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

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving Public Works & Government Services Canada/Réception des souissions Travaux publics et Services gouvernementaux Canada
1713 Bedford Row
Halifax, N.S./Halifax,(N.E.)
B3J 1T3
Halifax
Bid Fax: (902) 496-5016

Title - Sujet Bedford Row Interior Redesign	
Solicitation No. - N° de l'invitation EB144-180785/A	**Date** 2017-08-24
Client Reference No. - N° de référence du client EB144-18-0785	
GETS Reference No. - N° de référence de SEAG PW-$PWA-203-5640	
File No. - N° de dossier PWA-7-78053 (203)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2017-10-04**	**Time Zone** **Fuseau horaire** Atlantic Daylight Saving Time ADT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: MacDonald (PWA), Isabelle	**Buyer Id - Id de l'acheteur** pwa203
Telephone No. - N° de téléphone (902) 496-5025 ( )	**FAX No. - N° de FAX** (902) 496-5016
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:** DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CANADA SEE HEREIN HALIFAX NOVA SCOTIA B3J3C9 Canada	

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

A mandatory site visit will take place on Tuesday, September 12th, 2017 at 1:30 p.m. Please email Isabelle MacDonald to advise that you will be attending.

Instructions: See Herein

Instructions: Voir aux présentes

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

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

Issuing Office - Bureau de distribution
Atlantic Region Acquisitions/Région de l'Atlantique Acquisitions
1713 Bedford Row
Halifax, N.S./Halifax, (N.E.)
B3J 3C9
Halifax
Nova Scot

Canada

Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination	Unit Price/Prix unitaire FOB/FAM Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Bedford Row Interior Redesign	EB144	EB144	1	SUM	$	XXXXXXXXXX	See Herein	

THIS PROCUREMENT CONTAINS A SECURITY REQUIREMENT

REQUEST FOR PROPOSAL (RFP)

TABLE OF CONTENTS

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

SUPPLEMENTARY INSTRUCTIONS TO PROPONENTS (SI)

SI1 INTRODUCTION

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

2. This is a single phase selection process. The strict time frames to implement this project does not allow sufficient time to conduct the usual two phase selection process.

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

SI2 PROPOSAL DOCUMENTS

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

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

2. The following are the proposal documents:

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

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

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

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

   (c) Project Brief/Required Services;

(d) the document entitled "Doing Business with National Capital Area";

(e) the Security Requirements Check List (SRCL);

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

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

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

SI3 QUESTIONS OR REQUEST FOR CLARIFICATION

Questions or requests for clarification during the solicitation period must be submitted in writing to the Contracting Authority named on the RFP - Page 1 as early as possible. Enquiries should be received no later than five (5) working days prior to the closing date identified on the front page of the Request for Proposal. Enquiries received after that date may not be answered prior to the closing date of the solicitation.

SI4 CANADA'S TRADE AGREEMENTS

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

SI5 CERTIFICATIONS

1. Integrity Provisions – Declaration of Convicted Offences

In accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Proponent must **provide with its bid**, **as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal, **section 3b**.

2. Federal Contractors Program for Employment Equity - Proposal Certification

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

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

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

SI6 SECURITY REQUIREMENT

1. At the date of bid closing, the following conditions must be met:

   (a) the Proponent must hold a valid organization security clearance as indicated in Supplementary Conditions SC1;

   (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;

   (c) the Proponent must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites.;

2. For additional information on security requirements, proponents should refer to the Canadian Industrial Security Directorate (CISD), Industrial Security Program of Public Works and Government Services Canada (http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html) website.

SI7 WEBSITES

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

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

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

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

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

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

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

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

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

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

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

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

TERMS, CONDITIONS AND CLAUSES

AGREEMENT

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

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

Section GC1.1 of R1210D, Definitions, incorporated by reference above, is amended as follows:

ADD:

"Architectural and Engineering Services":
means services to provide a range of investigation and recommendation reports, planning, design, preparation, or supervision of the construction, repair, renovation or restoration of a work and includes contract administration services, for real property projects.

"Construction Services":
means construction, repair, renovation or restoration of any work except a vessel and includes; the supply and erection of a prefabricated structure; dredging; demolition; environmental services related to a real property; or, the hire of equipment to be used in or incidentally to the execution of any construction services referred to above.

"Facility Maintenance Services":
means services related to activities normally associated with the maintenance of a facility and keeping spaces, structures and infrastructure in proper operating condition in a routine, scheduled, or anticipated fashion to prevent failure and degradation including inspection, testing, servicing, classification as to serviceability, repairs, rebuilding and reclamation, as well as

cleaning, waste removal, snow removal, lawn care, replacement of flooring, lighting or plumbing fixtures, painting and other minor works.

Section GC1.12 of R1210D, Not applicable, incorporated by reference above, is deleted in its entirety and replaced with the following:

R1210D CG1.12 (2016-04-04) Performance evaluation - contract

1. Consultants shall take note that the performance of the Consultant during and upon completion of the services shall be evaluated by Canada. The evaluation includes all or some of the following criteria:
   a. Design
   b. Quality of Results
   c. Management
   d. Time
   e. Cost

2. A weighting factor of 20 points will be assigned to each of the five criteria as follows:
   a. Unacceptable: 0 to 5 points
   b. Not satisfactory: 6 to 10 points
   c. Satisfactory: 11 to 16 points
   d. Superior: 17 to 20 points

3. The consequences resulting from the performance evaluation are as follows:
   a. For an overall rating of 85% or higher, a congratulation letter is sent to the Consultant.
   b. For an overall rating of between 51% and 84%, a standard, meets expectations, letter is sent to the Consultant.
   c. For an overall rating of between 30% and 50%, a warning letter is sent to the Consultant indicating that if, within the next two (2) years, they receive 50% or less on another evaluation, the firm may be suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.
   d. For an overall rating of less than 30%, a suspension letter is sent to the Consultant indicating that the firm is suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.

e. For a rating of 5 points or less on any one criterion, a suspension letter is sent to the Consultant indicating that the firm is suspended from any new PWGSC solicitations for construction services, architectural and engineering services or facility maintenance services, of real property projects, for a period of one year.

The form PWGSC-TPSGC 2913-1, Select - Consultant Performance Evaluation Report (CPERF), is used to record the performance.

(c) Project Brief / Required Services;
(d) the document entitled “Doing Business with National Capital Area”;
(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 Agreement;
(c) this Agreement clause;
(d) Supplementary Conditions;
(e) General Terms, Conditions and Clauses;
(f) Agreement Particulars;
(g) Project Brief / Required Services;
(h) the document entitled “Doing Business with National Capital Area”;
(i) the document entitled “Security Requirement Check List”;
(j) the proposal.

SUPPLEMENTARY CONDITIONS (SC)

SC1 SECURITY REQUIREMENT

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

   A) The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, **hold a valid Designated Organization Screening (DOS),** issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).

   B) The Contractor/Offeror personnel requiring access to sensitive work site(s) must **EACH hold a valid RELIABILITY STATUS,** granted or approved by CISD/PWGSC. Until the security screening of the Contractor personnel required by this Contract has been completed satisfactorily by the CISD, PWGSC, the Contractor personnel **MAY NOT ENTER** sites without an escort.

   C) Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of CISD/PWGSC.

   D) The Contractor/Offeror must comply with the provisions of the:

      (i) Security Requirements Check List, attached at Appendix E;
      (ii) Industrial Security Manual (Latest Edition).

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

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

AGREEMENT PARTICULARS

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

SUBMISSION REQUIREMENTS AND EVALUATION

SUBMISSION REQUIREMENTS AND EVALUATION

SRE 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

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

1.2 Calculation of Total Score

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

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

SRE 2 PROPOSAL REQUIREMENTS

2.1 Requirement for Proposal Format

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

- Submit one (1) bound original plus three (3) 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 - 12mm 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 432mm (11" x 17") fold-out sheets for spreadsheets, organization charts etc. will be counted as two pages.
- The order of the proposals should follow the order established in the Request for Proposal SRE section

2.2 Specific Requirements for Proposal Format

The maximum number of pages (including text and graphics) to be submitted for the Rated Requirements under SRE 3.2 is fifty (50) pages.

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

- Covering letter
- Consultant Team Identification (Appendix A)
- Declaration/Certifications Form (Appendix B)
- Integrity Provisions – Required Documentation

- Front page of the RFP
- Front page of revision(s) to the RFP
- Price Proposal Form (Appendix C)

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

SRE 3 SUBMISSION REQUIREMENTS AND EVALUATION

3.1 MANDATORY REQUIREMENTS

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

3.1.1 Licensing, Certification or Authorization

The proponent (Prime Consultant) shall be an Architect, 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 Nova Scotia. For proponents not already licensed in NS, licensing eligibility must be demonstrated by way of a 'Letter of Good Standing' from the proponent's Local Architectural Association.

3.1.2 Consultant Team Identification

The consultant team to be identified must include the following:

Proponent (prime consultant) - Architect
Key Sub-consultants / Specialists:

- Structural Engineer
- Mechanical Engineer
- Electrical Engineer
- Project Coordinator
- Interior Designer
- Cost Consultant
- Sustainability Consultant

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

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

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

3.1.3 Declaration/Certifications Form

Proponents must complete, sign and submit the following:

- Appendix B, Declaration/Certifications Form as required.

3.1.4 Integrity Provisions – Required documentation

In accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Proponent must provide, **as applicable**, to be given further consideration in the procurement process, the required documentation as per R1410T (2016-04-04), General instructions 1 (GI1), Integrity Provisions – Proposal**, section 3a.**

3.2 RATED REQUIREMENTS

3.2.1 Achievements of Proponent on Projects

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

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

<u>Information that should be supplied:</u>

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

- names of key personnel responsible for project delivery
- awards received

The Proponent (as defined in R1410T General Instructions to Proponents, GI2 Definitions) must possess the knowledge on the above projects. Past project experience from entities other than the Proponent will not be considered in the evaluation unless these entities form part of a joint venture Proponent.

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

3.2.2 Achievements of Key Sub-consultants and Specialists on Projects

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

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

Information that should be supplied:

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

3.2.3 Achievements of Key Personnel on Projects

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

Information that should be supplied for each key personnel:

- professional accreditation
- accomplishments/achievements/awards

- relevant experience, expertise, number of years of experience
- role, responsibility and degree of involvement of individual in past projects

3.2.4 Understanding of the Project:

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

Information that should be supplied in the proposal to describe:

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

3.2.5 Scope of Services:

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

Information that should be supplied in the proposal to describe:

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

3.2.6 Management of Services:

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

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

Information that should be supplied:

- Confirm the makeup of the full project team including the names of the consultant, sub-consultants and specialist personnel and their role on the project.

- Organization chart with position titles and names (Consultant team). Joint Venture business plan, team structure and responsibilities, if applicable
- What back-up will be committed
- Profiles of the key positions (specific assignments and responsibilities)
- Outline of an action plan of the services with implementation strategies and sequence of main activities
- Reporting relationships
- Communication strategies
- Response time: demonstrate how the response time requirements will be met
- How the project team will address working with multiple tenants in parallel

3.2.7 Design Philosophy / Approach / Methodology

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

Information that should be supplied:

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

3.3 EVALUATION AND RATING

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

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

Generic Evaluation Table

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

	INADEQUATE	WEAK	ADEQUATE	FULLY SATISFACTORY	STRONG
0 point	**2 points**	**4 points**	**6 points**	**8 points**	**10 points**
Did not submit information which could be evaluated	Lacks complete or almost complete understanding of the requirements.	Has some understanding of the requirements but lacks adequate understanding in some areas of the requirements.	Demonstrates a good understanding of the requirements.	Demonstrates a very good understanding of the requirements.	Demonstrates an excellent understanding of the requirements.
	Weaknesses cannot be corrected	Generally doubtful that weaknesses can be corrected	Weaknesses can be corrected	No significant weaknesses	No apparent weaknesses
	Proponent do not possess qualifications and experience	Proponent lacks qualifications and experience	Proponent has an acceptable level of qualifications and experience	Proponent is qualified and experienced	Proponent is highly qualified and experienced
	Team proposed is not likely able to meet requirements	Team does not cover all components or overall experience is weak	Team covers most components and will likely meet requirements	Team covers all components - some members have worked successfully together	Strong team - has worked successfully together on comparable projects
	Sample projects not related to this requirement	Sample projects generally not related to this requirement	Sample projects generally related to this requirement	Sample projects directly related to this requirement	Leads in sample projects directly related to this requirement
	Extremely poor, insufficient to meet performance requirements	Little capability to meet performance requirements	Acceptable capability, should ensure adequate results	Satisfactory capability, should ensure effective results	Superior capability, should ensure very effective results

To be considered further, proponents **must** achieve a minimum Technical Rating of seventy (70) points out of the hundred (100) points available as specified above.

No further consideration will be given to proponents not achieving the pass mark of seventy (70) points.

SRE 4 PRICE OF SERVICES

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of seventy (70) points will be opened upon completion of the technical evaluation. An average price is determined by adding all the price proposals together and dividing the total by the number of price proposals being opened.

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

The remaining price proposals are rated as follows:

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

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

SRE 5 TOTAL SCORE

Total Scores will be established in accordance with the following:

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

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

SRE 6 SUBMISSION REQUIREMENTS - CHECKLIST

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

Please follow detailed instructions in R1410T General Instructions to Proponents**,** GI16 Submission of proposal, as amended in SI2 Proposal documents. Proponents may choose to introduce their submissions with a cover letter.

- ☐ Team Identification - see typical format in Appendix A
- ☐ Declaration/Certifications Form - completed and signed - form provided in Appendix B
- ☐ Integrity Provisions – Required documentation **– as applicable** in accordance with the Ineligibility and Suspension Policy (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) and as per R1410T (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) bound original plus three (3) bound 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

SITE REVIEW MEETING

For the purposes of developing the proposal, a Mandatory site visit will be conducted by PWGSC, on **Tuesday, September 12th, 2017 at 1:30 p.m**. All interested parties should meet promptly at the commissionaire's desk in the lobby of the Dominion Public Building. It is located at 1713 Bedford Row, Halifax, Nova Scotia. This meeting will provide an opportunity for all interested parties to tour the building and to ask questions concerning scope and expectations.

Project Requirements

General Objectives (GO)

Required Services (RS)

PR 1 PROJECT REQUIREMENTS

PR 1.1 Project Information

PR 1.1.1	**PSPC Project Title:**	Dominion Public Building Renovation
PR 1.1.2	**Facility Name and Location of Project:**	Dominion Public Building, 1713 Bedford Row, Halifax, Nova Scotia
PR 1.1.3	**PSPC Project Number:**	R.063820.005
PR 1.1.4	**Client Department:**	Public Services and Procurement Canada (PSPC)
PR 1.1.5	**Other Tenant Departments:**	Canada School of Public Service (CSPS), Public Service Commission (PSC), Shared Services Canada (SSC), Translation Bureau (TB)

PR 1.2 PSPC Project Team

PR 1.2.1	**PSPC Project Manager:**	**TBD**	**Phone:**
PR 1.2.2	**Senior Project Manager:**		**Phone:**
PR 1.2.3	**Design Manager (RTL):**		**Phone:**
PR 1.2.4	**Senior Design Manager:**		**Phone:**
PR 1.2.5	**Property Manager (BGIS):**		**Phone:**
PR 1.2.6	**Project Leader:**		**Phone:**
PR 1.2.7	**Project Architect:**		**Phone:**
PR 1.2.8	**Interior Designer:**		**Phone:**
PR 1.2.9	**Structural Resource:**		**Phone:**
PR 1.2.10	**Mechanical Resource:**		**Phone:**
PR 1.2.11	**Electrical Resource:**		**Phone:**
PR 1.2.12	**Commissioning Resource:**		**Phone:**
PR 1.2.13	**Environmental Resource:**		**Phone:**
PR 1.2.14	**Project Document Coord. :**		**Phone:**
PR 1.2.15	**Contract Mgmt. Officer:**		**Phone:**
PR 1.2.16	**Communications Officer:**		**Phone:**

PR 1.3 Project Description

PR 1.3.1 Purpose of the Project

Public Service and Procurement Canada (PSPC), formally known as Public Works and Government Services Canada (PWGSC), plays an important role in the daily operations of the Government of Canada as a key provider of services for federal departments and agencies. It supports them in the achievement of their mandated objectives as their central purchasing agent, linguistic authority, real property manager, treasurer, accountant, integrity adviser, and pay and pension administrator. The department's vision is to excel in government operations, and our strategic outcome and mission is to deliver high-quality, central programs and services that ensure sound stewardship on behalf of Canadians and meet the program needs of federal institutions.

The purpose of this project is to provide renovated office space for multiple tenants in the Dominion Public Building at 1713 Bedford Row, Halifax, Nova Scotia. The building is currently a single tenant building and it will need to be converted to a multi-tenant use. Public Services and Procurement Canada (PSPC) currently occupies the building and will continue to be the largest tenant. Other tenants known at this time are: Translation Bureau (TB), who will be relocating from Bedford Row, NS; Canada School of Public Service (CSPC) and the Public Service Commission (PSC), who will both be relocating from Maritime Centre in downtown Halifax; and, Shared Services Canada (SSC). A SSC representative will coordinate all engagement for this tenant remotely from Ottawa. The renovation will include all the usable space in the building whether or not there are tenants identified for all areas. While the majority of the space is to be general purpose office space, with some special purpose space, there are specific design goals for sustainability and innovation in design using both Workplace 2.0 and Activity Based Workplace (ABW) concepts. At this time, one tenant, PSC, will require a fit-up designed to meet Workplace 2.0 standards, a more prescriptive approach. For PSPC, and the remaining major tenants, the fit-up will be to Activity Based Workplace standards. This progressive standard for workplace design will incorporate a combination of various types of work points, including compact unassigned work stations, benching and collaborative areas. These concepts are described in greater detail in PR 1.3.3.5. This project description addresses the scope of work required for the interior fit-up and base building improvements (where these improvements make sense to incorporate in this project).

The asset is not configured to accommodate multiple tenants at this time and one of the goals of this project will be to create a multi-tenant asset. An assessment of the existing requirements has been undertaken by a consultant addressing crossover floors and other related issues and their report is found in the Appendix G - Capacity Study. The consultant is required to become familiar with this report, validate its findings and bring any additional issues or limitations to the attention of the departmental representative. If secure lobbies are necessary on some floors to facilitate the multi-tenant nature of the building, this could impact the total usable area available in the building.

PR 1.3.2 Project History Synopsis

The Dominion Public Building, 1713 Bedford Row, Halifax has 8,217.41 Um^2 over seven floors of space. PSPC is currently over-housed in this asset and with the application of the Workplace 2.0 and Activity Based Workplace Standards there will be approximately 3 floors of vacant space to accommodate other tenants.

The building was constructed in 1935 with an addition completed in 1955 and is a Recognized Heritage Asset. The building was transferred to Public Works Canada in the late 1980's and renovated for occupancy by the Department. A major renovation was completed on the exterior stone cladding of the tower in 2008-2010. The asset is considered a core asset in the portfolio and a viable asset to house government departments requiring location in the downtown core. PSPC recently completed a Workplace 2.0 project on the 4th floor, which achieved a Gold accreditation for the project under the GOC WP 2.0 rating system. As well, a project to address the exterior stone cladding on the first 7 floors of the asset is ongoing, with an anticipated completion date of 2019.

