.ca/cgi-bin/search/eforms/index.cgi?app=profile&form=lab1168&dept=sc&lang=e>

Ineligibility and Suspension Policy

<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>

Code of Conduct for Procurement

<http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html>

Lobbying Act

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

Buy and Sell

<https://buyandsell.gc.ca/>

Supplier Registration Information

<https://srisupplier.contractsCanada.gc.ca>

Consultant Performance Evaluation Report Form

<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/2913-1.pdf>

Canadian economic sanctions

<http://www.international.gc.ca/sanctions/index.aspx?lang=eng>

National Joint Council (NJC) Travel Directive

<http://www.njc-cnm.gc.ca/directive/travel-voyage/index-eng.php>

## SI 10 OPTIONAL SITE VISIT

1. There will be an optional site visit on 25 September 2019 at 10:00 am. Interested Proponents are to meet at 875 Heron Road, Ottawa, ON K1A 1A2 at the security desk in the main lobby. Due to the nature of the requirement, proponents should arrive 15-minutes early to sign in for security purposes. Proponents should limit the number of attendees to a maximum of 5 personnel at the site visit per Proponent.
2. Safety Attire: In order to be guaranteed access to the site visit all persons should have the proper personal protection equipment (safety glasses, footwear, vests and hard hats). Consultants personnel/individuals who do not have the proper safety attire may be denied access to the site.

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TERMS, CONDITIONS AND CLAUSES

**AGREEMENT**

1. The Consultant understands and agrees that upon acceptance of the offer by Canada, a binding Agreement shall be formed between Canada and the Consultant and the documents forming the Agreement shall be the following:
  - (a) the Front Page and this Agreement clause;
  - (b) the General Terms, Conditions and Clauses, as amended, identified as:
    - R1210D (2018-06-21), 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
    - R1250D (2017-11-28), General Condition (GC) 9 - Indemnification and Insurance
  - Supplementary Conditions
  - Agreement Particulars
  - (c) Project Brief / Terms of Reference;
  - (d) **the document entitled "Doing Business with PWGSC Documentation and Deliverables Manual";**
  - (e) the Security Requirements Check List (SRCL);
  - (f) any amendment to the solicitation document incorporated in the Agreement before the date of the Agreement;
  - (g) 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

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- (c) Agreement;  
this Agreement clause;  
(d) Supplementary Conditions;  
(e) General Terms, Conditions and Clauses;  
(f) Agreement Particulars;  
(g) Project Brief / Terms of Reference;  
(h) the document entitled "Doing Business with PWGSC Documentation and Deliverables Manual";  
(i) the document entitled "Security Requirement Check List";  
(j) the proposal.

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SUPPLEMENTARY CONDITIONS (SC)

SC1 SECURITY REQUIREMENT

1. The following security requirement (SRCL and related clauses) applies and form part of the Agreement.

SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:  
PWGSC FILE No EJ078200154 Revision1

1. The Contractor/Offeror must, at all times during the performance of the Contract, hold a valid Designated Organization Screening (DOS), with approved Document Safeguarding at the level of PROTECTED B, issued by the Contract Security Program (CSP) of the Industrial Security Sector (ISS), Public Works and Government Services Canada (PWGSC).
2. The Contractor/Offeror personnel requiring access to PROTECTED information, assets or sensitive work site(s) must EACH hold a valid RELIABILITY STATUS, granted or approved by the CSP/ISS/PWGSC.
3. Processing of PROTECTED materiel electronically at the Contractor/Offeror's site is NOT permitted under this Contract/Standing Offer.
4. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of the CSP/ISS/PWGSC.
5. The Contractor/Offeror must comply with the provisions of the:
  - (a) Security Requirements Check List and security guide (if applicable), attached at Annex E;
  - (b) *Industrial Security Manual* (Latest Edition).

SECURITY REQUIREMENTS FOR FOREIGN SUPPLIERS

PWGSC FILE #: EJ078200154

REQUEST FOR PROPOSAL (RFP), RELIABILITY, ACCESS TO PROTECTED B INFORMATION

The Canadian Designated Security Authority (Canadian DSA) for industrial security matters in Canada is the Industrial Security Sector (ISS), Public Works and Government Services Canada (PWGSC), administered by International Industrial Security Directorate (IISD), PWGSC. The Canadian DSA is the authority for confirming Contractor/Subcontractor compliance with the security requirements for foreign suppliers. The following security requirements apply to the foreign recipient Contractor/Subcontractor incorporated or authorized to do business in a jurisdiction other than Canada and delivering outside of Canada the services listed and described in the subsequent contract/subcontract.

1. The Foreign recipient Contractor/Subcontractor must be from a Country within the North Atlantic Treaty Organization (NATO), the European Union (EU) or from a country with which Canada has an international bilateral security instrument. The Contract Security Program (CSP) has international bilateral security instruments with the countries listed on the following PWGSC website:  
<http://www.tpsgc-pwgsc.gc.ca/esc-src/international-eng.html>.

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2. The Foreign recipient Contractor/Subcontractor must, at all times during the performance of the contract/subcontract, hold an equivalence to a valid Designated Organization Screening (DOS), issued by the Canadian DSA as follows:
    - i. The Foreign recipient Contractor/Subcontractor must provide proof that they are incorporated or authorized to do business in their jurisdiction.
    - ii. The Foreign recipient Contractor/Subcontractor must not begin the work, services or performance until the Canadian Designated Security Authority (DSA) is satisfied that all contract security requirement conditions have been met. Canadian DSA confirmation must be provided, in writing, to the foreign recipient Contractor/Subcontractor in an Attestation Form, to provide confirmation of compliance and authorization for services to be performed.
    - iii. The Foreign recipient Contractor/Subcontractor must identify an authorized Contract Security Officer (CSO) and an Alternate Contract Security Officer (ACSO) (if applicable) to be responsible for the overseeing of the security requirements, as defined in this contract/subcontract. This individual will be appointed by the proponent foreign recipient **Contractor's/Subcontractor's** Chief Executive officer or Designated Key Senior Official, defined as an owner, officer, director, executive, and or **partner who occupy a position which would enable them to adversely affect the organization's policies or practices in the performance of the contract/subcontract.**
    - iv. The Foreign recipient Contractor/Subcontractor must not grant access to CANADA PROTECTED B information/assets, except to its personnel subject to the following conditions:
      - a. Personnel have a need-to-know for the performance of the contract/subcontract;
      - b. Personnel have been subject to a Criminal Record Check, with favourable results, from a recognized governmental agency or private sector organization in their country as well as a Background Verification, validated by the Canadian DSA;
      - c. The Foreign recipient Contractor/Subcontractor must ensure that personnel provide consent to share results of the Criminal Record and Background Checks with the Canadian DSA and other Canadian Government Officials, if requested; and
      - d. The Government of Canada reserves the right to deny access to CANADA PROTECTED information/assets to a foreign recipient Contractor/Subcontractor for cause.
  3. CANADA PROTECTED information/assets provided or generated pursuant to this contract/subcontract must not be further provided to a third party Foreign recipient Subcontractor unless:
    - a. written assurance is obtained from the Canadian DSA to the effect that the third-party Foreign recipient Subcontractor has been approved for access to CANADA PROTECTED information/assets by the Canadian DSA; and
    - b. written consent is obtained from the Canadian DSA, if the third-party Foreign recipient Subcontractor is located in a third country.



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4. The Foreign recipient Contractor/Subcontractor MUST NOT remove CANADA PROTECTED information/assets from the identified work site(s), and the foreign recipient Contractor must ensure that its personnel are made aware of and comply with this restriction.
  5. The Foreign recipient Contractor/Subcontractor must not use the CANADA PROTECTED information/assets for any purpose other than for the performance of the contract/subcontract without the prior written approval of the Government of Canada. This approval must be obtained from the Canadian DSA.
  6. The Foreign recipient Contractor/Subcontractor must, at all times during the performance of the contract/subcontract hold an equivalence to an approved Document Safeguarding Capability (DSC) at the level of CANADA PROTECTED B.

All CANADA PROTECTED information/assets, furnished to the foreign recipient Contractor/Subcontractor or produced by the foreign recipient Contractor/Subcontractor, must also be safeguarded as follows:

7. The Foreign recipient Contractor/Subcontractor must immediately report to the Canadian DSA all cases in which it is known or there is reason to suspect that CANADA PROTECTED information/assets pursuant to this contract/subcontract has been compromised.
8. The Foreign recipient Contractor/Subcontractor must immediately report to the Canadian DSA all cases in which it is known or there is reason to suspect that CANADA PROTECTED information/assets accessed by the foreign recipient Contractor/Subcontractor, pursuant to this contract/subcontract, have been lost or disclosed to unauthorized persons.
9. The Foreign recipient Contractor/Subcontractor must not disclose CANADA PROTECTED information/assets to a third party government, person, firm or representative thereof, without the prior written consent of the Government of Canada. Such consent must be sought through the Canadian DSA.
10. The Foreign recipient Contractor/Subcontractor must provide the CANADA PROTECTED information/assets a degree of safeguarding no less stringent than that provided by the Government of Canada in accordance with the National Policies, National Security legislation and regulations and as prescribed by the Canadian DSA.
11. The Foreign recipient Contractor/Subcontractor must, at all times during the performance of this contract/subcontract, ensure the transfer of CANADA PROTECTED information/assets be facilitated through the Canadian DSA.
12. Upon completion of the Work, the foreign recipient Contractor/Subcontractor must return to the Government of Canada, all CANADA PROTECTED information/assets furnished or produced pursuant to this contract/subcontract, including all CANADA PROTECTED information/assets released to and/or produced by its subcontractors.
13. The foreign recipient Contractor/Subcontractor requiring access to CANADA PROTECTED B information/ assets, under this contract/subcontract, must submit a Request for Site Access to the Departmental Security Officer of the Department of Public Services and Procurement Canada.

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14. In the event that a Foreign recipient Contractor/Subcontractor is chosen as a supplier for this contract/subcontract, subsequent country-specific foreign security requirement clauses must be generated and promulgated by the Canadian DSA, and provided to the Government of Canada Contracting Authority, to ensure compliance with the security provisions, as defined by the Canadian DSA, in relation to equivalencies.
  15. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of the Canadian DSA.
  16. The Foreign recipient Contractor/Subcontractor must comply with the provisions of the Security Requirements Check List attached at Annex E.
  17. Canada has the right to reject any request to electronically access, process, produce, transmit or store CANADA PROTECTED information/assets related to the Work in any other country if there is any reason to be concerned about the security, privacy, or integrity of the information.
2. Consultant's Site or Premises Requiring Safeguard Measures  
The Consultant must diligently maintain up-to-date, the information related to the Consultant's site or premises, where safeguard measures are required in the performance of the Services, for the following addresses:  
Address:  
Street Number / Street Name, Unit / Suite / Apartment Number  
City, Province, Territory  
Postal Code

## SC 2 LANGUAGE REQUIREMENTS

1. Communication between Canada and the Consultant shall be in the language of choice of the Consultant, which shall be deemed to be the language of the Consultant's **proposal**.
2. The Consultant **services during construction tender call (such as addenda preparation, tenderers' briefing meetings, technical answers to questions by Proponents, including translation of Proponent'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 P3 Consortium. **The successful P3 Consortium will be asked to commit to one or other of Canada's official languages upon award** of the P3 Consortium contract and, thereafter construction and contract administration services will be conducted in the language chosen by the P3 Consortium.
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.

## SC 3 FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - DEFAULT BY THE CONSULTANT

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

#### AGREEMENT PARTICULARS

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

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## APPENDIX A – CONSULTANT TEAM IDENTIFICATION

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APPENDIX A – TEAM IDENTIFICATION FORM

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

The Proponent and 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 the Province of Ontario.

**Prime Consultant (Proponent – Architect and/or Engineer as Technical Advisor):**

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

Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation

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If the proponent proposes to provide multidisciplinary services that might normally be provided by a Sub-Consultant, this should be indicated here. If the Proponent is providing the services of any or all of the Key Sub-Consultants, the Proponent shall provide all the information for such Key Sub-Consultant in this section based on the Proponent being deemed to be such Key Sub-Consultant as the case may be.

II. Key Sub-Consultants / Specialist (s) :

**Architect**

*(Note to Proponent: applicable if Prime Consultant is not Architect. Proponent to state within their proposal whether Prime Consultant is Architectural Firm or Engineering Firm)*

Firm Name: .....  
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Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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Civil Engineer

Firm Name: .....  
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Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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Electrical Engineer

Firm Name: .....  
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Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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Information Technology Engineer

Firm Name: .....  
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Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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Mechanical Engineer

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

Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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Sustainable Design Specialist

Firm Name: .....  
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Key Personnel (Senior Resource as defined in Appendix C) and their provincial professional licensing status and/or professional accreditation:

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APPENDIX B – DECLARATION/CERTIFICATION FORM



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APPENDIX B – DECLARATION/CERTIFICATION FORM

Project Title: 875 HERON ROAD REHABILITATION PROJECT – TECHNICAL ADVISOR

Name of Proponent:

Street Address:

Mailing Address:

Proponent's Proposed Site or premises Requiring Safeguard Measures (refer to SI1 Security Requirement):

Address:

\_\_\_\_\_  
Street Number / Street Name, Unit / Suite / Apartment Number

\_\_\_\_\_  
City, Province, Territory

\_\_\_\_\_  
Postal Code

Telephone Number: (    )

Fax Number: (    )

E-Mail:

Procurement Business Number:

Type of Organization:  ____ Sole Proprietorship  ____ Partnership  ____ Corporation  ____ Joint Venture	Size of Organization:  Number of Employees _____  Graduate Architects / Professional Engineers _____  Other Professionals _____  Technical Support _____  Other _____
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APPENDIX B - **DECLARATION/CERTIFICATIONS FORM (CONT'D)**

Federal Contractors Program for Employment Equity - Certification

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

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

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

Complete both A and B.

A. Check only one of the following:

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

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

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

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

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

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

OR

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

B. Check only one of the following:

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

OR

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

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

Former Public Servant (FPS) - Certification

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

Definitions

For the purposes of this clause,

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

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

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

"pension" means a pension or annual allowance paid under the *Public Service Superannuation Act* (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the *Canadian Forces Superannuation Act*, R.S., 1985, c.C-17, the *Defence Services Pension Continuation Act*, 1970, c.D-3, the *Royal Canadian Mounted Police Pension Continuation Act*, 1970, c.R-10, and the *Royal Canadian Mounted Police Superannuation Act*, R.S., 1985, c.R-11, the *Members of Parliament Retiring Allowances Act*, R.S., 1985, c.M-5, and that portion of pension payable to the *Canada Pension Plan Act*, R.S., 1985, c.C-8.

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FE181

**Client Ref. No. - N° de réf. du client**  
20200154

**File No. - N° du dossier**  
fe181-EJ078-200154

**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

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

Former Public Servant in Receipt of a Pension

As per the above definitions, is the Proponent a FPS in receipt of a pension?

YES ( ) NO ( )

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

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

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

Work Force Adjustment Directive

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

If so, the Proponent must provide the following information:

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

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

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

Name of Proponent:

DECLARATION:

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

.....  
name

.....  
signature

.....  
title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

.....  
name

.....  
signature

.....  
title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

.....  
name

.....  
signature

.....  
title

I have authority to bind the Corporation / Partnership / Sole Proprietorship / Joint Venture

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

Telephone Number: (    ) \_\_\_\_\_ Fax Number: (    ) \_\_\_\_\_

E-mail: \_\_\_\_\_

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

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APPENDIX C – PRICE PROPOSAL FORM

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APPENDIX C - PRICE PROPOSAL FORM

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

PROPOSERS SHALL NOT ALTER THIS FORM

Project Title: 875 HERON ROAD REHABILITATION PROJECT – TECHNICAL ADVISOR

Name of Proponent:

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The following will form part of the evaluation process:

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Time Based Fees (R1230D (2018-06-21), GC 5 - Terms of Payment– Architectural and/or Engineering Services)

The role and responsibilities of individual required personnel listed within Table A are distinct and do not overlap, therefore personnel cannot provide multiple functions or expertise.

TABLE A

REQUIRED PERSONNEL	HOURS* (Column A)	ALL-INCLUSIVE HOURLY RATES** (Column B)	TOTAL (Columns A x B)
Senior Project Manager	8,000	\$ -	\$ -
Intermediate Project Manager	5,000	\$ -	\$ -
Junior Project Manager	2,000	\$ -	\$ -
Senior Architect	4,000	\$ -	\$ -
Intermediate Architect	2,000	\$ -	\$ -
Junior Architect	1,000	\$ -	\$ -
Senior Civil Engineer	1500	\$ -	\$ -
Intermediate Civil Engineer	1000	\$ -	\$ -
Junior Civil Engineer	600	\$ -	\$ -
Senior Environmental Engineer	1500	\$ -	\$ -
Intermediate Environmental Engineer	1000	\$ -	\$ -
Junior Environmental Engineer	600	\$ -	\$ -
Senior Electrical Engineer	2,500	\$ -	\$ -
Intermediate Electrical Engineer	1,800	\$ -	\$ -
Junior Electrical Engineer	1,000	\$ -	\$ -
Senior IT Engineer	1,500	\$ -	\$ -
Intermediate IT Engineer	1,000	\$ -	\$ -
Junior IT Engineer	600	\$ -	\$ -

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Senior Mechanical Engineer	2,500	\$ -	\$ -
Intermediate Mechanical Engineer	1,800	\$ -	\$ -
Junior Mechanical Engineer	1,000	\$ -	\$ -
Senior Structural Engineer	1,500	\$ -	\$ -
Intermediate Structural Engineer	1,000	\$ -	\$ -
Junior Structural Engineer	600	\$ -	\$ -
Senior Sustainable Design Specialist	1,500	\$ -	\$ -
P3 Procurement Specialist	1,500	\$ -	\$ -
Facility and Maintenance Management Specialist	2,000	\$ -	\$ -
Administrative Specialist	4,000	\$ -	\$ -
Audio-Visual Specialist	600	\$ -	\$ -
Cost Estimation Specialist	600	\$ -	\$ -
Geotechnical Engineer	400	\$ -	\$ -
Interior Designer	600	\$ -	\$ -
Landscape Architect	800	\$ -	\$ -
Security Consultant	400	\$ -	\$ -
Urban Planner	600	\$ -	\$ -
TOTAL (applicable taxes extra)			\$

Seniority of proposed resources shall be determined as follows:

Senior Resource: A resource with **a minimum 15 years' experience** delivering services of similar scope to that which is required for this Project under their respective discipline, including the Optional Services.

Intermediate Resource: A resource with **7 to 14 years' experience** delivering services of similar scope to that which is required for this Project under their respective discipline, including the Optional Services.

Junior Resource: A resource with **2 to 6 years' experience** delivering services of similar scope to that which is required for this Project under their respective discipline, including the Optional Services.

**Personnel with an undefined seniority: A resource with 7+ years' experience** delivering services of similar scope to that which is required for this Project under their respective discipline, including the Optional Services.

\* Number of Hours for Evaluation Purposes

The hours provided in Table A are for evaluation purposes only and are not a guarantee, commitment or undertaking that the actual services required will be reflective of the number of hours set out in Table A.

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

For the categories where a Senior, Intermediate and/or Junior Personnel is requested, the hourly all-inclusive rate must demonstrate a level of salary progression reflective of the seniority of the resource. For example, the hourly all-inclusive rate of a senior personnel must be equal to or greater than the hourly all-inclusive rate of the intermediate personnel and the hourly all-inclusive rate of an intermediate personnel must be equal to or greater than the hourly all-inclusive



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rate of the junior personnel within that category.

The hourly rates for any given category of personnel cannot be \$0.00 or nil value. Failure to insert an hourly rate for each position listed will render your proposal non-responsive.

IN THE CASE OF ERROR IN THE EXTENSION OF PRICES, THE UNIT PRICE WILL GOVERN.

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## TOTAL COST OF SERVICES FOR EVALUATION PURPOSES

**Total Evaluated Fees – Table A**

**\$.....**

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

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**The following will NOT form part of the evaluation process**

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### AGREEMENT PARTICULARS

#### TERMS OF PAYMENT – CALCULATION OF FEES

The Maximum Amounts payable pursuant to GC5.2 c. v. of R1230D has been established by Canada for the Required Services described and is set out below.

#### REQUIRED SERVICES

Required Services (RS)	Required Services Description	Maximum Amount Payable
RS 1	Pre-Procurement	\$2,400,000.00
RS 2	Procurement	\$1,300,000.00
MAXIMUM AMOUNT PAYABLE FOR REQUIRED SERVICES (applicable taxes extra)		\$3,700,000.00

The Consultant will be paid for actual services performed using the applicable hourly rate(s) in Table A for such services in accordance with GC5.2 c) (R1230D (2015 02 25)) Time Based Fee. The maximum amount payable under the Agreement may not exceed the sum specified except in accordance with GC5.8 of R1230D and with prior written authorization of Canada as required pursuant to GC5.2 c. v.

### 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.  
The following allowances (excluding applicable taxes) will be incorporated into the resulting contract.

DISBURSEMENTS	\$100,000.00
MAXIMUM AMOUNT PAYABLE FOR REQUIRED SERVICES (applicable taxes extra)	\$3,800,000.00

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

The following will NOT form part of the evaluation process

### **OPTIONAL SERVICES –PART 1**

The Consultant hereby grants to Canada an irrevocable option to acquire the services specified under the same terms and conditions as contained in the Contract, and in accordance with the rates and fees identified below. Canada is not obligated to exercise this option. This option shall only be exercised by the Contracting Authority by providing notification in writing through a formal Contract Amendment.

The Maximum Amounts payable pursuant to GC5.2 c. v. of R1230D has been established by Canada for the Optional Services PART 1 described below.

Optional Services - Maintenance	Services Description	Maximum Amount Payable
OS 1	Pre-Procurement - Maintenance	\$1,850,000.00
OS 2	Procurement - Maintenance	\$850,000.00
MAXIMUM AMOUNT PAYABLE FEES FOR OPTIONAL SERVICES - PART 1 (applicable taxes extra)		\$2,700,000.00

The Consultant will be paid for actual services performed using the applicable hourly rate(s) in Table A for such services in accordance with GC5.2 c) (R1230D (2015 02 25)) Time Based Fee. The maximum amount payable under the Agreement may not exceed the sum specified except in accordance with GC5.8 of R1230D and with prior written authorization of Canada as required pursuant to GC5.2 c. v.

### **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.

DISBURSEMENTS	\$0.00
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MAXIMUM AMOUNT PAYABLE FOR OPTIONAL SERVICES – PART 1 (applicable taxes extra)	\$2,700,000.00
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## APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

The following will NOT form part of the evaluation process

### OPTIONAL SERVICES – PART 2

The Consultant hereby grants to Canada an irrevocable option to acquire the services specified under the same terms and conditions as contained in the Contract, and in accordance with the rates and fees identified below. Canada is not obligated to exercise this option. This option shall only be exercised by the Contracting Authority by providing notification in writing through a formal Contract Amendment.

The Maximum Amounts payable pursuant to GC5.2 c. v. of R1230D has been established by Canada for the Optional Services PART 2 described below.

Optional Services (OS)	Services Description	Maximum Amount Payable
OS 3	Design & Construction	\$2,400,000.00
OS 4	Post Construction	\$350,000.00
MAXIMUM AMOUNT PAYABLE FOR OPTIONAL SERVICES – PART 2 (applicable taxes extra)		\$2,750,000.00

The Consultant will be paid for actual services performed using the applicable hourly rate(s) in Table A for such services in accordance with GC5.2 c) (R1230D (2015 02 25)) Time Based Fee. The maximum amount payable under the Agreement may not exceed the sum specified except in accordance with GC5.8 of R1230D and with prior written authorization of Canada as required pursuant to GC5.2 c. v.

#### 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.

The following allowances (excluding applicable taxes) will be incorporated into the resulting contract.

DISBURSEMENTS	\$50,000.00
MAXIMUM AMOUNT PAYABLE FOR OPTIONALSERVICES - PART 2 (applicable taxes extra)	\$2,800,000.00

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

The following will NOT form part of the evaluation process

### **OPTIONAL SERVICES –PART 3**

The Consultant hereby grants to Canada an irrevocable option to acquire the services specified under the same terms and conditions as contained in the Contract, and in accordance with the rates and fees identified below. Canada is not obligated to exercise this option. This option shall only be exercised by the Contracting Authority by providing notification in writing through a formal Contract Amendment.

The Maximum Amounts payable pursuant to GC5.2 c. v. of R1230D has been established by Canada for the Optional Services PART 3 described below.

Optional Services Maintenance	Services Description	Maximum Amount Payable
OS 5	Design & Construction - Maintenance	\$1,250,000.00
OS 6	Post Construction - Maintenance	\$250,000.00
MAXIMUM AMOUNT PAYABLE FOR OPTIONAL SERVICES - PART 3 (applicable taxes extra)		\$1,500,000.00

The Consultant will be paid for actual services performed using the applicable hourly rate(s) in Table A for such services in accordance with GC5.2 c) (R1230D (2015 02 25)) Time Based Fee. The maximum amount payable under the Agreement may not exceed the sum specified except in accordance with GC5.8 of R1230D and with prior written authorization of Canada as required pursuant to GC5.2 c. v.

### **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.

DISBURSEMENTS	\$0.00
MAXIMUM AMOUNT PAYABLE FOR OPTIONAL SERVICES – PART 3 (applicable taxes extra)	\$1,500,000.00

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## ESCALATION OF HOURLY RATES

The firm hourly rates detailed in the Required Services Table (located in Table A of Appendix C) will be adjusted (the “Escalation”) **annually on the start date of each new Contract Year (starting with Contract Year 4) based on the annual average percentage increase (decrease) in the monthly index of the Consumer Price Index for Canada, All-Items (Not Seasonally Adjusted), published in Statistics Canada Table 18-10-0164-01 Architectural, engineering and related services price index, quarterly, for the 12-month period ending 3 months prior to the new Contract Year Start date.**

The GC5.2 c.v. Maximum Amounts Payable set out in this Price Proposal are not affected by any escalation of hourly rates and will not be adjusted as a result of any such escalation.

This will be calculated using the following formula:

A = Sum of indices for the 12 months ending 3 months prior to the end of the third year

B = Sum of indices for the 12 months ending same month as A of the preceding year

Escalation% =  $[(A/B) - 1] * 100$

For Clarity:

Assuming that the contract was signed on July 1, 2012, the start of the 4th Year of the contract would be July 1, 2015 and firm hourly rates would be increased by 1.72% to come up to hourly rates applicable to Year 4, based on the following assumptions:

Preceding Year 12 month period = May 2013 - April 2014 Sum of Indices = 1,481.4

Current Year 12 month period = May 2014 - April 2015 Sum of Indices = 1,506.9

Escalation =  $((1,506.9 / 1,481.4) - 1) * 100$

Escalation = 1.72%

To determine the Contract Year 5 rates in the example, the Contract Years 4 rates determined above would be adjusted using the same Statistics Canada Table and same formula with data for the two 12 month periods May 2016 - April 2017.

## Discontinuation of Economic Price Adjustment Index

If an index set out in this Contract is discontinued or should be re-baselined by Canada, the parties agree to immediately negotiate in good faith a replacement index.

END OF PRICE PROPOSAL FORM

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APPENDIX D – DOING BUSINESS WITH PWGSC DOCUMENTATION AND DELIVERABLES MANUAL



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

# Doing Business with PWGSC

## Documentation and Deliverables Manual





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## Revisions

Version	Date	Description
0.1	August 14, 2017	Draft version for consultation.
1.0	January 12, 2018	Original Issuance

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# **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](http://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.

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### 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).

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### 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.

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### 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 Guide* and *NMS Development Guide* issued by the National Research Council for further guidance on using the NMS.



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## 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,

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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

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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).

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### **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.

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## 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

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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.

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## 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:



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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

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#### 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% <input type="checkbox"/> 50% or 66% <input type="checkbox"/> 99% <input type="checkbox"/> 100% <input type="checkbox"/>	

Drawings\Design			
Item	Verified by	Explanations	Action By
<b>1 Index</b>			
<b>1a</b> The index shows a complete listing of drawing titles and numbers.			
<b>2 Title Blocks</b>			
<b>2a</b> The title block is as per the <i>PWGSC National CADD Standard</i> .			
<b>3 Units</b>			
<b>3a</b> All units of measure are metric.			
<b>4 Trade Names</b>			
<b>4a</b> Trade names are not used.			
<b>5 Specification Notes</b>			
<b>5a</b> There are no specification-type notes.			
<b>6 Terminology</b>			
<b>6a</b> The term "Departmental Representative" is used instead of "Engineer," "PWGSC," "Owner," "Consultant," or "Architect."			
<b>6b</b> Notations such as "verify on site," "as instructed," "to match existing," "example," "equal to," "equivalent to," and "to be determined on site by" are not used.			
<b>7 Information to be included</b>			
<b>7a</b> The project quantities, configurations, dimensions, and construction details are included.			
<b>7b</b> 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
<b>8 Quality Assurance</b>			
<b>8a</b> Coordination review of the design between various disciplines has been completed by the Consultant.			
<b>8b</b> Constructability review of design has been performed.			
<b>9 Signing and Sealing</b>			
<b>9a</b> Every final drawing bears the seal and signature of the responsible design professional in compliance with various provincial jurisdiction requirements.			

<b>Specifications</b>			
<b>Item</b>	<b>Verified by</b>	<b>Explanations</b>	<b>Action by</b>
<b>1 National Master Specification</b>			
<b>1a</b> The current edition of the National Master Specification (NMS) has been used.			
<b>1b</b> Sections have been included for all work identified on drawings and sections have been edited.			
<b>2 Index</b>			
<b>2a</b> The index shows a complete list of specifications sections with the correct number of pages.			
<b>3 Organization</b>			
<b>3a</b> 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.			
<b>3b</b> Each section starts on a new page and the project number, section title, section number, page number and date is shown on each page.			
<b>3c</b> The Consultant's name is not indicated.			
<b>4 Terminology</b>			
<b>4a</b> The term "Departmental Representative" is used instead of "Engineer," "PWGSC," "Owner," "Consultant," or "Architect."			
<b>4b</b> Notations such as "verify on site," "as instructed," "to match existing," "example," "equal to," "equivalent to," and "to be determined on site by" are not used.			
<b>5 Dimensions</b>			
<b>5a</b> Dimensions are provided in metric only.			
<b>6 Standards</b>			
<b>6a</b> The current edition of all references quoted is used.			
<b>7 Specifications Materials</b>			
<b>7a</b> The method of specifying materials uses recognized standards. Actual brand names and model numbers are not specified.			
<b>7b</b> Materials are specified using standards and performance criteria.			

<b>Specifications</b>			
<b>Item</b>	<b>Verified by</b>	<b>Explanations</b>	<b>Action by</b>
<b>7c</b> Non-restrictive, non-trade name “prescription” or “performance” specifications are used throughout.			
<b>7d</b> The term “Acceptable Manufacturers” is not used.			
<b>7e</b> No sole sourcing has been used.			
<b>7f</b> 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.			
<b>8 Measurement for Payment</b>			
<b>8a</b> Unit prices are used only for work that is difficult to estimate.			
<b>9 Cash Allowances</b>			
<b>9a</b> No cash allowances have been used or if they have, approval from the Departmental Representative has been received.			
<b>10 Miscellaneous Requirements</b>			
<b>10a</b> No paragraphs noted as “Scope of Work” are included.			
<b>10b</b> In Part 1 - General of any section, the paragraphs “Summary” and “Section Includes” are not used.			
<b>11 Specification Coordination</b>			
<b>11a</b> The list of related sections and appendices are coordinated.			
<b>12 Health and Safety</b>			
<b>12a</b> Section 01 35 29.06 – Health and Safety Requirements is included.			
<b>13 Subsurface Investigation Reports</b>			
<b>13a</b> Subsurface investigation reports are included after Section 31.			
<b>14 Prequalifications</b>			
<b>14a</b> 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
<b>15 Contracting Issues</b>			
<b>15a</b> Contracting issues do not appear in the specifications.			
<b>15b</b> Division 00 of the NMS is not used except 00 01 07 (Seals Page) and 00 01 10 (Table of Contents).			
<b>16 Quality Assurance</b>			
<b>16a</b> There are no specification clauses with square brackets “[ ]” or lines “___” indicating that the document is incomplete or missing information.			
<b>17 Signing and Sealing</b>			
<b>17a</b> 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-1Civil
- L-1Landscaping
- A-1Architecture
- S-1Structural
- M-1Mechanical
- E-1Electrical

**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 1<sup>st</sup> 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 2<sup>nd</sup> Tier Subfolder**

The 2<sup>nd</sup> 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 3<sup>rd</sup> Tier Subfolder**

The 3<sup>rd</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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-folder 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 4<sup>th</sup>-Tier Subfolders for Specifications**

The “Specifications” and “Devis” folders must have 4<sup>th</sup> tier subfolders 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 4<sup>th</sup> 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

**Solicitation No. - N° de Sollicitation**  
EJ078-200154/001/FE

**Amd. No. - N° de la modif.**  
000

**Buyer ID - Id de l'acheteur**  
FE181

**Client Ref. No. - N° de réf. du client**  
20200154

**File No. - N° du dossier**  
fe181-EJ078-200154

**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

---

## APPENDIX E – SECURITY REQUIREMENTS CHECK LIST





Government of Canada  
Gouvernement du Canada

Contract Number / Numéro du contrat

EJ078200154

Security Classification / Classification de sécurité  
UNCLASSIFIED

SECURITY REQUIREMENTS CHECK LIST (SRCL)  
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine		Public Works and Government Services Canada	2. Branch or Directorate / Direction générale ou Direction Real Property Branch	
3. a) Subcontract Number / Numéro du contrat de sous-traitance		3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant		
4. Brief Description of Work / Brève description du travail 875 Heron Road Rehabilitation Project Advocate Architect (TA) P3 Contract				
5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?			<input checked="" type="checkbox"/> No Non	<input type="checkbox"/> Yes Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?			<input checked="" type="checkbox"/> No Non	<input type="checkbox"/> Yes Oui
6. Indicate the type of access required / Indiquer le type d'accès requis				
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)			<input type="checkbox"/> No Non	<input checked="" type="checkbox"/> Yes Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.			<input checked="" type="checkbox"/> No Non	<input type="checkbox"/> Yes Oui
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit?			<input checked="" type="checkbox"/> No Non	<input type="checkbox"/> Yes Oui
7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès				
Canada <input checked="" type="checkbox"/>		NATO / OTAN <input type="checkbox"/>		Foreign / Étranger <input type="checkbox"/>
7. b) Release restrictions / Restrictions relatives à la diffusion				
No release restrictions / Aucune restriction relative à la diffusion <input checked="" type="checkbox"/>		All NATO countries / Tous les pays de l'OTAN <input type="checkbox"/>		No release restrictions / Aucune restriction relative à la diffusion <input type="checkbox"/>
Not releasable / À ne pas diffuser <input type="checkbox"/>				
Restricted to: / Limité à: <input type="checkbox"/>		Restricted to: / Limité à: <input type="checkbox"/>		Restricted to: / Limité à: <input type="checkbox"/>
Specify country(ies): / Préciser le(s) pays:		Specify country(ies): / Préciser le(s) pays:		Specify country(ies): / Préciser le(s) pays:
7. c) Level of information / Niveau d'information				
PROTECTED A PROTÉGÉ A <input type="checkbox"/>		NATO UNCLASSIFIED <input type="checkbox"/>		PROTECTED A <input type="checkbox"/>
PROTECTED B PROTÉGÉ B <input checked="" type="checkbox"/>		NATO NON CLASSIFIÉ <input type="checkbox"/>		PROTECTED B PROTÉGÉ B <input type="checkbox"/>
PROTECTED C PROTÉGÉ C <input type="checkbox"/>		NATO RESTRICTED <input type="checkbox"/>		PROTECTED C PROTÉGÉ C <input type="checkbox"/>
CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>		NATO DIFFUSION RESTREINTE <input type="checkbox"/>		CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>
SECRET SECRET <input type="checkbox"/>		NATO CONFIDENTIAL NATO CONFIDENTIEL <input type="checkbox"/>		SECRET SECRET <input type="checkbox"/>
TOP SECRET TRÈS SECRET <input type="checkbox"/>		NATO SECRET NATO SECRET <input type="checkbox"/>		TOP SECRET TRÈS SECRET <input type="checkbox"/>
TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>		COSMIC TOP SECRET COSMIC TRÈS SECRET <input type="checkbox"/>		TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>



Government of Canada  
Gouvernement du Canada

Contract Number / Numéro du contrat

EJ078200154

Security Classification / Classification de sécurité  
UNCLASSIFIED

**PART A (continued) / PARTIE A (suite)**

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?

Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?

☒ No ☐ Yes  
Non Oui

If Yes, indicate the level of sensitivity:

Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets?

Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

☒ No ☐ Yes  
Non Oui

Short Title(s) of material / Titre(s) abrégé(s) du matériel :

Document Number / Numéro du document :

**PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)**

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

- |   |   |   |  |
|---|---|---|--|
| <input checked="" type="checkbox"/> RELIABILITY STATUS<br>COTE DE FIABILITÉ | <input type="checkbox"/> CONFIDENTIAL<br>CONFIDENTIEL           | <input type="checkbox"/> SECRET<br>SECRET           | <input type="checkbox"/> TOP SECRET<br>TRÈS SECRET               |
| <input type="checkbox"/> TOP SECRET- SIGINT<br>TRÈS SECRET - SIGINT         | <input type="checkbox"/> NATO CONFIDENTIAL<br>NATO CONFIDENTIEL | <input type="checkbox"/> NATO SECRET<br>NATO SECRET | <input type="checkbox"/> COSMIC TOP SECRET<br>COSMIC TRÈS SECRET |
| <input type="checkbox"/> SITE ACCESS<br>ACCÈS AUX EMPLACEMENTS              |   |   |  |

Special comments:

Commentaires spéciaux :

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.

REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work?

Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?

☒ No ☐ Yes  
Non Oui

If Yes, will unscreened personnel be escorted?

Dans l'affirmative, le personnel en question sera-t-il escorté?

☒ No ☐ Yes  
Non Oui

**PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)**

**INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS**

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises?

Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

☐ No ☒ Yes  
Non Oui

11. b) Will the supplier be required to safeguard COMSEC information or assets?

Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

☒ No ☐ Yes  
Non Oui

**PRODUCTION**

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises?

Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

☒ No ☐ Yes  
Non Oui

**INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)**

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data?

Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

☒ No ☐ Yes  
Non Oui

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency?

Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

☒ No ☐ Yes  
Non Oui



Government  
of Canada

Gouvernement  
du Canada

Contract Number / Numéro du contrat

EJ078200154

Security Classification / Classification de sécurité  
UNCLASSIFIED

**PART C - (continued) / PARTIE C - (suite)**

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.

Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.

Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

**SUMMARY CHART / TABLEAU RÉCAPITULATIF**

Category Catégorie	PROTECTED PROTÉGÉ			CLASSIFIED CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL	SECRET	TOP SECRET	NATO RESTRICTED	NATO CONFIDENTIAL	NATO SECRET	COSMIC TOP SECRET	PROTECTED PROTÉGÉ			CONFIDENTIAL	SECRET	TOP SECRET
				CONFIDENTIEL		TRÈS SECRET	NATO DIFFUSION RESTREINTE	NATO CONFIDENTIEL		COSMIC COSMIC TRÈS SECRET	A	B	C	CONFIDENTIEL		TRÈS SECRET
Information / Assets Renseignements / Biens Production		✓														
IT Media / Support TI																
IT Link / Lien électronique																

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?

La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No ☐ Yes  
Non Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?

La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No ☐ Yes  
Non Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

**Solicitation No. - N° de Sollicitation**  
EJ078-200154/001/FE

**Amd. No. - N° de la modif.**  
000

**Buyer ID - Id de l'acheteur**  
FE181

**Client Ref. No. - N° de réf. du client**  
20200154

**File No. - N° du dossier**  
fe181-EJ078-200154

**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

APPENDIX E: INFORMATION RELATED TO SECURITY REQUIREMENT

Prime Consultant: Proponent – Architect and/or Engineer as Technical Advisor	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

If the proponent proposes to provide multidisciplinary services that might normally be provided by a Sub-Consultant, this should be indicated here. If the Proponent is providing the services of any or all of the Key Sub-Consultants, the Proponent shall provide all the information for such Key Sub-Consultant in this section based on the Proponent being deemed to be such Key Sub-Consultant as the case may be.

Key Sub-Consultant / Specialist: Architect (Note to Proponent: applicable if Prime Consultant is not Architect. Proponent to state within their proposal whether Prime Consultant is Architectural Firm or Engineering Firm)	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

**Solicitation No. - N° de Sollicitation**  
EJ078-200154/001/FE

**Amd. No. - N° de la modif.**  
000

**Buyer ID - Id de l'acheteur**  
FE181

**Client Ref. No. - N° de réf. du client**  
20200154

**File No. - N° du dossier**  
fe181-EJ078-200154

**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

**APPENDIX E: INFORMATION RELATED TO SECURITY REQUIREMENT (CONT'D)**

Key Sub-Consultant / Specialist: Civil Engineer	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

Key Sub-Consultant / Specialist: Electrical Engineer	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

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APPENDIX E: INFORMATION RELATED TO SECURITY REQUIREMENT (CONT'D)

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Key Sub-Consultant / Specialist: IT Engineer	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

Key Sub-Consultant / Specialist: Mechanical Engineer	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

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**APPENDIX E: INFORMATION RELATED TO SECURITY REQUIREMENT (CONT'D)**

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Key Sub-Consultant / Specialist: Sustainable Design Specialist	
Legal Name of Firm:	
Complete Address:	
Telephone Number:	
CISD File Number:	
Organization Security Clearance:	

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APPENDIX E – INFORMATION RELATED TO SECURITY REQUIREMENT (CONT'D)

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Key Personnel – Senior Architect	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
Security Screening Certificate and Briefing Form File Number or CISD File Number:	

Key Personnel – Senior Civil Engineer	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
Security Screening Certificate and Briefing Form File Number or CISD File Number:	



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Key Personnel – Senior Electrical Engineer	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
Security Screening Certificate and Briefing Form File Number or CISD File Number:	

Key Personnel – Senior Mechanical Engineer	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
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APPENDIX E – INFORMATION RELATED TO **O SECURITY REQUIREMENT (CONT'D)**

Key Personnel – Senior IT Engineer	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
Security Screening Certificate and Briefing Form File Number or CISD File Number:	

Key Personnel – Senior Sustainable Design Specialist	
Legal Name of Individual:	
Name of Firm:	
Level of Security Clearance:	
Validity period of Security Clearance:	
Security Screening Certificate and Briefing Form File Number or CISD File Number:	

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APPENDIX F – SUBMISSION REQUIREMENTS AND EVALUATION (SRE)

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## SRE 1 GENERAL INFORMATION

**1.1** Calculation of Total Score and Basis of Selection  
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 and having achieved the overall passmark is the first entity that the Evaluation Board will recommend for the provision of the Required Services and Optional Services. In the case of a tie, the Proponent submitting the lower price for the services will be selected.

## SRE 2 PROPOSAL REQUIREMENTS

### 2.1 Requirement for Proposal Format

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

- Submit one (1) bound original plus five (5) bound copies of the proposal
- Paper size should be - 216mm x 279mm (8.5" x 11")
- Minimum font size - 11 point Times or equal
- Minimum margins - 12 mm (1.2 cm) left, right, top, and bottom
- Double-sided submissions are preferred
- **One (1) 'page' means one** side of a 216mm x 279mm (8.5" x 11") sheet of paper
- 279mm x 432 mm (11" x 17") fold-out sheets for spreadsheets, organization charts etc. will be counted as two pages
- The order of the proposals should follow the order established in the Request for Proposal SRE section

### 2.2 Specific Requirements for Proposal Format

The maximum number of pages (including text and graphics) to be submitted for the Rated Requirements under section SRE 3.2 is fifty-five (55) pages.

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

- Covering letter
- Consultant Team Identification (Appendix A)
- Declaration/Certifications Form (Appendix B)
- Price Proposal Form (Appendix C)
- Security Requirements Checklist (Appendix E)
- Integrity Provisions - Associated Information
- Front page of the RFP

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- Front page of revision(s) to the RFP

*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 Government of Canada Evaluation Board members for evaluation.*

PWGSC suggests, but does not prescribe, the following page-count breakdown for each rated requirement described in section SRE 3.2 as follows:

Rated Requirement	Suggested Page-Count
3.2.1 Achievements of Proponent on Relevant Projects	6
3.2.2 Achievements of Proponent Key Sub-Consultants on Relevant Projects	14
3.2.3 Achievements and Role of Key Personnel and other required personnel	12
3.2.4 Understanding of Project	6
3.2.5 Team Philosophy / Approach / Methodology	17

## SRE 3 SUBMISSION REQUIREMENTS AND EVALUATION

### 3.1 MANDATORY REQUIREMENTS

*FAILURE TO MEET THE MANDATORY REQUIREMENTS WILL RENDER THE PROPOSAL AS NON-RESPONSIVE AND NO FURTHER EVALUATION WILL BE CARRIED OUT.*

#### 3.1.1 Licensing, Certification or Authorization

The Proponent shall be an architecture and/or 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 provincial or territorial law in the Province of Ontario. Additionally, members of the Consultant Team shall be licensed, or eligible to be licensed, certified or otherwise authorized to provide the necessary professional services to the full extent that may be required by provincial or territorial law in the Province of Ontario.

#### 3.1.2 Consultant Team Identification:

The Consultant Team to be identified must include the following:

Prime Consultant (Proponent)

- Architect or Engineer as Technical Advisor

Key Sub Consultants/Specialists:

- Architect (*Note to Proponent: applicable if Prime Consultant is not Architect. Proponent to state within their proposal whether Prime Consultant is Architectural Firm or Engineering Firm*)
- Civil Engineer
- Electrical Engineer
- Mechanical Engineer
- IT Engineer
- Sustainable Design Specialist

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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. Key Personnel shall be a Senior Resource as further defined in Appendix C.

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

For the Prime Consultant and Key Sub-Consultants/Specialist, 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 R1110T General Instructions to Proponents, GI9 Limitation of Submissions).

### 3.1.3 Declaration/Certifications Form

Proponents must complete, sign and submit the following:

- Appendix B, Declaration/Certifications Form.

### 3.1.4 Integrity Provisions – Required documentation

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

### 3.1.5 Security Requirement

Before contract award, the following conditions must be met:

Proponents must meet all the security requirements as specified in the Supplementary Instructions to Proponents SI7, Supplementary Conditions SC1 and Appendix E.

## 3.2 RATED REQUIREMENTS

### 3.2.1 Achievements of Proponent on Relevant Projects

The Proponent should describe their accomplishments, achievements and experience as a technical advisor in the capacity as described in the project brief, working on behalf of the owner of a Federal, Provincial or Municipal government or public institution on projects comparable and relevant to the complexity, Scope and budget as per the *Project Brief* in this RFP.

The Proponent should present three (3) projects undertaken in the last fifteen (15) years that are minimum 1-year into construction, or that have reached Substantial Completion, at the issuance date of this RFP as stated on the RFP cover page. The Proponent should demonstrate experience working on large (P3 Consortium contract greater than \$250 million) projects and P3 experience. Only the first three (3) projects listed in sequence will receive consideration and any others will not be evaluated.

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The Proponent should demonstrate its experience providing the Required Services and Optional Services for projects of similar scope as this Project, including the following:

- a) Project delivered under the P3 model.
- b) Functioning as a technical advisor working on behalf of the owner of a Federal, Provincial or Municipal government or public institution.
- c) Management of a multi-disciplinary P3 technical advisor team from Schematic Design to P3 Consortium Substantial Completion.
- d) Projects with environmental sustainability design (such as Carbon Neutrality or Carbon Neutral Ready), LEED Gold or Platinum, WELL certification, Living Building Challenge, SITES or equivalent.
- e) Experience in the design and construction/rehabilitation of office accommodation buildings.
- f) Experience in the design and construction/rehabilitation of assets designated as recognized or classified heritage by the Federal Heritage Buildings Review Office (FHARO) or similar governing authority having jurisdiction.
- g) Experience coordinating approvals with Public governing authority having jurisdiction.

Information that should be supplied:

- 1) Project title, location, building program, building scale (m<sup>2</sup>), year started for the design services, year of P3 Consortium Substantial Completion (if applicable, or current status), P3 Consortium contract value, services provided, P3 procurement model used.
- 2) A clear demonstration of how the experience presented is comparable or relevant to criteria in section SRE 3.2.1 a) to g).
- 3) A project narrative, which should include a discussion of the approach used to meet the intent of the project, and the challenges encountered and resolutions employed. Narratives should include how key risks (e.g. costs, scope, schedule, adaptability of space, climate change, changing workplace arrangements, emerging technology, brownfield redevelopment, heritage, designated substances and NCC approvals) were managed and mitigated and how Facilities Management considerations were addressed.
- 4) A description of techniques employed for budget and schedule management.
- 5) Awards and external recognition received, if any.

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 Proponent Key Sub-Consultants on Relevant Projects

The Proponent should describe the Key Sub-Consultants' and Specialists' (as identified in section 3.1.2) firm/company accomplishments, achievements, knowledge and experience either as a Prime Consultant or a sub-consultant on two (2) projects per key sub-consultant and specialist that are comparable in terms of scope, scale and complexity of work, to the project described in the Project Brief. The projects should have been undertaken in the last fifteen (15) years that are either 1 year into construction or have reached Substantial Completion from the date of issuance of this RFP. Only the first two (2) projects listed in sequence for each identified Key Sub-Consultant will receive consideration and any others will not be evaluated. If the Proponent is providing the services of any or all of the Key Sub-Consultants, the Proponent shall provide all the information for such Key Sub-Consultant in this subsection based on the Proponent being deemed to be such Key Sub-Consultant as the case may be.

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With respect to projects described for each Key Sub-Consultant and Specialist, the Proponent **should demonstrate its experience providing the Required Services and Optional Services for projects of similar scope as this Project:**

- a) Project delivered under the P3 model.
- b) Functioning as a technical advisor or technical advisor sub-consultant working on behalf of the owner of a Federal, Provincial or Municipal government or public institution.
- c) Management of a multi-disciplinary P3 technical advisor team from Schematic Design to P3 Consortium Substantial Completion.
- d) Projects with environmental sustainability design (such as Carbon Neutrality or Carbon Neutral Ready), LEED Gold or Platinum, WELL certification, Living Building Challenge, SITES or equivalent.
- e) Experience working on medium-large (P3 Consortium contract greater than \$100 million) projects
- f) Experience in the design and construction/rehabilitation of office accommodation buildings.
- g) Experience in the design and construction/rehabilitation of assets designated by the Federal Heritage Buildings Review Office (FHBRO) or similar governing authority having jurisdiction.
- h) Experience coordinating approvals with the Public governing authority having jurisdiction.

Information that should be supplied for each project:

- 1) Project title, location, building program, building scale (m<sup>2</sup>), year started for the design services, year of P3 Consortium Substantial Completion (if applicable, or current status), P3 Consortium contract value, services provided, P3 procurement model used.
- 2) A clear demonstration of how the experience presented is comparable or relevant to criteria in section SRE 3.2.2 a) to h).
- 3) A project narrative, which should include a discussion of the approach used to meet the intent of the project, and the challenges encountered and resolutions employed. Narratives should include how key risks (e.g. costs, scope, schedule, adaptability of space, climate change, changing workplace arrangements, emerging technology, brownfield redevelopment, heritage, designated substances and approvals with the Public governing authority having jurisdiction) were managed and mitigated and how Facilities Management considerations were addressed.
- 4) A description of techniques employed for budget and schedule management.
- 5) Names of Key Personnel engaged on the project who are included as proposed technical advisor team members for the Project, and brief description of their roles and responsibilities on the project.
- 6) Awards and external recognition received, if any.

### 3.2.3 Achievements and Role of Key Personnel and other Required Personnel

The Proponent should provide **CV's that** describe the expertise, performance, achievements and experience of Key Personnel identified in Appendix A (Senior Resources) and other Required Personnel (listed below) to be assigned to this project (regardless of their past association with the Proponent). The Proponent should demonstrate that such Key Personnel and other Required **Personnel's (in the requisite professional capacity) ability to effectively work on** this project. This is the opportunity to emphasize the strengths of the individuals on the team, to recognize their past responsibilities, commitments and achievements.

**Key Personnel and other Required Personnel can only be proposed for one role and cannot perform multi-disciplinary roles. For example, the individual identified as a Senior Project Manager cannot also be the individual identified as the Architect or an Engineer. In the event that an individual is proposed for more than one role, PSPC will only evaluate the information provided for the first role in order of submission. The second role will not be evaluated and or rated.**

In addition to the Key Personnel, the following other required personnel will be evaluated:



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- 
- Senior Project Manager
  - Senior Environmental Engineer
  - Senior Structural Engineer
  - Landscape Architect
  - P3 Procurement Advisor
  - Facility Maintenance Management Specialist

The Senior Project Manager should demonstrate experience working on a large (P3 Consortium contract greater than \$250 million) project. All other listed Key Personnel and other required personnel should demonstrate experience working on a medium-large (P3 Consortium contract greater than \$100 million) project.

Information that should be supplied for each personnel:

- 1) Proposed role in the technical advisor team
- 2) CV for personnel providing:
  - (a) **Individual's name, title and name of firm**
  - (b) Experience, including a list of relevant projects with a brief project description, the P3 model used (if applicable), location, role on the project, project value, duration of mandate. Can include experience as a member of private sector firm or public sector institution.
  - (c) Experience working as a technical advisory team member working on behalf of the owner of a Federal, Provincial or Municipal government or public institution, including drafting PSOS, FMOS and other schedules of the PA.
  - (d) Experience on projects with environmental sustainability design (such as Carbon Neutrality or Carbon Neutral Ready), LEED Gold or Platinum, WELL certification, Living Building Challenge, SITES or equivalent.
  - (e) Experience in the design and construction/rehabilitation of assets security requirements (physical and IT)
  - (f) Experience in the design and construction/rehabilitation of assets designated by the Federal Heritage Buildings Review Office (FHBRO) or similar governing authority having jurisdiction.
  - (g) Experience coordinating approvals with Public governing authority having jurisdiction.
  - (h) Professional accreditation or certification details (province, year, status, etc.) and other relevant qualifications required to deliver the complexity, Scope and budget as per the *Project Brief* in this RFP.
  - (i) A demonstration of services provided, roles, responsibilities, and degree of involvement of the individual on past projects that will corroborate the **Key Personnel's** experience and expertise relevant per the *Project Brief* in this RFP.
  - (j) Special accomplishments / achievements / awards.

### 3.2.4 Understanding of Project

The Proponent should demonstrate an understanding of the Project Brief, Required Services (RS), Optional Services (OS) the functional / technical requirements, the constraints and the issues that will affect the design, P3 procurement model, and 1-stage/2-stage construction implementation strategies.

Information that should be supplied:

- 1) An interpretation of **Project Scope's** functional and technical requirements including the interrelation of complementary and / or co-dependent project components.

- 2) A demonstration that the Proponent understands the full scope of the Required Services and Optional Services and deliverables expected. Provide a strategy for the execution of each phase.
- 3) A critical assessment of broader goals as they relate to sustainable development as described in the Project Brief.
- 4) Demonstrate an understanding of **Project Scope's** significant issues, challenges and constraints.
- 5) Demonstrate an understanding of key Project risks, such as, but not limited to e.g. costs, Scope, schedule, adaptability of space, sustainability, changing workplace arrangements, emerging technology, brownfield redevelopment, heritage, designated substances, cost management and Public governing authority having jurisdiction.
- 6) Demonstrate an understanding of foresight/futurism in the design of 875 Heron Road.
- 7) Demonstrate an understanding of both the cost and schedule for the Required Services and Optional Services.

### 3.2.5 Team Philosophy / Approach / Methodology

The Proponent should describe their capability and capacity to perform the Required Services and Optional Services and meet Project Brief challenges and objectives.

The Proponent should describe how they propose to organize and manage the delivery of all Required Services and Optional Services and deliverables and provide a plan of action and provide indicative levels of effort for the services in each phase. The Proponent should highlight its proposed approach and elaborate on aspects of the Required Services and Optional Services considered to be major challenges. This is the opportunity for the Proponent to state the overall philosophy of the team as well as the approach to delivering results and resolving issues with a particular focus on the specific aspects of the Required Services and Optional Services.

Information that should be supplied:

- 1) Understanding of the roles and responsibilities of the technical advisor working on a P3 on behalf of the Government of Canada.
- 2) Provide a strategy for the execution of the Required Services and Optional Services and deliverables expected.
- 3) Provide potential mitigation management strategies of key Project risks, such as, but not limited to e.g. costs, Scope, schedule, adaptability of space, sustainability, changing workplace arrangements, emerging technology, brownfield redevelopment, heritage, designated substances, cost management and Public governing authority having jurisdiction.
- 4) Provide an organizational chart based on the Required Services and Optional Services listed in the Project Brief for all the anticipated personnel envisioned by the Proponent to be assigned to this project, identifying names, position titles and reporting relationships.
- 5) GANTT schedule of the Required Services and Optional Services activities and estimated level of effort for personnel based on milestones provided in section PD 1.2 for the members of the technical advisor team to demonstrate the **Proponent's proposed approach to managing the work.**
- 6) Demonstrate how the schedule/milestone objectives outlined in section PD 1.2 will be met and how response times during the RS-1 Pre-Procurement and RS-2 Procurement phases will be minimized.
- 7) Describe the major challenges that the Proponent foresees and the approach that will be applied to those particular challenges, inclusive of challenges described in section PD 7.
- 8) Describe if and how technical advisor team members have worked together on past projects and how this can create synergies and efficiencies to benefit the Project.
- 9) Describe the approach to managing the one-stage and two-stage construction implementations strategy outlined

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in section PD 6.

10) Describe how the Proponent will integrate the Facility Management requirements with the design requirements during the project work.

### 3.3 EVALUATION AND RATING

Proposals will be reviewed, evaluated and rated by a Government of Canada Evaluation Board in accordance with the following:

Criterion	Weight Factor	Rating	Weighted Rating	Overall Pass Grade
3.2.1 - Achievements of Proponent on Relevant Projects	1.75	0 - 10	0 – 17.5	
3.2.2 - Achievements of Proponent Key Sub-Consultants on Relevant Projects	2	0 - 10	0 – 20	
3.2.3 - Achievements and Role of Key Personnel and other required personnel	2.5	0 - 10	0 - 25	
3.2.4 - Understanding of Project	1.25	0 - 10	0 – 12.5	
3.2.5 - Team Philosophy / Approach / Methodology	2.5	0 - 10	0 – 25	
Technical Rating			0 - 100	65

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#### Evaluation Table

The Government of Canada 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 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 does 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

Proponents must achieve a minimum overall passmark within the Technical Rating of sixty-five (65) points out of the one hundred (100) points available as specified above.

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

#### SRE 4 PRICE OF SERVICES

1. To be declared responsive, a bid must:
  - a. Comply with all the requirements of the bid solicitation;
  - b. Meet all mandatory criteria; and
  - c. Obtain the required minimum of 65 points overall passmark for the technical evaluation criteria which are subject to point rating. (The rating is performed on a scale of 100 points.)
2. Bids not meeting (a), (b) and (c) will be declared non-responsive.
3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 90% for the Technical Rating and 10% for the Price Rating.
4. To establish the Technical Rating, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by 90%.
5. To establish the Pricing Rating, each responsive bid will be prorated against the lowest evaluated price and then multiplied by 10%.
6. All responsive price proposals which are greater than 35 percent above the average price will cause their respective complete proposals to be set aside and receive no further consideration. An average price is determined by adding all of the responsive Proponents' price proposals together and dividing the total by the number of price proposals being opened.
7. For each responsive bid, the Technical Rating and the Pricing Rating will be added to determine its Total Score.
8. Neither the responsive bid obtaining the highest Technical Rating nor the one with the lowest Price Rating will necessarily be accepted. The responsive bid with the highest Total Score will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the Consultant is determined by a 90/10 ratio of Technical Rating and Price Rating, respectively. The total available points equals 100 and the lowest evaluated price is \$8,850.00.

Basis of Selection – Total Score of based on Technical Rating (90%) and Price Rating (10%)

		Proponent 1	Proponent 2	Proponent 3
	Overall Total Score	65/100	70/100	78/100
	Bid Evaluated	\$9,850.00	\$8,850.00	\$10,500.00

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	Price			
Calculation	Technical Rating	65/100x90=58.5	70/100x90=63	78/100x90=70.2
	Pricing Rating	8850/9850x10=8.98	8850/8850x10=10	8850/10500x10=8.43
Total Score		67.48	73	78.63
Rank		3 <sup>rd</sup>	2 <sup>nd</sup>	1 <sup>st</sup>

#### SRE 5 SUBMISSION REQUIREMENTS – CHECKLIST

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

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

- ☐ Team Identification - see typical format in Appendix A
- ☐ Declaration/Certifications Form- completed and signed - form provided in Appendix B
- ☐ Integrity Provisions – Required documentation – as applicable in accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>) and as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, section 3a.
- ☐ Integrity Provisions- Declaration of Convicted Offences – with its bid, as applicable in accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>) and as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, section 3b.
- ☐ Proposal - one (1) original plus five (5) copies
- ☐ Front page of RFP
- ☐ Front page(s) of any solicitation amendment

In a separate envelope:

Price Proposal Form - one (1) completed and submitted in a separate envelope

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APPENDIX G – PROJECT BRIEF

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## DEFINITIONS

Carbon Neutral(ity) – See Net Zero Carbon.

Carbon Neutral(ity) Ready– See Net Zero Carbon Ready.

Commercial Close – the date when all of the commercial agreements required by PWGSC and the P3 Consortium for the Project, including the Project Agreement, have been finalized and executed.

Design, Bid, Build-Crown Construct (DBB-CC) – refers to the traditional approach to delivering infrastructure projects by PWGSC. This delivery model typically involves PWGSC completing design to 100% and soliciting proposals from the market for the construction of the asset(s) based on the completed design. Following construction PWGSC would either perform the operations, maintenance and lifecycle replacement activities or outsource this function.

Design, Build, Finance (DBF) – a P3 model where design and construction services are contracted to a single design-build consortium that is also required to arrange and provide private sector financing for the design and construction of the infrastructure asset(s). Payment is made by the sponsor (i.e. government) once the project is completely constructed to the standard stipulated by the P3 consortium contract.

Design, Build, Finance, Maintain (DBFM) – a P3 model where design, construction and maintenance and lifecycle rehabilitation services are contracted to a single entity that is also required to arrange and provide financing for the design and construction of the infrastructure asset(s). Financing under this model typically includes short-term construction financing that is repaid by the sponsor (i.e. government) once the project is completely constructed to the standard stipulated by the P3 consortium contract, and long-term financing that spans the term of the P3 consortium contract. Monthly payments are made by the sponsor to repay the long-term financing and to pay for maintenance services delivered by the P3 consortium. The inclusion of long-term financing incentivizes the P3 consortium to deliver the long-term maintenance and lifecycle rehabilitation services as stipulated by the P3 consortium contract. The operating responsibilities for the asset(s) are retained by the public sponsor.

Design, Build, Finance, Operate, Maintain (DBFOM) – a P3 model that has the same structure as the DBFM, but transfers long-term operation responsibilities for the asset(s) to the P3 consortium.

Design Performance Specifications – requirements forming part of the Project Specific Output Specifications that describe the functional performance criteria required for the Facility.

Embodied Carbon – refers to carbon dioxide emitted during the manufacture, transport and construction of building materials, together with end-of-life emissions.

Facility – refers to the 875 Heron Road Ottawa Taxation Campus Headquarters (higher tower) and Data Centre (lower tower) assets described in the Project Brief.

Facility Management – The overall coordinated management of all infrastructure, services, operations, maintenance and lifecycle replacement for the Facility in support of the core function of the Facility. The function of Facility Management is the management of Facility Maintenance Services as defined in R1210D (2018-06-



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21), General condition (GC) 1: General provisions – Architectural and/or engineering services.

Facility Management Output Specifications (FMOS) – requirements forming part of the Project Specific Output Specifications that describe the performance requirements of the Facility and the P3 Consortium for the Facility Management of the Facility.

Fairness Monitor – an independent third-party contracted by PWGSC to observe and advise on the fairness, openness and transparency of the procurement process(es) related to the Project.

Financial Advisor – a company contracted by PWGSC to provide financial and commercial advisory services for the Project.

Financial Close - the date on or after Commercial Close when all of the financing agreements required for the Project, including conditions precedent defined in the Project Agreement, have been finalized and executed.

Greenhouse Gas (GHG) – a gas, such as carbon dioxide and chlorofluorocarbons, that contributes to the atmospheric greenhouse effect by absorbing infrared radiation.

Independent Engineer – an independent advisory firm (or joint venture) to be contracted jointly by PWGSC and the P3 Consortium to monitor all work for the purpose of compliance with the Project Agreement; to sign the required attestations and certifications (e.g. Substantial Completion Certification); and to examine the design documents, supervision plans and the management and quality control system provided by the P3 Consortium.

Key Personnel – Key personnel, as defined in R1410T (2016-01-28), General Instructions (GI) – Architectural and/or Engineering Services – Request for Proposal. For the Project, Key Personnel are listed in Appendix A.

Key Sub-Consultant– Key Sub-Consultants, as defined as Sub-Consultant in R1210D (2018-06-21), General Conditions (GC) 1: General provisions – Architectural and/or engineering services. For the Project, Key Sub-Consultants are listed in Appendix A.

Life Cycle Assessment (LCA) – a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling.

National Capital Region – the official federal designation for the Canadian capital of Ottawa, Ontario, the neighbouring city of Gatineau, Quebec, and surrounding urban and rural communities as specifically defined at <https://laws.justice.gc.ca/eng/acts/N-4/page-4.html>.

Net Zero Carbon – in terms of the Greening Government Strategy, it is a condition where carbon-free renewable energy sources for the day-to-day operations of a facility is used to reduce the annual GHG emissions to close to zero. Only a small amount of GHG emissions are permitted as a result of the residual emissions associated with a very low carbon electricity grid. The objectives of the Strategy do not include emergency backup power as it is a backup solution and not part of the day-to-day operations. Embodied carbon in construction materials is also minimized. The Government of Canada does not account for or permit the purchase of GHG credits to offset carbon usage.

Net Zero Carbon Ready – in terms of the Greening Government Strategy, it is a condition of a building in which energy consumption is reduced to a minimum through building design strategies and efficiency measures to the point where it

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would be practical in the future to use non-carbon-based fuel sources to meet its energy needs. Embodied carbon in construction materials is also minimized.

Optional Services – services which, at the option of PWGSC, may be added to the Required Services.

Procurement Options Analysis (POA): a quantitative and qualitative assessment of the various P3 delivery models (e.g. DBB-CC, DBF, DBFM) being considered for the P3 Project to determine the P3 delivery model that will deliver the greatest Value-for-Money.

Project – 875 Heron Road Rehabilitation Project to be delivered as a P3 by a P3 Consortium.

Project Agreement – the P3 Consortium contract governing the Project.

Project Brief - As defined in R1210D (2018-06-21), General condition (GC) 1: General provisions – Architectural and/or engineering services.

Project Management Team (PMT) – PWGSC's project management team.

Project Specific Output Specifications – requirements that describe the performance requirements of the Facility and the P3 Consortium for the design and construction of the Facility, as well as Facilities Management, as applicable.

Proponent – as defined in R1410T (2016-01-28), General Instructions (GI) – Architectural and/or Engineering Services – Request for Proposal.

Preferred Proponent – the P3 Consortium Proponent selected by PWGSC during the RFP process to enter into final discussions to complete and sign the Project Agreement.

PWGSC – Public Works and Government Services Canada

Public-Private Partnership (P3) – a long-term performance-based approach for procuring public infrastructure that optimizes the allocation of risk between the partners for the design, construction, financing and maintenance, operation and lifecycle rehabilitation, as applicable. P3 contracts provide incentives to the P3 consortium to deliver an integrated package of infrastructure and services to the standards and timetable established by the contract. P3 transactions include private sector financing in the form of equity and debt (e.g. bank loans, bonds) and can include long-term and short-term financing instruments, depending on the P3 model used. P3 models include Design-Build-Finance (DBF), Design-Build-Finance-Operate-Maintain (DBFOM) and Design-Build-Finance-Maintain (DBFM). **P3's do not include** outright privatization; the project sponsor (i.e. government) retains ownership of the infrastructure asset at all times. For more information on the Canadian P3 definition and structure (i.e. P3 models, benefits, governance structure, etc.) please refer to the *Federal P3 Screen Guide* (Appendix K).

To further assist in the planning and P3 procurement of public infrastructure, additional information can be found within the *Procurement Options Analysis – Development guide* (Appendix L). Stakeholders are encouraged to utilize this document as it examines in greater detail the P3 procurement approach for the proposed infrastructure. In addition, the *Procurement Options Analysis – Methodology guide* (Appendix M) was developed for federal department and agencies to provide them with a framework for analyzing different options and selecting a preferred approach. Many of the techniques in this document are common financial and analytical techniques based on Canadian P3 best practices.

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P3 Consortium – the entity which enters into the P3 Project Agreement.

Quality Management Plan – the detailed approach to the management of quality for the Work required to deliver the Required Services, and Optional Services, as applicable, that is in accordance with PWGSC standards and industry accepted standards for quality management systems as defined in the Project Brief.

Request for Proposal (RFP) – a formal solicitation, requesting technical and financial information from Proponents shortlisted through a RFQ process, which evaluates and selects a Proponent to enter into an agreement with PWGSC.

Request for Qualifications (RFQ) – a process which evaluates and selects a shortlist of Proponents through assessment of their capacity and capability to undertake a project.

Required Services (RS) – **The TA's scope of services requested within this RFP.**

Schematic Design – the first phase of design, which is described in detail in section 1.4 Schematic Design and Class C Cost Estimates that translates the functional program into a depiction of space using physical drawings.

Schematic Design Evaluation Guide (SDEG) – a document prepared by PPP Canada used to guide the development of cost estimates for the Project that are used for value of money calculations required for formal P3 approvals.

Scope of Work (Scope) – the Design and Construction/Rehabilitation of 875 Heron Road, with Optional Services for the inclusion of long-term Facility Management.

Specialist – Key Specialist, as defined as Specialist Consultant in R1210D (2018-06-21), General Conditions (GC) 1: General provisions – Architectural and/or engineering services. For the Project, Key Sub-Consultants are listed in Appendix A.

Substantial Completion - The point at which the design and construction work in a P3 has been completed in accordance with the project agreement and the asset is sufficiently complete to be used as it is intended; a certificate of substantial completion in respect of the design and construction work has been issued by the Independent Engineer and has been published pursuant to applicable legislation (e.g. the Construction Act (Ontario)), as applicable.

Subsurface Utility Engineering (SUE) – refers to a branch of engineering that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design. The American Society of Civil Engineers (ASCE) published the standard ASCE 38-02: Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data. The standard defines SUE and sets guidance for the collection and depiction of subsurface utility information.

Technical Advisor (TA) – the party which submitted a responsive proposal to perform the Consultant Services under an Agreement and provides advice on such items, including design and construction, performance specifications and asset-handback requirements.

Technical Advisor Team (TA Team) – The Consultant Team, as defined in R1410T (2016-01-28), General Instructions (GI) – Architectural and/or Engineering Services – Request for Proposal.

Value-for-Money (VfM) – refers to the difference in the risk-adjusted cost of delivering the Project as a P3 versus a

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traditional procurement (DBB-CC). The Value-for-Money estimate is calculated as part of the Procurement Options Analysis.

Work/Works – all activities and things necessary to deliver the Required Services, and the Optional Services, as applicable, in accordance with the terms of the contract.

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## DESCRIPTION OF PROJECT

### PD 1 PROJECT INFORMATION

#### 1.1 Description

This Project is for the design and construction/rehabilitation of two office towers linked in the main floor and podium located at 875 Heron Road, hereinafter referred to as the Project, using a P3 model. The Project will use industry **accepted practices and documents for P3's in Canada**. The Project involves the Design-Build-Finance (DBF) of modern and environmentally sustainable office accommodation. PWGSC is also currently assessing the viability of including long-term financing and maintenance in the Project, which would make it a Design-Build-Finance-Maintain (DBFM) contract and, as a result, may require the provision of additional related services by the TA, as described in detail in sections PD 5 and OS 1 - 6.

#### 1.2 Schedule

The Project schedule is expected to be significantly influenced by the Construction Implementation Strategy as outlined in section PD 6. Highlighted below are two Project schedules with notional start and end dates for each of the four Project phases. These tables will be updated from time to time to reflect evolving Project decisions and circumstances.

##### 2-Stage Construction Implementation Strategy:

Phase	Indicative Dates
Award of Technical Advisor Contract	February 2020
Phase I – Pre-Procurement	February 2020 – January 2022
Phase II – P3 Consortium Procurement	July 2021 – March 2023
Phase III – Design and Construction	March 2023 – July 2028
Phase IV – Post-Construction	July 2028 – July 2030

##### 1-Stage Construction Implementation Strategy:

Phase	Indicative Dates
Award of Technical Advisor Contract	February 2020
Phase I – Pre-Procurement	February 2020 – January 2022
Phase II – P3 Consortium Procurement	July 2021 – March 2023
Phase III – Design and Construction	March 2023 – August 2026
Phase IV – Post-Construction	August 2026 – August 2028

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The Project contains many milestones within all four phases. The following two tables outline the schedules of the major milestones, in days, to be achieved for both the one-stage and two-stage construction implementation strategies for each phase of the Project. These tables will be updated from time to time to reflect evolving Project decisions and circumstances.