<u>Scope and Phasing of the design work</u>:

Renovation of the building will be done with PSPC staff in the building while the construction is taking place and it is anticipated that PSPC will occupy the 7th, 6th, 5th and 4th floors in the final state. This will be achieved by allowing approximately 100 staff to work from home and the balance of the building staff consolidated onto the 4th, 3rd, 2nd and 1st floors until the new work is completed on the 7th, 6th, 5th and 4th floors. (NOTE: Staff on the 4th floor will at some point be relocated from that floor to the lower floors to complete work on the 4th. Upon completion and occupancy of the 7th, 6th, 5th and 4th floors, construction will commence on the 3rd, 2nd and 1st floors). The three remaining lower floors and basement will be renovated to suit the remaining departments, as well as incorporate shared areas. The basement will be renovated to include shared storage, updated and enlarged shower/locker rooms and multipurpose room/exercise room (with folding partition, stage & sound system)/area that can be used by all departments. The basement storage will require assessment, recommendation & design of more efficient use of current layout located in a number of areas.

As part of the Government of Canada's efforts to modernize its employees' work environment, and promote efficiency of service delivery to the Canadian Public, the design of each department's space will include a combination of the latest accommodation standards in office design, suited to each department's operation. These standards will range from the latest accommodation standard, Activity Based Workplace and the previous standard Work Place 2.0, and possibly a mix of the two standards and/or technology for departments not able to modernize as much because of security restrictions in their operating methods.

The project scope will address necessary base building upgrades as well as fit-up in tenant spaces. From the base building perspective, the design will include the upgrade of building washrooms (providing gender neutral washrooms were plausible), elevator control (or access lobbies), Life Safety systems, sprinkler layouts, Electrical systems and fire exiting/egress, HVAC upgrades, lighting, ceilings and flooring. Fit-up design will address floor layouts, client requirements for special purpose space, furniture and work surface design, work point and work station accessory requirements, branch circuit wiring, finish selection, flooring, tenant security requirements and support spaces.

All existing building systems are to be modified to the extent necessary to suit new floor layouts in a functional and efficient manner. In addition, some aspects are to be completely removed and replaced, including ceiling tiles, lighting and flooring. Should any significant issues arise with existing base building infrastructure, they are to be brought to the attention of the Departmental Representative who will provide direction.

The project is to be completed by the **fall of 2020** or earlier with all tenants occupying their new space. Not all of the tenants are finalized at this time. The project will proceed with a phased approach with PSPC being the first phased construction contract. As soon as final tender drawings are completed PSPC will proceed to tender in order to get construction started on PSPC space as early as possible. This will allow vacated PSPC space to become available to the new tenants as PSPC moves into its completed space. The remaining tenants will follow as the second phase construction contract. The design of each occupant's space shall be expected to start as they commit to the project. Scheduling of the designs and construction will be a key component to the successful implementation of the project. Creative solutions will always be open for discussion during the course of the project.

PR 1.3.3 Detailed Scope of Work

PR 1.3.3.1 Architectural and Interior Design Requirements

Provide an office space that delivers flexible, functional, safe, healthy, and responsive environments that effectively meet the operational needs of the occupant groups while maximizing space utilization.

.1 Demolition

The Workplace 2.0 /Activity Based Workplace standards promote an open office concept and as such restrict the use of enclosed spaces, particularly offices. All enclosed spaces are to be located in the interior of the space and not on exterior windows, wherever possible. Therefore, there will be demolition of any existing partitioned spaces which cannot be incorporated into the new layout. Interior partitions of stairwells, elevator shafts and most M&E shafts will remain. Demolition will include but is not limited to the following:

- Removal of some interior partitions, glazing, doors and frames.
- Removal of all existing finishes on all surfaces, except core elements and some existing enclosed spaces.
- Removal of all existing suspended ceilings and bulkheads
- Removal of all lighting, controls and service elements outlined in M&E scope of work
- The kitchen associated with the former cafeteria

.2 Space Planning

A blocking diagram layout has been completed for the Dominion Public Building in consultation with the known tenants and is included in Appendix G - Capacity Study. The Consultant is to continue to develop this schematic layout through the design development phase, and confirm it meets the requirements of the NBCC, CSA B651-12 barrier free requirements, and the Workplace 2.0 and/or ABW fit-up standards.

Existing area measurement CADD drawings are included as Appendix L.

The consultant will conduct user meetings to gather more specific user information and technical requirements in order to develop the functional program for each tenant as described in RS-2. This will involve developing a questionnaire (with the assistance of PSPC) that will help the users collect information to determine the most suitable types of workstations and collaborative spaces. The consultant's expertise and recommendations will be essential in assisting the tenants meet their objectives, that of Workplace 2.0 and/or ABW, and creating a successful new workplace.

See additional information in regards to Workplace 2.0, ABW and related challenges in section PR 1.3.3.5.

.3 Space Requirements Summary

The following describes the type of space requirement for each known tenant and the associated size for the currently identified tenants. (Note, all areas are usable m²)

	Anticipated Space Demand Information			
Occupant	**Um² Office**	**Um² SPS***	**Um² Total**	**FTE**
Public Services and Procurement Canada	3,948.2	437.5	4,385.7	333
Shared Services Canada	1,284.0	171.3	1,455.3	107
Translation	84.0	0.0	84.0	7
Public Service Commission	243.4	360.8	604.2	14.0
Canada School of Public Service	120.0	579.7	699.7	10
	5,679.7	1,549.2	7,228.9	471

* Special Purpose Space

.4 Furniture

The consultant will be required to perform an analysis of all the client's furniture requirements and make recommendations. This includes the assessment and possible recommended re-use of any existing furniture (including new furniture purchased for the swing space). Any existing furniture recommended for re-use will require undertaking inventory, clear documentation, and direction for its re-use on furniture layouts. Generally, furniture will be new with any existing incorporated as appropriate. The fourth floor was recently renovated to meet Workplace 2.0 standards and it is expected that the furniture on this floor will be re-used. Recommendations and a strategy for the sustainable disposal of any surplus furniture will also be required.

New furniture for this project will be acquired through various methods, primarily through the use of PSPC Supply Arrangements and as well as other PSPC internal procurement processes. The types and quantities of furniture required will determine the procurement methods used and the consultants will be expected to recommend to PSPC each tenant's detailed furniture requirement and to prepare documents and drawings required to procure the furniture using the aforementioned Government of Canada tools. Furniture is identified as a mandatory commodity to be purchased only through the Government of Canada procurement tools. See RS-4.2.3 for additional information on furniture layout design and procurement drawings.

The consultant will be required to develop detailed furniture specification documents for workstation furniture, freestanding furniture and collaborative furniture that will be used to procure new furniture through the various furniture procurement instruments PSPC has at their disposal.

The consultants will be required to review Furniture Manufacturers/Suppliers quotations for technical compliance as well as installation plans for freestanding furniture, systems furniture and reconfiguration of existing furniture. They will ensure compliance with the approved furniture plans and specifications and the Client Department's functional requirements.

The Consultant shall oversee the installation of furniture by the Furniture Manufacturer/Supplier. They shall be available on site for verification of product receipt, its condition and acceptance, installation, inspection and periodically to resolve problems/issues as required.

The Consultant shall prepare a Furniture Deficiency/Discrepancy Inspection Report during the furniture installation inspections. The consultant shall review and revise the list until all deficiencies/discrepancies are rectified.

PR 1.3.3.2 Mechanical Requirements

Mechanical Systems Overview:

Currently, air conditioning and ventilation for the building is provided by three McQuay packaged rooftop variable air volume air handling units each equipped with a DX cooling coil, a glycol mixture heating coil and humidification. The supply air is distributed to terminal VAV boxes serving zones on each of the floors. Building heating is provided by two natural gas fired, Weil-McLain cast iron sectional boilers and distributed by a hydronic loop to perimeter hot water baseboard heaters. A separate glycol mixture heating loop is serving the roof top air handling unit (AHU) heating coils via a heat exchanger. The control of the various heating/cooling zones within the building space is provided by a Delta Direct Digital Control (DDC) system.

Implications of Workplace 2.0 and Activity Based Workplace (ABW) on Mechanical:

The Full Time Employee (FTE) count indicates an increase of occupants on many of the floors. This increase in floor occupancy may not have a significant impact on the air conditioning and ventilation loading of the space. However, complete heating and cooling load calculations must be performed in order to ensure suitability of the existing air handling system and for accurate sizing/modulation of the proposed heating system. Duct routing/upgrade and space zoning (i.e. VAV boxes, temperature controls, diffusers, etc.) within the building will have to be revised to accommodate the new floor layouts and the new building occupancy.
As part of this fit-up project there is a requirement to follow Green Globes standards and to obtain a designation under this system as applicable. Consequently, the required hardware and systems should be designed to satisfy the prerequisites and credit requirements of this Green Globes compliant system.

Appendix I - Building Condition Report (BCR) which further describes the mechanical equipment, its age and the life expectancy. Reference also supporting information provided in Appendix G - Capacity Study.

A basic description of the mechanical system upgrades expected in this project are outlined as follows. This list is not exhaustive and further requirements, if applicable, should be clarified at the concept design stage.

Demolition

Existing HVAC systems in the building at the zone level are to be removed as required to accommodate the new floor plan layout and increase in occupant load. The demolition also includes the removal of miscellaneous mechanical equipment which is not suitable for the revised building layout.

Ventilation and Air Conditioning

HVAC zoning will need to be revised as required to accommodate the new floor plan layout and reconcile the existing zoning where inappropriate. Central air handling sizing and ducting mains sizing are to be revised if increased building cooling and ventilation loading need to be accommodated.

There appear to be some instances (i.e. 7th floor, 3rd floor South, 5th floor NE corner) where the branch ductwork serving a number of existing VAV boxes is undersized and unable to satisfy the associated spaces with the cooling requirements. The O&M personnel have been dealing with a number of complaints from the occupants located at the perimeter of the building due to cold or hot air drafts. A combination of issues appear to be the explanation including cubicle panels and furniture placed against the baseboard heaters, type of diffusers used in the bulkheads, location of thermostats (in some cases they are installed in the ceiling space) etc. It appears these types of issues were minimized on the 4th floor renovation where there is a buffer zone between the building perimeter and the working spaces and where some HVAC zones were revised.

The system has been exposed to dust due to various remediation projects applied to the building envelope over the years. As a result, a full cleaning of the existing-to-remain ductwork distribution and HVAC equipment should be performed in addition to full testing, adjusting and balancing (TAB) of the hydronic and ventilation system.

The 3 rooftop AHU's were installed in 2012 and appear to be in good working condition based on the information in Appendix I - Building Condition Report and according to the building O&M personnel. The Mechanical Consultants are required to do a complete assessment of these units to ensure their suitability from a size and O&M perspective.

Heating

The boilers have been fitted with burners for natural gas, and date back to approximately 1992 (original with building). The primary heating loop (boiler loop) is a constant volume loop served by two original heating pumps (1992). The secondary (building) heating loop was recently modified to include variable speed drive (VSD) pumps. The glycol loop providing heating to the rooftop AHU heating coils also has VSD's on the pumps.

The baseboard radiation valves require replacement as they leak and their actuators have been failing. The existing type of actuators have been discontinued by the manufacturer. Approximately 10% of the total amount of heating valves have already been changed due to leaks. All existing perimeter heating zone valves and actuators should be replaced. Heating system zoning must be revised as required to accommodate the new floor layouts.

Plumbing

Plumbing systems must be revised in order to accommodate new floor layout.

Controls

The existing DDC system in the building is a Delta controls systems with version V3.33 of the building controllers. From the operator work station it appears that the controls network speed is suitable and provides reliable information.

DDC controls must be upgraded as required to accommodate new space zoning and any other changes in the building affecting the HVAC and domestic water systems. New strategies such as demand control ventilation, automatic fault detection and diagnosis system and similar smart building initiatives should be considered and presented in order to comply with the applicable prerequisites and credits associated with Green Globes certification/standards.

Fire Protection

Revised space layouts may require adjustments to the sprinkler system, however, it is expected that any revisions to this system will be minimal.

Codes

The mechanical system design for this project shall be done in accordance with the latest editions of all applicable requirements and/or recommendations of the following codes, standards and guidelines:

1. National Building Code of Canada
2. National Plumbing Code of Canada
3. National Fire Code of Canada/NFPA
4. National Energy Code of Canada
5. ASHRAE Handbooks and Standards
6. Green Globes

PR 1.3.3.3 Electrical Requirements

Electrical Systems Overview:

The scope of work is to complete an electrical retrofit of the building including but not limited to the following systems: lighting, lighting control, power ceiling grid, power distribution (regular and emergency), telecom raceway, structured cabling, Fire Alarm, and other miscellaneous systems.

The renovation/installation shall meet all general industry practices, which may be above the minimum requirements set by statutory codes and regulations. Installation is to be performed to permit ease of maintenance and operation. Capacity of electrical system shall include a 100% allowance for installed lighting with appropriate demand factors for other loads and planned future expansions; an additional allowance of 20% will be allowed for load growth over the life of the installation.

Incoming Service:

Currently, the main electrical room service switchgear is rated for 2000A and it is believed that it is only loaded to 1000A. Switchgear is 25+ years of age and it is in fair to good condition and could be reused. The rest of the 600V distribution within the main electrical room is also in fair to good condition and should only be replaced if it is needed due to loading requirements as part of this renovation. For the 120V distribution within this room and the basement, follow the same requirements described for the 120V distribution. The majority of the distribution to the rest of the floors consists of 600V feeds leaving this room to each secondary electrical room. The number of electrical rooms is as follows: 2 electrical rooms on each of the larger floors (1-4) divided into North and South parts of the building and 1 electrical room on the smaller floors (5-7). It is expected that these feeds can be reused. For further details of the distribution please refer to the single line diagram (Appendix F).

Distribution throughout the Building:

The Equipment, including panels, splitters, transformers, disconnect switches, raceways, cables and conductors, are existing and were installed in the 1991 renovation. The approach for this renovation should be as follows:

- The 600V panels feeding all of the lighting circuits and all 600V secondary panels throughout the building are to be replaced as part of this fit-up. The rest of the 600V distribution is only to be replaced or upgraded as required by the loading and limitation of the fit-up itself. Associated feeds are to follow the same approach.

- All 600V-120/208V transformers are to be replaced with single, dual or triple output harmonic mitigating transformers. Dual output cancelling transformers to be used for fit-up. The size of the transformers would depend on the loading of the renovation. Associated feeds to be reused or upgraded accordingly.

- All existing 42 cct 120V Panels are to be replaced to 66 or 72 cct Panels as recommended by the capacity study (Appendix G).

Replacement and upgrade of equipment is to meet the following minimum requirements:

Buss bars in switchboards, panels and splitters are to be copper.

All 120/208V Panels are to include TVSS protection with bolt-on breakers and be lockable and contain spares (20% minimum) and spaces.

Transformers on all floors are to be replaced as they predominantly feed non-linear loads. New transformers are to be harmonic mitigating. Changes to electrical distribution may be necessary to accommodate this new equipment.

An existing ceiling Power Grid is found on all floors, however, it consists of a single duplex receptacle grid in a 5m x 5m spacing. Due to increased power needs the existing grid will need to be replaced with a new grid. This new grid is to consist of a junction box with 3-15A circuits c/w separate neutrals and to be used for power drop needs only. This new distribution ceiling grid is to have 3m x 3m spacing. The rest of the existing wiring distribution is to be reused wherever and whenever is practical. All abandoned or redundant conduit and wiring is to be removed as part of this renovation. The ratio of the system furniture workstations is not to exceed 1 circuit per every 2 workstations.

Motor starters are existing and are generally grouped together in motor control centres. The only reason these may need to be replaced or upgraded is if there are any significant mechanical changes.

Magnetic and combination motor starters or Variable Frequency Drives to match the functionality of the existing ones.

Raceways to be generally EMT type. Rigid steel and flexible conduit (dry and liquid tight) to be used where required by code with associated approved fittings, clamps, supports, junction, and outlet boxes. Empty raceways shall be provided for the telephone, data wiring and security system stub down walls as needed.

All raceways to contain an insulated green bonding conductor sized to CEC but not less than #12 AWG copper.

Conductors used in raceways to 600 V RW90, XLPE insulated stranded copper conductors; minimum size #12 AWG copper.

Armoured cable to type AC90, 600 V XLPE insulated stranded copper conductors to be used for lighting drops and vibrating equipment only; minimum size #12 AWG, containing integral copper bonding conductor. Only approved connectors, clamps, supports and accessories for AC90 are acceptable. Installations are not to utilize T-bar suspension system for support.

Wiring Devices:

All wiring devices are to be replaced as part of this renovation. Wiring devices are to include but not be limited to toggle switches, convenience receptacles, ground fault circuit interrupting receptacles, appliance receptacles, and special receptacles and associated accessories. (See Lighting Systems (Interior) for low voltage devices)

All wiring devices are to be commercial specification grade and CSA standard configurations. Receptacles to be 15 A and 20 A 120 V duplex U-ground style with break off links for split wiring. GFCI receptacles to be duplex style with Class A leakage current protection.

Nylon or galvanized steel cover plates for all recessed devices to match rating and style; galvanized steel covers for devices installed in surface mounted utility boxes; cast covers for devices mounted in cast boxes. All wiring devices are to be properly identified by panel and circuitry.

Lighting Systems (Interior):

This section includes all interior lighting fixtures, lamps, and low voltage lighting control devices including relays and photo controls.

Lighting levels will be as stated in the IESNA recommended practices and CLC requirements for specific spaces or as indicated below;

The majority of the open area is to consist of pendant indirect/direct fixtures where ceiling clearances are adequate. Otherwise indirect troffers (volumetric) can be used where pendant mounted lighting is not practical. Lighting source to be LED source and proper glare control is to be considered. Fixtures with direct line of sight source will not be acceptable. Meeting room fixtures shall be replaced with pendent mounted indirect/direct dimmable fixtures. Architectural dimmable down lights can be used for accent lighting. New lighting fixtures to have dimmable LED drivers.

Special lighting (such as pot lights, track lighting, or accent lighting) will be required in meeting rooms, and several other spaces that will be identified during the design phase.

Existing Low Voltage lighting control system which is controlling existing 347 V lighting is believed to have gone though many changes and should be replaced. All low voltage switches, relays, relay panels, time clock modules, and interface modules are existing and should be replaced with new system. All redundant equipment is to be removed. Existing individual occupancy sensors have been added per workstation and are to be reused (and added) and reconfigured for new layout. Perimeter lighting is to have daylight harvesting capability with 0-10 V control and have gradual dimming. The occupancy sensor and photo sensors are to be interfaced with new LED light fixtures.

Emergency Lighting and Exit Signs:

Unit emergency lighting battery fixtures are only to be supplied in service rooms (mechanical, electrical, generator room and janitor rooms). The remainder of the building is to utilize night lights on emergency power. Most distribution is already existing.

Unit emergency lighting battery fixtures, remote lighting heads, exit signs wiring and associated accessories, to meet NBCC and CEC.

Unit emergency lighting equipment to conform to CSA C22.2 No 141: wall mounting, specification grade commercial enclosure; hard wired AC input; long life maintenance free battery; solid state battery charger and transfer circuitry; test switch; LED indicators for “on” and “charge”; dual integral lighting heads; 12 V dc distribution terminals for LED remote heads.

Remote lighting heads: adjustable single and dual heads as required; 12 V LED lamp(s).