2-Stage Construction Implementation Strategy estimated milestones:

875 HERON ROAD REHABILITATION PROJECT MILESTONES - 2-STAGE CONSTRUCTION IMPLEMENTATION STRATEGY	
MILESTONES	ESTIMATED MILESTONE DATE (BUSINESS DAYS FROM AWARD)
Award Technical Advisor Contract	0d
PHASE I PRE-PROCUREMENT	
Schematic Design and Class C Estimates (1st Iteration)	120d
Project Specific Output Specifications and Project Agreement (1st Iteration)	180d
Technical Advisor Studies	200d
National Capital Commission and Federal Heritage Building Review Office Approvals	250d
Project Specific Output Specifications and Project Agreement (2nd Iteration)	300d
Prepare RFQ Documents	350d
Final Pre-Procurement Schematic Design and Class C Estimate (Updates)	370d
Final Pre-Procurement Project Specific Output Specifications and Project Agreement	400d
Prepare RFP Documents	460d
PHASE II PROCUREMENT	
RFQ Tender Complete	450d
Prepare Data Room for Release	450d
RFP Open-Period Closes	610d
P3 Consortium Evaluations	660d
Financial and Commercial Close	690d
Treasury Board Submission Approval	720d
P3 Consortium Award	760d
PHASE III DESIGN AND CONSTRUCTION	
Higher Tower Construction & Deficiencies Complete	1420d
Lower Tower Construction & Deficiencies Complete	2110d
PHASE IV POST-CONSTRUCTION	
Post-Construction Support	2610d

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1-Stage Construction Implementation Strategy estimated milestones:

875 HERON ROAD REHABILITATION PROJECT MILESTONES - 1-STAGE CONSTRUCTION IMPLEMENTATION STRATEGY	
MILESTONES	ESTIMATED MILESTONE DATE (BUSINESS DAYS FROM AWARD)
Award Technical Advisor Contract	0d
PHASE I PRE-PROCUREMENT	
Schematic Design and Class C Estimates (1st Iteration)	120d
Project Specific Output Specifications and Project Agreement (1st Iteration)	180d
Technical Advisor Studies	200d
National Capital Commission and Federal Heritage Building Review Office Approvals	250d
Project Specific Output Specifications and Project Agreement (2nd Iteration)	300d
Prepare RFQ Documents	350d
Final Pre-Procurement Schematic Design and Class C Estimate (Updates)	370d
Final Pre-Procurement Project Specific Output Specifications and Project Agreement	400d
Prepare RFP Documents	460d
PHASE II PROCUREMENT	
RFQ Tender Complete	450d
Prepare Data Room for Release	450d
RFP Open-Period Closes	610d
P3 Consortium Evaluations	660d
Financial and Commercial Close	690d
Treasury Board Submission Approval	720d
P3 Consortium Award	760d
PHASE III DESIGN AND CONSTRUCTION	
Higher & Lower Tower Construction & Deficiencies Complete	1621d
PHASE IV POST-CONSTRUCTION	
Post-Construction Support	2125d

## PD 2 PROJECT BACKGROUND

### 2.1 Building Description, Location and Occupancy

In the 1950s, Jacques Gréber created the plan for the National Capital, which intended to decentralize federal employment in the National Capital Region. The plan resulted in the establishment of a federal office node at Confederation Heights, which was auto-centric and characterized by sprawling parking lots and large open spaces. The site contains 16 buildings primarily used for office space. Three major arterial roads divide the site: Bronson

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Avenue, Heron Road, and Riverside Drive. Light Rail Transit, Bus Rapid Transit and local bus routes service the area. Since the 1960s, the site remains largely unchanged and still exemplifies many of these characteristics. Currently, Confederation Heights is currently grossly underutilized. Confederation Heights must be redeveloped to meet current and future needs while creating an iconic federal employment node suitable for the Nation's Capital.

Located at 875 Heron Road, the Ottawa Taxation Complex is a Crown-owned asset and is the headquarters of CRA. It is considered a key site given its location between the RA Centre and other PWGSC-owned sites. Built in the 1970's following the Modernist era, the building complex is easily visible from the primary road network surrounding as a pavilion in a park-like setting. The simplicity of large areas of manicured lawn and grouped tree plantings in the lawns reinforced the park-like pastoral setting. The complex comprises of the 11-storey Taxation Data Centre and the 5-storey Taxation Headquarters. It has continually been occupied by CRA, which reports an ongoing requirement for the accommodations, and a preference to consolidate numerous functions at this location.

The towers are physically linked at grade and below grade through a tunnel system, and a two-storey cafeteria pavilion. Figure (1) shows the location of the complex as part of the larger campus known as the "Confederation Heights".



Figure 1 - The Ottawa Taxation Complex, 875 Heron Road, Ottawa (shown in red circle)



The Taxation Data Centre has approximately 32,983.9 sq. metres of **usable office space**. The building accommodates CRA's Ontario Region (CRA-OR) offices, among other CRA groups (i.e. CRA-HRB and CRA-FAB) on the first eight floors. Until recently, the two top floors **accommodated a data centre for use by the CRA's Information Technology Branch (CRA-ITB) business units**. Currently, the two top floors are vacant. Limited decommissioning is planned for 2019. According to the Building Owners and Managers Association (BOMA) standards the **office accommodation in the building is considered to be of "Class B" quality**. A Building Condition Report (BCR) completed in 2014 identifies the **overall condition of this asset to be "average" and recommends numerous capital improvements and repairs**. At the present time, the office accommodation in the building is not in compliance with the Government of Canada Fit-up Standards.



The Taxation Headquarters Building has approximately 13,500 sq. metres of usable office space. The building currently houses part of **CRA's Information Technology Branch (CRA-ITB)**. At the present time, the office accommodation in the building is not in compliance with the Government of Canada Fit-up Standards. A Building Condition Report (BCR) completed in 2014 identifies the overall condition of this asset to **be "average" and recommends numerous capital improvements and repairs**.



The location and siting of the building **pose a number of challenges**. The building's current circulation layout is car centric, with large setbacks and service parking lots undermining the provision of greenspace. For example, to the south and southeast are a number of access/exit connectors that join with the high-traffic arterial thoroughfares of Bronson Avenue and Heron Road. The layout has resulted in large areas of green space being segregated from any other use other than accommodating these vehicular connector links. As such, the current vehicular layout limits the potential for the site to accommodate municipal building improvements as well as negatively impacts user experience, in particular pedestrians and cyclists.

The building itself is a considerable walk from the current LRT station, transit way, and food and retail amenities. The walking time is well outside the limits of the six-minute walk, a best practice urban design principle between amenities. The topography of the site, although flat near the building, has a significant grade differential to the north and northeast. This poses accessibility challenges for pedestrians and cyclists linking with Billings Bridge, the RA Centre and the Rideau River. It also restricts the building of storm water retention ponds and geothermal capabilities. The current tree canopy is extremely sparse affording little-to-no protection to pedestrians and cyclists in the winter from the wind and in the summer **from the sun**. The building's placement on top of the plateau **exposes the building to harsh climatic conditions** and strong northwest winds in winter. As such, the experience of site users, in particular pedestrians and cyclists, is adversely impacted.

## 2.2 Recognized Federal Heritage Building Designation

In 2017, the campus was designated a Recognized Federal Heritage Building by the Federal Heritage Building Review

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Office (FHBRO). The following has been identified as the major character-defining elements of the building's Heritage value:

*Its brutalist and expressionist features as reflected in its multi-form and expressive massing, angular Geometry and modular façades that emphasize the hard and the angular, with their squares, rectangles and recessed window". Also, the "balance and juxtaposition of building components for visual interest, as well as, the functional design of the interiors and the exterior cladding using pre-cast concrete parts and panels.*

**For exterior finishes, the FHBRO's Statement of Potential Heritage Value for 875 Heron Road refers to "the interesting modular, sculptural facades, that emphasize the hard and angular; the balanced juxtaposition of the building components, which adds visual interest and functions well as a whole; the very good quality of workmanship and materials, including pre-cast concrete elements, black concrete aggregate, pre-cast black and white concrete panels, glass and black porcelain enameled spandrels."**

**For interior finishes, the FHBRO's Statement of Potential Heritage Value for 875 Heron Road refers to the "simplicity and flexibility" of the open plan office space with access to natural light, as well as mentions that the "building features very good craftsmanship and durable materials, including granite and cherry wood on the interiors."**

Interventions to these character defining elements (CDEs) should be carefully considered and any modifications should be done in accordance with the Standards and Guidelines for the Conservation of Historic Places in Canada, 2010.

## 2.3 Existing Building and System Condition

Many of the building systems are original and are now at the end of their useful service life. In addition, recently it has been reported that there is asbestos containing materials (ACM) within the building. The removal of asbestos and other designated substances is a significant and important element of the Project and is anticipated to be a considerable constraint to the ultimate approach to redeveloping the buildings. In anticipation of the planned major rehabilitation, no major rehabilitations or upgrades have been undertaken in recent years.

### 2.3.1 Architectural Conditions

**Exterior Finishes:** The eleven (11)-storey higher tower (data centre) and the five (5)-storey lower tower (headquarters) exterior walls are clad primarily with architectural precast concrete panels between the exterior columns. Each tower is composed of modular bays with deep recessed windows, which are found above the ground floor level. The recessed podium of the towers at the ground floor level, the link building and the cafeteria pavilion are enclosed with aluminum storefront windows with aluminum glazed doors.

There are numerous precast concrete panel wall compositions with varying effective R-values of R6.7 to R15.9. The R-values of the existing building envelope are significantly impacted by thermal bridging attributed to the exposed concrete structural columns, upstand perimeter beam and poured-in-place horizontal sun canopies. These elements are neither insulated on the exterior face, nor thermally broken, which results in significant thermal bridging at all floor levels.

A number of water leaks through the building envelope have been reported, causing some interior water damage to **a number of tenants' assets. Localized repairs have been completed to address these leaks.**

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A number of exterior caulking and sealants contain asbestos.

Windows: All the windows, curtain walls and storefront windows are original to the building construction and are considered to be in fair condition but approaching the end of their life expectancy. The R-value of the existing double-glazed window assembly is R2.5.

Roof: The typical roofing system installed in 1996 is a protected (inverted) built-up bituminous membrane roofing system. The main roofing systems will reach their expected service life (25 years) in 2021. The R-value of this existing roof compositions are R13 and R17 based on the insulation thickness.

Interior Finishes: The interior finishes of 875 Heron Road have not undergone any significant modifications since the original construction and are now reaching the end of their service life. The interior finishes contain a significant amount of Designated Substance that should be taken into consideration in the planning, phasing and estimating of the Work. Terracotta tile block partitions are found throughout the buildings, typically at the building cores, inside the exterior walls, and in the basement partitions. The mortar in these partitions is Asbestos Contained Material (ACM). These partitions do not meet current seismic codes.

There are a number of areas within the interior and exterior that were deemed non-compliant to the accessibility requirements of CSA Standard B651-12 including but not limited to washrooms, signage, corridors and exterior parking areas and routes to the main entrance.

### 2.3.2 Structural Conditions

The 875 Heron Road site consists of a building complex with several cast-in place concrete structures linked together on pile foundation. The majority of the building complex consists of one way reinforced concrete roof and floor slabs on reinforced concrete joists and beams which are supported on reinforced concrete columns. Lateral stability in the two towers is achieved via concrete moment frames. It appears that all aspects of the structure are generally in good condition with few areas of concern such as concrete delamination of a few beams in the basement due to water infiltration.

Seismic Capacity: The majority of the building complex meets 100% of the 2015 National Building Code seismic forces. A seismic report completed in 2017 also noted that the headquarters building is constructed as three separate structures with minimal separation, which does not comply with NBC requirements. Several columns in the Canteen Building only were able to meet 60% of the 2015 NBC seismic forces. All operational & functional components are not restrained for seismic forces.

The 2017 assessment also addresses the hollow terracotta block walls found in both buildings. The report notes that **some of the terracotta walls were not able to resist the forces due to the building's movements under a design seismic event**. The report further recommended that the terracotta walls be reinforced or replaced. The mortar used in the joints of the terracotta block walls contains asbestos.

### 2.3.3 Mechanical Conditions

In general, all mechanical systems are have reached or approaching the end of their useful service life and are expected to be replaced.

Elevators: The higher tower is served by seven gearless, traction passenger elevators and one freight elevator. Parts of the elevators were modernized in 2011 and 2012 with new controllers, operating fixtures and cab interiors. Many

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other elements of the original system, including the landing door equipment and gearless machines, were retained and are original to the system.

The lower tower is served by five gearless, traction passenger elevators and one freight elevator. Parts of the elevators were modernized in 2014 with new controllers, operating fixtures and cab interiors; many other elements of the original system, including the landing door equipment and gearless machines, were retained and are original to the system.

Plumbing: The lower tower typically provides two washrooms for women, two washrooms for men and two wheelchair **accessible washrooms per floor distributed around each of the building's two main cores.** The higher tower typically provides two washrooms for women, one washroom for men and one accessible washroom per floor within the **building's core. In both towers the majority of the fixtures were reported to be replaced in approximately 2000 with more water efficient models.**

Drinking fountains are in fair to good condition but are nearing the end of their useful service life. The drinking fountain chillers are in fair condition but have reached the end of their useful service life. Additionally, the chillers use R-22 refrigerant for which new supplies are being phased out by government regulations.

The domestic water distribution systems (cold water, hot water, recirculation water) are in fair condition but are nearing the end of their useful service life.

The sanitary system for both buildings consists of sanitary piping, floor drains, auxiliary drains, backflow prevention **valves, sump pumps and roof vents. The sanitary piping is original to the building's construction. The sanitary system** has reached the end of its useful service life.

The rainwater discharge system for both buildings consists of roof drains, rainwater leaders, sump pumps, **underground piping, catch basins and manholes. The rainwater system is original to the building's construction and** connects to the city stormwater main.

Gas Distribution: Both buildings are provided with natural gas for humidification equipment (and kitchen equipment **in the Data Centre) and a meter is located at the North side. Gas piping is 100 mm (4") in diameter and is distributed** through risers from basement to penthouse mechanical rooms. The gas piping system was installed in 2000.

Heating System: The CHCP supplies high temperature heating water (HTHW) at 143°C (290 °F) and 1070 kPa (155 psi) and return is at 60°C (140 °F) and 790 kPa (115 psi). The HTHW serves as the heating source for the medium temperature hot water (MTHW) loop which serves both buildings. The MTHW is produced by heat exchangers located **in the basement mechanical room and is distributed separately to each building's perimeter induction units and glycol heating loops. The heat exchangers for the glycol heating loops are located in each building's respective penthouse** mechanical rooms and serve the various air handling units (AHU). The majority of the heating distribution piping is **also original to the building's construction.** There is a total of thirty-five (35) pumps for distribution of hot water to the **perimeter induction units, glycol loops and AHU's. The pumps are located in the basement and penthouse mechanical** rooms and were replaced in 2001. The perimeter induction unit systems are two pipe changeover systems located below the windows on every floor. These units provide heating during winter and cooling during summer as well as **year-round fresh air requirements. They are original to the buildings' construction.** Although heat exchangers on the HTWH have been recently replaced with the CHCP upgrades to reduce HTHW supply temperature, they may be oversized and require replacement.

Cooling System: The CHCP supplies chilled water at 5.6 °C (42 °F) and 830 kPa (120 psi) and return is at 10.6°C

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(51 °F) and 690 kPa (100 psi). CHCP chilled water serves as the direct cooling source for both buildings and enters at the basement level before being distributed to AHU's and induction units. The majority of the cooling distribution piping is original to the building's construction. Cooling distribution piping is in fair condition but nearing the end of its useful service life.

Ventilation System: The two towers have cooling and heating AHU's located in both the basement and penthouse mechanical rooms which are original to the building's construction. The penthouse mechanical rooms in which the AHU's are located serve as return plenums and exhaust louvers on the exterior walls serve to evacuate the excess air. Fresh air louvers are directly connected to the AHU's mixing plenums. The units are equipped with heating and cooling coils, humidification systems and centrifugal supply and return fans which are typically external to the units. Most fans have variable speed drives to maintain ductwork pressure of 100% speed as per building automation system (BAS) command. Fresh air intake is controlled with dampers for minimum air requirements or economizer mode. Humidifiers are provided with most of the AHU's and were replaced in 2000. They are in poor operating condition and require frequent maintenance. Basement print room B70-8 of the Headquarter building is provided with temperature and humidity control with a special dehumidifying unit (Dectron unit) which was replaced in 2008.

Exhaust Fans: Exhaust fans are in fair condition but have exceeded their useful service life.

Ducting System: The ductwork systems are in fair condition but have exceeded their useful service life.

Fire Protection: Sprinkler protection in the Headquarters is limited to the basement level. The Headquarters also has a wet standpipe system with hose cabinets near stair shafts on every level, in the basement and on the ground floor. The kitchen has a wet chemical kitchen hood suppression system with three (3) cylinders. Sprinkler system, standpipe system and wet chemical suppression system are original to the building's construction.

Sprinkler protection in the Data Centre is limited to the basement level, ground level and part of the 11<sup>th</sup> floor. A pre-action sprinkler system serves part of the 9th, 10th and 11th floors. Main sprinkler control valves consist of two (2) 8" valves and one (1) 6" valve. The Data Centre also has a wet standpipe system with hose cabinets near stair shafts on every level, in the basement and on the ground floor. Fire Department (Siamese) connections are located at the southwest corner of the building. Sprinkler system, standpipe system and Siamese connections are original to the building's construction. Two (2) 75 hp vertical fire pumps with controllers and transfer switches (main pump and standby pump) serve the Data Centre sprinkler system. These pumps were changed in 2000. Fire extinguishers are provided throughout the buildings and were replaced in 2007.

The sprinkler systems are in fair condition but have exceeded their useful service life. Additionally, the sprinkler systems will not be code compliant upon major building renovations, alterations or re-capitalization since the NBC requires sprinklers on every floor. The standpipe systems are in fair condition but have exceeded their useful service life.

#### 2.3.4 Electrical Conditions

In general, the electrical system has reached or is approaching the end of its useful service life and is expected to be replaced.

The main incoming electrical 15kV primary high voltage (HV) distribution service for the Taxation Data Center is supplied from the 15kV underground distribution system of the Confederation Heights Central Heating Plant (CHCHP). Line F1 comes directly from the CHCHP and line F2A comes from Sir Leonard Tilley Building. The 15kV primary high voltage distribution enters into the Taxation Data Center via the main electrical room in the basement.

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The main electrical room and UPS rooms are clean and provided with clear access for equipment maintenance. All equipment, including the secondary distribution system, was installed in 1970 and will be at the end of its service life in the next five years.

### 2.3.5 Fire Alarm System Conditions

The Taxation Data Centre and Headquarters building are provided with a two-stage, Notifier 2020, fire alarm system with integrated voice communication. The fire alarm control panel is located in the security room in the ground floor of the Headquarters building. An annunciator panel is located in the basement management office. The 10th floor is provided with a simplex panel.

The fire alarm system consists of manual pull stations, smoke/heat detectors, speakers, fireperson handset, sprinkler flow switches, sprinkler supervisory switches, duct smoke detectors and bells.

The fire alarm system appeared to be in working order and no major issues were reported; however, the fire alarm system was installed 20 years ago and is past its useful service life. More recently, fire alarm system issues have been raised by operational staff.

## PD 3 EXISTING DOCUMENTATION

### 3.1 Request for Proposal Supporting Documents

An electronic copy of the following documents is provided to all Proponents for reference during the preparation of their RFP responses:

- Feasibility Report Final r03 (Extract of Executive Summary), DFS Architecture & Design, March 2018 (Appendix N)

### 3.2 Active Studies

The following studies will be provided to the successful Proponent upon completion.

#### 3.2.1 875 Heron Road CRA Functional Program Update

This study includes:

- a. Updated CRA Functional Programs for all Branches that will be occupying 875 Heron after the completion of the Project; and
- b. A swing space strategy and a comparison of the two-stage construction implementation strategy (vacate and renovate towers one at a time) and the one-stage construction implementation strategy (vacate both towers and renovate them simultaneously).

Anticipated completion is Spring 2020.

#### 3.2.2 Building Condition Report 2019

**This study includes a review of 875 Heron Road's present condition as an update to the building condition report previously completed in 2014.**

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Anticipated completion is Spring 2020.

### 3.2.3 Drone Study of Building and Site

This study involves an extensive aerial digital photogrammetric coverage of the site. The study will capture the site's features, building roofs, settings, and surrounding landscape, complete with panoramic images (deemed appropriate by the conservation technologist or as directed). The study will involve a survey with the use of a total station in order to capture ground control points to be used as control for the digital aerial photogrammetry of the site. The study will also produce a photogrammetric model of the site, an orthographic site plan and digital elevation model, and involve a procurement of any Project-related required equipment and/or software along with associated calibration, maintenance and licensing.

Anticipated completion is Spring 2020.

### 3.2.4 Heritage Recording and Documentation Report

This report will provide a photographic report of the as-found heritage character defining elements of 875 Heron Road including the interior context and generic areas complete with photo key plans. The report will not replace the official Heritage Character Statement produced by FHBRO which explain the reasons for the designation and the character-defining elements that should be respected.

Anticipated completion is Spring 2020.

### 3.2.5 Illustrated Heritage Character Sheets

In consulting the heritage character of the asset, these sheets will consist of approximately eight sheets that will list **and illustrate the building's character**-defining elements.

Anticipated completion is Spring 2020.

### 3.2.6 Confederation Heights Master Plan

Public Works and Government Services Canada (PWGSC) is working in partnership with Canada Lands Company (CLC) to prepare a master plan for the federally-owned Confederation Heights site lands. Prepared in close consultation with the National Capital Commission (NCC), the City of Ottawa, and other stakeholders, the Master Plan will include a comprehensive development strategy that defines the principles, objectives and policy direction for the site. Development planning and urban design principles and guidelines will be developed with respect to land use, circulation, built form, open space, heritage, sustainability, and servicing/utilities. Development options will be generated and evaluated, leading to the selection of a preferred option for the future development and phasing of the site. The Master Plan will guide the development of the site into a sustainable, transit-oriented urban mixed-use community and federal employment node over the next 25 years. The planning and design objectives of the Master Plan that will facilitate the development of the land include the following:

- A mix of land uses, including office, retail/service commercial, residential, community recreation, and open space;
- Integration and connectivity between buildings and services to allow for easy and convenient walkability, while encouraging greater use of public transit and cycling for daily transportation;
- A high quality, healthy work environment that supports optimum work productivity;

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- Sustainable development;
  - Universal accessibility;
  - Enhanced interface with surrounding communities; and
  - Flexibility to meet the evolving accommodation requirement of the federal government.

These objectives are to be reached while adhering to the Master Plan's guiding principles, which include the following:

- Creating the workplace of tomorrow with flexible and efficient workplaces;
- Going green through carbon footprint reduction, sustainable sites and buildings, adaptive reuse, and climate change resiliency;
- Promoting active mobility by incorporating active transportation networks and infrastructure, transit-oriented development, walkability, connectivity, accessibility, and human scale built form;
- Promoting a healthy vibrant community with work-life balance, integration, diverse amenities and services, and employee wellness;
- Creating a new sense of place through place-making, inclusiveness, and multi-generational and design excellence;
- Building on past stories by honouring key natural and cultural heritage elements; and
- Engaging Indigenous communities in the master planning process.

There are two major components that define the work to be accomplished: The Confederation Heights Master Plan, and the Confederation Heights Strategic Implementation Phasing Plan.

It is anticipated that the 6 stages of the master plan process outlined below, will lead to an approved master plan by the NCC within 24 months from the engagement of a consulting team to assist PWGSC and CLC in this Project. Further to the approved Master Plan, a Strategic Implementation and Phasing Plan will be prepared with an anticipated completion date of six months. The purpose of the Implementation and Phasing Plan is to develop three **distinct phasing options for the site leading to a preferred approach as well as identifying PWGSC's phase one** building locations.

The award of the consultant to start the work is scheduled for **Spring** 2020. The following dates are the stages of the Confederation Heights Master Plan Project Schedule (in months), which are sequential and commence from the award date:

Stage One – Project Review	3
Stage Two – Project Analysis	5
Stage Three – Options Development	9
Stage Four – Draft Master Plan	4
Stage Five – Final Master Plan	3
Stage Six - Strategic Implementation and Phasing Plan	6

The TA shall take the recommended Confederation Heights Master Plan option(s) for 875 Heron into consideration when developing the Project documents. As both projects are occurring in parallel, it is expected that the Confederation Heights Master Plan and 875 Heron Road Rehabilitation Project may influence one another in their respective development. The latest documents of the Master Plan should also be included in the P3 Consortium supporting documents of the electronic data room.

### 3.3 Other Supporting Documents



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The following documents will be provided to the TA upon Contract award:

1. Feasibility Report Final r03, DFS Architecture & Design, March 2018;
2. FHBRO Heritage Character Statement, Canada Revenue Agency Building, 875 Heron Road, Ottawa, Ontario, July 2017;
3. The Building Condition Assessment Report, Nadine International, November 2014;
4. Federal Heritage Buildings Review Office (FHBRO) Building Report 12-066, FHBRO, 2012;
5. Designate Substance Report (DSR), DST Consulting Engineers, September 6, 2017;
6. Building Envelope Study, MTBA in cooperation with IRC Building Sciences Group, September 6, 2017;
7. Canada Revenue Agency (CRA) – Information Technology Branch (ITB) Functional Program- 99% Submission, DFS Architecture & Design, March 10 2016;
8. Canada Revenue Agency (CRA) – Ontario Region (OR) Functional Program- 100% Submission, DFS architecture & design, March 10 2016;
9. Seismic Analysis Report, HP Engineering, February 2017;
10. Accessibility Audit, ERSKINE DREDGE & Associates Architects Inc., October 27, 2016;
11. Phase 1 Environmental Site Assessment, In AIR Environmental Ltd, August 23rd, 2016;
12. Phase II Environmental Site Assessment, LRL Engineering, December 22, 2017;
13. Elevator Inspection (Data Centre), Rooney, Irving & Associates Ltd., March 2014;
14. Elevating Device Inspection Report (Data Centre), Seaway Elevator Consultants, May 2013;
15. Electrical Maintenance Report – Ottawa Taxation Centre, Siemens, June 2012;
16. The Asbestos Inventory Update, Greenough Environmental Consulting, October 16<sup>th</sup> 2015;
17. Roof Condition Assessment Report, Fishburn Sheridan & Associates Ltd, Fall 2018;
18. Existing architectural, mechanical, electrical and structural drawings, dates vary;
19. Energy Services Acquisition Program (ESAP) as-built drawings and specifications, (875 Heron systems upgraded as result of ESAP project) dates vary;
20. Public Services and Procurement Canada, National Real Property Services 2016–19 Business Plan: Putting Strategy into Motion, 2016;
21. Building Systems on IP Networks (PSPC Industry Information Gathering Session) (2018); and
22. Confederation Heights Cultural Landscape Assessment (2019).

#### 3.4 Reference Documents:

1. Federal Sustainable Development Strategy (FSDS) (2016-2019): [https://www.fsds-sfdd.ca/downloads/Draft\\_FSDS\\_2019-2022.pdf](https://www.fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf);
2. DRAFT Federal Sustainable Development Strategy (FSDS) (2019-2022): [https://www.fsds-sfdd.ca/downloads/Draft\\_FSDS\\_2019-2022.pdf](https://www.fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf);
3. TBS Greening Government Strategy (2017): <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html>;
4. Real Property Sustainability Framework (RPSF) (2015), see Appendix I;
5. Real Property Sustainable Development and Environmental Strategy (RPSDES) (2018), see Appendix J: <https://www.tpsgc-pwgsc.gc.ca/rapports-reports/smd-dsds/index-eng.html>;
6. PSPC National Carbon Neutral Portfolio Plan (2017): [https://buyandsell.gc.ca/cds/public/2018/07/05/0a5d8ab5360ef32e82a6e1f47a8405a4/ABES.PROD.PW\\_Z\\_Q.B018.E33604.ATTA001.PDF](https://buyandsell.gc.ca/cds/public/2018/07/05/0a5d8ab5360ef32e82a6e1f47a8405a4/ABES.PROD.PW_Z_Q.B018.E33604.ATTA001.PDF);

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7. Project GHG Options Analysis Methodology (2017): included in Carbon Neutral Portfolio Plan [https://buyandsell.gc.ca/cds/public/2018/07/05/0a5d8ab5360ef32e82a6e1f47a8405a4/ABES.PROD.PW\\_Z\\_Q.B018.E33604.ATTA001.PDF](https://buyandsell.gc.ca/cds/public/2018/07/05/0a5d8ab5360ef32e82a6e1f47a8405a4/ABES.PROD.PW_Z_Q.B018.E33604.ATTA001.PDF);
8. GCworkplace: A modern workplace for the new public service (2018): <https://www.tpsgc-pwgsc.gc.ca/biens-property/mt-wp/mt-wp-eng.html#s2>;
9. Accessibility for Ontarians with Disabilities Act (2005): <https://www.ontario.ca/laws/statute/05a11>;
10. Technical Reference for Office Building Design (2017): [http://publications.gc.ca/collections/collection\\_2017/spac-pspc/P4-70-2017-eng.pdf](http://publications.gc.ca/collections/collection_2017/spac-pspc/P4-70-2017-eng.pdf);
11. Standards and Guidelines for the Conservation of Historic Places in Canada (2010): <https://www.historicplaces.ca/media/18072/81468-parks-s+g-eng-web2.pdf>;
12. Federal Identity Program Manual (2015) <https://www.canada.ca/en/treasury-board-secretariat/services/government-communications/federal-identity-program/manual.html>;
13. TBS Greening Government Strategy: Real Property Guidance (2019): [http://www.gcpeia.gc.ca/gcwiki/images/7/75/Guidance\\_Real\\_Property\\_March2019.pdf](http://www.gcpeia.gc.ca/gcwiki/images/7/75/Guidance_Real_Property_March2019.pdf); and
14. Capital Urban Lands Plan, NCC, (2015): <http://ncc-website-2.s3.amazonaws.com/documents/Capital-Urban-Lands-plan.pdf?mtime=20180822153248>.

## PD 4 PROJECT SCOPE

### 4.1 Project Scope Overview & Objectives

The purpose of the Project is to rehabilitate and modernize the 875 Heron Road Ottawa Taxation Campus Headquarters and Data Centre assets in order to extend its life expectancy, and Government of Canada occupancy for an additional 25 years.

Required work includes upgrades or outright replacements to all major systems and building elements including:

- Building structure;
- Interiors;
- Building Envelope;
- Mechanical and electrical systems;
- Site work; and
- Demolitions as required to facilitate the above.

In addition, the Government of Canada is committed to becoming a leader in climate change resolution and overall sustainability. In response to priorities set out in the Federal Sustainability Development Strategy (FSDS) 2016-2019 and the TBS Greening Government Strategy 2017, PWGSC has recently released its Real Property Sustainable Development and Environmental Strategy (RPSDES) 2018. The Strategy identifies long-term strategic goals that explicitly address sustainability and demonstrates the long-term sustainable future for real property.

As part of the modernization of the asset and given the recent roll-out of enhanced greening initiatives for federal buildings, and in accordance with the **goals of Canada's Federal Sustainable Development Strategy, Treasury Board's Greening Government Strategy (TB GGS, 2017), and Real Property's Sustainable Development and Environment Strategy (PSPC RP SDES 2018)**, the rehabilitation of 875 Heron has been identified as a candidate for demonstrating opportunities for enhanced sustainability performance and investments in clean technologies. The 875 Heron Road Rehabilitation Project will therefore lead by example and head innovative solutions that effectuate real change and reduce carbon dependencies. The Project has been identified by PWGSC as a flagship to achieve a higher benchmark for sustainability, as one that promotes social livability, an improved work environment, and short and long-term

efficiencies founded in good building science, as well as sound economic life-cycle values. Sustainability is to be integrated as an overarching driver to connect and advance innovative strategies.

As a result, the scope of this Project includes improvements in building performance over and above current minimum standards of LEED Gold sustainability (RPSF, 2015), and sustainability opportunities explored will not be confined or limited to those identified under any specified tool and/or performance level. In addition, resilient and adaptable design will support an understanding of change drivers, strong and weak signals for the development of credible foresight/futurism in the design of 875 Heron Road, inclusive of reducing vulnerability to outside forces/events and future-proofing for localized climate change impacts and anticipated community growth.

The minimum performance objectives for the Project include:

- Compliance with Technical Reference for Office Building Design, 2017;
- Meeting and exceeding where noted, minimum commitments identified in Real Property Sustainability Framework, 2015;
- Alignment with priorities identified in Real Property Sustainable Development and Environmental Strategy, 2018;
- Meeting/certifying to LEED V4 Platinum, or equivalent;
- Reducing the carbon emissions to as close to Carbon Neutral-ready as possible, excluding the use of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to offset the GHG emitted related to the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included;
- Achieving an energy performance that exceeds the National Energy Code for Buildings, 2011 baseline building performance by a minimum of 74%;
- Reducing GHG emissions by a minimum of 100% compared to 2005-2006 emissions;
- WELL Certification Silver or higher, or equivalent; and
- Compliance with GCWorkplace Fit-Up Standard.

#### 4.2 Feasibility Report Preliminary Design Features

A feasibility report (FR) was prepared in 2017 to identify the extent of required rehabilitation and Class D costs. The FR builds upon analysis contained in the 2014 Building Condition Report/Asset Management Plan, and evaluated options for the complex under two general scenarios:

1. Rehabilitating the existing building; or
2. Demolishing the existing building and reconstructing a new building of similar size.

The FR confirms the poor condition of the asset but does recommend it is retained and rehabilitated, rather than demolished and rebuilt. This conclusion reflects the overall good condition of base building structures, and the fact that this strategy would be less costly than redevelopment, as well as more environmentally conscious. Retention would also retain heritage elements and the building's prominent placement within Confederation Heights.

The facilities at 875 Heron Road will be redeveloped to meet balanced sustainability performance and heritage conservation requirements in accordance with the FR recommended option **"Option 1C – Balanced Sustainability"**. The project team will explore innovative and contemporary methods to maximize the environmental performance of the existing building while preserving its heritage character.

To achieve this objective, including reductions of GHG and energy consumption, as well as, supporting social livability,

ecosystem health and restoration, optimal performance for water and waste, occupant health and wellness, and social health and wellness, the FR outlined the following design features. These design features are preliminary and are provided for information purposes only. The TA will be expected to develop its own solutions to meet the aforementioned objectives, which may or may not include the following:

#### 4.2.1 Site

- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles;
- Locate PV arrays on-site to the south of the existing building and to the far east of the site;
- Plant groundcovers and meadows suitable for PV systems as the surfacing under the array;
- Reduce parking areas to reflect a long-term sustainable strategy, which aims to promote active and public transportation methods and minimize individual parking requirements;
- Promote site circulation that emphasizes active mobility, creating complete streets and multi-use pathways (MUPs), in alignment and in coordination with all NCC and City of Ottawa plans;
- Introduce community gardens for building occupants or others to support local food growth;
- Promote passive and active outdoor activity areas of activity and health (i.e. yoga, volleyball, basketball, jogging, walking, birdwatching, etc.);
- Favour planting that supports pollinators;
- Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site;
- Reforest portions of the existing site to reduce maintenance and support biodiversity. This may be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions;
- Introduce indigenous planting for new planting that requires no irrigation. This reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility;
- Improve and introduce new connections to the bicycle path and transit network and to the community in general to encourage the use of alternate modes of transport thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade;
- Facilitate wayfinding by including clear signage as defined by the Federal Identity Program Manual; and
- Increase bike parking to exceed LEED requirements by 10%. This will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking could be added in the basement, or alternatively, a separate enclosed exterior bike shelter could be considered.

#### 4.2.2 Water, Wastewater & Stormwater

- Reduce energy consumed to produce potable water through the reduction of potable water consumption by 50% for transport of waste by introducing low-flow fixtures combined with rain water collection in a cistern and treatment of grey water on-site;
- Introduce a living machine to treat black water into potable water. Potable water loop feeds building from living machine and the building would draw almost no potable water from off-site. This design feature requires further study by a Civil Engineer;
- Manage stormwater on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as reduce the financial and environmental cost to the community;

- Implement a stormwater management strategy and plan that would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community;
- Repave the existing parking areas with low-albedo permeable paving to allow stormwater to recharge the local water table and reduce the heat island effect;
- Eliminate irrigation with the exception of non-potable water for use in the planting establishment period and in extreme drought conditions. This reduces the potable water consumed locally and reduces the energy consumed to purify water at the treatment facility; and
- Introduce advanced water metering.

#### 4.2.3 Envelope

- Increase existing building envelope thermal resistance value of the walls to Wall R50. Replace roofing systems (end of service life) with a thermal resistance value of Roof R30. Improve wall composition from the interior to avoid impacting the existing exterior cladding (heritage character defining element) of the building. Existing effective thermal resistance values are estimated at R9.51 (Headquarters) or R16.42 (Data Centre) for walls and R31 for the roofs. It is important to note that effective R-values take into account the effect of thermal bridging of the existing design;
- Replace existing windows with a high performance curtain wall system complete with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing; and
- Improve air tightness with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the system's thermal resistance.

#### 4.2.4 Lighting

- Replace the existing lighting (end of service life) with LED lighting tied to motion and daylight sensors, dramatically reducing the amount of energy consumed. Reduce the amount of light provided by the fixtures and the energy consumed with dimmable fixtures with daylight sensors. Add controls to limit their light activation when a space is unoccupied further enhances the efficiency of the system; and
- Tie lighting systems metering to Smart building to help building operators understand where energy loads are being used, allowing for better control and offering opportunities for reduction.

#### 4.2.5 Heating, Ventilation and Cooling

- Introduce geothermal heat exchange system to achieve maximum reductions to energy consumption;
- Provide fresh air to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose;
- Introduce energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility; \
- Recover heat using fan coils from equipment rooms;
- Reduce energy consumption related to air transportation throughout the building by introducing low-velocity ventilation systems;
- Provide carbon dioxide sensors to ensure an optimal level of indoor air quality is provided to the building occupants;

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- Provide economizer mode on dampers to control fresh air intake;
  - Provide reduction in energy consumption using more efficient motors;
  - Provide an induction system with VAV for central zones;
  - Introduce hot and chilled water networks with variable flow using variable speed pumps and two-way valves. Low velocity piping for improved distribution energy efficiency;
  - Provide variable speed fans as an opportunity to reduce energy consumption when demand is less; and
  - Retain existing overhangs and side fins to offer solar shading during the summer to reduce cooling loads and associated energy consumption.

#### 4.2.7 Materials

- Promote natural materials over synthetic;
- Promote phase-change material to act as thermal mass, storing and radiating energy;
- Require a minimum of 90% of the Project construction waste be diverted from the landfill as part of the construction waste management plan;
- Use low VOC, high recycled content, locally manufactured products as part of the Project; and
- Inform and reduce the life-cycle environmental impacts from design/material choices, functional and operational uses through the use of Life Cycle Assessments and environmental product declarations to exceed industry norm by 20%.

#### 4.2.8 Indoor Environmental Quality

- Provide humidification using living walls;
- Introduce nature themes and planting in the building using biophilic design, which can be achieved by providing natural light, views to the exterior/nature, adding plants, introducing natural materials, providing images of nature and water features;
- Reduce, eliminate, or prevent pollution at the construction site and the building when completed as part of the pollution control plan; and
- Remove or reduce pollutants (VOCs and other particulate matter) within the building by air flushing & testing at the end of construction, and prior to occupancy. Air flushing forces air through a building to improve indoor air quality for building occupants.

#### 4.2.9 Health and Wellness

- Provide elevator controls limited to every second floor, requiring the occupants to use the stairs;
- Promote the use of stairs by making them more inviting to use;
- Meet or exceed accessibility standards;
- Introduce kinetic art to illustrate the environmental performance of the building in an effort to engage the building occupants to be sensitive and conscious of their energy use, as well as, their health and wellness;
- Conduct tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address issues to improve occupant health and wellness; and
- Integrate health and wellness design strategies to enhance social livability and create highly productive, healthy and comfortable environments within indoor and outdoor spaces that encourage social interaction, active living and nurture the human/nature connection.

#### 4.2.10 Energy

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- Recover lost energy using regenerative elevator motors and allowing the motor to essentially act as a generator during periods of low load;
- Introduce energy creating stairs. Kinetic energy recovery systems have been developed to generate energy when stepped on;
- Enhance zoning to allow different operating times for specific zones (i.e. call centre);
- Introduce sensors to shut off systems in unoccupied areas/workstations; and
- Feedback software to notify occupants of systems running at their vacant workstation offering to shut them down.

#### 4.2.11 Commissioning

- Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.

#### 4.2.12 Workspace

- Incorporate GC Workplace Fit-Up Standards design into workspace. The final solution for workspace is expected to result in space utilization (space per full-time equivalent) that exceeds the GC Workplace Fit-Up Standards. The PWGSC Technical Reference for Office Building Design Standard outlines all federal, codes, standards and best practices expected for this project. Its application is fundamental to ensuring an outcome that is in alignment with **PSPC Real Property's mandated role, responsibility and commitments as a custodian** and steward of federal office building assets; and
- Improve comfort and user experience of occupants in a responsive, intelligent, and flexible environment through SMART building, user-centric technologies that drives connectivity and productivity, enhancing space utilization and occupant engagement in addition to operational efficiency.

### PD 5 OPTIONAL PROJECT SCOPE

PWGSC has obtained approval to deliver the Project as a DBF, but there is indication from preliminary analysis that a Design-Build-Finance-Maintain (DBFM) may generate greater Value-for-Money. PWGSC is therefore considering the inclusion of long-term financing and Facilities Management in the Project Scope, subject to obtaining necessary approvals, as well as a more in-depth Value-for-Money analysis by the Financial Advisor based on refined cost estimates and other qualitative considerations generated by the TA.

Inclusion of these optional Scope elements would necessitate additional services from the TA, which are described in more detail in section OS 1-6.

### PD 6 CONSTRUCTION IMPLEMENTATION STRATEGY

The Project approval received for the Project was based on vacating and renovating one tower at a time (referred to as the **'two-stage construction implementation strategy'**) as a result of the limited availability of existing swing spaces to accommodate all occupants of 875 Heron Road. The Schematic Design, the Class C estimate and estimated schedule should reflect this strategy.

However, a market-sounding study conducted in March 2019 by Ernst and Young, it is recognized that a construction **implementation strategy where both towers are vacated and rehabilitated simultaneously (referred to as the 'one-stage construction implementation strategy')** may result in significant Project schedule and budget benefit to the Crown. As such, the TA shall also examine this strategy and prepare a second Class C estimate and schedule reflective of the one-stage construction implementation strategy. The Class C estimates for both scenarios should take into consideration, at a minimum:

- a. The economy of scale of implementing the work in a one-stage construction implementation strategy;
- b. The required level of effort for the separation of the construction zone from the occupied areas in the two-stage construction implementation strategy;
- c. The cost of leased spaces;
- d. The cost of annual inflation as it relates to construction;
- e. Possible limitations/required staging of construction activities; and
- f. Soft costs for each strategy.

The TA shall provide a technical recommendation on which construction implementation strategy should be implemented based on the comparison of estimated budget and schedule but also taking into consideration the following aspects:

- a. Impact on CRA operations;
- b. The possible health and safety exposure to building occupants in the two-stage construction implementation strategy;
- c. Benefits of each strategy to the P3 Consortium.

The recommendation and cost estimates will be provided to the FA, who will in turn conduct a Value-for-Money (VfM) analysis as part of the Procurement Options Analysis. The completed Procurement Options Analysis will allow PWGSC to seek an amended project and expenditure approval. Following the amended approval, all documentation, drawings, specifications, supporting background information, etc. produced by the TA shall reflect the approved construction implementation strategy.

## PD 7 PROJECT CHALLENGES

### 7.1 Accuracy of Cost Estimates

Effective cost estimating is of prime importance and shall be provided by a professional cost estimator – a professional who, by training and experience, provides expert advice on construction costs as well as Facility Management and maintenance – who is to be a member of the TA Team.

The cost estimates shall be produced in elemental cost analysis format. The standard of acceptance for this format is the current issue of the elemental cost analysis format issued by the Canadian Institute of Quantity Surveyors and the **estimates will be developed in accordance with the PPP Canada's Schematic Design Estimate Guide (SDEG)**, see Appendix H.

### 7.2 Federal Heritage Buildings Review Office (FHBRO) and National Capital Commission (NCC) Approvals

The Schematic Design of 875 Heron Road will require coordination and approval with both the Federal Heritage Buildings Review Office (FHBRO) and the National Capital Commission (NCC). This lengthy process, approximately 130 business days from beginning to end, requires several submissions, letters, presentations and committee approvals. PWGSC has initiated dialogue with both these agencies in advance of this RFP. The TA will provide



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support to PWGSC to obtain these approvals.

In order to initiate the FHBRO/NCC process, the first iteration of Schematic Design must be provided as part of the submission. At the end of the process, the signed approval letter with conditions must be incorporated into the final iteration of Schematic Design. To maintain the Project schedule in section PD 1.2, the TA will be challenged to complete the first iteration of Schematic Design and provide Class C estimates within 120 business days of award.

### 7.3 Heritage and Sustainability Balance

In accordance with the goals of **Canada's Federal Sustainable Development Strategy, Treasury Board's Greening Government Strategy (TB GGS, 2017), and Real Property's Sustainable Development and Environment Strategy (PSPC RP SDES 2018)**, the rehabilitation of the Facility was identified as a key opportunity to implement enhanced sustainability performance and investments in clean technologies. Given that the 875 Heron Rehabilitation Project **also involves the rehabilitation of a 'Recognized' Federal Heritage Building, a balance between heritage and sustainability will drive design decisions in this Project.** For alterations, changes of use, or other interventions to **'Recognized' Federal Heritage Buildings that could affect heritage character, appropriate conservation advice is required.** This advice is to be obtained from conservation experts and sustainability experts for proper sustainable integration.

### 7.4 Designated Substances

The Facility contains significant presence of asbestos and other designated substances. The removal of asbestos and other designated substances is a significant and important element of the Project design, demolition and construction while the building continues to be occupied if a two-stage construction implementation strategy remains as the approved construction implementations strategy. Additional considerations will need to be designed to ensure safety of the occupants.

### 7.5 Confederation Heights Master Plan

The Confederation Heights Master Plan and the Project will be running as parallel projects. Elements of each project may influence the other. The TA should take into consideration the Master Plan recommended option for the development of the 875 Heron Schematic Design and PSOS.

### 7.6 Maintenance Option, Construction Implementation Strategy and Project/Expenditure Approval Amendment

As described in sections PD 5 and PD 6, the Project approval received for the 875 Heron Road Rehabilitation Project was **based on vacating and renovating one tower at a time (referred to as the 'two-stage construction implementation strategy')** as a result of the limited availability of existing swing spaces to accommodate all the occupants of 875 Heron Road. Following a market-sounding conducted in March 2019 by Ernst and Young, it is recognized that a construction **strategy where both towers are vacated and rehabilitated simultaneously (referred to as the 'one-stage construction implementation strategy')** may result in significant Project schedule and budget benefits to the Crown. Further, as described in SI1, the same market-sounding identified a DBFM model would yield better Value-for-Money (VfM) to the Crown.

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In order for the Financial Advisor to complete a full VfM analysis, the first iteration of Schematic Design, class C estimates and schedule must be complete for both the two-stage construction implementation strategy and one-stage construction implementation strategy. The TA will be challenged to complete the first iteration of Schematic Design within 120 business days of award. The one-stage construction implementation strategy, Phase III, Phase IV, and maintenance option cannot be exercised until Project and Expenditure amendment approval is received.

## REQUIRED SERVICES

### RS GA GENERAL AND ADMINISTRATIVE

The TA Team will work interactively with PWGSC's internal and external consultants and stakeholders, including representatives of the CRA, to facilitate the delivery of this 875 Heron Road Rehabilitation Project through the approved P3 delivery model.

The TA is responsible for the delivery of the following services:

1. Coordinate and be responsible for Work or services throughout the duration of the Contract;
2. Employ Project Management Institute principles for, but not limited to: integration management, scope management, schedule management, cost management, quality management, resource management, communications management, risk management, procurement management, stakeholder management, claims management, health/safety/security/environmental management, and financial management throughout the Contract period;
3. Maintain full and open communication among the members of the TA Team throughout the life of the Contract. Ensure clear, accurate and ongoing communication with PWGSC as it relates to the responsibilities of the TA Team in fulfilling Required Services. Ensure the TA Team effectively shares information and works in the spirit of collaboration with the PWGSC Departmental Representative, other PWGSC representatives, CRA representatives and other stakeholders and parties engaged by Canada;
4. Apply a continual risk management program in the delivery of services throughout the Contract period. The TA is required to support the PWGSC Departmental Representative in identifying risks throughout the Project life cycle, and to develop and manage the risk management process/plan as per the requirements of the Federal National Project Management System described at: <https://www.tpsqc-PWGSC.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/risque-risk/index-eng.html>;

Maintain, organize and store information on a sharing server, provided by PWGSC, such that internal and external Project stakeholder members will have access to via any network. Manage permission settings to share with external parties. The sharing server will allow for collaborative editing of the PSOS.

The TA is expected to provide the resources and office accommodations space necessary to support the TA Team and, as necessary on occasion, other stakeholders for which the TA Team must engage with to deliver the Required Services as described in this Project Brief. The intent is to foster a collaborative and cohesive working environment.

#### GA.1 Project Phasing

The Work is expected to be generally structured into four phases:

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Phase I - Pre-Procurement

Phase II - P3 Consortium Procurement

Phase III - Design & Construction

Phase IV - Post-Construction

**The TA Team's Required Services and the timing of deliverables will be determined in conjunction with PWGSC's team.** A description of the anticipated scope, deliverables and services for each phase is available in sections RS and OS.

#### GA.2 PWGSC Governance

Project governance arrangements will be put in place to support the delivery of the Project. Senior review committees will be established at the Assistant Deputy Minister, Director General and Director levels. The governance will be maintained to leverage expertise, knowledge and mandate governmental stakeholders to ensure success of the Work and the Project. The established governance ensures a clear chain of command, timely decision and efficient coordination. The TA will be required to provide support where necessary to facilitate the preparation of supporting material, or on occasion, attend presentations as either an observer or co-presenter.

#### GA.3 Integrated Project Management Team Communication

The PWGSC Departmental Representative, and designated PWGSC representatives, will act as liaison between the TA, government representatives and other third parties as required. PWGSC will be engaging a Financial Advisor, Fairness Monitor and other third parties to deliver the Project. Justice Canada will also provide legal support. The TA Team will be required to communicate with other internal/external stakeholders which will primarily **be done in conjunction with the PWGSC's Departmental Representative.**

#### GA.4 Communication with the Media and the Public

The members of the TA Team will be required to sign a non-disclosure agreement. The TA shall not respond to requests for Project-related information or questions from the media. Such inquiries are to be directed to the PWGSC Departmental Representative. The TA shall not communicate any information on the Project with any individual of the public that is not a member of PWGSC, the TA Team or any individual that has not signed a non-disclosure agreement in relation to the Project.

#### GA.5 Service Response Time

It is a requirement that the TA Team be available to respond to inquiries as soon as possible and no later than within two (2) business days.

#### GA.6 Meetings

The TA is expected to work interactively with PWGSC and its internal and external advisors. The TA is expected to attend and/or lead bi-weekly meetings as required to assist PWGSC in the pre-procurement, procurement, design

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and construction and post-construction of the Project. Such meetings may include amongst others:

1. Planning and design meetings;
2. Information sessions for stakeholders;
3. Internal and external stakeholder engagement sessions;
4. Proponent meetings;
5. Proponent design feedback meetings;
6. Commercially confidential meetings;
7. Proponent evaluation meetings;
8. Project meetings;
9. Design compliance meetings; and
10. Commissioning, completion and occupancy meetings.

The TA will be expected to record and distribute, within two business days, the minutes of all meetings. Meetings will be held within the National Capital Region.

The typical frequency of Project meetings is anticipated to be bi-weekly; however, meetings should be held in accordance with approved Project schedules to deliver the Required Services. Meetings should occur between 9am and 5pm Eastern Standard Time. It is a requirement that the Key Personnel and other required personnel be available to attend meetings in person within the National Capital Region, as required or as requested by the PWGSC Departmental Representative. The use of conference calls will be addressed on a case-by-case basis as authorized by the PWGSC Departmental Representative.

#### GA.7 Administrative Services

The TA will provide administrative services to support the TA activities. It is the responsibility of the TA to monitor the performance of the administrative services.

#### GA.8 Deliverables

The TA will be required to maintain electronic copies of all draft and final Works and deliverables and native files on the sharing server. The PWGSC Departmental Representative may request, where reasonable, additional hard copies of final deliverables, printed and assembled by the TA, as required, at no additional cost to PWGSC. Deliverables and submissions may include, but are not limited to, specifications, reports, summaries, drawings, studies, plans, tests, simulations, design works. The TA must ensure that documents, including drawings and specifications, comply with the requirements set out in the most recent PWGSC standards included in Appendix D. All produced Works will become property of Canada for future use by Canada.

#### GA.9 TA Team Functions and Expertise

The TA Team for this Project should have experience working as a team member of a Public-Private Partnership

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and should possess the qualifications, experience and capability to provide the Required Services and Optional Services. PWGSC anticipates that the following functions and expertise, at a minimum, will be necessary to effectively deliver the Project:

Administrative services, archeological services, architecture, art, audio-visual, civil engineering, commissioning, cost control, cost estimation services, designated substances, ecology, electrical engineering, energy modeling, environmental engineering, environmental psychology, Facility Management, futurology, geo-environmental services, geotechnical engineering, geothermal engineering, health and safety, heritage and conservation, interior design, IP networking, landscape architect, LEED certification, lighting design, mechanical engineering, noise and vibration, P3 procurement, project controls, project management, quality assurance and control, risk management, security, smart building technology, stakeholder engagement, stormwater management, structural engineering, sustainability, systems/IT integration, traffic engineering, urban design, urban planning, utilities engineering, wayfinding/signage, and WELL certification.

The Proponent should ensure sufficient resources are assigned to the Project to perform the Required Services and Optional Services. The TA will be required to provide the expertise of the TA Team as necessary for the duration of the contract.

## RS 1 PHASE I – PRE-PROCUREMENT

### 1.1 Overview

In Phase I, the TA Team is expected to collaborate with PWGSC and its internal and external stakeholders in order to:

1. Collect and review existing Project documentation;
2. Conduct technical studies;
3. Develop Schematic Design and Class C cost estimates;
4. Support the development of the Procurement Options Analysis (POA) conducted by the Financial Advisor;
5. Coordinate National Capital Commission and Federal Heritage Building Review Office approvals; and
6. Develop Project Specific Output Specifications and other Project Agreement schedules.

Timelines for the provision of one or more of the deliverables identified above may extend into Phase 2.

### 1.2 Collect and Review Existing Project Documentation

The TA Team will review all existing information and studies completed on the Project. For a list of existing Project documentation, refer to section PD 3, inclusive of a list of studies currently being conducted by PWGSC.

### 1.3 Conduct Technical Investigations

The TA Team will make recommendations of additional studies required to decrease **PWGSC's** risk exposure. Additional recommended studies should be used to enhance the Project Agreement schedules in the P3 Consortium RFP. If PWGSC agrees that additional studies are required, the TA will perform the studies.

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The TA will be responsible for completing the following studies, at a minimum, in order to support the development of the Schematic Design, PSOS and PA schedules of the P3 Consortium RFP.

#### 1.3.1 875 Heron Road CRA Functional Program Update

PWGSC has commissioned an update to the existing CRA functional program, which will be made available to the TA upon award of contract. To the extent needed to supplement the information provided in the Functional Program Report, the TA shall **initiate and lead consultation meetings with PWGSC's group of functional experts and CRA representatives** to ensure the TA has a full understanding of the functional requirements.

#### 1.3.2 Tree and Invasive Species Inventory

The tree inventory study will consist of recording species, size, and condition of trees on the site, evaluating the impact of proposed construction and providing information and specifications to assist with tree preservation.

The invasive species inventory study will determine which (if any) invasive species are present on the site. The study will list the species, risk category, and any possible mitigation measures to limit the adverse effects of the species on surrounding native growth.

#### 1.3.3 Species at Risk Study

The species at risk study will consist of determining which endangered species currently use or contain habitats on the land and creating recovery and management plans to protect such species. This study will conform to the Ontario Ministry of the Environment Environmental Site Assessment requirements pertaining to areas of natural significance that may include endangered species.

#### 1.3.4 Site Circulation Study

The site circulation study will examine the functional and operational viability of the existing exterior circulation systems that support the building and site. Site specific considerations include: access to transit stations, universal accessibility, road/pathway networks, complete streets, active transportation routes and supportive infrastructure, connectivity within the site and with adjacent sites/buildings and surrounding urban fabric, wayfinding/orientation (including regulatory, directional, and information signs), pick-up/drop-off points, traffic impact, and transportation demand management strategies to manage multi-modal transportation.

Specific considerations will be given to the following modes:

- Pedestrians: walking distances/times to destination points (including public transit stations), pedestrian infrastructure (i.e. pathways (including desire paths), crossings, sidewalks), safety;
- Cyclists: bicycle access/egress, access to public transit stations, cyclist infrastructure (i.e. crossings, bike lanes), safety, storage areas;
- Public vehicles: routes, networks, shipping/receiving areas, infrastructure (i.e. transit stations), site lines; and

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- Private vehicles: road network, parking facilities.

Aspects that clearly need to be shown are ones that facilitate a safe, healthy and secure environment whereby circulation requirements, including vehicular parking and drop-off areas, are met for the following:

- 1) Employees
- 2) Visitors / General Public
- 3) Service Delivery
- 4) Emergency – fire, ambulance
- 5) Security
- 6) Public Transit
- 7) Waste Management
- 8) Snow Ploughs;
- 9) Material Handling
- 10) Construction

Pedestrian traffic systems including having safe universally accessible crossings, drop off /waiting zones and bus stops for the following:

- 1) Employees
- 2) Visitors /General Public
- 3) Operations
- 4) Security personnel

The objective is to integrate and balance all areas of the site holistically to maintain a fully functioning, operating site that fits within the urban fabric of the surrounding neighbourhood, the streetscapes and the site itself. The design of the circulation for the site must be in alignment and in coordination with existing NCC and City of Ottawa plans. It is to meet all of PWGSC codes, standards and best practices. Areas that must be considered at a minimum are:

- 1) Operations
- 2) Sustainability (Social, Economic and Environmental)
- 3) Transportation Demand Management
- 4) Active mobility
- 5) Health, Safety and Security
- 6) Universal Accessibility
- 7) Wayfinding and Orientation
- 8) Sightlines
- 9) Destination Points
- 10) Pick-up / Drop-off Points
- 11) Sense of Place / Experience
- 12) Aesthetics

This study will allow for a greater **understanding of the site's current circulation conditions and user experience** to produce recommendations for the site that can better support the functional, operational, health, and safety needs

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for all users. The study will assist in the development of the Schematic Design and Project Agreement ensuring that transportation demand management is achieved.

### 1.3.5 Geothermal Investigation

A geothermal study will determine the feasibility of geothermal energy production for the Project. The study will also review the different types of geo-exchange system that could be used, such as closed loop (horizontal, vertical and pond/lake) or open loop. As part of the study, the TA will review the site conditions and determine the location and depth of the systems. Based on the energy demand of the building, the TA will demonstrate that the systems can handle peak loads and determine the economic viability of three preferred options.

### 1.3.7 Preliminary Sustainable Development Strategy Outline

The preliminary sustainable development strategy outline will confirm sustainability priorities, objectives, and required credits, and additional performance targets for the PSOS based on the other support studies, and alignment with Government of Canada priorities and objectives. Government of Canada sustainability policies should be referenced to contextualize strategies and align Project requirements with Government of Canada priorities overall. This includes the Federal Sustainability Development Strategy (FSDS) 2016-2019 (and updated 2019-2022 version), Real Property Sustainable Development and Environmental Strategy (RP SDES, 2018); and the Treasury Board Greening Government Strategy (TB GGS, 2017), and its corresponding Real Property Guidance (TB GGS RPG, 2019). This will assist in identifying feasible sustainable design opportunities and strategies, which will align with the **Project's** sustainability objectives as well as the latest Government of Canada policies.

The preliminary sustainable development strategy outline should not be limited by or to credits/measures identified in the chosen rating tool(s). These performance assessment and rating tools are guides to verify an industry recognized level of performance, but it should not define the sustainable design. The TA must balance the requirements of said rating systems with other sustainability objectives to ensure pragmatic recommendations supportive of a sustainable strategy best suited for this Project and site.

Sustainability is to be integrated as an overarching driver to connect and advance innovative strategies at both the building and site scale. The strategies will enable applicable Departmental and Government-wide FSDS commitments to be met or exceeded. The outline must demonstrate a realistic, timely and life-cycle approach, integrating best practices that support innovative sustainable and low carbon solutions for smarter, healthier and more productive workplaces; and adaptive, restorative, and regenerative design solutions that will improve and enhance ecological integrity, while supporting mutually beneficial relationships between human and natural systems.

### 1.3.8 Subsurface Utility Engineering, Utility Capacity Study & Power-Load Investigation

The TA will be required to conduct a SUE investigation to Quality Level B as per ASCE 38-02.

The TA must confirm that the capacity of the existing water supply is sufficient to supply the site, as per the requirements of the Schematic Design. The TA must also confirm the capacity to outlet to sanitary and storm sewer municipally-owned infrastructure in consultation with the City of Ottawa. The TA shall analyze the availability and capacity of utilities including hydro, natural gas, communications (fiber-optic) and any other required services, as per the requirements of the Schematic Design. The TA will develop a site servicing plan as part of the study.



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With respect to power, the TA must estimate the required load calculations for the rehabilitated building. They will have to outline options for connectivity from **the rehabilitated building via ducts to Hydro One's exterior vault. If there is insufficient capacity in the existing primary transformers, the TA will have to seek Hydro One's or Hydro Ottawa's approval, as applicable, to integrate new high voltage concept designs in their recommended options.**

### 1.3.9 Site Development Guidance Document

The TA shall also prepare a Site Development Guidance Document for the use of the P3 RFP that outlines the recommendations, existing site data and completed studies, as well as **the City of Ottawa's procedure and timelines to apply and obtain a Development Permit, including approximate costs.** The Guidance Document shall also provide an **outline of each municipal or private utility provider's contacts, procedures, and timelines** for requesting utility service to the site and utility relocation requests, including approximate costs.

### 1.4 Schematic Design and Class C Cost Estimates

The TA shall develop Schematic Designs as per the requirements of sections PD 1 – 7.

The Schematic Design is intended to be the primary input to the development of the PSOS and obtaining NCC/FHBRO approvals.

The Schematic Design drawings should include, but not limited to:

- a. Proposed Floor plans;
- b. Decommissioning Plans;
- c. Sections;
- d. Elevations;
- e. Structural plans, sections and details;
- f. Electrical plans including equipment locations, sizes, single line diagrams and lighting layouts;
- g. Mechanical floor plans, including equipment layouts, sizing and routing of feeds and associated shafts and risers;
- h. Details of the proposed upgrades/modifications to the building envelope;
- i. Conservation and re-incorporation of heritage character defining elements;
- j. Construction zoning and isolation plans related to Designated Substances and CRA occupied/operated spaces in a two-stage construction implementation strategy;
- k. Site plans inclusive of parking, connectivity, landscaping, exterior lighting, sustainability features, security zoning, utilities, and land area for future expansion. Layout plans should be provided with cross sections and elevations;
- l. Furniture layouts; and
- m. Interior and exterior 3D renderings.

The Schematic Design produced by the TA Team should be developed to a 30% level of design to enable a Class C cost estimate. The first iteration of Schematic Design and Class C estimates are to be prepared and submitted within 120 business days of Contract award.

In preparing the Schematic Design, the TA Team is required to make assumptions, based on its professional design expertise and its knowledge of industry best practices, on the types of building systems appropriate to the Facility including the impact of architectural, structural, mechanical and electrical components on the program layout (e.g. electrical rooms, IT hub rooms, FM spaces). The TA Team may be required to produce enhanced schematic drawings

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of certain limited building areas where specialized layout, furnishings, fixtures or equipment, adjacencies, components or finishes may be critical to CRA and need to be illustrated to the P3 Consortium Proponents.

The Schematic Design should expand on the Functional Program Report to achieve the following:

- a. Identify operational assumptions, and planning and design principles (such as component organization, a proximity matrix, circulation systems, and security);
- b. Illustrate functional and spatial relationships;
- c. Enable the building and site program to be tested to ensure that the program with all its intended spatial and programming relationships can be physically achieved;
- d. Provide a sufficient level of detail for exterior elevations to inform stakeholder groups concerned with the external appearance and interface impacts of the future Facility;
- e. Demonstrate that a massing concept can function within the gross facility area allowance; and
- f. Serve as the initial step towards the production of the design and Facilities Management Output Specifications (FMOS), and allow design impacts on the building and site program to be uncovered in the block diagram stage prior to approval of the recommended program.

The TA will prepare a Schematic Design for the Facility to develop, test and refine the PSOS. The Schematic Design is expected to consist of partial schematic documents including a layout plan incorporating scaled and colour-coded diagrams to identify and differentiate all program areas, roadways, parking, loading dock, primary circulation patterns, service spaces, entrances and exits, and other defining elements as required. Plans should include a layout of each floor plate showing each discrete functional space and building elevations to illustrate theoretical massing. Narratives should be included to explain the blocking and massing concepts and assumptions. The text and diagrams together should permit a full understanding of the schemes.

The TA will also be required to prepare 2D and 3D renders, graphics, fly-through videos and other promotional materials of **Facility's** interior and exterior, showcasing the beautification and enhanced functionality of the rehabilitated spaces, sustainability features and exterior landscape.

The TA Team will allow for a minimum of 2-week review and input by PWGSC on all draft documents and revision to satisfy those reviews at each stage.

With regards to the Class C estimate, the TA will be required to:

- a. Review the design parameters and the initial functional space program and provide design and specification information to permit the development of a refined cost estimate (including capital, maintenance and lifecycle components) for the Facility by a cost estimator;
- b. Ensure the level of classification required for the capital cost estimate will be Class C (approximately -15% to +20% and based on Schematic Design);
- c. If the estimate exceeds the PWGSC budget, the TA may be required to make adjustments to the specifications and **functional space program, in consultation with PWGSC, to reduce the estimated cost to within PWGSC's budget.**

The TA must also be familiar with the costing information available and/or required for financial planning as well as to be able **to develop and provide such information if requested. Financial plans are typically presented as a "pro forma"** for all-inclusive Project costs which typically include:

- a. Hard Project costs (construction and land costs);
- b. Soft Project costs (such as professional fees, realtor fees);
- c. Market revenue analysis;
- d. Facility management fees;

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- e. Lifecycle costs;
- f. Contingencies and risk allowances;
- g. Escalations; and
- h. Applicable taxes and other fees.

The TA will provide cost estimates as requested for recommended content input for decision documents for Treasury Board Submissions, Memorandums to Cabinet, Procurement Options Analysis and Business Cases, and other various purposes.

#### 1.5 Financial Advisor Procurement Options Analysis Support

The TA Team will support PWGSC during the development of the Procurement Option Analysis by providing professional opinions on various risks (e.g., environmental, design development, site conditions). The TA Team will provide input to the risk matrix and participate in the risk and efficiencies workshops to be organized by PWGSC. This includes Project elements and risks related to Facility Management.

Financial plans are to provide all-inclusive, broken-down Project costs free of embedded contingencies with cash flows based on the recommended planned schedule. The TA will be required to work with the Financial Advisor that will be hired by PWGSC to develop the complete financial analysis.

#### 1.6 National Capital Commission and Federal Heritage Building Review Office Project Approvals

It is expected that the Project will require approval from the NCC as well as from FHBRO at various stages of the Project. The TA is to support the PWGSC Department Representative at these stages.

The Schematic Design will require coordination with both the Federal Heritage Buildings Review Office (FHBRO) and the National Capital Commission (NCC). PWGSC has developed a roadmap of the process, which is estimated to take approximately 130 business days from beginning to end and requires several submissions, letters, presentations and committee approvals. PWGSC has initiated dialogue with both of these agencies in advance of this RFP. The TA will provide support to PWGSC to obtain these approvals. In order to initiate the FHBRO/NCC process, the first iteration of Schematic Design must be provided as part of the submission. At the end of the process, the signed approval letter with conditions must be incorporated into the Project Specific Output Specifications and Project Agreement schedules. To maintain the Project schedule in section PD 1.2, the TA will be required to complete the first iteration of Schematic Design within 120 business days of award.

#### 1.7 Project Specific Output Specifications and Other Project Agreement Schedules

**The TA's scope includes developing and producing the** Project Specific Output Specifications for inclusion in the P3 Consortium RFP and Project Agreement.

The technical requirements governing the design, construction and Facility Management of the Facility will be set out in the Project Specific Output Specifications. Through its compliance with the Project Specific Output Specifications prepared by the TA, **the P3 Consortium will be able to design and construct a Facility that meets PWGSC's needs and objectives** with respect to such Facility, including the expectations for functionality, serviceability, reliability and durability established by PWGSC. The Project Specific Output Specifications will be used as a point of reference to

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evaluate the designs and technical submissions submitted by the P3 Consortium Proponents, and the PSOS will be included as a schedule to the Project Agreement.

The Project Specific Output Specifications will allow for lifecycle cost analysis of all major building components and engineered building services.

The TA will be required to prepare the Design Performance Specifications portion of the Project Specific Output Specifications. The Design Performance Specifications should define performance levels for all building systems and **components that are consistent with the final building and site program's specific requirements and support services**, including, but not limited to:

- Site – including roads, pathways, parking, lighting, drainage, landscaping, fencing, etc.;
- Building rooms and components including: loading dock, reception / public access area, offices, support rooms, security and information technology rooms;
- Washrooms and locker rooms, meeting rooms, lunchrooms;
- Physical attributes within spaces;
- All required dimensions within the planned space;
- The physical quality, functionality, capacity, material, durability, serviceability, lifespan, and sustainability requirements of the spaces and contained or contributing components;
- Stormwater;
- Architectural walls, ceilings, floors, doors, glazing, hardware and acoustic control;
- Building envelope;
- Structural capacity and serviceability;
- Ventilation, heating, cooling, humidification, filtering, pressurization, contaminants control, plumbing, controls, including special consideration for the preservation of archival materials;
- Power distribution and quality, lighting, life safety, data, communication and security systems, controls;
- Furniture, equipment, millwork and casework;
- Space templates and space data sheets;
- Sustainable building systems and design; and
- Applicable codes, standards, and guidelines.

The Design Performance Specifications should be consistent with all applicable building codes, standards, guidelines, regulations and other reference documentation as determined by authorities having jurisdiction.

The TA Team will be expected to ensure that Design Performance Specifications maintain and enhance the opportunities for flexibility and adaptability within each component, and allow for current and future best practices for service delivery.

## 1.8 Stakeholder Engagement

**The TA Team's scope includes assisting in or leading user groups** and stakeholder consultations in conjunction with PWGSC, to support the subsequent development of Project Specific Output Specifications and the development approvals process.

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The scope of work includes working closely with PWGSC to schedule, organize and conduct user group and key stakeholder sessions to ensure that requirements are addressed in the Schematic Design, Project Specific Output Specifications and Project Agreement. The TA Team will be expected to incorporate and respond on behalf of PWGSC to feedback generated by engagement activities.

Stakeholder and user groups that will need to be engaged may include, but are not limited to: PWGSC subject matter experts (e.g. real property, security), CRA, Justice Canada, City of Ottawa, Hydro One/Hydro Ottawa (further investigation is required to determine which organization services the site), National Capital Commission, FHBRO and Bell. The user group and stakeholder consultations are intended to ensure an understanding of user and stakeholder functional, operational and design requirements for the Facility.

The TA will be required to participate in information and stakeholder engagement sessions with the general public. This could include participating in open-houses and other events to communicate information on the Project.

### 1.9 Schedule Management

The TA will be required to create and maintain a detailed project master schedule in MS Project that includes all Project activities and milestones. The TA will be expected to advise PWGSC on schedule issues, events, activities or decisions that could impact the **Project's** critical path or schedule as soon as they occur. The schedule is to be updated at minimum at the end of every month and distributed to PWGSC in the first week of the new month. The TA is to highlight any major schedule changes (if any) at those times.

### 1.10 Project Construction Implementation Strategy

The TA will be required to develop an analysis of the one-stage and two-stage construction implementation strategy options for delivering the Project, which, at a minimum, will include: cost estimates, approximate schedule, benefits, challenges and risks for each option outlined in section PD 6.

### 1.11 Permits and Approvals

The TA Team will review all technical reports pertaining to the Site and will obtain additional information as required to develop indicative site and building plans, as well as supporting documents that will be used to:

- i. Demonstrate adherence to all relevant provincial and federal regulations;
- ii. Obtain required federal and provincial permits and approvals;
- iii. Obtain permissions and approvals for non-federally owned utility relocations;
- iv. Acquire municipal approvals, permits and licenses.

To satisfactorily address the approval requirements of the site plan, the supporting documents should:

- i. Outline the purpose and Scope of the Project, including justification, Project alternatives and existing conditions;
- ii. Identify infrastructure and service requirements;
- iii. Identify site-specific constraints;
- iv. Incorporate geotechnical investigation and reports, by a geotechnical engineering consulting firm to supplement, if required, the existing geotechnical information, to determine general geotechnical design parameters and Facility placement on site;
- v. Identify Project activities that may impact environmentally sensitive areas;

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- vi. Identify mitigation measures to be used to reduce impacts;
  - vii. Determine the significance of any residual environmental effects;
  - viii. Identify and incorporate heritage building requirements;
  - ix. Incorporate environmental investigation and reports, by an environmental consulting firm to supplement if required, the existing environmental information, to determine environmental damage mitigation or replacement in sensitive site areas; and
  - x. Develop surveillance and monitoring measures.

## 1.12 Document Preparation

As part of document preparation, the duties of the TA shall include but not necessarily be limited to:

- a. P3 Consortium RFQ Documents: Assist in preparing, reviewing and providing input to the P3 Consortium RFQ documents in conjunction with PWGSC;
- b. P3 Consortium RFP Documents: Assist in preparing, reviewing and providing input to the P3 Consortium RFP documents, including developing proposal requirements, detailed evaluation criteria and evaluation methodology of the design, construction and project management sections for the evaluation, selection and negotiation stages of the P3 Consortium RFP procurement process;
- c. Background Information: Assisting in the preparation and review of background materials, studies and reports of a technical nature (e.g. geotechnical reports, environmental site and risk assessments, seismic assessment, engineering studies, building condition reports, archaeological studies, etc.), as well as population in the electronic data room to support the P3 Consortium procurement process.
- d. Project Agreement: Generating content for sections of and schedules to the Project Agreement including, but not necessarily limited to, the PSOS, performance standards/indicators, site description; design review, design development and construction document submissions; moveable furniture, furnishings and equipment; cash allowance procedure; energy management; quality management; and requirements for commissioning, completion and occupancy processes (this advisory service will primarily involve modifications to the existing template Project Agreement); and addressing Project Agreement issues requiring input from the TA, including attending meetings and drafting text; and
- e. Cash Allowances: Working with PWGSC to identify cash allowances for any Facility elements or systems, furnishings, fixtures and equipment, demolition, construction or decanting procedures or other aspects which cannot be accurately defined in the P3 Consortium RFP at the time of issuance.

## RS 2 PHASE II – P3 CONSORTIUM PROCUREMENT

In Phase II, the TA Team will assist PWGSC throughout the P3 Consortium procurement process with advice and support related to the design and construction of the Project, including:

- a. Preparing responses to questions and information requests from P3 Consortium Proponents for the P3 Consortium RFQ and the RFP;
- b. Assisting with the development of communications;
- c. Participating in technical submission evaluations under the P3 Consortium RFQ and RFP; and
- d. **Advising on the selection of excerpts from the P3 Consortium's proposal to be included in the Project Agreement.**

## 2.1 P3 Consortium Procurement Open-Period

During the P3 Consortium procurement open-period, the duties of the TA are expected to include but may not be limited

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to:

- a. P3 Consortium Proponent Meetings: Participating in meetings with P3 Consortium Proponents including site visits, design presentations and commercially confidential meetings to discuss the design, technical requirements, the PSOS, the Project Agreement and to assist P3 Consortium Proponents in interpreting and understanding the P3 Consortium RFP documents and Project Agreement;
- b. Addenda to P3 Consortium RFQ, RFP and Project Agreement: Providing consultation and advice to PWGSC, as required, regarding addenda to the P3 Consortium RFQ, RFP and Project Agreement resulting from the commercially confidential meetings and requests for information;
- c. P3 Consortium Proponent Request for Information: Assisting PWGSC in the preparation and communication of responses to P3 Consortium Proponent questions throughout the procurement process, including drafting responses to questions relating to design, construction and Facility Management. Support the development of addenda and make any required amendments to specifications based on request for information responses where changes are agreed to; and
- d. Managing and Maintaining the Electronic Data Room: The TA will be required to manage and maintain the electronic data room during the procurement process. This will include, but not necessarily be limited to developing appropriate folder structures, posting/replacing documents, ensuring notifications from the system are sent to appropriate team members and acting as the system administrator to provide required access to team members.

## 2.2 P3 Consortium RFQ and RFP Evaluation

As part of the evaluation process, duties of the TA shall include but may not be limited to:

- a. Assist PWGSC by participating in the evaluation of the P3 Consortium RFQ and RFP submissions: Assisting PWGSC with the technical evaluation of the P3 Consortium RFQ and RFP submissions, including reviewing them for compliance with the PSOS;
- b. Assist PWGSC by participating in the evaluation of innovation in submissions: Evaluating innovation in the P3 Consortium Proponent proposals and advising PWGSC as to the acceptability of such proposals and their potential value;
- c. Technical Analysis Report: Preparing a detailed report of the results of the technical analysis of proposals (with a focus on functionality) for presentation to, and review by, the selection committee including a detailed analysis as to whether the proposal (i) does not meet, (ii) meets, or (iii) exceeds the P3 Consortium RFP technical requirements, and supporting rationale for those conclusions; and
- d. Support review of construction costs: Assisting PWGSC with the review of the P3 Consortium **Proponents'** construction cost submissions to assess the quality and completeness of pricing.

## 2.3 Selection and Evaluation Stage

As part of the selection and evaluation process, the duties of the TA are expected to include but are not limited to:

- a. Technical Support: Providing technical support for Project Agreement negotiations with the P3 Consortium Preferred Proponent, through to Financial Close, including attending required meetings as determined by PWGSC;
- b. Debriefing: Supporting PWGSC in debriefing sessions with the unsuccessful P3 Consortium Proponents and participating in lessons-learned sessions with PWGSC at the conclusion of the selection process;
- c. Final documentation: Assisting with discussions related to design and construction specifications as a result of negotiations or changes negotiated with the P3 Consortium Preferred Proponent. Assessing and identifying

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- impacts to specifications, making recommendations, making drafting changes to technical documentation. Attending periodic Project review meetings and ad-hoc meetings as needed; and
- d. Treasury Board Submissions: Assisting with the preparation of Treasury Board Submissions supporting information, presentation and other materials as needed.

## OPTIONAL SERVICES

PWGSC is considering the inclusion of long-term financing, maintenance, Facilities Management and lifecycle rehabilitation services in the Project Scope, subject to obtaining necessary approvals. As described in section PD 7, Phase III and Phase IV as well as the maintenance option cannot be exercised until Project and Expenditure amendment approval is received. If Project and Expenditure amended approvals are received, PWGSC may exercise the option to include long-term financing, maintenance, Facility Management services and lifecycle rehabilitation (DBFM model).

If these options are **included, the Optional Services Work activity will be included in the TA's Required Services** and will be integrated into the Work activity described in the four phases of the TA Services.

The TA will be required to provide all Optional Services described below. The services described below are supplemental to the Required Services described above and the TA will be expected to seamlessly incorporate Phase III, Phase IV, and Facility Management advisory services in order to support PWGSC in the development and delivery of a commercially viable Project using a DBFM model.

## OS 1 PHASE I – PRE-PROCUREMENT - MAINTENANCE

### 1.1 Stakeholder Engagement

1. Lead or participate in engagement sessions with user groups and stakeholder consultations to support the subsequent development of Facility Management Output Specifications.

### 1.2 Refined Class C Cost Estimate

1. Development of refined Class C cost estimates to include long-term Facility Management services.

### 1.3 Facility Management Output Specifications

The TA Team will be required to develop the Facility Management Output Specifications portion of the Project Specific Output Specifications that will form an integral part of the Project Agreement to be provided to P3 Consortium Proponents.

The TA Team will assist with the development of the key performance indicator framework that encompasses a performance incentive / penalty regime that will govern the P3 Consortium performance throughout the term of the contract. This framework will be included in the Project Agreement.

The Scope includes working in coordination with the Design Performance Specifications to optimize design and operational requirements with particular attention given to heritage and environmental and sustainability design elements. In addition, work with PWGSC, CRA representatives and the Project Management Team, as well as working



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with other stakeholders and consultants to ensure integration of the Facility Management Output Specifications with other elements of the Project Specific Output Specifications and the Project Agreement.

The Facility Management Output Specifications should ensure the provision of the necessary services and service levels to PWGSC so it can achieve its core objectives. The FMOS should also optimize the maintenance and lifecycle costs of the Facility over the duration of the Project Agreement with the P3 Consortium, including but not necessarily limited to:

1. General integrated management of all Facility services;
2. All operational and tenant related services, including cleaning, waste management and removal, grounds, pest control, parking management, ad hoc services, etc.;
3. All maintenance and repair services, including preventive, corrective, predictive services; and
4. Lifecycle replacement/refurbishment services.

The Facility Management Output Specifications will establish performance criteria to maintain LEED and WELL certifications for the duration of the maintenance contract. The Facility Management Output Specifications will also establish a monitoring program of carbon emissions in order to maintain Carbon Neutral Ready status, and, if required, recommissioning procedures to ensure the building continues to meet the established sustainability targets.

The FMOS shall include Facility Management, which includes, but is not limited to: maintenance, repair and lifecycle replacement/refurbishment services.

The FMOS should provide processes for reporting, annual review and reforecasting of Facility Management costs, including: utilities, operating staff, and building service contracts by the P3 Consortium.

The TA will work with legal advisors to ensure consistency of terminology definition, address specific issues or suggested language changes, etc.

Based on discussion and issues identification, proposed language, changes, items to consider, the TA will do research when necessary and write recommendations for PWGSC with rationale as needed to enable decision making.

## OS 2 PHASE II – P3 CONSORTIUM PROCUREMENT - MAINTENANCE

The following services are required as they pertain to Facility Management:

1. Provide technical advice on all matters related to Facility Management during all phases of the procurement process;
2. Prepare responses to questions and information requests from P3 Consortium Proponents for the P3 Consortium RFQ and RFP;
3. Assist with the development of communications;
4. Assist with technical submission evaluations under the P3 Consortium RFQ and RFP.
5. Provide consultation and advice to PWGSC as required regarding addenda to the P3 Consortium RFP documents resulting from the commercially confidential meetings and other communication with P3 Consortium Proponents;
6. Participate in P3 Consortium Proponent meetings including commercially confidential meetings to discuss Project Scope to assist P3 Consortium Proponents in interpreting and understanding the P3 Consortium RFP documents prepared by the TA;

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7. Assist PWGSC with design consultations with the P3 Consortium Proponents and provide written documentation of the design feedback process detailing all compliance issues;
  8. **Assist PWGSC with the review of the P3 Consortium Proponents' Facility Management cost submissions to assess the quality and completeness of pricing;**
  9. Provide technical support for Project Agreement negotiations with the P3 Consortium Preferred Proponent, through to Commercial Close and Financial Close, including attending required meetings as determined by PWGSC; and
  10. Assist with discussions related to FMOS as a result of negotiations or changes negotiated with the P3 Consortium Preferred Proponent. Assessing and identifying impacts to specifications, making recommendations, making drafting changes to technical documentation. Attending Project review meetings and ad-hoc meetings as needed.

### OS 3 PHASE III – DESIGN AND CONSTRUCTION

As part of the post-Financial Close process, the TA Team is expected to assist PWGSC in reviewing the P3 Consortium submissions required by the **Project Agreement and in carrying out PWGSC's monitoring and oversight responsibilities** during construction. The Required Services comprise the following components: design review and approval; construction oversight and monitoring, including quality management.

#### 3.1 Design Review and Approval

**The TA Team is expected to review the P3 Consortium's submissions during design development.** Reviews will be interactive with the P3 Consortium and will need to adhere to fast turnarounds for reviews to ensure PWGSC meets its review timelines stipulated in the Project Agreement.

In undertaking these reviews, the TA Team will be required to identify areas of technical non-compliance with the Project Specific Output Specifications and Project Agreement, including but not limited to the following items: drawings, specifications, functional requirements, room finish schedules, commissioning program, completion plan, occupancy plan, proposed Project schedule, LEED and WELL certification strategy, and strategy for sequential building permit approvals.

The Required Services that the TA is expected to undertake as part of this phase is detailed as follows:

##### 3.1.1 Schematic Design

**The TA Team is expected to lead certain aspects of the review of the P3 Consortium's technical submissions, including but not necessarily limited to the following items:**

- a. Reviewing P3 Consortium submissions for compliance with the technical and design requirements, including the Project Specific Output Specifications;
- b. Conducting day-to-day submission reviews and feedback on behalf of PWGSC to ensure compliance with the design requirements and Project Specific Output Specifications;
- c. Reviewing technical non-compliance lists as required for this stage; and
- d. Reporting to PWGSC detailing the Schematic Design process and acknowledging Schematic Design acceptance.

##### 3.1.2 Design Development

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Work to be undertaken by the TA is expected to include leading and/or supporting all aspects of the review of the P3 Consortium's design development submissions, including the following items:

- a. Conducting day-to-day submission reviews and feedback on behalf of PWGSC to ensure compliance with the design requirements and Project Specific Output Specifications;
- b. Monitoring and assisting the P3 Consortium LEED Enhanced commissioning authority;
- c. Developing technical non-compliance lists as required during this stage;
- d. Reporting to PWGSC detailing the design development process that includes a detailed opinion as to whether the design development is in compliance with the detailed Project Specific Output Specifications and is acceptable;
- e. Participating in regular design committee meetings with the P3 Consortium and PWGSC representatives; and
- f. Assisting the P3 Consortium Proponent to navigate the National Capital Commissioning and Federal Heritage Building Review Office approvals process by providing knowledge, experience, expertise and lessons learned, where practicable.

### 3.1.3 Construction Documents

**The Required Services are expected to include leading all aspects of the review of the P3 Consortium's construction document submissions, including the following items:**

- a. Reviewing P3 Consortium demolition, abatement, and construction document submissions with the design requirements, including review of selected shop drawings for consistency;
- b. Monitoring the inclusion of LEED-commissioning requirements into the construction documents through the P3 Consortium LEED Enhanced commissioning authority;
- c. Reviewing technical non-compliance lists as required during this stage;
- d. **Providing assistance, where required, in the P3 Consortium's preliminary LEED design review process with the Canada Green Building Council;**
- e. Reviewing the P3 Consortium submissions, such as health and safety plans (in particular occupant safety if the 2-stage construction implementation strategy remains), design submissions, quality management plan, security plan, project management plan, schedule, and environmental management plan;
- f. Reviewing **the P3 Consortium's submissions against the** sustainability, WELL and LEED targets; and
- g. Reporting to PWGSC in details the construction documents process, including the provision of a detailed opinion as to whether or not the construction documents submitted by the P3 Consortium are in compliance with the detailed Output Specifications and are acceptable.

### 3.2 Construction Oversight and Monitoring

During the construction stage, the TA will be required to monitor the progress of the Project, including the provision of the following services:

- a. Reviewing P3 Consortium construction, commissioning and completion document submissions;
- b. Providing and documenting on-site visits during construction to review conformance with the Project Agreement documents for construction and progress of the Project Works, and submitting reports as required to demonstrate Project progress;
- c. Providing reviews of any periodic submittals provided by the P3 Consortium necessary to assess the progress of the Project Works, as required and as determined by PWGSC throughout the assignment, and report results of such reviews to PWGSC;
- d. Reviewing shop drawings, construction quality reports, deficiency reports, and proposed substitutions and other value engineering proposals from the P3 Consortium;

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- e. Reviewing any variation, change, addition, deletion, substitution, or omission to the Project Works, which will increase or decrease costs of completing the Project Works or will cause material delay in completing the Project Works or affect conformance with the Project Specific Output Specifications, and provide recommendations to PWGSC;
  - f. Providing technical content for all notices of change;
  - g. Providing cost estimates of contemplated changes to ensure fair and reasonable value to Canada;
  - h. Responding to requests for information from the P3 Consortium;
  - i. **Reviewing the P3 Consortium's quality management system to confirm that requirements on quality control and quality assurance for all engineering, architectural and construction components are satisfactory;**
  - j. Making recommendations for non-destructive, destructive or invasive testing of construction work, as required;
  - k. Reviewing construction mock-ups and adjustments;
  - l. Ensuring the consistency of the preliminary P3 Consortium commissioning plan, completion plan and occupancy plan with the Project Agreement, including the design requirements;
  - m. Review the final P3 Consortium commissioning program, inclusive of LEED-commissioned systems through the P3 Consortium LEED Enhanced commissioning authority;
  - n. Provide oversight of commissioning services to test, verify and prove that system performance and operations comply with the Project Specific Output Specifications;
  - o. Receive status reports on commissioning activities and identify any issues of non-compliance;
  - p. Review P3 Consortium completion documentation and represent PWGSC during the completion certification process;
  - q. Assist PWGSC with the follow-up on the Independent Engineer reports, certification and fees;
  - r. Assist and advise PWGSC, when needed, in technical dispute resolutions involving the contracting authority, design and construction team, and the Independent Engineer;
  - s. Perform occasional spot check audits on site, the frequency and extent of the audits to be adjusted as a function of observations and the noted deficiencies;
  - t. Assist PWGSC in the application of the payment mechanism;
  - u. Provide technical assessment relating to the suitability of the reports, considering comments, observations, and recommendations stemming from the Independent Engineer review;
  - v. In conjunction with the Independent Engineer, review documents relating to quality assurance and quality control processes to determine whether the proposed system of quality assurance and quality control and its application by the P3 Consortium, complies with the requirements of the contract;
  - w. As requested, participate in on-site meetings, design-construction management or special technical meetings, or pre-established audit schedules, however always in keeping with the specific roles and responsibilities of the respective parties;
  - x. Visit the work sites to verify that works designed, developed or being developed are compatible with site conditions;
  - y. Provide related technical advice to the P3 Consortium on reducing carbon emissions to as close to Carbon Neutral-ready as able, reducing GHG and attaining WELL silver certification; and
  - z. Provide related technical advice where applicable.

#### OS 4 PHASE IV – POST-CONSTRUCTION

The TA will be required to provide the following services for two years commencing on the achievement of Substantial Completion by the P3 Consortium:

1. Support the monitoring of building performance against environmental and sustainability targets and provide technical advice to rectify deficiencies;
2. Support PWGSC in the transition from construction and commissioning to building operation and maintenance; and

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3. Review P3 Consortium document submissions related to transition and occupancy.

## OS 5 PHASE III – DESIGN AND CONSTRUCTION - MAINTENANCE

The following services are required as they pertain to Facility Management:

1. Provide technical advice from time-to-time, including preparing responses to P3 Consortium information requests;
2. Review and provide comment on P3 Consortium submittals related to Facility Management;
3. Reviewing any variation, change, addition, deletion, substitution, or omission to Facility Management, which will increase or decrease costs of completing the Project Works or will cause material delay in completing the Project Works or affect conformance with the Facility Management Output Specifications or Project Specific Output Specifications, and provide recommendations to PWGSC;
4. Providing technical content for all notices of change;
5. Providing cost estimates of contemplated changes to ensure fair and reasonable value to Canada; and
6. Responding to requests for information from the P3 Consortium.

## OS 6 PHASE IV - POST-CONSTRUCTION - MAINTENANCE

The TA will be required to provide the following services for two years commencing on the achievement of Substantial Completion by the P3 Consortium.

1. Support the preparation and updating of technical non-compliance lists as required;
2. Provide technical advice related to the interpretation of FMOS and support performance monitoring activities by PWGSC;
3. **Support PWGSC's contract management activities** as they pertain to Facility Management, which includes interpreting performance reports from the P3 Consortium, applying the payment mechanism, conducting spot checks and participating in regular Facility Management committee meetings.
4. Review and provide comments on P3 Consortium submissions related to Facility Management, such as quality management plan, quality audit plan, health and safety plan and emergency response plan.

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APPENDIX H – PPP CANADA SCHEMATIC DESIGN ESTIMATE GUIDE



PPP Canada

# PPP Canada

## Schematic Design Estimate Guide

IMPROVING THE DELIVERY  
INFRASTRUCTURE THROU  
PUBLIC-PRIVATE PARTNER  
UTILISER LES PARTENAR  
PUBLIC-PRIVÉ AFIN D'AM  
MISE EN PLACE D'INFRA  
PUBLIQUE

## ABOUT PPP CANADA

PPP Canada is the government of Canada's centre of expertise on P3s. A federal Crown corporation, it is mandated to improve the delivery of public infrastructure by achieving better value, timeliness and accountability to taxpayers, through P3s. The Corporation was created to deliver more P3s by leveraging incentives, demonstrating success, providing expertise; and promoting best practices and capacity-building.

Increasing the visibility of PPP Canada, through the Corporation's work as a procurement solution for governments is one of the major accomplishments of PPP Canada. The Corporation's work and the strategies it employs on its three (3) business lines:

P3 Knowledge Development and Sharing: to serve as a source of expertise and advice on public-private partnership matters;

Advancing Federal P3s: as the lead on federal P3 matters with a mandate to assess federal P3 opportunities; and to advise on the execution of federal P3 projects; and

Advancing Provincial, Territorial, Municipal and First Nations P3s: to assess the suitability of P3 projects from provincial, territorial, municipal, and First Nations governments seeking funding from federal infrastructure programs, in particular the P3 Canada Fund.

**p3canada.ca**



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# 1 INTRODUCTION

## 1.1 Overview

The purpose of this Guide is to provide Project Sponsors with the minimum requirements for preparing cost estimates suitable for quantitative analysis when considering a Public-Private Partnership (P3). As key inputs to the financial models, cost estimates form the basis of the selection of the preferred delivery option.

Accuracy in cost estimates is essential for P3 projects. Research shows that gaps between estimated and actual project costs have been significant. For example, a recent report from the Joint Federal Government/Industry Cost Predictability Taskforce examining traditional procured projects found that “40% of tenders had low bids that varied, either up or down, by more than 30% from the pre-tender estimate and fewer than 20% of tenders had bids within 10% of the estimate.”<sup>1</sup> Variations were determined to be independent of market bidding behavior and were primarily influenced by the techniques used to forecast project costs.

Many of the projects included in the Taskforce’s Guide worked with complete or nearly complete designs when preparing cost estimates. However, in a P3 project the Project Sponsor undertakes minimal design work in order to encourage design innovation and integration. Cost estimates based on partial designs are required to carry sufficient contingencies in order to address the level of inaccuracy inherent to partial designs. By including contingencies, Project Sponsors will be able to identify and assess the likely high-end of estimated cost ranges to secure a sufficient budget to pursue the projects. Estimates that are inaccurate or that lack contingencies will be rejected by participating firms when Project Sponsors publish affordability limits. This may lead to a failed procurement process.

This Guide highlights industry best practices that are based on the approaches, requirements and outputs at the Schematic Design Stage. Greater consistency in presentation of cost estimates will allow for easy verification, make it possible to benchmark costs against publicly verifiable construction cost databases, and allow for the comparison of results across projects over time.

In addition, this Guide outlines an approach to presenting results in a Cost Report along with an Elemental Cost Analysis.

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<sup>1</sup> Joint Federal Government / Industry Cost Predictability Taskforce (2012) “Guide to Cost Predictability in Construction: An Analysis of Issues Affecting the Accuracy of Construction Cost Estimates”.

## 1.2 Understanding Cost Estimates

The quality and accuracy of estimates depends on the level of advancement of the design for the project (refer to **Table 1**). For this reason, different sets of cost estimates will be prepared at different stages of design development. At an early stage, estimates will be at a high level. As the design becomes more specific with needs and requirements identified, more detailed cost estimates directly linked to the design specifications will be prepared. As the project definition and design evolve, cost estimates become more accurate. This Guide recommends that P3 cost estimates provide a level of cost accuracy of +/-15%, which typically requires that they be prepared on the basis of a Schematic Design. A Schematic Design encompasses plans, elevations, sections, and palettes of materials that generally represents 30% design completion. These inputs are used by Cost Consultants to prepare a Schematic Design Estimate, which is at a Class C level. This approach allows for the development of robust project cost estimates for decision-making, while minimizing any potential to impede innovation and duplicate the efforts undertaken by the Project Sponsor.

Traditionally, cost estimates in Canada have been classified into one of four categories, using Classes A, B, C and D.

**Class A** estimates are pre-tender estimates, based on completed construction drawings and detailed specifications contained in tender documents. They are expected to be quite accurate, within 5-10% of the actual contract price.

**Class B** estimates are design estimates based on an advanced project design. They are based on design drawings, project specifications and include detail on the design of electrical, mechanical and IT systems, as well as site requirements.

**Class C** is a planning level estimate usually based on a Schematic Design and presented in Elemental Format (a budget setting format/technique which considers the major elements of a project and provides an order of cost estimate based on an Elemental Cost Analysis of a building project). Typically, Class C estimates are required by the Project Sponsor to obtain preliminary approvals necessary to undertake design and project development. These estimates establish a preliminary budget estimate and a baseline against which project costs will be assessed at future project development milestones.

**Class D** estimates are conceptual estimates based on the project scope (the work that needs to be accomplished to deliver the project) and functional requirements (the output specifications/deliverables of a project), and are usually presented in unit cost analysis format (applying a monetary rate to an element, sub-element or component per unit of measurement), such as cost per m<sup>2</sup>.

**Table 1: Generic Design and Cost Estimate**

	PRIMARY CHARACTERISTICS	SECONDARY CHARACTERISTICS			
Estimate Classification	Project Definition	Intended Purpose	Methodology	Level of Precision	Preparation Effort % of project costs <sup>2</sup>
<b>Class A</b>	Design Documents (100% Design)	Compliance with effective project approval (budget)	Measured, priced, full detail quantities	-5% to +10%	5% to 50%
<b>Class B</b>	Design Development (66% Design)	Seeking effective project approval	Mainly measured, priced, detail quantities	-10% to +15%	2.5% to 10%
<b>Class C</b>	Schematic Design (33% Design)	Seeking preliminary project approval	Measured, priced, parameter quantities, where possible	-15% to +20%	1.5% to 5%
<b>Class D</b>	Design	Screening of various alternative solutions	Various	-20% to + 30%	0.5%

Within a class of estimates, the amount of underlying design and technical work can vary significantly from one asset class to another, giving rise to a misperception of the level of accuracy. For example, a Class D estimates could range from the use of very rough estimates of floor space requirements priced at average real estate pricing using general market indices to quite well specified space estimates with room requirements using m<sup>2</sup> pricing from similar projects.

### 1.3 Design under Public Private Partnerships

In a Public-Private Partnership (P3), the design function is integrated with construction, operations and maintenance phases under the responsibility of the private partner. In order to assess the timing, costs and risks involved in a project, the Sponsor must clearly define its project objectives and scope. As part of the competitive procurement process, Proponents are given the performance requirements and asked to propose designs that meet the Sponsor's needs. Proponents will develop their own designs, typically to between 30% and 50% design completion and submit them for evaluation as part of the technical submissions in the Request for Proposals (RFP) stage of procurement.

<sup>2</sup> The Association for the Advancement of Cost Engineering (2011) "Recommended Practice No. 17R-97 - Cost Estimate Classification System

The selected Proponent transfers the costs incurred for design to the Project Sponsor through the bid price. For this reason, Sponsors prefer to minimize the level of design completed prior to procurement in order to avoid incurring costs twice.

Generally, Sponsors strive to achieve the project design to +/- 15% to 20% level of cost accuracy at 20% to 30% of design completion, which is equivalent to Class C estimate in **Table 1**. This is consistent with best practices outlined by the Association for the Advancement of Cost Engineering (AACE) International's Recommended Practice No. 18R-97II, which states that a 10% design provides an average accuracy of -20% to +30 % and a 40% design provides an average accuracy of -10% to +10%<sup>3</sup>. Based on these ranges, it is reasonable to assume that design work would need to approach the high end of current P3 practices (i.e. 30% design), in order to achieve a level of cost analysis with an accuracy of +/- 15%. This level of accuracy balances a desire for greater accuracy with an appreciation of the added costs of further design development.

Apart from being duplicative of the efforts of the Proponents, design development could open the Sponsor to the risk of overly prescribing the project. In order to create incentives for innovation and obtain the best solutions possible, the Project Sponsor should define the needs and outputs that it requires. Moving into design development would mean that the needs and outputs could become tied to the specific design approach, as opposed to the true needs of the Sponsor. Therefore, it is recommended that P3 cost estimates are prepared to provide a Cost Analysis with an accuracy of +/- 15% which is generally supported by a Schematic Design at a 30% level.

## 1.4 Using the Guide

The Guide is presented as follows:

- Typical design information required for a Schematic Design Estimate
- Acceptable formats for a Schematic Design preparation
- Development of a Schematic Design Estimate
- Sector-Specific Considerations
- Outputs and Deliverables

The cost estimating methods, outputs and documentation are based on an accommodation facility. For other types of infrastructure, the required background information, elemental categories and outputs will vary, as discussed in the Outputs and Deliverables section. It is recommended that Sponsors seek advice from Technical Advisors and Cost Consultants regarding the appropriate approach to cost estimate accuracy for a particular sector.

<sup>3</sup> Association for the Advancement of Cost Engineering (2011) - AACE International Recommended Practice No. 18R-97: Cost Estimate Classification System - As Applied In Engineering, Procurement, And Construction For The Process Industries.

## 2 TYPICAL DESIGN INFORMATION REQUIRED FOR A SCHEMATIC DESIGN ESTIMATE

### 2.1 Minimum Requirements

The cost estimation process typically follows the main stages of design. The design process can be broken down into five stages:

- 1) Project Initiation
- 2) Conceptual Design
- 3) Schematic Design
- 4) Design Development
- 5) Design Document

In a traditional procurement process, the Project Sponsor is responsible for each of the five stages prior to tender. In P3 procurement, the Sponsor is responsible for the first three stages and the private partner is responsible for the design development and the preparation of final design and technical documents.

### 2.2 Project Initiation Stage

At the Project Initiation stage, the Sponsor identifies the need for the asset and defines the initial scope of the project. At this point, the focus will generally be on defining the issue, problem or opportunity to be addressed by new infrastructure in order to start shaping the project needs and requirements. The Project Sponsor will look at past experience within and outside the organization to address challenges and identify potential solutions. Typically, historical data on similar projects is gathered to better identify the scope of the project. For example, if the Sponsor has identified that there is a need for a new school, it will look at recently constructed schools in the vicinity and use the costs of those projects as a benchmark.

### 2.3 Conceptual Design Stage

At the Conceptual Design Stage, the Project Sponsor refines requirements for the infrastructure and begins to develop options to meet its needs. During this stage, the authority will develop a Functional Plan and specify its technical requirements. It will undertake pre-feasibility studies to identify technical options, define key project elements, gross floor areas or project characteristics (e.g. km of highway) and identify major equipment and component systems. At this stage, the Project Sponsor will typically begin to perform examinations of the proposed site to identify potential constraints.

The output of the Conceptual Design Stage is a report that illustrates the design concepts for the project. The report includes a discussion of the design objectives and how the design concepts address these objectives. The report includes drawings depicting the site layouts, floor plans and elevations.

It also outlines project constraints, high-level specifications and will define assumptions with respect to materials, major equipment and sub-systems. Finally, the report covers the proposed procurement approach, construction program and project timeline, along with a cost estimate and risk assessment.

## 2.4 Schematic Design Stage

The objective of the Schematic Design Stage is to test, resolve and amend the initial concept design and alternatives to produce a clearly defined design based on the Sponsor's requirements. During this stage, the project team designer will prepare plans, drawings and elevations to refine the Conceptual Design. The designs will be used to refine cost estimates, to further clarify the project scope and revise project timelines. A more detailed discussion on the Schematic Design Stage will be provided in section 3 of this Guide.

## 2.5 Design Development Stage

Industry best practices recommend that cost estimates are within +/- 15% degree of accuracy. This degree of accuracy is used to seek budget authority in preparation of Value-for-Money (VfM) analysis. Design and technical work need to be advanced to at least 30% completion in order to achieve this level of accuracy.

## 2.6 Design Document Stage

The generally acceptable levels of documentation that the Cost Consultant requires in order to produce a cost estimate within +/- 15% accuracy are produced by a consultant specializing in compliance or design. In the absence of the compliance documentation, which is illustrated in **Table 2**, the Cost Consultant must make reasonable assumptions and/or increase the level of estimating contingency (i.e. provide a lower level of accuracy).

**Table 2** outlines the minimum requirements including the sources and documentation that are recommended for a Schematic Design Estimate:



**Table 2: Minimum Design Work**

ITEM	SOURCE	DOCUMENT
Schematic floor plans (30% completion) including basic statistics i.e. gross floor area, number of floors, number of parking spaces, etc.	Architect	Drawing/Outline Brief
As-built drawings for existing building (if applicable)	Project Sponsor	Drawing
Demolition drawings (if renovation), including clear indication of existing materials to remain	Architect	Drawing
Structural foundation system and typical framing plan; load requirements; and, specific foundation requirements to address geotechnical issues	Structural Engineer	Drawing
Building elevations and sections; perspectives and/or models; horizontal and vertical space relationships	Architect	Drawing
Roof system selections	Architect	
Guidelines for interior floor, wall and ceiling finishes	Architect	Drawing/Outline Brief
Schedule of mechanical requirements, including: volume and delivery rate of outdoor air to be supplied per person; plumbing system requirements; and, the area and location of mechanical spaces in the building	Mechanical Engineer	Drawing/Outline Brief
Outline specification (10% or higher), with selected equipment, sizing and performance requirements	All Consultants	Report
Paving and parking requirements	Traffic/Civil Consultant	Drawing/Report
Existing and proposed building grades	Civil Consultant	Drawing
General site plan layout	Civil/Landscaping Consultant	Drawing
Equipment inclusions and exclusions	Project Sponsor	Contribution Matrix
Original site drawings and investigations (if applicable)	Project Sponsor	Report
Storm drainage solution	Civil Consultant	Outline Brief
Existing utility location	Civil Consultant	Drawing
Site lighting requirements	Electrical Engineer	Outline Brief
Geotechnical Report	Geotechnical Consultant	Report
Environmental Report	Environmental Consultant	Report
Heritage Report, if applicable	Heritage Consultant	Report
Details if any restraints to project i.e. site access, working hours, labour etc.	Architect	Outline Brief
'Soft' cost inclusions and exclusions	Project Sponsor	Contribution Matrix
Functional Program	Planning Consultant	Report
Blocking/Stacking Diagrams	Architect	Drawing
Initial views on construction procurement options and contract strategies	Project Sponsor	Report

ITEM	SOURCE	DOCUMENT
Details of any enabling work, decanting and other specific requirements	Architect	Drawing
LEED or sustainable design requirements	Sustainable Design	Report
Comparable facilities, if any	Project Sponsor	Report
Phasing requirements, if any	Architect	Drawing
Project preliminary schedule	Schedule Consultant	MS Project or Similar
Occupancy requirements i.e. the facility operational during construction	Project Sponsor	Report
Proposed basic electrical, telecommunications and IT systems	Electrical Engineer	Drawing/Outline Brief

## 2.7 Typical General Work Plan

The typical general work plan consists of the following steps:

1. The Cost Consultant meets with the Project Sponsor and reviews the extent of all aspects of project costs that need to be incorporated in the cost estimate, in particular Furniture, Fittings and Equipment (FFE) requirements, Planning, Design, Compliance (PDC) fees, etc.
2. Based on the Project Sponsor's approved Schematic Design documents, the Cost Consultant meets with the design team and reviews the nature and scope of the entire project.
3. The Cost Consultant then prepares a budget cost estimate(s) and Elemental Cost Plan ("Cost Plan" - the critical breakdown of the cost limit for the building(s) into Cost Targets for each element of the building) for the Project Sponsor's review, that reflects the size and character of the entire project including the architectural, structural, mechanical and electrical systems, site and civil and such other Elements as may be appropriate. The cost estimate(s) and Cost Plan shall include backup sheets with quantities, unit rates and amounts for composite or individual items of work, as well as an Elemental Cost Summary. The estimate should also provide appropriate risk recommendations for estimating/design development, inflation, schedule, market conditions, site conditions and post-contract (change orders).
4. Ideally, the Cost Consultant should be involved as early as possible in the project and should take part in the initial project team meetings and the risk workshop(s) for the project. At the risk workshop, the Cost Consultant should be mandated to provide his/her professional opinion with regard to risks associated with:
  - a. **Design development/estimating:**  
Risk that the Sponsor attempts to revise or impact the design of the project causing delays in the project.
  - b. **Change order by Sponsor during construction:**  
Risk that the scope of work is changed by the Sponsor during the construction period.
  - c. **Acute market conditions / construction price escalation:**  
Risk associated with construction costs being higher than estimated by the construction contractor. This results in higher costs and a reduced profit margin for the contractor.

**d. Procurement:**

Risk that the procurement tender documentation is not complete. This will result in increased addenda and could give a sense of uncertainty to Proponents, resulting in reduced tolerance to risk and higher bids.

**e. Site access:**

Risk of temporary closure of the site and delay in contract completion

**f. Site conditions/soil conditions/environmental risks:**

Risks that environmental reports (i.e. geotechnical, archaeological) provided to Proponents contain errors. This could result in the contractor having a claim for additional time and costs. The magnitude of this risk will vary depending on particular site conditions. Proponents will insist that they can rely upon the environmental reports provided in the tender documentation.

5. The Cost Consultant then reviews draft estimates with the Sponsor and design team, and prepares any subsequent revisions. At the Schematic Design Stage, the Project Sponsor may request more than one Schematic Design resulting in more than one estimate to assist in the decision to move forward with one design option.
6. The agreed-upon budget cost estimate shall become the Cost Plan, and form the basis for cost control for the Project Sponsor moving forward.
7. The Cost Consultant finalizes the cost estimate and prepares an overall Cost Report.

# 3 ACCEPTABLE FORMATS FOR A SCHEMATIC DESIGN PREPARATION AND DEVELOPMENT OF A SCHEMATIC DESIGN ESTIMATE

## 3.1 Introduction

Meaningful cost comparisons and analyses of cost estimates will only be possible if cost data are based on a uniform standard analysis. The following section provides an overview of acceptable formats for a Schematic Design preparation by:

- Defining the Elemental Format
- Defining Selection of Elements
- Preparing Elemental Cost Analysis for an accommodation project
- Discussing design, estimation, escalation and construction allowances

The Cost Consultant should use the proposed, industry accepted, formats to ease analysis of results and to facilitate comparative elemental estimating.

## 3.2 Elemental Format

Elemental Cost Analysis "Cost Analysis" is a system of cost planning and control intended to monitor and control project costs during the design development of buildings and other structures. Cost control is achieved by preparing a Cost Plan based on the information contained in the analysis in the very early stages of a project when little is known about the materials or methods that will be used.

An Elemental Cost Analysis examines the known costs of a building at the end of the design process into an Elemental Format and divides the cost by a quantity to give a unit rate. A Cost Plan is used at the beginning of the design process and determines the required reserve. It multiplies a quantity by a unit rate obtained from one or more cost analyses to give a cost. To be useful, the breakdown and method of analyzing the costs in the Cost Analysis must therefore be identical to that used in the Cost Plan<sup>4</sup>.

It is generally an accepted industry standard that a Schematic Design Estimate is prepared in Elemental Format which is approved by the Canadian Institute of Quantity Surveyor, (CIQS) or an equivalent format. Using industry standards makes the output understandable to a wide audience and allows for comparisons between projects.

<sup>4</sup> Canadian Institute of Quantity Surveyors (2006) "Elemental Cost Analysis: Format - Method Of Measurement - Pricing - Measurement of Buildings by Area & Volume, Canadian Institute of Quantity Surveyors.

### 3.3 Selection of Elements

An Element is defined as a major component common to most buildings, fulfilling the same function irrespective of its design, specification or construction. In selecting and defining the Elements the following CIQS principles are used<sup>5</sup>:

1. Each Element should have a significant influence on the cost of a structure and a high frequency of occurrence.
2. There should be consistency and simplicity in the definitions of Elements. One of the primary purposes of a standard list of Elements is to enable cost analyses of completed projects and to help control costs of future projects.
3. Each Element is intended to represent a component of the building which always performs the same function regardless of its composition. Any attempt to try to identify materials in a Cost Analysis defeats the purposes of a Cost Plan which is prepared when few, if any, materials have been selected.
4. Wherever possible an Element should be measurable.
5. The Elements are ordered hierarchically into four levels to allow for different levels of aggregation and summarization as follows:
  - a. Level 1      Major Group Elements      - denoted by a single character code
  - b. Level 2      Group Elements      - denoted by a two character code
  - c. Level 3      Elements      - denoted by a three character code
  - d. Level 4      Sub-Elements      - denoted by a four character code

**For example:**

A	SHELL	Level 1
A1	Substructure	Level 2
A11	Foundations	Level 3
A111	Standard Foundations	Level 4

A more detailed sample of an Elemental Format for an accommodation project, which is consistent with the CIQS standard, is provided in the sub-section below. Potential adaptations for other asset classes will be discussed in the next section (e.g., UNIFORMAT II).

<sup>5</sup> Association for the Advancement of Cost Engineering (2011) - AACE International Recommended Practice No. 18R-97: Cost Estimate Classification System - As Applied In Engineering, Procurement, And Construction For The Process Industries.

## 3.4 Preparing an Elemental Cost Analysis

All Elements of an Elemental Cost Analysis should be shown in the same sequence for easy reference. CIQS and UNIFORMAT use numbering systems that lay out Elemental Estimates in a standard order, generally corresponding to the order of construction. If no cost is attributable to an Element, a zero or dash should be entered in the cost column. For analysis purposes the cost of each Element is expressed in a separate column as a price per square metre of the gross floor area.

Where appropriate, each Element should also be expressed with an elemental quantity, a ratio and an elemental unit price. Furthermore, an itemized Elemental Cost Summary should accompany the Elemental Cost Analysis, together with copies of plans and elevations. When there is more than one building on a single site, separate element costs analyses should be prepared for each building and for the site work (e.g., landscaping, entrance roads) with general requirements and fees (e.g., supervision and labour expenses, permits, insurance and bonds) and allowances (e.g., design, escalation and construction) proportioned between them.<sup>6</sup>

**Table 3** illustrates an Elemental Cost Analysis for an accommodation project (e.g., Public Administration Buildings). Starting from Level 1, the largest Element grouping, Major Group Elements such as the shell, interiors, and services are identified. Level 2 subdivides Level 1 Elements into Group Elements. The shell, for example, includes the superstructure, structure, and exterior closure. Level 3 breaks the Group Elements further into Individual Elements. Exterior closure, for example, includes walls below grade, walls above grade, windows and entrances, roof covering, and projections. For illustrative purposes, a cost breakdown column was not included.

<sup>6</sup> Association for the Advancement of Cost Engineering (2011) - AACE International Recommended Practice No. 18R-97: Cost Estimate Classification System - As Applied In Engineering, Procurement, And Construction For The Process Industries.

**Table 3: Elemental Cost Analysis - Accommodation Project**

LEVEL 1 Major Group Elements	LEVEL 2 Group Elements	LEVEL 3 Individual Elements
<b>A Shell</b>	A1 Substructure	A11 Foundation A12 Basement Excavation
	A2 Structure	A21 Lowest Floor Construction A22 Upper Floor Construction A23 Roof Construction
	A3 Exterior Enclosure	A31 Walls Below Grade A32 Walls Above Grade A33 Windows and Entrances A34 Roof Covering A35 Projections
<b>B Interiors</b>	B1 Partitions and Doors	B11 Partitions B12 Doors
	B2 Finishes	B21 Floor Finishes B22 Ceiling Finishes B23 Wall Finishes
	B3 Fittings and Equipment	B31 Fittings and Fixtures B32 Equipment B33 Conveying Systems
<b>C Services</b>	C1 Mechanical	C11 Plumbing and Drainage C12 Fire Protection C13 H.V.A.C C14 Controls
<b>NET BUILDING COSTS</b> (Excluding Site)		
<b>D Site and Ancillary Work</b>	D1 Site Work	D11 Site Development D12 Mechanical Site Services D13 Electrical Site Services
	D2 Ancillary Work	D21 Demolition D22 Alterations
<b>NET BUILDING COSTS</b> (Including Site)		
<b>Z General Requirements and Allowances</b>	Z1 General Requirement and Fee	Z11 General Requirements Z12 Fee
<b>TOTAL CONSTRUCTION ESTIMATE</b> (Excluding Allowances)		
	Z2 Allowances	Z21 Design Allowance Z22 Escalation Allowance Z23 Construction Allowance
<b>TOTAL CONSTRUCTION ESTIMATE</b> (Including Allowance)		

The following is an expanded list of items that are generally found in each Element. These items should be measured under the same Element to ensure consistency from one Cost Plan to the other.

**A) Shell:**

1. Substructure - includes foundation systems, basement excavation, shoring system, dewatering.
2. Structure - includes slab on grade, granular sub-base, upper floor framing, roof framing.
3. Exterior - includes the building envelope such as curtain wall, solid wall system and assembly (brick, metal, etc.), windows, roof membrane, canopy, parapets.

**B) Interiors:**

1. Partitions and doors - includes elevator and stair core walls, block wall, drywall partition, hollow metal doors, solid core doors, door frames and hardware.
2. Finishes - includes floor, wall and ceiling finishes.
3. Fittings and equipment - includes fixed millwork, washroom accessories, handrails, guardrails, equipment (approved and agreed with Project Sponsor outside of the FFE list).

**C) Services:**

1. Mechanical - includes plumbing, fire protection and sprinkler, HVAC, building controls.
2. Electrical - includes Service Distribution, Lighting, Power Systems and Ancillaries, Fire Alarm, Security and IT systems.

**D) Site and Ancillary Work:**

1. Site work - includes soft and hard landscaping, exterior lighting, incoming hydro service, storm service, sewer service, natural gas service.
2. Ancillary work - includes demolition, renovation works.

**E) General Requirements:**

General conditions and fees - includes General Contractor's overhead and profit, site supervision cost, temporary service, hoarding, temporary accommodation/office.

## 3.5 Allowances

In **Table 3**, the example of an Elemental Cost Analysis, the total construction estimate excluding allowances, represents the base estimate. It is common practice to add allowances, otherwise known as contingencies, to the base estimate. A contingency can be defined as a financial provision to absorb the impacts of cost escalating events that are likely to occur, but for which costs cannot be estimated with a high degree of certainty at the time of the capital investment budget establishment. Contingencies are typically related to imprecision in quantities, depending on the level of advancement of the detailed design, and the variation of unitary prices due to events that may be difficult to quantify with a high degree of certainty (e.g., volume of soil to be decontaminated).



Within the Elemental Cost Analysis, the Cost Consultant should determine the appropriate contingencies for different elements. The different elemental contingencies will reflect the different levels of uncertainty associated with the respective elements. The contingencies are included in the primary budget. Schematic estimates typically contain contingencies or allowances to deal with uncertainty in three different project areas:

1. Design and Estimating Allowances are added to reflect the early state of the project design. The contingencies are to cover omissions and unknown project elements resulting that can be expected to be discovered over the design process.
2. Escalation Allowances are added to allow for unexpected changes in sub-contractor and input prices between the time of the initial estimate and when the work is ultimately performed. In capital projects, local market conditions can often give rise to short-term labour, material and equipment shortages resulting in spikes in construction prices.
3. Construction Allowances are added to address potential cost increases that can occur during the construction stage. These allowances are built in to absorb cost overruns and project delays. They will also cover unexpected damage to the project, site or adjacent areas.

When developing the cost estimates for the asset, the Cost Consultant separately identifies the contingencies from base costs, in parallel with risk quantification to help ensure there is no double counting between cost contingencies and risk quantification. It is recommended that the scope of the Cost Consultant's engagement include participation in the risk workshop(s). Contingencies should be built into the Project Sponsor's primary budget with the expectation to be fully spent during the capital investment.

When Proponents prepare bid prices, they will typically include a risk provision (also sometimes called owner's reserve), which will vary depending on the delivery method and risk allocation approach. The risk provision is typically left outside of the primary budget.

## 4 SECTOR-SPECIFIC CONSIDERATIONS

In Sections 2 and 3 of this Guide, the general requirements applicable to an accommodation project were provided. Though different classes of infrastructure will have many features in common, there are notable differences in the types of background information, design representations, reports and technical reports across sectors. The breakdown of assets into Elements will vary depending on the class of infrastructure which will impact the output of the Cost Estimate. The following section will examine sector-specific considerations; it is recommended that Project Sponsors seek advice from Technical Advisors and Cost Consultants for the appropriate inputs for cost estimates and Cost Report formatting.

**Table 4** summarizes the general differences in available information for projects in different infrastructure classes that serve as the basis for the cost estimate.

**Table 4: Available Information in Different Infrastructure Assets**

Item	Source	Document	ASSET CLASS					
			Light/ Heavy Rail	Bridges/ Highways	Water Treatment Facilities	Wastewater Treatment Facilities	Maintenance Facilities - Trains	District Energy
Schematic floors plans including basic statistics (i.e., gross floor area, number of floors, number of parking spaces, etc.)	Architect	Drawing/ Outline Brief	X		X	X	X	
As-built drawings for existing building (if applicable)	Project Sponsor	Drawing		X	X	X		
Demolition drawings (if renovation), including clear indication of existing materials to remain	Architect	Drawing	X	X	X	X	X	X
Preliminary Structural foundation system and typical framing plan	Structural Engineer	Drawing		X	X	X	X	X
Preliminary Exterior wall elevations	Architect	Drawing		X	X	X	X	X

Different infrastructure classes will have specific information requirements. A Cost Consultant is required to have this information at the time of Schematic Design Estimate preparation. These items could have significant cost impact and are considered cost drivers for the project. The following list summarizes suggested requirements for various infrastructure classes:

### **1. Light Rail/Heavy Rail**

- System requirements
- Vehicle specifications
- Signalization requirements
- Station design information (i.e. plan layout, structural, mechanical and electrical brief)
- Guideway information (i.e. structure, etc.)
- Electrical systems information: overhead contact systems; supply; and, substations and distribution
- Fare equipment requirements
- Vertical movement requirements/accessibility
- Signage and way finding requirements
- Special structures (i.e. bridges, viaducts, etc.)
- Grading requirements
- Track layout and assembly
- Services/ utilities brief and utilities diversion (if required)

### **2. District Energy (Steam Generating Facility, etc.)**

- Boiler and steam generator sizes and product specification.
- Schematic diagrams
- Design brief
- Floor plan including equipment layout

### **3. Maintenance Facilities - Train**

- Preliminary layout plan
- Block and stacking diagram
- Facility capacity
- Lift equipment requirements (i.e. cranes, etc.)
- Maintenance requirements
- Drive through bus washing system requirements
- Body work and paint booths
- Waste disposal requirements
- Storage/shelving requirements
- Fuel equipment requirement

- Track lay-out and assembly
- Special trackwork
- Special structures (i.e. pits, etc.)

#### **4. Maintenance Facilities - Bus**

- Preliminary layout plan
- Block and stacking diagram
- Facility capacity (number of buses)
- Lift equipment requirements (i.e. cranes, etc.)
- Maintenance equipment requirements
- Body work and paint booths
- Bus washing system requirements
- Waste disposal requirements
- Storage/shelving requirements
- Fuel equipment requirement
- Special structures (i.e. pits, etc.)

#### **5. Water Treatment Facilities**

- System description report
- Process, instrumentation and wiring program
- Floor plans including equipment layout
- Process equipment sizes
- Design brief

#### **6. Wastewater Treatment Facilities**

- Water testing structure capacity
- Leachate tank and storage tank size and capacity
- Aeration channel size/dimension
- Filter building plan/dimension
- UV disinfection requirements
- Travelling bridge filter requirements
- Instrumentation requirements (i.e. programming)
- Electrical requirements (i.e. service and distribution, emergency power, etc.)

#### **7. Bridges/Highways**

- Traffic information and forecasts
- Bridge load and substructure requirements
- Drainage

- Bridge Span
- Bridge - Dual or single structure
- Earthworks/cut & fill/grading plan
- Retaining wall layout
- Ramp requirements
- Sub-base requirement
- Asphalt/paving specification
- Preliminary road and bridge layout

## 8. Accommodations

### (a) Detention Centres

- Number of cells
- Security requirements - Interior and exterior
- Block stacking diagram
- Preliminary layout plan
- Communication/IT requirements

### (b) Offices

- Number of parking space - Above and/or below grade
- Block stacking diagram
- Preliminary layout plan
- Floor to floor heights
- Preliminary elevation drawings
- Security and communication/IT requirements

Even with this additional information, it may not always be possible to achieve a desired level of accuracy (+/- 15%), typically reached with a 30% design. For example, in water and wastewater treatment plants, the design may have to be further advanced for some components in order to have a clearer understanding of the special process and functional inter-relationships. As well, certain elements, such as major equipment requirements, may need to be well-specified in order to obtain accurate pricing on the plant. To incorporate the unique features of different classes of infrastructure, it will also be necessary to adapt the elemental model to provide categories that are meaningful to the project. In the following UNIFORMAT II bridge classification table, the Elemental Cost Analysis has been revised to reflect the differences between an accommodation facility and a bridge.

**Table 5** divides the classification of bridge elements into three hierarchical levels: Level 1, Major Group Elements; Level 2, Group Elements; and Level 3, Individual Elements. The major groups are listed in normal chronological order of construction.

**Table 5: Proposed UNIFORMAT II Classification of Bridge Elements<sup>7</sup>**

LEVEL 1 Major Group Elements	LEVEL 2 Group Elements	LEVEL 3 Individual Elements
<b>A Substructure</b>	A10 Piers	A1010 Foundations A1020 Walls A1030 Columns A1040 Cap Beams
	A20 Towers	A2010 Foundations A2020 Walls A2030 Columns A2040 Cap Beams
	A30 Abutments	A3010 Foundations A3020 Stems A3030 Wing Walls
	A40 Other Supports	A4010 Thrust Blocks A4020 Anchorages
<b>B Superstructure</b>	B10 Short Span Assemblies	B1010 Flexural Members B1020 Diaphragms B1030 Bracings B1040 Bearings
	B20 Long Span Assemblies	B2010 Ribs B2020 Cables B2030 Hangers B2040 Spandrels B2050 Ties B2060 Truss Members B2070 Segmental Box Girders
	B30 Deck	B3010 Structural Surface B3020 Wearing Surface
<b>C Protection</b>	C10 Structure Protection	C1010 Slope Walls C1020 Expansion Joints C1030 Protective Coats C1040 Sacrificial Beams C1050 Drainage Systems C1060 Inspection and Maintenance Systems
	C20 Traffic Protection	C2010 Barriers C2020 Protective Shields C2030 Traffic Controls
	C30 Other Protection	C3010 Lighting C3020 Signage C3030 Sound Barrier Walls C3040 Air Pressure Barriers C3050 Enclosure

<sup>7</sup> Kasi, Muthiah and Robert E. Chapman (2011), "Proposed UNIFORMAT II Classification of Bridge Elements", U. S. Department of Commerce National Institute of Standards and Technology.

LEVEL 1 Major Group Elements	LEVEL 2 Group Elements	LEVEL 3 Individual Elements
<b>D Site Work</b>	D10 Site Preparation	D1010 Clearing and Grubbing D1020 Demolition and Relocation D1030 Earthwork D1040 Hazardous Material Handling D1050 Environmental Restoration /Replacement
	D20 Approach Construction	D2010 Approach Slabs D2020 Sleeper Slabs D2030 Earth Retention Systems

The Canadian Institute of Quantity Surveyors (CIQS) standard is well suited to Canadian accommodations projects and may be less suited to some infrastructure classes. In these cases, Cost Consultants may wish to use an alternate format for the cost estimate, such as Master Format or UNIFORMAT II. Though different in form, alternative formats should allow for the same level and detail of analysis.

# 5 OUTPUT / DELIVERABLES

## 5.1 Overall Project Budget

The Schematic Design Cost Estimate approach results in the preparation of a construction cost estimate in the Elemental Format. Traditionally, construction costs are the most significant cost factor of a project. In P3s, the Project Sponsor is concerned with both the capital (construction) costs as well as the total costs over the asset's lifecycle. When several design approaches are being considered, the Cost Consultant will typically assess the operations and maintenance requirements of the asset, as well as major maintenance activities over the lifecycle in order to prepare whole-of-life project costs.

The operation and maintenance costs may be estimated in conjunction with the Project Sponsor. Often, the Sponsor will provide operational cost data drawn from current facilities. In more complex projects, or in cases where there is no available data on similar facilities, the Project Sponsor may obtain the services of a Facilities Management Advisor to provide more detailed information on operations and maintenance costs.

In some cases, projects may have unique inputs that will have a significant impact on operational costs. For example, a district energy system will be energy intensive. In these cases, it may be worthwhile to undertake specialized investigations to better understand requirements over the life of the project. This will allow for a better forecast of project operational costs.

Similarly, the Cost Consultant will typically work with the designer and technical staff to understand the lifespan of the infrastructure and the maintenance requirements. The maintenance cycles and activities will be used to develop an estimated program for major maintenance.

As well, the Cost Consultant will work with the Project Sponsor and the Technical and Financial Advisors to develop estimates for other relevant project costs.

**Table 6** provides a list of inputs which are also useful or required to prepare the overall project budget:



**Table 6: Inputs**

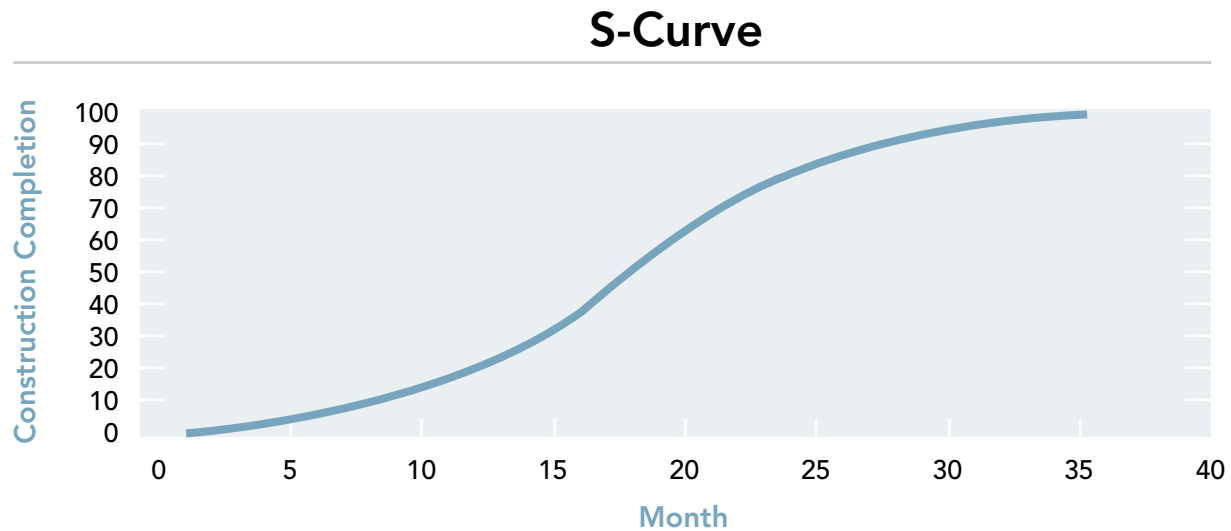
ITEM	SOURCE
Risk recommendations (Design, inflation, market conditions, etc.)	Cost Consultant
Furniture, finishings and equipment	Cost Consultant/Consultant
Ancillary costs (Planning, design compliance (PDC)) Fees, permits, development changes, insurances, etc.	Cost Consultant Project Sponsor
Land cost	Project Sponsor
HST/GST	Cost Consultant
Moving/relocation cost	Moving Consultant
Financing cost	Financial Advisor
Testing and inspection	Architect
ITEM	SOURCE
Transaction advisor cost	Financial Advisor
Design bid fees	Project Sponsor
Facilities operational cost	Facility Management Advisor
Maintenance and lifecycle cost	Technical Advisor

## 5.2 Construction S-Curve

To assist the Project Sponsor, the Cost Consultant will provide an expected construction cash flow in the form of an S-Curve. The S-Curve indicates estimated cumulative construction expenditures as a percentage of total construction costs over the construction schedule. This S-Curve is used to distribute construction costs in real terms across the construction period.

The shape of the curve is the result of costs being incurred at a lower rate for equipment mobilization and site preparation then ramping up for the major works and tapering off again as testing and commissioning takes place. A robust and substantiated S-Curve from a Cost Consultant demonstrates that thought has been given to the construction program. The real-valued S-Curve will allow for costs to be cost estimates escalated to the projected construction start date. **Figure 1** illustrates a typical expenditure curve for a construction project.

Figure 1: Construction S-Curve



## 5.3 Cost Report

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Once the cost estimate has been completed and the Cost Consultant has worked with the Project Sponsor to identify and estimate other costs contributing to the total project budget, the Cost Consultant should prepare a Cost Report. This document provides a summary of the following: the methodology for the estimate; construction phasing; the cost considerations (basis for escalation, inflation, market volatility and contingency calculations); a description of all supporting documents referred to; and, a listing of all cost components bearing significant risk. The Cost Report includes the Elemental Cost Analysis, the total cost of each cost component and the cost per square metre of building gross floor areas (as defined for the specific building types).

**A typical Cost Report includes the following:**

- **Executive Summary**
- **Background**
  - Project background
  - Project objectives
  - Project scope
- **Design Considerations**
  - Site context
  - Program spaces
  - Functional, construction and operational requirements
  - Structural, mechanical, electrical and landscape requirements
  - Architectural styles

- Type of construction, materials and finishes
- Building code review
- Sustainability
- **Methodology**
  - Basis of estimate
  - Method of preparation
  - Major quantities or length
  - Major assumptions
  - Cost basis
  - Inclusion/exclusions
- **Cost Summary**
  - Summary project budget
  - Elemental Cost Estimate
  - Operations & Maintenance estimates
  - Planning and implementation costs
  - Summary of areas
  - Building statistics
  - Project/construction schedule
  - S-Curve
  - Unit costs and cost base
  - Commentary on economic and market forces
- **List of Documents**
  - Functional plans
  - Scoping documents
  - Feasibility studies
  - Planning/technical documents
  - Previous cost estimates
- **Figures and Drawings**
  - Site plan
  - Floor plan
  - Elevations
  - Perspectives

As the project is developed, the Project Sponsor will prepare and update the project budget. By the time the Schematic Design Cost Estimate is prepared, the Project Sponsor has prepared a rough order-of-magnitude estimate as well as an estimate for the Conceptual Design. In these cases, the Cost Consultant should include a section on budget variances in the Cost Report. The Cost Consultant should also reconcile differences between current estimates and previous budget estimates. Specifically, the budget variance report should distinguish between changes that are due to changing quantities (i.e. building floor areas), to price changes or to changing project requirements/specifications.

## 6 CONCLUSION

One of the most significant challenges for a Project Sponsor is to successfully deliver on all aspects of an infrastructure project relative to output specifications and budget constraints. The ability to control whole-of-life costs requires the development of detailed cost estimates. Following established guidelines, learning from precedent projects and reacting effectively to changes in project needs is essential to delivering the project on-time and on-budget.

The accuracy of cost estimates is clearly a critical factor in P3 projects, where little design work is undertaken in order to encourage design innovation and avoid replicating work effort with Proponents. Accordingly, the need for accurate cost estimates is arguably greater in P3s than in traditional design-bid-build models.

For P3 projects, this Guide recommends a Cost Analysis with an accuracy of +/- 15% which is generally supported by a Schematic Design at a 30% level. The Schematic Design Estimate focuses the capital costs of the project during the construction phase. This approach allows for the development of robust cost estimates for decision-making, while minimizing any potential to impede private sector innovation and duplicate efforts in a P3. It is generally an accepted industry standard that a Schematic Design Estimate is prepared in Elemental Format, which is approved by the Canadian Institute of Quantity Surveyor. However, developing a Schematic Design Estimate varies based on the type of infrastructure being constructed. Although different classes of infrastructure will have many common features there will be departure points, therefore, the required background information, elemental categories, and final outputs will be different among infrastructure classes.

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To incorporate the unique features of different classes of infrastructure, the Project Sponsor can adapt an alternate format for the cost estimate such as Master Format or UNIFORMAT II. Though different in form, alternative formats allow of the same level and detail of analysis.

The cost of preparing a Schematic Design Estimate can range from 1.5% to 5% of the overall project costs. However, the greater reliability attained in the preparation of a Schematic Design Estimate benefit the Sponsor. Securing a sufficient project budget and having the ability to benchmark costs against publicly verifiable construction databases for comparisons of results across projects over time are significant advantages related to the design estimate approach.

Utilizing the industry best practices recommended in this Guide in conjunction with the support of Cost Consultants and Technical Advisors, Project Sponsors have the ability to successfully deliver on all aspects of an infrastructure.

# ANNEX A: GLOSSARY

<b>Association for the Advancement of Cost Engineering (AACE)</b>	AACE International is a non-profit professional association. AACE International serves total cost management professionals in disciplines such as: cost engineering, cost estimating, planning and scheduling, decision and risk management, project management, project control, cost/schedule control, earned value management, claims, and more. AACE International has members in 87 countries and cover 80 local sections.
<b>Base Cost Estimate</b>	An evolving estimate of known factors without any allowances for risk and uncertainty, or Element of Inflation. The Base Cost Estimate is the sum of the Works Cost Estimate, the project/Design Team fees estimate and the Other Development/Project Costs estimate.
<b>Building Work (or Building Works)</b>	All components measured and incorporated in Group Elements (i.e. substructure; superstructure; Internal finishes; fittings, furnishings and equipment; services; complete buildings and building units; work to existing buildings; external works).
<b>Building Works Estimate</b>	The sum of the Cost Targets for Group Elements 1 to 9 (i.e. substructure; superstructure; internal finishes; fittings, furnishings and equipment; services; complete buildings and building units; work to existing buildings; external works; and facilitating works). It eludes main contractor's preliminaries and main contractor's overheads and profit.
<b>Canadian Institute of Quantity Surveyors (CIQS)</b>	The Canadian Institute of Quantity Surveyors (CIQS) is a self-regulatory, professional body that sets the highest standard for construction economics in Canada.
<b>Capital Variance Report</b>	Is a report reconciling the current estimate versus Project Sponsor's budget which identifies variations in capital costs, resulting from changes in the input factors (e.g., building).
<b>Client</b>	The person or organization who engages the professional advice or services of another.
<b>Component</b>	A measured item which forms part of an Element or Sub-element. The quantity of one or more items will be measured and the cost estimated to ascertain the Cost Target for an Element or a Sub-element.
<b>Conceptual Design</b>	Following the Project Initiation, the Sponsor refines requirements for the asset and begins to consider options for the development of the project.
<b>Construction Inflation</b>	An allowance included in the order of cost estimate (OCE) or elemental plan for fluctuations in the basic prices of labour, plant and equipment, and materials during the period from the date of tender return to the mid-point of the construction period. See also the definition for Tender Inflation.
<b>Cost Checks (Cost Check or Cost Checking)</b>	Take place during all design stages and are concerned with comparing current estimated costs against Cost Targets previously set for Elements or Sub-elements of the building. This entails an ongoing advisory role during each design stage.
<b>Cost Consultant</b>	A professional who, by training and experience, provides expert advice on construction costs as well as operations and maintenance.

<b>Cost Control</b>	The process of planning and controlling the costs of building(s). Takes place throughout complete duration of the construction project.
<b>Cost Limit (or Authorized budget or Approved Estimate)</b>	The maximum expenditure that the Project Sponsor is prepared to make in relation to the completed building.
<b>Cost per Functional Unit (or Functional Unit Cost)</b>	The Unit Rate which, when multiplied by the number of functional units, gives the total Building Works Estimate (i.e. Works Cost Estimate less Main Contractor's preliminaries and Main Contractor's overheads and profit). The total recommended Cost Limit (i.e. Cost Limit, including Inflation) can also be expressed as a Cost per Functional Unit when reporting costs.
<b>Cost Report</b>	This document provides a summary of the following: the methodology for the estimate; construction phasing; cost considerations (basis for escalation, Inflation, market volatility and contingency calculations); a description of all supporting documents referred to; and a listing of all cost Components bearing significant risk. The Cost Report includes the Elemental Cost Analysis, the total cost of each cost component and the cost per square meter of building gross floor areas (as defined for the specific building types).
<b>Cost Target</b>	The recommended total expenditure for an Element. The Cost Target for each Element is likely to be derived from a number of Sub-elements and Components.
<b>Design Team</b>	Architects, engineers and technology specialist responsible for the Conceptual Design aspects and the development into drawings, specifications and instructions required for construction of the building or facility and associated processes. The design team is a part of the project team.
<b>Element</b>	Elements are major components common to most buildings. Elements usually perform a given function, regardless of the design specification, construction method, or materials used. A separate cost target can be established for each Element.
<b>Element Unit Quantity</b>	A unit of measurement which relates solely to the quantity of the Element or sub-element itself (e.g. the area of the external walls, the area of windows and external doors and the number of internal doors).
<b>Element Unit Rate (EUR)</b>	The total cost of an Element divided by the Element Unit Quantity (EUQ), equates to a "composite Unit Rate". For example, the Element Unit Rate for external walls is the total cost of the external walls divided by EUQ for external walls. It includes all the cost of all materials, labour; plant, Subcontractor's preliminaries, Subcontractor's design fees and Subcontractor's overheads and profit/margins. EURs exclude Main Contractor's preliminaries, Main Contractor's overheads and profit and other allowances, such as project/Design Team fees, Other Development/Project Costs, Risk Allowances and Inflation. These items are to be assessed separately.
<b>Elemental Cost Analysis/ Cost Analysis</b>	Elemental Cost Analysis is a system of Cost Planning and control for buildings and structures which helps monitor and control project costs during design development. This analysis computes the total cost of each cost component and the cost per square metre of building gross floor areas (as defined for the specific building types).

<b>Elemental Cost Plan (or Cost Plan)</b>	The critical breakdown of the Cost Limit for the building(s) into Cost Targets for each Element of the building(s). It provides a statement of how the Design Team proposes to distribute the available budget among the Elements of the building, and a frame of reference from which to develop the design and maintain Cost Control. It also provides both a work breakdown structure (WBS) and a cost breakdown structure (CBS) which, by codifying, can be used to redistribute work in Elements to construction works packages for the purpose of procurement.
<b>Elemental Cost Summary</b>	Provides for a common point of agreement on costs for all project stakeholders in a way that is concise, consistent, easily understood, and adapted to elemental cost analysis.
<b>Elemental Format</b>	A comprehensive method of cost analysis for use in cost planning and budget control.
<b>Elemental Method</b>	A budget setting technique which considers the major Elements of a building and provides an order of cost estimate based on an Elemental Cost Analysis of a building project. The Elemental Method can also be used to develop an initial cost model as a prerequisite to developing an Elemental Cost Plan.
<b>Estimate Base Date</b>	The date on which the Cost Limit (excluding inflation - i.e. the sum of the Works Cost Estimate, project/Design Team fees estimate, Other Development/Project Costs estimate and Risk Allowance estimate) is established as a basis for calculating inflation, changes or other related variances.
<b>Facility Management Advisor</b>	Provides facility management advice for a transaction.
<b>Financial Advisor</b>	Provides financial advice for a transaction.
<b>Functional Areas Estimate Summary</b>	A report summarizing capital costs based on departmental gross floor areas.
<b>Functional Plan</b>	Developed at the Conceptual Design Stage, the Functional Plan specifies the technical requirements of the Project Sponsor. Such technical requirements may include specifying the floor layout, the type of equipment, and technology that will be used in the asset.
<b>Group Elements</b>	A main heading used to describe the facets of an Elemental Cost Analysis. Group Elements are a subset of Major Group Elements. The Shell, for example, includes the superstructure, exterior closure, and roofing.
<b>Individual Elements</b>	A main heading used to describe the facets of an Elemental Cost Analysis. Individual Elements breakdown Group Elements further; exterior closure, for example, includes exterior walls, exterior windows, and exterior doors.
<b>Industry Professionals</b>	Individuals or a group of Individual Professionals who are engaged in a certain activity and have expertise and specialized knowledge in field which one is practicing professionally
<b>Inflation</b>	An allowance included in the order of cost estimate or Cost Plan for fluctuations in the basic prices of labour, plant and equipment and materials. Refer to definitions for Tender Inflation and Construction Inflation.

<b>Key Indicators Report</b>	A report outlining key statistics on the project such as gross floor area, overall Site Area, total length of rail/track etc.
<b>Main Contractor (or Prime Contractor)</b>	The contractor responsible for the total construction and completion process of the building project. The term prime contractor is often used to mean Main Contractor in central civil government and the defense sector.
<b>Main Contractor's Overheads and Profit</b>	The Main Contractor's costs associated with head office administration proportioned to each building contract plus the Main Contractor's return on capital investment. Main Contractor's preliminaries exclude costs associated with Subcontractors overheads and profit, which are to be included in the Unit Rates applied to building works.
<b>Main Contractor's General Conditions</b>	Items which cannot be allocated to a specific Element, Sub-element or Component. Main Contractor's preliminaries include the Main Contractor's costs associated with management and staff, site establishment, temporary services, security, safety and environmental protection, control and protection, common user mechanical plant, common user temporary works, the maintenance of site records, completion and post-completion requirements, cleaning, fees and charges, sites services and insurances, bonds, guarantees and warranties. Main Contractor's preliminaries exclude costs associated with Subcontractor's Preliminaries, which are to be included in the Unit Rates applied to building works.
<b>Major Group Elements</b>	A main heading used to describe the facets of an Elemental Cost Analysis. Major Group Elements include: Shell, Interiors, Services, Site & Ancillary Work, and General Requirements and Allowances.
<b>Master Format</b>	Master Format is a standard for organizing specifications and other written information for commercial and institutional building projects in the U.S. and Canada. Master Format is a product of the Construction Specifications Institute (CSI) and Construction Specifications Canada. It provides a master list of divisions, and section numbers and titles within each division, to follow in organizing information about a facility's construction requirements and associated activities
<b>Moving Consultant</b>	Provides advice and/or assistance with moves.
<b>Other Development Project Costs</b>	Costs that are not necessarily directly associated with the cost of constructing the building, but form part of the total cost of the building project to the employer (e.g. land acquisition costs, marketing costs, etc.
<b>Professional Association</b>	A professional association is an organization seeking to further a particular profession, the interests of individuals engaged in that profession, and the public interest.
<b>Project Cost Plan</b>	Addresses the cost of the resources needed to complete the project.
<b>Project Initiation</b>	The point at which the Project Sponsor identifies the need for the asset and outlines the initial scope of the project.
<b>Project Sponsor / Sponsor</b>	One who has the legal right or title to a project or asset.
<b>Proponent</b>	A bidder in a procurement process.



<b>Public-Private Partnership (P3)</b>	A long-term contractual relationship between a Project Sponsor and the private sector that involves: the provision of capital assets and associated services to meet a defined output specification (i.e., define what is required rather than how it is to be done); the integration of multiple project phases (e.g., design, build, finance, operate and maintain); the transfer of risk to the private sector anchored with private sector capital at risk; and the performance-based payment mechanism.
<b>Risk Allowance</b>	The amount added to the Base Cost Estimate for items that cannot be precisely predicted to arrive at the Cost Limit.
<b>Risk Transfer</b>	Risk exists in all projects, irrespective of the procurement approach. In a P3, risks are transferred to the party that can best manage them, thereby reducing financial uncertainty for public sector.
<b>Risk Workshop</b>	An event in which the project team and relevant specialists are asked to identify, quantify (impact and probability) and allocate risks that could affect the various stages of a project (planning, construction, operations, lifecycle).
<b>S-Curve</b>	The S-curve shows graphically the cumulative progress of a construction project over the project duration
<b>Schematic Design</b>	The Schematic Design, prepared by architects and engineers, considers the overall design of the build with production of preliminary sketch drawings and an outline specification.
<b>Schematic Design Estimate</b>	An estimate between the what is referred to as a Class D and Class C estimate which is at the higher end of the range and provides a more specific, more accurate cost figure while focusing on the use of the output requirement of +/- 15% level of accuracy. The purpose this estimate level is to provide a more comprehensive cost estimate and will be typically based on a better definition of the scope of work. An estimate at this level may be used to price various design schemes in order to see which scheme best fits the budget, or it may be used to price various design alternatives, or construction materials and methods for comparison.
<b>Site Area</b>	The total area of the site within the site title boundaries (or the total area within the site title boundaries defined by the employer as the site for the building), measured on a horizontal plane, excluding the area of the building footprint. Excludes any areas used temporarily for the building works that do not form part of the delivered building project.
<b>Subcontractor</b>	A contractor who undertakes specific work within the building project; known as specialist, works, trade, work package, and labour only Subcontractors.
<b>Subcontractor's Preliminaries</b>	Preliminaries that relate specifically to Building Work which is to be carried out by a Subcontractor. Costs associated with Subcontractor's preliminaries are to be included in the Unit Rates applied to Sub-elements and individual components.
<b>Sub-element</b>	A part of an Element. Similar to Elements, a separate Cost Target can be established for each Sub-element.
<b>Technical Advisor</b>	Provides advice on such items including: design and construction, performance specifications, and asset hand-back requirements.

<b>Tender Inflation</b>	An allowance included in the order of cost estimate or Cost Plan for fluctuations in the basic prices of labour, plant and equipment and materials during the period from the Estimate Base Date to the date of tender return. See also the definition for construction Inflation.
<b>Total Development Cost</b>	The Cost Limit (including Inflation – i.e. the total of the Works Cost Estimate, the project/Design Team fees estimate, Other Development/Project Costs estimates, Tender Inflation and construction Inflation) for the building project.
<b>The Total Project Costs Report</b>	A report that includes the total cost of each cost Component and the cost per square foot of building gross floor area (as defined for the specific building type).
<b>Transaction Advisor</b>	Provides advice on a transaction.
<b>UNIFORMAT II / UniFormat</b>	UniFormat is a standard for classifying building specifications, cost estimating, and cost analysis in the U.S. and Canada. The elements are major components common to most buildings. The system can be used to provide consistency in the economic evaluation of building projects. It was developed through an industry and government consensus and has been widely accepted as an American Society for Testing and Materials (ASTM) standard. In 1989, ASTM International began developing a standard for classifying building elements, based on the UNIFORMAT. It was renamed to UNIFORMAT II.
<b>Unit Rate(s)</b>	The monetary rate applied to an Element, Sub-element or component per unit of measurement (e.g. cost per m, cost per m <sup>2</sup> and cost per m <sup>3</sup> ). The term also includes costs/m <sup>2</sup> of GFA and Cost per Functional Unit (or Functional Unit Cost).
<b>Value for Money (VfM)</b>	Value for Money (VfM) is the comparison between the total project costs (capital base costs, financing costs, retained risks and ancillary costs), at the same point in time, for a traditionally procured project (known as the public sector comparator or PSC) and delivery of the same project using the P3 model (known as the shadow bid). The incremental difference between the public sector comparator and the shadow bid is referred to as the VfM. There is said to be a positive VfM for procuring a project using a P3 approach when the Shadow Bid is less than the public sector comparator.
<b>Works Cost Estimate</b>	The combined total estimated cost of the building works estimate, the Main Contractor's preliminaries and the Main Contractor's overheads and profit prepared using prices current at the time the estimate is prepared (or updated). The Works Cost Estimate contains no allowance for project/Design Team fees, Other Development/Project Costs, Risk Allowances, Tender Inflation and construction Inflation.