Exit running man signs: these signs have recently been replaced throughout the building, their location is to be revised according to the new layout. New fixtures are to match existing depending on the new layout. LED light source: 347 V input; integral emergency backup power source and charging and transfer circuitry.

Fire Alarm System:

Existing addressable Fire Alarm system is to be extended if needed depending on the changes in layout. Install fire detection devices; manual pull stations; HVAC shutdown interface modules; audible and visible alarm signaling devices; raceways; boxes and wiring as needed.

Installation is to be in accordance with NBCC 3.2.4 Fire Alarm and Detection Systems.

Addressable Smoke and Heat detectors:
Addressable multiplex single stage fire alarm detection system wired as style B (Class B) configuration.
System to be connected to ASD approved monitoring service via dialer module (existing).

All equipment to be CAN/ULC certified for fire alarm service; equipment to be approved for control of fire Protection system where required; equipment to be of one manufacturer.
Metallic raceways and fitting; junction and pull boxes; wire type and size to fire alarm system Manufacturer's recommendations.

Miscellaneous Systems:

Public Address and Sound System:

The existing building is equipped with a new Public Address System. Reuse existing speakers and add new compatible speakers in areas if needed depending on the changes in layout.

Telephone and Data System:

New Telephone and Data systems hard wire is to be provided only in certain parts of the building and to be provided by SSC (see wireless system below).

Ladder type tray system shall be provided for the telecom systems. Existing telecom closet to be reused unless there are changes in layout. Existing zone conduit distribution is to be removed and reused for other applications if feasible.

Wireless System:

Most, if not all, areas of the building will be provided with wireless routers throughout the floor for data. These locations will be allocated to suit the occupants of that floor area and identified as part of their functional program and coordinated with the block plan provided by PSPC. Close co-ordination with our service provider, Shared Services Canada will be required on the part of the consultant. For all other locations a hardwire data connection will be required to the desk/workstation; as well as functions such as Meeting rooms, Boardrooms and Quiet Rooms and Collaborative Spaces where coverage by Wi-Fi will also be required. These spaces shall also require telephone hardwire connections. Otherwise, the intent is to provide staff with cell phone service only, so that telephone hardwire connection will not be required to work points.

Grounding System:

Existing grounding system is to be reused throughout the building. Consultant is to include testing of system in construction contract documents to ensure reliability of grounding system at the end of the job.

Elevator:

Elevator work under this project is to consist of reprograming the controller to not allow occupants access to the floors under construction, reprogramming the controller to provide employee access only to the floors they work on and to have a fully functional elevator by the end of the project.

Specific instructions relating to reprogramming the elevators will be provided by BGIS, the company providing building management services to the Crown.

Door Access Control Systems:

An existing door access system is to remain and to be maintained operational during construction. Modifications to the system will be required to suit the new layout.

Sound Masking System:

A sound masking system was installed on the 4th floor. This system is to be replaced and a new system is to be installed in the entire building. The system is to consist of, but not be limited to the following components:

- sound masking amplifiers with multiple input channel mixer;
- sound masking generator;
- speakers;
- volume control

Consultant is to investigate if existing PA system could be modified to incorporate sound masking system.

Lock out and tag out procedures:

Consultant is to specify that working on a power distribution while it is energized is not permitted. Lockout and tag out procedures according to the CLC, OHS guidelines and CSA Z460-13.

Multipurpose sound system:

New multipurpose room is to include a sound system for events. This room may be able to be split into 2 rooms and so should the sound system be split into 2 zones with 2 separate inputs.

Careful consideration is to be given to this requirement as there will be ceiling plenums that may contain circuitry from 2 different floors (either the floor above or below the floor that is under construction).

Support systems:

Ensure that by project completion, all new and existing to remain electrical systems are properly supported independently from ceiling T-bar support or other dedicated support system.

Existing Generator and UPS:

The existing generator and UPS size are believed to be adequate for this renovation. Changes in distribution may be required based on renovations requirements.

PR 1.3.3.4 Structural Requirements

The original design drawings are available for the Bedford Row building and annex (Appendix F), however the design loads used for the original design are not evident. The floor design in all areas of the building is expected to meet or exceed the National Building Code for general office space. A preliminary study was recently completed to analyze the acceptable floor loading capacity throughout the building and is found at Appendix H. The study identified areas of the floor plates that are likely unable to support more than typical office floor loads and should be avoided for large concentrations of storage, fixed filing and moveable file storage, identified during this project. Detailed design calculations ensuring the floor capacity for areas with these and other types of increased floor loads will need to be completed by the Consultant once the loads and locations have been identified. One such load is the relocation of the rolling files to the 3rd floor, North. The Consultant must also consider floor loads due to stockpiling materials during the demolition or implementation phases of the project.

PR 1.3.3.5 Activity Based Workplace and Workplace 2.0 Fit-up Standards

Approximately 6 years ago, PWGSC (now PSPC) introduced the Workplace 2.0 Fit-up Standards which were intended to begin the modernization of the federal workplace and to standardize space types and sizes for typical office functions. These standards are still in place, and, since they are considered our minimum standards, continue to be used in some situations. Workplace 2.0 has been a successful first step toward workplace renewal for the federal government and it is now recognized that our workplaces need to go further in support of the federal government objectives for Blueprint 2020 and in becoming a workplace of choice. The most recent development in the federal government's workplace modernization is called Activity Based Workplace (ABW) and the Government of Canada has adopted a version that incorporates unassigned seating. The intent is that this concept will gradually be adopted government-wide and this project will be one of several "Pathfinder" projects across the country intended to lead the way in demonstrating this new concept. This renovation/fit-up will incorporate the principles and guidelines of the Activity Based Workplace as adopted by the Government of Canada wherever possible. However, at this time, it is anticipated that at least 1 tenant, PSC, will have their space designed to WP 2.0, as a minimum, instead.

While WP 2.0 strove to achieve more modern, open and collaborative workplaces, it used a prescriptive method of providing standardized sizes of workstations and other support spaces to do so. By contrast, ABW anticipates the provision of a completely non-prescriptive, customized design approach to suit each tenant`s needs using a common design philosophy to enhance flexibility. The resulting workplaces will provide a wide variety of unassigned work points (from high concentration areas to semi-private and shared collaboration areas) in a flexible, near-paperless, wireless environment permitting employees complete flexibility to choose a work point suited to the task at hand throughout their workday. Since the government realizes that not all tenant departments are equally prepared and ready to make this transition, WP 2.0 has been maintained as the 'minimum' standard for modernization. The ABW approach is now also described within the WP 2.0 standard and all tenants are being encouraged to incorporate as many features of ABW as could positively support their organizations' needs, now and for the future. The consultant for this project must anticipate the majority of the building to be designed completely using the ABW approach (e.g. PSPC, CSPS, TB and SSC), while at least one other tenant (PSC) will still require the prescriptive WP 2.0 standard to be applied. Some tenants may require an approach using some features of both. At least one tenant, CSPS, will require a high percentage of enclosed classroom and special purpose spaces, derived from a traditional functional program; with only a small percentage of the remaining area available for open office areas.

Activity Based Workplace Philosophy within the Federal Government:

To make work more efficient but also more enjoyable for employees and also more effective for the organization. This vision is realized by focusing on the employees and giving the freedom to decide for themselves how to work, where to work, when to work, the tools to use and with whom to collaborate to get the work done.

Concept:

Activity Based Workplace (ABW) is a concept which recognizes that through the course of any day, people engage in many different activities and that they need different types of work settings to accommodate these activities.

1. The activity based workplace solution is a modern open work environment which is bright, healthy, sustainable and flexible. With ABW, the definition of work environment is expanded to include environments like technology, information management, people, security, health and safety, as well as the physical workplace as all must be coordinated to create an effective work environment.
2. Supports a diverse activity-based workplace providing diversity and choice of work points to enhance performance, wellness, and engagement of employees.
3. Provides a workplace of unassigned work points in a variety of solutions, furniture types and configurations to support diverse activities and personal preferences.

4. The workplace reflects the activities of the employees, whether they are of an individual nature, collaborative, private or social. The workplace respects the employees' need for acoustic and visual privacy for both individual and collaborative work, supporting wellness and reducing stress in the workplace.
5. The workplace supports the tenant's virtual environment vision, where information and collaboration is available to employees in any place, at any time, without requirement for paper-based processes or records; to the greatest extent possible.
6. Respecting the tenant's program culture, create a variety of spaces and activity based work points leveraging mobility, and inspiring engagement, collaboration, creativity and innovation.

More information on the Government of Canada's approach to Activity Based Workplace can be found at the following link:

http://www.gcpedia.gc.ca/wiki/Fit-up_Standards

Challenges

PSPC acknowledges that there are two particular challenges with implementing Workplace 2.0 and ABW in this project.

The first is that it is a new approach and it is critical that the consultant clearly understands the objectives of Workplace 2.0 and ABW and its implications on the tenants' work environment.

The second is that the Activity Based Workplace is an approach which the employees have not yet experienced and is significantly different from their current work environment.

The consultant will be a key component in the change management aspect of this project, both in the functional programming role and in support of the PSPC led change management team.

Due to the transformative nature of implementing the Workplace 2.0 and ABW approach, above normal effort on the part of the consultant will be required throughout the project. During the early stages, from problem identification to development of options, significant employee engagement on the part of the consultant must be recognized. Ensuring that user requirements are gathered with the optics of WP 2.0 and ABW in mind is critical.

PSPC will put in place a Change Management team. Employee acceptance will be critical to the success of the project. From ensuring users are confident their needs have been understood and then explaining the benefits of various proposed solutions will require considerable work. See RS 11 for specific duties in support of this team.

PR 1.3.3.6 Sustainability Requirements

Sustainability is a major priority for the Government of Canada and our goal is to incorporate sustainability into all aspects of our operations over the coming years so that sustainability becomes business as usual and not just a backdrop.
As one aspect of incorporating sustainability on this project, certification will be sought using the Green Globes rating system.

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 and for interior space fit-ups of existing spaces. Buildings are awarded one to five 'Green Globes' based on their score.

Refer to section RS 9 for detailed requirements.

The fit-up for the Dominion Public Building space is to meet the requirements of 4 Green Globes for Commercial Interiors.

The Green Globes rating system consists of environmental performance criteria in seven categories for a total of 1000 points:

1. Project Management (120 points)
2. Energy (180 points)
3. Water (65 points)
4. Resources (245 points)
5. Emissions (45 points)
6. Indoor Environment (275 points)
7. Space and Amenities (70 points)

The Prime Consultant will be responsible to prepare and submit documentation for the Green Globes certification of the project and coordinate work performed by all consultant team disciplines and incorporate into the reporting. Refer to the Green Globes website (www.greenglobes.com) for tools and support.

The Government of Canada is committed to improving the sustainability of its infrastructure. This requires improvements in consumption of electricity, water, heating, cooling and reducing waste.

1.3.3.7 Data and communications

Data and communications systems must be designed to support the modernized workplace and the concept of work anywhere and anytime.

PR 1.3.4 Site Conditions

The Dominion Public Building was designated “Recognized” because of its historical associations, its importance as a work of Architecture, and its local and environmental significance. Any modifications to the building’s interior must respect the heritage character of the building. The basement will be included in the scope of work and could serve as ancillary space for all tenants. The Federal Heritage Buildings Review Office (FHBRO) Heritage Character Statement for the Dominion Public Building and associated Building report are provided as Appendix J and Appendix K respectively.

PR 1.3.5 Implementation Strategy (Issues/Constraints/Challenges/Opportunities/Training)

The intention at the outset of the project, is to consolidate the employees of PSPC onto the first four floors of the building and the asset’s Facility Manager, Brookfield Global Integrated Solutions (BGIS) has been engaged to complete this portion of the project. This will allow the vacated floors to undergo renovation. PSPC employees will not be moving to off-site swing space so the building will be occupied during the renovation. As the renovated floors are completed, the PSPC employees will gradually move to the newly renovated space.

The fourth floor of the building has been recently renovated to meet the Workplace 2.0 standards. There will be some work required on this floor as identified later in this document. The intention is that this floor will be vacated for renovation during the overall PSPC renovation.

Issues/Constraints/Challenges/Opportunities:

- Gathering and determining functional program requirements to help determine PSPC, CSPS, PSC, SSC and any other tenants' building fit-up requirements. As noted earlier, this will involve the use of more than one standard and more than one approach.
- Developing innovative approaches to achieve a modernized workplace by incorporating flexibility, work point and workspace variety that supports an array of work activities. Assess and filter the amount of physical file storage an employee needs to perform their work.
- Changing employees' perception that work can only be done in a workstation, workspace sizes are an entitlement and that the workspace is an employee's personal space. Promote the benefits of being mobile and gain employee acceptance of a modernized working environment which will impact the way in which all levels of PSPC, and tenants, work.
- Employing an efficient and integrated approach with key stakeholders such as but not limited to Shared Services Canada, BGIS, PSPC, and other government tenants to facilitate an alignment between the needs of the modernized workplace with the tools needed to successfully implement the initiative.
- Review the proposed implementation strategy, analyze and validate its premise and implications and provide recommendations for the most effective implementation strategy for the project.
- Completing base building upgrades in a thorough and strategic way throughout the building so that there is minimal impact on the phased end-state completion dates. The upgrades will include but not be limited to flooring replacement, lighting, blinds, fire alarm, suppression systems, washrooms, cabling (including WIFI throughout or where possible), ceilings, perimeter convector work and HVAC.

PR 1.3.6 Consultant Access to the Site

During the planning, and design phases the Consultant will be required to conduct site reviews, investigations and testing, and will have access to the sites during daylight hours by pre-arranging site visit times with the Project Manager at least 48 hours in advance. Building access will require the possession of a PSPC Reliability Status security clearance.

PR 1.4 Budget (Order of Magnitude Estimate)

The Class 'D' construction cost estimate for this project is in the range of $17,000,000 - $20,000,000 excluding HST.

The construction estimate does not include taxes, furniture, artwork, plants, telephone service, moving, and Escalation and Consultant fees and is in "Budget-Year" (Current Canadian) dollars. Fees are not to be directly associated with **Construction costs and are to be fixed fees in accordance with the Submission Requirements and Evaluation Section of this RFP**.

The construction cost estimates are to be produced and updated at each stage and closely monitored by the consultant and adjusted as necessary by the Client progressively for the duration of the project. The consultant is responsible to produce a design solution that is within the approved project budget. Any issues in this regard are to be brought to the attention of the Departmental Representative immediately.

PR 1.5 Existing Documentation

The following information is located on the Buy and Sell website:

Appendix D **–** Doing Business
Appendix F **–** Existing As-Builts
Appendix G **–** Capacity Study
Appendix H **–** Preliminary Structural Study

Appendix I – Building Condition Report
Appendix J – FHBRO Heritage Character Statement
Appendix K – FHBRO Building Report
Appendix L – Space Measurement Drawings
Appendix M – Commissioning Oversight Requirements and 3rd Party Commissioning Agent Scope of Work
Appendix N – Technical Reference for Office Building Design

Federal accessibility standards for real property are on the internet at:

https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12044

Government of Canada Workplace 2.0 fit up standards are on the internet at:
http://www.gcpedia.gc.ca/wiki/Fit-up_Standards

Existing Operation & Maintenance Manuals are available for viewing from BGIS upon request.

PR 1.6 Codes, Acts, Standards and Regulations

1.6.1 General

Notwithstanding those Codes, Acts, Standards and Regulations already legislated and commonly accepted as applicable by the Design Professionals and Construction Industry, those described in the articles below may also apply to the Work (In all cases the most stringent applies):

a) The NRC National Building Code of Canada 2015,
b) The NRC National Fire Code of Canada 2015,
c) The NRC National Plumbing Code of Canada 2015,
d) The Canada Labour Code: http://laws.justice.gc.ca/en/L-2/,
e) The Canada Occupational Health and Safety Regulations: http://laws.justice.gc.ca/eng/SOR-86-304/index, html
f) Accessible Design for the Built Environment CAN/CSA B651 2012,
g) All other Provincial and Municipal Acts, Codes, By-laws and regulations appropriate to the area of concern.
h) National Energy Code of Canada 2015
i) PSPC Mechanical Design (MD) Standards applicable to the project scope
j) PSPC Best Practices; describing indoor humidity levels for Federal Buildings –2006
k) Government of Canada Workplace 2.0 Fit-up Standards

PR 1.6.2 Authorities Having Jurisdiction (AHJ)

Codes, regulations, by-laws and decisions of local authorities having jurisdiction will be respected. In the case of conflict, the most stringent will apply.

The Consultant will identify other jurisdictions appropriate to the project.

PSPC will voluntarily comply with the applicable Provincial/Territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Health and Safety Regulations.

PR 1.7 Schedule

The following is the proposed schedule for the PSPC Renovation:

PR 1.7.1 RS 1 Pre-design Services	
Completion of RS 1.1 Feasibility Study and Health & Safety Plan	4 weeks after award
PR 1.7.2 RS 2 Schematic Design	
Completion of RS 2 Schematic Design	4 weeks
PSPC and Client Review	2 weeks after RS2 completion
PR 1.7.3 RS 3 Design Development	
Completion of RS 3 Design Development	10 weeks
PSPC and Client review	3 weeks after RS3 completion
PR1.7.4 RS 4 Construction Documents	
33% submission (P&S)	6 weeks
2 weeks after submission of 33% docs	
66% submission (P&S)	8 weeks
2 weeks after submission of 66% docs	
99% submission (P&S)	10 weeks
2 weeks after submission of 99% docs	
Final submission (P&S)	2 weeks
PR 1.7.5 RS 5 Tender Call, Bid Evaluation & Contract Award	6 weeks
Completion of RS5 Tender & Award	
PSPC & Client Department Review:	2 weeks after RS 5 completion
PR 1.7.6 RS 6 Construction and Contract Administration & Post Construction Warranty Review	3 weeks

PR 1.7.7 Tenant Move-In
The tenant move-in & occupancy dates are dependent upon the various phases/move-in dates for various sections of each tenant department.

Schedules for other government department clients shall be developed as part of the Consultant scope and shall be reviewed and approved by the PSPC Project Team.

PR 1.8 Building Permit

The building contractor will be responsible to apply for and obtain the building permit. The consultant shall prepare all design related documents required by the authorities having jurisdiction for the application process.

PR 2 Health and Safety Plan

.1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.

.2 Health and Safety Plan shall include the following components:
- .1 List of health risks and safety hazards identified by hazard assessment.
- .2 Control measures used to mitigate risks and hazards identified.
- .3 On-site Contingency and Emergency Response Plan as specified below.

.4 On-site Communication Plan as specified below.

.3 On-site Contingency and Emergency Response Plan shall include:

.1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.

.2 Evacuation Plan: prior to entering the Work Site confirm escape routes, marshalling areas, and location of firefighting equipment.

.3 Emergency Contacts: name and telephone number of officials from:

.1 Departmental Representative.

.2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

.3 Local emergency resource organizations.

.4 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PSPC and Facility Management contacts.

.4 On-site Communication Plan:

.1 Procedures for sharing of work related safety information to Sub consultants, including emergency and evacuation measures.

.2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.

.5 Address all activities of the Work including those of sub consultants.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever a new sub consultant arrives at Work Site.

.7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

.8 Plan must outline how the consultant will share information, collaborate and cooperate with building facility manager, BGIS, throughout duration of project, particularly is the context of managing Health and Safety aspects, in an integrated fashion.