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IMPROVING THE DELIVERY OF  
INFRASTRUCTURE THROUGH  
PUBLIC-PRIVATE PARTNERSHIPS  
UTILISER LES PARTENAIRES  
PUBLIC-PRIVÉ AFIN D'AMÉLIORER  
LA MISE EN PLACE D'INFRASTRUCTURE  
PUBLIQUE

<b><u>Solicitation No. - N° de Sollicitation</u></b>	<b><u>Amd. No. - N° de la modif.</u></b>	<b><u>Buyer ID - Id de l'acheteur</u></b>
EJ078-200154/001/FE	000	FE181
<b><u>Client Ref. No. - N° de réf. du client</u></b>	<b><u>File No. - N° du dossier</u></b>	<b><u>Title of Project – titre du projet</u></b>
20200154	fe181-EJ078-200154	875 HERON ROAD REHABILITATION PROJECT – TECHNICAL ADVISOR

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## APPENDIX I – REAL PROPERTY SUSTAINABILITY FRAMEWORK (RPSF), 2015



Public Works and  
Government Services  
Canada

Travaux publics et  
Services gouvernementaux  
Canada

Canada



# PWGSC Real Property Sustainability Framework

April 1, 2015

Public Works and Government Services Canada  
Real Property Branch

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



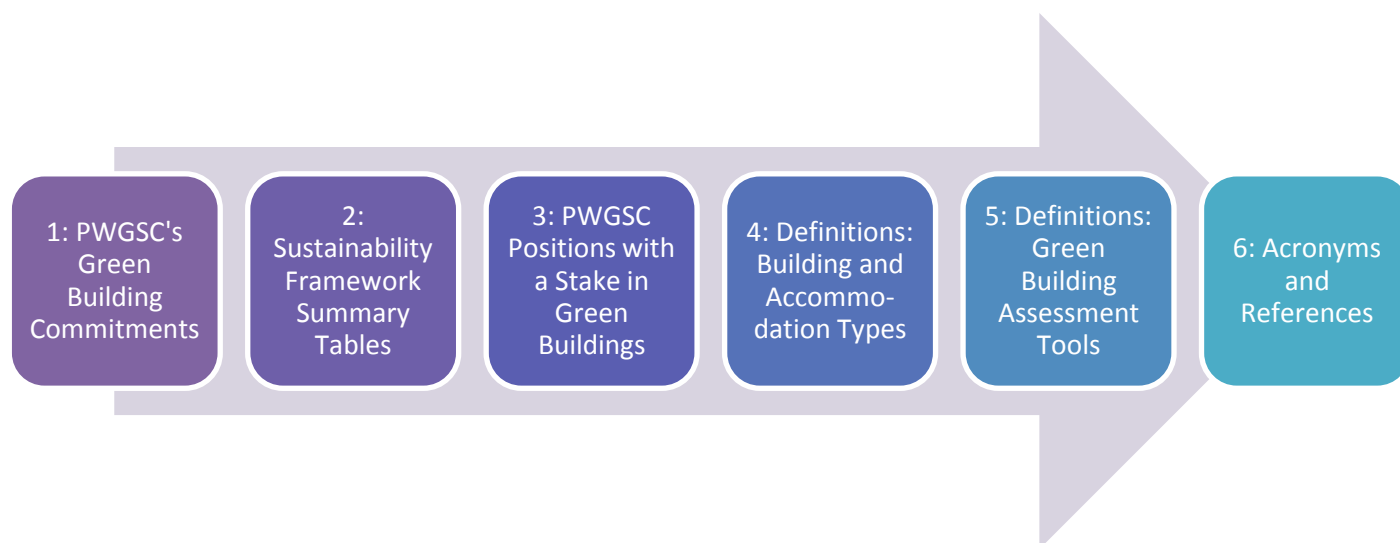
# Introduction

The Government of Canada is committed to minimizing the environmental footprint of the more than 28,000 buildings it owns or leases across Canada. Public Works and Government Services Canada (PWGSC) provides accommodation to parliamentarians and more than 272,000 public servants in 1733 locations across Canada. As one of the largest custodians of federal real property and as a leader in sustainable buildings, PWGSC is committed to minimizing the environmental impact of the accommodations it provides to federal employees through the management and delivery of the department's programs and activities.

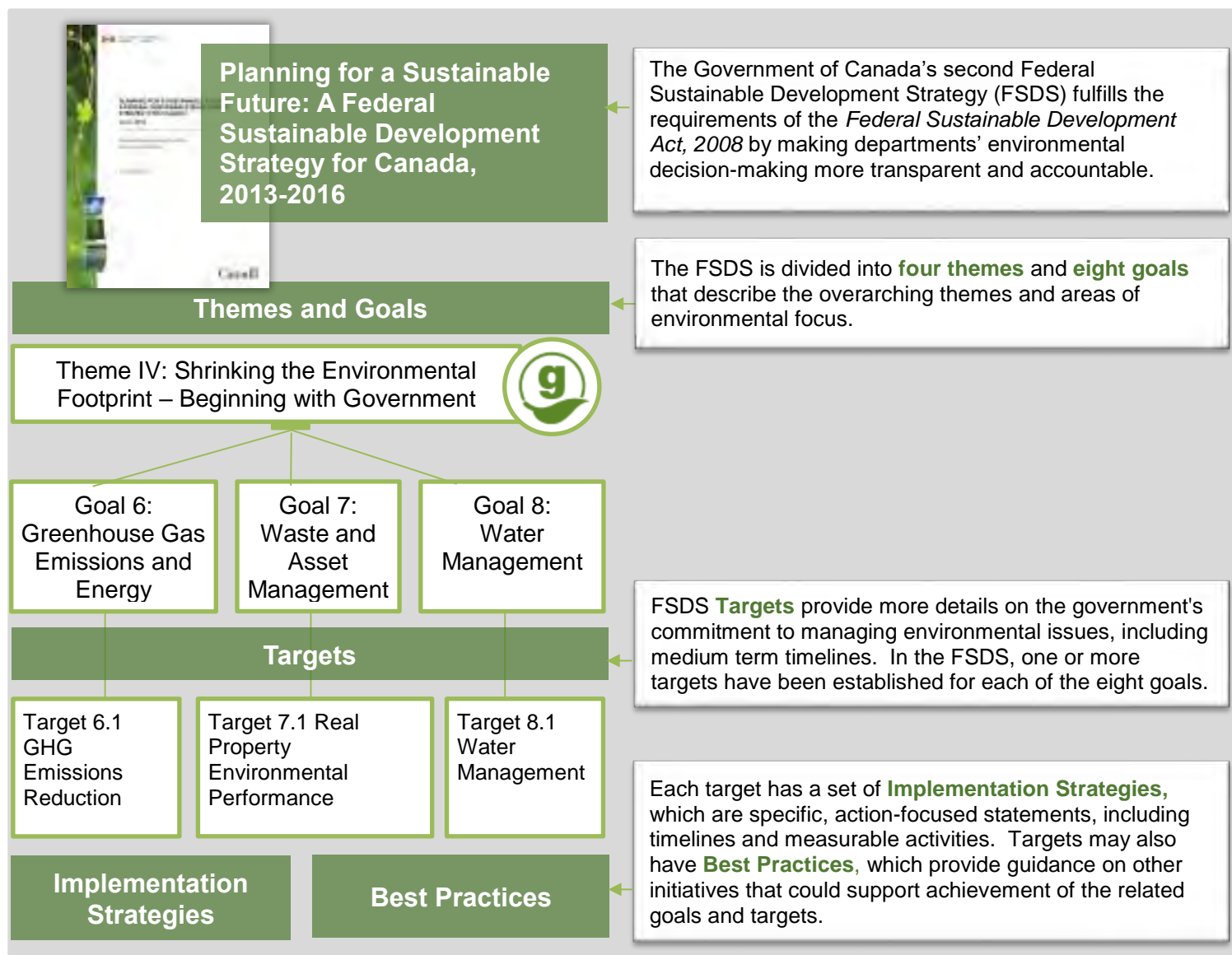
The purpose of this **Real Property Sustainability Framework** is to present PWGSC's commitments and approaches for reducing the environmental footprint of its buildings. This framework integrates and summarizes PWGSC's diverse green building commitments. The following documents encompass the scope of PWGSC's commitments: *Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada* (FSDS), departmental Sustainable Development Strategies (SDS), departmental business plans, departmental Reports on Plans and Priorities (RPP), and the Real Property Branch (RPB) Sustainable Buildings Policy. This framework applies to all real property assets under custodianship of PWGSC, whether they are managed by the department or by a contractor under a RP-n contract.

PWGSC has also adopted a number of green building best practices, such as incorporating Green Leases into business operations, promoting an integrated design approach, fostering the use of sustainable materials, and establishing environmental performance benchmarks. Additional details for these and other best practices are provided for staff in the *Green Building Implementation Guide* (refer to Section 6 for a link to this document).

This Real Property Sustainability Framework is simple to navigate. The key sections of the framework include:



# 1. PWGSC's Green Building Commitments



**Figure 1: Overview of FSDS**

**Spotlight on Green Buildings:** As illustrated in Figure 1, the fourth theme in the current FSDS establishes specific goals and targets aimed at “Shrinking the Environmental Footprint – Beginning with Government”, including a focus on green buildings. The FSDS requires that departments and agencies manage their real property in an environmentally responsible manner, consistent with the definition and basic principle of sustainable development. Such commitments are to be reflected in a Real Property Sustainability Framework.

In response, PWGSC's Real Property Branch has identified the Implementation Strategies and Best Practices (Table 1) most relevant to its operations, based on its past experience, its commitments, and its expectations for the future operations of the department. Specifically, the Branch has committed to several FSDS Implementation Strategies and Best Practices that will help achieve Targets 6.1 (GHG Emissions Reduction), 7.1 (Real Property) and 8.1 (Water). All of these commitments are presented in Table 1 of the department's framework.

**Table 1: Green Building Commitments relevant to FSDS Targets 6, 7 and 8<sup>1</sup>**

**FSDS Target 6.1: GHG Emissions Reduction.** *The Government of Canada will reduce greenhouse gas emissions from its buildings and fleets by 17% below 2005 levels by 2020.*

The Real Property Branch, on behalf of PWGSC, has committed to reducing its greenhouse gas (GHG) emissions from its buildings and fleet of vehicles by 17% below 2005 by March 31, 2021. The strategy to address this commitment is presented in the 2014 PWGSC Greenhouse Gas Action Plan.

**FSDS Target 7.1: Real Property Environmental Performance.** *As of April 1, 2014, and pursuant to departmental Real Property Sustainability Frameworks, an industry recognized level of high environmental performance will be achieved in Government of Canada real property projects and operations.*

FSDS Implementation Strategies and Best Practices	Relevant PWGSC Green Building Commitments
<p><b>7.1.1</b> By March 31, 2015, each department will update as appropriate, their Real Property Sustainability Framework to define the custodian's approach to managing the environmental performance of new construction, build-to-lease projects, major renovations, operation and maintenance of existing Crown-owned buildings, and new lease or lease renewal projects over 1000 m<sup>2</sup>. Key elements of the Real Property Sustainability Framework will address the scope of application and commitments to:</p>	
<p><b>7.1.1.1</b> Achieve a level of performance that meets or exceeds the custodian's current commitment(s) to sustainable buildings using industry-recognized assessment and verification tool(s).</p>	<p>As of April 1, 2012, all newly constructed federal government office buildings, including Crown-owned, leased-to-own, and build-to-lease will meet the LEED Canada-NC Gold, 4 Green Globes for Design or equivalent level of environmental performance.</p> <p>As of April 1, 2012, all major renovations of office buildings and all non-office buildings will meet the LEED Canada-NC Silver, 3 Green Globes for Design or equivalent level of environmental performance.</p> <p>From April 2004, the PWGSC building acquisition process will be updated to include environmental assessment and the requirement to meet either LEED Silver equivalent or 3 Green Globes rating. The costs to bring the building to these standards will be included in the selection process.</p> <p>As of April 1, 2012, existing crown buildings ≥1000 m<sup>2</sup> in rentable area will be assessed for environmental performance using an industry-recognized assessment tool, such as BOMA BEST, LEED EB:O&amp;M or equivalent.</p> <p>As of April 1, 2012, leased office and non-office space ≥500 m<sup>2</sup> in rentable area and in which PWGSC is the majority leasee (&gt; 50% of the total rentable area in the building) will be assessed using the BOMA BEST assessment method and must qualify for at least the first level of certification. This applies to leases with a term of greater than 5 years, including all option years.</p>

<sup>1</sup> The buildings covered in these commitments include all federal buildings that are under the custodianship of PWGSC or linked to the government through its leasing activities.

FSDS Implementation Strategies and Best Practices	Relevant PWGSC Green Building Commitments
	<p>As of April 1, 2012, leased office space <math>\geq 10,000</math> m<sup>2</sup> in rentable area and in which PWGSC is the majority leasee (&gt; 50% of the total rentable area of the building) will be assessed using the BOMA BEST assessment method and must qualify for at least the second level of certification. This applies to leases with a term of greater than 5 years, including all option years.</p> <p>As of April 1, 2012, all office-space fit-up and retrofit projects with a project area <math>\geq 1000</math> m<sup>2</sup> in usable area that involve a complete redesign will achieve LEED Commercial Interiors Silver or 3 Green Globes for fit-up or equivalent.</p>
<p><b>7.1.1.2</b> Conduct life-cycle assessments for major construction and renovation projects using an industry recognized tool.</p>	<p>As of April 1, 2015, all new building construction and major renovation projects of &gt; \$5M will undergo a life-cycle assessment of the major building elements (structure and envelope) using the Athena Sustainable Materials Institute's "Environmental Impact Estimator", "EcoCalculator" or equivalent.</p> <p>The commitment does not apply in remote and northern communities, as the Athena tool does not accommodate these locations well.</p> <p>The commitment does not apply to space fit-up projects.</p>
<p><b>7.1.1.4</b> Manage the collection, diversion and disposal of workplace waste in Crown-owned buildings in an environmentally responsible manner.</p>	<p>By April 2007, multi-material recycling will be implemented in PWGSC Crown-owned buildings where recycling infrastructure exists.</p> <p>Starting on March 31, 2016, PWGSC will assess all Crown-owned general purpose office buildings <math>\geq 5000</math> m<sup>2</sup> through waste audits and waste reduction work plans to baseline, track, and assess performance of non-hazardous solid waste management practices on a five-year cycle.</p> <p>By March 31, 2016, PWGSC will ensure that paper material generated in Crown-owned buildings is reused or recycled, where feasible.</p> <p>By March 31, 2017, PWGSC will have implemented composting collection services in all existing Crown-owned buildings, where feasible.</p> <p>As of April 1, 2015, all newly constructed federal government office buildings, including Crown-owned, leased-to-own, and build-to-lease will be designed to accommodate composting collection services and will implement these services, where feasible.</p> <p>As of March 31, 2016, PWGSC will have implemented a national waste diversion program such as the 3R Plus Program in Crown-owned buildings, where feasible.</p> <p>Commencing in April 2004, at the time of lease renewals and new lease agreements, cost effective multi-material recycling will be implemented in leased buildings, where the recycling infrastructure exists and where PWGSC is the majority lessee.</p>
<p><b>7.1.1.5</b> Manage construction, renovation and demolition waste in Crown-owned buildings in an environmentally responsible manner.</p>	<p>As of April 2004, in real property projects over \$1M and in communities where industrial recycling is supported, the implementation of construction and demolition waste management practices will be completed, with waste materials being reused or recycled.</p> <p>As of March 31, 2015, construction, renovation, and demolition projects of more than \$1M will achieve a minimum waste diversion target of 75%.</p>

FSDS Implementation Strategies and Best Practices	Relevant PWGSC Green Building Commitments
	By March 31, 2016, construction, renovation, and demolition waste management practices will be integrated into the National Project Management System (NPMS) and will be used for reporting, including the projects' final diversion rates.
<b>7.1.1.6</b> Develop an approach to improve performance of Crown-owned buildings via automation and commissioning.	<p>As of April 1, 2015, start using only Open Protocol (BACnet) capable Building Automation Systems and building components (e.g. building envelopes) in all new construction and major renovation projects.</p> <p>By March 31, 2016, assess the status of Building Automation Systems in buildings <math>\geq 5000</math> m<sup>2</sup> under Department's custody for suitability for integration with a Smart Building/Intelligent Building system.</p> <p>By March 31, 2017, start implementing Smart/Intelligent Building technology in selected (suitable) buildings.</p>
<b>7.1.1.9</b> Benchmark and report annually on the energy usage intensity of Crown-owned office buildings using an industry recognized tool.	Commencing April 1, 2015, PWGSC will register all Crown-owned office buildings for which it is the custodian, in the ENERGY STAR Portfolio Manager and maintain the information in the program thereafter.
<b>Best Practice 7.1.2</b> Real property managers and functional heads responsible for new construction, leases or existing building operations will have clauses related to environmental considerations incorporated into their performance evaluations.	As of April 1, 2014, in support of the Real Property Branch Assistant Deputy Minister/Associate Assistant Deputy Minister's Performance Management Agreement, all staff at the EX-1 level and above will include a statement of support for the organization achieving results pertaining to the Greening Government Operation's priority of reducing the government's environmental footprint; and continue to lead national programs that guide and support operations that ensure compliance with environmental acts, legislation and Federal Sustainable Development Strategy commitments.

**FSDS Target 8.1: Water Management.** *As of April 1, 2014, the Government of Canada will take further action to improve water management within its real property portfolio.*

FSDS Implementation Strategies and Best Practices	Relevant PWGSC Commitments
<b>8.1.1</b> By March 31, 2015, each department will update, as appropriate, the Real Property Sustainability Framework to define the custodian's approach to sustainable water management in Crown-owned assets. Key elements of the approach will address the scope of application and commitments to:	
<b>8.1.1.1</b> Conserve potable water	As of April 1, 2015, PWGSC will examine the feasibility of reducing potable water consumption from cooling towers in existing crown-owned buildings by increasing cooling tower cycle of concentration to six or more on a case by case basis.

FSDS Implementation Strategies and Best Practices	Relevant PWGSC Commitments
	<p>By March 31, 2016, PWGSC will, where feasible, install water meters in buildings that are currently not metered.</p> <p>By March 31, 2017, PWGSC will determine the department's national baseline water consumption to establish an achievable national water-reduction target in terms of litres/person or litres/m<sup>2</sup> for its existing crown-owned inventory.</p> <p>By March 31, 2016, PWGSC will eliminate the use of cooling systems that utilize single-pass cooling.</p>
<b>8.1.1.2</b> Manage storm water run-off	<p>By March 31, 2016, where feasible, PWGSC will ensure that all roof drains in its existing crown-owned buildings <math>\geq 1000</math> m<sup>2</sup> are disconnected from sanitary or combined sewers, where feasible.</p> <p>By March 31, 2016, PWGSC will develop and implement a framework for assessing and installing storm water reuse options in new building constructions <math>\geq 1000</math> m<sup>2</sup>.</p>
<b>8.1.1.4</b> Meter the water usage in new projects	<p>As of April 1, 2015, all new construction projects will include the installation of a building level water meter.</p> <p>As of April 1, 2015, all major renovations (as defined in Table 2, Row 5.) that affect the building's plumbing system, will include the installation of a building level water meter.</p>
<b>Best Practice 8.1.2</b> Conduct potable water audits in Crown-owned assets	Water audits will be conducted as part of building utility (energy and water) audits under the regular building management program of Real Property Branch's Asset Management Plan / Building Management Plan program.
<b>Best Practice 8.1.4</b> Reclaimed non-potable water is used for landscape irrigation	For properties with significant landscaped features, new construction and building renovations that affect the plumbing system, the collection and use of non-potable water (rainwater and greywater) will be considered for site irrigation requirements, where feasible. A study identifying those sites with this potential will be updated to reflect current conditions.

## 2. Sustainability Framework Summary Tables

The tables below summarize PWGSC's commitments for each building project type, including the threshold, assessment tool(s) and energy efficiency targets. Table 2 addresses the commitments related to Project Design and Delivery; and Table 3 addresses ongoing Building Management.

### ***How does the National Energy Code for Buildings (NECB) inform energy efficiency targets?***

The NECB provides a series of design criteria (e.g. for systems and equipment for heating, lighting, and electrical power systems) that result in a building having a certain energy performance. This NECB level of energy performance is used as a baseline for the targets specified here. Most of these targets aim to make projects significantly more energy efficient than a building that meets only NECB requirements.

**Table 2: Project Design and Delivery**

Building Project Type	Threshold <sup>2</sup> (\$ or m <sup>2</sup> )	Assessment Tool & Target	Energy Efficiency Target	Lifecycle Assessment
1. New office buildings	All projects	<a href="#">LEED Gold</a> or <a href="#">4 Green Globes</a>	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 <sup>3</sup>	All projects	<a href="#">LEED Silver</a> or <a href="#">3 Green Globes</a>	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 <sup>2</sup>	<a href="#">LEED Gold</a> or <a href="#">4 Green Globes</a>	24% more energy efficient than NECB performance and/or 35% more energy efficient than the building being replaced.	No
4. Building acquisition	All projects	<a href="#">LEED Silver</a> or <a href="#">3 Green Globes</a>	24% more energy efficient than NECB performance.	No
5. Buildings undergoing Major Renovations <sup>4</sup>	All projects	<a href="#">LEED Silver</a> or <a href="#">3 Green Globes</a>	24% more energy efficient than NECB performance.	Athena EIE/EC (>\$5M, location restrictions)
6. Space Fit-Up and Retrofits	≥1000 m <sup>2</sup> (Office)	<a href="#">LEED Silver</a> or <a href="#">3 Green Globes</a>		No

**Table 3: Building Management**

Building Project Type	Threshold (\$ or m <sup>2</sup> )	Assessment Tool and Target	Frequency
1. Existing federally-owned buildings (office and non-office)	≥1000 m <sup>2</sup>	<a href="#">BOMA BEST</a>	5 years
2. New and renewed leased office buildings	≥10,000 m <sup>2</sup> , 5+ year lease	<a href="#">BOMA BEST Certified (second level)</a>	3 years
	≥500 m <sup>2</sup> (major lessee of 5+ year lease)	<a href="#">BOMA BEST Certified (first level)</a>	3 years
3. New and renewed leased non-office buildings	≥500 m <sup>2</sup> (major lessee of 5+ year lease)	<a href="#">BOMA BEST Certified (first level)</a>	3 years

<sup>2</sup> This only includes buildings where PWGSC is the custodian or leases where PWGSC is the lease holder.

<sup>3</sup> This does not include special purpose buildings for which no appropriate green assessment tool is available.

<sup>4</sup> Heritage buildings undergoing major renovations are subject to the Sustainable Heritage Guide



### 3. PWGSC Positions Involved in Green Buildings

Table 4 lists the most common positions within Real Property Branch that are involved in green buildings. These stakeholders have various roles in implementing the commitments PWGSC has made in response to the FSDS 2013 – 2016 (described in Section 1). Many also have a role in reporting PWGSC's performance against meeting these commitments. A number of these position titles are generic, that is, they are meant to describe the position in a general way, recognizing that the position may be defined differently between various sectors and regions.

**Table 4: Common Projects Relevant to each RPB Position**

RPB Position:	Project Delivery:						Building O&M:	
	New Office Buildings	Other Types of Newly Constructed Buildings	Long-Term Lease	Building Acquisitions	Buildings Undergoing Major Renovations	Space Fit-up and Retrofits	Management of Existing Federally Owned Office and Non-Office Buildings	Management of New and Renewed Leased Office and Non-Office Buildings
Regional and Senior Directors	●	●	●	●	●	●	●	●
Owner / Investor	●	●	●	●	●	●		
Sustainable Building Coordinators <sup>5</sup>	●	●	●	●	●	●	●	●
Project Leaders	●	●	●	●	●	●		
Senior Project Managers	●	●	●	●	●	●		
Project Managers	●	●	●	●	●	●		
Environmental Services Department (ESD) Technical Specialists	●	●	●	●	●	●	●	
All Other Technical Specialists (e.g. Architects, Engineers)	●	●	●	●	●	●		
Client Accommodation Service Advisor	●	●	●		●	●		
Leasing Officers	●		●			●		●
Lease Administrators, Asset and Facility Management Services	●		●			●		●
Asset / Facility Manager, Asset and Facility management Services (AFMS)						●	●	
Maintenance Management							●	

<sup>5</sup> **Sustainable Building Coordinators:** Each region should have a "sustainable building coordinator" under one of a variety of position titles. Ordinarily, this coordinator will be within the Environmental Services group of Professional and Technical services, but each region is organized differently to meet its own unique requirements. For project delivery, the sustainable building coordinator is to be consulted at the outset of each project as an integral part of the project team. The sustainable buildings coordinator will be included on the project team from the initial planning stages of the project. They assist the project team to determine how the building will achieve its targets. They also provide advice for integrating sustainability design principles into projects and for operating practices to be used in building management. And, they coordinate the collection of reporting information from the project manager on the green building targets.



## 4. Definitions: Building and Accommodation Types

PWGSC's green building commitments vary across the types of buildings and accommodations. The following tables provide definitions for the common building and accommodation types applicable to the Department.

**Table 5: Definitions of Common Building Types**

Building Types	Definition
1. New office buildings	All newly constructed general-purpose office buildings owned by PWGSC.
2. Other types of newly constructed buildings	Any newly constructed building type (e.g. shops, warehouses, garages) owned by PWGSC, other than a general-purpose office building.
3. Long-term lease buildings	<p>All buildings leased for a term of 15 years or greater for any combination of the initial term plus optional extensions. This includes:</p> <p><i>Lease-to-purchase:</i> All new and existing buildings that are leased with an option to purchase the building at the end of the lease.</p> <p><i>Build-to-lease new office buildings:</i> Newly constructed office buildings that are built to the specifications of a federal government lease agreement.</p> <p><i>Sale-leaseback:</i> All new and existing buildings that are sold to a third party, with whom PWGSC subsequently enters into a lease agreement. May be short to medium term (1-10 years) or long term (20+ years) subject to the vendor's specific occupancy or capital requirements.</p>
4. Building acquisition	Existing buildings purchased by PWGSC.
5. Buildings undergoing Major Renovations	<p>Defined as a renovation to a building owned by PWGSC that may entail any one of the following set of conditions:</p> <ul style="list-style-type: none"> <li>– The building is stripped to its structure, or it is undergoing a mid-life retrofit;</li> <li>– The building renovations include significant alterations to the building's envelope and heating, ventilation and air conditioning (HVAC) systems; and/or</li> <li>– The total renovation budget is equal to or greater than 50% of the replacement cost of the building in current dollars.</li> </ul> <p>Buildings with heritage elements are a sub-group of this building project type.</p>
6. Space Fit-Up and Retrofits	<p>"Fit-Up" refers to the preparation of a building office space for initial federal occupancy whereas "Retrofit" (or "Refit") refers to the preparation of a building office space previously occupied by a federal organization to meet new requirements or to respond to a change in functional requirement of an organization.</p> <p>This definition applies to space fit-ups and retrofits for building office space of <math>\geq 1000</math> m<sup>2</sup> and a complete redesign of the space. This includes:</p> <ul style="list-style-type: none"> <li>– Space is stripped to its base building (industry standard) configuration;</li> <li>– Redesign of lighting; and</li> <li>– Redesign of plumbing services for the space.</li> </ul>

**Table 6: Definitions of Accommodation Types**

Accommodation Types	Definition
1. Crown-owned, Crown managed	The building is owned by the Crown under the custodianship of PWGSC and managed by employees of the Department.
2. Crown-owned RP-n managed	The building is owned by the Crown under the custodianship of PWGSC and managed by a private sector contractor under an RP-n contract.
3. Buildings in which space is leased	The building is owned by a private sector company and managed by that company or its agent.

## 5. Definitions: Green Building Assessment Tools

Green or sustainable buildings are generally defined as those that deliver superior environmental performance in areas such as: the building site; water; energy; material resources; and the indoor environment. PWGSC uses the tools presented in Table 7 (below) to assess the performance and impact of its buildings during project delivery (i.e. design and construction) and building management (i.e. operation and maintenance).

When selecting a tool to assess and report on environmental performance and impact, the project team must consider the project type, the total value of project and the relevant commitment made by PWGSC toward greening its operations. The *Green Building Implementation Guide* (refer to Section 6 for a link to this document) outlines in detail how project teams should approach the assessment of each project type, including how to select the appropriate assessment tool.

**Table 7: Description of Assessment Tools and Supporting Materials**



**Leadership in Energy and Environmental Design®:** LEED is a points-based rating system used to assess the environmental performance of buildings. It is the principal system used by PWGSC and is widely recognized as the industry standard. It can be used to assess: new construction, including major renovations (NC); the fit-up of an existing building; commercial interiors (CI); and existing building operations and maintenance (EB:O&M). Buildings are awarded one of four levels based on their score: Certified, Silver, Gold, and Platinum.



**Green Globes:** Green Globes (formerly BREEAM/Green Leaf) is a points-based rating system used to assess the environmental performance of buildings. It can be used for both new construction (including major renovations) and for interior space fit-ups of existing spaces. Buildings are awarded one to five 'Green Globes' based on their score.



**Athena Environmental Impact Estimator (EIE) and EcoCalculator® (EC):** The Athena Sustainable Materials Institute's EIE/EC tools are used to conduct a life-cycle assessment to determine the environmental impact of major construction and renovation projects. These tools enable informed decisions, at different levels of detail and precision, estimate the environmental impact of construction materials and their use in building projects, focusing principally on concrete, steel and wood.



**Building Owners and Managers Association Building Environmental Standards program (BOMA BEST®):** The BOMA BEST program assesses the energy and environmental performance of operation and maintenance of existing buildings. It is the principal system used by PWGSC for existing buildings and is widely recognized as the industry standard. It has a set of best practices and gradations of environmental certification.



**ENERGY STAR Portfolio Manager:** The ENERGY STAR Portfolio Manager is an interactive energy management tool for tracking and assessing the energy and water consumption of buildings. It allows users to monitor, rate, and optimize their building's energy use – all in a secure online environment. Developed and owned by the U.S. Environmental Protection Agency, the Portfolio Manager is currently in use by Natural Resources Canada and has been adapted to include Canadian weather and other data specific to Canada.



**National Energy Code for Buildings, 2011 (NECB):** The National Energy Code for Buildings, 2011 (NECB) provides minimum requirements for the design and construction of energy-efficient buildings. It covers the building envelope, systems and equipment for heating, ventilating and air-conditioning (HVAC), service water heating, lighting, and the provision of electrical power systems and motors. It applies to new buildings and additions. It does not apply to farm buildings nor to housing and smaller buildings covered in Part 9 of the National Building Code of Canada (NBC).

**2014 PWGSC Greenhouse Gas Action Plan:** The 2014 PWGSC Greenhouse Gas Action Plan was developed as a specific guide to achieving the Department's FSDS greenhouse gas (GHG) emission reduction target. The Action Plan identifies the most cost effective path to achieving the Department's emission reduction goal by 2020. The Action Plan establishes specific regional GHG goals to achieve the overall GHG emission reduction target, and identifies the key facilities across the country that must be the focus of PWGSC's efforts.

**Sustainable Heritage Guide (SHG):** The Sustainable Heritage Guide was developed by PWGSC to provide guidance to project teams on integrating sustainability building standards in heritage building projects.

**Green Lease:** PWGSC's 'green lease' provision was established in 2004 to address other types of leases for office buildings (other than those that are Crown owned). The PWGSC Green Lease addresses key environmental standards such as the proper management of wastewater, indoor air quality and energy efficiency.

## 6. Acronyms and References

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**Athena EIC/EC** – Athena Environmental Impact Estimator and EcoCalculator ([EIE/EC®](#))

**BOMA BEST** – Building Owners and Managers Association Building Environmental Standards program ([BOMA BEST](#))

**EB:O&M** – LEED Existing Building Operations & Maintenance ([LEED EB:O&M](#))

**ENERGY STAR Portfolio Manager** – ([ENERGY STAR Portfolio Manager](#))

**FSDS** – Federal Sustainable Development Strategy Canada ([FSDS](#))

**GHG** – Greenhouse Gas

**Green Building Implementation Guide** – ([Green Building Implementation Guide](#))

**Green Globes** – ([Green Globes](#))

**Green Lease** – ([Green Lease](#))

**HVAC** – Heating, Ventilation and Air Conditioning

**LEED** – Leadership in Energy and Environmental Design ([LEED®](#))

**NCA** – National Capital Area

**NBC** – National Building Code of Canada

**NECB** – National Energy Code for Buildings – ([NECB](#))

**NPMS** – National Project Management System

**OGGO** – Office for Greening Government Operations

**PWGSC** – Public Works and Government Services Canada

**RPB** – Real Property Branch

**RPP** – Reports on Plans and Priorities

**SDS** – Sustainable Development Strategy

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APPENDIX J – REAL PROPERTY SUSTAINABLE DEVELOPMENT AND ENVIRONMENT STRATEGY, 2018

# PSPC REAL PROPERTY SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL STRATEGY

JUNE 2018



THIS DOCUMENT WAS PREPARED FOR PUBLIC  
SERVICES AND PROCUREMENT CANADA BY WSP

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## 1.0 Introduction

The Government of Canada (GC) is committed to minimizing the environmental footprint of more than 28,000 of its owned or leased buildings across Canada. The Real Property Services (RPS) within Public Services and Procurement Canada (PSPC) provides accommodation to parliamentarians and more than 257,000 public employees in approximately 6,930,000m<sup>2</sup> rental space in approximately 1,600 locations across Canada.

As one of the largest custodians of federal real property and as a leader in sustainable buildings, RPS is committed to operating within the principles of sustainable development.

Sustainable development is a key priority and has been emphasized in the Speech from the Throne (2015–2016), Blueprint 2020, Federal Sustainable Development Strategy 2016–2019, the Real Property Services 2016–2019 Business Plan, Treasury Boards' Greening Government Strategy (December 2017), as well as the Deputy Minister's three departmental priorities: greening the way we work, changing the way we work and changing the way we deliver services.

RPS has responded by initiating the development of the Sustainable Development and Environmental Strategy (the Strategy), which embraces the Government's sustainability direction in a holistic manner. The Strategy identifies long-term strategic goals that explicitly address all three pillars of sustainability: the environment, the economy, and the society.

For the Strategy, RPS has adopted the definition of sustainable development from the [United Nations World Commission on Environment and Development](#) report entitled *Our Common Future*<sup>1</sup>. In the report, sustainable development is defined as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*'

*Our Common Future* also emphasized the three pillars of sustainable development: the environment, the economy and society. These pillars form the foundation of the RPS Strategy.

For RPS, sustainable development is the bridge that connects it to a future where its assets and leases are models of sustainable performance; it is a trusted partner in the communities in which it operates; it is an employer of choice for top talent, and its clients are served with excellence. This Strategy demonstrates the long-term sustainable future RPS is determined to achieve by year 2050. As a companion document to the Strategy, a strategy implementation plan will be developed and will outline the short-, medium- and long-term initiatives to guide how RPS will meet its goals.

## 2.0 Purpose

Sustainability has had a place within Real Property Services (RPS) for several decades and as it evolves into an increasingly integral part of RPS, a document that provides strategic guidance is required.

The Strategy is a significant step in establishing that sustainability principle to become 'simply the way things are done within RPS'. Additionally, enriching RPS with long-term strategic goals will ensure the change is sustained over the long-term.

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<sup>1</sup> *Our Common Future* is also known as the Brundtland Report



RPS' existing sustainability practices are focused primarily on obtaining industry recognized third party green building certifications. As such, this effort emphasizes some areas of sustainability while overlooking other key areas. For example, when pursuing a green building certification, projects take into account the implementation of sustainable performance initiatives (i.e. reduction of energy and water consumptions) but will not address social and economic initiatives (e.g. being an employer of choice and integrating with local communities).

While green building certification can help in many ways, the absence of an overarching sustainability strategy will limit RPS from addressing all three pillars of sustainability: the environment, the economy, and society.

The Strategy will enable RPS to:

- have a powerful and a systematic tool that is uniquely designed to address challenges within RPS;
- drive a holistic, sustainable change within RPS and maintain the change over the long-term; and
- encourage deeper and transparent engagement with all Canadians.

The Strategy is an overarching strategic document that provides a roadmap to guide RPS to its desired future. The ultimately it formulates long-term strategic goals that frame where RPS wants to be.

For the Strategy to be embedded, deployed and transitioned into effective operational procedures within RPS, an implementation plan will be developed as a subsequent phase. The Implementation Plan's purpose is to frame how RPS will achieve its long-term strategic Goals. It will support the Strategy by breaking each long-term strategic goal into identifiable steps, assign steps to teams, set timelines and identify the resources.

RPS will know the Strategy is being successfully implemented when the long-term strategic goals are effectively integrated into plans, policies, procedures and decision-making processes.

### 3.0 Approach

The Strategy was developed drawing on research of various international and national corporations and levels of government.

Extensive stakeholder consultation was also conducted including a visioning session with the Real Property Services (RPS) Professional Technical Services senior management. Numerous engagement sessions were also held with participants from every RPS service line and sector, the Public Services and Procurement Canada (PSPC) regions, the Parliamentary Precinct Branch, Brookfield Global Integrated Solutions (BGIS) and the Centre for Greening Government of the Treasury Board of Canada Secretariat.

Developing the Strategy was guided by the desire to define a robust sustainable future in which RPS is a recognized leader in sustainable development. In crafting this future, a systematic process was designed to address the requirements of RPS and included the following steps:

- **Visioning session** with senior leadership to establish long-term strategic goals:  
Senior leadership was engaged in developing the four long-term strategic goals. These goals formalize sustainability aspirations in a clear message to internal employees and external stakeholders.
- **Expert opinion** of sustainability consultants to provide feedback and insight:  
Sustainability experts from WSP Canada Inc. and The Natural Step Canada ensured the long-term strategic goals were rigorous and market-relevant.
- **Engagement sessions** to contribute to each long-term strategic goal:

Multiple engagement sessions and workshops were used to involve RPS employees and stakeholders. Sessions were comprised of group and one-on-one meetings consisting of sustainability consultants and RPS service lines. These sessions were guided by the four long-term strategic goals and identified areas of focus and action items.

- **Market research** to understand the sustainability strategies of similar organizations:  
Sustainability strategies of corporations, non-governmental organizations and other governments were reviewed by sustainability professionals. This research identified industry best practices, lessons learned and trends to consider when developing the Strategy. For more details on the research completed please refer to **Appendix A**.
- **Documentation review** of RPS' policies, plans and procedures:  
Reviewing RPS' policies, plans and procedures helped to obtain information on the existing sustainability status of RPS. This task enabled a comprehensive understanding of the history, philosophy, and operation of sustainability initiatives within RPS.

## 4.0 The Strategy structure: Goals, focus areas and action items

The long-term strategic goals were designed using an amalgamation of existing and anticipated industry trends. These long-term strategic Goals are uniquely designed to address Real Property Services' (RPS) specific internal operations, external services as well as their presence within their communities. The goals are consistent with what other sustainability leaders are implementing globally and will allow RPS to position itself as a leader in sustainable development. The long-term strategic Goals are as follows:

### **Goal 1: Sustainable Performance - Mission Zero**

*RPS buildings, leases and other assets are models of sustainable performance due to their management of GHGs, transition to renewable energy, preference of sustainable materials, elimination of waste, and significant reduction of water consumption.*

### **Goal 2: Community Integration**

*RPS will be a trusted partner in the communities where it operates. Leadership in this area will contribute to the international recognition of RPS' approach to sustainable development.*

### **Goal 3: Thriving Culture**

*RPS is recognized as an employer of choice that attracts, engages and retains talented people who contribute to our success. It provides healthy workplaces conducive to individual fulfillment and creates a culture of respect, inclusion, health, safety, and equal opportunity.*

### **Goal 4: Client Service Excellence**

*RPS will be recognized for providing our clients and communities with industry-leading strategies that work and are informed by our commitment to sustainability.*

Each long-term strategic goal is subdivided into focus areas and subsequently into action items. Action items will later be incorporated into elements of the Implementation Plan. The Strategy is organized according to the following hierarchy for each goal:

- Goals
  - └ Focus areas
    - └ Action items
      - └ **Elements of implementation plan (not part of this strategy document)**

**Focus areas** are the foundation for each long-term strategic goal. They provide structure and expand each goal into distinctive concentration areas that encompass all aspects of the goal.

**Action items** are specific sustainability initiatives that RPS aspires to implement in day-to-day operations. These initiatives will be developed in the future implementation plan. Each action item is categorized by one of the following three levels:

**Fundamental action items** are high priority and relatively simple to implement. These items are identified as essential to ensuring sustainability in the daily operations. Fundamental actions are often pre-requisites for the implementation of value-added and stretch action items.

**Value-added action items** are complex activities that may only be applicable to unique instances across the RPS portfolio.

**Stretch action items** are an array of agile sustainability initiatives envisioned to become feasible in time. They are part of the RPS commitment to emerging initiatives.

## 5.0 RPS Sustainable Development and Environmental Strategy

The Strategy chart shown in Figure 1 below identifies the long-term strategic goals and focus areas of the Strategy. The four primary quadrants of the Strategy Chart represent the long-term strategic goals. The outer-most section identifies the focus areas for each goal. Action items are identified in separate tables for each focus area.

Figure 1: PSPC Real Property Strategic Sustainability Goals and Action Areas



The following sections introduce each long-term strategic goal, focus area and action item in detail, beginning with Sustainable Performance: Mission Zero, and moving clockwise through each of the four long-term strategic goals set out in Figure 1 above. Applicable focus areas are introduced after each goal, followed by tables that itemize the associated action items.

Pages containing action items identify the applicable long-term strategic goal and focus area in the corner of each page to help readers orient themselves in the document.

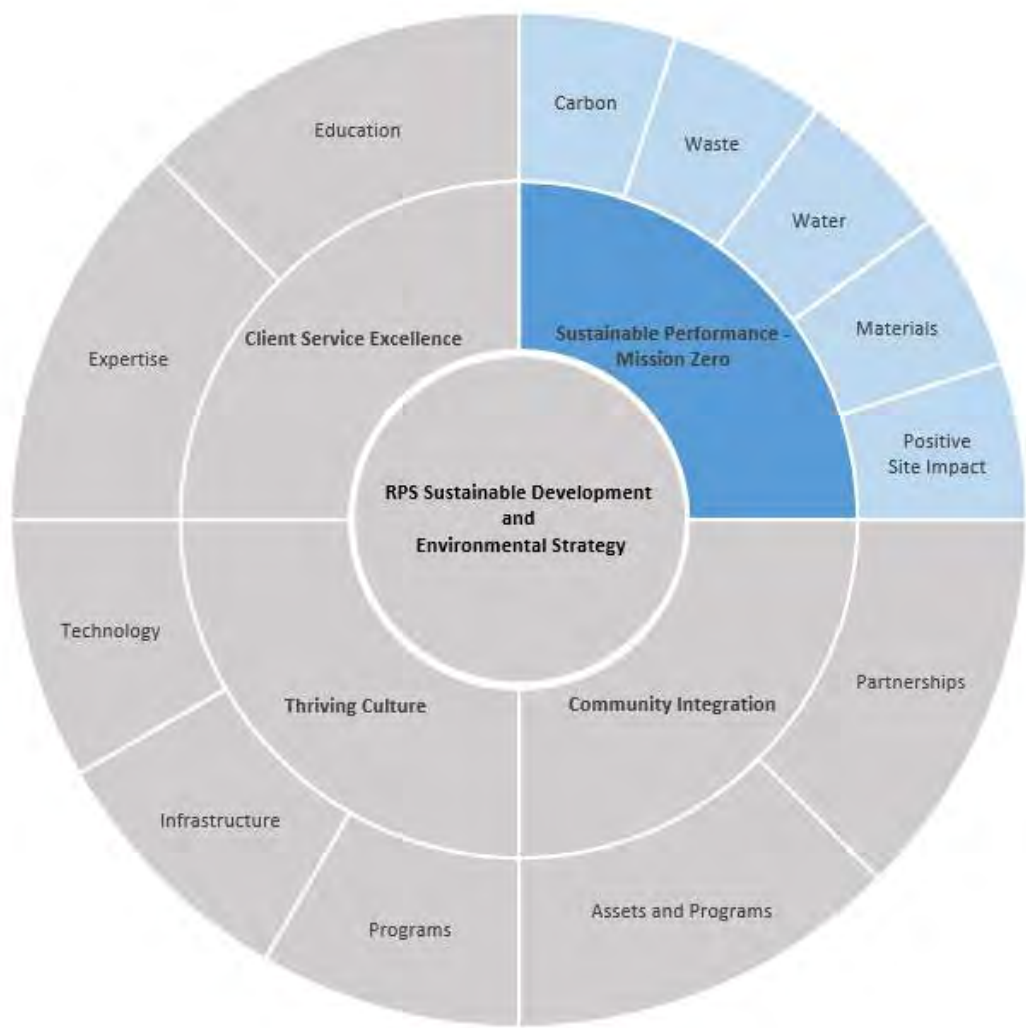
**Goal 1: Sustainable Performance – Mission Zero**

**RPS buildings and other assets are models of sustainable performance due to their management of GHGs, transition to renewable energy, preference of sustainable materials, elimination of waste, and significant reduction of water consumption**

Achieving sustainable performance requires monitoring environmental metrics and tracking the progress of initiatives. This Goal is supported by focus areas which consolidate key sustainability metrics for Carbon, Water, Waste, Materials and Positive Site Impact initiatives. This goal aspires to eliminate the negative impacts of operations and construction on human health and the environment as much as possible.

The circular chart below in Figure 2 highlights the focus areas for Goal 1: Sustainable Performance – Mission Zero. Each focus area is supported by action items as identified in the tables on the following pages.

*Figure 2: Goal 1 Sustainable Performance - Mission Zero*



# Carbon

Action Items



**Why is Carbon a focus area?** Carbon dioxide (CO<sub>2</sub>) and other GHGs (measured as CO<sub>2</sub> equivalents or eCO<sub>2</sub>) are fundamental sustainability metrics, which are simple conveyed. Most sustainability management systems across the world have committed to managing carbon emissions and the action items below provide programmatic and technological solutions for reducing carbon emissions associated with our buildings.

FUNDAMENTAL	
Action Item	Intent
<b>Benchmark, track and influence energy use</b>	Benchmark emissions and energy use of buildings will serve as a basis for tracking and prioritizing carbon reduction initiatives.  Provide building occupants with data and feedback to influence behavioral change.
<b>Deep energy retrofits</b>	Conduct deep energy retrofits of building systems across aging assets to increase energy efficiency and decrease carbon footprint.
<b>Supporting the conversion of fleet and private vehicles to electric</b>	Supply fast-charging electric vehicle charging stations with the objective to support the conversion of fleet and private vehicles from gas to electric.
<b>Environmentally friendly refrigerants</b>	Phase out fluorinated gases and replace them with non-hazardous, non-GHG and non-ozone depleting refrigerants.
<b>Integrated building analytics</b>	Integrate analytics software to automatically analyze building energy usage and equipment; and identify issues and opportunities for improved performance.
<b>Manage scope 1, 2 and 3 GHGs</b>	Manage scope 1 and 2 GHGs in accordance with the provisions and expectations provided in the PSPC Carbon Neutral Plan. Design a unique management plan for scope 3 GHG, as applicable to operations.
<b>Ongoing commissioning</b>	Optimize the performance of building subsystems by conducting ongoing commissioning, following a regular and timely service schedule.
<b>Smart submetering</b>	Incorporate smart submeters into buildings to provide data on the real-time energy consumption of individual tenants, systems and floors.



VALUE ADDED	
Action Item	Intent
<b>Minimize embodied GHG</b>	Use products, materials and construction methods that produce fewer GHG emissions during their life cycle than alternative conventional products.
<b>Renewable energy</b>	Incorporate renewable energy generation technologies in accordance with the PSPC's Carbon Neutral Plan.
<b>Smart buildings</b>	Integrate sensors, actuators and data logging to collect data and manage infrastructure associated with business functions and services (i.e. building comfort and energy use).

STRETCH	
Action Item	Intent
<b>Net-positive buildings</b>	Design, construct and operate buildings that contribute more energy to the grid than what is consumed from the grid.
<b>Grid independent buildings</b>	Design, construct and operate buildings to be grid independent.

# Waste

Action Items



**Why is Waste a focus area?** Waste materials directly impact communities worldwide by contributing to landfills and creating increased demands for resources. Responsibility of managing the materials that leave our buildings and construction sites is a fundamental component of limiting our impact on the environment. The action items below include programmatic and technological solutions for managing waste generation and disposal.

## FUNDAMENTAL

Action Item	Intent
<b>Benchmark, track and influence waste diversion</b>	<p>Benchmark waste diversion rates of all project and operation streams will serve as a basis for tracking and prioritizing waste reduction initiatives.</p> <p>Data from these initiatives must be shared with occupants through engagement campaigns to help them improve their waste diversion rates.</p>
<b>Waste diversion management program</b>	<p>Develop a multi-material waste management program that includes construction, demolition and operational waste. Include methods for diverting recyclable material, furniture, electronic, and biological or other waste appropriately. Report and verify performance at the building level.</p> <p>Programs should include strategies that help reduce waste, such as reusing material, minimizing resources associated with construction, and purchasing products with minimal packaging.</p>

## VALUE ADDED

Action Item	Intent
<b>On-site composting program</b>	<p>Develop on-site composting programs that feed on-site or local community gardens and energy generation systems.</p>

## STRETCH

Action Item	Intent
<b>On-site recycling and reusing technology</b>	<p>Future technologies may generate opportunities for the on-site recycling of paper, plastic and organic material. These materials may be transformed on-site into new products and contribute to input streams for 3D-printed materials.</p>



# Waste

Action Items



<b>On-site bioreactors</b>	Incorporate blackwater and other organic waste streams as feeds for on-site power generation systems. By-products such as combustible gas and fertilizer can then be reused on-site or by third parties.
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# Water

Action Items



**Why is Water a focus area?** Water is a precious and limited resource that we consume daily. Responsibly managing water consumption reduces the risk of negative environmental effects and lessens burdens on local water systems. The action items below include programmatic and technological solutions to reduce potable water use, manage rainwater and reuse greywater in our buildings.

## FUNDAMENTAL

Action Item	Intent
<b>Adaptive landscaping</b>	<p>Develop a landscaping management plan that includes the use of adaptive landscaping and other strategies to reduce the amount of irrigation required.</p> <p>This plan should be developed in conjunction with low-impact products and techniques identified as the green landscape plan action item under the Positive Site Impacts focus area.</p>
<b>Benchmark, track and influence water use</b>	Benchmark water consumption of all operational end-uses will serve as a basis for tracking and prioritizing water use reduction initiatives. Provide occupants with feedback to influence behavioral changes.
<b>Water management program</b>	Develop a program that identifies reduction targets for each water end-use. Include opportunities to use materials that have less embodied water than conventional alternatives. Identify streamlined retrofits and procedural standards to meet targets.
<b>Stormwater erosion and sedimentation management</b>	Develop stormwater, erosion and sedimentation management plans. Management techniques should reduce the amount of suspended solids and total quantity of run-off leaving site after storm, heavy rainfall, and snowmelt events.

## VALUE ADDED

Action Item	Intent
<b>Greywater, rainwater and blackwater re-use</b>	Develop blackwater, greywater or rainwater infrastructure for applications, such as toilets, urinals and process water.

# Water

Action Items



## STRETCH

Action Item	Intent
On-site water treatment	Treat water effluent on site before discharging to local water systems or re-using on site.

# Materials

## Action Items



**Why are materials a focus area?** Manufacturing industries are becoming more transparent with respect to the environmental impacts of their products. This new trend provides tools to manage the health and ecological impacts of the products we use. Responsible materials can greatly reduce human exposure to harmful chemicals as well as reduce burdens on ecosystems worldwide. The action items below include programmatic and technological solutions to manage the environmental and health impacts of the materials we purchase.

FUNDAMENTAL	
Action Item	Intent
Eco-friendly product and material procurement	<p>Purchase products and materials that demonstrate responsible land stewardship, resource management, ethical employment and animal treatment.</p> <p>Develop a plan to help prioritize purchases based on environmental performance as elaborated in the Expertise Focus Area under Goal 4: Client Service Excellence.</p>
Green housekeeping	<p>Develop a green housekeeping program that identifies minimum standards for cleaning practices, training, auditing and product use. Cleaning products should be replaced with zero-VOC alternatives to the greatest extent possible.</p>
VALUE ADDED	
Action Item	Intent
Third party certifications	<p>Specify products which meet the third-party certification requirements to demonstrate environmental performance. Identify methods for comparing and prioritizing certifications to advise procurement.</p>

# Materials

Action Items



STRETCH	
Action Item	Intent
3D printing	Incorporate 3D printing technology for materials and products when there is a demand and a resource-efficiency benefit.
Next generation building materials	Specify materials that incorporate nanotechnology, biomimicry and multifunctional components. Examples of existing technology include window integrated solar panels, self-regulating materials for temperature control, self-repairing concrete and masonry and lightweight composites.

# Positive Site Impact

Action Items



**Why is Positive Site Impact a focus area?** Our sites physically connect us to our community and provide us with an opportunity to showcase our commitment to sustainability. Responsible development and management processes can positively impact local ecology and human experience. The action items below include programmatic and technological solutions to reduce the impacts our sites have on the environment, while improving usability and reducing negative site impacts.

FUNDAMENTAL	
Action Item	Intent
Manage heat island effect	Incorporate materials that reflect low levels solar radiation (low albedo) and other heat island reducing strategies.
Landscape management	Develop landscape management plans that identify low-impact lawn care products and least-toxic pesticides. This plan should be developed in conjunction with the adaptive species selection techniques identified as action items under the water focus area.
Promote habitat for native and endangered species	Develop programs for safeguarding space, habitat and ecological conditions for native and endangered species.
Light pollution reduction	Incorporate materials and lighting that minimize the amount of light entering the building and site, reduce sky-glow to increase night sky access, reduce glare to improve nighttime visibility and reduce development impact from lighting on nocturnal environments.

# Positive Site Impact

Action Items



## VALUE ADDED

Action Item	Intent
<b>Mixed use sites</b>	Incorporate a diverse array of space uses and functions within each building.
<b>Site selection</b>	Incorporate site selection criteria into accommodation decision making processes which increase the social value of our sites. Examples include: proximity to public transit and alternative transit infrastructure, sports fields, greenspace, community and wellness centres and other amenities.

## STRETCH

Action Item	Intent
<b>Eco districts</b>	Incorporate elements such as district energy systems, transit oriented developments and service nodes to clients and community partners.
<b>Ecological service programs</b>	Promote programs which go beyond providing and safeguarding space for native and endangered species. These services can vary from transforming underused bridges and roadways to wildlife corridors; developing on-site apiary and pollinator projects; creating bird and bat habitat; restoring natural habitats; increasing community, urban, and rural agriculture opportunities or even green pasture space for local farmers.

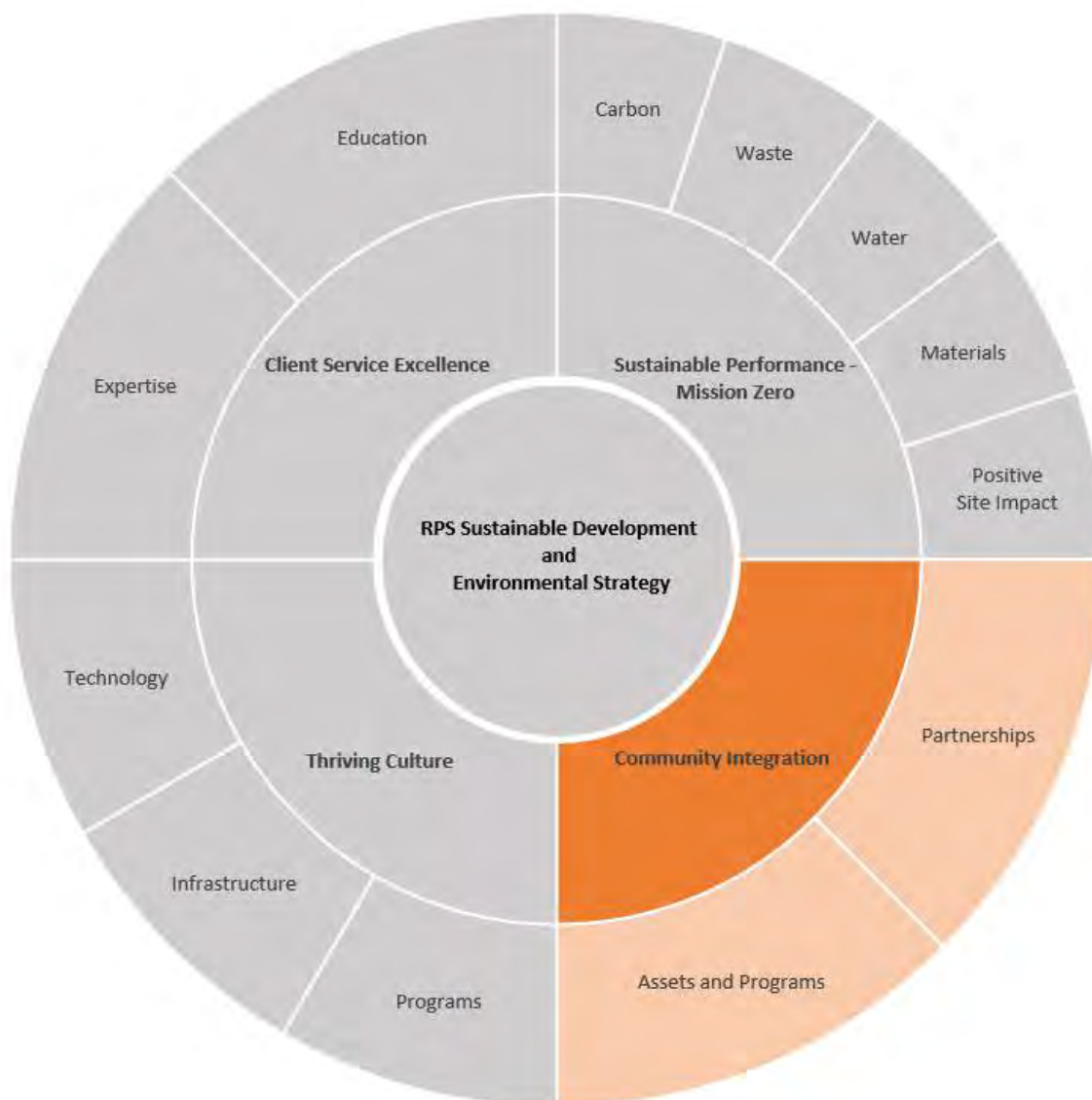
## Goal 2: Community Integration

**RPS will be an international leader and trusted partner in the communities where we operate.**

As the lead organization of one of Canada's largest and most diverse real property portfolios, RPS cannot afford to sit on the sidelines while communities across the country take on challenges related to sustainability. Two focus areas have been identified to encapsulate the tools and resources we can use to help. The first focus area identifies initiatives that nurture partnerships and identify needs within our communities. The second focus area identifies methods that adapt our assets and programs to meet community needs. Enabling community members to leverage our assets and programs will provide RPS with a unique opportunity to lead initiatives in our communities.

The circular chart below (Figure 3) highlights the focus areas for Goal 2: Community Integration. Each focus area is supported by one or more action items identified in tables on the following pages.

*Figure 3: Goal 2 Community Integration*





# Assets and Programs

Action Items



**Why are Partnerships a focus area?** Fostering community partnerships inherently demonstrates our commitment to sustainability to a larger audience. Engaging our communities, which include other federal departments, provincial, territorial, municipal governments, indigenous people, industry, academia, non-profits etc., also provides insight into opportunities to meet the unique needs of our communities. The Action Items below identify opportunities to engage our communities and make positive environmental impacts outside of the typical day-to-day operations.

## FUNDAMENTAL

Action Item	Intent
<b>Community integration programs and feedback channels</b>	<p>Develop a community integration program that addresses the priorities of each Public Services and Procurement Canada (PSPC) Community Based Investment Strategy and incorporates plans to integrate communities and local planning priorities into projects and existing buildings.</p> <p>Focus on establishing strong communication channels, feedback mechanisms, networks and links to strengthen community engagement mechanisms and tools.</p>

## VALUE ADDED

Action Item	Intent
<b>Existing community programs</b>	Participate in community initiatives.

## STRETCH

Action Item	Intent
<b>Community sustainability education</b>	Provide community stakeholders with sustainability, education programs, materials, and tours to help develop industry understanding of sustainability initiatives, challenges and opportunities.

# Assets and Programs

Action Items



**Why is Assets and Programs a focus area?** Assets and Programs encompasses all of the tools that can be used to support local non-government and PSPC communities. The action items below aspire to create symbiotic relationships wherein the general public and other PSPC communities are able to leverage programs and assets provided by RPS.

## FUNDAMENTAL

Action Item	Intent
<b>Surplus and decommission sites</b>	Include the consideration of community stakeholders and partners when planning disposal of buildings and sites. Consideration should be given to a site's value to a community. Identify underused assets and develop a plan on how best to repurpose space. This plan should take into consideration community and municipality needs, government initiatives such as the Affordable Housing Initiative and other similar programs.

## VALUE ADDED

Action Item	Intent
<b>Shared spaces plan</b>	Identify and promote space sharing opportunities in buildings or outdoor spaces for community group events.
<b>GC remote work opportunity and national workforce</b>	Provide non-geographically constrained or site specific remote work opportunities for Government of Canada (GC) employees where feasible.
<b>Heritage management program</b>	Integrate existing heritage management programs and plans to ensure heritage features in buildings are evaluated and integrated into project design and are managed appropriately.

# Assets and Programs

Action Items



## STRETCH

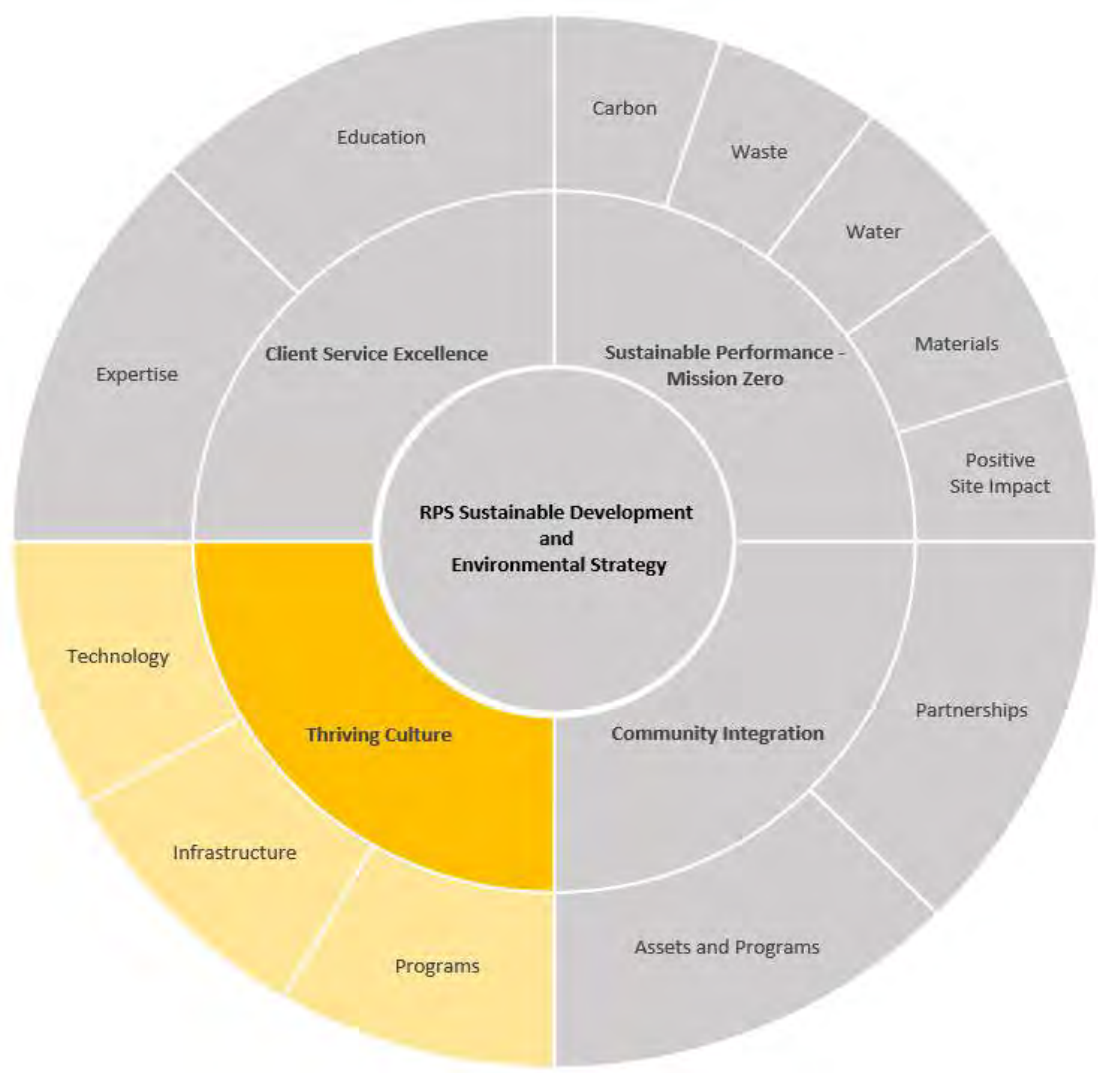
Action Item	Intent
<b>GC decentralized work hubs</b>	Designate non-assigned activity-based workplaces where any government employee can access a variety of work hubs. Work hubs constitute buildings in which any GC employee can access a site, work from a non-assigned activity-based workplace and have access to government networks and facilities.

Goal 3: Thriving Culture

RPS recognized as an employer of choice that attracts, engages and retains talented people who contribute to our success. We provide a healthy workplace conducive to individual fulfillment and create a culture of respect, inclusion, health, safety, and equal opportunity.

RPS must create an appealing work environment by adopting and improving upon the best practices of other leaders in the industry. Employers of choice offer flexible work programs such as mobile and flexible work locations and hours of work, as well as efficient technology and modern infrastructure that appeals to employees. Initiating the action items within these focus areas will enable improved mentorship, knowledge transfer and feedback mechanisms to foster a successful and thriving culture. The circular chart below (Figure 4) highlights the focus areas for Goal 3: Thriving Culture. Each focus area is supported by one or more action items, as identified in the tables on the following pages.

Figure 4: Goal 3 Thriving Culture



# Technology

## Action Items



**Why is Technology a focus area?** We must use technology to connect our staff to our infrastructure and improve the usability of our programs. Incorporating new technology into our systems provides an opportunity to increase productivity and reduce the complexity of tasks. The action items below identify technologies that must be incorporated into daily operations.

### FUNDAMENTAL

Action Item	Intent
Digital signatures	Reduce the need for hand-written signatures by integrating digital signatures into organizational processes.
Communications technology	Integrate the use of videoconferencing, teleconferencing, Instant Messaging, and knowledge sharing application such as GCdocs and GCconnex into day-to-day operations to provide seamless connectivity to colleagues and clients.

### VALUE ADDED

Action Item	Intent
Alternative transportation technology	Identify or develop online tools to help building occupants organize carpooling, bike groups, car-sharing and other alternative transportation.

### STRETCH

Action Item	Intent
Augmented and virtual reality integration	Incorporate augmented reality and virtual reality technologies to conceptualize projects in real-time, work remotely via virtual-presence and improve efficiency in other aspects of operations.
Internet of things analytics	Integrate data from the internet of things to advise and refine processes related to smart appliances, energy meters, wearable devices, cars, and other monitors to improve efficiency and comfort.

# Infrastructure

## Action Items



**Why is Infrastructure a focus area?** RPS must provide staff with physical infrastructure that promotes usability of our programs and technology. Installing infrastructure that promotes green lifestyles and comfortable environments can help improve productivity and reduce resource use.

### FUNDAMENTAL

Action Item	Intent
<b>Alternative transportation infrastructure</b>	Integrate opportunities to promote and increase use of alternative transportation such as electric car charging stations, bicycle storage, etc.
<b>Sustainability data feedback</b>	Provide feedback mechanisms that are engaging, interactive and educational, to promote and validate green behavior.
<b>Inclusivity</b>	Design work environments that incorporate local heritage and universal design principles that anticipate new standards of human diversity.
<b>Individual thermal light management</b>	Allow employees to manage the temperature and lighting levels of their work environment.
<b>Water quality</b>	Promote and provide staff with high-quality water.
<b>Indoor air quality</b>	Implement air filtration systems and management strategies to reduce contaminant levels and manage CO <sub>2</sub> levels in building spaces.

### VALUE ADDED

Action Item	Intent
<b>Active workstations</b>	Encourage physical activity at workstations.
<b>Bring your own recycling</b>	Encourage and enable those who do not have composting, e-waste or other diversion programs at home to bring the materials to work.
<b>Nature-connected spaces</b>	Provide spaces that incorporate natural aesthetic elements such as green walls, indoor gardens, and other biophilic design principles.
<b>On-site food / tea gardens</b>	Encourage and enable teams to grow food on-site by identifying underused space and negotiating terms for use with landlords or the surrounding community.

# Infrastructure

Action Items



## STRETCH

Action Item	Intent
<b>Comfort adaptable architecture and interiors</b>	Integrate occupant-controlled design elements such as operable windows, seasonal building solar shading, modular furniture, adjustable radiative technology in furniture for thermal comfort, and ventilation distribution systems that that employees can use to manage changes in space layout.
<b>Provision of healthy living infrastructure and/or incentives</b>	Provide showers and lockers in support of employees who cycle, walk or jog, and who have a membership at local fitness facilities.
<b>On-site healthy / local cafeterias</b>	Provide employees with access to delivery programs and cafeterias on-site that serve healthy and local in-season food.

# Programs

## Action Items



**Why are Programs a focus area?** RPS must develop formal programs that manage our people, technology and infrastructure to guide the development of initiatives. Committing to the implementation of green, educational, lifestyle, and feedback programs can help create a sense of community and improve participation.

### FUNDAMENTAL

Action Item	Intent
<b>Building-level sustainability teams</b>	Identify interdisciplinary groups of employees responsible for green outcomes and on-site cultural events and education. Responsibilities may include items such as education on waste streams, local transit, local food programs, and other components of this strategy.
<b>Comfort surveys</b>	Monitor, maintain and improve satisfaction related to comfort, building conditions, cleanliness, lighting and other factors related to human experience.
<b>Designated noise zones</b>	Identify quiet and collaborative areas for employee use.
<b>Employee on-boarding and on-going engagement</b>	<p>Develop an employee engagement program in buildings to drive sustainability through behaviour change.</p> <p>The program should include engagement initiatives on human resources, information technology, digital communications, security, facilities, interior design, health, transportation, community partnerships, energy, water, waste reduction and other elements of this strategy.</p> <p>The program should include initiatives for engaging each tenant through employee committees, awareness sessions, educational materials, social networking, data sharing, incentives and other programs.</p> <p>The program will be on-going and updated via feedback collected from participants.</p>
<b>Knowledge retention</b>	Document employee knowledge prior to departure through exit interviews, succession planning, contribution to knowledge databases and other techniques.
<b>Flexible hours</b>	Provide flexible working schedules.
<b>Flexible workplace options</b>	Provide options to work from home, different buildings or spaces within a building.
<b>HR/IT mentorship and hotline</b>	Expedite human resources and information technology complaints, concerns and suggestions.



# Programs

## Action Items



<b>Third-party green standard certification</b>	Incorporate third-party green standards used by industry into project and building requirements.
<b>Mental health resources</b>	Provide resources and accommodations for employees to manage and monitor mental health and wellness. Resources may include third party consultants, outreach programs, or programs that assess impacts on employee work-life balance.
<b>Occupant comfort hotlines</b>	Expedite occupant comfort complaints through designated channels.
<b>'TED' Talks knowledge sharing</b>	Encourage knowledge sharing through participation in presentations.
<b>Volunteering</b>	Encourage and enable teams to participate in volunteering/fundraising.

## VALUE ADDED

Action Item	Intent
<b>Campus oriented departments</b>	Identify buildings and areas for departments with similar specialisations, to encourage collaboration.
<b>Gamification of green recognition programs</b>	Identify employees, buildings and service lines/sectors who reduce their resource and energy use, and their miles traveled. Employ gamification elements such as using points, avatars, teams, timelines and other game-like feedback mechanisms to promote usability and encourage friendly competition.
<b>Inter-office health and wellness</b>	Promote and endorse activities that promote networking, sports and recreational activities between offices.

# Programs

Action Items



STRETCH	
Action Item	Intent
Financial incentives for green performance	Provide teams with financial incentive for meeting or exceeding sustainability criteria.
Designated temperature zones	Identify warmer and cooler areas or floors for employees to use.

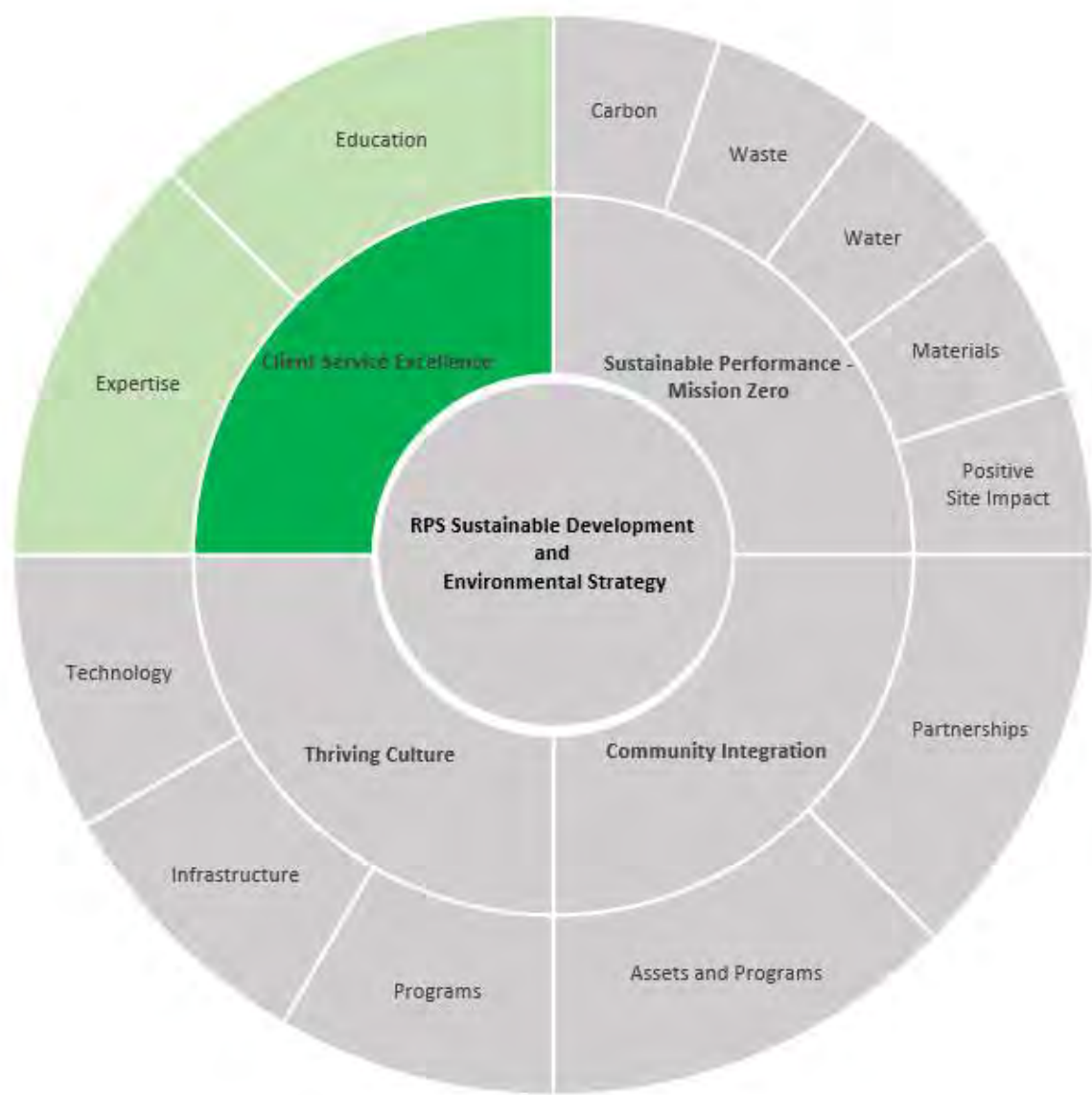
Goal 4: Client Service Excellence

RPS will be recognized for providing our clients and communities with industry-leading strategies that work and are informed by our commitment to sustainability.