PR 3 Definitions

ACCEPTANCE: A formal action by an assigned authority (contractual or otherwise) to declare some aspect of the project is permitted to proceed. Accountability for the specific aspect of the project remains with the designer.

Activity Based Work (ABW): A concept of working based on the premise that no employee 'owns' or has an assigned workstation. Rather, the broader workspace provides employees with a variety of predetermined activity areas that allow them to conduct specific tasks including learning, focusing, collaborating and socialising. See also Work Point.

BASE BUILDING: As per Government of Canada Work Place 2.0 Fit-up Standards – see Glossary. Also refer to Building definition.

BASIS OF DESIGN (BOD): Documentation of the primary thought process and assumptions behind design decisions to meet the Occupying Tenant requirements stated in this RFP and as determined on site.
A report component submitted at the conclusion/sign-off at each of the RFP Required Services.

a) Live document updated during the various provisions of Services.
b) Integral component of the Schematic and Design Development Reports and ongoing Cx Plan development.

BGIS: The company providing Facility Management Services to the Crown for the Dominion Public Building.

BUILDING PERFORMANCE VERIFICATION: Landlord formally submitted verification statements indicating the Building, as per the LDP, remains capable to support Tenant Improvements requirements throughout all the project life cycle services submissions from Pre-Design Service through to Post Construction Services.

COMMISSIONING (CX): In general, a systematic planning, testing and documenting process to ensure that the Building and Tenant Improvements Work performs interactively according to the design intent and the Occupying Tenant(s) operation needs.
Specific to Tenant Improvements Work, Commissioning Services focus is the Leased Premises endpoints proof of performance.

a) End point performance verification is, as defined in, for example, CSA Z320- Functional Performance Testing.

COMMISSIONING (CX) PLAN:

a) As identified in CAN/CSA Z320.
b) Updated throughout projects life cycle.
c) Also refer to Basis of Design (BOD).

COMPONENT (FUNCTIONAL PROGRAMMING): Functional Programming term. A group of spaces that is functionally similar but not necessarily contiguous or spatially cohesive. A component is comprised of one or more Elements (see definition).

DECISION LOG: Debrief of minutes and resultant decisions/action summary.
Suggested column format headings: Date Raised, Topic, OPI, Action Plan, Update, and Status.

ELEMENT (FUNCTIONAL PROGRAMMING): Functional Programming term. A group of spaces, open or enclosed, that are functionally similar, reliant on each other and are spatially cohesive/contiguous.

FIT-UP (TENANT IMPROVEMENTS): Work to bring office space to “in-service” functionally and operationally.

FIT-UP STANDARDS: Space and cost (funding) allocation and workplace configuration and furnishing as per Framework for Office Accommodation and Accommodation Services – Government of Canada Workplace 2.0 and Activity Based Workplace Fit-up standards.

FUNCTIONAL PROGRAM: The document which assembles all of the tenant functional visions and user requirements.
Functional Programming tools developed by PSPC (in MS Excel).

a) The space calculator data, due to its level detail breakdown may be considered a form or an element of a functional program to directly initiate a schematic design.

INTEGRATED PROJECT DELIVERY: Mechanism that enables early and ongoing engagement of a project team to provide a better designed, constructed, cost effective and timely project.
Early and strategic engagement of the stakeholders allows for the potential of early start in the construction sequence, as the design is proceeding.

ISSUES LOG:

a) Log contains description of issues and variances on matters such as Program, Fit-up Standards, Budget, Schedule and Performance, Commissioning, Basis of Design and Building Project Related Requirements.
b) On an ongoing basis the log maintains status of current and resolved issues

c) Issues are identified and tracked as encounter during all design phases, construction and operations of the lease premises and building.
d) Issues Log is included as part of the monthly design and construction phase reporting. LEAD:

Identified entity to facilitate an activity and be accountable for the resulting deliverable.

LEASE/TENANT IMPROVEMENTS: Also means Fit-up.

MASTER COST PLAN: Master Cost Plan is produced and updated by and is the responsibility of the PM with input and responsibilities of the Consultant Team addressing elements such as:

a. Design cost
b. Construction cost
c. Risk allowance
d. Escalation
e. Cost variance
f. Earned value to date
g. Actual and budget variances

MASTER PROJECT SCHEDULE: Master Schedule is produced by and is the responsibility of the PM with input and support from the Consultant Team.
A primary project schedule to which all other schedules roll up and are coordinated.

OCCUPYING TENANT: Tenant “Client” or an occupying tenant in Leased Premises.

OWNER PROJECT REQUIREMENTS (OPR): Tenant Project Requirements (TPR) used in the RFP is the same as the industry term Owner Project Requirements (OPR) with the purpose to:

a) Define performance benchmarks and acceptance criteria by which project success is assessed. OPR/TPR may be available in advance of the TOR development otherwise; the Landlord develops the document, in advance of any design, as may be described in TOR Scope and Activities.
b) Form the basis from which all design, construction, acceptance, and operation decisions are made. The OPR/TRP may be modified during the design and construction process as the Owner’s/Tenant’s objectives and criteria are refined.
c) Evaluate BOD and Construction Documentation compliance with the OPR.

START-UP MEETINGS: Meeting led by the PM addressing, as may be appropriate, depending on the attendee, following items such as:

a) Roles and responsibilities,
b) Rules of engagement,
c) Project status, goals, objectives, elements, scope, funding, preliminary schedules,
d) Project risks and development of initial risk management plan,
e) Review of existing available documentation and site,
f) Schedule bi-weekly project and milestone meetings,
g) Establish communication and document control plan.

PM and Consultant Team as part of the design team are responsible for matters such as the Master Schedule and Commissioning Plan and provide input into matters such as design, phasing, constructability, availability of materials and equipment.

PLANNING DIAGRAM: A schematic representation of spaces whose functional relationships may be sufficiently complex to still require further detail design. A planning diagram is illustrative and, as such, does not include all design-specific spaces and therefore is not a resolved floor plan layout.

PROJECT PROCEDURES PLAN: A dynamic and evolving plan to establish how the design, construction and closeout process will be structured to deliver the improvements on time and within budget and scope. A measure against which performance is evaluated and success is judged.
Includes items such as:

a) Organization and communication charts.
b) Master Cost Plan including narratives discussing cost estimating, control and management techniques.
c) Master Project Schedule complete with a detailed Work breakdown structure.
d) Quality Management Plan, a procedures and documentation plan to determine for example documentation completeness and suitability, testing, inspection and submissions requirements.
e) Construction procurement options and/or number and sequence of tender packages.
f) Contracting/procurement strategies, bid packaging description, bidders cost breakdowns.
g) Site Mobilization.

QUALITY MANAGEMENT PLAN (QMP): Quality Management goal is to assure:

a) Design Quality:
  i. Confirmation design satisfies the Tenant (“Owner”) Project Requirements,
  ii. Complementary design principles,
  iii. Planning/layout efficiency,
  iv. Accuracy, adequacy, conformance to standards of practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and function as per the RFP.
b) Construction Quality:
  i. Construction preparation – review schedule and check points.
  ii. Follow-up of inspection and testing to confirm on-going performance compliance.
  iii. Final acceptance.
c) Management Quality:
  i. Management assignments,
    a. Managers associated with design, project and construction,
    b. Quality process reporting and resolution forums,
    c. Decision making protocols.
  ii. Document control,
  iii. Risk management program.

SWING SPACE: A temporary work environment which provides generic office accommodation for other government departments on a short term basis, while their permanent office accommodation is under renovation.

WORK: “Work” means all work set forth in this RFP. “Work” includes Professional and Construction Services and at times in the RFP may also be addressed as a “project” in a matter such as Project Management or Project Administration.

WORKPLACE 2.0: The Workplace 2.0 concept is space being allocated based on the functional requirements of workers and the amount of time spent in the workplace. Workplace 2.0 optimizes office accommodation while supporting public servants in their work, encouraging a collaborative environment and providing the latest technologies.

WORK POINT: A work point provides conducive and alternative workspace for an individual or group to complete tasks which could include open and closed workspaces, support spaces, meeting spaces, collaboration areas, etc.

GO-1 GENERAL OBJECTIVES (GO)

GO 1.1 General Objectives

1.1.1 The services rendered by the selected proponents will be in support of the Real Property Services Branch of PSPC. Services for this contract will include provision of the Required Services listed in the RS's. Firms will be expected to be able to provide expertise in the noted areas. The following RS sections indicate the general extent of required services that the consultant team must be able to provide. Specific services, if required, are also identified in the Project Brief section of this RFP. All services that are required for a specific contract are to follow the guidelines as set out herein.

1.1.2 Services must be complete and identify all major issues that will have a significant impact on the project. Services for this contract are to include all disciplines required to complete the work. Should there be a requirement for the Consultant to engage sub consultants, all such sub consultants must follow the same guidelines with regard to performance of work and submissions as outlined in this document.

1.1.3 Incorporate sustainable design principles in project solutions.

1.1.4 For any or all of the Required Services listed in RS 2 the Consultant will be required to:

.1 Chair project status meetings during the life of the project, prepare and distribute minutes within five working days of meetings.

.2 Submit project progress reports.

1.1.5 When client requested changes, site factors, or other issues, alter the scope of work or add to the cost of the project, and/or the cost of services, request approval of the Departmental Representative prior to incorporation in the design. Be advised that, in general, Architectural/Engineering services provided to PSPC must be complete in that they identify any issues that will have a significant impact on the project. This will provide a surprise-free environment, which will enhance the success of project implementation.

1.1.6 Unless otherwise indicated in the Contract, provide five (5) paper copies of all deliverables. Alternatively, deliverables can be submitted via electronic format and or from share sites.

1.1.7 All documents (drawings and specification) are to be produced in accordance with Appendix D - Doing Business and at project delivery stages as described in the RS documents.

1.1.8 The schedule for the delivery of services will be determined in the RS documents.

1.1.9 The Consultant will be required to meet the following design performance goals:

.1 Meet PSPC's functional requirements;

.2 Provide a healthy and safe working environment that meets or exceeds all codes for fire, health and safety, including the Canada Labour Code and Accessible Design for the Built Environment;

.3 Provide efficient and productive accommodations with planning configurations and workspaces that are flexible, functional, responsive and efficient in keeping with current PSPC, Treasury Board, Health Canada and Workplace 2.0/ABW Fit-up Standards;

.4 Embody contemporary sustainable design and application principles implemented in an environmentally responsible manner;

.5 Fully integrate all components and systems, including architectural, structural, mechanical, electrical, information technology (IT), multimedia, security, and furniture design;

.6 Conform to the Workplace 2.0 and Activity Based Workplace Fit-up Standards;

.7 Conform to CAN/CSA-B651-12 Barrier Free Design, including access to workstations;

.8 Federal accessibility standards for Real Property; and,
.9 Meet the sustainability goal of 4 Green Globes certification.

GO 1.2 Roles and Responsibilities

1.2.1 Project Leader:

During the delivery of the project, the Project Leader has the ultimate responsibility and accountability for the project delivery within the approved project parameters and budget. The Project Leader has the following responsibilities:
.1 Establishes project parameters and obtains the necessary project approvals;
.2 Ensures that implementation strategies, cost estimates and schedules are in accordance with approved parameters;
.3 Mandates the Project Manager to assist in the advance planning and to deliver the project within the approved parameters;
.4 Reviews the project communication plan;
.5 Assembles the PSPC team for the project;
.6 With the Project Manager and Architecture and Interior Design (A&ID), finalizes project requirements, budget and funding requirements;
.7 Approves any revisions which affect schedule or budget; and
.8 Participates in scheduled project team meetings during all phases of the project to monitor progress, to provide information upon request and to report on issues to PSPC senior management.

1.2.2 Project Manager:

The Public Services and Procurement Canada (PSPC) Professional & Technical Services, Project Manager or as delegated, is the “Departmental Representative” directly concerned with this project and responsible for the delivery of the project within the pre-established parameters of scope, quality, budget and schedule. The Project Manager has the following responsibilities:
.1 Establishes the approval process to be followed as well as the time frames to be adhered to;
.2 Provides information to the consultant on issues such as budget and implementation strategy;
.3 Oversees the project review and approval process to ensure that the deliverables meet PSPC’s expectations;
.4 Verifies and certifies payment requests;
.5 Provides the project team with progress status report on a regular basis and as needed; and
.6 Addresses problems that require immediate attention.

1.2.3 Resource Team Lead (RTL):

The Resource Team Lead provides design advisory services, collaborates with and provides strategic and technical advice to the Project Manager while ensuring the design services related to the project are of a level and quality that meet the expectations of all stakeholders throughout all phases of the project. The Resource Team Lead has the following responsibilities:
.1 Assists the PM in the definition of project parameters, implementation strategy, approval process, methodologies and project schedule;
.2 Provides Consultant with existing documentation related to the project requirements and federal government policies, standards, regulations, etc.
.3 Monitors and reviews Consultant’s progress and deliverables and coordinates comments from various disciplines on conformity with approved scope, standards, and policies/guidelines for both PSPC and/or the Client;

.4 Participates in meetings and discussions between the PM, consultants, engineers, architects and other specialists;
.5 Reviews the Consultant progress claims and requests for additional services and advises PM on impact on schedule, time frames and budget; and
.6 Identifies any problems that may impact on project delivery to the PM and recommends remedial action.

1.2.4 Property Manager:

During the delivery of the project, the Project Manager acts as the prime point of contact for the PSPC Property and Facilities Management Sector. The Property Facility Manager has the following responsibilities:
.1 Works with the PM to provide requirements for specialized items such as security, telecommunication, etc.
.2 Acts as the principal contact with the lesser on base building issues;
.3 Advises on operational considerations associated with various design options;
.4 Participates at the commissioning inspection and accepts the new space from PSPC Project Leader for property management takeover.

1.2.5 Departmental Representative:
.1 The PSPC Departmental Representative or assigned Departmental Representative, as determined on a project by project basis, has overall responsibility for the progress of the project, including management, administration and coordination of the activities as set out in this Document.
.2 PSPC will review all respects of the Consultant Team's work on a continuing basis to determine the validity and completeness of the information provided. In the event PSPC may identify areas of concern including errors and omissions as well as areas of inadequate detail or areas that require further explanation, the Consultant Team shall re-examine the documents provided and make such revisions as are subsequently agreed to be necessary and/or provide ample acceptable evidence that such corrections or amendments are unnecessary.
.3 At the end of the contract, a Consultant Performance Evaluation Report Form (CPERF) will be prepared. Consultants with unsatisfactory reports may be prevented from participation in future proposals until PSPC is assured that relevant corrective steps have been taken.

1.2.6 Consultant is to:
.1 Be responsible for the assembling and engagement of the complete design team required, to carry out the work in a conscientious and professional manner.
.2 Be responsible for gathering, identifying and documenting the needs of the client department and incorporating those needs into the required project deliverables.
.3 Establish and maintain, throughout the duration of each project, a team capable of effectively delivering the services described in this document.
.4 Deliver the project within the time frame and assigned budget in accordance with the approved plan.
.5 Coordinate project requirements with any other current and planned projects work that may be underway.
.6 No acceptance by PSPC, whether expressed or implied, shall be deemed to relieve the Consultant of professional or technical responsibility for the correctness or completeness of any element of the project.

GO 1.3 Coordination with PSPC

1.3.1 Carry out services in accordance with approved documents and directions given by the Departmental Representative.

1.3.2 Correspond only with the Departmental Representative at the times and in the manner dictated by the Departmental Representative. Do not communicate with the client department unless so authorized in writing by the Departmental Representative.

1.3.3 Ensure all communications carry the PSPC's Project Title, Project Number and File Number.

1.3.4 Advise the Departmental Representative of any changes that may affect schedule or budget or are inconsistent with instructions or written approvals previously given. Detail the extent and reasons for the changes and obtain written approval before proceeding.

1.3.5 Note that depending on the type of project, PSPC may dictate input into the project via in house resources, or other PSPC consultants and the prime consultant is to incorporate and coordinate these “subs” in the prime consultant’s team for that project. Further, this Prime Consultant and all Subs will be required to sign and seal all documents that it prepares as required by the Province of the work and or its municipalities.

GO 1.4 Consultant Team Coordination

1.4.1 The required consultant services for this contract includes Architectural with a set of sub consultants noted elsewhere. The Architectural Consultant is considered as the Prime Consultant and will be responsible for coordination of all sub-consultant work prior to document submission at the various project stages.

GO 1.5 Project Response Time

1.5.1 It is a requirement of all projects covered under this Request for Proposal that the Prime Consultant project staff and their proposed Sub-consultants should be personally available to attend online/on call meetings to respond to inquiries within 6 hours of the Departmental Representative's request. In addition, Consultant project staff and their proposed Sub-consultants should be personally available to attend at the place of the work within 24 hours’ notice, from the date of the award of the Consultant contract until final inspection and turnover.

1.5.2 The Consultant must be able to demonstrate the availability of adequate resources within their proposed team(s) to deliver the scope of services outlined in this Request for Proposal in a timely fashion.

1.5.3 The Client also commits to provide responses to information requests in such manner as to prevent unnecessary delays to the schedule.

GO 1.6 Media Inquiries

The Consultant shall not respond to requests for project related information or questions from the media. Such inquiries are to be directed to the Departmental Representative.

REQUIRED SERVICES (RS)

RS 1.0 Pre-Design Services

RS 1.1 Feasibility Studies / Options Analysis - Not Required

RS 1.2 Functional Requirements/Programming

1.2.1 Intent

Functional Requirements/Programming:

A written statement which describes client requirements for various design criteria including design objectives, site requirements and constraints, spatial requirements and relationships, building systems overview, and future expandability. The purpose of this stage is to describe the requirements which a building/facility must satisfy in order to support end user activities. For any interior work related to office fit-up, the consultant shall follow the current Government of Canada Fit-up Standards and/or Work Place 2.0.

This process seeks to answer the following questions:

- What is the nature and scope of the problem?
- What information is required to develop a proper built solution to the problem?
- How much and what type of space is needed?
- What space will be needed in the next five to ten years to continue to operate efficiently?
- How can sustainability be addressed at this stage?

1.2.2 Scope and Deliverables

In order to complete a functional program, the consultant must understand users' requirements. In addition, the consultant must clearly understand the objectives and general impact of implementing WP 2.0 and ABW.

The first step in gathering user requirements will be to understand the organizational/functional vision of each tenant department. To that end, the consultant will meet with management to determine the department's purpose, philosophy, values and goals. The consultant will then develop data collection tools (questionnaires, surveys, interviews etc.,) to be used in the next stage of the process with the optics of migrating to WP2.0 and ABW. Present these along with the functional vision statement to management of each tenant department for approval.

The next step will be to gather detailed information on the functions, processes and user requirements for each tenant. Focus groups based on business lines will be created for each tenant department. There will be 12 groups for PSPC, 4 groups for SSC and one each for CSPS, PSC and TB. The consultant will work with the various focus groups and use the data collection tools previously approved to gather the detailed user requirements. Information to be captured must include (but not be limited to):

- description of work activities and processes,
    - including special technical requirements (finishes, equipment, mechanical, electrical, etc.)

  - implications on space requirements including storage, special purpose, etc.
- proximity requirements and flow patterns
- security

Once the user requirements have been assembled, the consultant will meet with management of each tenant department to review these and obtain approval. Although at this point, design solutions would not yet be developed, the consultant is to discuss with management the broad implications of implementing WP2.0 or ABW on the organizations work environment.

After having obtained management approval, prepare the final functional programming document.

The following is an expected list of design-related services to be incorporated into the functional programming phase and to support change management activities:

1. **Visioning Activities #1 - "Discovery"**
   a) Develop/determine the vision of the organization.
   b) Describe how the vision is to be applied.
   c) Assess how the existing environment meets or does not meet the vision.
   d) Assess how the work environment needs to change in order to meet the vision.
   e) Provide support as required to the PSPC change management plan.
   f) Submit a plan to gather functional requirements present and future from end-users to meet the vision.
   g) Submit a plan to conduct interviews with business lines to meet the vision.
   h) Develop survey, interview, and data collection tools for use in visioning session (samples to be provided by PSPC).
   i) Develop an agenda and meeting plan one week prior to session.
   j) Consolidate information gathered and provide recommendations and supporting documentation for the purpose of obtaining upper management approval to proceed to the next step.
   k) Recommendation should include but not be limited to the analysis of the pros and cons, space utilization and end user requirements.

2. **Visioning Activity #2 – "Confirmation"**
   a) Determine how vision and information gathered are to be applied to create a modernized workplace. Present findings.
   b) Make recommendations on how to engage all stakeholders to participate or be knowledgeable about change.
   c) In collaboration with PSPC team, determine speaking points and presentation materials in support of stakeholder communication and change management.
   d) Describe how/if potential policy changes are needed/to be implemented in order to support the modernized workplace.
   e) Develop an agenda and meeting plan one week prior to session.
   f) Consolidate information gathered and provide recommendations and supporting documentation for the purpose of obtaining PSPC team and upper management approval to proceed to the next step.
      i. Recommendation should include but not be limited to the analysis of the pros and cons, space utilization and end user requirements.

3. **Townhall meetings – "Concept Introduction (1)" and "Findings (2)"**
   a) Requirement: Participation in 2 Townhall meetings for all staff (470 employees)
      i. Verbal presentation to staff

ii. Accompanying visuals, including drawings, sketches, renderings, photos, slide decks, etc.
iii. Provision of documented speaking points for use of PSPC Managers after Townhall sessions, specifically with regard to:
  - The vision
  - The findings
  - The PSPC workplace of the future: work types, space requirements, schematic block plans
iv. Provision of simplified slide deck for use of PSPC Managers after Townhall sessions.

4. Information Gathering

a) Schedule group interviews.
b) Schedule employee information sessions/survey interviews.
c) Information required: assessment of current space utilization rates, type of work being performed, how they perform it, can the work be performed differently, equipment necessary for activity, storage required for activity, work style/preferences, technical capability/comfort level etc.
d) Develop survey, interview, and data collection tools for use in information gathering
e) Develop an agenda and information gathering plan one week prior to session(s).
  i. Consolidate information gathered and provide recommendations and supporting documentation for the purpose of obtaining upper management approval to proceed to the next step.
  ii. Recommendation should include but not be limited to the analysis of the pros and cons, space utilization and end user requirements.

5. Focus Groups – "Discussions with Group Representatives"

a) Requirement: 19 groups within building = 19 different Focus Group Sessions
  i. Introduction of approach to gathering data
  ii. Lead Workshops
  iii. Evaluate data gathered
  iv. Prepare Report
  v. Confirm direction with Project Team
  vi. Share results
  vii. Mid-project check-in with Group Representatives

6. Round Table Conversations – "Q and A"

a) Requirement: 2 Round Table Conversations with Exec/Sr. Management
  i. Presentation and discussion regarding outcomes from Vision Activities 1 & 2, Focus Groups and Information Gathering

7. Final Functional Program Document

a) The Functional Program will present an alternative and innovative approach to current workplace standards in support of the vision, workplace modernization (refer to 3.1.4 for definition). The functional program is expected to:
  i. Compile and synthesize all findings from Vision Session #1, Information Gathering and Vision Session #2 in a final Functional Program document for the review and approval of PSPC team and upper management.
  ii. Capture final speaking points and presentation materials as agreed upon in Vision Session #2 for acceptance of PSPC team and upper management.
  iii. Address/meet the essential functional requirements of the end user.

b) Functional Program document to include:
   i. Compilation of analysis and functional requirements
   ii. Definition of Work Activity and Workpoint Types.
   iii. Space Requirement Summary
   iv. Opportunities for collaboration and sharing of Work Activity Space(s) and Workpoints.
   v. Space Requirement Summary by Work Activity and Workpoint type.
   vi. Schematic Block Plan of Activity Based Work Space (3 options)
   vii. Appendices: Survey Results, Minutes of Visioning Sessions, Change Management Speaking Points, supporting Change Management presentation materials.
   viii. Delivery of Functional Program presentation to upper management to include at a minimum:
   ix. Presentation of speaking points and presentation materials in support of communication and change management.
   x. A comprehensive list of pros and cons for each proposed option or solution so that management discussions can make an informed decision based on all available facts.

RS 1.3 Implementation Strategy and Schedule

2.3.1 Intent

The purpose of this work is to prepare an implementation strategy and or project schedule to meet the project goals and objectives at the pre-design stage.

2.3.2 Scope and Deliverables

The consultant shall provide an implementation strategy and schedule including (but not limited to):

- A report that outlines all activities, milestones and deliverables required for the effective delivery of the project including time frames for submissions, reviews and acceptances.
- Prepare a project Time Plan (Project Schedule) that identifies, in a graphic format such as Critical Path Method (CPM), all major activities and important milestones.
- The Implementation Strategy and Schedule may include known elements such as:
    - Space acquisition strategy, building master plan;
    - Decommissioning and environmental clean-up strategy;
    - Major move milestones and swing space requirements;
    - Construction strategy.

Advise the Departmental Representative of any risk issues that may affect schedule or are inconsistent with instructions or written acceptances previously given.

Submit the Implementation Strategy and Schedule for review. Revise as required. Resubmit for final acceptance. The final accepted schedule will become the "Baseline" schedule to monitor project progress.

Throughout the project, monitor critical path and deadlines for submissions, revisions and acceptances. Submit progress reports at agreed times identifying completed deliverables, slippage and upcoming activities.

RS 2 SCHEMATIC DESIGN

1.1 Intent

To translate the project requirements into viable options in the most economical, and environmentally sustainable manner. To explore the design options and analyze them with respect to the priorities and program objectives previously identified. Out of this process, one option will be recommended to proceed to Design Development.

1.2 Scope and Deliverables:

- Obtain written approval from the Departmental Representative for development of selected options based on the analysis of the Project Brief.
- Consultant will develop design options exploring possible technical and environmental strategies which are viable and which have potential for development;
- Analyze each solution with regard to the project goals including cost and schedule;
- Write a preliminary project-description report outlining the various major components and major systems for the various options;
- Each discipline will begin reviews of applicable statutes, regulations, codes and by-laws as appropriate for this stage of design.
- Produce a Class ‘C’ cost estimate for the various options; *Class 'C' Estimate: to be in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors and based on a comprehensive list of requirements and assumptions, including a full description of the preferred schematic design option, construction/design experience, and market conditions; Class ‘C’ estimates are developed during the Schematic Design Phase.*
- Produce an implementation schedule, including alternative procurement and construction strategies for the various options;
- Recommend one option for further development with all supporting background and technical justifications;
- Consultant Team members are to participate in Design Review meetings as requested by the Departmental Representative.
- Proximity Recommendations - the recommendations shall reflect the modernized approach by considering the impacts and solutions to unassigned workspaces. Assigned workspaces or anchor points such as, but not limited to Leadership offices shall be identified as there may be adjacency requirements for the assigned spaces. By default, the assigned workspaces may create neighbourhoods. The intent is to minimize the number of neighbourhoods by having unassigned workspaces.
- Furniture and Workstations Recommendations

For the purpose of this RFP, the recommendations shall reflect the modernized approach by linking work functions and activities with spaces. Include a variety of solutions that will satisfy different work styles and fall within the mandatory PSPC Consolidation Procurement Instrument (CPI) Supply Arrangement components / kit of parts must be used.

Some considerations*:

- Leadership workstations will be 4.5m^2 (EX01 & EX02) with a designated meeting room (10m^2) per every two (2) leadership workstations.
- Workstation ranges and variety, but within the limitations of the CPI. The range shall not exceed 4.5m^2 and the variety shall include but not limited to the components, configurations and sizes.
- Personal storage towers (lockers) will not be included within the footprint of an unassigned workspace (workstation), the m^2 typically consumed by the storage will be reallocated to a designated storage or locker area.

- Collaborative spaces shall be multi-use spaces with work points that provide an array of furniture configurations for the diverse workforce.

* The considerations are with the expectation that the Consultant will recommend other alternative and innovative solutions to support work functions within the context of the modernized workplace,

- Definition of the activities which will take place in each space in the building usually expressed in "room data sheets" showing;
    - The function, name and size of each space;
    - The functional relationships of the room to other spaces;
    - Furniture and equipment;
    - Finishes to all surfaces;
    - Mechanical and electrical requirements;
    - Special technical / communication requirements;
    - Sketch (schematic) design options;
    - Other requirements including:
    - Regulatory issues such as zoning and building code requirements;
    - Other requirements from Authorities having Jurisdiction;
    - Internal goals and concerns;
    - Ecological and environmental concerns;
- Sustainable Development as RS 9.

2.3 Detailed Description

2.3.1 Architectural Drawings:

- Provide schematic building plans of alternatives showing relative disposition of main accommodation areas, circulation patterns, numbers of floors, etc.;
- Calculate summary of main accommodation areas required and proposed;
- Indicate horizontal and vertical space relationships.

2.3.2 Structural Drawings:

- An internal structural review of the existing floor slab bearing capacities has been conducted and shall be used as a reference consideration for placement of concentrated loads such as filing rooms or high density rolling file storage.

2.3.3 Mechanical:

- The schematic design submission shall include a description of general mechanical requirements and function for the project.
- Identify any unique or specialized equipment required by the subject facility. Incorporate in the submission a schedule of requirements and identify the mechanical building services to be provided.
- Explain in the concept submission the manner in which the proposed mechanical systems correlate with user requirements.
- Carry out preliminary energy analysis on system alternatives.
- Establish an energy budget for the building and compare it to energy consumption of other similar buildings. Total energy consumed in the building shall be expressed in kWh/m2.
- Submit a preliminary energy analysis.

2.3.4 Electrical:

- Show proposed basic electrical systems of significance to the early design.
- Identify any unique or specialized equipment required by the subject facility

- Prepare schematic Floor plans complete with locations of major electrical equipment and distribution centres.
- Provide an electrical design synopsis, describing the electrical work in sufficient detail for assessment by the Department. Include feasibility of proposed systems complete with estimated loads.

2.3.5 Commissioning:

- The design consultant's responsibilities in regards to commissioning are described in for COMM 301 03 RP1 found in Appendix M.
- Provide support to the commissioning agent as described in RS10.

2.3.6 Specifications:

- Prepare preliminary outline of NMS specification sections indicating main building components and any options for use of "Green" components and systems.

2.3.7 Cost Plan:

- Prepare preliminary cost plan from the selected schematic design;
- Provide advice and recommendations on project planning in order to achieve the most cost effective project sequence;
- Identify potential risks and make recommendations to minimize negative cost impacts; and/or
- Identify, forecast and analyze project-related issues including possible market shortages and potential price fluctuations.

2.3.8 Cost Estimate:

- Prepare Class 'C' cost estimates;
- Quantify design and construction costs, contingencies and risks;
- Prepare and investigate costing alternatives to assist in the identification of the most cost-effective design and/or construction approach;
- Investigate and report on life-cycle costs; and / or
- Document all unit pricing, analysis, and valuation.

2.3.9 Time Plan (Schedule):

- Prepare project master schedule;
- Identify potential risks to schedule.

RS 3 DESIGN DEVELOPMENT

3.1 Intent:

To further develop the accepted option presented at the Schematic Design stage. The Design Development documents consist of drawings and other documents to describe the size and character of the entire project as to Architectural, Structural, Mechanical and Electrical systems, materials, equipment and such other elements as may be appropriate.

3.2 Scope and Deliverables:

- Obtain written approval from Departmental Representative for development of one of the previously recommended Schematic Design options;
- If any alterations are required, document all required changes, analyze the impact on all project components, and resubmit for acceptance if required;
- Expand and clarify the Schematic Design intent for each design discipline;
- Present the design materials to the client, design review or other committees as indicated by the Departmental Representative;
- Prime Consultant to ensure ongoing coordination between all disciplines;
- Analyze the constructability of the project and advise on the construction process and duration;
- Based on all material available at the time, prepare a milestone schedule for consideration with special attention to the impact on tenants;
- Each discipline will continue to review all applicable statutes, regulations, codes and by-laws to ensure that the selected option will be compliant in all areas.
- Consultant Team members are to participate in Design Review meetings as requested by the Departmental Representative.
- Risk Management Report as per RS 7.
- Estimating and Cost Planning Report as per RS 8;
- Sustainable Development as per RS 9.

3.2.1 Detailed Description:

- Provide Floor plans including all disciplines showing all floor plan elements and services to a level of detail necessary to make all design decisions and to substantially estimate the cost of the project;
- Provide Architectural, structural, engineering, millwork and finishing details sufficient to show choice of materials and finishes;
- Provide Preliminary construction schedule including long term delivery items;
- Provide Fire Protection Report including requirements, strategies or interventions for protection of the building and its occupants;
- Provide Project dossier detailing the basic assumptions of the project and the justifications for all major decisions;
- Coordinate the initial development of the Interior Design concepts including selection of finishes, colours and materials. Consultant will develop the concepts for inclusion in the tender documents.

3.2.2 Architectural Drawings:

- Provide Floor Plans of each floor showing all accommodation required with room names and calculated areas, including all necessary circulation areas, stairs, elevators, etc., and ancillary spaces for service use. Indicate building grids, modules, etc., and key dimensions;
- Provide preliminary Furniture and Equipment plans;
- Provide preliminary Reflected Ceiling plans showing proposed grids and for future coordination with mechanical and electrical services.
- Provide Preliminary Demolition plans, finish schedules, door/window schedules, etc.
- Develop a minimum of two (2) colour schemes on illustration boards that further define the ‘general look and feel’ and clearly demonstrate the intended use of materials including, as a minimum, architectural finishes and finishes for furniture and furnishings.
- In a written legend, identify the colour, pattern, texture, name, manufacturer and reference number for each finish and colour identified.

3.2.3 Structural Drawings:

- If localized structural reinforcements are required, provide Preliminary Drawings indicating the proposed structural framing system, structural materials, and other significant or unusual details being proposed.
- Include a copy of the site report on which the design is based;

3.2.4 Mechanical:

- Provide drawings showing preliminary sizing of ventilation, cooling and heating systems showing locations, and all major equipment layouts in mechanical rooms;
- Provide Preliminary Drawings of plumbing system, showing routing and sizing of major lines and location of pumping and other equipment where required;
- Provide Design Drawings of the fire protection systems showing major components;
- Update the energy analysis and energy budget established at the schematic design stage;
- Provide information of all internal and external energy loads in sufficient detail to determine the compatibility of the proposal with existing services, accepted concept and energy budget;
- Provide Analysis of selected equipment and plant with schematics and calculations sufficient to justify the economy of the selected systems;
- Describe the perceived operation of the mechanical systems;
- Describe the building systems control architecture. Provide preliminary EMCS network architecture and mechanical control schematics,
- Explain what acoustical and sound control measures are to be included in the design.

3.2.5 Electrical Drawings:

- Provide drawings showing design development of the following:
  - Single line diagram of the primary distribution showing major loads.
- Electrical plans with:
  - Floor plans and room identification.
  - Preliminary Telephone conduits system layout for ceiling/floor distribution.
- Provide Preliminary Riser diagrams for lighting, power, telephone and telecommunication cable systems, fire alarm and other systems. Telecommunications design shall consist of empty cable tray and conduit distribution only. Cabling shall be provided and installed by SSC.
- Provide Elementary control diagrams for each system.
- Provide the following estimated data:
  - Total connected load.
  - Maximum demand and diversity factors.
  - Sizing of standby load.
  - Short-circuit requirements and calculations showing the ratings of equipment used.

3.2.6 Commissioning:

- The design consultant’s responsibilities in regards to commissioning are described in form COMM 301 03 RP1 found in Appendix M.
- Provide support to the commissioning agent as described in RS10.

3.2.7 Specifications:

- Provide a list and draft specification sections of all NMS sections to be used;
- Submit outline specifications for all systems and principle components and equipment;
- Provide in the outline specifications manufacturers’ literature about principal equipment and system components proposed for use in this project;

- Highlight proposed “Green” materials, components and systems.

3.2.8 Cost Plan:

- Update cost plan;
- Highlight changes from preliminary cost plan;
- Include cash flow analysis.

3.2.9 Cost Estimate:

- Provide Class ‘B’ cost estimate;
- Highlight changes from Class ‘C’ cost estimate.

3.2.10 Time Plan (Schedule):

- Update time plan (Schedule);
- Highlight changes to the time plan.

RS 4 CONSTRUCTION DOCUMENTS

4.1 Intent:

- To prepare coordinated A&E drawings and specifications setting forth in detail the requirements for the construction and final cost estimate of the project.
- Document submissions to conform to the PSPC drawing standards as outlined in Appendix D - Doing Business.
- 33% indicates the level of technical completeness of all working documents;
- 66% indicates substantial technical development of the project - Substantial Architectural and Engineering plans, details, schedules and specifications;
- 99% is the submission of complete Construction Documents ready for tender call and submission to local authorities for permit purposes;
- Final Submission incorporates all revisions required from the 99% version and is intended to provide PSPC with complete construction documents for the tender call.

4.2 Scope and deliverables:

Activities and deliverables are similar at all three stages; the current submission stage of the project should be reflected in the completeness of each submission.

- Obtain Departmental Representative’s acceptance of the final Design Development submission;
- Confirm format of drawings and specifications;
- Clarify special procedures (i.e. phased construction);
- Submit drawings and specifications at the required stages. (33%, 66%, 99% and final);
- Prime Consultant to confirm that comments from various PSPC review stages have been reviewed / addressed / answered in a formal response process and incorporated into the Construction Documents where required;
- Advise as to the progress of cost estimates and submit updated cost estimates as the project develops;
- Update the project time plan (schedule);
- Prepare a final Class ‘A’ (substantive) estimate;
- Prime Consultant to ensure ongoing coordination between all disciplines;
- Risk Management Report as per RS 7;

- Estimating and Cost Planning Report as per RS 8;
- Commissioning as per RS 10;
- Sustainable Development as per RS 9.

4.2.1 Detailed Description:

The production of tender documents will proceed from general design solutions to eventually include all project specific requirements in the final documents. At each stage development of technical solutions for all disciplines will proceed at the same rate and will be coordinated for each submission.

Each discipline will continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project to ensure that the project will be compliant in all areas. Minimum requirements may include but are not limited to the following.

- Updated fire protection Report

4.2.2 Technical and Production Meetings:

- All Submitted construction documents at the (33%, 66%, 99% and final); submissions will be reviewed as arranged by Departmental Representative and Consultant;
- Representatives from Client Department(s) and PSPC support staff will be present as required;
- Consultant shall ensure that his or her staff and the sub-consultant representatives attend the technical and production meetings as required;
- Consultant shall ensure all documents are coordinated between all sub-consultants;
- Consultant shall arrange for all necessary data, progress prints, etc.;
- Consultant shall prepare minutes of the meetings and distribute copies to all participants.