Client management, industry management and education have been identified as the focus areas for this goal. Action items for this goal are intended to leverage our expertise to influence and transform the markets in which we operate, while providing enjoyable experiences for clients.

The circular chart below (Figure 5) highlights the focus areas for Goal 4: Client Service Excellence. Each focus area is supported by one or more action items identified in the tables on the following pages.

Figure 5: Goal 4 Client Service Excellence





**Why is Education a focus area?** Solving problems for our clients and staff has allowed us to accumulate a vast knowledge of solutions to common problems. Sharing these solutions will enable us to stand out as a valued leader among our clients and community.

### FUNDAMENTAL

Action Item	Intent
<b>Occupant on-boarding and on-going engagement</b>	<p>Develop an occupant engagement program in buildings to drive sustainability through behaviour change.</p> <p>The program should include engagement initiatives around human resources, information technology, digital communications, security, facilities, interior design, health, transportation, community partnerships, energy, water, waste reduction and other elements of this strategy.</p> <p>The program should include initiatives for engaging each tenant through occupant committees, awareness sessions, educational materials, social networking, data sharing, incentives and other programs. The program will be on-going and will be updated based on feedback collected from participants.</p>
<b>Stakeholder education sessions to advise design</b>	<p>Educate clients and landlords on environmental and social sustainability. Provide strategic advice and guidance on appropriate design decisions to create an integrated sustainable design solution. Outcomes should promote low-carbon infrastructure, life cycle assessment of material options, incorporation of RPS' own green programs and other project-specific sustainability considerations.</p>

### VALUE ADDED

Action Item	Intent
<b>Public green awareness platform</b>	<p>Provide the public with quantifiable and clear information about PSPC's green initiatives and sustainability performance through a single platform.</p>
<b>Share our infrastructure and programs</b>	<p>Share our infrastructure and programs with other government departments.</p>

# Education

Action Items



STRETCH	
Action Item	Intent
Green helpline for OGDs	Provide resources to allow Other Governmental Departments (OGDs) to seek for advice on green initiatives.

# Expertise

Action Items



**Why is Expertise a focus area?** We are the bridge between our clients and many different industries. Leveraging our understanding and relationships with these industries is a core component of the value we provide to our clients. Demonstrating expertise will result in responsibly procured materials, attraction of outside talent and new opportunities to investigate and implement sustainability.

FUNDAMENTAL	
Action Item	Intent
Industry expertise	Leverage industry expertise in the area of sustainability.
Green leases	Develop a green leasing action plan to incorporate sustainability clauses in new and renewed leases.
Sustainable procurement	<p>Review and update PSPC's Policy on Green Procurement, programs and processes to incorporate action items from the implementation plan and other industry best practices.</p> <p>This procurement strategy should identify a method for prioritizing product selection based on environmental performance.</p> <p>The environmental impact of procurement should be analyzed through life cycle cost analysis, cradle-to-cradle assessments, environmental product declarations, supply chain management, and third-party environmental certifications.</p> <p>Products should demonstrate considerable reduction than conventional alternatives in energy, water, and resource consumption, as well as an improved stewardship of workforces and environments.</p>
Measured and verified key performance indicators and feedback mechanisms	Identify programs that provide clients and project teams with meaningful performance indicators and ongoing feedback mechanisms for code compliance and satisfaction.
Post-occupancy surveys and tests	Conduct post-occupancy surveys and tests (e.g. comfort, satisfaction) and incorporate lessons learned into future project delivery programs. Tests should be used to confirm that spaces are healthier, based on the VOC, CO2 and other indoor air quality parameters relevant to the materials used in those spaces.



## VALUE ADDED

Action Item	Intent
<b>Life cycle analysis of assets and leases</b>	Review the life cycle costs and sustainability impacts of current leases and owned buildings. Review opportunities to move away from poor performing buildings which are owned or have long-term leases.

## STRETCH

Action Item	Intent
<b>Industry research partnerships</b>	Engage industry and educational leaders to research new technologies, identify community needs and identify solutions to workplace design and operational issues.
<b>Dynamic project management</b>	Implement management processes that leverage new technologies and elements of this strategy to quickly adjust to dynamically changing internal and external factors.

## 6.0 Core Recommendations

This section of the Strategy provides core recommendations that are essential to support the implementation plan. The core recommendations shall remain applicable and in effect for the entire time the Strategy is in use.

### 1. **Appoint a sustainability officer:**

- A senior leadership role; director general under Real Property Services (RPS) or an assistant deputy minister for Public Services and Procurement Canada.
- Has authority and influence, similar to other decision makers.
- Has resources to implement the sustainability agenda.

### 2. **Measure, verify, track and report:**

- Continuous benchmark to track progress.
- Create monitoring tools to collect data.
- Have internal audit process to measure performance with timeframes and frequencies.
- Have third-party auditors to conduct performance verification.
- Continuous assessment of RPS' strengths and weaknesses.
- Implement sustainability reporting system, external and internal.
- Report progress on previously set goals and future plans and commitments.

### 3. **Educate:**

- Keep your employees engaged, informed and stimulated.
- Encourage sustainability behaviours.
- Encourage employees to carry the organizational sustainability messages to their communities.
- Create cross-functional teams to work on sustainability issues.
- Make use of the diversity of talents and ideas across RPS.
- Communicate with external stakeholders, communities and clients.

### 4. **Train:**

- Train managers in ethical and sustainable decision-making, consistent with Public Services and Procurement Canada's mission, Goals and objectives.
- Train employees to implement and operate sustainability management systems.
- Provide regular training updates to keep sustainability at the forefront of peoples' thoughts.

### 5. **Reflect:**

- Carefully consider what RPS is doing.
- Set regular opportunities to reflect on priorities.
- Stand back and assess the macro perspective.
- Observe organizational trends and ensure they are consistent with sustainability values.
- Take a holistic view and be aware of RPS' surroundings.
- Develop a process for making recommendations for improvement.
- Take advantage of failures and see them as opportunities for significant transformational and sustainable change.



## Appendix A: Market research summary

A research was conducted about sustainability initiatives undertaken throughout industry and service sectors around the world. The research was categorized into government, countries, cities, public organizations and private organizations. The purpose of the research was to understand industry best practices and formulate lessons learned and trends to consider for the Strategy.

The research focused on the following research criteria:

- Trends and best practices: What are the trends, programs and vision statements which set the company apart from typical standard operating procedures?
- Outcomes: What are the measurable outcomes of the trends, best practices, leadership, services and culture?
- Governance and Leadership: ways in which the organization shares power, makes decisions, manages knowledge and succession.
- Voice, brand and communications.
- Services and operations: ways in which the company runs its business and how it creates value for clients.
- Culture: the personality of the organization and the ways in which this is shared and maintained.

The research focused on the following organizations:

1. General Services Administration
2. Carbon Neutral Cities Alliance
3. Urban Sustainable Directors Network
4. Real Pac
5. Skanska
6. Oxford
7. Province of British Columbia
8. New York City
9. Bentall Kennedy LP
10. Walmart

The outcomes of the research are as follows:

### **Common trends to avoid:**

- 1) Adhering to LEED/BOMA and not promoting or tracking outcomes transparently at the building-level.
- 2) Failing to focus on big-picture global sustainability (e.g. promoting buying local, yet local products are not as efficient/sustainable as international products).
- 3) Lack of consistent and customized knowledge sharing, training and reporting tools.
- 4) Media silence regarding stakeholder engagement, programs and outcomes.
- 5) Decentralizing and creating non-dedicated sustainability teams and boards.
- 6) Conducting stakeholder engagement without developing meaningful programs, reporting mechanisms and quality assurance.
- 7) Not developing performance baselines nor collecting relevant baseline data.
- 8) Using third-party certifications (i.e. LEED, BOMA, and Green Globes) without having overarching guiding strategies in place.

**Common leadership trends to consider:**

- 1) Accurate, automated and consistent energy, water and waste reporting across portfolios.
- 2) Specialized internal training programs led by dedicated sustainability teams on sustainability topics.
- 3) Customized internal tools for sustainable procurement, asset management and operations.
- 4) Contractual requirements with stakeholders for sustainability outcomes.
- 5) Stakeholder engagement on sustainability topics, with transparent goals, reporting and media updates.
- 6) Lifecycle analysis, analyzing first-cost versus life-cycle costs as a prerequisite to conducting business.
- 7) Adhering to LEED and BOMA requirements while having overarching guiding strategies in place.
- 8) Commitment to net zero and 100% renewable energy use within next 20 years.

**Potential future leadership trends to consider:**

- 1) Sustainable procurement of paper (North American bamboo, hemp) and re-usable notebooks (e.g. rocket book wave). Supporting the growth of Canadian bamboo farms also decreases soil erosion, sequesters more CO<sub>2</sub> than conventional trees and is rapidly renewable, unlike wood.
- 2) In-office connectivity to community programs (rentable or free space after hours for community use, promotion of local programs in-office).
- 3) Local food delivery programs, partnerships with farmers' markets and vendors.
- 4) Specifying carbon-negative construction materials and re-usable/modular building design that reduce the use of concrete and steel, (hempcrete to replace concrete in many housing and infrastructure applications, and bamboo to replace steel in low-rise construction projects can reduce building costs).
- 5) Second-skin building envelopes to reduce heat gains/loss.
- 6) Regional 3D printing to reduce costly generation of prototypes and processes, which require high volume customized components.
- 7) On-site biofuel combined heat and power systems to supplement renewable photovoltaic/ wind systems to form micro-grids on campuses.
- 8) Focus on system regeneration and negative-carbon systems rather than doing less damage.
- 9) Achieving Living Building Challenge (banning harmful chemicals that are currently still legal: achieving net positive energy and water, promote off-hours use of buildings, and promoting occupant health and wellness

The outcomes of the research have guided and influenced the development of the Strategy.

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EJ078-200154/001/FE

**Amd. No. - N° de la modif.**  
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**Buyer ID - Id de l'acheteur**  
FE181

**Client Ref. No. - N° de réf. du client**  
20200154

**File No. - N° du dossier**  
fe181-EJ078-200154

**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

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APPENDIX K – FEDERAL P3 SCREEN

# PPP Canada

## **FEDERAL P3 SCREEN:**

The Guide for Federal Departments  
and Agencies

IMPROVING THE DELIVERY  
INFRASTRUCTURE THROU  
PUBLIC-PRIVATE PARTNER  
UTILISER LES PARTENAR  
PUBLIC-PRIVÉ AFIN D'AM  
MISE EN PLACE D'INFRA  
PUBLIQUE

## About PPP Canada

PPP Canada's mandate is to improve the delivery of public infrastructure by achieving better value, timeliness and accountability through public-private partnerships (P3s). PPP Canada is a knowledge-based organization of dynamic professionals, who understand public infrastructure needs and the private sector's ability to leverage innovative and efficient approaches to generate results.

Successfully delivering large and complex public infrastructure projects requires a strong public sector partner. PPP Canada builds public sector capacity through sharing of tools and leading market practices and by working in close collaboration with project teams, as needed, to carry out capital investments successfully.

PPP Canada delivers value for Canadians through our three business lines:

- **P3 Knowledge Development and Sharing:** With a continuous focus on learning, PPP Canada has translated our experience and expertise into an array of tools and guides to document lessons learned and further build public sector capacity to implement alternative infrastructure funding and financing approaches.
- **Advancing Federal P3s:** PPP Canada supports federal departments and agencies in considering P3s for the delivery of public infrastructure. PPP Canada collaborates with the Treasury Board Secretariat and Public Services and Procurement Canada to assess opportunities for future federal P3s, and leverages each organization's expertise to achieve quality capital projects at the best value for Canadians. PPP Canada supports its clients from the application of the Federal P3 Screen, through the development of their Procurement Options Analysis, to procurement and construction, into operations.
- **Advancing Provincial, Territorial, Municipal and First Nation P3s:** The P3 Canada Fund invests in new and inexperienced jurisdictions who are considering the P3 model for their public infrastructure procurements. To date, we have committed over \$1.3 billion to more than 20 large or complex infrastructure investments across the country in a variety of asset classes. These P3s have combined capital costs of over \$6 billion and have resulted in savings of approximately \$800 million compared to traditional procurement approaches.

### Federal Project Highlight - New Champlain Bridge Corridor

PPP Canada's experience and expertise were key to the successful procurement of the New Champlain Bridge Corridor project. The new bridge is one of the largest infrastructure projects in North America. Canada's selection of a P3 procurement model provides estimated savings of more than \$1.7 billion (33.7%) over a traditional procurement approach. The Government of Canada is committed to delivering a world-class capital investment and PPP Canada is continuing to work collaboratively with federal partners, to provide the needed public sector capacity to ensure on-time and on-budget delivery of federal assets.

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# INTRODUCTION

Public-private partnerships (P3s) have demonstrated their ability to produce value for taxpayers in the procurement of public infrastructure. By partnering with the private sector to manage many of the risks associated with the construction, financing and operation of assets, governments can build public infrastructure faster and at a lower cost to taxpayers.

In *Budget 2011*, the Government of Canada announced that federal departments and agencies are now required to evaluate the potential for using a P3 for large federal capital investments. All infrastructure investments creating an asset with a lifespan of at least 20 years and having capital costs of \$100M or more will be subjected to the Federal P3 Screen to determine whether the P3 approach may be a suitable procurement option. Should the assessment conclude that there is P3 potential, the department or agency will be required to develop a P3 proposal among possible procurement options.

In addition to these specific thresholds, the Government encouraged departments and agencies to explore the potential of P3 models for other types of investments and the delivery of services.

## Purpose

This document is meant to assist federal departments and agencies in complying with this new screen requirement by providing a consistent and systematic approach for assessing the P3 suitability of capital investments. An equally important objective of this document is to support the efficient use of analytical resources by ensuring that they are not expended on the consideration of P3 procurement for assets that are not compatible with the model.

PPP Canada is the focal point for P3 expertise within the Government of Canada. The Corporation's in-house expertise and access to external partners can directly supplement the capacity of federal departments and agencies as they consider the P3 suitability of specific assets or all assets contained in a department or agency's investment plan. For these reasons, departments and agencies are required to consult PPP Canada when undertaking screening activities.

*Federal P3 Screen* is one of many tools that have been developed by PPP Canada to assist federal departments and agencies in meeting the requirements of *Budget 2011* and help with the development and implementation of P3s. The *Guides for Federal Departments and Agencies* include:

- **Procurement Options Analysis Development**, the guide to developing comprehensive Procurement Options Analysis (POA) to inform decision makers about capital investments;
- **Procurement Options Analysis Methodology**, the guide to assist officials through the analytical process of selecting the optimal procurement option;
- **P3 Procurement**, the guide to best practices for the process of procuring major infrastructure assets using the P3 model.

PPP Canada has also developed *Schematic Design Estimate Guide*, a guide to preparing cost estimates suitable for a Quantitative Analysis when considering a P3 as an asset procurement option.

## Document Overview

Assessing any capital asset's P3 suitability presupposes an understanding of P3s in general and more specifically, P3s in the context of the Government of Canada. As such, the present guide begins with a section dedicated to providing some foundational knowledge on the P3 approach to infrastructure procurement. The P3 Primer section includes:

- A definition of what constitutes a P3 in the federal context;
- Core P3 concepts;
- Benefits, costs and myths associated with P3s;
- P3 decision-support tools;
- P3 resources for federal organizations.

In **Section 2**, the focus shifts to the actual P3 suitability assessment process: the matrix (see **Section 2.2**) and the application of the screening criteria (see **Section 2.3**). The screening criteria are presented in the form of 14 questions related to specifics such as: investment size; private sector capacity and potential for competition; market precedence; and asset complexity.

The Federal P3 Screen has been designed to be useable by all federal departments and agencies, even those with limited P3 experience and expertise. However, screening outcomes can be expected to be more accurate when greater P3 expertise is brought to bear. As such, departments and agencies are required to contact PPP Canada for direct support and advice as they undertake the screening of their proposed capital investments.



# 1. P3 PRIMER

Before beginning to determine whether a given asset has the potential to be a successful public-private partnership (P3), it is important to understand what constitutes a P3 and how P3s generate value for Canadians. The following section will define a P3 in the federal context and provide departments and agencies with a basic understanding of some core concepts.

## 1.1 P3: A Definition for the Federal Context

In Canada, and globally, there are many definitions of what constitutes a P3, such as Alternative Financing and Procurement (AFP) in Ontario and Private Finance Initiative (PFI/PF2) in the United Kingdom, and nearly as many alternative terms used to refer to the P3 concept. For the purposes of the Government of Canada, a P3 is defined as a long-term contractual relationship between a public partner and a private partner that involves:

- Public ownership of the asset throughout its life cycle;
- Provision of capital assets and associated services to meet defined performance-based output specifications (i.e. define what is required rather than how it is to be done);
- Integration of multiple elements of the asset (e.g. design, build, finance, operate and maintain);
- Transfer of risk to the private sector;
- Private sector capital at risk throughout the duration of the contract;
- Performance-based payment mechanism.

Outside of the federal government, there is a broad spectrum of models included in the definitions used by different organizations. At one end of the spectrum is the Canadian Council for Public-Private Partnerships' definition, which encompasses traditional outsourcing arrangements. At the other end of the spectrum is the view that only the most advanced of the P3 models, the Design-Build-Finance-Operate-Maintain (DBFOM), is a true P3. While these different views can be attributed to a number of factors, in the federal context, we will focus on those facets of P3s that are critical to generating value for Canadians.

## 1.2 What Is Not a P3?

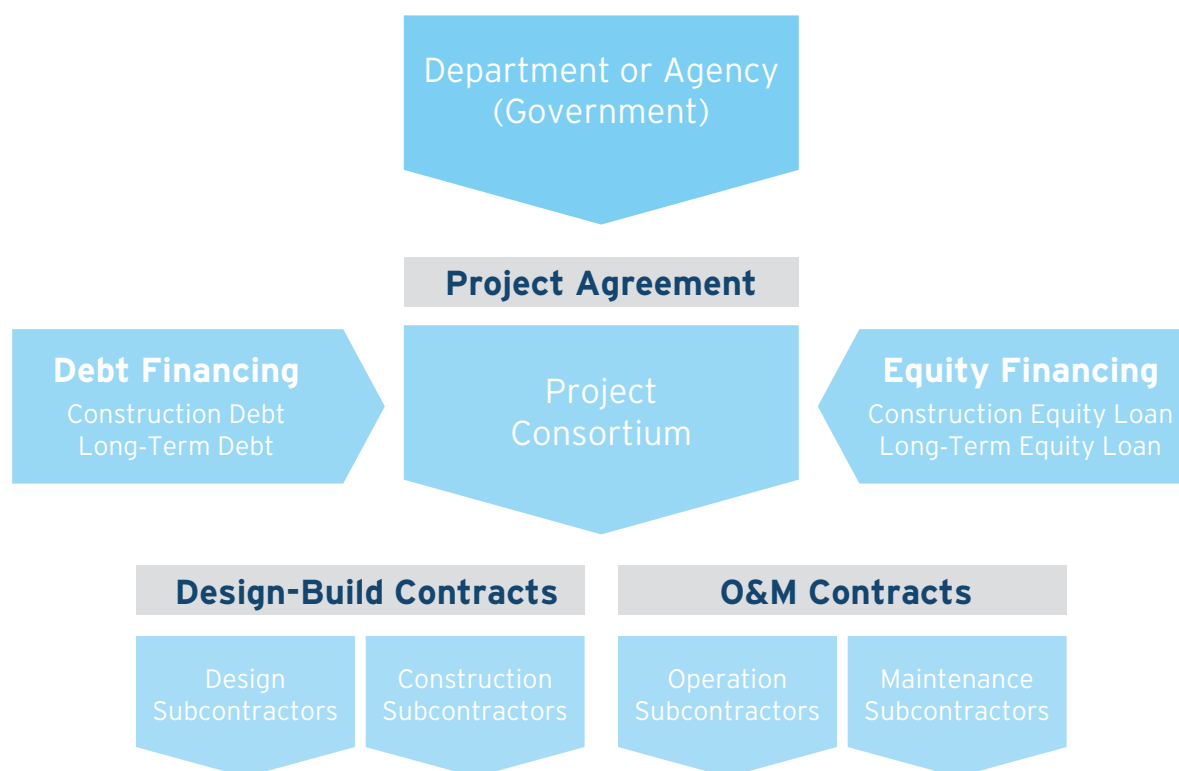
Given the Government of Canada's definition, the following types of contractual arrangements ARE NOT examples of P3 arrangements:

- Privatization;
- Joint ventures with the private sector;
- Co-ownership with another public sector body;
- Arrangements for the divestiture of federal assets where the private partner will become the new owner;
- Service only arrangements;
- Design-Build (DB) contracts;
- Sale-lease-back contracts;
- Lease-purchase contracts.

## 1.3 What Does a P3 Look Like?

In general, P3s involve a private partner in the form of a purpose-built corporate legal and economic entity (e.g. a Project Consortium [Project Co.]) created for a specific capital investment. The private partner is comprised of a consortium of firms with specific expertise relevant to the asset, typically design and building contractors, an operator or maintenance provider and an equity provider.

The Project Consortium would have agreements with lenders that govern its financing and with the department or agency sponsoring the project. These relationships are depicted in the figure below.



While the Project Consortium is comprised of a number of firms, the department or agency would have only one agreement with the private partner. This contract is known as the Project Agreement and will be discussed later.

## 1.4 P3 Myths

Given the broad range of how P3s have been interpreted and applied around the globe, it is not surprising that some P3 myths have emerged. Below, we address some of the main ones and how they relate to the federal context.

### Public-private partnerships mean privatization of public infrastructure

Privatization implies full or partial private ownership of an asset. However, in the Canadian context, P3s are structured such that ownership of the infrastructure always remains with the public sector. Furthermore, the public sector retains full control of the project's outcomes.

### P3s cost more

The cost of private sector financing will normally mean that the cost of the P3 option will exceed the cost of delivering the asset in the traditional manner. However, a fair comparison of P3 costs vs. traditional costs also requires consideration of the risk transfers that are anchored by that private sector financing. This risk-adjusted comparison (where the costs are adjusted to reflect the value of the risks associated with the asset) is a more accurate and appropriate basis for comparing the two options. When this is done for assets that are well suited to P3 procurement, the positive value of the risk transfers normally exceeds the negative financing costs.

### **P3s make taxpayers accountable for private sector mistakes**

As noted above, the public sector's payment obligations in a P3 are predicated on the private sector's performance relative to the specifications in the Project Agreement. Furthermore, P3s provide the public sector with cost certainty. As such, P3s have the effect of insulating the public sector from any errors made by the private sector, such as cost overruns.

### **P3s just mean bigger profits for the private sector**

The private sector is involved in all public infrastructure assets and in all procurement models; their participation is predicated on the potential to earn profit, regardless of whether the asset is being delivered as a P3. Similarly, the public sector's motivator in constructing public infrastructure is to realize the benefits associated with that infrastructure. The choice of delivery approach for a given piece of infrastructure is based on maximizing value for Canadians.

Project agreements are designed to take into account the potential profits of the private sector partner based on an expected performance of the asset. With regard to assets where the private sector's returns might be greater than forecasted on the strength of tolls or user fees, modern P3s are designed to ensure a sharing of these windfalls between the private and public sectors.

The answer is that P3s provide a long-term investment opportunity with a stable governmental partner that also provides the possibility of a reliable long-term revenue stream over the life of the contract, assuming proper performance.

### **Higher consumer/end-user costs**

In a P3 arrangement, the full life-cycle costs of the asset are transparent to the consumer/end-user as the costs are factored into the investment costs, unlike in the situation of a traditional procurement where the full costs of the asset over its life cycle are often unknown or unavailable. It is ultimately the user, the tax-paying public, that funds the unanticipated costs of the traditional process. By contrast, P3s can provide cost certainty over the long term while guaranteeing a level of service.

## **COSTS VS. BENEFITS:**

### **The Concept of Value for Money**

Intuitively, as individual consumers who make decisions about what to do with our personal income on a daily basis, we all understand what is meant by the words “value for money”. In the public-private partnership (P3) context, the meaning of the term carries the same overall meaning, but rather than considering the asset being built, it is focused on the delivery approach. Essentially, the value for money question focuses on determining which delivery approach is mostly likely to produce the desired asset at the lowest cost when all factors, including asset life, risk and time value of capital, are considered.

Answering this question is done through a Value for Money (VfM) Analysis, which amounts to developing robust estimates of the risk-adjusted net present value (NPV) of competing procurement options on a like-for-like basis.

A critical component of the VfM Analysis is the identification and valuation of risk. As we have discussed, P3s involve significant risk transfer from the public sector to the private sector. Different delivery approaches will imply or enable different risk transfer profiles. Therefore, comparing these approaches requires the identification and valuation of the risks associated with the investment. These risk valuations of each delivery approach for design, construction and long-term operation and maintenance (O&M), when combined with the differing risk transfer profiles of the transaction costs and financing costs, will change the relative costs of each option. Lastly, to account for the timing of expenditures, the comparison of options is done on an NPV basis.

The details and assumptions underlying a VfM Analysis are very important. While there are several approaches to conducting the analysis, they tend to produce very similar results. In order to assist federal organizations in carrying out a VfM Analysis in a standardized and consistent manner that will in turn facilitate decision making, PPP Canada is developing a VfM methodology that responds to the needs of federal decision makers.

## 1.5 How Do P3s Generate Value for Canadians?

The focus on performance-based output specifications, rather than on the input (prescriptive) methods to be used, is central to the P3 model and the foundation on which the other facets of the definition are built. Unlike more traditional approaches that tend to rely on prescriptive specifications that detail how the asset is to be designed and constructed, performance-based output specifications allow the public sector to measure whether the asset is performing as required, not simply whether it was built according to the prescriptive input specifications.

The integration of asset life-cycle elements into one contract is important because it aligns the incentives of the private sector to the benefit of the public sector. For example, the integration of design, build and private financing ensures that the outputs of design are practical and “buildable” while the scrutiny of lenders and financing costs drive on-time delivery. Private sector responsibility for an asset during the asset’s life cycle incorporates greater efficiencies into the design and building of the asset, and further into the operation and maintenance (O&M) of the asset.

A reliance on performance-based output specifications, along with the integration of asset life-cycle elements, form the foundation upon which asset-related risks can be transferred from the public sector to the private sector. The optimal allocation of risks between the public and private partners is based on which partner is best suited to manage or mitigate each risk as well as on the particulars of the asset in question.

In general, the risks associated with design, build and the securing of financing are the most common and straight-forward risks to transfer to the private sector. Such risks, including material cost escalation and design/integration errors, once transferred, directly affect the private partner’s cash flows. Risks associated with operation and long-term maintenance, while often being straight forward to transfer, sometimes require more consideration by the public sector. Such risks include a failure to do required maintenance or unanticipated maintenance costs. In a traditional delivery approach, there is no optimal allocation of risks—it is the public sector which assumes the risks associated with the asset and their associated costs, often resulting in a high public sector cost for the asset. Risks that could be more effectively mitigated by the private sector are not transferred. P3s generate value for Canadians through the optimal allocation of risks between public and private parties; through increased innovation and efficiency; and by stipulating performance requirements during the life cycle of an asset.

Performance-based payments and private capital are the final components that make this risk transfer real. The due diligence of lenders assists in keeping the Project Consortium on track. The private partner, having borrowed the funds to construct the asset, must now make debt repayments over the life of the agreement. The cash flow from which the Project Consortium makes these payments, as well as extracts its income, is the stream of payments it receives from the public sector, which normally begins only when the asset is complete and ready for use. Unlike traditional approaches, payment is dependent on the private partner’s performance in relation to the performance-based output specifications. If the Project Consortium fails to meet the specified performance standards, its payments will be reduced in accordance with the penalty provisions set out in the Project Agreement. As such, the Project Consortium has a very strong incentive to ensure that it performs according to these standards.

## 1.6 P3 Models and Their Benefits

While the federal definition of a P3 is decidedly more precise than some others, it remains sufficiently broad to encompass a number of P3 models or structures that vary by the degree of private sector involvement and associated risk transfer. In all of the models below, the discussion assumes public ownership of the asset throughout the duration of the Project Agreement. Our discussion begins with the model that has the lowest level of private sector involvement.

### **Design-Build-Finance:**

In the Design-Build-Finance (DBF) model, the Project Consortium has responsibility for designing and building the asset to comply with the specifications of the public sector. The private sector is also responsible for arranging its own financing during the construction period as it will not normally receive any payments from the public sector until the asset is complete and ready to operate. The duration of these agreements normally span the construction period of the asset and a warranty period following delivery.

The main benefits of this model are cost and time certainty for the public sector as well as the transfer of design and construction risks. The limitation of this model is that it can provide the private sector with an incentive to limit its costs in design and construction on the basis that the public sector will be responsible for the asset over the long term.

### **Design-Build-Finance-Maintain:**

The Design-Build-Finance-Maintain (DBFM) model builds on the DBF by making the private sector responsible for maintaining the asset in accordance with the performance-based output specifications over the long term, normally 20 to 35 years. Maintenance can include daily facilities maintenance, annual maintenance and lifecycle maintenance, which includes upgrades or replacements of major components.

Unlike the DBF, the disciplines brought by private sector finance and performance-based payments are brought to bear over the entire life of the asset, which has the effect of providing the public sector with a long-term warranty on the performance of the asset. The benefits of cost and time certainty continue to apply during construction as well as through major life-cycle expenditures, which are now to be undertaken by the private partner.

Within the DBFM model, there is room for variation with respect to the amount of maintenance responsibility/risk that is transferred to the Project Consortium and to the duration of private financing. Obviously, these variants present different risk (and cost) profiles for the public sector.

The long-term nature of the DBFM requires that the public sector also specify the desired condition of the asset at the end of the Project Agreement. The Project Agreement will normally contain provisions designed to ensure that the private sector has the appropriate financial incentives to meet these handback expectations.

### **Design-Build-Finance-Operate-Maintain:**

The Design-Build-Finance-Operate-Maintain (DBFOM) model maximizes risk transfer to the private sector with the transfer of the associated responsibility for the operation and the maintenance of the asset. Operation is normally differentiated from maintenance in the following way: maintenance is focused on maintaining the asset where operation relates to delivery of the services associated with the asset. In the simple example of a public library, maintenance would relate to the building envelope, the building's heating/cooling/ventilation systems, etc. Operation would relate to the staffing of librarian staff, maintaining the collection, serving clients, etc. In addition to the benefits of the DBFM, the DBFOM links operational effectiveness to all elements of the asset's life cycle and further sets operational performance requirements which reinforce that effectiveness. This imposes yet another layer of accountability and discipline associated with payments on the private partner.

The DBFOM is also subject to variations in the duration of private financing and the extent of the private sector responsibility for O&M. These variations will affect the risk profiles for the public sector.

As with the DBFM, DBFOM project agreements will normally contain provisions aimed at ensuring that the asset is in the desired condition at the end of the agreement.

## 1.7 Costs of P3s

P3s generate value for Canadians as well as the benefits presented by the major P3 models in use in Canada. While these benefits are important, they do come with costs, including higher financing and transaction costs, as well as greater upfront planning demands.

### Higher Financing Costs

One of the common criticisms of P3s is that their reliance on private financing automatically makes them more expensive for the public sector since the private partner's borrowings will always cost more than the government's risk-free borrowing rate.

While this criticism is entirely valid, the increased cost of private financing must also be weighed against the value of the risk transfers that are anchored by that private financing, the value of the private sector innovation that can be brought to the asset and the overall performance of the asset over its life cycle.

Also, experience has shown a downward trend in the gap between the private partner's cost of borrowing and the public sector's cost of capital. While this gap will likely always exist, its impact is decreasing.

### Higher Transaction Costs

As mentioned, the private partner in a P3 is normally a corporate entity composed of a number of other firms.

This multitude of players, while driving a higher degree of discipline on the process, also implies higher transaction costs as each participant incurs costs in the form of advisors and analysis as it undertakes its own due diligence. These expenditures are necessarily reflected in bids and are therefore passed on to the public sector. Experience has shown that as P3 markets mature, as contracts become more standardized and as market participants become more familiar with those standards, costs tend to decrease. Nevertheless, P3 transaction costs will most often exceed traditional transaction costs, but must be weighed against the value of the risk transfers enabled by the P3 model.

### Greater Upfront Planning Demands

P3s, by virtue of their long-term nature, require a significant investment in upfront planning and analysis and the engagement of advisors with P3 expertise. This upfront planning serves as an assurance that needs are well understood and articulated; that cost estimates are robust; that risks are understood and optimally allocated; and that competitive bids will be received through the Request for Qualification (RFQ) and Request for Proposals (RFP) process. The benefits of the due diligence implied by the P3 planning process can improve the performance of public sector investments that often involve the expenditure of hundreds of millions in public funds.

## Screening Investments for P3 Potential

Public-private partnerships (P3s) are currently operating across the country—from bridges and roads to hospitals and fire stations, schools and prisons—and users and taxpayers are reaping the benefits with better service, lower costs and faster delivery times. However, because the value of P3s is best leveraged in large, complex projects where innovation can reduce life-time costs and deliver better infrastructure, the P3 market is not boundless. It is estimated that P3s are the better procurement option in only up to 20% of public infrastructure delivery. As a result, P3s are only one tool of many that governments can employ to optimize the value that is being delivered in public infrastructure procurement.

Determining whether an investment could have potential for P3 procurement is only the first step in a larger decision-making process that concludes with a recommendation regarding the optimal approach to procurement.



## 2. FEDERAL P3 SCREEN: WHEN AND HOW

This section will provide departments and agencies with an overview of the Federal P3 Screen process as well as guidance for the application of the screening criteria to specific capital investments.

Identifying the optimal delivery approach for a given asset can be seen as an iterative approach that applies progressively finer filters to the list of viable procurement options until one emerges as the optimum choice.

In general, this process begins with the consideration of the asset in question to determine which of the various procurement options available to government (e.g. leasing, traditional Crown construct) are likely to be viable. This first step can be seen as the “screening” stage.

The initial list of options that emerges from the screening stage is then assessed against qualitative factors such as the public sector’s program and policy objectives/constraints, stakeholder acceptability, timing imperatives, etc. This assessment further reduces the number of options for consideration and identifies the extent to which the remaining options align with the identified qualitative factors. We’ll refer to this stage as the “Qualitative Analysis”.

The options that emerge from the Qualitative Analysis are subjected to rigorous financial analysis to determine each option’s financial implications for the public sector. This financial analysis, or “Quantitative Analysis”, supplements the Qualitative Analysis by making clear the costs associated with each procurement option. For more information on the approach used for the Quantitative Analysis, please refer to the box entitled *Costs vs. Benefits: The Concept of Value for Money* on page 6.

The final “integration” stage considers the output from both Qualitative and Quantitative Analyses to identify the optimal procurement option. Depending on the importance of qualitative factors, this optimal choice may not always be the lowest cost option.

Now that we have a sense of the overall analytical process, we can turn our attention to when to best apply the Federal P3 Screen. The purpose of the Federal P3 Screen is to raise the level of awareness and consideration of public-private partnerships (P3s) in the federal investment planning process, thereby ensuring that where P3 potential exists, the P3 option is given due consideration.

In this context, the best time to apply the Federal P3 Screen is at the initial stage. As explained above, it is at this stage that we define the initial list of procurement options for further consideration. Applying the Federal P3 Screen at this time will ensure that the P3 option is included whenever P3 potential is identified.

It is also important to note that the identification of P3 potential does not imply that the P3 model will be the final delivery approach. Rather, it means that the P3 option must be carried forward through the next stages of the analytical process outlined above.

## 2.1 Screening Matrix

The screening matrix has been developed by PPP Canada to assist departments and agencies as they assess capital investments for P3 potential.

The screening matrix asks the user to consider 14 questions and enter a score for each question. Considerable effort has been made to ensure that the questions/criteria do not overlap with one another, that they do not repeat and that users are provided with objective indicators for each question.

The evaluation criteria have been developed in order to ensure that the screening can be completed based on readily available information that would be established through the conventional investment planning process. However, some of the criteria may require a more in-depth understanding of a wide spectrum of P3 procurement models and an awareness of the P3 market in Canada. PPP Canada is readily available to provide this additional context and to discuss support to federal departments and agencies as they undertake the screening of their proposed assets.

The screening matrix should be completed electronically to allow for automated scoring. The electronic file is available for download on PPP Canada's website at [www.p3canada.ca](http://www.p3canada.ca).

## 2.2 How to Use the Screening Matrix

For each of the 14 questions in the screening matrix, the user will be presented with a scale from 1 to 5. Accompanying this scale will be indicators meant to assist the reader in choosing the appropriate rating.

The user should consider the question in the context of their specific asset, then identify the indicator that best aligns with their assessment and finally enter the rating associated with that indicator in the rating cell. The user is also asked to provide a brief rationale for their rating.

In the background, the user's scores will be modified by a weighting factor that reflects the relative importance of that criterion in determining P3 suitability. There is no one overwhelming indicator of P3 suitability. These weighted ratings are then normalized to a score out of 100.

## 2.3 Application of the Screening Criteria

Below is a detailed overview of each of the questions to be put into the screening matrix along with an indication of what the question is meant to measure, the indicators that should guide the rating and additional context to assist the user.

CRITERION #1: INVESTMENT SIZE		
What is being measured:	Whether the asset's size/value in dollar terms is likely to be sufficiently large to offset the higher transaction costs that accompany the P3 approach.	Weighting
		10%
Question asked:	What is the estimated capital cost of the proposed asset?	

P3s need to be of sufficiently large to offset their associated transaction costs and to ensure that the investment has a critical mass to attract private financing. These transaction costs include the additional effort involved in completing the extensive procurement documents, including the advisory services that are necessary to bring the procurement to a financial close.

Capital costs are the focus of this question as they tend to be the focus of early analysis. However, assets that have low initial capital costs but high operation and maintenance (O&M) costs can often be viable P3s. If you have a sense of O&M costs, try to estimate their aggregate value over the life of the asset when answering this question.

Lastly, it should be noted that assets of less capital costs (<\$50 million) could be considered as potential P3 candidates if they exhibit complex implementation or operations for which the public partner has limited internal capabilities. The capital costs considered may be for a stand-alone asset or for a bundle of assets that will be delivered as a single asset.

Response Indicators				
5	4	3	2	1
Capital costs will be \$100M or more.	Capital costs will be less than \$100M, but O&M costs will be 2-3 times larger than capital costs.	Capital costs will be \$50M or more, but less than \$100M.	Capital costs will be less than \$50M, but O&M costs will be 3-4 times larger than capital costs.	Capital costs will be less than \$50M.

## CRITERION #2: PRIVATE SECTOR EXPERTISE

What is being measured:	Whether there is sufficient private sector capacity to deliver the asset and to create a competitive bidding environment.	Weighting
		10%
Question asked:	How many private sector firms have the capacity to deliver and maintain this type of asset?	

The availability of private sector expertise is critical for two reasons: 1) ensuring a competitive bidding environment and 2) ensuring that there is private sector capacity to perform the functions and manage the risks associated with the asset.

The success of a P3 is dependent upon the team that the private sector partner assembles to fulfill its obligations to the public partner. There needs to be an adequate pool of private sector participants who would be interested in and capable of pursuing the opportunity. Currently, private sector expertise exists in virtually all areas of public infrastructure, with P3 activity in most sectors, including transportation, wastewater and correctional facilities. If there are only a limited number of private sector companies that could deliver the asset, then there could be challenges related to a competitive bidding process, regardless of delivery approach.

Response Indicators				
5	4	3	2	1
There are more than 5 private sector firms capable of forming teams with the expertise to design, build, maintain and operate this type of asset.	There are more than 5 private sector firms capable of designing, building and maintaining this type of asset. Operation capability is not yet determined.	There are 3 to 5 private sector firms capable of forming teams with the expertise to design, build, maintain and operate this type of asset.	There are 3-5 private sector firms capable of designing, building and maintaining this type of asset. Operation capability is not yet determined.	There are fewer than 3 private sector firms capable of forming teams with the expertise to design, build, maintain and operate this type of asset.

### CRITERION #3: MARKET PRECEDENTS

What is being measured:	Whether the P3 market has experience with assets of a similar nature in all phases of the asset's life cycle.	Weighting
		5%
Question asked:	Have assets with similar requirements and of similar size and scale been delivered through the P3 model?	

The existence of P3s for similar assets is a strong indicator of the viability of a P3.

P3s are delivered in a multitude of sectors across Canada, including bridges and roads, hospitals and fire stations, schools and prisons. Alberta, British Columbia, Ontario and Québec have undertaken the vast majority of P3 procurements in Canada representing a diverse portfolio of public infrastructure. P3s across various infrastructure asset classes, such as transit, waste management and broadband, have been procured across Canada and internationally.

Information related to P3s is available on the website of provincial and international procurement agencies. A list of resources providing information on the Canadian and international P3 organizations can be found on PPP Canada's website at [www.p3canada.ca](http://www.p3canada.ca).

Response Indicators				
5	4	3	2	1
Assets of similar value and scope have been delivered as P3s in Canada.	Assets with higher or lower value and similar scope, or assets of similar value but smaller or larger scope, have been delivered as P3s in Canada.	Assets of similar value and scope have been delivered as P3s internationally.	Lower value assets of similar scope, or assets of similar value but smaller scope, have been delivered as P3s internationally.	Assets of similar value and scope have not been previously delivered as P3s.

## CRITERION #4: TYPE OF INFRASTRUCTURE SITE

What is being measured:	Whether the nature of the asset lends itself to the effective transfer of risk owing to the nature infrastructure site.	Weighting
Question asked:	How much of this asset involves new construction on a previously undeveloped site?	5%

In general, assets involving new construction on sites not previously developed (greenfield developments) lend themselves to maximizing risk transfer to the private sector. However, investments that involve existing assets are also suitable when they involve reconstruction or very extensive renovations.

Refurbishment, renovation and facility expansion investments (brownfield developments) offer less potential for risk transfer because it may not be possible to distinguish the defects in new construction from preexisting or latent defects in the infrastructure. Also, the private sector may be less averse in taking on risks related to existing assets over the long term of a new P3 contract. Nevertheless, these types of investments may still make viable P3s.

Response Indicators				
5	4	3	2	1
Asset is new construction on an undeveloped site.	Asset is new construction on an already developed site.	The planned asset involves at least 50% new construction and/or significant changes to the asset footprint.	The planned asset involves expansion and/or refurbishment of an existing asset.	The planned asset mainly involves refurbishment, modernization, minor renovation or involves integration of new facilities with existing facilities.

## CRITERION #5: SCOPE FOR PRIVATE SECTOR INNOVATION GAINS

What is being measured:	Whether the public sector's needs or expectations are compatible with realizing gains from private sector innovation.	Weighting
		10%
Question asked:	To what extent will the performance-based output contracts specify deliverables?	

The scope for private sector innovation is inversely related to the public sector's need to be prescriptive.

Performance-based output contracts specify deliverables in terms of outcomes (safety, amount of lighting) rather than prescribing the inputs or materials to be used in delivering the outputs. The specifications need to reflect the final requirements of the end user. These innovative types of contracts encourage innovation by giving the private sector discretion over how it will deliver the required outcomes. Performance-based contracts are viable when the outputs are easily measurable and verifiable using accepted standard measures. Provisions in an output-based contract are not unique to P3s and are already used in some conventional contracts such as O&M services.

With this in mind, the public sector must consider the extent to which it can express its requirements in terms of outputs.

**Illustrative example:** Expressing a requirement in output-based terms could include a statement that highspeed internet access should be available 24/7 for all 1,000 people in the facility. This would leave the Project Consortium to determine how to best meet that need. By contrast, an input-based approach would involve prescribing type of cable to be used, where it should be laid out, etc. Not only does the inputbased approach curtail the opportunities to realize innovation efficiencies, but it also fails to recognize that the specified technologies and approaches may be rendered obsolete by technological advances.

Response Indicators				
5	4	3	2	1
The public sector is prepared to use performance-based output specifications for all phases of the asset's life cycle.	There are very few areas where the public sector feels it must use prescriptive input specifications.	The requirements will be expressed as a mix of prescriptive input specifications and performance-based output specifications.	The planned asset's design and construction will be based on prescriptive input specifications.	The public sector believes it must define specific prescriptive input specifications for the majority of the asset.

## CRITERION #6: SECURITY REQUIREMENTS

What is being measured:	Whether security requirements are likely to pose an impediment to P3 procurement.	Weighting 5%
Question asked:	Are there considerable and complex security requirements associated with functioning of the asset?	

Federal assets typically have security requirements. In some cases, these may be limited to facility access. In others, these may relate to the security of highly sensitive information and systems.

In most cases, federal departments and agencies must address security requirements adequately when preparing asset documents. Specifically, organizations may need to provide assurances in the documents that they have conducted a threat and risk assessment, and identified and dealt appropriately with all security issues. Also, security (e.g. physical security measures and IT security software/hardware) can be very costly, especially if dealt with retroactively.

This question asks the assessor to consider the extent to which the asset's security profile exceeds the federal norm and whether that is likely to pose significant challenges.

Response Indicators				
5	4	3	2	1
The security of the asset is consistent with the majority of federal assets; access to site requires security pass or escort.	The security of the asset is higher than the majority of federal assets; some access is restricted to secret pass holders.	The security of the asset is consistent with the majority of federal assets. However, there are some special requirements and/or there is potential for contractor exposure to secure areas and information assets, including secret information.	Access to the site is limited to secret pass holders and contractors, and their organizations are required to be secret cleared.	The security requirements of the asset exceed the federal norm, include information technology or the protection of top secret information.



## CRITERION #7: POTENTIAL FOR CONTRACT INTEGRATION

What is being measured:	The extent to which asset elements (i.e. design, build, finance, operation and maintenance) can be integrated into one contract.	Weighting
		10%
Question asked:	Which elements of the potential P3 (i.e. design, build, finance, operation and maintenance) can be integrated into one contract?	

One of the important mechanisms through which P3s generate value is the integration of various elements of the potential P3 (i.e. design, build, finance, operation and maintenance). The greater the potential for integration, the more likely a P3 will generate value.

The argument for integrating the elements of an asset is that it creates incentives for the private sector to minimize the total capital and facilities maintenance costs over the economic useful life of the asset. This is a challenging task that requires bringing together different disciplines (architects, builders, facilities managers and financial experts) to decide which approaches are likely to improve financial performance and which are not.

Response Indicators				
5	4	3	2	1
Design, build, finance, maintenance and operation could be integrated into one contract.	Design, build, finance, maintenance and some operational activities could be integrated into one contract.	Design, build, finance and some maintenance could be integrated into one contract.	At least design, build and finance could be integrated into one contract.	Only two elements could be integrated into one contract.

CRITERION #8: ASSET LIFE		
What is being measured:	The expected useful life of the asset.	Weighting
		5%
Question asked:	What is the anticipated useful life (i.e. service life) of this asset?	

The duration of P3 contracts tend to correspond to the useful life of the asset and, in general, longer-lived assets tend to be better suited to a P3. A lengthy contracting period allows the public partner to benefit from efficiencies, innovations and cost certainty while the private sector partner can rely on a long-term source of revenue that is reasonably secure and sufficient to recover its investments.

Response Indicators				
5	4	3	2	1
Asset life is greater than 25 years.	Asset life is 20-24 years.	Asset life is 15-19 years.	Asset life is 10-14 years.	Asset life is less than 10 years.

## CRITERION #9: NUMBER OF ASSET CLASSES

What is being measured:	Implementation and scheduling complexity through the procurement of multiple asset classes or components that require different design and construction disciplines.	Weighting
		10%
Question asked:	Is there any benefit in combining the procurement of different components into one contract, reducing the inherent interface and management risk involved in the commissioning of the asset?	

A P3 approach is more suited to complex capital investments that combine different related asset classes, or assets of a unique nature, where the private partner is responsible for bringing and integrating the different design and construction disciplines required. A traditional approach is more suited for capital investments that involve only one component of low difficulty to implement or lack of integration of different construction disciplines.

Response Indicators				
5	4	3	2	1
Combines the commissioning of three or more components with a high degree of interdependence (i.e. civil engineering, electromechanical works, other relevant systems such as communications, control or signalling).	The planned investment by its nature is very difficult to implement as it involves two or more components, or involves significant technology.	Combines two components of medium difficulty to implement.	Combines two components of low difficulty to implement, or one component of higher difficulty.	Single component of low difficulty to implement.

## CRITERION #10: PERFORMANCE-BASED OUTPUT SPECIFICATIONS (CONSTRUCTION)

What is being measured:	The availability/accessibility of performance-based output specifications for the construction of the asset.	Weighting
		5%
Question asked:	What is the current status of the performance-based output specifications for the construction of the asset?	

P3s are characterized by the public sector setting its desired outcomes or outputs in the form of measurable technical output/service/performance specifications that provide the basis for performance-based contracts.

Performance-based output specifications will include performance specifications for the entire concession period, becoming a fundamental part of the Project Agreement between the department or agency and the Project Consortium. The development of performance-based output specifications for the life cycle of an asset requires a shift in mindset from the approach of developing prescriptive input specifications for a single phase of the asset's life. Performance-based output specifications will allow a supplier maximum flexibility to achieve innovation and efficiency in design of the asset and service delivery, by providing a description of how the asset is to perform in each phase of the life cycle and the condition of the asset at the end of the concession period. This requires a clear definition of the specifications/standards to be met by the private sector during not only the construction phase but in the longer-term operation and maintenance phases. Inaccurate or incomplete performance-based output specifications can have lasting negative impact on the performance of an asset and how it is maintained.

Response Indicators				
5	4	3	2	1
Performance-based output specifications for same type of asset(s) exist and are available.	Performance-based output specifications for similar asset are available.	Existing conventional specifications can be converted into performance-based output specifications easily.	Existing conventional specifications can be converted into performance-based output specifications with some difficulty.	New technical performance-based output specifications will have to be developed.

## CRITERION #11: STABILITY OF OPERATIONAL AND MAINTENANCE REQUIREMENTS

What is being measured:	Stability and predictability of the operation and maintenance requirements for the asset.	Weighting
		5%
Question asked:	Are the long-term operation and maintenance needs of the planned asset relatively stable and predictable?	

Being able to forecast the O&M requirements for an asset over time is desirable in the context of long-term contracts. Most infrastructure assets, such as buildings and roads, have stable and predictable O&M requirements over their life spans. However, certain types of assets may be more unpredictable in nature due to external factors such as regulatory standards. Risks, which are challenging to quantify, tend to command risk premiums associated with the risk transfer and result in increased overall costs.

The relationship between contract duration, asset life cycle and timing of potential external drivers will influence the scoring of this criterion.

**Illustrative example:** Assuming the operating permit for a wastewater treatment facility is renewed every 10 years using the standards in force at the time of the renewal, a contract with duration of 10 years or less should score 5. By contrast, if the anticipated contract is longer than 10 years, then the score would be lower in recognition of the uncertainty related to future standards.

Response Indicators				
5	4	3	2	1
O&M requirements are predictable and stable.	O&M requirements are predictable, but have some instability based on known factors.	Operation requirements are unstable, but maintenance requirements are predictable.	Operation requirements are not stable and maintenance requirements are somewhat predictable.	O&M requirements cannot be predicted and are unstable over the useful life of the asset.

## CRITERION #12: PERFORMANCE SPECIFICATIONS AND INDICATORS (OPERATION)

What is being measured:	The availability of performance specifications and indicators for the operation and maintenance of the asset.	Weighting
		5%
Question asked:	Are operation- and maintenance-related performance specifications and indicators available?	

Establishing specifications and monitoring performance against them using key performance indicators (KPIs) is critical to the management of any performance-based contract, including P3s.

The public sector must be able to articulate its required minimum O&M standards to be met in output- or performance-based terms. Measurement against the minimum standards involves the development and monitoring of KPIs. Monitoring performance over the life of the P3 agreement may also necessitate change in management initiatives as the public partner moves away from an input-based approach to managing performance.

Response Indicators				
5	4	3	2	1
Performance specifications and indicators for O&M activities are available.	Performance specifications and indicators exist, but are not readily available.	Performance specifications and indicators for comparable assets exist and are available.	Performance specifications and indicators for comparable assets exist and are not readily available.	Performance specifications and indicators will have to be developed.

## CRITERION #13: REHABILITATION COSTS

What is being measured:	Whether the public sector has sufficient information to develop a profile of the rehabilitation costs associated with the asset.	Weighting
		10%
Question asked:	Can most of the full rehabilitation costs of the asset, mainly related to construction, fitup (i.e. investment costs) and long-term operation, including maintenance, be quantified upfront with reasonable assumptions and/or availability of historic data?	

Rehabilitation costs are a very important factor in the success of a P3. The public partner will pay for maintenance and operation through the Project Agreement with the expectation that the asset will be maintained in accordance with the performance specifications.

The estimation of rehabilitation costs begins with the identification of what has to be analyzed and the time period for the asset life-cycle study along with the appropriate financial criteria. Giving potential bidders as much information as possible will result in more comprehensive bids and ultimately benefit the public partner. A whole-life approach to the procurement of public infrastructure assets generates potential efficiency gains, especially where operation and maintenance of the asset become the responsibility of the private sector. Decisions relating to rehabilitation costs are a major consideration for the private sector in preparing a complete and competitive proposal. The cost profile should reflect most activities occurring in technical and non-technical disciplines.

**Illustrative example:** If major costs such as design, construction, energy and water, and replacement of mechanical and electrical systems can be documented fairly accurately, then the score should be 5. If costs such as design and construction can be calculated, and energy and equipment replacement costs cannot be easily established due to poor quality of historic data or unpredictable operating conditions over the long term, then a score of 3 could be given.

Response Indicators				
5	4	3	2	1
The total rehabilitation costs are well understood and accurate estimates can be developed by the public partner.	The total rehabilitation costs are understood but estimates, while accurate, are incomplete to some extent.	The total rehabilitation costs are well understood and can somewhat be accurately estimated by the public partner.	There is limited understanding of rehabilitation costs, but costs cannot be accurately estimated by the public partner.	The total rehabilitation costs are not well understood and cannot be estimated by the public partner.

## CRITERION #14: REVENUE GENERATION

What is being measured:	Whether the asset could potentially generate revenues and lessen its impact on taxpayers.	Weighting
		5%
Question asked:	Does the planned asset have inherent scope to generate any revenue?	

Revenue generation is not a requirement for a successful P3. However, where an asset could potentially generate revenue and reduce the burden on public funds, the P3 model is ideally suited to leveraging that potential, particularly where there is scope to transfer the risks associated with that revenue generation to the private partner.

While the proportion of federal assets with revenue generation potential is likely to be small, in some contexts, adjustments to investment scope, such as a move from a single-use building to a multi-use building, can sometimes create revenue opportunities.

Response Indicators				
5	4	3	2	1
The planned asset will generate revenues and the private sector may be willing to assume associated revenue risk.	The planned asset could generate revenues and the private sector may be willing to share revenue risk.	The planned asset could generate revenues and the private sector's willingness to accept revenue risk is unknown.	The planned asset could generate minimal revenues and the private sector is unlikely to accept any revenue risk.	It is unlikely that the planned asset will generate any revenues.



## 2.4 Interpreting the Results

The matrix indicates an appropriate level of P3 suitability of each asset being considered and produces a final numerical output that should be assessed against the following:

Decision Range for Evaluating Assets for P3 Viability		
1	50	The P3 option should not be retained for further analysis.
51	75	The asset presents a mix of favourable and unfavourable indicators for P3 procurement. Please consult PPP Canada for assistance in screening your investment.
76	100	The P3 option should be included in the Procurement Options Analysis (POA) to be developed for the asset.

The accuracy of these results is a function of the degree of definition around the asset and the current state of planning—clearer definition and greater understanding of the proposed asset will provide better screening results. As such, it is important to note that while it is reasonable to undertake iterative screenings as understanding of an investment increases, the last screening—the one upon which the decision to include or discard the P3 option is based—should be undertaken when investment parameters are sufficiently well defined to defensibly support a decision to include or exclude the P3 option.

Of particular interest are assets that score in the yellow range. Given the mix of positive and negative indicators that such assets present, a sound screening decision will require an in-depth understanding of P3s and the P3 market. As such, we strongly encourage departments and agencies to contact PPP Canada before finalizing their screening decision regardless of the score.

### 3. CONCLUSION AND NEXT STEPS

It should be reiterated that even the most positive screening result does not constitute a decision to proceed with a public-private partnership (P3). Rather, a green result simply triggers the requirement to include P3 procurement in the Procurement Options Analysis (POA).

PPP Canada is available to assist departments and agencies interpret available data, identify information gaps and complete their Federal P3 Screen. If you have completed this screening process without the guidance of PPP Canada, please contact us so that we can discuss your ratings and screening results to ensure the soundness of the outcome.

To complete the screening process, departments and agencies may wish to prepare a screening report that summarizes the details of the asset, the findings from the matrix and any other details that influenced the outcome. A brief summary of these reports could also be included in the department or agency's investment plan when it is submitted for central agency and ministerial consideration.

Should your screening results indicate that your investment has P3 potential, you will be required to complete a POA. This process is relevant to any asset, regardless of the Federal P3 Screen outcome, as it facilitates the process of needs identification, promotes clearer asset definition and creates a robust framework for assessing trade-offs, all of which will deliver value for the public sector through a more effective and efficient procurement process.

A POA presents the Qualitative and Quantitative Analyses of a range of infrastructure asset procurement models and recommends an optimal model on the basis of demonstrable public benefits, most notably Value for Money (VfM) for the public sector.

It also presents the department or agency's procurement plan, which identifies the roles and responsibilities of the various stakeholders, procurement activities, key milestones and timelines. This upfront planning will help ensure successful procurement, effective asset delivery and sustainability of the asset throughout its operational period.

Departments and agencies are asked to follow PPP Canada's *Guides for Federal Departments and Agencies: Procurement Options Analysis Development, Procurement Options Analysis Methodology and P3 Procurement*, as well as the *Schematic Design Estimate Guide*, in developing their POA. Departments and agencies may need to expand the scope of the POA to support internal or governmental decision-making requirements.

In addition to assisting federal departments and agencies with screening, PPP Canada can work with its clients throughout the P3 development process to produce procurements that are well structured and deliver optimal VfM. We can also help our federal clients tap into the array of experts available in the Canadian P3 market.

## Let us help you:

- Screen capital investments for P3 suitability;
- Create a development plan;
- Follow best practices;
- Procure advisory services;
- Design your research plans, methodologies and presentation;
- Undertake a robust VfM Analysis and risk assessment;
- Develop a POA;
- Determine the optimal P3 structure for your investment;
- Package analysis for decision makers;
- Develop your communications plan.

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APPENDIX L – PROCUREMENT OPTIONS ANALYSIS DEVELOPMENT

# PPP Canada

## **PROCUREMENT OPTIONS ANALYSIS DEVELOPMENT:**

The Guide for Federal Departments  
and Agencies

IMPROVING THE DELIVERY  
INFRASTRUCTURE THROU  
PUBLIC-PRIVATE PARTNER  
UTILISER LES PARTENAR  
PUBLIC-PRIVÉ AFIN D'AM  
MISE EN PLACE D'INFRA  
PUBLIQUE

## About PPP Canada

PPP Canada's mandate is to improve the delivery of public infrastructure by achieving better value, timeliness and accountability through public-private partnerships (P3s). PPP Canada is a knowledge-based organization of dynamic professionals, who understand public infrastructure needs and the private sector's ability to leverage innovative and efficient approaches to generate results.

Successfully delivering large and complex public infrastructure projects requires a strong public sector partner. PPP Canada builds public sector capacity through sharing of tools and leading market practices and by working in close collaboration with project teams, as needed, to carry out capital investments successfully.

PPP Canada delivers value for Canadians through our three business lines:

- **P3 Knowledge Development and Sharing:** With a continuous focus on learning, PPP Canada has translated our experience and expertise into an array of tools and guides to document lessons learned and further build public sector capacity to implement alternative infrastructure funding and financing approaches.
- **Advancing Federal P3s:** PPP Canada supports federal departments and agencies in considering P3s for the delivery of public infrastructure. PPP Canada collaborates with the Treasury Board Secretariat and Public Services and Procurement Canada to assess opportunities for future federal P3s, and leverages each organization's expertise to achieve quality capital projects at the best value for Canadians. PPP Canada supports its clients from the application of the Federal P3 Screen, through the development of their Procurement Options Analysis, to procurement and construction, into operations.
- **Advancing Provincial, Territorial, Municipal and First Nation P3s:** The P3 Canada Fund invests in new and inexperienced jurisdictions who are considering the P3 model for their public infrastructure procurements. To date, we have committed over \$1.3 billion to more than 20 large or complex infrastructure investments across the country in a variety of asset classes. These P3s have combined capital costs of over \$6 billion and have resulted in savings of approximately \$800 million compared to traditional procurement approaches.

### Federal Project Highlight - New Champlain Bridge Corridor

PPP Canada's experience and expertise were key to the successful procurement of the New Champlain Bridge Corridor project. The new bridge is one of the largest infrastructure projects in North America. Canada's selection of a P3 procurement model provides estimated savings of more than \$1.7 billion (33.7%) over a traditional procurement approach. The Government of Canada is committed to delivering a world-class capital investment and PPP Canada is continuing to work collaboratively with federal partners, to provide the needed public sector capacity to ensure on-time and on-budget delivery of federal assets.

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# INTRODUCTION

## Purpose

This document is meant to assist federal departments and agencies in the planning and procurement of public infrastructure where a public-private partnership (P3) has been identified as a potential implementation option, in particular those who have completed the P3 screening matrix.

The Procurement Options Analysis (POA) presents the Qualitative and Quantitative Analyses of a range of infrastructure asset procurement models and recommends an optimal model on the basis of demonstrable public benefits, most notably Value for Money (VfM) for the public sector.

It also presents the department and agency's procurement plan, which identifies the roles and responsibilities of the various stakeholders, procurement activities, key milestones and timelines. This upfront planning will help ensure successful procurement, effective project management and sustainability of the asset throughout its operational period.

Departments and agencies are encouraged to use the information in this document as a guide in developing their POA but may need to expand the scope of the POA to support internal or governmental decision-making requirements.

The present guide assumes that the department or agency has already completed preliminary analysis on the suitability of using the Federal P3 Screen. If your department or agency has not yet completed this analysis and requires advice on how to proceed, refer to PPP Canada's *Federal P3 Screen: The Guide for Federal Departments and Agencies* in accordance with the Treasury Board of Canada Secretariat's *Policy on Investment Planning*. Department heads are responsible for ensuring that the alternative options are considered, taking into account such factors as whole-of-life costs and risk. Departments and agencies will typically engage external consultants and PPP Canada to assist with this analysis.

The *Procurement Options Analysis Development* guide is one of many tools that have been developed by PPP Canada to assist departments and agencies in meeting the requirements of *Budget 2011* and help with the development and implementation of P3s. In addition to the present document, the *Guides for Federal Departments and Agencies* include:

- **Federal P3 Screen**, the guide for assessing the P3 suitability of capital investments;
- **Procurement Options Analysis Methodology**, the guide to assist officials through the analytical process of selecting the optimal procurement option;
- **P3 Procurement**, the guide to best practices for the process of procuring major infrastructure investments using the P3 model.

PPP Canada has also developed *Schematic Design Estimate Guide*, a guide to preparing cost estimates suitable for Quantitative Analysis when considering a P3 as an asset procurement option.

## Context

The analysis in a traditional capital investment business case is typically a critical input into a POA. While a traditional business case is focused on assessing public need for the asset, as well as the economic and technical feasibility of an investment, a POA goes further to present a comparative analysis of various procurement options.

The intent of a POA is to present the process through which the department or agency identified and assessed viable procurement options in order to recommend the option that best achieves investment objectives and VfM. A POA will also propose a credible implementation strategy for the asset.



As illustrated in **Figure 1**, developing a POA includes the following key components:

**Figure 1: Developing a Procurement Options Analysis**



### Investment Analysis

Because of the unique nature of each capital investment, departments or agencies will approach the Investment Analysis differently and the information presented to the Treasury Board of Canada Secretariat may vary. Nonetheless, this section highlights the information that will be beneficial for departments and agencies to prepare when requesting expenditure approval. A robust Investment Analysis will be supported by an asset needs analysis, which includes the Federal P3 Screen. To begin producing the POA, it is recommended that expenditure approval(s) be obtained as soon as possible by the department or agency.

The Investment Analysis will support an investment decision for the proposed asset. The Federal P3 Screen portion of the analysis will answer the essential question: "Is procuring the asset through a P3 a viable procurement option?" It is recommended that PPP Canada's *Federal P3 Screen: The Guide for Federal Departments and Agencies* form the basis of the screen.

The early works in the Investment Analysis will have useful information that should be re-examined and carried forward into the first component of the POA. The Investment Analysis includes the following items:

- Investment rationale;
- Investment description and scope;
- Investment objectives, benefits and strategic alignment;
- Potential constraints;
- Federal P3 Screen results;
- Market Sounding and assessment of jurisdictional precedents;
- Observations on potential P3 models;
- Shortlist of key qualitative considerations;
- Indicative cost-benefit analysis;
- Source of funding;
- Indicative cost estimates.

Of particular interest for the POA are the findings of the Federal P3 Screen, the Market Sounding, the potential P3 models and the shortlist of qualitative considerations. These factors help form considerations in the POA. For example, the Federal P3 Screen results may identify issues related to public policy that impact the investment or require additional analysis and mitigation strategies.

In addition, the Market Sounding is used to define and confirm investment-specific information such as the scope, structure, timelines, affordability and components of the P3 procurement option. The Market Sounding includes confidential discussions with departments and agencies, builders, operators and financiers on the viability of the capital investment as a P3, on which models are most suitable, and on the key business risks and financial terms necessary to attract market interest. It is possible that the Market Sounding will result in changes to the asset to increase the interest of the private sector; therefore, the feedback from the Market Sounding needs to be well documented in order for decision makers to understand the rationale for the final structure.

The findings from the Market Sounding are used to construct and inform the procurement options for the POA. It is common practice to conduct a second Market Sounding to reconfirm the findings from the Investment Analysis and to ask more detailed questions once the asset is more defined.

At the Investment Analysis phase, the department or agency will develop a shortlist of qualitative factors relevant to the choice of procurement options. This list will typically include objectives, expected outcomes, constraints, issues and challenges that need to be factored into decision making. This shortlist will serve as a source for criteria to be built into the Qualitative Analysis that will be undertaken in the POA.

At this point, the department or agency will have an understanding of P3 characteristics and options, potential issues and benefits of the P3 approach to infrastructure procurement. However, it is unlikely that the Investment Analysis will have considered a specific P3 model in detail. Rather, it will consider the spectrum of P3 options and identify those that are most viable for further analysis by considering qualitative factors.

### **Procurement Options Analysis**

The POA builds on the Investment Analysis to support the decision to proceed with an asset as well as the choice of delivery approach. It describes, examines and compares the traditional procurement model, the P3 procurement model and other alternatives for the delivery of infrastructure. A POA includes the following sections:

- Shortlisting the procurement options;
- Qualitative Analysis;
- Quantitative Analysis;
- Integrated recommendation.

The optimal procurement option is selected by subjecting the shortlisted options to Qualitative and Quantitative Analyses, and determining which option best meets the identified criteria. The Qualitative Analysis focuses on non-quantifiable factors that influence asset procurement. Criteria that can be assessed and compared across procurement options are used to select the preferred procurement model from a qualitative perspective.

The Quantitative Analysis considers measurable benefits, costs and risks associated with different procurement options. It assesses the VfM generated by each procurement alternative and selects the option that delivers the highest value for taxpayers. The integrated recommendation identifies the procurement option that best meets the needs identified by the department or agency based on the Qualitative and Quantitative Analyses.

The remainder of the present guide will explain the analytical process of selecting an optimal procurement model by conducting a POA. Pursuant to the Treasury Board of Canada Secretariat's *Guideline to Implementing Budget 2011 Direction on Public-Private Partnerships*, the POA methodology presented in this document will guide government officials through the analysis to support the preferred option. Departments and agencies are also encouraged to consult the Treasury Board of Canada Secretariat's *Policy on the Management of Projects* for guidance on approvals that may be required through project development.

## Implementation Strategy

The implementation strategy will demonstrate the department or agency's resources by outlining the current status of the proposal and the critical path for moving it forward. By combining the non-procurement- and procurement-related tasks, the implementation strategy should identify the plan for the engagement of stakeholders throughout the execution of the procurement.

In addition to serving as a robust foundation upon which to select the best procurement option, a POA sets out an analytical process that helps to ensure that the delivery of the asset is planned in sufficient detail in order to:

- Minimize the likelihood of issues arising later in an asset's life cycle;
- Maximize the likelihood of achieving investment objectives;
- Improve risk management and contingency planning.

## Organization of This Document

The preparation of a well-developed POA is one way for departments and agencies to reduce risks such as:

- Selection of an inappropriate or suboptimal procurement model;
- Cost underestimation and optimism bias;
- Inadequate risk identification and mitigation;
- Poor project management during procurement.

A POA is an important tool for departments and agencies to use in:

- Ensuring proper project planning and risk assessment;
- Managing timeframe pressures for investments through increased accountability;
- Managing stakeholder and market sentiment;
- Focusing on value drivers.

The POA helps decision makers determine the optimal procurement model for a major infrastructure asset. The present guide is organized into the following 10 sections that mirror the structure of a completed POA. On the next page is a sample table of contents.

**Figure 2: Sample Procurement Options Analysis Table of Contents**

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<b>2</b>	<b>Investment Description and Rationale</b>	8.3	Affordability of the P3
2.1	Strategic Context	<b>9</b>	<b>Procurement Strategy</b>
2.2	Investment Description	9.1	Recommended Procurement Process
2.3	Viable Options	9.2	Procurement Governance
2.4	Conclusions	9.3	Project Team
<b>3</b>	<b>Procurement Options</b>	9.4	Capital Investment Resources and Budgeting
3.1	Procurement Objectives and Considerations	9.5	Procurement Documents
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4.1	Qualitative Criteria and Scoring Methodology	10.3	Procurement Schedule and Implementation Strategy
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<b>5</b>	<b>Market Sounding</b>	10.5	Post-Procurement Contract Administration
5.1	Methodology		
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<b>6</b>	<b>Quantitative Analysis</b>		
6.1	Value for Money Methodology		
6.2	Investment Costs		
6.3	Cash Flow Assumptions		
6.4	Financing Assumptions		
6.5	Risk Assessment and Quantification		
6.6	Estimated Value for Money		

In each section, we define the objectives and their relevance, and provide guidance on expected content.

## Assistance in Preparing a Procurement Options Analysis

The preparation of a POA is a significant undertaking as it presents the results of a significant body of analysis, consultation and planning. Departments and agencies are encouraged to retain professional advice with the expertise in the preparation of Procurement Options Analyses and the analysis underpinning them.

PPP Canada is the Government of Canada's centre of expertise and the federal lead on P3 matters with a mandate to assess federal P3 opportunities; advise on the execution of federal P3s; and, more generally, serve as a source of expertise and advice on P3 matters.

PPP Canada staff is available to support departments and agencies through the process of preparing a POA, including Market Sounding, and Qualitative and Quantitative Analyses, as well as to provide general P3 education and awareness. We can also help our federal clients tap into the array of experts available in the Canadian P3 market.

### Let us help you:

- Screen capital investments for P3 suitability;
- Create a development plan;
- Follow best practices;
- Procure advisory services;
- Design your research plans, methodologies and presentation;
- Undertake a robust VfM Analysis and risk assessment;
- Develop a POA;
- Determine the optimal P3 structure for your investment;
- Package analysis for decision makers;
- Develop your communications plan.

## SECTION 1: EXECUTIVE SUMMARY

The purpose of this section is to present an overview of the entire Procurement Options Analysis (POA). This part of the POA will contain:

- A brief description of the proposed capital investment and the rationale underpinning the need for it;
- A brief overview of the procurement options considered and analyzed;
- A summary of the results of the Qualitative and Quantitative Analyses of those procurement models;
- An integrated recommendation based on the Qualitative and Quantitative Analyses;
- Discussion on the implementation strategy and governance structure for the procurement process.

The executive summary frames the context of the proposed investment for the reader by demonstrating that the department or agency has completed the necessary preliminary analysis that underlies public-private partnership (P3) procurement planning. The identification and provision of supporting rationale for the optimal procurement option should be clear. Readiness to proceed with investment implementation should be apparent in this section of the POA.

### Completion Checklist

This section should answer the following questions:

- ✓ Are the scope and objectives of the investment clearly described?
- ✓ Are the feasible procurement options presented and discussed?
- ✓ Is the recommended approach clearly presented?
- ✓ Are the Qualitative and Quantitative Analyses for the optimal procurement model summarized?
- ✓ Is the procurement plan described along with key milestones and deliverables?
- ✓ Did the executive summary present a general overview of all of the sections of the POA?

## SECTION 2: INVESTMENT DESCRIPTION AND RATIONALE

The purpose of this section is to justify the capital investment. This step is important as it:

- Identifies the scope of the proposed investment;
- Outlines the rationale for the pursuit of the investment (i.e. needs assessment and investment objectives);
- Demonstrates the department or agency's preparedness, knowledge and understanding of the proposed investment;
- Presents the analysis that has been completed to support the feasibility of the investment, including a discussion of alternative methods of procurement;
- Identifies the analysis undertaken on procurement options;
- Provides the justification and rationale for the choice of the proposed investment.

Generally speaking, departments and agencies working through the preparation of a Procurement Options Analysis (POA) will have already completed much of the analysis to be presented in this section as part of the process of identifying potential solutions to the business needs that will be addressed through the proposed investment. As such, this section proposes an approach for the presentation of that analysis.

### 2.1 Strategic Alignment and Priorities - Rationale for the Investment

#### Purpose

The purpose of this section is to present the strategic alignment and the priorities of the department or agency within the context of the proposed investment as well as the rationale justifying its implementation. This step is important as the department or agency should provide:

- The forces that are driving the need for the investment;
- The strategic policy and business, social and economic issues/drivers;
- The investment's expected impacts and outcomes;
- The scope and boundaries of the investment.