4.2.3 Architectural Drawings:

- Provide Floor Plans of each floor showing all accommodation required with room names and calculated areas, including all necessary circulation areas, stairs, elevators, etc., and ancillary spaces for service use. Indicate building grids, modules, etc., and key dimensions;
- Prepare a final furniture and finishes board(s) that clearly demonstrates the furniture and finishes proposed for the project including as a minimum the following:
  - Furniture and furnishings selected.
  - Final approved colour scheme for walls, floors, ceilings, furniture and furnishings including a legend;
  - Specialized lighting;
  - Specialized details; and
  - Hardware.
- Provide Reflected Ceiling plans showing proposed grids and coordination with mechanical and Electrical;
- Include large scale detail drawings of millwork and other details necessary to fully describe the work;
- Include a Legend of all Architectural symbols used;
- Provide Demolition plans, finish schedules, door/window/partition schedules, etc.

4.2.4 Structural Drawings:

- If localized structural reinforcements are required, provide Drawings indicating the proposed structural framing system, structural materials, and other significant or unusual details proposed;
- Include a Legend of all Structural symbols used;
- Include a copy of the site report on which the design is based;

4.2.5 Mechanical:

- Provide Drawings showing sizing of ventilation, cooling and heating systems showing locations, and all major equipment layouts in mechanical rooms;
- Provide Drawings of plumbing system, showing routing and sizing of lines and location of pumping and other equipment where required;
- Provide Drawings of the fire protection systems;
- Include a Legend of all mechanical symbols used;
- Update the energy analysis and energy budget established previously;
- Provide information of all internal and external energy loads in sufficient detail to determine the compatibility of the proposal with existing services, accepted concept and energy budget;
- Provide Analysis of selected equipment and plant with schematics and calculations sufficient to confirm the economy of the selected systems;
- Describe the mechanical systems to be provided and the components of each system;
- Describe the perceived operation of the mechanical systems;
- Explain what operating staff will be needed to operate the building systems and the expected functions of the operation staff;
- Describe the building systems control architecture. Provide final EMCS network architecture, mechanical control schematics, and sequence of operation;
- Explain what acoustical and sound control measures are to be included in the design.

4.2.6 Electrical drawings:

- Provide drawings showing development of the following:
  - Single line diagram of the power circuits with their metering and protection, including:
    - Complete rating of equipment
    - Ratios and connections of CT's and PT's
    - Description of relays when used
    - Maximum short circuit levels on which design is based
    - Identification and size of services
    - Connected load and estimated maximum demand on each load centre
  - Electrical plans with:
    - Floor plans and room identification
    - Legend of all symbols used
    - Circuit numbers at outlets and control switching identified
    - All conduit and wire sizes except for minimum sizes which should be given in the specification
    - A panel schedule with loadings for each panel
    - Telephone conduits system layout for ceiling/floor distribution
- Provide Riser diagrams for lighting, power, telephone and telecommunication cable systems, fire alarm and other systems.
- Provide final control diagrams for each system.
- Provide Schedule for motor and controls.
- Provide lighting, power, security, fire safety and telecommunication layouts and fixture schedules clearly indicating methods of circuiting, switching and fixture mounting methods.
- Provide the following data:
  - Total connected load
  - Maximum demand and diversity factors
  - Sizing of standby load
  - Short-circuit requirements and calculations showing the ratings of equipment used

4.2.7 Commissioning:

- The design consultant's responsibilities in regards to commissioning are described in form COMM 301 03 RP1 found in Appendix M.
- Provide support to the commissioning agent as described in RS10.

4.2.8 99% Submission:

- Complete specifications and working drawings.
- Complete Commissioning plan and Systems Operations manual
- Complete colour schedule, including textures, colour chips and material samples.
- Other documents as required by the specific project.
- Complete copy of support data, studies, calculations, etc., required by PSPC Engineering disciplines for final checking and record.
- Complete copy of updated Cost Plan and Project Schedule
- Complete Report from External Fire Protection Review Service, as designated by the client/user group.

4.2.9 Final / Tender Submission:

- This submission incorporates all revisions required by the review of the 99% submission.
- Complete set of originals of the working drawings.
- Complete sets of original specifications.
- Class 'A' estimate with a description of any changes from the Class 'B' report.
- Complete Commissioning Plan
- Complete set of original Colour Schedules.
- One set of designated substance survey reports (provided by PSPC).
- Confirmation that recommendations from the relevant Fire Protection Review Service have been incorporated into the documents.
- As a safeguard against loss or damage to the originals, retain a complete set of all submitted documents in a standard reproducible form.
- Other documents as required by the specific project.

RS 5 TENDER CALL, BID EVALUATION & CONSTRUCTION CONTRACT AWARD

5.1 Intent:

To assist PSPC to obtain and evaluate bids from qualified contractors to construct the project as per the Tender Documents.

5.2 Scope and Deliverables:

- Attend bidders briefing meeting(s)
- Provide Addenda information, based on questions arising in such meetings for issue by the Contracting Authority.
- Provide the Departmental Representative with all information required by bidders to fully interpret the Construction Documents. PSPC will issue the addenda to all participants.
- Pending notification from the Departmental Representative, be prepared to revise and amend the construction documents to bring the cost of the work within the stipulated limits of the Class 'A' Cost Budget.
- Provide Updated report on any cost and schedule impact created by the issue of tender / contract Addenda.

- If PSPC decides to re-tender the project, provide advice and assistance to the Departmental Representative.
- Provide Revised documents if the tender costs were too high. (more than 10% over the accepted Class A budget)

RS 6 CONSTRUCTION & CONTRACT ADMINISTRATION & POST CONSTRUCTION WARRANTY REVIEW

6.1 Intent:

To implement the project in compliance with the Contract Documents and to direct and monitor all necessary or requested changes to the scope of work during construction.

6.2.0 Scope and Deliverables:

- During the implementation of the project, act on PSPC's behalf to the extent provided in this Document.
- Carry out the review of the work at intervals appropriate to determine if the work is in conformity with the Contract Documents.
- Keep PSPC informed of the progress and quality of the work and report any defects or deficiencies in the work observed during the course of the site review.
- Provide support to the commissioning agent as described in RS10.
- Determine the amounts owing to the Contractor based on the progress of the work and review and certify payments to the contractor.
- Act as interpreter of the requirements of the Contract Documents.
- Provide cost advice during construction.
- Advise the Departmental Representative on all potential changes to scope for the duration of the implementation.
- Review the Contractor's submittals.
- Prepare and justify change orders for issue by the Departmental Representative.
- Indicate any changes or material/equipment substitutions on Record Documents.
- During the twelve (12) month warranty period investigate all defects and alleged defects
- Review Systems Operations Manual prepared by General Contractor.
- Conduct a final warranty review.
- Sustainable Development as per RS 9.

6.2.1 Detailed Description:

During RS 6 the Consultant Team will be expected to respond appropriately to site issues that will arise from time to time. It is to be understood that unreasonable delays in responding to contractor questions may result in project delays being assessed to the Consultant Team.

During the construction period the normal expectation is that there will be on site reviews by relevant disciplines at two week intervals or as requested by the Departmental Representative.

6.2.2 Construction Meetings:

Immediately after contract award attend a briefing meeting with the Contractor and the Departmental Representative. Prepare minutes of the meeting and distribute copies to all participants and to other persons agreed upon with the Departmental Representative. Subsequent Construction Meetings shall be chaired by the General Contractor who will be responsible for preparation and distribution of Meeting Minutes.

Attend job meetings commencing with the construction briefing meeting. The Departmental Representative may invite client Departments to attend any of these meetings.

6.2.3 Project Schedule:

- Obtain Project Schedule, from the contractor, with detailed commissioning component shown separately, within 14 days after contract award.
- Monitor the accepted construction schedule, and submit a detailed report to the Departmental Representative concerning any delays.
- Keep accurate records of causes of delays.
- Make every effort to assist the Contractor to avoid delays.

6.2.4 Time Extensions:

Only the Department may accept any request for Time Extensions. Acceptance will be issued in writing by the Departmental Representative.

6.2.5 Labour Requirements:

The Contractor will be bound by the Contract to maintain competent and suitable workmen on the project and to comply with the Canada Department of Labour - Labour Conditions. Inform the Departmental Representative of any labour situations that appear to require corrective action by the Department.

6.2.6 Bylaw Compliance:

Matters pertaining to the Department of Labour or other jurisdictional violations shall be referred to the Departmental Representative.

6.2.7 Construction Safety:

- All construction projects that are occupied by federal employees during construction are subject to the Canada Occupational Safety and Health Act and Regulations as administered by Health and Welfare Canada and/or Provincial Regulations - whichever is more restrictive.
- Fire safety provisions during construction must comply with FCC Standards 301 and 302, administered by the Fire Protection Review Service, (i.e. Fire Marshall), as designated by the client/user group
- In addition to the above, the Contractor must comply with the provincial and municipal safety laws and regulations, and with any instructions issued by the officers of these authorities having jurisdiction relating to construction safety.

6.2.8 Site Visits:

- Consultant is to provide site review services to ensure work by contractor is performed in accordance with the construction contract documents.
- Provide services of qualified personnel who are fully knowledgeable with technical and administrative requirements of project.
- Establish a written understanding with contractors as to what stages or aspect of the work are to be inspected prior to being enclosed.
- Assess quality of work and identify in writing to the Department all defects and deficiencies observed at time of such reviews.

- Review materials and prefabricated assemblies and components as necessary for the progress of the project.
- Any directions, clarifications or deficiency lists, shall be issued in writing only to PSPC.
- Provide written reports from site visits including persons involved
- Site visits will be generally at two week intervals during the construction period

6.2.9 Clarifications:

Provide clarifications on Plans and Specifications or site conditions, to the Departmental Representative as required, in order that project not be delayed.

6.2.10 Progress Reports:

Report to the Departmental Representative regularly on the progress of the work.
Submit written reports on the progress of the work and the cost of the project at the end of each month.

6.2.11 Work Measurement:

If work is based on unit prices, measure and record the quantities for verification of monthly progress claims.
When Contemplated Change Notice is to be issued based on Unit Prices, keep accurate account of the work. Record dimensions and quantities.

6.2.12 Detail Drawings:

Provide for the Department's information any additional detail drawings as and when required to properly clarify or interpret the contract documents.

6.2.13 Shop Drawing Reviews:

- Shop drawings shall be provided in electronic format whenever possible. Verify the number of copies of shop drawings required. Consider additional copies for Client's departmental review.
- Ensure that shop drawings include the project number and are recorded in sequence.
- Shop drawings shall be stamped: "Checked and Certified Correct for Construction" by the Contractor and stamped: "reviewed" by the Consultant before return to the Contractor.
- Expedite the processing of Shop Drawings.
- On completion of project forward copies of reviewed shop drawings to the Department, in a format as directed by the Departmental Representative.

6.2.14 Testing:

- Prior to tender, provide a recommended list of tests to be undertaken, including on site and factory testing;
- Ensure all testing is detailed within the commissioning plan;
- When the contract is awarded, assist Departmental Representative in briefing the testing firm(s) on required services, distribution of reports, communication lines, etc.;
- Review all test reports and take necessary action when work fails to comply with the contract;
- Immediately notify Departmental Representative when tests fail to meet project requirements and when corrective work will affect schedule;
- Assist Departmental Representative in evaluating testing firm's invoices for services performed.

6.2.15 Construction Cost Changes:

- The Consultant does not have authority to change the work or the price of the Contract. However, the Consultant will prepare Contemplated Changes Notices (CCNs) and Change Orders (COs) as required by project conditions for consideration by the Department.
- Changes which affect cost or design concepts can only be accepted/approved, in writing, by the Departmental Representative.
- Upon Departmental acceptance obtain quotations from the Contractor in detail.
- Review prices and forward promptly recommendations to the Department.
- The Department will issue Consultant-prepared CCNs and COs to the Contractor, with copy to the client, once the Department is in agreement with the change.
- All changes, including those not affecting the cost of the project, will be covered by Change Orders.
- The Consultant Team must provide additional detail drawings when required to clarify, interpret or supplement the Construction
- The practice of "trade-offs" is not allowed.

6.2.16 Contractor's Progress Claims:

- Each month the Contractor submits a progress claim for work and materials as required in the Construction Contract.
- The claims are made by completing the following forms where applicable:
  - Request for Construction Payment
  - Cost Breakdown for Unit and/or combined Price Contract
  - Cost Breakdown for Fixed Price Contract
  - Statutory Declaration
  - Progress Claim
- Review and sign designated forms and promptly forward claims to the Department (Departmental Representative) for processing.
- Submit with each progress claim:
  - Updated schedule of the progress of the work.
  - Photographs of the progress of the work.

6.2.17 Interim Inspection:

The official take-over of the project, or parts of the project, from the Contractor is established by the PSPC Project Acceptance Board, which includes the Consultant and the Client Department. The Project Acceptance Board shall inspect the work and list all unacceptable and incomplete work on a designated form. The Board shall accept the project from the Contractor subject to the deficiencies and uncompleted work listed and priced.

6.2.18 Interim Certificates:

- Payment requires completion and signing, by the parties concerned, of the following documents:
  - Certificate of Substantial Completion
  - Statutory Declaration
  - Interim Certificate of Completion
  - Worker's Compensation Board Certificate.
- Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Department for processing.

6.2.19 Building Occupation:

The Department or Client Department may occupy the building after the date of acceptance of the building by the Project Acceptance Board. The acceptance date is normally that of the Interim Certificate issued to the Contractor.

6.2.20 Operation and Maintenance Data Manual(s):

The required three hard copy sets plus two electronic copies on CD of each volume are produced by Contractor in accordance with project specifications and are to be verified for completeness, relevance and format by the Architectural, Mechanical and Electrical Consultants and submitted to PSPC Departmental Representative prior to interim acceptance or actual start of operation and instruction period, whichever occurs sooner. The Contractor shall retain one copy of each volume for his/her record and use during the instruction/warranty period.

6.2.21 Final Inspection:

The Department reconvenes the Project Acceptance Board which makes a final inspection of the project. Inform the Departmental Representative when satisfied that all work under the contract has been completed, including the deficiency items. If everything is satisfactory the Board recommends final acceptance of the project from the Contractor.

6.2.22 Final Certificate:

The final payment requires completion and signing, by the parties concerned, of the following Documents:

- Final Certificate of Completion
- Statutory Declaration
- Workers Compensation Clearance Certificate

Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Department for processing.

6.2.23 Warranties:

The date of Interim Certificate of Completion and the Final Certificate of Completion signifies commencement of the 12 month warranty period for work completed on the date of each certificate in accordance with the General Conditions of the Contract.

Provide the Department with an original copy of Contractor's warranties for all materials and work covered by an extended warranty or guarantee, according to the conditions of the specifications.

- Verify their completeness and extent of coverage.
- Warranty deficiency list
- Report on Final Warranty Review

6.2.24 As-Built and Record Drawings and Specifications:

Following the take-over, obtain as-built marked-up hard copy from the Contractor. As-built drawings will show significant deviations in construction from the original Contract drawings, including changes shown on Post-Contract Drawings, changes resulting from Change Orders or from Site Instructions.

Check and verify all as-built records for completeness and accuracy and submit to PSPC.

Produce and Submit Record Drawings and Specifications by incorporating As-Built information into project drawings.

Submit copies of all documents in a format as directed by the Departmental Representative within eight (8) weeks of final acceptance.

The General Contractor is to provide a complete set of final shop drawings.

RS 7 RISK MANAGEMENT (ALL STAGES)

7.1 Intent

The Consultant is to provide support to the Departmental Representative in identifying risks throughout the project life cycle.

7.2 Scope and Deliverables

7.2.1 Risk Management Process:

- Identify risk events based on past experience and using checklist or other available lists;
- Qualify/quantify risk events (Low, Medium, High) and their impact (Low, Medium, High);
- Prioritize risk events (i.e. concentrate efforts on risk events with High probability and Medium to High impact);
- Develop risk response, (i.e. evaluate alternatives for mitigation.)
- Prepare Risk Management Reports at Design Development, (66%, and 100%), submission stages.
- Include input from all sub-consultants, and from Client.
- Recommend further analysis, investigations, site meetings, site supervision, etc.

RS 8 ESTIMATING AND COST PLANNING (ALL STAGES)

8.1 Cost Estimate Definitions

The current Treasury Board (TB) classification definitions are as follows:

An ***Indicative Estimate*** is an estimate that is not sufficiently accurate to warrant TB acceptance as a cost objective and provides a rough cost projection used for budget planning purposes in the early stages of concept development of a project. It is usually based on an operational Statement of Requirement (SOR), a market assessment of products and technological availability that would meet the requirement and other considerations such as implementation, life cycle costs and operational savings.

Indicative Estimates are used to seek Preliminary Project Approval (PPA) and Lease Project Acceptance (LPA)

A **Substantive Estimate** is one of high quality and reliability and is based on:

Detailed system and component design, design adaptation, work plans and drawings for components, construction or assembly, and installation. It includes site acquisition, preparation and any special requirements estimates. Contingency funding requirements must be justified based on line-by-line risk assessments, including market factors, industrial capability and labour considerations;

All agreed objectives, including those resulting from procurement review; and, Market assessment, where acquisition is through lease, lease purchase or capital lease. The provisional allowance for fit-up or special tailoring requirements will be subject to review and possible revision at the contract acceptance stage.

Substantive Estimates are used to seek Effective Project Approval (EPA)

Real Property Branch (RPB) Estimating Process:

For complex or sizeable projects, five categories of estimates are prepared in RPB. The process begins with the development of an initial estimate that is further developed during the early phases of the project. Estimates should generally differentiate between base building and fit-up costs, as well as all site, PSPC, consulting, other contracts and risk potential costs.

Broad Cost Projection: based on historical data from similar projects, indicates a budget for resources to develop a project up to PPA as well whether or not total project costs are expected to exceed $1 million. This is not a construction estimate.

Class 'D' (Indicative) Estimate: to be in unit cost analysis format (such as cost per m² or other measurement unit) based upon a comprehensive list of project requirements (i.e. scope) and assumptions; the Class ‘D’ estimate is evolved throughout the phases of the Project Identification Stage, finally being incorporated into the cash flows in the Analysis Phase; for more complex projects such as laboratories, elemental cost analysis and the input of specific disciplines may be required; *the Class D Indicative estimates developed during the National Project Management System (NPMS) Feasibility Phase shall be revisited with cost planners in the Analysis Phase before finalizing.*

Class 'C' Estimate: to be in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors and based on a comprehensive list of requirements and assumptions, including a full description of the preferred schematic design option, construction/design experience, and market conditions; *Class C estimates are developed during the NPMS Schematic Design Phase*

Class 'B' (Substantive) Estimate: to be in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors and based on design development drawings and outline specifications, which include the design of all major systems and subsystems, as well as the results of all site/installation investigations; *Class B estimates are developed during the NPMS Design Development Phase;*

Class 'A' (Pre-Tender) Estimate: to be in both elemental cost analysis format as well as trade divisional format latest edition issued by the Canadian Institute of Quantity Surveyors and based on completed construction drawings and specifications prepared prior to calling competitive tenders. The Class 'A' Estimate is generally expected to be within 5% to 10% of the actual contract award price for new construction. Tendering risks should be included in the project risk plan and costed accordingly. The accuracy of Class 'A' estimates can be influenced by many factors, including complexity of project, volatile market, remote locations, tight schedules, and unclear contract documents; *Class 'A' estimates are prepared during the NPMS Implementation Phase and can be a more accurate Substantive Estimate, depending on the complexity of the project;*

8.2 Cost Specialist:

Delivering projects on time and within budget is a high priority. A fully qualified cost estimating, cost planning and cost control resource(s), referred to herein as the Cost Specialist, with a demonstrated record of successful cost management on construction projects may be required. This Cost Specialist will be conversant with all aspects of construction cost estimating during the design stages including the use of Elemental Cost Analysis, Risk Analysis, Life Cycle Costing and Value Engineering/Management techniques.

• The purpose of cost planning and cost control is to assist in the accomplishment of project cost objectives. It is a continuous and interactive process involving planning, action, measurement, evaluation and revision.
• For projects budgeted at more than $1,000,000 construction value, the "Cost Specialist" shall hold one of three designations:
a) PQS (Professional Quantity Surveyor) or
b) CEC (Construction Estimator Certified) or
c) "Gold Seal Certified Estimator
• For projects budgeted at more than $5,000,000 construction value, an independent cost consulting firm shall be hired to perform the Cost Planning/Estimating functions.
• Cost Plan presentation format: The link shown is to the NPMS system which gives the required forms and formats.

http://www.tpsgc-PSPC.gc.ca/biens-property/sngp-npms/conn-know/couts-cost/definition-eng.html

• When an estimate, at any stage, is presented for PSPC review it must be covered by a "sign-off" sheet encompassing the names and signatures of all those sub consultants who contributed to the estimate. The submitting cost specialist will also verify, by signature, that the estimate has been coordinated, to properly contain all required elements relevant to the "class" of the submission.

8.3 Scope and Deliverables

The Cost Specialist shall provide an interactive cost consulting service from the commencement of project design through to construction completion and subsequent evaluation, including the preparation of complete estimates for all construction trades, escalation, inflation and contingency costs.

The Cost Specialist shall provide to PSPC and the Consultant, a cost advising and cost Monitoring / Reporting service.

The Cost Specialist shall attend all relevant project and production meetings throughout the design phases and be prepared to present and defend the estimates directly to the Departmental Representative.

8.4 Exception Report

The Cost Specialist is to provide cost monitoring, timely identification and early warning of all changes that affect or potentially affect the estimated construction costs of the project.

If the estimate significantly falls short of or exceeds the Construction Cost Limit due to such changes, the Cost Specialist with the Consultant team shall fully advise the Departmental Representative. The Cost Specialist with the Consultant team shall submit to PSPC proposed alternative design solutions.

An Exception Report will include sufficient description and cost detail to clearly identify:
1. Scope Change: Identifying the nature, reason and total cost impact of all identified and potential project scope changes affecting Construction Cost Estimate.
2. Cost Overruns and Under runs: Identifying the nature, the reason and the total cost impact of all identified and potential cost variations.
3. Options enabling a return to the Construction Cost Estimate: Identifying the nature and potential cost effects of all identified options proposed, in order to return the project within the Construction Cost Estimate

8.5 Responsibilities to PSPC

PSPC will review all respects of the Cost Specialist's work on a continuing basis to determine the validity and completeness of the information provided. In the event PSPC may identify areas of concern including errors and omissions as well as areas of inadequate detail or areas that require further explanation, the Cost Specialist shall re-examine the estimates provided and make such revisions as are subsequently agreed to be necessary and/or provide ample acceptable evidence that such corrections or amendments are unnecessary.

8.6 Abrogation

No acceptance by PSPC, whether expressed or implied, shall be deemed to relieve the Cost Specialist, or the Consultant, of professional or technical responsibility for the estimates and cost reports.

Neither does acceptance of an estimate by PSPC in any way abrogate the Consultant Team's responsibility to maintain the specified Construction Cost Limit throughout the life of the project, or the requirement to redesign should the lowest acceptable bid differ significantly (more than 10% above) the accepted Class ‘A’ estimate, unless and until the Departmental Representative indicates otherwise in writing.

RS 9.0 Sustainable Development Strategies and Reports (ALL STAGES)

9.1 Intent

The PSPC has established a goal for the project to achieve 4 Green Globes, Green Globes Sustainable Interiors, licensed for use by the Green Building Initiative (GBI).
The project is to earn points toward certification by meeting or exceeding each 4 Green Globes credit’s technical requirements. The Consultant is to work collaboratively with the PSPC project team and provide advice and guidance on which credits points are best pursued for the project.
Refer to the Green Globes website (www.greenglobes.com) for tools and support.

9.2 Scope and Deliverables

-The consultant shall review applicable criteria for achieving the target level of 4 Green Globes and shall consult with PSPC with regard to such requirements. The consultant shall attend meetings during the design and construction phases, communicate with members of the project team and issue progress reports as appropriate to coordinate the Green Globes certification process for the project.
-The consultant shall coordinate the Green Globes certification services provided by the consultant and sub-consultants.
-The consultant shall provide the owner with copies of all agreements required to register the project and the consultant shall pursue the anticipated 4 Green Globes certification.
- during the design process, including the design kick off meeting, minutes should be taken to illustrate the integrated design process as required by the Green Globes standard.
-At the conclusion of the schematic design phase, the consultant, with their sub-consultants, shall conduct a design workshop with the owner and the owner’s consultants, during which the consultant will review the Green Globes building rating system, review the pre-design survey which illustrates the targets/credits this project is pursuing, examine strategies for implementation of the targeted Green Globes credits and discuss the potential impact of these credits on the project schedule, program and budget .
-The consultant shall register the project with the GBI through the Green Globes website. Registration fees and any other fees charged by the GBI, and paid by the consultant, shall be a reimbursable expense.
-The consultant shall collect documentation, calculations and submittals necessary to meet the 4 Green Globes certification requirements from all pertinent team members including, but not limited to, the PSPC, Commissioning Agent and General Contractor.

-The consultant shall ensure they have access to all required back up documentation that could be requested by the Green Globes verifier in order to appeal a ruling or other interpretation denying a minimum program requirement to achieve the 4 Green Globes certification.

The consultant shall:
-Prepare and submit the pre-design, construction and post construction surveys for the project using the Green Globes website. They shall follow up with the third party verifier to ensure they have all of the required documentation for their review as well.
- Prepare responses to and submit any additional documentation required by comments or questions received from the Green Globes Third-Party Verifier.
-Prepare responses to questions from prospective bidders and provide clarifications and interpretations of the bidding documents relating to 4 Green Globes certification to all prospective bidders in the form of addenda.
-Consider request for substitutions and prepare and distribute addenda identifying approved substitutions related to 4 Green Globes certification to all prospective bidders.
-Review requests, by the contractor, for additional information about the contract documents related to 4 Green Globes certification and provide a detailed written statement indicating the specific drawings or specifications in need of clarification and the nature of the clarification requested.
-Prepare supplemental drawings, specifications and other information in response to request for information by the contractor related to 4 Green Globes certification
-Visit the site, at intervals appropriate to the stage of construction, or as otherwise required to become generally familiar with and to keep the owner informed about the progress of the portions of the work related to 4 Green Globes certification.

RS 10 Commissioning

An independent 3rd party Commissioning Agent will be separately engaged and will have to comply with the BGIS requirements as per appendix M, document COMM 302 02 RP1 entitled: Commissioning Oversight Requirements and Scope of Work for 3rd Party Commissioning Agent.

The design consultant’s responsibilities in regards to commissioning are described in form COMM 301 03 RP1 found in appendix M. These responsibilities include providing support to the 3rd party commissioning agent.

Please see appendix M for the following commissioning related documents:

- COMM 301 01 RP1: Commissioning Oversight Risk Assessment and Evaluation
- COMM 302 02 RP1: Commissioning Oversight Requirements and Scope of Work for 3rd Party Commissioning Agent
- COMM 301 03 RP1: Commissioning Oversight Requirements and Scope of Work for Consultants.

The consultant will be responsible to provide support to the Commissioning Agent in fulfilling their responsibilities as identified in the Appendix M – Commissioning Oversight Requirements

RS 11 Change Management Support Services

Due to the transformative nature of this project on the users’ work environment, PSPC will put in place a Change Management team. This team will be led by 2 members for the PSPC tenant and one member for the other tenants. Employee acceptance of the new work environment will be critical to the success of the project.

The consultant will provide the PSPC project team with services in support of change management including providing recommendations, presentation materials and support during presentations and information sessions, engaging stakeholder groups in the Workplace Renewal Initiatives (Workplace modernization initiative), and building a cohesive team approach that is transparent and informative to encourage a positive relationship between the end-users and the project team. Specifically, the consultant will support the project team in assisting end-user workgroups and teams talk about their workplace of the future by:

1. Creating awareness about different work styles and activities
2. Linking work functions and activities to work spaces
3. Seeing new ways of working

The Consultant will aid in changing employees' perception that:

1. work can only be done in a workstation,
2. workspace sizes are an entitlement
3. that the workspace is an employee's personal space.
4. The amount of physical file storage currently in possession is actually required.

The consultant will provide support to the team in two ways. The first being the work performed as part of the design services during the entire duration of the project, described in the previous RS sections. The second, which is the focus of this RS section, will be to assist in the communication to the tenants of the benefits of this new approach. This will generally include preparing presentation material, participating in presentations and developing talking points for tenant management.

An awareness session in regards to ABW has taken place for the PSPC tenant. There will be awareness sessions taking place for the remaining tenants in regards to ABW or WP 2.0, whichever applies.

Once schematic design options have been developed, there will be a requirement for presenting these to management of each tenant department in order to obtain their approval. In collaboration with the PSPC Change Management team, the consultant will prepare the presentation material and participate in the presentation. A comprehensive list of the pros and cons for each proposed option or solution is required so that management can make an informed decision based on all the available facts. *Allow for five (5) presentations.*

Once tenant management approval of the preferred option has been obtained, presentations to focus groups leaders will be required. The objective will be to gain employee acceptance of the proposed solutions. In collaboration with the PSPC Change Management team the consultant will prepare the presentation material, talking points for tenant management and participate in the presentation. *Allow for nineteen (19) presentations.*

RS 12 PROJECT ADMINISTRATION

DESCRIPTION OF SERVICES

12.1 Intent

The following administrative requirements apply during all phases of project delivery:

12.2 PSPC Project Management

The Project Manager is the Departmental officer directly concerned with the project and responsible for its progress. The Project Manager is the liaison between the Consultant, PSPC and the tenant departments.

PSPC administers the project and exercises continuing control over the Consultant's work during all phases of development. Unless directed otherwise by the Project Manager, the Consultant obtains all Federal requirements and approvals necessary for the work.

12.3 Project Coordinator

The Consultant will provide a dedicated, continuous Project Coordinator, based in Halifax, throughout design and construction, to support the PSPC Project Manager. The Project Coordinator will provide site coordination between contractors, support the PSPC Project Manager, and provide any site information in support of the Design Consultant as required. It is intended that the Project Coordinator role will continue through the design and construction phases in support of this project. The Consultant will be responsible to coordinate with BGIS the construction site safety throughout the duration of the project. The Consultant will be responsible to liaise and co-ordinate with all contractors working inside and outside the building during construction in matters of safety and access co-ordination to the building for deliveries, removals and safety. The Consultant will be responsible to co-ordinate with the building Property Management representatives BGIS to have Hot Work Permits and other safety related paperwork completed in a timely fashion and to participate in site safety and coordination meetings once construction starts.

Project Administration Services, described further in RS12, will include services such as:

a. Phasing plan
b. Record of meeting minutes and distribution
c. Cost planning and control
d. Schedule for all steps in planning, design and construction
e. Services during construction
   i. CCN preparation and control
   ii. Change Order preparation and control
   iii. Review of work
   iv. Code compliance
f. Close out Documentation

12.4 Project Deliverables

Where deliverables and submissions include summaries, reports, drawings, plans or schedules, six (6) hard copies shall be provided plus one (1) copy shall be provided in electronic format and loaded to the Buy and Sell website. Consultant will be responsible to load submissions to the Bedford Row Consolidation SharePoint site. Documents will not be circulated through email or FTP sites. Access to the SharePoint site will be provided at Contract Award.

12.5 Lines of Communication

The consultant’s primary contact with PSPC shall be with the Project Manager who is responsible for the overall project delivery.

In order to perform the services under this contract, the consultant will be required to communicate with various stakeholders. Such communications will require approval from the Project Manager.

During construction tender call, PSPC conducts all correspondence with bidders and makes the contract award.

12.6 Media

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

12.7 Meetings

The Project Manager shall arrange meetings throughout the entire project development period, for all members of the project team, including representatives from:

- Tenant departments PSPC, CSPC, SSC, PSC and TB.
- PSPC project delivery team
- Consultants
- Commissioning Agent (BGIS)

The Consultant shall attend the meetings on site, and when requested, record the issues and decisions and prepare and distribute minutes within 48 hours of the meeting.

As the project proceeds the consultant will provide information as required to inform PSPC and new building tenants of project progress for use on their internal electronic communication message board system.

12.8 Project Response Time

It is a requirement of this project that the key personnel of the successful proponent and sub consultant or specialist firms be personally available to attend meetings or respond to inquiries within 2 business days.

12.9 Submissions, Reviews and Approvals

Work in progress is to be reviewed by the Project Manager as well as the following:

PSPC in-house services

- Submission Format: report, drawings and specifications, etc.
- Submission Schedule: Submissions are reviewed when completed work has been forwarded to the Project Manager.
- Expected Turnaround Time: 1 week
- Number of Submissions: until approval has been received

Stakeholder Management – Steering/Sub Committee

- Submission Format: Presentation
- Submission Schedule: Approximately 2 weeks after each design phase submissions and at significant milestones during construction phase (assume 4 times per year, for 3 years). These presentations shall take place on site.

Design review Committee - PSPC

- Submission Format: drawings and specifications, oral presentation.

- Submission Schedule: Submissions are reviewed when completed work has been forwarded to the Project Manager. PSPC will schedule meetings at a minimum two weeks in advance.

Municipal authorities
- Submission Format: drawings and specifications
- Submission Schedule: as required by Halifax Regional Municipality (HRM) bylaws
- Expected Turnaround Time: 1 month
- Number of Submissions: two (2)

Chart of Reviews and Approvals	PSPC		SSC		CSPC		PSC		TB	
	R	A	R	A	R	A	R	A	R	A
RS1 Pre-Design Services										
Functional Program(s)	X	X	X	X	X	X	X	X	X	X
RS2 Design Concept										
Design Options	X	X	X	X	X	X	X	X	X	X
Recommended Design Option	X	X	X	X	X	X	X	X	X	X
Class ‘C’ Estimate(s)	X	X	X	X	X	X	X	X	X	X
RS3 Design Development										
Design Development Documents	X	X	X	X	X	X	X	X	X	X
Class ‘B’ Estimate(s)	X	X	X	X	X	X	X	X	X	X
RS4 Construction Documents										
33% Construction Drawings	X		X		X		X		X	
66% Construction Drawings and Specs	X		X		X		X		X	
99% Construction Drawings and Specs	X		X		X		X		X	
Class ‘A’ Estimate(s)	X	X	X	X	X	X	X	X	X	X

Final Tender Documents	X		X		X		X		X	
RS13 Interior Signage										
Design Development Documents	X	X	X	X	X	X	X	X	X	X
99% Construction Drawings and Specs	X	X	X	X	X	X	X	X	X	X

R = Review
A = Approval

Design

Submission Requirements

	Submissions			
Deliverables	Design Development	66%	99%	100%
Drawings				
Specifications				
Design Brief				
Code Analysis				
Green Globes Checklist				

12.10 Official Languages

Although the Dominion Public Building is located in an officially non-bilingual province, some employees of PSPC and the new tenant departments may have staff that have French as their first language. Any presentations to the Stakeholders may require translation. PSPC will provide translation services for project materials, but Consultant will allow three weeks for translation.

RS 13 INTERIOR SIGNAGE

1.0 Design requirements

The Consultant will meet, at a minimum, the following signage and graphics design requirements:

1 The signs shall be attractive and exhibit a professional quality of workmanship, which will reflect positively on Canada.

2 Signage and graphics should incorporate all room, way finding, directional (including lobby), emergency panels and equipment signage.

3 Signage should incorporate the spatial organization of the facility and utilize architectural design features, destinations zones, landmarks, shape, color, lighting, etc.

4 Signage should be easy to recognize, consistent, clear, distinctive, and easy to read.

5 Signage shall be compliant with 2010 ADA Standards for Accessible Design. Graphics and signage must meet the requirements set by the *Policy on Communications and Federal Identity* for the application of the Coat of Arms and flag symbol with bilingual titles, and the use of the “Canada” word mark. For design standards, refer to the *Federal Identity Program Manual* issued by the Treasury Board as well the following requirements:

signs for washrooms, elevators, stairwells, emergency exits, and doors of main corridors must comply with the tactile signage section of the *Federal Identity Program Manual*;

for heritage buildings, signage must be compatible with the original signage design, using the materials, finishes, colours, typefaces, size, and scale as a guide for the new signage design; and

all equipment and piping in maintenance rooms and in mechanical and electrical rooms, must be provided with signage.

6 The Contractor should have a primary goal of ensuring that signage works in unity with all building occupants, in order to generate a well-coordinated facility.

7 Signage should be updateable by Canada and utilize Canada's internal resources whenever possible.

2.0 Deliverables

The Consultant will provide, at a minimum, the following:

1 Develop an understanding of appropriate national and local building codes, ordinances and other requirements, as they relate to signage for the Dominion Public Building

2 Perform a site review to verify locations, determine available areas for signage, confirm dimensions and avoid potential conflicts with architecture designs.

3 Prepare budget estimates as part of the overall building cost estimates.

4 Coordinate all procurement activities as part of the larger procurement package.

5 Develop way finding and circulation solutions.

6 Develop sign location plans and messages schedules. These location plans and message schedules will be submitted and approved by Canada, BGIS and other tenants.

7 Prepare conceptual designs in sketch form to determine design direction and review, with the design team, considerations for materials, finishes, color, typography, lighting and scale. The Consultant shall develop a menu of recommended signage types for programming review.

8 Finalize all elements of the sign system design including materials, fabrication specifications, graphic design and installation details.

9 Prepare sign layouts based on actual sign messages to determine sign and letter sizes and to determine the need for variations to the way finding/signage program.

10 Provide final fabrication submittals based on approved design.

11 Be responsible for the oversight of fabrication of the interior way finding/signage program in accordance with the approved design.

12 Develop an installation schedule to assure timely, accurate and code compliant installation.

13 Be responsible for the installation of the interior way finding/signage program in accordance with the design intent of the approved program.

END OF REQUIRED SERVICES

APPENDIX A - TEAM IDENTIFICATION FORM

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

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

I. Prime Consultant (Proponent - Architect):

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

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

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

II. Key Sub Consultants / Specialists:

Structural Engineer

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

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

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

Mechanical Engineer

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

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

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

Electrical Engineer

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

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

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

Project Coordinator

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

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

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

Interior Designer

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

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

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....
....

Cost Consultant

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

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

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

Sustainability Consultant

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

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

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

APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title: **Dominion Public Building Interior Renovation (1713 Bedford Row Fit-Up)**

Name of Proponent:

Street Address: **Mailing Address:**

Telephone Number: (   )

Fax Number: (   )

E-Mail:

Procurement Business Number:

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

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

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.