#### *Investment Need*

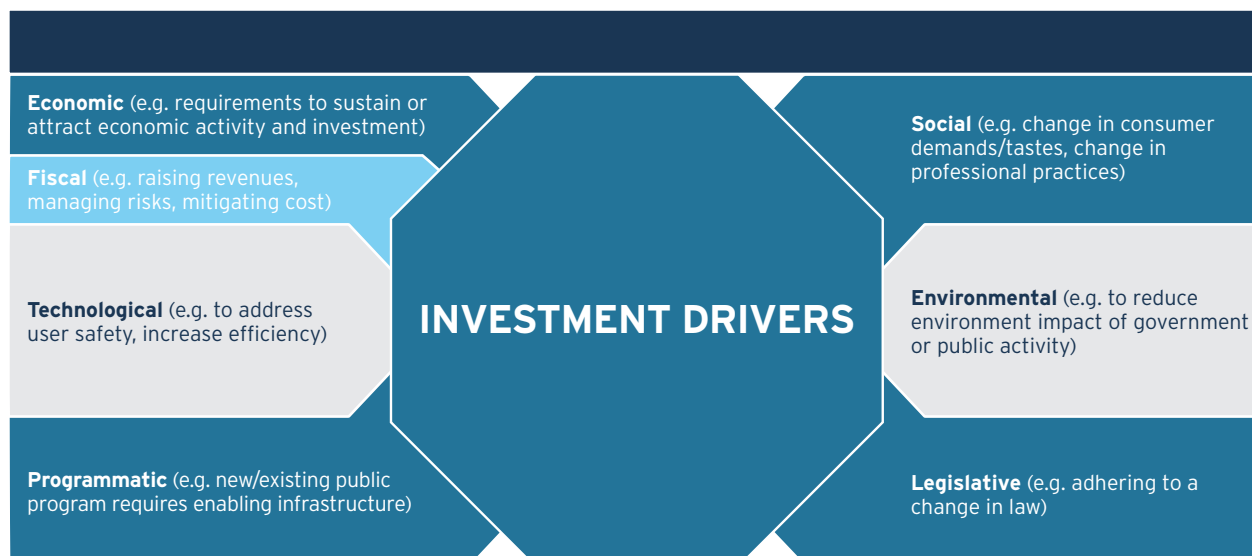
In particular, this section should focus on the following areas related to the need for the proposed investment:

- Qualitative and quantitative needs for the investment;
- Supporting documentation that demonstrates that a methodical needs assessment was conducted;
- Key constraints on the investment's planning and development.

### Capital Investment Drivers

The department or agency should articulate the factors that are driving the need for the investment. Below are examples of capital investment drivers:

**Figure 3: Sample Capital Investment Drivers**



### Expected Outcomes

The department or agency should:

- Discuss objectives related to the department or agency's overall policy, political, environmental, economic, social and technological environments as well as investment-specific objectives;
- Substantiate the economic, social, environmental and other benefits related to the achievement of general and investment-specific objectives. The process for measuring the benefits should be disclosed;
- Present the objectives and outcomes in both qualitative and quantitative terms.

## 2.2 Investment Description

### Purpose

The purpose of this section is to provide a description of the proposed investment and its scope. This step is important as the department or agency should:

- Explain the investment's parameters, specifically the "what", "where" and "when";
- Clearly relate the investment's scope to the needs identified in **Section 1**.



The following figure illustrates the main points covered in an investment description.

**Figure 4: Investment Description**

<b>What</b>	Definition of the asset's mandate; scope; functionality; capabilities; studies and planning completed to date; feasibility; economic impact; costing; design; engineering and other technical elements; and physical characteristics.
<b>Where</b>	The location of the asset; physical context and any sensitivities; environmental approvals; planning or other municipal requirements; land assembly and Aboriginal consultation requirements.
<b>When</b>	Information on planning, design and construction timelines as well as risks to timing (e.g. expiring leases, legislative changes).

### Sources of Information

- Sources of information include, but are not limited to: environmental scans and analyses; legislative and policy documents and announcements; stakeholder consultations; research studies; capital and asset management reports; corporate documents (e.g. charter, by-laws, etc.); operating and capital budgets; and consultant studies (e.g. geotechnical, archaeological, design, engineering, feasibility studies, cost-benefit analyses, environmental impact assessments, planning documents and by-laws, legal site descriptions, environmental assessment processes, cost studies and functional program studies).

### Completion Checklist

This section should answer the following questions:

- ✓ Which public interest is being served by the investment?
- ✓ Is there a clear rationale for the proposed investment?
- ✓ Does the investment address a critical need within the department's mandate?
- ✓ Is the need/issue that is being resolved by this investment clearly presented and substantiated?
- ✓ Is a clear link made between the investment drivers and the needs assessment?
- ✓ Are the general and investment-specific objectives clearly stated and the process used for developing those objectives clearly described?
- ✓ Are the objectives realistic, achievable and related to the achievement of the general and investment-specific benefits?
- ✓ Have the expected benefits of the investment been articulated? Are substantiating sources clearly referenced?
- ✓ Is an appropriate amount of planning and due diligence demonstrated throughout this section of the POA?

## 2.3 Viable Options

### Purpose

The purpose of this section is to summarize the results of all work done to assess alternative solutions to the needs or issues to be addressed by the proposed investment and describe key assumptions, methodologies and findings. This step is important as the department or agency should:

- Summarize the results of all analysis on the fiscal, financial, economic, legal, technical and environmental feasibility of the investment;
- Incorporate, where appropriate, consideration of investment costs and revenues, alternative revenue sources, alternative technical solutions, legal environment in which the investment is being implemented, emissions from the investment and other relevant information;
- Summarize the findings on the costs and benefits of different investment options and articulate the financial feasibility of the proposed investment, including demonstration that serious consideration has been given to the costs of proceeding and the sources of revenue to fund and finance it;
- Discuss the risks inherent to different investment options as well as potential mitigation strategies;
- Disclose and substantiate public and political governmental support confirmed to date.

Feasibility studies should assess the degree to which various features of the investment are either sustainable or achieve the objectives desired by the department or agency. A common approach used in feasibility studies is the use of the triple bottom line (TBL) analysis. The TBL assesses different options on the basis of social, economic and environmental factors, as illustrated in **Figure 5**.

**Figure 5: Triple Bottom Line**

Criteria	Weighting (%)
<b>Environmental</b>	<b>40</b>
Effects of construction	10
Non-renewable fuel use (GHG emissions)	10
Regulatory risks	10
Impacts on air, soil and surface ground water	10
<b>Social</b>	<b>30</b>
Odours	15
Traffic/road condition/public safety	10
Community impacts during operations and construction	5
<b>Economic</b>	<b>30</b>
Total cost to the city	15
Risk assessment	15
<b>Total</b>	<b>100</b>

## Sources of Information

- Sources of information include, but are not limited to: feasibility studies; cost-benefit analyses; environmental assessment reports; reviews of precedent transactions; stakeholder consultations; reviews of government commitments (e.g. Cabinet records, speeches from the Throne); legal opinions; technical reports (e.g. geotechnical, design and engineering); risk assessments; fiscal analysis; and financial modelling.

## Completion Checklist

This section should answer the following questions:

- ✓ Is the proposed investment fiscally, economically, legally, technically and environmentally feasible?
- ✓ Where feasibility is yet to be assessed, is a process for assessing feasibility disclosed?
- ✓ Is it clear that alternatives to the investment were considered?
- ✓ Is the rationale for not pursuing particular alternatives clearly substantiated?

## 2.4 Conclusions

### Purpose

In this part of the POA, the department or agency should conclude **Section 2** by summarizing:

- The rationale for pursuing the proposed investment;
- The political and financial commitments (past, current and future) to the investment;
- The scope of the investment and its viable procurement options.

## Sources of Information

- Sources of information include, but are not limited to: resolutions of government policy; legislation; operating and capital budgets; and public announcements.

## Completion Checklist

This section should answer the following questions:

- ✓ Is the rationale for the proposed investment decision clear?
- ✓ Is there clear evidence of political, governmental and financial commitment to the investment?
- ✓ Does the description encompass the scope and elements of the investment?

## SECTION 3: PROCUREMENT OPTIONS

The purpose of this section is to reduce the range of potential procurement models to a number of viable models.

Later in the Procurement Options Analysis (POA), only viable procurement models will be subjected to a battery of Qualitative, Commercial and Quantitative Analyses that will ultimately allow defining the optimal procurement model. This step is important as it:

- Articulates the department or agency's procurement objectives, opportunities and constraints;
- Clearly describes the traditional procurement model to be considered in the POA;
- Establishes a realistic and market-acceptable range of procurement models for qualitative assessment by the department or agency;
- Presents the criteria upon which the procurement models were shortlisted by the department or agency;
- Describes engagement of public-private partnership (P3) market and stakeholders as well as present findings from this engagement;
- Presents qualitative criteria to substantiate the choice of the optimal procurement model.

### Procurement Options Analysis

**Sections 3 to 7** of the present guide collectively form PPP Canada's recommended approach to the Procurement Options Analysis (POA)—a systematic and methodical approach to comparing different methods of delivering a given asset or investment.

While the present guide provides insight into this analytical process, more detail is available in *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, another PPP Canada publication available at [www.p3canada.ca](http://www.p3canada.ca).

PPP Canada recommends the use of both documents in the preparation of a POA.

## 3.1 Federal P3 Screen

### Purpose

The purpose of this section is to summarize the results of applying the Federal P3 Screen to the proposed capital investment and the nature of consultations with PPP Canada.

### Sources of Information

- Sources of information include: completed Federal P3 Screen; consultations with PPP Canada; and PPP Canada's assessment of the screening results.

### Completion Checklist

This section should answer the following questions:

- ✓ What were the results of the Federal P3 Screen?
- ✓ Was PPP Canada consulted and what was its recommendation?

## 3.2 Traditional Public Sector Delivery Approach

### Purpose

The purpose of this section is to examine the traditional public sector delivery approach. This step is important as the department or agency should:

- Define the Public Sector Comparator (PSC);
- Explain the roles, responsibilities and risk transfer under the PSC.

### Sources of Information

- Sources of information include, but are not limited to: reviews of experience on similar investments; policy documents; procurement directives and guidelines; feasibility studies; risk assessment; technical studies; stakeholder consultations; and project team.

## 3.3 Developing and Shortlisting the Procurement Options

### Purpose

The purpose of this section is to draw up a shortlist of viable procurement options that will be subjected to the Qualitative Analysis outlined in **Section 4**. The shortlist must include, at a minimum, one PSC and one P3 model.

This step is important as once every potential procurement option has been identified, they should be examined against a number of broader factors. The department or agency should:

- Identify, disclose and discuss any departmental constraints that would preclude the use of a commercially acceptable and viable procurement option;
- List precedent transactions that have been pursued as P3s based on interjurisdictional studies. Precedent transactions can be used to identify potential procurement options for investments by uncovering particular challenges or issues to be addressed in choosing the option.

Note that precedent transactions should be recent and relevant to the proposed investment in terms of size, scope and objectives. Reviewing the alternatives and the technologies already in use, information about funding, and opportunities and challenges will help solidify the viability of the investment. PPP Canada recommends presenting three case studies on precedent transactions of similar size and scope to the proposed investment.

## Sources of Information

- Sources of information should include PPP Canada's *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, Section 1.
- Sources of information include, but are not limited to: domestic and international precedent transactions; and the experience of knowledgeable and reputable transaction and financial advisors.
- Sources of information for the review of precedent transactions include, but are not limited to: articles from websites and magazines specializing in infrastructure (such as *Infrastructure Journal*, *Project Finance* and *InfraAmericas*) or in the investment's particular industry.

## Completion Checklist:

This section should answer the following questions:

- ✓ Have the different roles, responsibilities and risk allocation underlying the options been clearly explained?
- ✓ Are the P3 models identified as commercially acceptable substantiated by precedent transactions or the knowledge and experience of a reputable transaction or financial advisor?
- ✓ Are precedent transactions that reflect particular challenges or issues studied?
- ✓ What transaction structures and procurement strategies have other departments or agencies used when developing similar investments? How successful were they?

## SECTION 4: QUALITATIVE ANALYSIS

The purpose of this section is to examine the benefits and risks of the proposed capital investment that are not directly quantifiable. This step is important as the department or agency should:

- Discuss investment-specific objectives related to the proposed investment;
- Present robust qualitative evaluation criteria to assess the range of procurement options;
- Present qualitative assessment factors and criteria relevant to the investment;
- Determine the relative importance of each criterion in meeting the overall strategic objectives of the investment;
- Assess and compare the suitability of each option relative to the criteria;
- Prepare a Sensitivity Analysis, develop mitigation strategies and interpret conclusions.

A comprehensive Qualitative Analysis requires industry experience in order to provide sufficient insight into intangible factors surrounding the procurement method selection. There could potentially be a significant number of initial criteria. Low impact, low importance and low probability of occurrence criteria should be removed in order to maintain a manageable list. A clear summary of why certain options were removed should be provided. Conversely, some criteria may be deemed mandatory. These criteria must be particularly well substantiated because of their importance in the selection of the optimal procurement option.

### Sources of Information

- Sources of information should include PPP Canada's *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, Section 2.

### Completion Checklist:

This section should answer the following questions:

- ✓ Has the department or agency provided a rationale for the exploration of a public-private partnership (P3)?
- ✓ Does the analysis support that conclusion?

## 4.1 Qualitative Criteria and Scoring Methodology

### Purpose

The purpose of this section is to present robust criteria for assessing the procurement options under consideration. PPP Canada recommends identifying 7 to 10 criteria that will have the greatest potential for a positive or negative impact on the investment. This step is important as the department or agency should:

- Base criteria on investment-specific objectives, policy direction, risk profile, stakeholder considerations, Market Sounding feedback (explained further in **Section 5**) and insights from precedent transactions;
- Present a clear and defensible assessment methodology for evaluating the procurement options against the developed evaluation criteria;
- Present elements for consideration in developing the assessment methodology, including the weighting of criteria; the scoring mechanism and process; the evaluation approach (e.g. use of an evaluation panel versus judgment of experts); standalone versus relative scoring, etc.

## Sources of Information

- Sources of information include, but are not limited to: reports from workshops; Market Sounding; cost-benefit analyses; economic impact studies; interjurisdictional studies; environmental assessment reports; stakeholder consultations; and members of the project team and external advisors.

## Completion Checklist

This section should answer the following questions:

- ✓ Are the criteria clearly linked to relevant investment considerations and factors? In particular, do the criteria consider the feedback received from the Market Sounding?
- ✓ Is the assessment methodology articulated?
- ✓ Is the rationale for the components of the methodology duly justified?

## 4.2 Recommended P3 Models

### Purpose

The purpose of this section is to present the results of applying the evaluation criteria and assessment methodology against the procurement options under consideration and to recommend P3 models that respond to the qualitative requirements. This step is important as the department or agency should:

- Describe the results obtained after applying the evaluation criteria and assessment methodology to the different procurement options under consideration;
- Clearly present the rationale for each scoring/ranking of procurement;
- Explain clearly the Qualitative Analysis conclusions;
- Present recommended P3 models, duly justified.

## Sources of Information

- Sources of information include, but are not limited to: policy direction; planning documents; feasibility studies; workshop notes; precedent transactions; stakeholder input (including input from project and department or agency management); technical reports; legal opinions; and consultant reports.

## Completion Checklist

This section should answer the following questions:

- ✓ Is the rationale for each scoring/ranking clearly presented?
- ✓ Is it apparent that each procurement option, including traditional procurement, was given fair consideration?



## 4.3 Sensitivity Analysis and Mitigation Strategies

### Purpose

The purpose of this section is to prepare a Sensitivity Analysis and develop mitigation strategies. This step is important as the department or agency should:

- Develop a Sensitivity Analysis to test the overall impact of different input assumptions on estimates;
- Test for robustness when outcomes are uncertain;
- Detect errors in procurement model objectives at an early stage;
- Simplify the procurement options by eliminating redundant or unnecessary data;
- Develop and document potential mitigation strategies, with a focus on the causes of particularly high or low scores, including budgetary impact of any costs associated with mitigation strategies.

### Sources of Information

- Sources of information include, but are not limited to: workshop notes; precedent transactions; technical reports; and consultant reports.

### Completion Checklist

This section should answer the following questions:

- ✓ Is the Qualitative Analysis well documented, with support for the underlying assumptions?
- ✓ Does the Qualitative Analysis mitigate errors in the procurement model and eliminate redundant data?

## SECTION 5: MARKET SOUNDING

The purpose of this section is to allow the department or agency to explore private sector standing, prices, capabilities as well as ascertain its interest in different procurement models. This step is important as the department or agency should:

- Demonstrate an understanding of the marketability of the capital investment;
- Highlight potential market constraints;
- Identify specific concerns with respect to risk allocation;
- Begin to prepare the market for the investment and improve competitive tension;
- Estimate or confirm assumptions to be used in the Quantitative Analysis.

### 5.1 Market Sounding Methodology

#### Purpose

In this step, the department or agency should conduct a Market Sounding to ascertain the market's interest in different procurement models and to determine which specific models will attract increased participation. This step is important as the department or agency should:

- Outline its overall strategy for engaging with Market Sounding participants;
- Describe the process used to identify Market Sounding participants to ensure that selected participants are appropriate. A list of Market Sounding participants should be included;
- Describe the process used to conduct the Market Sounding, including details about the investment-related information provided to participants in advance of the meeting, the role of the department or agency during meetings and questions asked;
- Provide information on the department or agency's plan for follow-up consultations and refreshes.

#### Sources of Information

- Sources of information should include PPP Canada's *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, Section 3.
- Sources of information include, but are not limited to: reputable Market Sounding participants (including bidders on precedent transactions); industry publications (e.g. *Infrastructure Journal*, *InfraAmericas*, etc.); financial and technical advisors; industry associations (e.g. Canadian Council for Public-Private Partnerships); government public-private partnership (P3) procurement agencies (e.g. Infrastructure Ontario, Partnerships BC, Infrastructure Québec, Alberta Strategic Partnerships Office and PPP Canada); department or agency's transaction advisor; and internal staff. In addition, departments and agencies should seek guidance on planning and conducting the Market Sounding.

#### Completion Checklist

This section should answer the following questions:

- ✓ Have the Market Sounding process and participants been clearly presented?
- ✓ Is the rationale for the selection of the participants disclosed?
- ✓ Does the list of participants cover the range of market participants (i.e. builders, financiers and operators)?
- ✓ Are there between 18 and 25 participants comprised of relevant stakeholders (i.e. builders, financiers and operators)?

- ✓ Are the selected participants likely to submit bids?
- ✓ Is it clear that the Market Sounding was conducted without prejudice and in a manner that allowed participants to speak freely about their concerns?
- ✓ Do the questions in the Market Sounding involve areas such as market interest, potential for innovation and ability to transfer risk where appropriate?

## 5.2 Market Sounding Findings

### Purpose

The purpose of this section is to summarily report Market Sounding findings. This step is important as the department or agency should:

- Describe Market Sounding findings and conclusions;
- Articulate how the findings of the Market Sounding impact the viability of the procurement model.

### Sources of Information

- Sources of information for this section will include information recorded during Market Sounding meetings.

### Completion Checklist

This section should answer the following questions:

- ✓ Is the Market Sounding process clearly described?
- ✓ Is the proposal of significant interest to the market (domestic and international)?
- ✓ Did market participants highlight any particular constraints or opportunities related to the transaction?
- ✓ Are all key issues expressed by the private sector during the Market Sounding reflected in the Procurement Options Analysis (POA)?

## SECTION 6: QUANTITATIVE ANALYSIS

The purpose of this section, which includes the Value for Money (VfM) Analysis, is to consider the quantifiable factors pertaining to each shortlisted viable procurement model and to evaluate the total net present value (NPV) of each proposed model, in order to ultimately compare their respective costs and determine which one provides more VfM. The Quantitative Analysis will:

- Identify the option that provides the greatest value in quantitative terms over the design, construction, and operation and maintenance (O&M) phases of the capital investment;
- Provide a clear description of the risk allocation model and the quantitative benefits brought to the department or agency from the model;
- Demonstrate that the department or agency understands the investment risks and has thoroughly considered the risk transfer benefits and financial costs.

This step is important because it:

- Presents robust financial models for the investment based on the best available cost estimates and information from capital markets;
- Compares the risk-adjusted whole-of-life costs between the Public Sector Comparator (PSC) and the public-private partnership (P3) model;
- Provides an accessible, usable financial model available to support its analysis. Financial models should be designed to be highly flexible and allow for testing the overall impact of different inputs and assumptions;
- Presents a focused Quantitative Analysis of the investment;
- Presents the NPV of both the PSC and the P3 model, adjusted to reflect how risks are allocated between the department or agency and the private sector for each shortlisted procurement model. The difference in the risk-adjusted NPV between the two models is the VfM.

### Value for Money Methodology

There are several Value for Money (VfM) methodologies in use in Canada, each reflecting the realities of the jurisdictions in which they were developed.

For the federal government, PPP Canada has developed a VfM methodology that responds to federal realities and challenges such as the selection of the appropriate discount rate and how to appropriately quantify efficiency measures.

This methodology is documented in Section 4 of the *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*.

In addition, PPP Canada has developed the *Schematic Design Estimate Guide* to assist in the development of your capital investment costs. Both documents are available for download at [www.p3canada.ca](http://www.p3canada.ca).

## 6.1 Value for Money Methodology

### Purpose

The purpose of this section is to define the VfM methodology to be used in the Quantitative Analysis. This step is important as the department or agency should:

- Describe the VfM methodology to be applied to the investment;
- Explain in detail how risks are to be estimated and incorporated into the model, the rationale and basis for the choice of discount rates, the approach to innovation and efficiencies, and the approach to competitive neutrality;
- Present a VfM methodology that yields the highest degree of transparency and can withstand public scrutiny;
- Demonstrate that no bias has been introduced in the evaluation of procurement options, that baseline information is reliable and adjustments are transparent, and that a Sensitivity Analysis is performed to examine the impact of key assumptions and estimates.

### Selecting a Value for Money Methodology

Ideally, a VfM methodology should be transparent and able to withstand high degrees of public scrutiny. Furthermore, the chosen methodology should respond to the particularities of the public sector's decision-making systems and frameworks. These drivers have caused a number of provinces to develop VfM methodologies for use in the analysis of infrastructure investments at the provincial level. Each of these approaches involves different methodological choices and trade-offs, responding to the particular needs of the jurisdiction that developed them.

To avoid the repetitive cost involved of developing a bespoke VfM methodology on a department-by-department or even project-by-project basis, PPP Canada has developed a VfM approach for use by federal departments and agencies. This approach, which is detailed in *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, Section 4, is based on interjurisdictional experience and PPP Canada's own experience working with P3 procurements from virtually all Canadian jurisdictions active in the P3 market. The methodology has been designed to provide a very high level of transparency and rigour, and respond to the conventions and expectations of federal decision-making systems. Over time, the use of a consistent analytical approach will also provide for comparability across investments, allowing central agencies to maximize the quality of advice they provide to ministers.

### Sources of Information

- Sources of information should include PPP Canada's *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*.

### Completion Checklist

This section should answer the following questions:

- ✓ Is the selected VfM methodology consistent with Canadian P3 Best Practices?
- ✓ Have any deviations from the selected VfM methodology been clearly disclosed and duly justified?

## 6.2 Investment Costs

### Purpose

The purpose of this section is to present two separate base cost estimates, on a whole-of-life basis, of the PSC and the preferred P3 model. This step is important as the department or agency should:

- Provide a clear understanding of how cost estimates are developed, how they compare across models and, ultimately, how VfM is estimated;
- Present base costs for both the PSC and the P3 model on a whole-of-life basis, which include the expected direct costs (hard construction costs), indirect costs (soft construction costs), facilities management costs, and O&M and life-cycle costs;
- Provide a detailed investment cost report, which: discusses the design options that were explored; describes the basis of design; and includes a schematic design cost estimate in elemental cost format, a description of unit prices and other key model assumptions, an S-curve or timeline for investment expenditures, an analysis on the labour and resource requirements, commentary on economic and market conditions, and commentary on exposure to inflation and risk;
- Outline and justify any efficiency gains and risk premiums applied to the PSC and the P3 model. Efficiencies refer to both construction and O&M cost savings obtained through the leveraging of private sector experience and expertise that would not otherwise be achievable under a traditional Design-Bid-Build (DBB) approach to infrastructure procurement and, if included, must be substantiated by historical data. Risk premiums refer to the additional costs that the private sector proponents will build into their bid to account for risks that are transferred to them. Any assumptions related to efficiencies and risk premiums should be clearly disclosed and duly justified by the department or agency;
- Outline the ancillary costs to be incurred by the public sector under both the P3 and traditional scenarios. Ancillary costs include costs borne by the public sector related to upfront procurement costs (including fees to any procurement agency); procurement costs for the O&M (in the case of the PSC); legal, technical and financial advisory fees; project management costs during construction; and contract management costs over the life of the asset;
- Identify and explain the timing of these costs.

It is recommended that the cost estimates be prepared to provide a level of accuracy of +/- 15%, which is usually based on a schematic design of 30% completion. More detailed information can be found in PPP Canada's *Schematic Design Estimate Guide*.

### Sources of Information

- Investment costs should be provided by a qualified quantity surveyor (cost consultant). O&M cost estimates should come from an experienced facilities management consultant. These costs should be based on a functional program and 30% design completion for the investment.
- Ancillary and private sector financing costs are best obtained from transaction and financial advisors experienced in advising on P3s.

### Completion Checklist

This section should answer the following questions:

- ✓ What base was used to derive costs? (e.g. schematic designs, performance-based output specifications, other)
- ✓ Are cost information sources disclosed? Is the level of precision of the cost estimates and the associated impact on the financial models discussed?

- ✓ Are all base and ancillary cost categories accounted for?
- ✓ Is the timing of cash outflows typical for (where relevant) the PSC and the P3 model?
- ✓ Are deviations from expected differences between the PSC and the P3 model base and ancillary costs clearly explained?

## 6.3 Cash Flow Assumptions

### Purpose

The purpose of this section is to articulate cash flow assumptions corresponding to the different procurement models. This step is important as the department or agency should:

- Use costing information described in Section 6.2 as the basis for the PSC and the P3 cash flow models;
- Articulate all key modelling assumptions that have been incorporated into the models. Such assumptions include, but are not limited to: inflation, construction escalation, discount rates, and timing of cash inflows and outflows;
- Provide a rationale for the choice of assumptions.

### Sources of Information

- Sources of information include, but are not limited to: engineering and technical studies conducted for the asset; Market Sounding; economic reports; financial advisors; and input from stakeholders and project managers.

### Completion Checklist

This section should answer the following questions:

- ✓ Is the list of modelling assumptions comprehensive?
- ✓ Are the assumptions duly justified and from credible sources?

## 6.4 Financing Assumptions

### Purpose

The purpose of this section is to articulate financing assumptions corresponding to the different potential procurement models. This step is important as the department or agency should outline:

- The assumptions made with respect to the financing of the asset under both the PSC and the P3 model;
- Any assumptions with respect to the level and timing of public sector capital injections during the construction of the asset (Milestone Payment) and at substantial completion (Substantial Completion Payment);
- The assumed financing plan under the P3 model, including the types, amounts and timing of different senior-debt, equity or mezzanine instruments, along with associated fees and pricing.

### Sources of Information

- Sources of information include, but are not limited to: Market Sounding reports; data from financial models from proposals submitted for recent comparable assets (within the last 6 months); input from the department or agency's finance department; credit rating agency reports; industry publications; and department or agency's transaction and financial advisors.

## Completion Checklist

This section should answer the following questions:

- ✓ Are all key financing assumptions outlined?
- ✓ Are the financing assumptions for the P3 model relevant to the chosen financing structure?
- ✓ Are the inputs based on sound research? Are they reflective of current market conditions?

## 6.5 Risk Assessment and Quantification

### Purpose

The purpose of this section is to conduct a risk assessment and to quantify the risks. This step is important as the department or agency should:

- Identify investment risks, after they have been duly analyzed quantitatively, and allocate these risks between the department or agency and the private sector partner for the procurement models under consideration;
- Describe the process and methodology used to identify, assess and allocate investment risks;
- Describe, in detail, the risk profile of the asset and the allocation of key risks between the public and the private sectors, the rationale underlying the allocation, and summary tables showing the value of the risks retained and transferred under both the PSC and the P3 model;
- Identify the 5 to 10 most important risks as well as the characteristics of the asset that give rise to each risk. Where possible, describe the actions that can be taken to reduce or mitigate these risks;
- Describe the type of statistical analysis used to determine the distribution of impacts for each risk. The department or agency should disclose any adjustments made for optimism biases, competitive neutrality and other factors that may be relevant to the accuracy of the VfM;
- Identify participants in every qualitative risk workshops as well as describe the workshop methodology and highlight the main points of discussion.

**Figure 6: Sample Risk Categories**

SAMPLE RISK CATEGORIES	
Policy and strategic risk	Permitting and approval risk
Design and tender risk	Completion and commissioning risk
Procurement risk	Life-cycle and residual risk
Site condition and environmental risk	Operation and maintenance risk
Construction risk	Contractual risk
Equipment risk	Financial risk

### Sources of Information

- Sources of information include, but are not limited to: input from the department or agency's project team (including technical, engineering, financial and transaction advisors); PPP Canada's template sector-specific risk registers or template generic risk register; investment risk data held by procurement agencies or external advisors; asset technical requirements; and discussion notes from risk workshops that may have been conducted.



## Completion Checklist

This section should answer the following questions:

- ✓ Did the process used to identify, quantitatively assess and allocate investment risks reflect best practices and include the expertise necessary to conduct such an exercise effectively?
- ✓ Is the rationale underlying the risk allocation clear? Is it linked to discussions that occurred during the Market Sounding, jurisdictional analyses or the department or agency's investment and procurement objectives?
- ✓ Has appropriate professional expertise (technical, legal, financial) been consulted? (PPP Canada's expectation is that such experts will have been consulted and will remain involved through the process.)
- ✓ Are the financial inputs appropriate for the procurement model, commercially reasonable and substantiated by historical data where appropriate?
- ✓ Is the risk allocation appropriate for the procurement model and commercially reasonable? Does the risk premium accurately reflect unknown investment costs for risks that are transferred to the private sector in the risk assessment?
- ✓ Has the risk quantification been benchmarked against the risk profiles of similar assets?

## 6.6 Value for Money Analysis

### Purpose

The purpose of this section is to assess the VfM of each potential procurement model, taking into account their corresponding financial models and their qualified risks. This step is important as the department or agency should present:

- The Quantitative Analysis over the cash flow models to generate the risk-adjusted NPV of the PSC and the P3 model;
- The methodology used to calculate the discount rate for the NPV;
- A Sensitivity Analysis of the VfM results to assess how changes in certain variables affect the VfM achieved by the investment. A high- and low-end VfM Analysis should be presented;
- The benchmark of the VfM for its investment with respect to the VfM generated by similar assets using similar transaction structures;
- The points during procurement execution when the VfM Analysis will be updated.

### Sources of information

- Sources should include PPP Canada's *Schematic Design Estimate Guide*. PPP Canada can also provide additional guidance with respect to risk and efficiencies.

## Completion Checklist

This section should answer the following questions:

- ✓ Is the methodology and rationale for the selection of the discount rate clearly presented? Is the relationship between the discount rate and the department or agency's cost of capital discussed?
- ✓ Is the VfM model structurally and mathematically sound?
- ✓ Is the VfM Analysis conducted without bias? Is it consistent with the assumptions and inputs outlined above?
- ✓ Are the sensitivity variables identified and the rationale for selection articulated?
- ✓ Has a sufficiently robust Sensitivity Analysis been conducted? What do the results of the Sensitivity Analysis mean for the investment's ability to achieve meaningful VfM if pursued as a P3?
- ✓ Is the VfM presented consistent with comparable assets that have been procured using similar transaction structures? Are variations clearly explained?

## SECTION 7: INTEGRATED RECOMMENDATION

The purpose of this section is to formulate a recommendation concerning the optimal procurement model for the proposed capital investment. This step is important as the department or agency should:

- Summarize the Qualitative Analysis conducted in **Section 4** with the Quantitative Analysis conducted in **Section 6** in order to identify the optimal procurement model;
- Summarize the critical rationale underlying the department or agency's selected procurement model;
- Present the relative weight given by the department or agency to various evaluation criteria.

### 7.1 Recommended Procurement Option

#### Purpose

The purpose of this section is to present an exhaustive recommendation that combines the results of the Qualitative Analysis conducted in **Section 4** and the results of the Quantitative Analysis conducted in **Section 6**, in order to identify the optimal procurement model. This step is important as the department or agency should:

- Review the results of both Qualitative and Quantitative Analyses. Departments and agencies should pay particular attention to whether the results of the Value for Money (VfM) have had any impact on the assessment of the procurement options. There may be discrepancies between the Qualitative and Quantitative Analyses. In these cases, the department or agency should reassess the procurement options against the qualitative criteria;
- If the procurement models are reassessed from a qualitative perspective, disclose the process for doing so and the revised scoring along with the rationale for each adjustment;
- Clearly identify qualitative factors, such as early delivery and resulting beneficial outcomes, influence of private sector operating practices and improvements in public sector procurement;
- Based on the revised Qualitative Analysis and the VfM Analysis, provide a recommended procurement option (i.e. traditional procurement or a specific public-private partnership [P3] model). The department or agency should: 1) make clear the relative importance that the Qualitative and Quantitative Analyses had in arriving at the recommended procurement option and 2) state the expected benefits of the recommended option.

## Sources of Information

- Sources of information should include PPP Canada's *Procurement Options Analysis Methodology: The Guide for Federal Departments and Agencies*, Section 5.
- Sources of information include, but are not limited to: policy direction; Market Sounding reports; planning documents; feasibility studies; workshop notes; precedent transactions; stakeholder consultations; technical reports; legal opinions; and consultant reports.

## Completion Checklist

This section should answer the following questions:

- ✓ Is there a clear qualitative and quantitative result pointing to an optimal procurement model? Where a result is not clear, is the rationale for the recommended procurement option duly justified?
- ✓ Are the process and information used to achieve this result defensible and repeatable?

It is important to note that the following sections presume that the department or agency has selected a P3 as the preferred approach and the optimal structure for infrastructure asset procurement.

## SECTION 8: FUNDING AND AFFORDABILITY

The purpose of this section is to demonstrate the department or agency's financial preparedness to undertake the proposed capital investment. This step is important as the department or agency should list the sources and uses of funds for the investment.

### 8.1 Sources of Funds

#### Purpose

The purpose of this section is to disclose all the sources of funds for the proposed investment. This step is important as the department or agency should identify:

- The sources of funds committed or available to the investment, including a description of the specific nature, structure and timing of the funds to be provided. The department or agency should reference Treasury Board decisions, investment plans, budgets and other approvals that confirm funding authorities;
- Any conditions associated with these approval/funding commitments.

#### Sources of Information

- Sources of information include, but are not limited to: Cabinet decisions; budgets; Treasury Board decisions; main and supplementary estimates; and government announcements.

#### Completion Checklist

This section should answer the following questions:

- ✓ Are the identified funding sources or commitments confirmed?
- ✓ Where sources of funds are expected to be made available in the future (for example, through revenues), are the projections and assumptions underlying their availability clearly stated and reasonable?

### 8.2 Uses of Funds

#### Purpose

The purpose of this section is to disclose all manners in which the funds will be used. This step is important as the department or agency should demonstrate:

- How each of the sources of funds listed above is used, including a description of the timelines over which these funds are utilized. The funding should be provided in nominal terms;
- That the uses of these funds do not violate any restrictions associated with their provision or use;
- How the timing of the uses of funds impacts the Value for Money (VfM) generated by the investment, including operation and maintenance (O&M) over the concession period and life-cycle costs;
- Where in the financial model these funding sources/commitments appear.

#### Sources of Information

- Sources of information include, but are not limited to: reports from the department or agency's finance staff; financial models; and Sensitivity Analysis created by financial advisors.

## Completion Checklist

This section should answer the following questions:

- ✓ Are the uses of funds clearly identified? Is it clear that the use as described does not violate any restrictions associated with their provision or use?
- ✓ Are funds utilized in a manner that maximizes VfM?

## 8.3 Affordability of the P3

### Purpose

The purpose of this section is to demonstrate the department or agency's ability to execute its short- and long-term plans. This step is important as the department or agency should outline:

- The investment's sources and uses of funds, and identify any gap in funding;
- The measures being put into place to address the funding gap;
- The sensitivity testing on the affordability analysis. The Sensitivity Analysis could be conducted on department or agency or investment revenues, interest rates, inflation, among other variables. The department or agency may consult with PPP Canada to determine the parameters of any Sensitivity Analysis on affordability.

### Sources of Information

- Information for this section will be sourced from previous sections of the Procurement Options Analysis (POA).

## Completion Checklist

This section should answer the following questions:

- ✓ Is the department or agency's plan to meet the ongoing commitments associated with the public-private partnership (P3) sustainable?
- ✓ Where commitments and measures are to be enacted in the future, has the department or agency demonstrated its ability to execute its plans?

## SECTION 9: PROCUREMENT STRATEGY

The purpose of this section is to present the procurement strategy for the proposed capital investment. It demonstrates the degree to which the department or agency has planned ahead and has laid an appropriate legal and policy framework for the procurement. This step is important as the department or agency should:

- Define the human and financial resources to be dedicated to the execution of the procurement;
- Develop a governance framework to oversee the procurement;
- Provide the project team with guidance and overall direction on next steps;
- Demonstrate the degree to which the department or agency has planned ahead;
- Provide clarity on the investment's future direction and anticipated key milestones;
- Demonstrate that the asset is going to be procured according to public-private partnership (P3) Best Practices.

Realizing the value potential of a public-private partnership (P3) procurement requires a high level of competitive tension among bidders.

The best way to ensure that tension is to provide for a predictable, timely and market-acceptable procurement process.

To assist departments and agencies in designing P3 procurement processes that recognize the specific requirements of P3 procurement, PPP Canada has developed *P3 Procurement: The Guide for Federal Departments and Agencies* available for download at [www.p3canada.ca](http://www.p3canada.ca).

### 9.1 Recommended Procurement Process

#### Purpose

The purpose of this section is to describe the recommended procurement process and to present a procurement strategy. This step is important as the department or agency should:

- Outline and assess the procurement options considered for the investment and present a recommended procurement strategy (e.g. Request for Qualification [RFQ] and Request for Proposals [RFP]);
- Confirm procurement objectives and note any procurement constraints or limitations, along with how objectives and constraints are to be addressed through the procurement process;
- Describe the plan to pre-market the investment to maximize competitive tension in the marketplace;
- Illustrate the evaluation procedures (e.g. affordability thresholds, scope ladders, innovations) to be used to select the preferred private partner and how these factors may impact Value for Money (VfM);
- Note the timing of any VfM refreshes to take place through the procurement process;
- Present a timeline for the procurement of the asset with major milestones and accountabilities identified.

## Sources of Information

- Sources of information should include PPP Canada's *P3 Procurement: The Guide for Federal Departments and Agencies*.
- Sources of information include, but are not limited to: Canadian law; Cabinet policies and directives; international trade obligations; input from the Market Sounding and reviews of precedent investments; input from the department or agency's financial and transaction advisors; and assessment of local and regional deal pipelines.

## Completion Checklist

This section should answer the following questions:

- ✓ Is a clearly defined procurement process presented?
- ✓ Will the procurement be transparent, open and competitive?
- ✓ Is the procurement process consistent with Canadian P3 Best Practices?
- ✓ Where amendments to the department or agency's procurement policies are required, is the process to achieve the amendment set out?
- ✓ Is a reasonable timeframe presented for the execution of the preferred procurement process?

## 9.2 Procurement Governance Structure

### Purpose

The purpose of this section is to develop a procurement governance structure. This step is important as the department or agency should:

- Demonstrate its legislative and policy authorities to undertake a procurement as well as any authorities to be delegated to the project team to enable the successful implementation of a P3 procurement;
- Organize a governance structure for the procurement, including the hierarchy for decision making and the authorities vested at each level of the hierarchy;
- Comply with the five elements that help to develop a robust P3 procurement governance structure;
- Specify any key points where the project team will need to consult with oversight committees and receive formal authorities to proceed to further stages of procurement;
- Indicate the process and timelines where legislative or policy authorities are required to enable procurement.

## Sources of Information

- Sources of information should include PPP Canada's *P3 Procurement: The Guide for Federal Departments and Agencies*.
- Sources of information include, but are not limited to: legislative and policy requirements; statements or official documents from the department or agency's leadership delegating sufficient authority to members of the project team; discussions with procurement and legal departments; and discussions with project leaders, senior management and political leadership.

## Completion Checklist

This section should answer the following questions:

- ✓ Are there any impediments to the implementation of an effective P3 process? What measures are being taken to address these impediments?
- ✓ What is the mandate and structure of procurement governance?
- ✓ Is it clear who is making the decisions for the investment?

- ✓ Who is to be involved with overseeing the procurement? How are the various committees organized?
- ✓ Do the right bodies, individuals and departments or agencies have sufficient authority to execute the requirements of a P3 transaction?
- ✓ What are the key features of the governance structure that will help to ensure that it is an effective body to move the procurement forward?
- ✓ Are sufficient processes in place to ensure accountability and smooth implementation?

## 9.3 Project Team

### Purpose

The purpose of this section is to describe the project team and define the roles and responsibilities of individual members. This step is important as the department or agency should present:

- The resourcing requirements and commitments necessary to properly execute the P3 procurement and any approvals acknowledging these requirements and commitments;
- The roles and responsibilities of individual members of the project team and outline the rationale for their inclusion. In particular, the department or agency should define the roles and responsibilities of the project manager, internal and external advisors, communications director and department or agency staff members. Where external advisors are to be hired, the department or agency should provide a description of the procurement approach to be used to retain this expertise;
- Each member's qualifications and the authority delegated to them in order to undertake their role. For internal team members, full names, biographical information and anticipated time commitment to the project should be provided;
- The department or agency's approach to ensuring appropriate contingency and transition planning. In particular, a description of the involvement of the project team of the eventual contract manager/operations manager should be provided;
- Resourcing constraints and mitigation measures.

### Sources of Information

- Sources of information should include PPP Canada's *P3 Procurement: The Guide for Federal Departments and Agencies*.

### Completion Checklist

This section should answer the following questions:

- ✓ Is a well-structured and resourced project team presented? Are there dedicated resources assigned to the P3? Are these dedicated resources sufficiently qualified to undertake their role through the planning, procurement, design, construction and operation phases of the asset?
- ✓ Are the members of the project team and their roles and responsibilities clearly defined?
- ✓ Has the department or agency articulated its understanding of the resourcing commitments associated with P3 procurement? Is there funding or other approvals in place to support the project team?
- ✓ Are resourcing constraints addressed in a manner that demonstrates foresight and adequate planning on behalf of the department or agency?
- ✓ Are external advisors going to be hired? If so, how will they be used? How will their services be procured?



## 9.4 Capital Investment Resources and Budgeting

### Purpose

The purpose of this section is to develop the capital investment budget and the resourcing plan. This step is important as the department or agency should:

- Identify the person responsible for developing the budget and ensuring that it is duly met and tracked;
- Describe what resourcing plan and budget have been approved for moving the investment through the planning, procurement and post-procurement phases;
- Ensure that the resourcing plan demonstrates the time commitment required of governance and project team members, the training required to assist team members in effectively executing their responsibilities, and the budget associated to fund time and training commitments.

### Completion Checklist

This section should answer the following questions:

- ✓ Are a resourcing plan and budget available to support the P3? Have they been approved by the appropriate authority?
- ✓ Do the resourcing plan and budget fully consider the internal staff and external professional expertise that will be required to execute the P3? Have the resourcing and budgetary requirements of procurement and communications been fully considered and accounted for?
- ✓ Are the resourcing schedules and budgets presented consistent with those used for the VfM Analysis?

## 9.5 Procurement Documents

### Purpose

The purpose of this section is to research and gather documentary precedents and models as well as developing a timeline providing for the development and approval of procurement documents. This step is important as the department or agency should identify:

- The models or templates that will be used as the basis of the RFQ, RFP and Project Agreement, and disclose the process and expertise to be used to develop the documentation;
- Critical issues and features, and describe how these will be reflected in the documentation to ensure that investment objectives are met;
- Any approaches or key terms that will be included that depart from standard P3 practice along with an explanation of the rationale for these departures;
- A timeline for the development and approval of critical procurement documents.

### Sources of Information

- Sources of information include, but are not limited to: template documents available from procurement agencies or consultants and financial models developed by the department or agency or its financial advisors.

### Completion Checklist

This section should answer the following questions:

- ✓ Are all key required documents described? Is the rationale underlying their use articulated?
- ✓ Are the key features of the investment, as described in previous sections, reflected in the documents provided?
- ✓ Are a clear process, expertise and timelines provided for the development of key procurement documents?

## SECTION 10: IMPLEMENTATION STRATEGY

The purpose of this section is to assess the department or agency's readiness to undertake the proposed capital investment by demonstrating the degree to which the asset is "market ready" by highlighting the department or agency's resourcing strategy for the investment. This step is important as the department or agency should:

- Ascertain the current status of the investment and the steps required to move it forward;
- Outline the key milestones required to move the investment forward that are not procurement related;
- Combine the non-procurement- and procurement-related tasks into a single work plan;
- Identify the critical path items on the work plan;
- Develop a plan for the engagement of stakeholders throughout procurement execution;
- Develop a transition plan through the post-transaction period.

### 10.1 Procurement Status

#### Purpose

This step is important as the department or agency should describe:

- The current status of planning and preparations, and upcoming work with respect to environmental assessments, property conveyance, utilities, site approvals, design development and other non-procurement-related processes;
- Efforts to consult with relevant stakeholders and a list of stakeholder meetings and events. Departments and agencies should ensure that appropriate due diligence is done when determining the stakeholders to be consulted;
- Key themes and messages relevant to the successful execution of the procurement.

#### Sources of Information

- Sources of information include, but are not limited to: relevant government approvals; stakeholder consultation reports; departmental or agency staff; and interdepartmental staff.

#### Completion Checklist

This section should answer the following questions:

- ✓ Has the department or agency conducted due diligence on the approval requirements associated with the investment? Is the list of non-procurement-related processes to be completed exhaustive?
- ✓ Has the department or agency consulted with relevant stakeholders that may be impacted by the investment? Has the consultation been conducted in a manner that ensured the incorporation of their views into the investment planning process? Is a stakeholder management plan in place or being developed?

## 10.2 Approvals

### Purpose

This step is important as the department or agency should:

- List all approvals that will be required after the Procurement Options Analysis (POA) phase to move the investment from procurement to financial close;
- Disclose which approvals have been received to date, and set out a timeline and the processes to be followed to achieve all outstanding approvals.

### Sources of Information

- Sources of information include, but are not limited to: procurement policies and directives; internal delegations of authority; and governance by-laws, policies and procedures.

### Completion Checklist

This section should answer the following questions:

- ✓ Are all required approvals presented and approvals to date disclosed? Is a timeline for securing outstanding approvals provided?
- ✓ Are risks to the approvals timelines presented and mitigation measures disclosed?

## 10.3 Procurement Schedule and Implementation Strategy

### Purpose

This step is important as the department or agency should:

- Present an integrated procurement schedule (e.g. GANTT chart) that outlines the critical path for successfully procuring the asset;
- Include in the schedule an assignment of responsibilities for key milestones, approvals, deliverables and associated transition and lessons-learned meetings. Risks to the procurement schedule should also be presented and mitigation measures for these risks described.

### Sources of Information

- Sources of information include, but are not limited to: department or agency's senior decision makers; project team; transaction, financial and other advisors; and the POA.

### Completion Checklist

This section should answer the following questions:

- ✓ Does the schedule set out a critical path that addresses the key milestones, approvals and deliverables articulated in the POA? Does it also capture other requirements typical of a public-private partnership (P3)?
- ✓ Is the timeline provided in the schedule reasonable in the context of the resourcing and budget set for the procurement?
- ✓ Are the risks to the schedule identified and are prudent mitigation measures identified?

## 10.4 Stakeholder Engagement and Communications

### Purpose

This step is important as the department or agency should:

- Present a communications plan outlining its overall approach to engaging and communicating with key stakeholders through the remainder of the planning, procurement, construction and operation phases;
- Present a communications protocol identifying the methods and key messaging to be used to guide all communications with regard to the investment. A team, or point person, responsible for stakeholder engagement and communications should also be identified;
- Highlight the stakeholders to be engaged and communicated with as well as the frequency and the form of engagement and communications.

### Sources of Information

- Sources of information include, but are not limited to: corporate or project communications strategies and public engagement regulations or policies.

### Completion Checklist

This section should answer the following questions:

- ✓ Who are the key stakeholders? Are they internal or external?
- ✓ What is each stakeholder's role, interest or position on the investment?
- ✓ How does each role, interest or position on the investment drive engagement and communications requirements?
- ✓ Who will lead engagement and communications?
- ✓ How and when will engagement and communications happen?

## 10.5 Post-Procurement Contract Administration

### Objective

This step is important as the department or agency should include:

- A succession or transition strategy to demonstrate: 1) an understanding of the importance of life-cycle management and oversight to secure value from a P3 model and 2) a commitment to integrate contract management and operations representative in the project team to ensure a proper transitioning of the investment from the design and construction phase to the operation phase;
- How the individuals, departments or agencies that will be responsible for the contractual obligations under the P3 contract will be integrated into the planning, procurement and construction phases of the asset, and outline how the investment will be transitioned from procurement to operation after substantial completion.

### Sources of Information

- Sources of information include, but are not limited to: policy and procedure guidance from other jurisdictions, such as the U.K. and Australia; Canadian P3 procurement agencies (e.g. Infrastructure Ontario, Partnerships BC); and publicly available studies on P3 contract management.

## Completion Checklist

This section should answer the following questions:

- ✓ Is a realistic post-procurement transition and contract management plan set out?
- ✓ Is there clear evidence that individuals, departments or agencies responsible for the P3 contract will be involved in the planning and procurement of the asset?
- ✓ Are there any activities or tactics outlined to ensure a sustained link among the planning, procurement and operation phases?

## APPENDIX A: GLOSSARY

Public-private partnership (P3) terminology can vary significantly across jurisdictions. The following glossary defines key terms as used within the present guide.

<b>Affordability threshold</b>	Specified bid value determined by the department or agency above which the capital investment becomes unsustainable from the department or agency's financial perspective.
<b>Competitive neutrality</b>	Adjustments that remove any net advantages or disadvantages when comparing government and private bids.
<b>Department or agency</b>	Public sector party in a public-private partnership (P3) contract.
<b>Discount rate</b>	In discounted cash flow analysis, the interest rate used to determine the present value of future cash flows.
<b>Feasibility study</b>	Study conducted as part of a traditional Procurement Options Analysis (POA) which assesses the degree to which the various features of a capital investment are sustainable or achieve the department or agency's objectives.
<b>Needs assessment</b>	Document assessing the community's need for the asset and any constraints being placed on its procurement.
<b>Public-private partnership (P3)</b>	Cash flows of a capital investment developed on the basis that it is procured by the private sector using a P3 methodology.
<b>Public Sector Comparator (PSC)</b>	Cash flows of a capital investment developed on the basis that it is procured and financed by the department or agency using its usual asset delivery approach.
<b>Request for Expression of Interest (RFEI)</b>	Non-binding procurement document usually released prior to a Request for Qualification (RFQ) to gauge the level of market interest in the capital investment and to highlight any potential bidder concerns.
<b>Request for Proposals (RFP)</b>	Final procurement document usually released to a limited set of bidders with the intention of receiving final bids for the capital investment.
<b>Request for Qualification (RFQ)</b>	Binding procurement document released with the intention of qualifying proponents to submit proposals for a forthcoming Request for Proposals (RFP). The RFQ usually describes the asset and requests interested parties to submit experience and qualifications with respect to specific parameters.
<b>Risk premium</b>	Additional cost or contingency that a public-private partnership (P3) consortium will add to its bid submissions to account for risks that have been allocated (transferred) to the private sector in a P3 transaction.
<b>Scope ladder</b>	Tiered-pricing methodology in which bidders make more than one price submission based on varying scopes of the capital investment.
<b>Traditional procurement</b>	Procurement methodology usually used by the department or agency to procure the asset-type being analyzed. For most jurisdictions, this is usually a Design-Build (DB) or Design-Bid-Build (DBB) methodology.
<b>Value for Money (VfM)</b>	Difference in the risk-adjusted net present value (NPV) of delivering the asset using the department or agency's traditional methodology and the anticipated cost of delivering it through the private sector (i.e. using a public-private partnership [P3] methodology).

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**Title of Project – titre du projet**  
875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

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## APPENDIX M – PROCUREMENT OPTIONS ANALYSIS METHODOLOGY



# PPP Canada

## **PROCUREMENT OPTIONS ANALYSIS METHODOLOGY:**

The Guide for Federal Departments  
and Agencies

IMPROVING THE DELIVERY  
INFRASTRUCTURE THROU  
PUBLIC-PRIVATE PARTNER  
UTILISER LES PARTENAR  
PUBLIC-PRIVÉ AFIN D'AM  
MISE EN PLACE D'INFRAS  
PUBLIQUE

## About PPP Canada

PPP Canada's mandate is to improve the delivery of public infrastructure by achieving better value, timeliness and accountability through public-private partnerships (P3s). PPP Canada is a knowledge-based organization of dynamic professionals, who understand public infrastructure needs and the private sector's ability to leverage innovative and efficient approaches to generate results.

Successfully delivering large and complex public infrastructure projects requires a strong public sector partner. PPP Canada builds public sector capacity through sharing of tools and leading market practices and by working in close collaboration with project teams, as needed, to carry out capital investments successfully.

PPP Canada delivers value for Canadians through our three business lines:

- **P3 Knowledge Development and Sharing:** With a continuous focus on learning, PPP Canada has translated our experience and expertise into an array of tools and guides to document lessons learned and further build public sector capacity to implement alternative infrastructure funding and financing approaches.
- **Advancing Federal P3s:** PPP Canada supports federal departments and agencies in considering P3s for the delivery of public infrastructure. PPP Canada collaborates with the Treasury Board Secretariat and Public Services and Procurement Canada to assess opportunities for future federal P3s, and leverages each organization's expertise to achieve quality capital projects at the best value for Canadians. PPP Canada supports its clients from the application of the Federal P3 Screen, through the development of their Procurement Options Analysis, to procurement and construction, into operations.
- **Advancing Provincial, Territorial, Municipal and First Nation P3s:** The P3 Canada Fund invests in new and inexperienced jurisdictions who are considering the P3 model for their public infrastructure procurements. To date, we have committed over \$1.3 billion to more than 20 large or complex infrastructure investments across the country in a variety of asset classes. These P3s have combined capital costs of over \$6 billion and have resulted in savings of approximately \$800 million compared to traditional procurement approaches.

### Federal Project Highlight - New Champlain Bridge Corridor

PPP Canada's experience and expertise were key to the successful procurement of the New Champlain Bridge Corridor project. The new bridge is one of the largest infrastructure projects in North America. Canada's selection of a P3 procurement model provides estimated savings of more than \$1.7 billion (33.7%) over a traditional procurement approach. The Government of Canada is committed to delivering a world-class capital investment and PPP Canada is continuing to work collaboratively with federal partners, to provide the needed public sector capacity to ensure on-time and on-budget delivery of federal assets.

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# INTRODUCTION

## Purpose

The purpose of the present guide is to assist federal government officials undertaking a Procurement Options Analysis (POA) for capital investments where a public-private partnership (P3) has been identified as a potential procurement option. The POA methodology presented in this document will guide federal government officials through the analytical process of selecting the optimal procurement option.

In *Budget 2011*, the Government of Canada announced that federal departments and agencies will be required to evaluate the potential for using a P3 delivery approach in the procurement of large federal capital investments. All infrastructure projects creating an asset with a lifespan of at least 20 years and having capital costs of at least \$100 million are required to undergo the Federal P3 Screen to determine whether the P3 approach may be a suitable procurement option. If the screen concludes that there is P3 potential, it is recommended that the department or agency develop a POA.

This guide assumes that the department or agency has already completed preliminary analysis on the suitability of using the Federal P3 Screen. If your department or agency has not yet completed this analysis and requires advice on how to proceed, refer to PPP Canada's *Federal P3 Screen: The Federal Guide for Departments and Agencies* in accordance with the Treasury Board of Canada Secretariat's *Policy on Investment Planning*. Department heads are responsible for ensuring that the alternative options are considered, taking into account such factors as whole-of-life costs and risk. Departments and agencies will typically engage external consultants and PPP Canada to assist with this analysis. Ultimately, the department or agency presenting the POA is responsible for the choice of the preferred procurement option.

The POA is one of many tools that have been developed by PPP Canada to assist departments and agencies in meeting the requirements of Budget 2011 and to help with the development and implementation of P3s. In addition to the present guide, the *Guides for Federal Departments and Agencies* include:

- **Federal P3 Screen**, the guide for assessing the P3 suitability of capital investments;
- **Procurement Options Analysis Development**, the guide to developing a comprehensive POA to inform decision makers about capital investments;
- **P3 Procurement**, the guide to best practices for the process of procuring major infrastructure investments using the P3 model.

PPP Canada has also developed *Schematic Design Estimate Guide*, a guide to preparing cost estimates suitable for a Quantitative Analysis when considering a P3 as an asset procurement option.

## Context

As outlined in PPP Canada's *Procurement Options Analysis Development: The Guide for Federal Departments and Agencies*, the analysis in a traditional capital investment business case is typically a critical input into a POA. While a traditional capital investment business case is focused on assessing public need for the asset, as well as the economic and technical feasibility of an investment, a POA goes further to present a comparative analysis of various procurement options.

The intent of a POA is to present the process through which the department or agency identified and assessed viable procurement options in order to recommend the option that best achieves investment objectives and Value for Money (VfM). As illustrated in **Figure 1**, developing a POA includes the following key components:

**Figure 1: Developing a Procurement Options Analysis**

## **Part I: Investment Analysis**

## **Part II: Procurement Options Analysis**

## **Part III: Implementation Strategy**

The focus of this guide is on Part II of the POA, which is a key component of the pre-procurement activities required for any major infrastructure acquisition.

### **Organization of This Document**

The remainder of this document is structured as follows:

- **Section 1 - Shortlisting Procurement Options:** Articulates the department or agency's procurement objectives, opportunities and constraints. This section describes the realistic and "market" range of asset procurement models by confirming the results from the Federal P3 Screen and exploring additional procurement options. It describes the traditional delivery model, the P3 options to be considered in the POA and any other potential options that may exist for the asset class. Comparisons are usually made between two options: the Public Sector Comparator (PSC) and a P3 model. In some cases, a third alternative form of procurement, such as sale/leaseback, will also be included. In the case of the P3 model, experience indicates that there will be only one or two plausible models remaining for analysis by this stage.
- **Section 2 - Qualitative Analysis:** Examines various non-quantifiable aspects that will influence the selection of the best procurement option. These aspects include, but are not limited to: public policy considerations, economic factors, stakeholder expectations, operational flexibility and the ability to determine expected outputs/outcomes. This section of the analysis describes the criteria being considered, ranks the criteria according to potential impact on the investment, assesses each option against the criteria and highlights the preferred option from a qualitative perspective.
- **Section 3 - Market Sounding:** Provides an opportunity to gain an understanding of the marketability of the investment within the context of market constraints, the potential for innovation and risk allocation. Relevant stakeholders, including builders, operators and financiers, are asked to provide feedback on the viability of the investment.
- **Section 4 - Quantitative Analysis:** Identifies and summarizes all relevant quantifiable benefits and costs over the life of the asset, including the potential value of the different risks inherent to the investment. Risk adjustments quantify the probability and financial consequences of different risk events that are identifiable, quantifiable and material. The outcome of the Quantitative Analysis is a comparison of the risk-adjusted cash flows for each procurement option. This comparison determines which option will generate the greatest VfM for taxpayers.

- **Section 5 - Integrated Recommendation:** Takes into account the Qualitative and Quantitative Analyses to identify the preferred procurement option.

## Development of the Methodology

In the context of infrastructure procurement and selecting the best procurement option, the methodology considers federal government approval processes and encourages the same characteristics as set out in the Treasury Board of Canada Secretariat's policies, including being responsive to program delivery needs, being an affordable and productive asset, and being financially sustainable and "reflective of an appropriate balance of risk, benefits and return to the Crown and third parties". In developing the *Procurement Options Analysis Methodology* guide, PPP Canada examined the practices of those Canadian provinces most active in P3s, specifically Alberta, British Columbia and Ontario, as well as the P3 practices of the United Kingdom and Australia. This examination indicated that the methodologies of the various jurisdictions are largely similar with the exception of two items. The main exceptions are the method by which risks are valued and accounted for, and the rate at which cash flows are discounted. PPP Canada has considered the approaches from other jurisdictions and tailored the POA methodology to suit the needs of the Government of Canada.

## Using the Methodology

This guide provides departments and agencies with a framework for analyzing different options and selecting a preferred approach. Departments and agencies may need to tailor some aspects of the methodology to conform to specific approvals, authorities and processes required for the investment and procurement decision within a specific departmental context, policies and processes as well as with the Treasury Board of Canada Secretariat's policies and processes.

Many of the techniques in this document are common financial and analytical techniques. It is presumed that the reader has some knowledge of these techniques and their meanings; therefore, the intention herein is to avoid textbook explanations of these techniques and focus on those assumptions and considerations that are unique to a POA.

When departments and agencies are implementing the methodology, it is important that PPP Canada be used as a source of expertise and a resource to assist in the assessment and analysis of the investment's potential to be delivered as a P3.

# 1. SHORTLISTING PROCUREMENT OPTIONS

The purpose of this section is to develop a shortlist of alternative procurement options that would meet program needs and document the significant features of the different options. Conducting a review of all possible procurement options and shortlisting those that are most viable for further analysis ensures that human and financial resources are utilized efficiently. At a minimum, the Procurement Options Analysis (POA) compares a traditional procurement option (Public Sector Comparator or PSC) to a public-private partnership (P3) procurement option. However, for some asset classes, there are additional options, such as leasing, and it is therefore beneficial to include such additional options in the analysis. In most cases, the shortlist of options can be determined by:

- Reviewing experience on similar assets;
- Reviewing departmental needs;
- Examining the Federal P3 Screen results to identify constraints and defining factors for procurement options;
- Examining current market conditions and precedent capital investments in other jurisdictions;
- Confirming preferences on the length of Project Agreements, operational timeframes and the flow of funding for the initiative.

It may be necessary to consider constraints that may impact the investment. The POA includes an assessment of qualitative factors, which are considered as part of the shortlisting exercise.

This phase of the analysis will define the most viable procurement options to be compared on a qualitative and quantitative basis. Different options have different flow of payments, allocation of risks, opportunities for innovation, financing requirements, etc. It is critical that the scope and implications of each option are well understood and documented. The outcome of the shortlisting exercise is the identification and definition of the most viable procurement options. The remainder of the analysis will identify the option that provides the greatest value to Canadian taxpayers.

## 1.1 Developing Procurement Options

Typical infrastructure projects have five components. Any combination of these components may be undertaken by the government or the private sector and these combinations define different procurement models. These component responsibilities are:

1. Design
2. Build
3. Finance
4. Operate
5. Maintain

Different combinations of the foregoing infrastructure components create commonly found procurement models, such as Design-Build (DB), Design-Bid-Build (DBB), Design-Build-Finance (DBF), Design-Build-Finance-Maintain (DBFM) and Design-Build-Finance-Operate-Maintain (DBFOM). The analysis which is undertaken in the POA must first acknowledge which combinations are being examined and then identify the responsibilities and risks associated with each component under the different procurement options. The POA examines the initial configurations and validates the hypotheses underlying the configurations.



## 1.2 Public Sector Comparator

The PSC is the procurement option that is traditionally used to procure assets of a class that is similar to, or the same as, the one being assessed. It represents the way the government would most likely procure the asset. For the purposes of the POA, the PSC is assumed to be a DBB. This model is widely used by departments or agencies to procure capital assets. Under the DBB, the department or agency completes the specifications and the design of the asset. The completed design is tendered through a Request for Proposals (RFP) process to builders who bid to construct the asset. As a result, competitive bids are provided on the basis of a final (or very advanced) detailed design. The department or agency, therefore, retains the risk of any design deficiencies or subsequent changes during the construction period. The department or agency makes Progress Payments on work completed during the construction period as work progresses.

Once construction is complete, the department or agency takes possession of the asset and assumes long-term responsibility, including the risk associated with it, because the department or agency owns, operates and maintains the asset. Greater emphasis is placed on low-cost and best-value construction, and less emphasis is placed on the life-cycle costs of the asset.

Occasionally, a variation of the DBB may be used, such as the DB model. In this model, the department or agency issues general requirements and specifications for the asset. Then, the private sector is responsible for the design and construction of the asset. The asset is paid by the department or agency using Progress Payments or a series of Milestone Payments throughout the construction. This model or other variations of the DBB are best used in situations where similar assets have been successfully implemented in the past.


When defining the PSC, it may be necessary to conduct reviews of previous asset procurements of similar scope and consult other departments or agencies. To the extent possible, consultations must be held with government officials involved in previous procurements, in order to acquire valuable insights into prior procurement and understanding of potential challenges and key success factors. Observations from the research can then be incorporated into the POA.

## 1.3 P3 Model

The P3 model represents an alternative procurement option that is based on the transfer of a significant amount of design, construction, operation and maintenance risks to the private sector. Procurement models that include operation and maintenance (O&M) maximize private sector incentives to design and build high-quality infrastructure and to provide first-rate maintenance, allowing the asset to meet life-cycle expectations.

Risk allocation between the department or agency and the Project Consortium can have a significant effect on the cost of the asset. Defining clearly the responsibilities assigned to the Project Consortium and resulting risk allocation are critical steps in a well-conducted POA. The department or agency can build on the work performed to describe options as part of the Investment Analysis. It is important to validate responsibility and risk allocation with the Project Consortium through Market Sounding, as discussed further in **Section 3**.

Two common P3 models are DBFM and DBFOM because of the extent of risk transfer to the Project Consortium. In both models, the Project Consortium is responsible for the design, construction, financing and maintenance of the asset. The capital investment is also paid for by the department or agency in instalments over a long-term, fixed period (20+ years) under both models. Under the DBFOM model, the Project Consortium additionally provides services to the public, such as collecting and administering the tolls on a road, whereas the department or agency provides such services under the DBFM.



When determining the possible P3 model(s), the DBFOM model is the recommended starting point of the exercise, since it transfers the greatest amount of risk to the Project Consortium. A critical analysis of the feasibility of this option should be conducted and the model should be adjusted incrementally until a preferred P3 option is identified. For example, if it is determined that the Government of Canada is legally required to operate an asset, a DBFM model would then be considered. This step will inform which P3 model is most appropriate to be compared against the PSC.

The definition of the P3 model is a crucial step of the POA and the conclusions of the preliminary Market Sounding conducted as part of the Investment Analysis are reviewed. In instances where significant time has passed or significant market events have occurred, it may be necessary to reconfirm the conclusions of the preliminary Market Sounding. It is also important to consult other departments/agencies with experience implementing P3s, as well as PPP Canada, which can provide guidance on the development of the P3 model.

## 1.4 Other Approaches to Procurement

Governments are finding alternative approaches to delivering capital investments beyond those described above. A common approach is the leasing of office accommodation. In this example, the Project Consortium builds, owns and operates the building, and maintains the infrastructure. The owner leases the space to the government. In some instances, the owner may have financed and constructed the building on the strength of a long-term government lease commitment already in hand. In other instances, when the government has entered into a long-term lease, the fit-up of the space may be to unique specifications.

Another variation is the sale and leaseback. In this transaction, the government sells a property and then leases it back from the Project Consortium. The lease term may be based on the Project Consortium's financing cost, the strength of the guaranteed lease from the government and the Project Consortium's desired rate of return. In such instances, the department or agency's employees continue to provide services from the building to the public, while the Project Consortium respects government standards, such as health and safety.

The typical advantage of these alternative approaches to the department or agency is that it enables the government to focus on its primary business which, generally, is not operating or maintaining buildings or capital assets. This allows the government to access cost-effective service delivery that leverages private sector innovation, involvement, expertise and experience in managing capital-intensive activities. Furthermore, the government receives the value in the property with the immediate inflow of funds. The Project Consortium obtains an essentially guaranteed long-term income stream, an appropriate return on the purchased investment and, depending on corporate circumstances, some potential tax advantages.

PPP Canada supports the consideration of other approaches to infrastructure procurement. Lease models have been identified as one possible alternative, but departments or agencies may consider other procurement models. If alternative models are considered, they will be defined and developed as a second procurement option along with the P3 option(s) being considered. It is recommended that departments or agencies consult PPP Canada when examining alternative models to ensure that all qualitative and quantitative considerations are analyzed appropriately for the POA.

## 1.5 Developing the Shortlist of Procurement Options

The Quantitative Analysis, described in **Section 4**, contributes to the determination of the best procurement option and requires complex and detailed financial analysis. In order to minimize the time and resources required to conduct the Quantitative Analysis, it is recommended that departments or agencies develop a robust evaluation methodology to assess a variety of procurement options and shortlist the most viable options. The objective of shortlisting the options is to determine a manageable set of procurement options for the capital investment that merit a deeper review using both Quantitative and Qualitative Analyses. In order to shortlist the options, the department or agency will examine experience on similar assets, departmental needs, Federal P3 Screen results and current market conditions. Criteria are based on investment and procurement objectives, constraints, policy direction, risk profile, stakeholder considerations, Market Sounding feedback and insights from precedent transactions.

Precedent transactions can be used to identify potential procurement options for capital investments. They can help uncover particular challenges or issues to be addressed in choosing the procurement option and clearly present the benefits and risks associated with similar assets. Collected case studies can also identify areas of improvement relative to past investment completions. It is important to note that precedent transactions should be relevant to the proposed investment in terms of size, scope and objectives as well as timely in nature. Reviewing the alternatives and the technologies already in use, information about funding, and opportunities and challenges will help solidify the viability of the proposed investment. PPP Canada recommends providing at least three case studies on precedent investments of similar size and scope to the proposed asset.

In the absence of precedent capital investments, or as a complement to them, different procurement options can be considered against the needs and strategic objectives of the proposed investment to see which options provide the best fit. The options available, as outlined in **Sections 1.1 to 1.5**, range from the traditional DBB model to the fully inclusive DBFOM model. The first focus for a proposed asset should be on the full-value model (DBFOM), which optimizes the risk transfer to the Project Consortium. Considering the objectives, needs and constraints of the proposed investment first within the context of a DBFOM leverages the overall efficacy of a P3 model. If, for reasons related to asset-specific requirements, a DBFOM model cannot be leveraged, the proposed investment should be considered within the context of the other potential P3 models in descending order relative to private sector responsibilities.

Elements for consideration in developing the assessment methodology include, among other things, the weighting of shortlisting criteria; the scoring/ranking mechanism and process; the evaluation approach (e.g. use of an evaluative panel versus facilitated workshops); and the stand-alone versus relative scoring. When shortlisting procurement options, it is important that evaluative criteria are clearly linked to investment needs, objectives and constraints. A report should be developed to document the shortlisting of options as well as the rationale for the approach.<sup>1</sup> Options should be described in detail in order to fully justify the pursuit of a P3.

<sup>1</sup> Note that the *P3 Suitability Screening Matrix* or *Federal P3 Screen: The Guide for Federal Departments and Agencies* tools developed by PPP Canada may prove useful in this process.

## 2. QUALITATIVE ANALYSIS

The purpose of a Qualitative Analysis is to account for the benefits and risks of a capital investment that are not directly quantifiable. PPP Canada recommends taking both quantifiable and non-quantifiable factors into consideration when choosing the procurement option that best meets the objectives of the proposed investment.

Information from the Investment Analysis must be reviewed, including the previously completed Market Sounding, infrastructure justification and results from other public-private partnership (P3) initiatives. The list of factors may come from experts, senior leadership in the department or agency, various economic or engineering reports and stakeholder consultations. A workshop can also be used to finalize the list.

A comprehensive Qualitative Analysis requires industry experience and internal knowledge of the department or agency in order to provide sufficient insight into intangible factors surrounding the procurement method selection. A thorough Qualitative Analysis includes the following steps:

- Develop qualitative assessment factors and criteria relevant to the proposed investment;
- Determine the importance of each criterion relative to meeting the overall strategic objectives of the proposed investment;
- Assess and compare the suitability of each option relative to the criteria;
- Prepare a Sensitivity Analysis, develop mitigation strategies and interpret conclusions.

### 2.1 Developing Qualitative Assessment Factors

The qualitative assessment factors developed for the proposed investment must relate to:

- Departmental objectives;
- Asset objectives;
- P3 objectives.

Considering the capital investment constraints and policy direction, departmental objectives must reflect the department's mandate as well as historical data that are relevant and how the investment contributes to overall program outcomes. Qualitative assessment factors that best reflect the objectives of the capital investment can be developed using the documentation found in the investment plan, such as the departmental mandate and portfolio, horizontal and government-wide priorities and strategies, relevant historical data and the expected contribution of planned assets to departmental outcomes.

P3-specific criteria may be included in the list of qualitative factors, but should not inherently favour a P3 delivery approach. At a minimum, the Qualitative Analysis must consider the extent to which each procurement option aligns with the overall objectives of the investment. The procurement option selection has the potential to affect the ability to meet objectives and may not be critically assessed elsewhere in the process, so it is imperative that a thorough consideration of the criteria be conducted. Considerations such as sustainable development, stakeholder management, social and economic objectives may also warrant inclusion in this list.

**Table 1** provides a list of generic qualitative factors for consideration. It is recommended that the suitability of these factors be assessed relative to the specific investment.

**Table 1: Sample Qualitative Factors**

Factor	Description
Alignment with investment objectives	The extent to which each procurement option aligns with the objectives of the investment.
Time to deliver asset	The extent to which each procurement option is likely to achieve operations by a specified date.
Private sector market interest/capacity	The extent to which each procurement option generates market interest in the investment among the appropriate players possessing the relevant skills, expertise and capacity to deliver the infrastructure, while promoting fair and transparent competition.
Budget certainty	The extent to which each procurement option assists in providing earlier cost certainty to the department or agency.
Corporate risk	The extent to which each procurement option has the ability to meet departmental mandates.
Operational flexibility (future scope changes)	The extent to which each procurement option allows, over time, the department or agency to manage and implement changes to the functional requirements of the planned investment (particularly in relation to any variation in the required capacity of the infrastructure) as compared to the forecasted need to make such changes.
Stakeholder management	The extent to which each procurement option enables the department or agency to address stakeholder issues and needs throughout the life of the asset.
Political constraints	The extent to which each procurement option can address political issues and manage approvals.
Economic factors	The extent to which each procurement option is able to handle factors such as financing availability, employment and exchange rates.
Social factors	The extent to which each procurement option addresses social and community needs.
Sustainable development factors	The extent to which each procurement option aligns with economic, environmental and social initiatives outlined in the Treasury Board of Canada Secretariat's Sustainable Development Strategy.
User considerations	The extent to which each procurement option addresses concerns and expectations of the user (e.g. access, service satisfaction).
Strategic alignment	The extent to which each procurement option aligns with the program delivery strategies of the department or agency (e.g. those set out in the departmental plans and priorities).
Implementation and capacity considerations	The extent to which each procurement option aligns with the departmental or agency's capacity to oversee or manage the infrastructure investment.
Regulatory and legal considerations	The extent to which each procurement option addresses regulatory and legal considerations in terms of risk, cost, public policy, etc.

Factor	Description
Technological factors	The extent to which each procurement option offers an element of innovation.
Public acceptance considerations	The extent to which each procurement option is viewed positively among stakeholders (i.e. end users, the City and the media).
Security factors	The extent to which information, services and assets are reasonably protected, employees are not exposed to workplace violence and governance structures are implemented to manage security as outlined in the Treasury Board of Canada Secretariat's <i>Policy on Government Security</i> .

As noted above, these factors are generic and must be altered based on the nature of the proposed investment. For example, “alignment with investment objectives” would need to set out the asset’s specific objectives over its useful life. Some criteria may be deemed mandatory. These criteria must be particularly well substantiated because of their importance in the selection of the best procurement model. The initial list of criteria should be applied first to identify any options that fail to meet basic requirements. Low impact, low importance and low probability of occurrence criteria should be removed in order to maintain a manageable list. It is also important to avoid double counting of criteria, since, in conjunction with the Quantitative Analysis, duplicate factors may skew the overall analysis of procurement models. For example, if “time to deliver the asset” can be quantified and included in the risk assessment from a quantitative perspective, then this factor must be excluded from qualitative criteria. Again, criteria that comprehensively favour P3s, are broad or do not add value to the decision making should be minimized. On average, the Procurement Options Analysis (POA) presents 9 criteria and PPP Canada recommends the presentation of 7 to 10 criteria that could potentially have the greatest positive or negative impact on the investment.

## 2.2 Determining Importance of Criteria

After developing the list of qualitative factors for consideration, the importance of each criterion relative to meeting the overall strategic objectives of the proposed investment must be determined. Each criterion should be weighted based on its overall impact on the investment, with the total weight of all criteria equal to 100%. Any mandatory requirements need to be applied as key qualitative criteria first in order to identify any of the procurement options that do not meet basic requirements. Any options that do not meet the mandatory requirements may not be considered as viable procurement options.

The weighting system must not inherently favour a P3 because it indicates a predetermined alternative selection that undermines the proposed objective framework associated with the Qualitative Analysis. The weights should be objectively developed based on the overall investment objectives. Some of the known benefits of a P3 model may be included in the list, but should not dominate the overall criteria. A common approach is to organize a group from the leadership of the department or agency and to place percentages of importance on one criterion versus another, relying on industry experience. For example, weights can be based on the parameters related to optimal asset delivery, relative contribution of the criterion to overall asset delivery or functional importance of the criterion.

## 2.3 Assessing and Comparing Options

The next step is to assess how well each procurement option matches the criteria. A numerical scoring system is a useful way to distinguish among procurement options and to show the relative advantage of one option over another. This evaluation is best done independently by individuals who then come together to compare scores and the rationale behind their scoring. A group composite score may be used.

PPP Canada recommends the development of relative scores through the creation of an evaluation scale from 1 to 4 (i.e. 1-disagree, 2-tend to disagree, 3-tend to agree, 4-agree) applicable to each criterion. The selection of an appropriate numerical scoring system refers to choosing between even- and odd-scoring systems as well as the number of possible choices on the scale. Odd-numbered scales (i.e. 5 alternatives, 7 alternatives) allow respondents to choose a neutral position by selecting the middle alternative. From a data collection perspective, if the majority of respondents choose a neutral position, the viability and usefulness of the data collection is essentially void. Respondents are also more likely to choose a neutral position relative to committing to either a slightly positive or slightly negative position if they are unsure of a response. Alternatively, a scale with an even number of choices (i.e. 4 alternatives, 10 alternatives) does not allow ambiguities and therefore adds more value to the data collection process.

The number of possible choices for respondents to select from also impacts the overall effectiveness of the scoring system. Given a larger scale (i.e. 1 to 20), there is less differentiation between alternatives and therefore the results will not be as significant. A lower scale range of models (i.e. 1 to 4) allows respondents to differentiate more effectively between alternatives.

The combination of the weighted importance of each criterion and the score for each option gives a weighted value of each option. **Table 2** provides a sample scoring matrix for the Qualitative Analysis. The purpose of the scoring system is to create a tool that promotes discussion of issues and strategies related to the procurement of the asset, resulting in a robust Qualitative Analysis of procurement options.

**Table 2: Sample Qualitative Analysis Scoring Matrix**


Criteria	Weighting	PSC Score	P3 Score	PSC Weighted Result	P3 Weighted Result
Alignment with objectives	35%	2	4	0.7	1.4
Strategic alignment	20%	1	4	0.2	0.8
User considerations	20%	3	2	0.6	0.4
Market interest	15%	2	5	0.3	0.8
Operational flexibility	10%	4	2	0.4	0.2
Total	<b>100%</b>	<b>12</b>	<b>17</b>	<b>2.2</b>	<b>3.6</b>

Once the scores have been developed for each criterion, it is important to examine what the impact would be if the weights were to change.

## 2.4 Sensitivity Analysis, Mitigation Strategies and Conclusions

The Sensitivity Analysis is used to test the overall impact of different input assumptions on estimates, which provides insight into the degree to which a particular procurement option is superior. If the outcome of a particular criterion is different than what was initially assumed, the overall impact on asset delivery can be better ascertained. Benefits of conducting a Sensitivity Analysis include: testing for robustness when outcomes are uncertain, finding errors in the procurement model's objectives at an early stage and simplifying the procurement options in the sense that redundant or unnecessary data is omitted.





A final activity in the analysis is to consider potential mitigation measures, with a focus on the causes of particularly high or low scores. In some instances, a low score may be given because of concern that the option will not deliver against the criterion. The reviewers discuss what measures might be taken to mitigate this situation and potentially improve competition. For example, contractual terms could be used to address operational flexibility concerns related to the P3 model or strengthened project management could address schedule issues associated with the Public Sector Comparator (PSC). In each instance, the intent is to try to leverage a situation for higher value to the department or agency.

These types of mitigation measures and alternative considerations are documented and form part of the report on the Qualitative Analysis, and are ultimately incorporated as considerations in the Integrated Recommendation. The budgetary impact of any costs associated with the mitigation measures is also considered. The end product is a description of the qualitative criteria, scores, underlying assumptions and mitigation strategies for each procurement option. The rationale for each of the weighted outcomes is explained.

It is recommended that the analysis be well documented to provide evidence of a well-thought-out process and defensible results. The documentation includes support for why certain criteria were used, how the weights were determined and applied, how the scores were given and then used in the analysis, and what were the prime criteria and findings used to make the recommendation. This information will be extracted for the Integrated Recommendation, which considers the results of the Quantitative and Qualitative Analyses to justify the selection of the preferred procurement model.



### 3. MARKET SOUNDING

A Market Sounding is the process by which information about the interest, opportunities and challenges associated with a proposed investment are discussed with relevant participants, such as departments and agencies, builders, operators and financiers. The Market Sounding provides an opportunity to:

- Gain an understanding of the investment's marketability;
- Gain an understanding of potential market constraints;
- Gain an understanding of risk allocation;
- Prepare the market for the investment and improve competitive tension during the process of the transaction;
- Provide estimations or confirmations for the Quantitative Analysis.

#### 3.1 Developing a Market Sounding

A preliminary Market Sounding should be conducted to ascertain the market's interest in different procurement models and to determine the extent to which specific models will attract competition. The participants in the Market Sounding should have experience with similar assets as well as have the resources to service the investment's objectives. On average, the feedback of 15 participants is required for a suitable Market Sounding. PPP Canada recommends between 18 and 25 participants. The participants should be comprised of relevant departments and agencies, builders, operators and financiers. It is important to have a sufficient number of participants from each of these categories; it is recommended that there are at least four participants from each category.

Confidentiality and accuracy are two significant concerns during this part of the Market Sounding process. In some cases, firms will request anonymity to feel free to express their point of view; however, firms' reputation is often considered important during the Procurement Options Analysis (POA) review. For example, a firm that discloses its name and has well-documented public-private partnership (P3) experience will likely be granted more weight in the decision-making process than an anonymous firm will. It is also important to enlist participants that show significant interest in the proposed investment, in order to garner relevant responses.

Questions raised in the Market Sounding process should involve areas such as the market's interest in the investment, the potential for innovation and the ability to transfer risk where appropriate. In preparing for the Market Sounding, the department or agency can look at findings from precedent transactions and publications to anticipate the range of potential issues that industry might raise. They may also wish to consult with financial or technical advisors, industry associations and government P3 procurement agencies. PPP Canada can also assist federal organizations in designing Market Sounding activities.

The number of Market Sounding questions varies based on asset-specific criteria, but generally there should be questions geared towards builders, operators and financiers. **Table 3** provides examples of generic questions and information that may be gathered during the Market Sounding process.

**Table 3:** Sample Market Sounding Questions

Question	Targeted Participant
Is the investment considered an attractive opportunity from your perspective?	Builders, operators, financiers
Are there any factors that would influence your decision to participate in the proposed investment?	Builders, operators, financiers
Are there opportunities or concerns surrounding your membership in a Project Consortium?	Builders, operators, financiers
What is a realistic timeframe for the proposed investment?	Builders, operators, financiers
Describe your company's role in similar (industry-specific) investments.	Builders, operators, financiers
What types of challenges and risks do you foresee during the construction period of this asset?	Builders, financiers
What is your preference in terms of length of time for the operating term?	Builders, financiers
What is the minimum equity contribution that would make this investment attractive?	Financiers
In your experience, what equity structure would work best for this type of investment?	Financiers
What is the likely financing approach for this asset?	Financiers
What is the best method to reduce the costs of financing and their impact on overall investment costs?	Financiers
What are some of the perceived risks associated with the procurement process?	Builders, financiers
Are there lender or credit rating agency concerns associated with the viability of the investment?	Financiers

As noted above, the questions should be targeted towards the market participants that are best able to respond to the questions in an informed manner. It is important to note that these questions are generic and must be customized and expanded based on the nature of the investment and specific risks and concerns associated with it. On average, a POA presents at least nine Market Sounding questions to participants; PPP Canada recommends both the presentation of questions as well as the option for participants to comment on concerns and suggestions to improve the overall viability of the proposed investment.

## 4. QUANTITATIVE ANALYSIS

The substantive output of the Quantitative Analysis is the estimated Value for Money (VfM) and, as a result, the Quantitative Analysis is often referred to as the “VfM Analysis”. VfM compares the risk-adjusted cost of the Public Sector Comparator (PSC) to the risk-adjusted cost of a public-private partnership (P3) model and other options being evaluated.

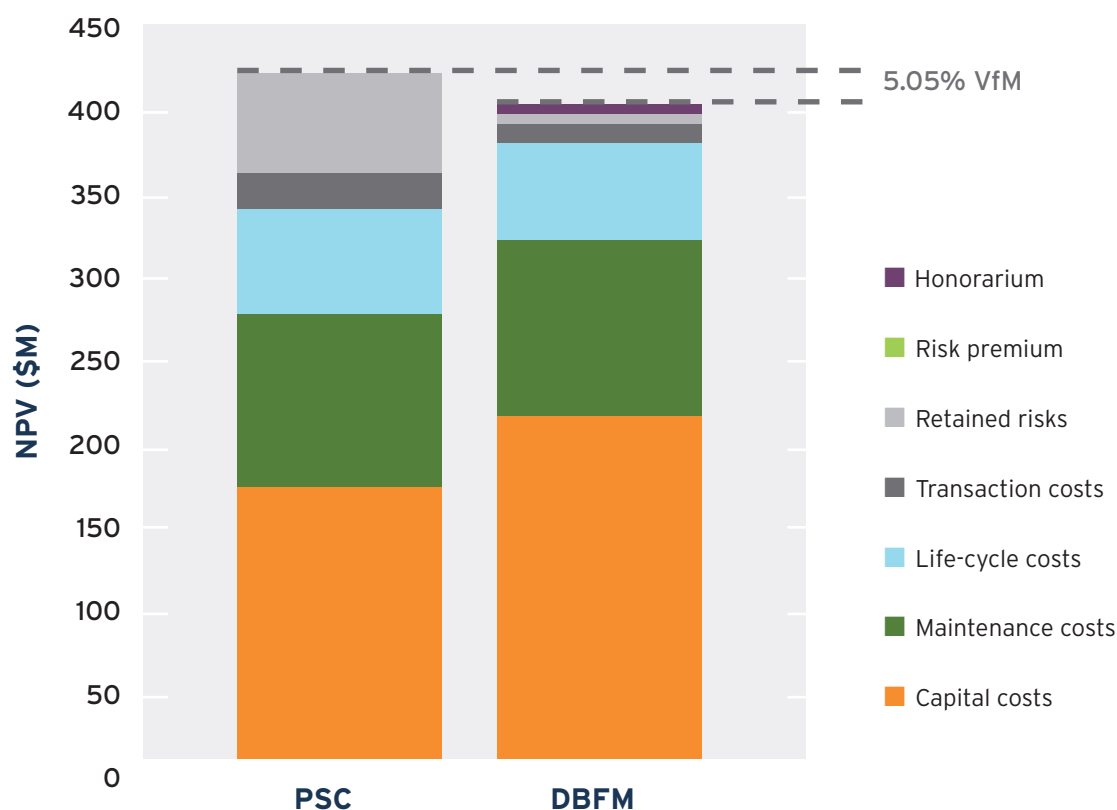
VfM identifies the option that provides the greatest value in quantitative terms over the design, construction, and operation and maintenance (O&M) phases of the asset. Each procurement option is, therefore, evaluated using whole-of-life cost estimates over the analysis period. This allows for the comparison of the different procurement options over the useful life of the asset using comparable cost components, timeline and performance-based output specifications to provide a like-for-like comparison of the procurement options.

The output of the Quantitative Analysis is a robust, risk-adjusted financial comparison of the procurement options being considered. **Table 4** and **Figure 2** provide the sample results of a VfM Analysis.

**Table 4:** Sample Value for Money Analysis

NPV (\$M, 2013)					
PSC		P3 (Shadow Bid)		Difference	
<b>Project costs</b>		<b>Project costs</b>			
Construction costs	\$200	Capital costs	\$222		
O&M costs	\$130	O&M costs	\$132		
Life-cycle costs	\$65	Life-cycle costs	\$75		
<b>Subtotal</b>	<b>\$395</b>	<b>Subtotal</b>	<b>\$429</b>	<b>(\$34)</b>	<b>-8.61%</b>
Transaction costs	\$15	Transaction costs	\$24.50		
Competitive neutrality	\$5	Honorarium	\$1		
Retained risks	\$70	Retained risks	\$6		
<b>Total</b>	<b>\$485</b>	<b>Total</b>	<b>\$460.50</b>	<b>\$24.50</b>	<b>5.05%</b>

**Figure 2: Sample Value for Money Graph**



The VfM Analysis is a complex undertaking and a critical component of the Procurement Options Analysis (POA). The methodology below examines the structure of the analysis. Each cost component presented in **Table 4** and the source of cost differences between the procurement options is described in detail. When implementing the methodology, it is important to ensure that:

- No bias has been introduced in the evaluation of procurement options;
- The baseline information is reliable and adjustments are transparent;
- The Sensitivity Analysis is performed to examine the impacts of estimates and key assumptions.

#### 4.1 Public Sector Comparator Cost Estimates

The objective of this section is to provide a clear understanding of how the cost estimates are developed, how they compare across models and, ultimately, how VfM is estimated.

As outlined in **Table 4**, the whole-of-life costs of the PSC are made up of different cost components, including construction, O&M and life-cycle costs (often referred to as “base costs”). It is recommended that these costs be estimated by a certified cost consultant and be based on historical experience from the department or agency. It is also recommended that departments and agencies consult the Treasury Board of Canada Secretariat's *Guide to Costing* to ensure that the estimation approach is consistent with general federal government costing practices.

Transaction costs are the costs required to implement the asset and include land acquisition costs, external advisory fees, costs to conduct studies, preliminary design costs and procurement costs. Other ancillary costs, such as bid development costs incurred by the department or agency, must also be taken into account.

Competitive neutrality is an adjustment brought to the PSC to reflect tax and insurance differences in the two models to ensure a like-for-like comparison. Retained risk cost is an adjustment that accounts for the level of risk retained by the department or agency under the traditional delivery model. These are not typical accounting costs, but are important considerations for decision making. All of the above items are discussed in detail throughout this section.

Note that for revenue-generating assets, such as toll roads, revenues must also be factored into the PSC as a separate line item.

#### 4.1.1 Construction Costs

Construction costs represent a significant portion of the total investment and must therefore be rigorously estimated. They typically include construction base costs, such as the costs to plan and design the asset, raw materials, labour and equipment, costs associated with project management, permitting, insurance and bonding, as well as costs to obtain environmental and regulatory approvals.

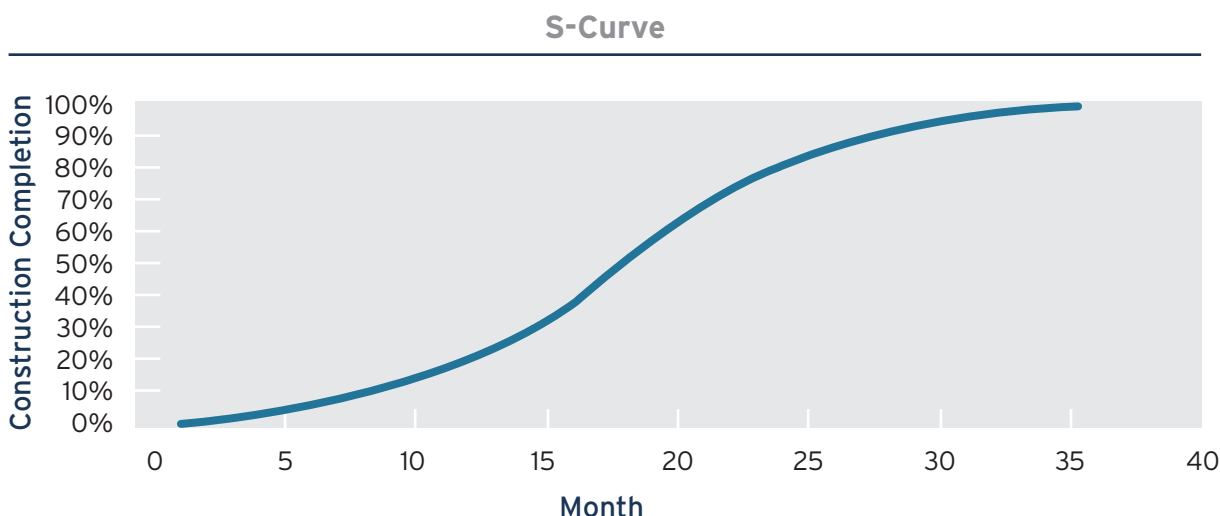
Cost estimates should be based on preliminary drawings, design parameters, performance-based output specifications, updated user requirements, general description of the final built work, preliminary site information and existing conditions. The estimates also take into consideration market conditions as well as basic implementation logistics. Costs must be developed in real terms (i.e. no inflation adjustment) by a certified cost consultant and included in a cost report that follows industry standards. The cost consultant also provides a construction schedule and the spending profile over the construction period, known as the “S-Curve” (see **Section 4.1.1.1**).

The Quantitative Analysis requires the same base construction cost estimates to be used for the PSC and the P3 model. Under the P3 option, the private sector proposes designs based on performance-based output specifications. The P3 model is structured this way in order to transfer design risk to the private sector, unlike the PSC where design work is finalized by the department or agency and bid on by construction firms. It is recommended that the design used to create construction cost estimates for the POA be completed to a level that allows for estimation with +/- 15% level of accuracy, usually based on a schematic design at 30% completion. This will ensure a reasonably accurate estimate of costs, while avoiding duplication of design efforts and leaving sufficient flexibility for the Project Consortium to finalize the design. If the PSC is ultimately selected, the design can then be finalized and more accurate cost estimates can be developed before procurement. Cost estimates include contingencies to account for the level of design, which is further described in **Section 4.1.3**. Additional details on asset cost estimation can be found in PPP Canada's *Schematic Design Estimate Guide*.

##### 4.1.1.1 Construction S-Curve

An S-Curve must be developed by cost consultants to estimate cumulative cash disbursements as a percentage of total construction costs over the construction schedule. S-Curves are commonly used to distribute construction costs estimated in real terms through time. The shape of the curve is the result of costs being incurred at a lower rate for equipment mobilization and site preparation, then ramping up for major works and tapering off again as testing and commissioning take place. A robust and substantiated S-Curve developed by a certified cost consultant allows costs to be appropriately estimated and financed throughout the concession. **Figure 3** illustrates a typical expenditure curve for a construction project.

**Figure 3: Construction S-Curve**



#### 4.1.1.2 Funding for Construction Costs

When developing the PSC, it must be assumed that funding originates from the department or agency's general funds. As a result, any private financing costs related to construction loans need to be estimated and built into the construction cost estimate. It is important for the payment structure to accurately reflect the manner in which private sector contractors typically receive payments for construction work, which is usually in the form of Progress Payments or Milestone Payments. Progress Payments are monthly payments based on completed work, while Milestone Payments are lump sum payments paid when the contractor reaches predetermined construction milestones. Once construction is completed, the asset is fully paid and owned by the department or agency.

When estimating the costs of a PSC, the government typically allocates funding for the construction of the asset on a cash basis; there are no implied financing costs to be considered and there is no private sector involvement in the financing of the asset. For the purposes of this analysis, construction payments should be modelled as Progress Payments or Milestone Payments, as applicable, and private sector working capital financing requirements should be built into the PSC financial model.

#### 4.1.2 Operation, Maintenance and Life-Cycle Costs

The VfM Analysis is based on the whole-of-life of the asset; this is why it is important to examine the costs of operating, maintaining and rehabilitating the asset in the long term (i.e. 20-30 years). Operation services are necessary for the functioning of the asset, but are not related to maintenance of the structure or equipment (e.g. security services, porter services, janitorial services, tolling). Maintenance services help prevent the deterioration of infrastructure and ensure that it operates as required. Life-cycle services are associated with planned replacement, renovation and refurbishment of building systems, equipment and fixtures that have reached the end of their useful life. O&M and life-cycle services may either be provided by department or agency staff, a third-party service provider on a short-term basis or a combination of the two, depending on the PSC.

O&M and life-cycle costs may represent a significant portion of the investment costs due to the longtime horizon of the analysis. These cost estimates must be produced by a certified cost consultant on the basis of historical costs, functional program, regulatory requirements, industry data and performance-based output specifications.

The O&M and life-cycle period of the analysis must be specified in the Project Agreement. Its duration will depend on the timing of major life-cycle costs and may vary across asset types. To determine the optimal period, it is necessary to include one major life-cycle replacement and to

take into consideration elements concerning the financing and affordability of the asset. The same period of analysis must be used for the PSC and the P3 model, and is discussed in greater detail in **Section 4.3.3**. O&M and life-cycle costs are funded as they are incurred and this must be reflected in the PSC financial model.

The month-to-month O&M costs are typically the same except for a slight increase due to inflation. Life-cycle costs, on the other hand, have a “lumpy” or non-uniform cost profile due to the periodic nature of life-cycle replacement and refurbishment requirements for assets. The department or agency will be required to make capital injections for these life-cycle requirements, as reflected in the PSC.

### 4.1.3 Contingencies

Contingencies are typically added to base cost estimates. A contingency can be defined as a financial provision to absorb the costs of an asset-related event that is likely to occur, but which cost cannot be estimated with a high degree of certainty when preparing the capital investment budget. Contingencies are typically related to the lack of precision regarding measures and quantities that depend on the advancement of the design; they also fluctuate in accordance to the variation of quantities and unitary prices, mainly for known events that may be difficult to quantify with a high degree of certainty (e.g. volume of soil to be decontaminated).

Cost estimates must be developed to a level of accuracy such that a 15% contingency allowance is appropriate to reflect the extent of documentation at this stage of design. In the case of construction costs, estimates should be based on preliminary drawings, design parameters and performance-based output specifications, updated user requirements, general description of the final built work, preliminary site information and existing conditions. Estimates must take into consideration construction experience and market conditions as well as basic implementation logistics, including costs for design, documentation and construction supervision. Estimates must be based on a full description of the schematic design preferred option, on the construction/design level of experience and on market conditions.

Contingencies are generally included in the budget, but the risk provisions (also sometimes called “owner’s reserve”) is generally outside the primary budget. In most cases, contingencies tend to be fully spent during the capital investment. On the other hand, the utilization of an owner’s reserve can vary from the initial estimate as a result of the risk management program put in place.

When developing cost estimates for the asset, cost consultants must clearly itemize and distinguish contingencies from base costs and from quantified risks. Contingencies are expected to be identical for the PSC and the P3 model. The logic supporting the estimate of contingencies must be well documented in order to ensure a clear delineation between indeterminate future costs covered by contingencies versus future costs that may or may not materialize, which pertain to risk provisions.

To help ensure that there is no double counting between cost contingencies and risk quantification, it is recommended that the scope of the cost consultant’s professional services include participation in the risk workshop.

### 4.1.4 Cost Inflation

Construction costs must be presented in real dollars and inflated on the basis of industry-accepted indexes and regional factors. General economic conditions will drive construction inflation, but regional factors, such as availability of labour, equipment and other resources, will also affect the inflation rate. Therefore, indexes, such as the Consumer Price Index (CPI), may not reflect actual cost increases over time. Construction associations at a provincial level, for example, may need to be consulted to determine the appropriate inflation rate. Cost consultants may also provide intelligence on inflation based on their surveys of local subcontractors and material providers, during the development of base estimates.

Cost estimates for O&M and life-cycle costs are to be estimated in real dollars and inflated to nominal terms. Inflation rates are based on industry-accepted indexes such as the CPI. Inflation is often applied

uniformly across all O&M and life-cycle costs, but if an individual cost category, such as energy or labour, represents a significant portion of the overall costs, a specific cost index should be applied independently to that cost category. This is the case with construction inflation rates whose future estimates may require analysis of historical patterns or consultation with industry associations.

#### **4.1.5 Transaction Costs**

Public sector transaction costs are the ancillary costs of procuring an asset from the department or agency's perspective. These costs normally include land acquisition costs, costs to conduct preliminary studies, external advisor fees, internal project team and governance costs, project management costs and procurement costs.

Cash flows associated with ancillary costs should be spread over the planning, design and construction phases in the PSC. These costs are typically estimated by the department or agency. They are based on information from past capital investments and internal data, including salary costs; procurement and project management costs for past investments of similar scope; market rates for external advisors or actual proposals for the delivery of services. It is important for departments or agencies to develop a detailed implementation strategy and schedule on which cost estimates can be based.

#### **4.1.6 Competitive Neutrality**

When developing the PSC, adjustments must be brought to ensure that the comparison between the PSC and the P3 model is made on a like-for-like basis; without this, the total PSC cost may be artificially higher or lower than the P3 model. Competitive neutrality adjustments reflect cost differences between the two models, which may arise due to different tax treatments applied to public and private sectors, as well as the different insurance coverages offered in these two sectors. For example, the private sector pays taxes: such taxes must be factored into the bid and they must be considered an additional cost pertaining to that option. However, part of those taxes will eventually be paid back to the government: this fact must also be taken into consideration.

Two main competitive neutrality adjustments are usually made for taxes collected by the government and for insurance premiums payable by the Project Consortium. Adjustments must appear in every financial analysis of the PSC or the P3 model, in order to render them comparable.

Competitive neutrality adjustments can only be made after the P3 financial model has been fully developed, since it is dependent on the output of that portion of the analysis, as described below.

##### **4.1.6.1 Taxes**

The cost of the P3 model reflects all costs incurred by the Project Consortium to deliver the asset and services for which it will receive a periodic payment from the department or agency. These costs usually include taxes paid by the Project Consortium, which will likely pay income taxes on its net earnings, depending on its legal/tax structure. In certain cases, it may also have a net GST/HST and PST cost (e.g. GST/HST and PST collected on service charges and remitted to the government).

Since no Project Consortium is created under the PSC, no corporate income tax is payable to the government. The government will not receive the tax revenue or any of the secondary benefits.

Due to differences in tax treatment, the P3 model may appear more expensive than the PSC in present value terms, all other costs considered equal. Yet, taxes payable to the government in the P3 model are not a true additional cost for the department or agency, since these taxes represent revenue for the government and provide secondary benefits. As a result, the net cost to the government of the portion of the payment made to the Project Consortium for the services it provides and returned to the government as taxes is in fact nil. The competitive neutrality adjustment seeks to reflect this effect.

The tax adjustment must be correctly calculated in order to properly reflect the costs of each procurement model being analyzed and consideration must be given to the differences between provincial and federal tax laws.



No specific adjustment is made for income taxes paid by individual design or construction companies acting as subcontractors to either the Project Consortium in the P3 model or to the department or agency in the PSC. Such taxes are included in construction costs and are deemed comparable across procurement models.

The VfM Analysis should include revenues to the department or agency arising from the financial structure of the procurement models. This method ensures consideration of the “net” cost of the P3 model and result in a more accurate net cash flow comparison with the PSC. If a tax is payable on taxable income (i.e. dividend stream) of the Project Consortium under the taxation regime applicable at the moment of preparing the VfM, such revenue must be added to the PSC. The total estimated revenues, based on applicable federal and provincial taxes, is then added to the PSC as part of the competitive neutrality tax adjustment, since the provincial and federal governments will realize the full benefit of these revenues under the P3 model.<sup>2</sup>

#### *4.1.6.2 Payment in Lieu of Taxes*

Any buildings owned by the federal government are subject to payment in lieu of taxes (PILT). This is a payment made by government to compensate jurisdictions where assets are located as the federal government is not subject to property taxes. Jurisdictions apply to Public Services and Procurement Canada for PILT each year. The payment is calculated using the jurisdiction’s base rate and the size of the land and asset owned. For the purpose of our analysis, the building will continue to be owned by the government during the P3 procurement and into operations so PILT will be the same for both the PSC and the P3 model.

It is recommended that these costs be noted in the analysis to accurately reflect whole-of-life costs and to ensure that the asset is affordable.

#### *4.1.6.3 Insurance*

Competitive neutrality adjustments for insurance premiums arise from the differences in insurance practices under traditional and alternative procurements. P3 model costs usually include insurance premiums for mandatory policies that the Project Consortium must undertake to cover its responsibilities. In the case of the PSC, some of these risks tend to be self-insured by the federal government, yet there is an inherent cost to these risks that must be considered. If no insurance premium is included in the PSC to account for the equivalent cost of obtaining insurance coverage in the market, a competitive neutrality adjustment is required. Self-insurance bears a financial cost equal to the market cost of relevant insurance premiums for the purpose of a fair VfM Analysis. Although these market premiums will include a level of profit, it is too difficult to break out the cost of profit and the full premium represents a conservative estimate of the cost of self-insurance. Therefore, the total cost of all relevant premiums must be added to the PSC.

### **4.1.7 Revenues**

Revenues are the cash flows generated from the end users of an asset, such as toll roads. The revenue component needs to be included in the analysis to offset capital, O&M and life-cycle costs. Revenue estimates must be based on market studies and economic data. Depending on the type of asset, revenues may take different forms: toll revenues for a highway, lease revenues for social infrastructure, sale of electricity produced, etc.

It is recommended that studies produced to estimate revenues include inflation and that the same index used in those studies be used in the POA.

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<sup>2</sup> Some Canadian provincial jurisdictions have considered a portion of the federal tax rate for the competitive neutrality adjustment with the view that the province will not experience the full benefit of taxes paid to the federal government.

#### 4.1.8 Retained Risks

All capital investments involve risks that are shared, to some degree, between the public and private sectors, regardless of the manner in which the infrastructure is procured and delivered. When performing the Quantitative Analysis, risks are identified, allocated to the Project Consortium or the department or agency and then quantified. The quantification of risks estimates the value of the risks, which are added to asset costs to allow for the comparison of the risk-adjusted cost of the options being considered. The value of risks is estimated by department or agency staff and external advisors through a robust process that involves historical research, risk workshops and statistical analysis. Below is a summary of the risk quantification methodology. A more detailed description of the methodology is presented in **Annex A**.

Once there is a clear understanding of the scope of the capital investment, the project team assembles in a risk workshop setting to identify all investment risks and allocate those risks to the party best able to manage them. The allocation of risks will be different depending on the selected delivery model. Risks may be: 1) retained by the department or agency, 2) shared by the department or agency and the Project Consortium or 3) completely transferred to the Project Consortium. The typical allocation of risks under traditional and P3 procurements is summarized in **Table 5**.

**Table 5:** Summary of Risk Allocation

Risk	Typical Allocation of Risk	
	PSC (Traditional model)	P3 (Shadow bid) (DBFOM)
Planning, policy and strategic risk	Public sector	Public sector
Land acquisition cost risk	Public sector	Public sector
Procurement risk	Public sector	Public sector
Permitting and approval risk	Public sector	Private sector
Environmental risk	Private sector (except existing soil contamination risk)	Private sector (except existing soil contamination risk)
Existing soil contamination risk	Public sector	Public sector
Design risk	Public sector	Private sector
Construction risk	Shared	Private sector
Operation, maintenance and life-cycle risk	Public sector	Private sector
Financing risk	N/A	Private sector
Revenue risk (if applicable)	Public sector	Public sector or private sector, depending on the type of infrastructure and contractual arrangement

Once the risks have been identified and allocated, the workshop participants then work towards estimating the probability that a risk will occur and the cost impact of the risk if it were to occur. This exercise can be facilitated by using a researched list of risks as well as probability and impact benchmarks produced and maintained by PPP Canada. The outputs of the workshop are compiled into what is referred to as a risk matrix, a sample of which is illustrated in **Annex A, Table 8**. The cost base is the portion of the asset cost that would be impacted if a risk were to occur. For example, the cost base for construction risks is the cost of design and construction. The probability is the estimation of the potential that a risk will occur (expressed as a single percentage between 0 and 100%). The impact of the risk if it occurs is estimated as either:

- A cost value of each individual risk, should it occur, defined in dollars;
- A percentage of the investment expressed in net present value (NPV) before risks;
- A cost of delay on the investment due to the occurrence of the risk.

The outputs of the workshop are entered into an analytical software and a statistical analysis is performed through a Monte Carlo simulation to determine the most likely value of each risk. The values of the risks under each model are summed to produce the values of retained and transferred risks.

Retained risk refers to the estimated cost of the risks the department or agency will be responsible for under the PSC or the P3 model, including a portion of any shared risks (typically assumed to be 50% of the value). The estimated value of retained risks for the PSC and the P3 model must be added to their respective costs. The value of transferred risks results in a cost to the department or agency under the P3 model in the form of a risk premium. Since the value of retained risks allocated to the department or agency can be different between the PSC and the P3 model and is a deciding factor in the procurement option decision, the estimation of the value of risks is a crucial component of the analysis that is further discussed in **Section 4.4.7**.

#### 4.1.9 Residual Value

The monetary value of the asset at the end of the period of analysis is the residual value. The residual value can correspond, for example, to what the department or agency would obtain or pay in a competitive market if it was selling or purchasing the asset at the end of the period of analysis.

While an asset is usually owned outright under the PSC and the P3 model, residual value considerations are usually not included in the analysis. However, in the case of accommodation assets where leasing options are being considered and the ownership status of an asset may change at the end of the analysis period, there may be a need to consider residual value. Residual value assumptions are based on the use of an index of physical deterioration that is plausible and reflects the asset maintenance practices by the department or agency.

For the purpose of this document, residual value will not be included, since it applies only to specific cases. For more information on a recommended approach for how residual value is calculated or treated in a POA, project team representatives are encouraged to consult with PPP Canada.

## 4.2 P3 Model Cost Estimates

Although there are various P3 models, we assume the use of a Design-Build-Finance-Maintain (DBFM) model throughout this section. The P3 model should be compared against the PSC to determine which has the lowest risk-adjusted NPV. The comparison of the two models must be performed on a like-for-like basis and, therefore, many of the elements of the two models will be the same. The P3 model is built from the PSC with some key adjustments and considerations, as outlined below.

One fundamental difference between the two models is the payment method for services rendered. Generally, under the PSC, payments are made as costs are incurred. For example, construction is paid for in full by the end of the construction period, while O&M and life-cycle payments are paid for when work is required and as it is performed.

On the other hand, under the P3 model, only part of the construction costs are paid for by the end of the construction period through Milestone Payments, a Substantial Completion Payment or a combination of the two. Substantial completion is defined as the completion level where the asset may be put in service, even though some minor work, such as landscaping may not be completed.<sup>3</sup> The remainder of the construction costs are financed by the Project Consortium over the long term and repaid by the department or agency. The payments made by the department or agency to repay the long-term financing are referred to as the Capital Annual Service Payment (Capital ASP). This payment is typically broken out into regular monthly or quarterly payments.

In a P3 model, the O&M and life-cycle services are paid for by the department or agency and these payments are referred to as the Non-Capital Annual Service Payment (Non-Capital ASP). Similar to the Capital ASP, the Non-Capital ASPs are made regularly on a monthly or quarterly basis. There is no financing element associated with the Non-Capital ASP.

The total of the Capital ASP and the Non-Capital ASP is simply referred to as the Annual Service Payment (ASP). The calculation of the Capital ASP and Non-Capital ASP is described in greater detail below.

#### **4.2.1 Substantial Completion Payment and Milestone Payments**

The P3 model requires the Project Consortium to use short-term construction financing for a portion of the construction costs that will be repaid by a Substantial Completion Payment or Milestone Payments. A Substantial Completion Payment is a single payment at the end of construction to repay the principal and interest for the short-term financing. Using a single payment at the end of construction anchors the allocation of construction risk with the Project Consortium. In general, if the Project Consortium does not deliver the asset as contractually required, it will not receive payment.

In some instances, Milestone Payments may be used during construction rather than a single Substantial Completion Payment. Typically, Milestone Payments should be used for capital investments that require the construction of distinct assets. For example, if a bundle of buildings are being constructed under a single Project Agreement and the completion of each building will occur at different times, Milestone Payments can be made for the substantial completion of each building rather than the completion of the entire bundle.

Milestone Payments may also be used for large capital investments to reduce short-term financing costs or to increase bankability. It is important, however, to carefully consider and analyze the trade-offs of using Milestone Payments. If the Project Consortium defaults during construction, they may have already received some payments from the department or agency. Milestone Payments will, therefore, limit the transfer of risks to the Project Consortium and can erode VfM, thus negating the benefits for increased affordability or bankability. Insight into the costs and benefits will be obtained from Market Sounding with potential lenders and the risk workshops conducted to quantify risks, as discussed in **Section 4.1.8** and further described in **Annex A**.

The value of the Substantial Completion Payment or Milestone Payments will also impact risk transfer and affordability. Under the P3 model, risks are anchored over the term of the Project Agreement by requiring the Project Consortium to be financially accountable to equity and debt providers. Increasing the value of the Substantial Completion Payment, for example, will improve affordability by reducing the long-term financing costs, but will also reduce the effectiveness of the risk transfer. Therefore, it is important to determine an optimal balance between affordability and the amount of Project Consortium financing in a deal. As a rule of thumb, long-term financing is recommended to be at least 50% of capital costs.

<sup>3</sup> Substantial completion is the point when the contractor has fulfilled all of their obligations relative to the construction period under the terms of the Project Agreement. The work must be totally completed. The only obligation of the Project Agreement or relative to the construction period would be to perform any warranty/guarantee work covered by the warranty provisions.

## 4.2.2 Capital Annual Service Payment

The department or agency must make payments over the term of the Project Agreement to repay the principal amount of the long-term debt as well as interest, equity, dividends and taxes associated with equity repayments. These payments make up the Capital ASP. This structure is necessary to transfer risks to the Project Consortium and ensures that it has financial incentives or “skin in the game” to provide the proposed services through the duration of the long-term Project Agreement.

### 4.2.2.1 Construction Costs

The same base construction costs provided by the cost consultant will be used for the P3 model. However, some additions and adjustments must be brought to these costs in order to reflect the true VfM of the P3 model.

#### 4.2.2.1.1 Private Sector Ancillary Costs

Due to the structure of the P3 model, there are ancillary costs to the Project Consortium. Any such costs will be capitalized and charged back to the department or agency. To reflect this in the P3 model, these costs are included with construction costs and are ultimately repaid in part by the Milestone or Substantial Completion Payments and as part of the Capital ASP.

##### 4.2.2.1.1.1 Legal Costs

Lawyers play a significant role during the procurement phase of a P3. Agreements have to be prepared and reviewed to govern the relationships between multiple parties involved in the bidding process (engineering firms, construction companies, financiers, facility management companies, operators, etc.). Lawyers must also review the Project Agreement, which is a lengthy document, often in the thousands of pages.

##### 4.2.2.1.1.2 Bid Preparation

The scope of P3 procurements increases the amount of work required to prepare bids when compared to the PSC. The Project Consortium must respond to design, construction, financing and O&M requirements, ensuring that each element forms a single, cohesive proposal. This additional effort translates into significant additional costs to the Project Consortium.

##### 4.2.2.1.1.3 Special Purpose Vehicle Costs

The selected Project Consortium will generally constitute a Special Purpose Vehicle (SPV) to undertake P3s, which SPV is usually structured as a limited partnership. There are administrative costs associated with such companies and corporate vehicles that are not present in the PSC. The SPV will also be required to have insurance, as stipulated in the Project Agreement, which coverage should also be included in the SPV costs.

##### 4.2.2.1.1.4 Financing Fees and Financial Guarantees

There are a variety of fees and expenditures associated with financing arrangements and with the provision of other financial instruments, such as letters of credit, which will be required as financial guarantees at different points during the procurement process. These fees can be significant and must be included in the analysis.

##### 4.2.2.1.1.5 Insurance and Bonding

The P3 model includes insurance premiums for mandatory policies that the Project Consortium must undertake to cover its responsibilities. The Project Consortium will also be responsible for providing performance bonds during construction, the cost of which should ultimately be borne by the department or agency.

##### 4.2.2.1.1.6 Reserve Accounts

The Project Consortium will be required to fund a debt service reserve account (DSRA) and may be required to fund a major maintenance reserve account (MMRA). The DSRA creates a cash buffer for periods of lower than expected cash flows and covers debt service obligations (principal and

interest) for 3, 6, 9 or 12 months. The account may be funded, totally or in part, on the last day of construction or built up over time.

A MMRA may be required if there is a significant capital expenditure related to the life cycle of the asset, such as resurfacing of a road or runway, planned lane widening or planned expansion of a wastewater treatment plant. The MMRA is typically required by lenders and will accumulate funds to ensure that sufficient cash is available to cover the required capital expenditures. The target balance may be a fixed amount or may be set at 6, 12, 18 or 24 months of major maintenance costs. The account is funded in the same way as the DSRA.

Assumptions related to the size of the DSRA and MMRA, as well as the manner in which these accounts should be funded, must be developed by the financial advisor for the investment and built into the financial model.

#### 4.2.2.1.2 Construction Efficiencies

Efficiencies relate to both construction and O&M cost savings obtained through the leveraging of private sector experience and expertise that would not otherwise be achievable under a traditional Design-Bid-Build (DBB) model. Efficiencies in P3s materialize through a lower NPV in the construction, operation and maintenance of an asset. Efficiencies often arise from the integration and synergies of various capital investment components in a P3 model as well as the competition and innovation associated with the competitive procurement process.

Although efficiencies are possible under the P3 model, they are not guaranteed. Efficiencies should only be included if they can be substantiated by relevant and reliable historical data, such as data from previous investments, or by expert/professional advice. If the presence or impact of efficiencies is uncertain, then they should be removed from the analysis. A conservative approach such as this helps prevent a situation where the Project Consortium proposes a higher cost than expected, requiring approvals for additional funding. Sensitivity testing must be performed on the efficiencies to ensure that VfM does not become negative if expected efficiencies are not delivered.

#### 4.2.2.2 Inflation

All costs estimated to this point are in real dollars and must be converted into nominal dollars. The same inflation rate used for the PSC must be used for the P3 model.

#### 4.2.2.3 P3 Financing

Differences in financing costs between the PSC and the P3 model are an important consideration when choosing the most effective procurement option. The main difference in costs between the PSC and the P3 model lies in the private sector financing costs. The trade-off is a greater risk transfer to the Project Consortium, resulting in fewer risks retained by the department or agency as discussed in **Section 4.1.8** and described in detail in **Annex A**. The main question of the analysis is, therefore, whether the value of retained risks outweighs the private sector financing costs. Below is an explanation of the elements and factors needed to determine the financing structure and financing costs of the P3 model. **Section 5** describes how to bring together the outputs of the analysis in order to determine which model has the lowest risk-adjusted cost and provides the greatest value to the taxpayer.

Under the P3 model, the Project Consortium usually finances construction costs using a short-term construction loan, equity and long-term debt. Short-term debt will typically amount to the total of the Substantial Completion Payment at the end of the construction. The department or agency will repay the short-term construction loan (principal and interest) with a single payment at substantial completion. As a result, the debt undergoes a simple compounding effect throughout the construction period. For some assets with high construction costs or long construction schedules, it may be difficult or costly for the Project Consortium to carry the short-term debt for the entire construction period. In this case, it may be necessary for the department or agency to make payments based on major construction milestones.



The remaining construction costs will be financed by the Project Consortium using long-term debt and equity. The debt and equity is repaid by the department or agency through the Capital ASP over the term of the O&M period, also referred to as the “concession period” (discussed in **Section 4.3.3**). Long-term debt may be in the form of a bond, in which case the rate would correspond to yield rates or bank debt, with a long-term interest rate. The bond yield or long-term interest rate is typically higher than the short-term loan rates.

In the P3 model, the Project Consortium is expected to invest equity in the project in order to be financially tied to it. In return, the private partner makes a return on its investment, as compensation for the extra risk it has undertaken. In the PSC, the private sector makes a margin on the transaction as a whole, but no return on equity as none is invested. Therefore, equity is treated differently from debt because it represents the financial interest of the private sector. The required post-tax rate of return on equity will vary depending on the risk transferred to the Project Consortium, but is typically between 10 and 15%. The target rate of return on equity is driven by a number of variables, including the debt-to-equity ratio, the amount of free cash flows over debt service required by lenders (debt service coverage ratio or DSCR) and the project-specific risks.

When developing the P3 model, the department or agency will need to make assumptions about how the asset will be financed by the Project Consortium. The following are the main assumptions related to asset financing:

- Type of long-term debt (bank debt versus bond);
- Short-term interest rates;
- Long-term interest rates or bond yield rates;
- Financing fees (e.g. arrangement fees, commitment fees);
- Debt-to-equity ratio (also referred to as “gearing”);
- DSCR;
- Target equity rate of return.

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Assumptions must be developed by an experienced financial advisor and tested through Market Sounding and precedent investments. PPP Canada maintains financial assumption benchmarks that can also be used to test assumptions.

The assumptions used in the P3 model will be subjected to a Sensitivity Analysis. The Sensitivity Analysis (described in **Section 2.4**) will study the financial impact and the impact on VfM if such assumptions need to be modified, holding all else equal.

#### *4.2.2.4 Capital Annual Service Payment Calculation*

When all the costs, assumptions and adjustments are built into the model, the Capital ASP can be calculated using the financial model. This calculation is done under constraint, meaning the Capital ASP is calculated to cover all the associated costs, but also to achieve the target return on equity and the DSCR, which are the main requirements of the equity and debt providers, respectively. This calculation is done using sophisticated financial modelling and is best performed by an experienced financial advisor.

### **4.2.3 Non-Capital Annual Service Payment**

Non-Capital ASPs are the annual payments to the Project Consortium for costs incurred after construction, and they include the O&M and life-cycle costs described below.

#### *4.2.3.1 Operation, Maintenance and Life-Cycle Costs*

Non-Capital ASPs cover O&M and life-cycle costs, which are the same as those used for the PSC. Some additional costs, however, will be incurred by the Project Consortium during this phase related to the ongoing administration and management of the SPV.

As noted earlier, O&M costs are consistent over time, whereas life-cycle costs are lumpy and require capital injections to cover the cost peaks to pay for life-cycle work, such as major maintenance, asset refurbishment and equipment replacement. The requirements for O&M and life-cycle replacement are the same for the PSC and the P3 model, but the cash flows are different. The total of all the Non-Capital ASPs over the term of the Project Agreement must be sufficient to cover all the O&M and life-cycle costs; however, the ASPs must also remain consistent and increase only over time due to inflation. The Project Consortium must, therefore, manage its funds and ensure that sufficient cash is available to perform the required life-cycle work when required. This facilitates the budgeting process by the department or agency, since the payments are known from year to year.

#### 4.2.3.2 Revenues

There may be differences in the ability of the Project Consortium and department or agency to maximize revenue yield over the concession period. For example, public and private sectors are assumed to have different perceptions of their abilities to effectively collect and efficiently price lease charges for commercial space in public buildings. Any differences in revenue estimates between the PSC and the P3 model must be duly documented with appropriate substantiation from market or economic studies. Intended incentives and contractual arrangements to be included in the Project Agreement, such as revenue sharing mechanisms, must be fully documented and supportive of the assumptions used to build the P3 financial model.

The Project Consortium will usually use revenues to lower the requested Availability Payment required to amortize the upfront capital expenditure. In some cases, there may actually be enough revenues for the Project Consortium to pay a fee to the department or agency instead of charging an Availability Payment.

It is preferred that assumptions about revenue risks be duly documented; that is, assumptions about the private partner's willingness to incorporate future revenue streams in any proposal need to be mentioned. Because of uncertainty about revenues, private sector bids may include a premium. Alternatively, revenue concessions, where there are few other options, may encourage the private sector to provide a financial benefit to government in its bids.

#### 4.2.3.3 Operating Efficiencies

Similar to construction efficiencies, if operating efficiencies are included in the P3 model, estimates must be conservative and substantiated by relevant and reliable historical data, such as data from previous investments. Efficiencies must be excluded if there is uncertainty related to expected efficiency rates. Sensitivity testing must also be performed.

#### 4.2.4 Transaction Costs

Transaction costs incurred by a department or agency are typically higher for a P3 when compared to a PSC. The incremental costs are due to the increased level of planning work required to successfully implement a P3 as well as the higher level of complexity of the model. Most common difficulties lie in the development of performance-based output specifications by technical advisors as well as in the financial analysis and in the drafting and review of the voluminous contractual documents.

The procurement process includes both face-to-face and written exchanges with potential private partners. It is, therefore, important to retain the services of a fairness advisor throughout the procurement procedure to ensure that the process is fair and transparent. The services of technical, financial and legal advisors must be retained throughout procurement to answer to questions raised by the bidders and to participate in the evaluation of proposals. Although P3s entail much higher transaction costs, they usually result in more thorough planning and a more diligent management of the procurement process, thus increasing the probability of success. Costs are also offset by the benefits of the P3 model when VfM is generated.

For a comprehensive discussion of the P3 procurement planning and procurement processes, refer to PPP Canada's *Guides for Federal Departments and Agencies: Procurement Options Analysis Development and P3 Procurement*.



### 4.2.5 Honoraria

The cost of preparing a bid for a P3 is significantly higher than for a PSC. Each bidder will spend in excess of a million dollars on design fees, legal fees and other specialist resources to develop a strong proposal. Honoraria are payments made to unsuccessful bidders to partially compensate them for the cost of preparing a bid in response to a Request for Proposals (RFP). The honoraria paid to unsuccessful bidders who submit a compliant bid typically compensate for only a fraction of the actual bid costs, but still provide incentive to the private sector to develop advanced and innovative proposals. The amount of the honoraria is dependent on the complexity and design of the asset.

Honoraria are paid either by the department or agency, or by the selected Project Consortium following financial close. If paid by the selected Project Consortium, the cost of the honoraria must be included in the Capital ASP to be repaid by the department or agency. Payment of the honoraria should generally provide the department or agency with the intellectual property rights to all proposals received, such that all or part of unsuccessful proposals may be used for the current or future investments.

### 4.3 Discounted Cash Flow Considerations

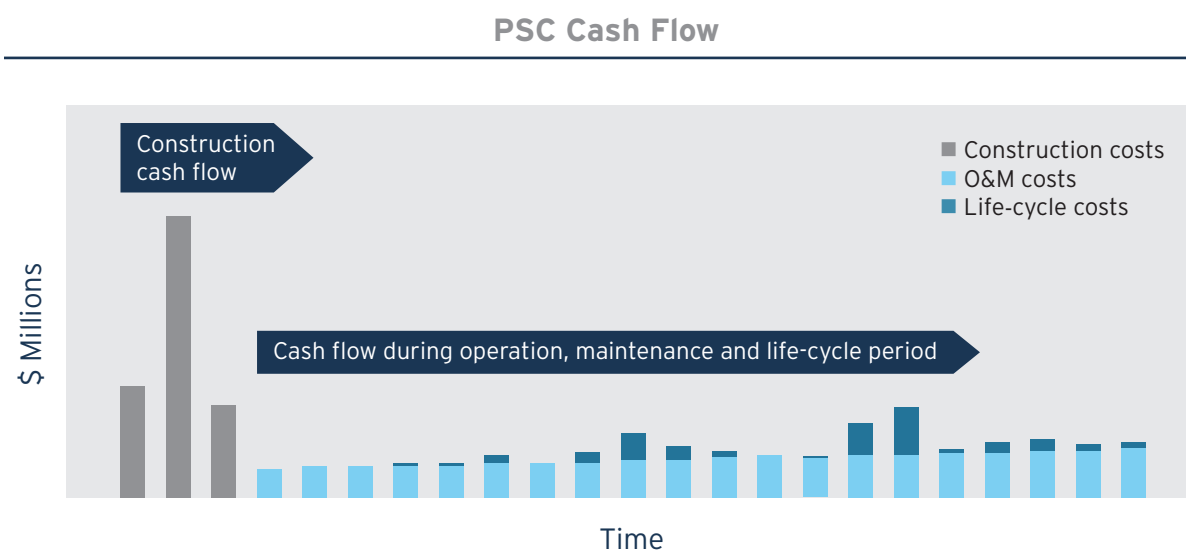
The VfM Analysis compares the NPV of estimated future cash flows corresponding to the PSC and the P3 model. It is necessary to use the NPV because the timing of the accumulation of costs and payments differs across cash flows for different procurement models. The most notorious difference between the PSC and the P3 model regarding construction costs is that construction costs are entirely funded by construction completion for the PSC, whereas a portion of the construction costs are financed over the long term for the P3 model.

The second most notorious difference between the two models is that life-cycle costs are paid as they are incurred under the PSC, while the P3 model entails regular uniform life-cycle payments.

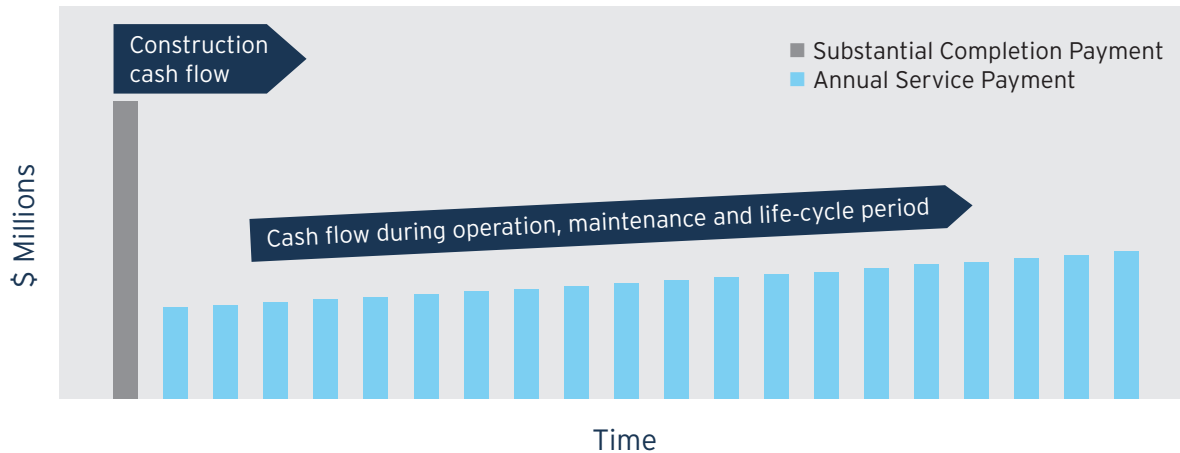
**Figure 4** illustrates the differences in cash flows between the PSC and the P3 model. These differences prevent the proper comparison of cash flows in nominal terms. This is why it is important to use the NPV to obtain an accurate comparison.

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**Figure 4: Cash Flow Profiles**



## P3 Cash Flow



NPV expresses dollar values at a single point in time, known as a “base date”, by the technique of discounting cash flows. The base date is typically the date of the POA report. Discounting enables nominal cash flows that differ in terms of timing and amount to be discounted back to the base date. This operation allows procurement methods with different cash flow impacts to be compared on a like-for-like basis providing objective means of choosing the method that offers the best value in terms of cost.

Bringing cash flows forward or back in time follows the concept of time value of money—the premise that a dollar today is worth more than a dollar in the future. This reflects the opportunity cost of capital: funds available earlier can earn a return or be used for capital expenditures and therefore reduce the associated cost of borrowing.

### 4.3.1 Net Present Value Calculations

Discounted cash flows (DCF) are calculated by summing the net cash flows of each future period. The formula for DCF is:

$$DCF = \sum_{n=1}^N \frac{FV}{(1+r)^n}$$

Where:

FV = Future value

r = Discount rate

N = Number of periods (e.g. annual, semi-annual, monthly)

### 4.3.2 Discount Rate

VfM is calculated using the NPV of cash flows and depends primarily on two variables: the composition of the estimated cash flow stream of the investment and the rate at which these cash flows are discounted (i.e. the discount rate) from future periods to the base date of the analysis, usually the date of the report. If an inappropriate discount rate is used, an inappropriate procurement model may be selected.

As a result, the choice of the discount rate may have a significant impact on the choice of the procurement model: the higher the discount rate, the lower the value attributable to future cash flows. Given the customary design of cash flows in P3 models where the amortization of initial capital expenditures is spread over a longer period of time as opposed to Design-Build (DB) and traditional models, a higher

discount rate reduces the present value of cash flows for P3 procurement models. **Table 6** provides a sample cash flow in nominal terms (inflated at 2%) over 20 years and the NPV of the cash flow using a discount rate of 3 and 6% to illustrate the impact of the discount rate on the NPV.

**Table 6: Discount Rate Impact on Cash Flows**

DISCOUNT RATE		YEAR OF OCCURRENCE									
		0	1	2	3	4	5	10	15	20	Total
3%	Nominal (\$M)	10	10.2	10.4	10.6	10.8	11	12.2	13.5	14.9	257.8
	NPV (\$M)	10	9.9	9.8	9.7	9.6	9.5	9.1	8.6	8.2	190.8
6%	Nominal (\$M)	10	10.2	10.4	10.6	10.8	11	12.2	13.5	14.9	257.8
	NPV (\$M)	10	9.6	9.3	8.9	8.6	8.3	6.8	5.6	4.6	146.9

It is recommended that the discount rate correspond to a risk-free rate based on the cost of borrowing of the Government of Canada for an instrument with an equal life cycle. The risk-free rate is a conservative rate which allows a more reasonable reflection of the opportunity costs of capital for government. The department or agency is making a choice about one investment versus another which is the opportunity cost for the funding reflected by the risk-free rate. The federal government's borrowing rate can be seen as a reflection of society's intertemporal preferences. In private industry, they use a risk-adjusted rate to reflect the risks and the need to make profit when accepting those risks. Furthermore, the federal government has a risk-free borrowing rate so it makes sense for them to also have a risk-free discount rate. The use of a risk-free rate is also consistent with discounting approaches used in other federal POAs.

In other words, the risk-free rate used as the discount rate equals the yield of the Government of Canada benchmark bond with X years to maturity, where X is the concession period. This rate accurately reflects the Government of Canada's borrowing rate and the actual cost of funds for the capital investment. Using the same maturity as concession term to determine the discount rate ensures alignment between the investment and the Government of Canada's borrowing term. When the department or agency is a Crown corporation, a premium may be added to this discount rate to reflect a higher cost of borrowing.

#### 4.3.3 Concession Period

Cash flows are discounted to a base date as discussed above, but it is important to determine how far the cash flows go into the future. The end of the O&M and life-cycle period will determine this. The O&M and life-cycle costs are estimated over what is referred to as the concession period, which is the time between construction completion and the end of the Project Agreement. To ensure a like-for-like comparison between the PSC and the P3 model, the concession period will be the same for both.

The length of the concession period is an important element of the analysis. The life-cycle work to be completed by the Project Consortium and associated risk is dictated by the length of the concession period. The handback of the asset to the department or agency occurs at the end of the concession period, and the asset must be in a condition that meets that quality and performance standards set out in the Project Agreement (additional detail on the handback process and requirements can be found in *P3 Procurement: The Guide for Federal Departments and Agencies*). The Project Consortium, therefore, must perform life-cycle work to help mitigate life-cycle risks and risks related to asset performance during the concession period as well as mitigate the risk of not meeting the handback stipulated requirements at the end of the concession period.

The concession period must be long enough to allow for one major life-cycle replacement of the asset. This responsibility will provide appropriate incentives for the Project Consortium to design, construct

and maintain the asset effectively and ensure that it meets life-cycle expectations. However, it is preferred that life-cycle replacement does not occur near the end of the concession period in order to provide certainty to private partners on the life-cycle expectations when pricing bids. It is also best practice for handback to occur at least five years before any expected life-cycle replacements. This will ensure the department or agency will not incur any significant costs immediately after handback. In light of these timing considerations, it is important for an experienced technical expert to be involved in the determination of an appropriate concession period.

The length of the concession term will have an impact on financing costs, affordability and VfM. The concession period is approximately the same as the amortization period for the long-term debt or the maturity period of a bond and, therefore, will affect financing rates and repayment amounts. The value of the ASP will decrease as the concession period increases, but the financing costs will increase. A lower ASP will make the asset more affordable, but increased financing costs will lower VfM. The financial advisor should work with the technical advisor in order to find an appropriate balance between affordability and VfM taking into account the technical and timing considerations described above.

## 4.4 Sensitivity Analysis

At this point in the analysis, departments and agencies will be able to use the information completed to date in order to identify the preferred procurement option. However, this analysis is only based on a static scenario and resulting probable events and cash flows. A static analysis does not provide a realistic sense of the potential variability in the estimates, but may rather lead to extremely conservative or overly optimistic estimates.

The purpose of the Sensitivity Analysis is to:

- Help identify the key variables which may influence the capital investment total cost;
- Investigate the consequences of likely adverse changes in these key variables;
- Assess whether the capital investment procurement decision is likely to be affected by such changes;
- Identify actions that could mitigate possible adverse effects.

In a Sensitivity Analysis, all variables are kept constant, except for one, with the purpose of evaluating how sensitive the estimated cost of the asset is to variation of that particular variable. For example, efficiencies cannot be the sole source of VfM. As such, the Sensitivity Analysis must be conducted to understand the sensitivity of the VfM if efficiencies are excluded from the calculation. It is also possible to conduct a scenario analysis that combines two or more variables that have been individually analyzed. Some of the variables for consideration are described below.

### 4.4.1 Discount Rate

In order to evaluate the sensitivity of the models with respect to a change in discount rates, all the inputs in both models must be left unchanged and the discount rate must be modified by 25 or 50 basis points. The resulting NPV should then be compared to determine the revised VfM proposition.

The break-even discount rate must also be determined. It corresponds to the discount rate that results in zero VfM.

### 4.4.2 Cost Assumptions

In the baseline cost work, assumptions are developed based on engineering studies, prior similar initiatives, historical costs, etc. A Sensitivity Analysis must be applied to these costs for changing circumstances, order of magnitude, errors in estimations, etc.

### 4.4.3 Cost of Debt

The process to perform a Sensitivity Analysis on the cost of debt is similar to the discount rate. It involves applying percentage changes around the base cost of debt to determine the impact of a change in the cost of debt on the cash flows.

#### 4.4.4 Revenue Assumptions

Revenue assumptions may vary significantly from one investment to another. If the proposed investment includes commercial revenues, particular attention needs to be paid to analyzing the sensitivity of the revenue model to changes in factors such as taxes, demand, segments of clientele, seasonality, etc. Revenue sensitivities are highly dependent on the structure of the revenue model and need to be performed by qualified financial specialists.

#### 4.4.5 Indexation Assumptions

In order to determine the impact of higher or lower inflation than expected on the ASP and on the NPV of both the PSC and the P3 model, a percentage change is applied to construction and operation indexation assumptions over the whole period of analysis.

#### 4.4.6 Private Sector Efficiencies

If private sector efficiencies have been included in the P3 model to adjust cost estimates, it is important to test the case of lower than anticipated efficiencies. In the P3 model, a Sensitivity Analysis is therefore applied on different levels of lower efficiencies, including the worst-case scenario of zero private sector efficiencies.

#### 4.4.7 Risk Valuation

It is important to test the sensitivity of the Quantitative Analysis to the variation of the risk provisions for both public and private risks in the PSC and the P3 model. Risk estimation is an inherently subjective exercise, and the private partner may view the asset being procured as riskier, therefore adding higher risk provisions to their bids. At the same time, sensitivity is run on the risks the department or agency retains in the PSC.

In addition to the above variables, special attention must be paid to financing considerations, including the debt/equity ratios, return on investment and cash flows.

The cash flow structure is the distribution between Substantial Completion Payments and Availability Payments. Determining this structure may be an iterative process until the most efficient distribution is determined. Although this structure may not have much flexibility due to estimated availability of public funding, it is important to consider it on a project-by-project basis. It should be noted that there are trade-offs between a smaller Substantial Completion Payment and higher financing fees, and a larger Substantial Completion Payment and higher private partner risk.

It might be necessary to run numerous simulations. This is the reason why it is important to develop a robust and flexible financial model. The results of the simulations must be duly documented, as shown in **Table 7**.

**Table 7:** Sample Sensitivity Analysis Results

VFM SENSITIVITY	LOW		L/M		BASE		M/H		HIGH	
	Test	VfM	Test	VfM	Test	VfM	Test	VfM	Test	VfM
Debt-to-equity ratio	84%	2.5%	87%	3.9%	90%	5.2%	93%	6.7%	96%	8.1%
Internal rate of return	11%	6.6%	12%	6%	13%	5.2%	14%	4.6%	15%	4%
Discount rate	5.5%	-0.4%	6%	2.5%	6.5%	5.2%	7%	7.9%	7.5%	10.4%
Short-term debt spread	125 bps	6%	175 bps	5.7%	225 bps	5.2%	275 bps	4.9%	325 bps	4.6%
Long-term debt spread	125 bps	9.6%	175 bps	7.5%	225 bps	5.2%	275 bps	3.1%	325 bps	0.9%
Efficiencies	0%	2%	3.5%	3.7%	7%	5.2%	10.5%	6.9%	14%	8.5%

At the completion of this step, the result of the Sensitivity Analysis regarding the VfM should appear clearly, and it should be easy to identify the components that have a greater impact upon the results. Best- and worst-case scenarios should also be examined in depth. This information and insight will be necessary to inform the Integrated Recommendation, as discussed in **Section 5**.

## 5. INTEGRATED RECOMMENDATION

### 5.1 Final Reporting

This section provides recommendations on how the outcomes of the Quantitative and Qualitative Analyses are considered together to make a procurement recommendation.

The Integrated Recommendation summarizes the qualitative and quantitative rationale for the selection of a particular procurement option including the Sensitivity Analysis. The rationale provided is a rich and comprehensive discussion of the outcomes of the Quantitative and Qualitative Analyses. Particular emphasis is placed on those costs or factors which most influence the decision.


The Qualitative Analysis and the risk assessment (part of the Quantitative Analysis) would have identified mitigation measures for various circumstances and risks. These mitigation measures are carried forward and reported in the Integrated Recommendation.

The Qualitative and Quantitative Analyses may not come to the same conclusion about the preferred procurement option. The procurement model with the lowest risk-adjusted net present value (NPV) may not be the most suitable qualitatively because, for example, it may not achieve objectives effectively in the long term or may not be viable under the identified constraints. On the other hand, the procurement model that seems to be the most suitable qualitatively may have an NPV too high to be considered affordable. It is therefore important to analyze the quantitative and qualitative results together to reach conclusions about the preferred procurement model.

In most instances, the quantitative and qualitative results will both favour one option over the other(s) and the preferred procurement recommendation will be clear. For some cases, the recommendation will not be as straightforward.

For some investments, the quantitative and qualitative results will be conflicting; for example, the quantitative results will be favourable and the qualitative results will be unfavourable. In these cases, it will be necessary to re-examine the Qualitative Analysis results and determine what is driving the conclusions. If the qualitative factors are significant and may have a serious negative impact on the asset if it is procured under a certain model, it may be necessary to place greater weight on the Qualitative Analysis results. Since the Qualitative Analysis is inherently subjective, it is important to reconfirm the conclusions from the analysis prior to making a recommendation. This may require further consultation with stakeholders and an examination of the criteria and their ranking to ensure that conclusions remain accurate.

For public-private partnerships (P3s) to be successful, it is necessary for them to generate Value for Money (VfM). If VfM is negative, the P3 is not the preferred option from a quantitative standpoint; it is therefore suggested that the project does not proceed as a P3 regardless of the outcomes of the Qualitative Analysis. If the Qualitative and Quantitative Analyses favour the same option but VfM is marginal (less than 3%), the Sensitivity Analysis is incorporated as a major consideration in the Integrated Recommendation. The variables that affect the VfM the most are examined carefully to determine the potential of VfM dropping below 0%. The Qualitative Analysis may also receive greater weight in the Integrated Recommendation, which may require additional substantiation for the conclusions of that analysis.



The Integrated Recommendation balances the results of the Qualitative and Quantitative Analyses. While the confidence in the conclusions of one of the analyses may be limited due to uncertainties around assumptions or variables, the results of the other supplement those limitations to result in robust conclusions regarding the recommended option. This will require in-depth rationale and evidence for the conclusions reached as well as an understanding of the sensitivities of both analyses.

The information in the Integrated Recommendation or the Procurement Options Analysis (POA) can be utilized in future phases as monitoring tools if any changes to documents and Project Agreements are contemplated in order to ensure that the risk transfer is not negatively impacted and that the VfM is maintained.

## **5.2 Future Phases**

### **5.2.1 Use of the Procurement Options Analysis**

The POA is completed with the writing of an Integrated Recommendation, which takes into account the Qualitative and Quantitative Analyses as well as the risk assessment, and results in a recommendation to pursue a procurement option for the required infrastructure. (See **Figure 1**)

### **5.2.2 Value for Money Refresh**

The VfM Analysis and financial model are not static. Assumptions and estimates underlying the VfM Analysis may evolve throughout the POA development process. Contingencies, risk provisions and risk allocation are the variables most often subject to such changes. Changes in the risk profile (i.e. retained versus transferred) may change following Market Sounding. The VfM is updated to reflect such changes.

New information will also become available during the procurement process that will be used to update and refine the VfM estimate. The first VfM refresh is performed once the selected Project Consortium has been identified at the end of the procurement process. The refresh is performed by integrating the costs proposed by the Project Consortium into the P3 model.

The final VfM refresh is performed immediately after financial close based on the signed Project Agreement and finalized price. A public report is also produced outlining the VfM savings based on this final refresh to ensure transparency of the analysis and demonstrate value for taxpayers.





# **ANNEXES**

## Annex A - Risk Assessment and Quantification

A reasonable valuation of risks and risk premium as part of the Procurement Options Analysis (POA) is a vital factor for the effective evaluation of the procurement options being compared. Not only can it have an impact on the choice of the procurement model, but misestimating investment risks can potentially lead to inappropriate decisions being made with regard to the asset itself or its affordability. It can be useful as a budgeting tool, with risk quantification fed back into capital and operating budgeting decisions.

The objective of the risk assessment is not to maximize risk transfer from the department or agency to the Project Consortium, but to assign risks to the party best able to manage each risk. The transfer of certain risks to the Project Consortium may result in an unacceptably high cost charged back by the Project Consortium. The department or agency aims to optimize the risk allocation in order to maximize the Value for Money (VfM) delivered by the procurement model and the capital investment.

The inputs needed for the risk assessment and quantification include, but are not limited to: a thorough asset definition, scope description and description of known constraints; engineering and technical studies conducted for the capital investment, capital investment schedule, performance-based output specifications, template risk registers and risk benchmarks provided by PPP Canada; and inputs from stakeholders and project managers.

To ensure that risks are estimated accurately, it is recommended that a systematic approach be used. The following describes an approach to risk quantification that is based on industry best practice.

### Risk Workshops

Risk workshops are an excellent tool to identify, assess, categorize and estimate investment risks. The purpose of the risk workshops is to identify, describe, allocate and quantify all relevant potential risks of a capital investment.

During the workshops, the participants review the allocation of risks between the public and private sectors, develop the inputs required for the quantification of risks, namely, the probability of occurrence of each risk, and define a minimum, maximum and most likely (i.e. Mode) impact of each individual risk, in case it occurs. These inputs are then used to quantify each risk based on a Monte Carlo simulation.

### Risk Identification

The first part of this process is the identification of potential risks that may materialize during the period of capital investment analysis. This risk identification process results in the development of a list of risks, often known as a “risk register”, as well as their detailed definitions and descriptions. There is no minimum or maximum number of risks that must be included in the risk register. PPP Canada has developed template risk registers for different sectors that can be used to aid the risk identification process including a generic risk register for investments outside those asset classes.

### Risk Allocation

The objective of risk assessment in public-private partnership (P3) procurements is the efficient allocation of risk: to assign each risk to the party best able to manage them. While each capital investment is unique, the allocation of risks is usually broadly similar from one P3 to another.

**Table 5** in the body of this guide presented the risk allocation according to the procurement option considered. Although it outlines the typical allocation of risk, all capital investments are different and the transfer of certain risks to the Project Consortium may result in an unacceptably high cost charged back by the Project Consortium, referred to as a “risk premium”. The department or agency aims to optimize the risk allocation in order to minimize the risk premium and optimize VfM.

Allocations are assigned in one of three categories:

**Transferred risks** – Risks that are fully allocated to the Project Consortium (e.g. land contamination by the Project Consortium during construction);

**Retained risks** – Risks that are the full responsibility of the department or agency (e.g. delay in gaining initial capital investment approvals);

**Shared risks** – Risks that are the responsibility of both the Project Consortium and the department or agency (e.g. regulatory permits and approvals, utility relocations, etc.). The standard practice is to consider any risk sharing on a 50/50 basis.

In a P3, the actual risk allocation is written into the Project Agreement. It is recommended that the department or agency consult the completed risk register when developing its tender or bid documents to ensure that all risks identified as transferred to or shared with the Project Consortium are written into the agreement. In a P3, the Project Agreement is often amended during the Request for Proposals (RFP) open period, as more asset-specific information is brought forward by bidders. It is important to ensure that the risk register is regularly updated throughout the procurement process, as the Project Agreement evolves throughout commercially confidential meetings (CCMs) and negotiations leading up to commercial close. The updated risk register is used to refresh VfM calculations, ensuring that it is still positive throughout the planning and procurement phases.

## Risk Probability and Impact

The purpose of risk valuation is to assign a dollar value to each risk based on the likelihood and expected impact of the risk if it were to occur. A monetary value must be given to each identified risk in order to correctly reflect the total risk-adjusted cost of an asset. This monetary value is probability adjusted based on the evaluation of the probability that a risk event occurs.

Risk values and supporting calculations are usually determined during risk workshops and documented in a risk matrix. The risk matrix brings together a description of each risk, the likelihood of it happening, the impact of risk event and then a calculation of value of that risk event.

It is recommended that a rigorous approach be used in the estimation of the probability that the risk will occur (expressed as a single percentage between 0 and 100%) and the impact of the risk if it occurs (three impact values [i.e. low, typical and high] required to constitute a triangular distribution). A triangular distribution is the most common distribution used to quantify risks that are viewed as continuous random variables but that are not necessarily normally distributed. A triangular distribution uses the following three parameters to determine the expected value of the cost outcome for each risk:

- Low (10% certain that if the risk occurs, it will cost no more than this minimum);
- Typical (usually defined as the “mode”, i.e. the value that is the most likely to occur);
- High (90% certain that if the risk occurs, it will cost less than this maximum).

Triangular distributions may be skewed, meaning that the values are not necessarily equally distributed around the mean, unlike symmetrical normal distributions. For example, a geotechnical risk may be a negative amount for the minimum data point (contingencies are deemed conservative and the actual expense required may be lower than the budgeted amount), \$0 at the median (contingencies are deemed adequate) and a positive amount for the maximum data point to account for the possible expense in excess of standard capital investment budget plus contingencies. The minimum, median and maximum values of the individual risk impacts can be calculated based on either:

- A cost value of each individual risk, should it occur, defined in dollars;
- The effect of the costs in the event that the risk occurs.

Every risk must be allocated to at least one cost base. The cost base refers to the costs associated with each phase, expressed in net present value (NPV) terms, obtained directly from the financial model. In general terms, the cost base is one or more of the following: total contract, design and construction. For example, the appropriate cost base for the risk of construction cost overruns would be design and construction. In the context of developing the capital investment risk matrix, it is important to ensure that the cost base values are “live-linked” directly to the financial model such that updates to cost estimates are appropriately reflected in the risk matrix on a continuous basis.

In many models, the inclusion of risk premiums and efficiencies creates distinct variances between the cost estimates for the Public Sector Comparator (PSC) (traditional model) and the P3 model (shadow bid). In this context, it is important to ensure that the risk matrix presents two cost bases to appropriately account for the differing costs under the PSC and the P3 model.

Quantification of key risks considers the level of progress in the planning and the risks over and above contingencies that are already included in the asset costs. Once quantified, risks are expressed in NPV terms but can be presented in nominal or real terms during the workshops and subsequently converted into present values for the purpose of the like-for-like comparison between procurement models. The outcome of this process is a completed risk matrix. The following is a sample excerpt of a risk matrix.

**Table 8: Sample Risk Matrix Excerpt**

RISK CATEGORY	COST BASE	RISK ALLOCATION	PSC (TRADITIONAL MODEL)				P3 (SHADOW BID) (DBFOM)			
			PROBABILITY %	IMPACT			PROBABILITY %	IMPACT		
				MIN (10 <sup>TH</sup> PERCENTILE)	TYPICAL	MAX (90 <sup>TH</sup> PERCENTILE)		MIN (10 <sup>TH</sup> PERCENTILE)	TYPICAL	MAX (90 <sup>TH</sup> PERCENTILE)
Construction										
Construction delays	Design and const.	Public, private or shared	90%	1%	2%	5%	50%	0%	0.5%	1%
Force majeure	Design and const.	Public, private or shared	1%	2%	3%	5%	1%	2%	3%	5%
Latent defects	Design and const.	Public, private or shared	5%	1%	2%	5%	5%	1%	2%	5%
Failure to build to design	Design and const.	Public, private or shared	1%	1%	2%	5%	1%	1%	2%	5%
Resource availability	Design and const.	Public, private or shared	2%	0.5%	0.75%	1%	2%	0.5%	0.75%	1%
Acceleration to maintain schedule	Design and const.	Public, private or shared	75%	1%	1.5%	2%	50%	2%	3%	5%

## Risk Valuation

The value of each risk will be the product of the cost base in NPV terms, the probability estimate and the expected mean impact (as calculated using the Monte Carlo simulation), as follows:

Quantified Risk (QR) = Cost Base x Probability x Impact

The subsequent step is to allocate the value of each risk to the appropriate party (i.e. department or agency, Project Consortium or shared). The user can then aggregate the value of all risks associated with the federal government to determine the total value of risk retained by the department or agency throughout the entire project, under each procurement model.

## Monte Carlo Simulation

Once the probability and impact ranges have been estimated for each risk through the risk workshop process, statistical analysis using Monte Carlo simulation is conducted to determine the risk distribution. The main objective of the Monte Carlo simulation is to define the impact of each individual risk under each procurement model using the low, typical and high data points selected during the risk workshop. The three data points are used to define the boundaries of a random probability distribution, typically a triangular distribution that will be determined using a statistical software such as @Risk or Crystal Ball. The software will run a simulation (e.g. 10,000 iterations) to determine the impact distribution for each risk.

## Integrating Risk Values Into the Public Sector Comparator and the P3 Model

Once the identified risks have been quantified, their value can be integrated into both the PSC and P3 cash flow financial model, in order to compare procurement models on a risk-adjusted basis. The procedure for inclusion of quantified risks is as follows:


**PSC:** Risks related to the PSC are valued from the perspective of the department or agency and include the risks that would be retained as well as half of the shared risks. The NPV of these risks is added directly to the NPV of the PSC cash flows.

**P3 model:** Risks related to the P3 model are valued from the perspective of the department or agency and include the risks that would be retained, half of the shared risks plus a risk premium. The NPV of these risks and the risk premium is added directly to the NPV of the P3 cash flows.

## Risk Premium

A risk premium is an additional cost or contingency that a Project Consortium will add to its bid submissions to account for risks that have been allocated to it in a P3 transaction. The risk premium represents actual and real costs that are paid by the department or agency through Availability Payments or Annual Service Payments (ASPs) over the term of the P3 contract. However, the value of a risk premium does not fully reflect the value of transferred risk due to the following two factors:

- **Private sector risk management** – The P3 model allocates risks to the party best suited to manage them. The risks allocated to the private sector are those that it can control and has experience managing. If this is done effectively, the value attributed to those risks by the private sector will be valued less (or at times completely discounted) than what would otherwise be estimated if it were undertaken by the public sector. The private sector will typically add risk premiums for risks that it is unable to effectively control or insure, but has been allocated.
- **Competitive procurement process** – The competitive nature of the Canadian P3 procurement process provides the necessary incentive for private sector bidders to submit innovative bids that minimize their risk through mitigation measures in order to include the lowest possible risk premiums.



The value of the risk premium varies based on the complexity of the asset, market conditions and the quantum of transferred risks. Within a Canadian P3 context, the approach to the estimation and application of risk premiums varies across jurisdictions. Despite these differing approaches, the overriding principle between jurisdictions remains consistent—a risk premium is added to the shadow bid base costs to reflect the additional risks transferred to the Project Consortium under a P3 procurement model and this value is most commonly estimated using a heuristic or risk-modelling approach.

PPP Canada can assist departments and agencies when estimating risk premiums by providing guidance with respect to risk and efficiencies. The Corporation recommends several acceptable approaches, including the combination of a standard risk premium of 0 to 5% on construction costs for Design-Build-Finance-Maintain (DBFM) and Design-Build-Finance-Operate-Maintain (DBFOM) models and a quantification of atypical risks of investment-specific risk workshops.

### **Mitigation Strategies**

The next step is to develop potential strategies or actions that could be taken to reduce or eliminate the risk. Such strategies are carried forward and used in the POA as considerations to change the risks. The cost effectiveness and reasonableness of the proposed mitigation measures can be confirmed and challenged by examining circumstances in previous procurement approaches. It will also be useful information for managers during the tendering process or the construction/implementation process.

## Annex B - Glossary

This glossary contains definitions for terms commonly used throughout the present guide. Definitions for other terms may be defined by context within the document.

<b>External advisor</b>	External team member engaged by the department or agency to provide specialty advice and guidance to the federal team through the public-private partnership (P3), from definition to close out.
<b>Fairness advisor</b>	Helps to ensure fair, open and transparent competition for participants.
<b>Federal team</b>	Core team of dedicated federal government personnel focused on the public-private partnership (P3) procurement representing the department or agency and other identified groups.
<b>Financial advisor</b>	Provides financial advice for a transaction.
<b>Legal advisor</b>	Provides legal advice for a transaction.
<b>Market Sounding</b>	The Market Sounding informs the market of the impending procurement, providing an outline of the asset, including the potential procurement process and the commercial structure to prospective private sector partners and sector specialists. The aim of the Market Sounding is to receive feedback from the private sector on various aspects of the opportunity, including testing or confirming assumptions, provide an opportunity to identify issues of concern from the private sector's perspective and receive early intelligence on the potential level of interest the public-private partnership (P3) could attract in the market.
<b>Net present value (NPV)</b>	Sum of the present values of cash flows over a period of time reflecting the time value of money.
<b>Output specifications</b>	Technical specifications and requirements upon which Project Consortia are invited to bid, leaving them with the responsibility for determining how to best deliver those requirements and allowing for discretionary innovation. Output specifications are set out by the department or agency.
<b>Preferred proponent</b>	Single highest ranking Project Consortium selected at the end of the Request for Proposals (RFP) evaluation process for negotiation to reach commercial close and financial close.
<b>Procurement Options Analysis (POA)</b>	The POA identifies and assesses a range of procurement models. The intent is to recommend an appropriate procurement methodology that best achieves investment objectives and Value for Money (VfM). The POA will start with a rationale and then proceed to a plan for the execution of the investment, including strategic alignment, transaction structure, procurement process and investment governance.
<b>Procurement strategy</b>	Element of the Procurement Options Analysis (POA) that outlines the department or agency's policies and guidelines with regard to procurement. In addition, it details procurement staging (Request for Qualification [RFQ], Request for Proposals [RFP], etc.), information release, Project Consortium engagement, Project Consortium compensation, governance, bid response, applicant-private partner interaction and an evaluation procedure. Timing is also addressed as per the implementation strategy.

<b>Project Consortium (Project Co.)</b>	In the context of a public-private partnership (P3), these terms are used to refer to the commercial entity established to fulfill the private sector's obligations under the Project Agreement, also known as the "Special Purpose Vehicle" (SPV). This entity, which could take many forms, including that of a corporation or a partnership, will have no pre-existing assets or liabilities and will typically be owned by equity providers of the winning consortium. Lenders, designers, constructors, and operation and maintenance (O&M) contractors are all contractually related to this entity.
<b>Proponent</b>	Participant in the bidding process for a public-private partnership (P3).
<b>Public-private partnership (P3)</b>	Total costs (capital base costs, financing costs, retained risks and ancillary costs) to deliver an asset under a public-private partnership (P3) model, risk adjusted and typically measured on a net present value (NPV) basis.
<b>Public Sector Comparator (PSC)</b>	Total costs (capital base costs, financing costs, retained risks and ancillary costs) to deliver an asset under a traditional model, risk-adjusted and typically measured on a net present value (NPV) basis.
<b>Risk transfer</b>	Risks arise in all assets, irrespective of the approach adopted. In a public-private partnership (P3), risks are transferred to the party best able to manage them, thereby reducing financial consequences by leveraging private sector expertise.
<b>Shadow bid</b>	Cash flow model that details the life-cycle cost of a capital investment based on the use of the public-private partnership (P3) procurement method under consideration and that is developed for comparison to the Public Sector Comparator (PSC) for that investment.
<b>Special Purpose Vehicle (SPV)</b>	In the context of a public-private partnership (P3), these terms are used to refer to the commercial entity established to fulfill the private sector's obligations under the Project Agreement, also known as "Project Consortium". This entity, which could take many forms, including that of a corporation or a partnership, will have no pre-existing assets or liabilities and will typically be owned by equity providers of the winning consortium. Lenders, designers, constructors, and operation and maintenance (O&M) contractors are all contractually related to this entity.
<b>Substantial completion</b>	Point at which the construction phase has been completed in accordance with the Project Agreement (but for minor deficiencies), the department or agency may begin operations in the facility, the services phase may begin, all equipment has been installed, any applicable occupancy permits have been issued and all specific requirements for substantial completion described in the commissioning program have been satisfied.
<b>Technical advisor</b>	Provides advice on such items, including design and construction, performance specifications and asset-handback requirements.
<b>Treasury Board (TB)</b>	The TB is a Cabinet committee of the Queen's Privy Council of Canada and is responsible for accountability and ethics, financial, personnel and administrative management, comptrollership, regulations approval and most orders-in-council. The formal role of the president is to chair the TB. He carries out his responsibility for the management of the government by translating the policies and programs approved by Cabinet into operational reality and by providing departments with the resources and the administrative environment they need to do their work.



<b>Treasury Board Secretariat (TBS)</b>	As the administrative arm of the Treasury Board (TB), the TBS has a dual mandate: to support the TB as a committee of ministers and to fulfill the statutory responsibilities of a central government agency. The TBS makes recommendations and provides advice to the TB on policies, directives, regulations and program expenditure proposals with respect to the management of the government's resources. Its responsibilities for the general management of the government affect initiatives, issues and activities that cut across all policy sectors managed by federal departments and organizational entities. The TBS is also responsible for the comptrollership function of government.
<b>Value for Money (VfM)</b>	A VfM is the comparison between the Public Sector Comparator (PSC) and the public-private partnership (P3) model. The incremental difference between the PSC and the P3 model is referred to as the "Value for Money" (VfM). If the P3 model costs are less than the PSC, there is positive VfM to the taxpayer by procuring the asset using the P3 model.



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875 HERON ROAD REHABILITATION  
PROJECT – TECHNICAL ADVISOR

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APPENDIX N – EXTRACT OF THE FEASIBILITY REPORT FINAL R03 EXECUTIVE SUMMARY



**875 Heron Road**

# **FEASIBILITY REPORT**

875 Heron Road, Ottawa, Ontario

## **Final (r03)**

ISSUED TO:

**PSPC**

Ahmed Elsayed  
Project Manager

**R.053081.201**

PREPARED BY:

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Approvisionnement  
Canada

DATE ISSUED :

**24 FEB 2018**

# 1 Executive Summary

## 1.1 Introduction

The 875 Heron building was built in 1970 to house the Canada Revenue Agency (CRA) headquarters and data centre. It was designed by Page & Steele and Moody Moore and Partners Architects. It comprises the eleven (11) storey Taxation Data Centre, and the five (5) storey Taxation Headquarters. The buildings are physically linked at grade and below, and there is also a two-storey Cafeteria Pavilion (Canteen). Based on its heritage qualities and its prominent placement within Confederation Heights, the building has been identified for modernization as a general purpose office building for the next 25 years as a minimum. Recently the Government of Canada (GoC) has approved an enhanced greening initiative and 875 Heron Road has been selected as a pilot project to explore the feasibility of achieving a higher benchmark for sustainability. 875 Heron Road is considered a good example of a crown-owned mid-rise type building common to Real Property's NCA asset portfolio. Similar to many of the buildings in this portfolio, 875 Heron is due for a major recapitalization project as most of the systems in the building are or have reached the end of their service life.

DFS Inc. architecture & design was retained by PSPC as the Architects and Prime Consultants for the preparation of a Feasibility Study on the 875 Heron Road Building to evaluate options for two general scenarios:

1) rehabilitating the existing building or demolishing the existing building and 2) reconstructing a new building of similar size and quality. Within each scenario, a number of design options have been developed with increasing performance targets. As a minimum requirement, both the rehabilitation and the new building options must meet the requirements of the Technical Reference for Office Building Design (TRFOBD) and enhanced options are included for each scenario to evaluate the additional requirements to exceed the TRFOBD for long term sustainability excellence. Recommendations are to be based on information provided in existing reports, as well as, energy modelling and life-cycle cost analyses by the consultant team.

This revised report now includes a Status Quo option and Option 1C has been split, with Option 1D being the same as the original Option 1C and the revised Option 1C excludes the proposed parking garage structure and regenerative elevators.

## 1.2 Existing Conditions

As the building was built in the early 1970's, it should have been designed and constructed according to the 1960 National Building Code of Canada (NBCC). Over the years, 875 Heron has undergone numerous renovations, repairs and upgrades; however, the original structural system and construction remain unchanged. The existing structural systems are able to meet the strength requirements outlined in the PSPC Seismic Policy, but the lower "headquarters building" is at risk of damage due to pounding in an earthquake as the building is constructed as three separate structures with minimal separation. Further, the Operational & Functional Components (OFCs) such as the terra cotta masonry walls, mechanical equipment and piping require special attention in order to meet life-safety requirements and the PSPC policies.

Similarly, the building envelope has in large part remained unaltered, which has ensured that the character defining elements (CDEs) have not been significantly impacted or lost. Similarly, the interior has remained as originally constructed with relatively minor modifications to the open office areas over the years.

This Feasibility Study will take into account a number of past and more recent building condition and seismic reports and summarize the current condition of the various building systems. It will analyse, assess, conclude and recommend next steps in order to rehabilitate the building and propose equivalent solutions for new construction options.

## Executive Summary

## Federal Policy Framework

### 1.3 Federal Policy Framework

Federal policy provides numerous guidelines and standards, which would apply to this building and have informed both the rehabilitation and demolition options. At this time, the official designation for this building has not been announced. However, FHBRO considers that the complex has “Potential Heritage Value”, because of its historical associations, and its architectural and environmental values. It is anticipated that the *Standards and Guidelines for the Conservation of Historic Places in Canada* apply to the rehabilitation options, while the *Procedure for the Stewardship of Federal Heritage Buildings* applies to the demolition options. It should be noted that public consultation about disposal of the existing building will be required whether or not the building has heritage status. The Technical Reference for Office Building Design (TRFOBD) provides the overall framework for all of the options and encompasses the goals of Real Property Sustainability Framework (RPSF) and the Federal Sustainability Federal Sustainable Development Strategy (FSDS) including LEED targets and reduction of GHG emissions.

*Refer to Section 4 for a complete summary list of all relevant federal policies.*

Based on our analysis, all of the options meet the major TRFOBD targets identified for each of the options as summarized in the table below:

**Table 1.2-T1:** Minimum Performance Summary Table

Target	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish and Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
<b>Minimum 40% GHG reduction as compared to 2005-2006 baseline for the existing building</b>							
<b>Construction waste diversion minimum target of 75%</b>							
<b>Conserve potable water and install water metering</b>							
<b>Manage storm water run-off</b>							
<b>Maximize daylighting and views</b>							
<b>Comply with CSA-S478-95 Guidelines on Durability in Buildings.</b>							
<b>LEED Silver or 3 Green Globes</b>							
<b>LEED Gold or 4 Green Globes</b>							
<b>LEED Platinum or 5 Green Globes</b> <i>(Required for Options 1C.1, 1C.2, 2B and 2C only)</i>							
<b>Minimize energy consumption and GHG emission so that with the addition of on-site renewable energy the site could be carbon neutral.</b> <i>(Required for Options 1C and 2C only)</i>			***	*			**

\*\*\* The results of the Option 1C energy model show that an area of approximately 25,432m<sup>2</sup> of photovoltaics would be required for the site to carbon neutral.

\* The results of the Option 1D energy model show that an area of approximately 24,851m<sup>2</sup> of photovoltaics would be required for the site to carbon neutral.

\*\*The results of the Option 2C energy model show that an area of approximately 24,073m<sup>2</sup> of photovoltaics would be required for the site to carbon neutral.

## 1.4 Scenarios and Options

This feasibility study will consider two (2) scenarios: rehabilitate the existing buildings and demolish the existing building and construct a new building on the site. For each scenario, there are three (3) options to be explored as part of this feasibility report identifying the various interventions proposed for each. The scenarios and their options are further described in Section 2.3 – Scope of Work as Described in the TOR.

The following is a summary description of the two (2) scenarios and then their associated options that are to be studied:

- **Scenario 1 – Renovate Existing Buildings**
- **Scenario 2 – Demolish and Build New** (replace with buildings of similar size and function)

Within each scenario, three (3) options are to be developed with increasing performance targets, as well as, overall sustainability goals in support of social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness. It is important to note that the requirements for the three (3) options are slightly different between the two (2) scenarios of renovating the existing buildings and building new. These differing requirements have been highlighted below. The targets of each scenario and their options are as follows:

### 1.4.1 Scenario 1 – Renovate Existing Buildings

- **Option – Status Quo**
  - Implement the 5 year and 30 year program of work as described and estimated in the Building Condition Report (BCR).
- **Option 1A – Rehabilitate to meet Minimum Departmental Standards**
  - Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)
  - Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)
  - Meet/certify to **LEED V4 Silver. 3 Green Globes** or equivalent
  - Achieve an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **24%**
  - Reduce GHG emissions by 40% compared to 2005 emissions
- **Option 1B – Rehabilitate to Achieve Cost-Neutral ((25 years) GHG Emission Reductions)**
  - Exceeds Option A requirements
  - *Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)*
  - *Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
  - Meet/certify to **LEED V4 Gold. 4 Green Globes** or equivalent
  - Include measures that improve energy performance and reduce the greenhouse gases emitted by the facility. The best option will result in a positive NPV on the incremental cost (compared to option 1), when calculated over the lifecycle identified for the project (at a minimum 25 years, and longer periods where justified). Priority is given to energy conservation, before fuel switching alternatives are considered for reducing GHG emissions.
- **Option 1C – Balanced Sustainability**
  - Exceeds Option B requirements
  - *Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)*
  - *Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
  - Meet/certify to **LEED V4 Platinum** or equivalent
  - Attain carbon neutrality while excluding the purchase of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to balance the GHG emitted in the energy consumed by the building. Priority should be given to reducing emissions through improved

## Executive Summary

## Scenarios and Options

energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.

- Represents leading edge upgrades including clean energy.

- **Option 1D – Renewable Investment** (Design to Achieve Maximum GHG Emission Reductions)

- Exceeds Option 1B requirements
- Exceeds Option 1C requirements with the inclusion of a parking garage structure and regenerative elevators
- *Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- *Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- Meet/certify to **LEED V4 Platinum** or equivalent
- Attain carbon neutrality while excluding the purchase of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to balance the GHG emitted in the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.
- Represents the maximum in sustainability design and features, including a parking garage structure and regenerative elevators.

#### 1.4.2 Scenario 2 – Demolish and Build New

(replace with buildings of similar size and function)

- **Option 2A – Minimum Performance**

- Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)
- Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)
- Meet/certify to **LEED V4 Gold, 4 Green Globes** or equivalent
- Achieve an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **28%**
- Reduce GHG emissions by 40% compared to 2005 emissions

- **Option 2B – Design to Achieve Cost-neutral (25 years) GHG Emission Reductions**

- Exceeds Option 2A requirements
- *Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- *Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- Meet/certify to **LEED V4 Platinum, 5 Green Globes** or equivalent
- Include measures that improve energy performance and reduce the greenhouse gases emitted by the facility. The best option will result in a positive NPV on the incremental cost (compared to option 1), when calculated over the lifecycle identified for the project (at a minimum 25 years, and longer periods where justified). Priority is given to energy conservation, before fuel switching alternatives are considered for reducing GHG emissions.

- **Option 2C – Design to Achieve Maximum GHG Emission Reductions**

- Exceeds Option 2B requirements
- *Compliance with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- *Compliance with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- **Exceed LEED V4 Platinum, 5 Green Globes** or equivalent
- Attain carbon neutrality while excluding the purchase of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to balance the GHG emitted in the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.



## 1.5 Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options

The following summarizes the detailed Scenario 1 option descriptions provided in Section 5 – Feasibility Options, as well as, Section 7.4 - Options Analysis Matrix in the report.

### 1.5.1 Option – Status Quo

The Status Quo option implements the 5 year and 30 year program of work as described and estimated in the Building Condition Report (BCR). This option was included as a matter of due diligence. Upon review the Status Quo option has been deemed non-feasible since this option does not address the issue of designated substances throughout the building nor will it meet the new GOC sustainability targets. As such, this option will not be further considered.

### 1.5.2 Option 1A – Rehabilitate to meet Minimum Departmental Standards

Option 1A has been developed as the baseline for comparison as it is to achieve the minimum requirements for the project. The following summarizes these requirements:

- ☐ Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)
- ☐ Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)
- ☐ Meet/certify to **LEED V4 Silver, 3 Green Globes** or equivalent
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **27% (24% minimum requirement)**
- ☐ Reduces GHG emissions by **54%** compared to 2005-2006 emissions (**40% minimum requirement**)

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 1A has been developed with numerous design features, which have been summarized below. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

#### Site

- ☐ The existing parking areas would be replaced with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- ☐ Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- ☐ Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.
- ☐ Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- ☐ **Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.**
- ☐ Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.
- ☐ **Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.**

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options**

- Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.

**Water**

- Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.
- Low flow fixtures will be installed through the building to reduce potable water consumption by 30% for transport, which will reduce energy consumed to produce potable water.
- Advanced water metering.

**Envelope**

- Existing building envelope thermal resistance value of the walls will remain as existing and the roofing systems will be replaced (end of service life) with a thermal resistance value of Roof R30. The existing effective thermal resistance values are estimated at R9.51 (Headquarters) or R16.42 (Data Centre) for walls and R31 for the roof. *It is important to note that effective R-values take into account the affect of thermal bridging of the existing design.*
- Replace existing windows with a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.
- Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.

**Lighting**

- The existing lighting (end of service life) will be replaced with LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.
- Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.

**Ventilation**

- Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.
- Economizer mode on dampers controlling fresh air intake.
- More efficient motors (end of service life) will provide reduction in energy consumption.
- Induction system with VAV for central zones
- Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (enthalpy wheel) to recover heat from the exhaust air (75%). The general and sanitary exhausts will need to be centralized and combined for this purpose.
- Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.
- Variable speed fans provide an opportunity to reduce energy consumption when demand is less.
- Existing overhangs and side fins will be retained to offer solar shading during the summer to reduce cooling loads and associated energy consumption.

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options****Materials**

- ☐ Low VOC, high recycled content, locally manufactured products will be used as part of the project.
- ☐ Construction waste management will require a minimum of 75% of the project construction waste be diverted from the landfill.

**Indoor Environmental Quality**

- ☐ Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.
- ☐ Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.

**Health and Wellness**

- ☐ *None targeted as the baseline.*

**Energy**

- ☐ *None targeted as the baseline.*

**Operations and Maintenance**

- ☐ Basic commissioning of systems is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, lighting, controls, etc. are functions as designed.
- ☐ Life Cycle Assessment (LCA) is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

Option 1A – Rehabilitate to meet Minimum Departmental Standards	
PROS	CONS
<ul style="list-style-type: none"> <li>- Tangible and intangible heritage of the building are maintained</li> <li>- Narrow floor plate allows for high levels of daylighting</li> <li>- Lowest embodied energy and construction waste</li> <li>- Energy reduction of <b>27%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>54%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Silver</li> </ul>	<ul style="list-style-type: none"> <li>- Narrow floor plate and low floor to floor height limit flexibility and adaptability</li> <li>- Increased complexity to integrate heritage considerations, improved sustainability and universal access</li> </ul>
[Redacted from Feasibility Report]	
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## Executive Summary

## Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options

**1.5.3 Option 1B – Rehabilitate to Achieve Cost-Neutral ((25 years) GHG Emission Reductions)**

Option 1B has been developed based on Option 1A with additional features to meet the increased performance requirements summarized below:

- ☐ Exceeds Option 1A requirements
- ☐ *Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- ☐ *Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- ☐ Meet/certify to **LEED V4 Gold, 4 Green Globes** or equivalent
- ☐ Include measures that improve energy performance and reduce the greenhouse gases emitted by the facility. The best option will result in a positive NPV on the incremental cost (compared to Option 1A), when calculated over the lifecycle identified for the project (at a minimum 25 years, and longer periods where justified). Priority is given to energy conservation, before fuel switching alternatives are considered for reducing GHG emissions.
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **62%**
- ☐ Reduces GHG emissions by **88%** compared to 2005-2006 emissions

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 1B has been developed with numerous design features, which have been summarized below. A number of energy reducing design features were evaluated based on their Life Cycle Cost Assessment (refer to Appendix E – Life Cycle Cost Estimates of this report for the detailed assessments) to determine if they have a payback within 25 years and should be included in this option. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

**Site**

- ☐ The existing parking areas would be repaved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- ☐ Parking area reduced to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.
- ☐ Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- ☐ **Community gardens for building occupants or others to support local food growth.**
- ☐ **Passive and active outdoor activity areas to promote activity and health eg. Yoga, volleyball, basketball, jogging, walking, birdwatching, etc.**
- ☐ **Favour planting that supports pollinators.**
- ☐ *The existing parking areas would be replaced with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.*
- ☐ *Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.*
- ☐ *Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.*
- ☐ *Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- ☐ *Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.*
- ☐ *Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.*
- ☐ *Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections,*

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options**

*benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.*

- *Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.*

**Water**

- *Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- *No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.*
- *Low flow fixtures will be installed through the building to reduce potable water consumption by 30% for transport, which will reduce energy consumed to produce potable water.*
- *Advanced water metering.*

**Envelope**

- *Existing building envelope thermal resistance value of the walls will be increased to Wall R50 and the roofing systems will be replaced (end of service life) with a thermal resistance value of Roof R30. The wall composition will be improved from the interior to avoid impacting the existing exterior cladding (character defining element (CDE)) of the building. The existing effective thermal resistance values are estimated at R9.51 (Headquarters) or R16.42 (Data Centre) for walls and R31 for the roof. It is important to note that effective R-values take into account the affect of thermal bridging of the existing design.*
- *Replace existing windows with a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.*
- *Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.*

**Lighting**

- *The existing lighting (end of service life) will be replaced with LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.*
- *Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.*

**Ventilation**

- *Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose.*
- *Energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility.*
- *Fancoil to recover heat from equipment rooms.*
- *Low velocity ventilation system reduces energy consumption related to air transportation throughout the building.*
- *Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.*
- *Economizer mode on dampers controlling fresh air intake.*
- *More efficient motors (end of service life) will provide reduction in energy consumption.*
- *Induction system with VAV for central zones*

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options**

- ☐ *Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.*
- ☐ *Variable speed fans provide an opportunity to reduce energy consumption when demand is less.*
- ☐ *Existing overhangs and side fins will be retained to offer solar shading during the summer to reduce cooling loads and associated energy consumption.*

**Materials**

- ☐ Construction waste management will require a minimum of **90%** of the project construction waste be diverted from the landfill.
- ☐ *Low VOC, high recycled content, locally manufactured products will be used as part of the project.*

**Indoor Environmental Quality**

- ☐ *Biophilic design to introduce Nature themes and planting in the building, which can be achieved by provide natural light, views to the exterior/nature, adding plants, introducing natural materials, as well as , images of nature and water features.*
- ☐ *Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.*
- ☐ *Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.*

**Health and Wellness**

- ☐ *Promote stairs by making them more inviting to use.*

**Energy**

- ☐ *None targeted.*

**Operations and Maintenance**

- ☐ Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.
- ☐ Life Cycle Assessment (LCA) to exceed industry norm by 20% is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.
- ☐ Tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address these issues to improve occupant health and wellness.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

## Executive Summary

## Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options

Option 1B – Rehabilitate to Achieve Cost-Neutral ((25 years) GHG Emission Reductions)	
PROS	CONS
<ul style="list-style-type: none"> <li>- Tangible and intangible heritage of the building are maintained</li> <li>- Narrow floor plate allows for high levels of daylighting</li> <li>- Lowest embodied energy and construction waste</li> <li>- Energy reduction of <b>62%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>88%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Gold</li> </ul>	<ul style="list-style-type: none"> <li>- Narrow floor plate and low floor to floor height limit flexibility and adaptability</li> <li>- Increased complexity to integrate heritage considerations, improved sustainability and universal access</li> <li>- Increased complexity to achieve the sustainability targets</li> </ul>
[Redacted from Feasibility Report]	
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#### 1.5.4 Option 1C – Balanced Sustainability

Option 1C has been developed based on Option 1B with additional features to meet the increased performance requirements. This revised Option 1C has excluded the proposed parking garage structure and regenerative elevators and has been summarized below:

- ☐ Exceeds Option 1B requirements
- ☐ *Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- ☐ *Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- ☐ Meet/certify to **LEED V4 Platinum** or equivalent
- ☐ Reduce the carbon emissions to as close to carbon neutral as possible, excluding the use of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to offset the GHG emitted related to the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **74%**
- ☐ Reduces GHG emissions by **100%** compared to 2005-2006 emissions (achieved through carbon balancing with PV arrays)

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 1C incorporates many of the design features assessed in Option 1B for additional reductions in energy consumption and related GHG emissions. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

##### Site

- ☐ The existing parking areas would be repaved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- ☐ Parking area reduced to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.



**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options**

- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- PV arrays on-site will be located to the south of the existing building and to the far east of the site. Groundcovers and meadows suitable to PV systems will be planted as the surfacing under the array.
- Parking area reduced to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.
- The remaining parking areas would be repaved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- Community gardens for building occupants or others to support local food growth.
- Passive and active outdoor activity areas to promote activity and health eg. Yoga, volleyball, basketball, jogging, walking, birdwatching, etc.
- Favour planting that supports pollinators.
- The existing parking areas would be replaced with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.
- Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.
- Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.
- Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.
- Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.

**Water**

- Low flow fixtures combined with rain water collected in a cistern and treatment of gray water to reduce potable water consumption by 50% for transport of waste, which will reduce energy consumed to produce potable water.
- Living machine treats black water to potable level. Potable water loop feeds building from living machine and the building would draw almost no potable water from off-site. \* This design feature requires further study by a Civil Engineer.
- Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.
- Advanced water metering.



**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options****Envelope**

- Based on our assessment and energy modelling, there is no value in increasing the envelope performance further. *Existing building envelope thermal resistance value of the walls will be increased to Wall R50 and the roofing systems will be replaced (end of service life) with a thermal resistance value of Roof R30. The wall composition will be improved from the interior to avoid impacting the existing exterior cladding (character defining element (CDE)) of the building. The existing effective thermal resistance values are estimated at R9.51 (Headquarters) or R16.42 (Data Centre) for walls and R31 for the roof. It is important to note that effective R-values take into account the affect of thermal bridging of the existing design.*
- *Replace existing windows with a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.*
- *Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.*

**Lighting**

- *The existing lighting (end of service life) will be replaced with LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.*
- *Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.*

**Ventilation**

- **Geothermal heat exchange system has been proposed to achieve maximum reductions to energy consumption.**
- *Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose.*
- *Energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility.*
- *Fancoil to recover heat from equipment rooms.*
- *Low velocity ventilation system reduces energy consumption related to air transportation throughout the building.*
- *Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.*
- *Economizer mode on dampers controlling fresh air intake.*
- *More efficient motors (end of service life) will provide reduction in energy consumption.*
- *Induction system with VAV for central zones*
- *Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.*
- *Variable speed fans provide an opportunity to reduce energy consumption when demand is less.*
- *Existing overhangs and side fins will be retained to offer solar shading during the summer to reduce cooling loads and associated energy consumption.*

**Materials**

- **Material selection to promote natural materials over synthetic.**
- **Phase changing material to act as thermal mass, storing and radiating energy.**
- *Construction waste management will require a minimum of 90% of the project construction waste be diverted from the landfill.*
- *Low VOC, high recycled content, locally manufactured products will be used as part of the project.*

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options****Indoor Environmental Quality**

- Living walls to provide humidification.
- Biophilic design to introduce Nature themes and planting in the building, which can be achieved by provide natural light, views to the exterior/nature, adding plants, introducing natural materials, as well as , images of nature and water features.
- Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.
- Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.

**Health and Wellness**

- Elevator controls limited to every second floor, requiring the occupants to use the stairs.
- Promote stairs by making them more inviting to use.

**Energy**

- Elevator controls limited to every second floor, requiring the occupants to use the stairs.
- Regenerative elevator motors recover lost energy and allowing the motor to essentially act as a generator during periods of low load.
- Energy creating stairs; kinetic energy recovery systems have been developed to generate energy when stepped on.
- Enhanced zoning to allow different operating times for specific zones (i.e. call centre).
- Workstation sensors to shut off systems in unoccupied areas/stations.

**Operations and Maintenance**

- Feedback software to notify occupants of systems running at their vacant workstation offering to shut them down.
- Kinetic art to illustrate the environmental performance of the building in an effort to engage the building occupants to be sensitive and conscious of their energy use, as well as their health and wellness.
- Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.
- Life Cycle Assessment (LCA) to exceed industry norm by 20% is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.
- Tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address these issues to improve occupant health and wellness.

**Renewable Energy Production**

- Introduce photovoltaic (PV) panels to produce clean energy on-site to compensate for the amount of GHG emissions related to energy consumed by the building, this initiative is referred to as “carbon balancing”.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

## Executive Summary

## Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options

Option 1C – Balanced Sustainability	
PROS	CONS
<ul style="list-style-type: none"> <li>- Tangible and intangible heritage of the building are maintained</li> <li>- Narrow floor plate allows for high levels of daylighting</li> <li>- Lowest embodied energy and construction waste</li> <li>- Energy reduction of <b>74%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>100%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Platinum</li> </ul>	<ul style="list-style-type: none"> <li>- Narrow floor plate and low floor to floor height limit flexibility and adaptability</li> <li>- Increased complexity to integrate heritage considerations, improved sustainability and universal access</li> <li>- Greatest complexity to achieve the sustainability targets</li> <li>- Limited reduction of surface parking compared to Option 1D</li> <li>- Impact of PV panels on the building and the site</li> </ul>
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### 1.5.5 Option 1D – Renewable Investment (Design to Achieve Maximum GHG Emission Reductions)

Option 1D has been developed based on Option 1B and Option 1C with additional features to meet the increased performance requirements summarized below:

- ☐ Exceeds Option 1B requirements
- ☐ Exceed Option 1C requirements with the inclusion of a parking garage structure and regenerative elevators
- ☐ *Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- ☐ *Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- ☐ Meet/certify to **LEED V4 Platinum** or equivalent
- ☐ Reduce the carbon emissions to as close to carbon neutral as possible, excluding the use of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to offset the GHG emitted related to the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **74%**
- ☐ Reduces GHG emissions by **100%** compared to 2005-2006 emissions (achieved through carbon balancing with PV arrays)

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 1C incorporates many of the design features assessed in Option 1B for additional reductions in energy consumption and related GHG emissions. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

#### Site

- ☐ Minimum required parking would be accommodated in an open-air parking structure with a total of three levels with universal-access spaces adjacent to the building.

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options**

- Photovoltaic (PV) arrays would be installed on the roof of the parking structure to provide shading in the parking area.
- PV arrays on-site will be in place of the existing parking areas along the eastern side of the site. Groundcovers and meadows suitable to PV systems will be planted as the surfacing under the array.
- Parking area reduced to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.
- The remaining parking areas would be repaved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- Community gardens for building occupants or others to support local food growth.
- Passive and active outdoor activity areas to promote activity and health eg. Yoga, volleyball, basketball, jogging, walking, birdwatching, etc.
- Favour planting that supports pollinators.
- The existing parking areas would be replaced with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.
- Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.
- Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.
- Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.
- Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.

**Water**

- Low flow fixtures combined with rain water collected in a cistern and treatment of gray water to reduce potable water consumption by 50% for transport of waste, which will reduce energy consumed to produce potable water.
- Living machine treats black water to potable level. Potable water loop feeds building from living machine and the building would draw almost no potable water from off-site. \* This design feature requires further study by a Civil Engineer.
- Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.
- Advanced water metering.

**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options****Envelope**

- Based on our assessment and energy modelling, there is no value in increasing the envelope performance further. *Existing building envelope thermal resistance value of the walls will be increased to Wall R50 and the roofing systems will be replaced (end of service life) with a thermal resistance value of Roof R30. The wall composition will be improved from the interior to avoid impacting the existing exterior cladding (character defining element (CDE)) of the building. The existing effective thermal resistance values are estimated at R9.51 (Headquarters) or R16.42 (Data Centre) for walls and R31 for the roof. It is important to note that effective R-values take into account the affect of thermal bridging of the existing design.*
- *Replace existing windows with a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.*
- *Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.*

**Lighting**

- *The existing lighting (end of service life) will be replaced with LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.*
- *Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.*

**Ventilation**

- **Geothermal heat exchange system has been proposed to achieve maximum reductions to energy consumption.**
- *Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose.*
- *Energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility.*
- *Fancoil to recover heat from equipment rooms.*
- *Low velocity ventilation system reduces energy consumption related to air transportation throughout the building.*
- *Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.*
- *Economizer mode on dampers controlling fresh air intake.*
- *More efficient motors (end of service life) will provide reduction in energy consumption.*
- *Induction system with VAV for central zones*
- *Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.*
- *Variable speed fans provide an opportunity to reduce energy consumption when demand is less.*
- *Existing overhangs and side fins will be retained to offer solar shading during the summer to reduce cooling loads and associated energy consumption.*

**Materials**

- **Material selection to promote natural materials over synthetic.**
- **Phase changing material to act as thermal mass, storing and radiating energy.**
- *Construction waste management will require a minimum of 90% of the project construction waste be diverted from the landfill.*
- *Low VOC, high recycled content, locally manufactured products will be used as part of the project.*



**Executive Summary****Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options****Indoor Environmental Quality**

- Living walls to provide humidification.
- Biophilic design to introduce Nature themes and planting in the building, which can be achieved by provide natural light, views to the exterior/nature, adding plants, introducing natural materials, as well as , images of nature and water features.
- Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.
- Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.

**Health and Wellness**

- Elevator controls limited to every second floor, requiring the occupants to use the stairs.
- Promote stairs by making them more inviting to use.

**Energy**

- Elevator controls limited to every second floor, requiring the occupants to use the stairs.
- Regenerative elevator motors recover lost energy and allowing the motor to essentially act as a generator during periods of low load.
- Energy creating stairs; kinetic energy recovery systems have been developed to generate energy when stepped on.
- Enhanced zoning to allow different operating times for specific zones (i.e. call centre).
- Workstation sensors to shut off systems in unoccupied areas/stations.

**Operations and Maintenance**

- Feedback software to notify occupants of systems running at their vacant workstation offering to shut them down.
- Kinetic art to illustrate the environmental performance of the building in an effort to engage the building occupants to be sensitive and conscious of their energy use, as well as their health and wellness.
- Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.
- Life Cycle Assessment (LCA) to exceed industry norm by 20% is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.
- Tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address these issues to improve occupant health and wellness.

**Renewable Energy Production**

- Introduce photovoltaic (PV) panels to produce clean energy on-site to compensate for the amount of GHG emissions related to energy consumed by the building, this initiative is referred to as “carbon balancing”.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

## Executive Summary

## Summary Evaluation of Scenario 1 – Renovate Existing Buildings Options

Option 1D – Renewable Investment	
PROS	CONS
<ul style="list-style-type: none"><li>- Tangible and intangible heritage of the building are maintained</li><li>- Narrow floor plate allows for high levels of daylighting</li><li>- Re-establishment of park-like landscape with new parking garage structure to minimize surface parking</li><li>- Lowest embodied energy and construction waste</li><li>- Energy reduction of <b>74%</b> compared to NECB 2011</li><li>- GHG reduction of <b>100%</b> compared to 2005-2006 existing building baseline</li><li>- Meets LEED Platinum</li></ul>	<ul style="list-style-type: none"><li>- Narrow floor plate and low floor to floor height limit flexibility and adaptability</li><li>- Increased complexity to integrate heritage considerations, improved sustainability and universal access</li><li>- Greatest complexity to achieve the sustainability targets</li><li>- Impact of PV panels on the building and the site</li></ul>
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## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

## 1.6 Summary Evaluation of Scenario 2 – Demolish and Build New – Options

The following summarizes the detailed Scenario 2 option descriptions provided in Section 5 – Feasibility Options, as well as, Section 7.4 - Options Analysis Matrix in the report.

### 1.6.1 Option 2A – Minimum Performance

Option 2A has been developed as the baseline new building for comparison as it is to achieve the minimum requirements for the project. The following summarizes these requirements:

- ☐ Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)
- ☐ Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)
- ☐ Meet/certify to **LEED V4 Silver, 3 Green Globes** or equivalent
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **28% (24% minimum requirement)**
- ☐ Reduces GHG emissions by **64%** compared to 2005-2006 emissions (**40% minimum requirement**)

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 2A has been developed with numerous design features, which have been summarized below. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

#### Site

- ☐ The parking areas would be paved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.
- ☐ Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- ☐ Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.
- ☐ Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.
- ☐ *Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.*
- ☐ Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.
- ☐ *Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.*
- ☐ Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.

#### Water

- ☐ Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.



**Executive Summary****Summary Evaluation of Scenario 2 – Demolish and Build New – Options**

- ☐ No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.
- ☐ Low flow fixtures will be installed through the building to reduce potable water consumption by 30% for transport, which will reduce energy consumed to produce potable water.
- ☐ Advanced water metering.

**Envelope**

- ☐ The new building envelope thermal resistance value of the walls will be R23 and the roof will be R31.
- ☐ Windows will be a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.
- ☐ Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.

**Lighting**

- ☐ Lighting will be LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.
- ☐ Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.

**Ventilation**

- ☐ Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.
- ☐ Economizer mode on dampers controlling fresh air intake.
- ☐ More efficient motors (end of service life) will provide reduction in energy consumption.
- ☐ Induction system with VAV for central zones
- ☐ Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (enthalpy wheel) to recover heat from the exhaust air (75%). The general and sanitary exhausts will need to be centralized and combined for this purpose.
- ☐ Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.
- ☐ Variable speed fans provide an opportunity to reduce energy consumption when demand is less.
- ☐ Horizontal overhangs (760mm) are proposed for all south facing windows to offer solar shading during the summer to reduce cooling loads while allowing daylight/solar gains during the winter.

**Materials**

- ☐ Low VOC, high recycled content, locally manufactured products will be used as part of the project.
- ☐ Construction waste management will require a minimum of 75% of the project construction waste be diverted from the landfill.

**Indoor Environmental Quality**

- ☐ Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.
- ☐ Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.

**Health and Wellness**

- ☐ *None targeted as the baseline.*

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## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

**Energy**

- ☐ None targeted as the baseline.

**Operations and Maintenance**

- ☐ Basic commissioning of systems is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, lighting, controls, etc. are functions as designed.
- ☐ Life Cycle Assessment (LCA) is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

Option 2A – Minimum Performance	
PROS	CONS
<ul style="list-style-type: none"> <li>- New building layout would optimize daylighting</li> <li>- Improved efficiency and adaptability</li> <li>- Energy reduction of <b>28%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>70%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Gold</li> </ul>	<ul style="list-style-type: none"> <li>- Loss of tangible and intangible heritage of the building</li> <li>- Would require “Best Effort” demonstration to demolish existing building</li> <li>- Potential delays due to public consultation</li> <li>- Higher embodied energy and construction waste</li> </ul>
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## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

**1.6.2 Option 2B – Design to Achieve Cost-neutral (25 years) GHG Emission Reductions**

Option 2B has been developed based on Option 2A with additional features to meet the increased performance requirements summarized below:

- ☐ Exceeds Option 2A requirements
- ☐ *Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- ☐ *Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- ☐ Meet/certify to **LEED V4 Platinum, 5 Green Globes** or equivalent
- ☐ Include measures that improve energy performance and reduce the greenhouse gases emitted by the facility. The best option will result in a positive NPV on the incremental cost (compared to Option 2A), when calculated over the lifecycle identified for the project (at a minimum 25 years, and longer periods where justified). Priority is given to energy conservation, before fuel switching alternatives are considered for reducing GHG emissions.
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **59%**
- ☐ Reduces GHG emissions by **80%** compared to 2005-2006 emissions

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 2B has been developed with numerous design features, which have been summarized below. A number of energy reducing design features were evaluated based on their Life Cycle Cost Assessment (refer to Appendix E – Life Cycle Cost Estimates of this report for the detailed assessments) to determine if they have a payback within 25 years and should be included in this option. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

**Site**

- ☐ Parking area reduced to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.
- ☐ Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.
- ☐ **Community gardens for building occupants or others to support local food growth.**
- ☐ **Passive and active outdoor activity areas to promote activity and health eg. yoga, volleyball, basketball, jogging, walking, birdwatching, etc.**
- ☐ **Favour planting that supports pollinators.**
- ☐ *The parking areas would be paved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.*
- ☐ *Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.*
- ☐ *Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.*
- ☐ *Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- ☐ *Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.*
- ☐ *Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.*
- ☐ *Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian*

**Executive Summary****Summary Evaluation of Scenario 2 – Demolish and Build New – Options**

*connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.*

- ☐ *Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.*

**Water**

- ☐ *Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- ☐ *No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.*
- ☐ *Low flow fixtures will be installed through the building to reduce potable water consumption by 30% for transport, which will reduce energy consumed to produce potable water.*
- ☐ *Advanced water metering.*

**Envelope**

- ☐ *Based on our assessment and energy modelling, any further envelope improvements would not offer a payback within 25 years. The new building envelope thermal resistance value of the walls will be R23 and the roof will be R31.*
- ☐ *Windows will be a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.*
- ☐ *Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.*

**Lighting**

- ☐ *Lighting will be LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.*
- ☐ *Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.*

**Ventilation**

- ☐ *Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose.*
- ☐ *Energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility.*
- ☐ *Fancoil to recover heat from equipment rooms.*
- ☐ *Low velocity ventilation system reduces energy consumption related to air transportation throughout the building.*
- ☐ *Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.*
- ☐ *Economizer mode on dampers controlling fresh air intake.*
- ☐ *More efficient motors (end of service life) will provide reduction in energy consumption.*
- ☐ *Induction system with VAV for central zones*
- ☐ *Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.*
- ☐ *Variable speed fans provide an opportunity to reduce energy consumption when demand is less.*
- ☐ *Horizontal overhangs (760mm) are proposed for all south facing windows to offer solar shading during the summer to reduce cooling loads while allowing daylight/solar gains during the winter.*

## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

**Materials**

- ☐ Construction waste management will require a minimum of **90%** of the project construction waste be diverted from the landfill.
- ☐ *Low VOC, high recycled content, locally manufactured products will be used as part of the project.*

**Indoor Environmental Quality**

- ☐ Biophilic design to introduce Nature themes and planting in the building, which can be achieved by provide natural light, views to the exterior/nature, adding plants, introducing natural materials, as well as , images of nature and water features.
- ☐ *Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.*
- ☐ *Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.*

**Health and Wellness**

- ☐ *Promote stairs by making them more inviting to use.*

**Energy**

- ☐ *None targeted.*

**Operations and Maintenance**

- ☐ Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.
- ☐ Life Cycle Assessment (LCA) to exceed industry norm by 20% is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.
- ☐ Tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address these issues to improve occupant health and wellness.

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

Option 2B – Design to Achieve Cost-neutral (25 years) GHG Emission Reductions	
PROS	CONS
<ul style="list-style-type: none"> <li>- New building layout would optimize daylighting</li> <li>- Improved efficiency and adaptability</li> <li>- Energy reduction of <b>59%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>89%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Platinum</li> </ul>	<ul style="list-style-type: none"> <li>- Loss of tangible and intangible heritage of the building</li> <li>- Would require “Best Effort” demonstration to demolish existing building</li> <li>- Potential delays due to public consultation</li> <li>- Design competition may be required to ensure design excellence. Negative impacts on budget and schedule</li> <li>- Higher embodied energy and construction waste</li> <li>- Increased complexity to achieve the sustainability targets</li> </ul>
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## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

**1.6.3 Option 2C – Design to Achieve Maximum GHG Emission Reductions**

Option 2C has been developed based on Option 2B with additional features to meet the increased performance requirements summarized below:

- ☐ Exceeds Option 2B requirements
- ☐ *Complies with Technical Reference for Office Building Design, 2017 (TRFOBD)*
- ☐ *Complies with commitments identified in Real Property Sustainability Framework, 2015 (RPSF)*
- ☐ Exceeds **LEED V4 Platinum. 5 Green Globes** or equivalent
- ☐ Reduce the carbon emissions to as close to carbon neutral as possible, excluding the use of carbon offsets or renewable energy credits. Provide for clean on-site energy generation to offset the GHG emitted related to the energy consumed by the building. Priority should be given to reducing emissions through improved energy efficiency, followed by the selection of non-emitting energy sources. The production of on-site carbon-free renewable energy generation must be included.
- ☐ Achieves an energy performance that exceeds the National Energy Code for Buildings, 2011 (NECB) baseline building performance by **72%**
- ☐ Reduces GHG emissions by **100%** compared to 2005-2006 emissions (achieved through carbon balancing with PV arrays)

To achieve the above noted objectives, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health, and social and occupant health and wellness, Option 1C incorporates many of the design features assessed in Option 1B for additional reductions in energy consumption and related GHG emissions. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features included in previous design option(s).

**Site**

- ☐ Minimum required parking would be accommodated in an open-air parking structure with a total of three levels with universal-access spaces adjacent to the building.
- ☐ Photovoltaic (PV) arrays would be installed on the roof of the parking structure to provide shading in the parking area.
- ☐ PV arrays on-site will be placed along the eastern side of the site. Groundcovers and meadows suitable to PV systems will be planted as the surfacing under the array.
- ☐ *Limited parking area to reflect a long term sustainable strategy, which aims to promote public transportation methods and minimizes the individual parking requirements.*
- ☐ *Parking areas to be paved with low albedo, permeable paving to allow storm water to recharge local water table and reduction of the heat island effect.*
- ☐ *Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.*
- ☐ *Community gardens for building occupants or others to support local food growth.*
- ☐ *Passive and active outdoor activity areas to promote activity and health eg. yoga, volleyball, basketball, jogging, walking, birdwatching, etc.*
- ☐ *Favour planting that supports pollinators.*
- ☐ *Introduce shade into parking areas with tree planting in the landscape areas along parking aisles.*
- ☐ *Introduce plantings that will enhance summer cooling of the building and site and winter passive solar heat gain for building and site.*
- ☐ *Storm water management strategy would introduce retention ponds to keep 100% of rain water on site to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- ☐ *Reforest portions of the existing site to reduce maintenance and support biodiversity, which would be achieved by replanting areas of the site to return it to a more natural state requiring less maintenance and thereby reducing energy consumption and GHG emissions.*

**Executive Summary****Summary Evaluation of Scenario 2 – Demolish and Build New – Options**

- *Introduce indigenous planting for new planting that requires no irrigation, which in turn reduces the potable water consumed locally and reduces the energy consumed to purify water at the water treatment facility.*
- *Improve and introduce new connections to the bicycle path and transit network and community in general to encourage the use of alternate modes of transport and thereby reducing the use of personal vehicles and the resulting GHG production and traffic in the community. To further enhance these connections, benches are proposed on site for accessibility, spaced appropriate around the site along all pedestrian connections with a minimum of 50% of the benches having shade. Improving the connection to the community strengthens the community at large.*
- *Increased bike parking to exceed LEED requirements by 10% will reduce the use of personal vehicles thereby reducing the energy and GHG footprint of the occupants. Bike parking would be introduced in the basement or alternatively a separate, enclosed exterior bike shelter could be considered.*

**Water**

- *Low flow fixtures combined with rain water collected in a cistern and treatment of gray water to reduce potable water consumption by 50% for transport of waste, which will reduce energy consumed to produce potable water.*
- *Living machine treats black water to potable level. Potable water loop feeds building from living machine and the building would draw almost no potable water from off-site. \* This design feature requires further study by a Civil Engineer.*
- *Storm water managed on site through permeable paving and LID techniques for stormwater ponds and bioswales to recharge the local water table, reduce the strain on municipal systems, as well as, reduce the financial and environmental cost to the community.*
- *No irrigation except non-potable water for use in the planting establishment period and in extreme drought conditions will reduce the potable water consumed locally and reduce the energy consumed to purify water at the treatment facility.*
- *Advanced water metering.*

**Envelope**

- *The new building envelope thermal resistance value of the walls will be R40 and the roof will be R31.*
- *Windows will be a high performance curtain wall system with thermally-broken framing to improve the thermal resistance of the windows. The windows will have low-e double glazing to reduce the amount of heat transfer across the glazing.*
- *Improved air tightness will be achieved with proper sealing of junctions between different systems and materials to prevent air leakage through the envelope to improve the systems thermal resistance.*

**Lighting**

- *Lighting will be LED lighting tied to motion and daylight sensors, which dramatically reduce the amount of energy consumed. Dimmable fixtures with daylight sensors reduces the amount of light provided by the fixture and the amount of energy consumed. Adding controls to limit their light activation to when a space is occupied further enhances the efficiency of the system.*
- *Lighting systems metering tied to Smart building helps building operators to understand where energy loads are being used, which allows for better control and offers opportunities for reduction.*

**Ventilation**

- *Geothermal heat exchange system has been proposed to achieve maximum reductions to energy consumption.*
- *Fresh air will be provided to the systems by a dedicated fresh air treatment system, which will be equipped with an Energy Recovery System (heat bank) to recover heat from the exhaust air (85%). The general and sanitary exhausts will need to be centralized and combined for this purpose.*
- *Energy recovery with chillers are necessary to achieve the required energy savings. A facility heat recovery plant has been proposed and will be composed of heat recovery chillers, dry coolers, heat pumps, hot and cold gradient tanks and geothermal wells. The plant will reduce reliance on the CHCP and maximize energy recovery within the facility.*
- *Fancoil to recover heat from equipment rooms.*



**Executive Summary****Summary Evaluation of Scenario 2 – Demolish and Build New – Options**

- ☐ *Low velocity ventilation system reduces energy consumption related to air transportation throughout the building.*
- ☐ *Carbon dioxide sensors are provided to ensure an optimal level of indoor air quality is provided to the building occupants.*
- ☐ *Economizer mode on dampers controlling fresh air intake.*
- ☐ *More efficient motors (end of service life) will provide reduction in energy consumption.*
- ☐ *Induction system with VAV for central zones*
- ☐ *Hot and chilled water networks will be Variable Flow with variable speed pumps and Two-way Valves. The piping will be low velocity for improved distribution energy efficiency.*
- ☐ *Variable speed fans provide an opportunity to reduce energy consumption when demand is less.*
- ☐ *Existing overhangs and side fins will be retained to offer solar shading during the summer to reduce cooling loads and associated energy consumption.*

**Materials**

- ☐ *Material selection to promote natural materials over synthetic.*
- ☐ *Phase changing material to act as thermal mass, storing and radiating energy.*
- ☐ *Construction waste management will require a minimum of 90% of the project construction waste be diverted from the landfill.*
- ☐ *Low VOC, high recycled content, locally manufactured products will be used as part of the project.*

**Indoor Environmental Quality**

- ☐ *Living walls to provide humidification.*
- ☐ *Biophilic design to introduce Nature themes and planting in the building, which can be achieved by provide natural light, views to the exterior/nature, adding plants, introducing natural materials, as well as , images of nature and water features.*
- ☐ *Pollution control at source to reduce, eliminate, or prevent pollution at the construction site and the building when completed.*
- ☐ *Air flush & testing is to be done at the end of construction and prior to occupancy in order to remove or reduce pollutants (VOCs and other particulate matter) within the building. Air flushing forces air through a building to improve indoor air quality for building occupants.*

**Health and Wellness**

- ☐ *Elevator controls limited to every second floor, requiring the occupants to use the stairs.*
- ☐ *Promote stairs by making them more inviting to use.*

**Energy**

- ☐ *Elevator controls limited to every second floor, requiring the occupants to use the stairs.*
- ☐ *Regenerative elevator motors recover lost energy and allowing the motor to essentially act as a generator during periods of low load.*
- ☐ *Energy creating stairs; kinetic energy recovery systems have been developed to generate energy when stepped on.*
- ☐ *Enhanced zoning to allow different operating times for specific zones (i.e. call centre).*
- ☐ *Workstation sensors to shut off systems in unoccupied areas/stations.*

**Operations and Maintenance**

- ☐ *Feedback software to notify occupants of systems running at their vacant workstation offering to shut them down.*
- ☐ *Kinetic art to illustrate the environmental performance of the building in an effort to engage the building occupants to be sensitive and conscious of their energy use, as well as their health and wellness.*
- ☐ *Enhanced commissioning of systems and envelope by an independent commissioning agent is the process of verifying near the end of construction that all subsystems for mechanical (HVAC), plumbing, electrical, fire/life safety, building envelopes, interior systems, sustainable systems, lighting, wastewater, controls, etc. are functions as designed.*



**Executive Summary****Summary Evaluation of Scenario 2 – Demolish and Build New – Options**

- *Life Cycle Assessment (LCA) to exceed industry norm by 20% is a technique to assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCA aids in product and material selection for the project.*
- *Tenant engagement / satisfaction surveys to determine if there are any issues with occupant comfort and to address these issues to improve occupant health and wellness.*

**Renewable Energy Production**

- *Introduce photovoltaic (PV) panels to produce clean energy on-site to compensate for the amount of GHG emissions related to energy consumed by the building, this initiative is referred to as “carbon balancing”.*

*Refer to Section 5 – Feasibility Options of this report for more detailed descriptions of these design features.*

**Option 2C – Design to Achieve Maximum GHG Emission Reductions**

PROS	CONS
<ul style="list-style-type: none"> <li>- New building layout would optimize daylighting</li> <li>- Improved efficiency and adaptability</li> <li>- Energy reduction of <b>72%</b> compared to NECB 2011</li> <li>- GHG reduction of <b>100%</b> compared to 2005-2006 existing building baseline</li> <li>- Meets LEED Platinum</li> </ul>	<ul style="list-style-type: none"> <li>- Loss of tangible and intangible heritage of the building</li> <li>- Would require “Best Effort” demonstration to demolish existing building</li> <li>- Potential delays due to public consultation</li> <li>- Design competition may be required to ensure design excellence. Negative impacts on budget and schedule</li> <li>- Higher embodied energy and construction waste</li> <li>- Greatest complexity to achieve the sustainability targets</li> <li>- Impact of PV panels on the building and the site</li> </ul>
<i>[Redacted from Feasibility Report]</i>	
<i>[Redacted from Feasibility Report]</i>	

## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

## 1.6.4 Comparison Summary of Design Features for Each Option

The following table summarizes the design features proposed in each of the options to be analyzed as part of this report. As previously noted, these features have been developed to achieve the overall sustainability goals for each option, including reductions of GHG and energy consumption, as well as, supporting social livability, ecosystem health and restoration, optimal performance for waste and water, occupant health and well-being, etc. This holistic approach to sustainability goes beyond the typical ratings systems to not only address building and site improvements, but also social and occupant health and wellness.

Detailed descriptions of these features have been provided in Section 6 - Sustainability Strategies and Performance of this report. Design features that demonstrate innovation in sustainability are identified with green font. Strategies in gray italics font are features considered in this report, but were not included in the options.

Table 1.3-T1: Options Design Features Summary Table

Design Features	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish and Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
<b>Site</b>							
Parking area with permeable paving							
Introduce shade into parking area							
Covered parking structure							
Storm water management: retention ponds to keep 100% of rain water on site and recharge local water table							
Reforest site to reduce maintenance and support biodiversity							
Use planting that requires no irrigation							
Improve connections to the bicycle path and transit network and community in general							
Community gardens for building occupants or others to support local food growth							
Activity areas to promote activity and health							
Increased bike parking to exceed LEED requirements by 10%							
Favour planting that supports pollinators							
<b>Water</b>							
Storm water managed and retained on site							
No irrigation							
Low flow fixtures reduce potable water consumption by 30%							
Low flow fixtures combined with rain water collected in cistern and treatment of greywater to reduce potable water consumption by 50%							
Living machine treats black water to potable level. Potable water loop feeds building from living machine. System draws almost no potable water from offsite.			*	*			*

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## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

Design Features	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish and Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
Advanced water metering							
<b>Envelope</b>							
No increase in wall, Roof R30							
Thermal resistance: Wall R23, Roof R31							
Thermal resistance: Wall R50, Roof R30							
Thermal resistance: Wall R40, Roof R31							
Replace windows with high performance curtainwall with double low e glazing							
<i>Replace windows with high performance curtainwall with low e triple glazing</i>							
Improved air tightness							
<b>Lighting</b>							
LED lighting tied to motion and daylight sensors							
Systems metering tied to Smart building							
<i>Circadian lighting changing light temperature to mimic the natural environment</i>							
<b>Ventilation</b>							
Carbon dioxide sensors							
Economizer							
More efficient motor							
Induction system with VAV for central zones							
Dedicated outside air treatment system / Energy recovery (enthalpy wheel) on exhaust air (75%)							
Dedicated outside air treatment system / Energy recovery (heat banks) on exhaust air (85%)							
Energy recovery with chillers							
Fancoil to recover heat from equipment rooms							
Low velocity ventilation system							
Geothermal heat exchange system							
Variable speed pumps / Two way valves							
Variable speed fans							
Existing overhangs and side fins							
Overhang 760mm (south facing windows)							

## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

Design Features	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish and Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
Natural ventilation through operable windows with feedback loop when they can be opened.							
Nighttime ice production and storage to be used for daytime cooling							
Predictive controls to adjust temperature in advance capitalizing on thermal mass.							
<b>Materials</b>							
Low VOC, high recycled content, locally manufactured							
Construction waste management (75% diverted)							
Construction waste management (90% diverted)							
Material selection to promote natural materials over synthetic							
Phase changing material to act as thermal mass, storing and radiating energy							
<b>Indoor Environmental Quality</b>							
Pollution control at source							
Enhanced air quality, air flush & testing							
Biophilic design to introduce Nature themes and planting in the building							
Living walls to provide humidification							
<b>Health and Wellness</b>							
Promote stairs making them inviting to use							
Elevator controls limited to every second floor, requiring users to use stairs							
<b>Energy</b>							
Predictive elevator controls to optimize elevator travel							
Regenerative elevator motors							
Energy creating stairs, generate energy when stepped on							
Enhanced zoning to allow different operating times for specific zones. i.e. call centre							
Workstation sensors to shut off systems in unoccupied stations							
<b>Operations and Maintenance</b>							
Basic commissioning of systems							

## Executive Summary

## Summary Evaluation of Scenario 2 – Demolish and Build New – Options

Design Features	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish and Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
Enhanced commissioning of systems and envelope by independent commissioning agent							
Life Cycle assessment							
Life Cycle assessment to exceed industry norm by 20%							
Tenant engagement/satisfaction surveys							
<i>Concierge system for transient workstations designed to group occupants and creates areas of vacancy within the floor plate. Systems shut down in vacant areas</i>							
Feedback software to notify occupants of systems running at their vacant workstation offering to shut them down							
Kinetic art to illustrate environmental performance of the building							
<b>Renewable Energy Production</b>							
Use of photovoltaic panels to produce clean energy (compensates for the amount of GHG emissions related to energy consumed by the building)							

\* Living Machine requires Civil Engineering input and design to evaluate the feasibility of this system.

## 1.7 Options Analysis

The selection of a preferred option for this project was a significant challenge considering the numerous project objectives, risks, and overall feasibility. The analysis matrix and evaluation criteria were established in collaboration with all the stakeholders and consultants in attendance during a workshop. The criteria have been divided into the following five (5) categories: Financial, Sustainability, Design Excellence, Heritage, and Risks. Each of the categories was further divided into specific criteria, with each of these criteria evaluated and assessed for each of the options.

Upon further review by the stakeholders, a weight of 1 to 3 has been given to each non-financial evaluation criteria based on their importance, which has been indicated in brackets beside its name and summarized as follows:

### Sustainability

- **GHG Emission Reduction (3)**
- **Energy Efficiency (3)**
- **Water Efficiency (2)**
- **Embodied Energy Efficiency (2)**
- **Health & Wellness (3)**

### Design Excellence

- **Design Quality (3)**
- **Site Integration & Design (2)**
- **Adaptability (1)**
- **Functionality (1)**

### Heritage

- **Building Heritage Impact (3)**
- **Cultural Heritage Value (1)**

### Risk

- **Implementation (3)**
- **Constructability (2)**
- **Schedule (2)**
- **Unknown (unknowns) Building & Site Conditions (1)**

For each non-financial evaluation criteria, the options have been rated based on a numerical scale of 1 to 5, as follows:

**5** Responds very well to objective/criteria (highest score)

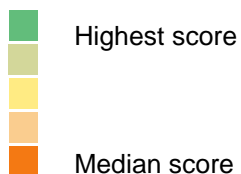
**4** Responds well to objective/criteria

**3** Responds somewhat to objective/criteria

**2** Neutral

**1** Responds poorly or Conflicts with objective/criteria (lowest score)

This rating has then been multiplied by the criteria weight to determine the score of each option for that criteria. For ease of analysis, a colour scale has then been applied to the scoring on the Options Analysis Matrix as follows:



Lowest score

Based on this numerical weighting system, the greater the total score, the better the option responds to the evaluation criteria/objectives.

Executive Summary

Options Analysis

The following is a summary of the options analysis in Section 7.4 of this report.

Table 1.4-T1: Options Analysis Matrix Summary Table - Financial Evaluation Criteria

Financial Evaluation Criteria		Scenario 1 – Renovate Existing Buildings								Scenario 2 – Demolish & Build New					
		Option 1A		Option 1B		Option 1C		Option 1D		Option 2A		Option 2B		Option 2C	
	Costing (\$M)	25 Yrs	40 Yrs	25 Yrs	40 Yrs	25 Yrs	40 Yrs	25 Yrs	40 Yrs	25 Yrs	40 Yrs	25 Yrs	40 Yrs	25 Yrs	40 Yrs
Financial	Initial Capital Cost	<i>[Redacted from Feasibility Report]</i>													
	Life Cycle Cost														
	Energy Cost														
	Maintenance Cost														
	NPV														
Financial Ranking (NPV 25 yrs)		1		2		3		4		5		6		7	

## Executive Summary

Table 1.4-T2: Options Analysis Matrix Summary Table – Non-Financial Evaluation Criteria

Non-Financial Evaluation Criteria		Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish & Build New		
		Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
Sustainability	<b>GHG Emission Reduction (3)</b> (Ton CO <sub>2</sub> eq) (compared to Existing)	1,354 (6) 54% reduction	2,200 (12) 88% reduction	605 (15) 100% reduction (w/ PV array)	605 (15) 100% reduction (w/ PV array)	1,743 (9) 70% reduction	2,226 (12) 89% reduction	577 (15) 100% reduction (w/ PV array)
	<b>Energy Efficiency (3)</b> (kWh) (compared to NECB 2011)	5,128,479 (6) 27% reduction	11,635,607 (12) 62% reduction	13,857,794 (15) 74% reduction	13,975,018 (15) 74% reduction	4,360,963 (9) 28% reduction	9,417,689 (12) 59% reduction	11,335,142 (15) 72% reduction
	<b>Water Efficiency (2)</b>	8	8	10	10	8	8	10
	<b>Embodied Energy Efficiency (2)</b>	8	6	6	6	4	2	2
	<b>Health &amp; Wellness (3)</b>	6	9	12	12	9	12	15
Design Excellence	<b>Design Quality (3)</b>	15	15	15	15	15	15	15
	<b>Site Integration &amp; Design (2)</b>	6	8	8	8	6	8	10
	<b>Adaptability (1)</b>	3	3	3	3	5	5	5
	<b>Functionality (1)</b>	3	3	3	3	5	5	5
Heritage	<b>Building Heritage Impact (3)</b>	15	12	9	9	3	3	3
	<b>Cultural Heritage Impact (1)</b>	4	5	3	4	1	2	1
Risk	<b>Implementation (3)</b>	12	12	12	12	6	6	6
	<b>Constructability (2)</b>	8	6	6	6	10	8	8
	<b>Schedule (2)</b>	10	8	6	6	8	6	4
	<b>Unknown (unknowns) Building &amp; Site Conditions (1)</b>	3	3	3	3	5	5	5
<b>Total Points (Score)</b>		113	122	126	127	103	109	119
<b>Non-Financial Ranking</b>		4	2	1	1	6	5	3



## 1.8 Recommendations

As mentioned earlier, the selection of a preferred option for this project is a significant challenge considering the numerous project objectives, risks, and overall feasibility. The options analysis workshop was a very helpful exercise and proved informative for all stakeholders. As agreed at the workshop, the options would be separately ranked based on the Financial Criteria (NPV 25 years) and Non-Financial Criteria. This was done to determine which option provides the best value to the crown and represents the most sustainable. Based on the options evaluation, the ranking of the proposed options (most to least responsive to the evaluation criteria/objectives) is as follows:

**Table 1.5-T1: Options Ranking Summary**

	Scenario 1 – Renovate Existing Buildings				Scenario 2 – Demolish & Build New		
	Option 1A	Option 1B	Option 1C	Option 1D	Option 2A	Option 2B	Option 2C
<b>Financial Ranking (NPV 25 yrs)</b>	1	2	3	3	4	5	6
<b>Non-Financial Ranking</b>	4	2	1	1	6	5	3

In parallel to this study, there have been numerous other discussions and meetings, which continue to inform the direction of this project. The Asset Management Plan and the PSPC executives' recommendation during the RPIB meeting held in October 2017 was to keep the existing building, the following was also captured in the IAR:

- The OTC was designated in the NCA-Portfolio Management's Client Accommodation Strategy as the replacement solution for downtown leases of Canada Revenue Agency (CRA). The asset is a key location for CRA and provides general administrative accommodations. Ongoing and longer-term demand is reported for the asset/space by the current tenancy. Indeed, a key component of CRA's accommodation strategy is retention and consolidation within the complex during the implementation phase.

Based on these recent developments, Scenario 2 – Demolish & Building New options have been deemed non-feasible.

This project team concurs with this direction and also does not recommend pursuing the Scenario 2 – Demolish & Build New options due in large part to the significant impact that these options would have on the Heritage value of the existing building and site, as well as, the significant cost implications of demolition and construction of a new building in its place.

With regard to the best value for the crown based solely on the Net Present Value for the 25 year life cycle analysis, **Option 1A** to rehabilitate the existing building offers the best value compared to the other options. The lower cost of this option is directly related to the minimal interventions and limited performance improvements proposed. Subsequently, Option 1A did not rank well against the other options for the Non-Financial Criteria.

**Option 1A** meets the TRFOBD targets and provides a good retention of heritage values. The energy efficiency of the existing building has been improved to achieve GHG emission reduction by 54% when compared to the existing building in 2005-2006 and 27% reduction in energy consumption when compared to the NECB 2011. This option also represents the lowest initial capital cost and the lowest Net Present Value based for the 25 year life cycle analysis. If the government's priority is lowest cost for the crown, **Option 1A** is the recommended option.

Based on the Non-Financial ranking results, **Option 1C and Option 1D** to rehabilitate the existing building represent the options that best respond to the Non-Financial evaluation criteria including building performance, sustainability, design excellence, heritage conservation, and risk.

Both **Option 1C and Option 1D** exceeds the TRFOBD targets, represent sustainable options and propose to rehabilitate the existing building providing a good retention of heritage values. In both options, the energy efficiency of the existing building has been improved to achieve GHG emission reduction by 100% (with carbon balancing achieved with PV panels on-site) when compared to the existing building in 2005-2006 and 74% reduction in energy consumption when compared to the NECB 2011. The initial capital cost of Option 1C is less than Option 1D and is approximately 10% higher than Option 1A, and the Net Present Value based on the 25 year

**Executive Summary****Recommendations**

life cycle analysis is approximately 4% higher than Option 1A. If the government's initiatives to decrease GHG emissions are a priority, then **Option 1C** is the recommended option.

While the above mentioned options are viable depending on the priorities of the government, the most appropriate option should represent a balanced approach to the diverse objectives of this study, both Financial and Non-Financial. **Option 1B** exceeds the TRFOBD targets, represents a sustainable options, and proposes to rehabilitate the existing building providing a good retention of heritage values. The energy efficiency of the existing building has been improved to achieve GHG emission reduction by 88% when compared to the existing building in 2005-2006 and 62% reduction in energy consumption when compared to the NECB 2011. The initial capital cost for Option 1B is approximately 5% less than Option 1C, and the Net Present Value based on the 25 year life cycle analysis is approximately 4% less than Option 1C.

Therefore, **Option 1B** to rehabilitate the existing building (*Financial Ranking 2; Non-Financial Ranking 2*) is the recommended option if a balanced approach to the objectives is the priority.