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

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)

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

Former Public Servant (FPS) - Certification

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

Definitions

For the purposes of this clause,

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

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

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

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

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

Former Public Servant in Receipt of a Pension

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

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

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

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

Work Force Adjustment Directive

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

If so, the Proponent must provide the following information:

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

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

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

Name of Proponent:

DECLARATION:

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

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

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

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

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

Telephone Number: ( ) ____________ Fax Number: ( ) _____________

E-mail: _________________________________

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

APPENDIX C - PRICE PROPOSAL FORM

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

PROPONENTS SHALL NOT ALTER THIS FORM

Project Title: **Dominion Public Building Interior Renovation (1713 Bedford Row)**

Name of Proponent:

The following will form part of the evaluation process:

REQUIRED SERVICES

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

SERVICES	FIXED FEE
RS 1.0 Pre-Design Services	$.................
RS 2.0 Schematic Design	$.................
RS 3.0 Design Development	$.................
RS 4.0 Construction Documents	$.................
RS 5.0 Tender Call, Bid Evaluation & Construction Contract Award	$.................
RS 6.0 Construction & Contract Administration & Post Construction Warranty Review	$.................
RS 7.0 Risk Management (All Stages)	$.................
RS 8.0 Estimating and Cost Planning (All Stages)	$.................
RS 9.0 Sustainable Development Strategies and Reports	$.................
RS 10.0 Commissioning	$.................
RS 11.0 Change Management Support Services	$.................
RS 12.0 Project Administration	$.................
RS 13.0 Interior Signage	$.................
Total Fee for Required Services	**$.......................**

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

Total Fee for Required Services $.......................

Total Evaluated Fee $.......................

END OF PRICE PROPOSAL FORM

Serving GOVERNMENT, Serving CANADIANS.

Respect • Integrity • Excellence • Leadership

Doing Business with the National Capital Area (NCA)

Last updated: Apr 8, 2013

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

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

SECTION 2 PWGSC NATIONAL CADD STANDARD

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

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

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

SECTION 3 GUIDE TO PREPARATION OF CONSTRUCTION DOCUMENTS FOR PWGSC

1 Purpose

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

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

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

2 Principles of PWGSC Contract Documents

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

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

3 Quality Assurance

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

SPECIFICATIONS

1 National Master Specification

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

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

2 Specification Organization

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

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

3 Terminology

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

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

4 Dimensions

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

5 Standards

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

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

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

6 Specifying Materials

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

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

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

Acceptable Materials: set up the paragraph format as follows:

Acceptable Materials:

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

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

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

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

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

"Designated Contractor

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

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

"Designated Contractor

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

and in Part 2 as "Materials

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

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

"Acceptable materials

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

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

7 Unit Prices

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

Use the following wording:

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

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

Sample of Unit Price Table:

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

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

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

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

8 Cash Allowances

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

9 Warranties

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

- "For the work of this Section [______], the 12 month warranty period is extended to 24 months.
- Where the extended warranty is intended to apply to a particular part of a specification section modify the above as follows: "For [_____] the 12 month ... [______] months."

Delete all references to manufacturers' guarantees.

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

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

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

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

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

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

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

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

Subsurface investigation report(s)

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

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

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

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

18 Experience and Qualifications

Remove experience and qualification requirements from specification sections.

19 Prequalification and Pre-award submissions

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

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

20 Contracting Issues

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

Remove all references within the specifications, to the following:

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

DRAWINGS

1 Title Blocks

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

2 Dimensions

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

3 Trade Names

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

4 Specification Notes

No specification type notes are to appear on any drawing.

5 Terminology

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

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

6 Information to be included

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

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

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

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

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

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

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

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

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

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

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

ADDENDA

1 Format

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

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

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

2 Content

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

DOCUMENTATION

Translation

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

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

Consultant shall provide:

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

PWGSC shall provide:

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

SECTION 4 CLASSES OF CONSTRUCTION COST ESTIMATES USED BY PWGSC

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

Class 'D' (Indicative) Estimate:

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

Submit Class D cost estimates in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors with cost per m^2 for current industry statistical data for the appropriate building type and location. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

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

Class 'C' Estimate:

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

Submit Class C cost estimates in elemental cost analysis format latest edition issued by the Canadian Institute of Quantity Surveyors with cost per m^2 for current industry statistical data for the appropriate building type and location. Include a summary in the cost estimate, plus full back up, showing items of work, quantities, unit prices, allowances and assumptions.

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

Class 'B' (Substantive) Estimate:

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

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

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

Class 'A' (Pre-Tender) Estimate:

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

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

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

SECTION 5 TIME MANAGEMENT

1 Time Management, Planning, and Control

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

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

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

1.1 Schedule Design

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

When building a Control System you must consider:

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

1.2 Schedule Development

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

Work Breakdown Structure

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

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

The WBS is as follows:

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

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

Major and Minor Milestones

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

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

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

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

Activities

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

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

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

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

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

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

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

Project Logic

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

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

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

Activity Duration

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

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

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

Activity List

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

Milestone List

A Milestone List identifies all project Major and Minor milestones.

Master Schedule

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

Detailed Project Schedule

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

1.3 Schedule Review and Approval

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

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

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

1.4 Schedule Monitoring and Control

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

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

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

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

Progress Reports

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

The Progress Report includes:

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

Narrative reporting begins with a statement on the general status of the project followed by a summarization of delays, potential problems and project status criticality, any potential delays, outstanding issues and concerns and options for dealing with any serious planning and scheduling issues.

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

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

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

Exception Report

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

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

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

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

1.5 Standard Submissions

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

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

1.6 Schedule Outputs and Reporting Formats

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

Progress Reports

Paper Size: Letter

Paper Format: Portrait

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

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

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

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

Exception Reports

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

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

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

Activity Lists

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

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

Milestone Lists

Paper Size: Letter
Paper Format: Portrait

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

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

Master Schedule (Bar Chart)

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

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

Detailed Project Schedules (Bar Chart)

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

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

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

Last updated November 21, 2012

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

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

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

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

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

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

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

Consultant's Representative: ____

Firm name: ____

Signature: ______________________ Date: ______________________

APPENDIX 'B' - Sample of Addendum
Last updated April 22, 2008

ADDENDUM No. ____________________

Project Number: ____________________

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

DRAWINGS

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

1 A1 Architectural

.1

SPECIFICATIONS

SPEC NOTE: indicate section number and title.

1 Section 01 00 10 - General Instructions

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

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

2 Section 23 05 00 - Common Work Results - Mechanical

.1 Add new article (x) as follows:

APPENDIX 'C' - Sample of Index
Last updated April 22, 2008

Project No: ______________________

Index
Page 1 of ___

DRAWINGS AND SPECIFICATIONS

DRAWINGS:

SPEC NOTE: List all Drawings by number and title.

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

SPECIFICATIONS:

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

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

APPENDIX 'D'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005

Last Updated: June 3, 2008

Version 1.0

PREFACE

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

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

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

1. DIRECTORY STRUCTURE

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

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

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

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

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

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

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

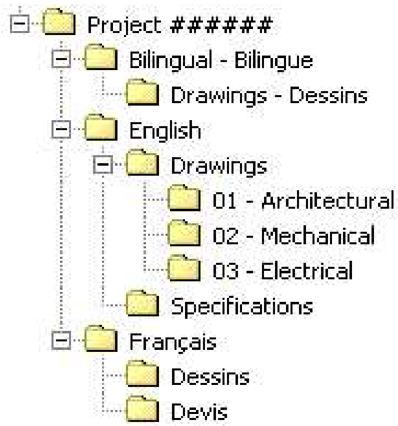
1.2 4^{th} Tier Sub-Folders for Drawings

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

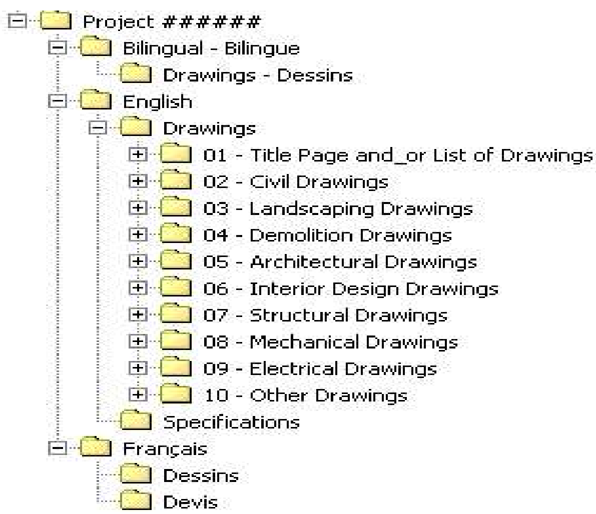
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the "*Drawings – Dessins*", "*Drawings*" and "*Dessins*" folders.

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

Examples of 4th Tier sub-folders for drawings:



or



1.2.1 Naming Convention

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

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

- Y

Where:

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

Example: 03 – Mechanical

For the "*Drawings - Dessins*" folder:

- Y - Z

Where:

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

Example: 04 - Electrical - Électricité

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

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

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

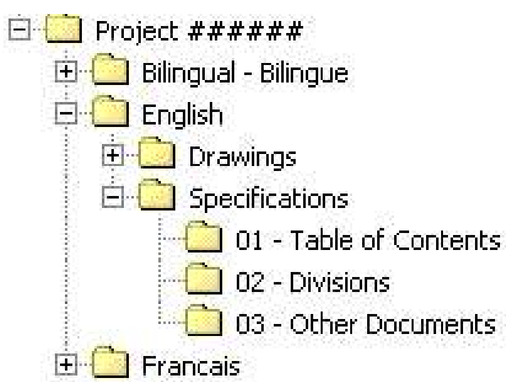
1.3 4th Tier Sub-Folders for Specifications

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

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

Examples of 4th Tier sub-folders for <u>specifications</u>:

or



1.3.1 Naming Convention

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

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

    ## - Y

Where:

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

Example: 02 – Divisions

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

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

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

2. NAMING CONVENTION FOR PDF FILES

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

2.1 Drawings

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

X### - Y

Where:

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

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

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

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

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

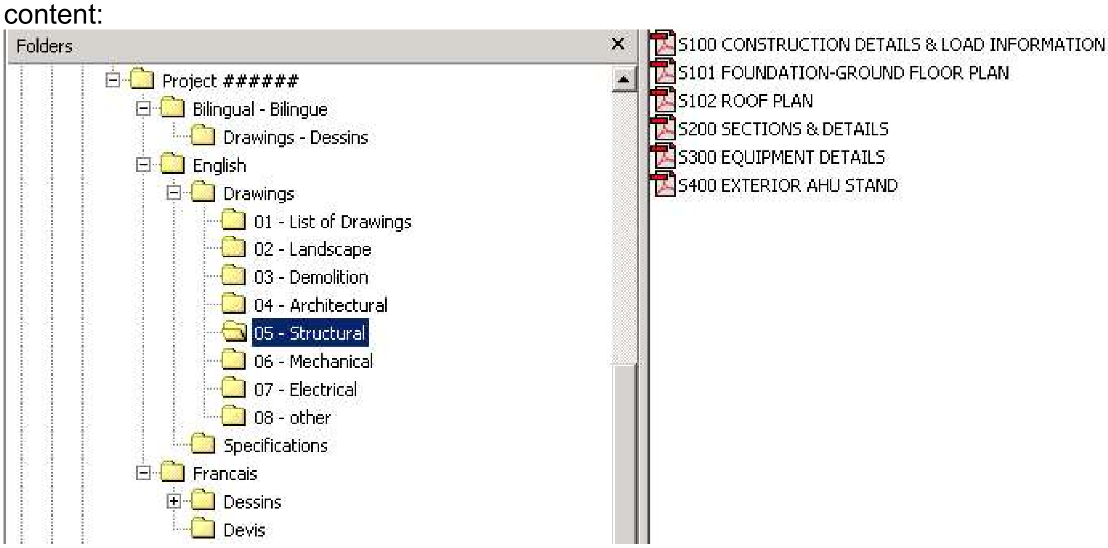
  ## - Y

  Where:

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

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

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



2.2. Specifications

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

2.2.1 Documents other than Specifications Divisions

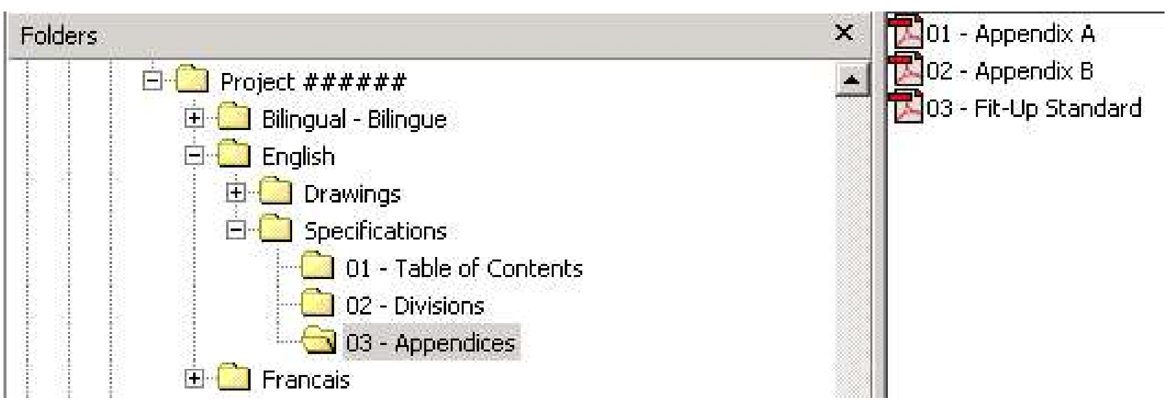
Because PDF files within the Specifications sub-folders are sorted alphanumerically (in ascending order) for both on screen display and printing order, all files that appear in folders other than the "*Divisions*" sub-folder must be named using a number:

- Y

Where:

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

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



2.2.2 Specifications Divisions

The Specifications Divisions must be named as follows:

Division ## - Y

Where:

Division ## = The actual word "*Division*" followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)

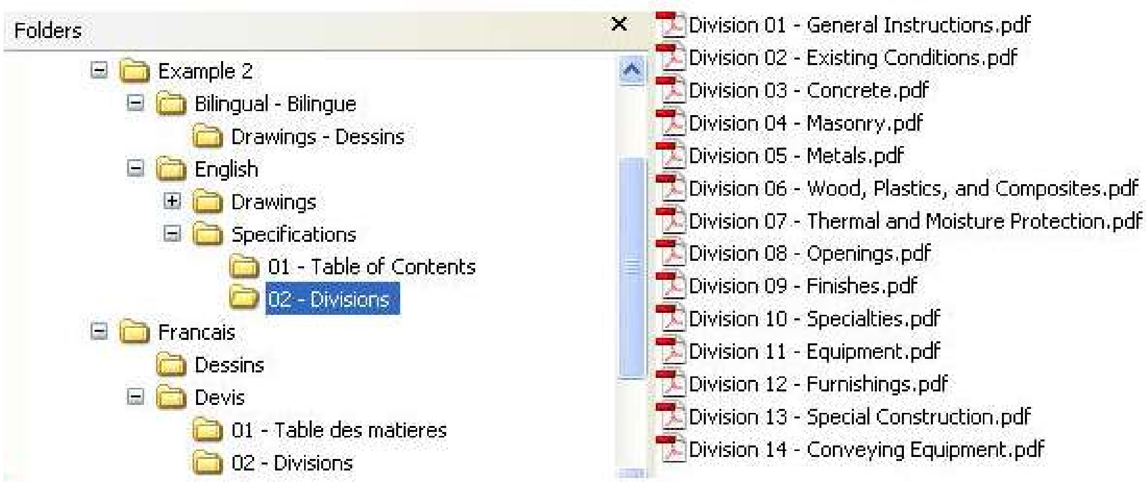
Y = Name of the Specifications Division as per **CSC/CSI MasterFormat™**

Example: Division 05 – Metals

The following important point about specifications is to be noted:

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

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



3. CD-ROM LABEL

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

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

Example:

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

Documents for Tender / Documents pour appel d'offres
CD 1 of/de 1

APPENDIX 'E'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005Last Updated: May 3, 2005

Version 1.0

PREFACE

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

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

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

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

1. PRINTER DRIVERS

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

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

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

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

2. PRINTER CONFIGURATION

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

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

3. CREATING PDF FILES

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

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

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

4. PDF FILES SETTINGS

4.1 Security

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

4.2 Drawing Orientation

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

4.3 Font Type

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

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

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

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

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

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

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

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

RECEIVED
June 2 2014

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
2A018717

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: CSSMC

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
OI renewal for 1713 Bedford Row Regional office

5. a) Will the supplier require access to Controlled Goods?
Le fournisseur aura-t-il accès à des marchandises contrôlées?
☑ No / Non ☐ 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?
☑ No / Non ☐ 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)
☑ No / Non ☐ 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.
☐ No / Non ☑ 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?
☑ No / Non ☐ 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 ☐	NATO / OTAN ☐	Foreign / Étranger ☐

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☐	All NATO countries / Tous les pays de l'OTAN ☐	No release restrictions / Aucune restriction relative à la diffusion ☐
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐
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

Canada	NATO / OTAN	Foreign / Étranger
PROTECTED A / PROTÉGÉ A ☐	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☐	PROTECTED A / PROTÉGÉ A ☐
PROTECTED B / PROTÉGÉ B ☐	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☐	PROTECTED B / PROTÉGÉ B ☐
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☐	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☐	NATO SECRET / NATO SECRET ☐	CONFIDENTIAL / CONFIDENTIEL ☐
SECRET / SECRET ☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☐
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

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?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :
☑ No / Non ☐ Yes / Oui

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 / Non ☐ Yes / 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

- ☑ RELIABILITY STATUS / COTE DE FIABILITÉ
- ☐ CONFIDENTIAL / CONFIDENTIEL
- ☐ SECRET / SECRET
- ☐ TOP SECRET / TRÈS SECRET
- ☐ TOP SECRET– SIGINT / TRÈS SECRET – SIGINT
- ☐ NATO CONFIDENTIAL / NATO CONFIDENTIEL
- ☐ NATO SECRET / NATO SECRET
- ☐ COSMIC TOP SECRET / COSMIC TRÈS SECRET
- ☐ SITE ACCESS / 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 / Non ☐ Yes / Oui

If Yes, will unscreened personnel be escorted?
Dans l'affirmative, le personnel en question sera-t-il escorté?
☑ No / Non ☐ Yes / 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 / Non ☐ Yes / 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 / Non ☐ Yes / 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 / Non ☐ Yes / 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 / Non ☐ Yes / 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 / Non ☐ Yes / Oui

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
2A018717
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 CONFIDENTIEL	SECRET	TOP SECRET TRÈS SECRET	NATO RESTRICTED NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET COSMIC TRÈS SECRET	PROTECTED PROTÉGÉ A	B	C	CONFIDENTIAL CONFIDENTIEL	SECRET	TOP SECRET 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 Non ☐ Yes Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier 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 Non ☐ Yes 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, classifier 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).

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
2A018717
Security Classification / Classification de sécurité UNCLASSIFIED

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme				
Name (print) - Nom (en lettres moulées) ROGERS, CORRINA		Title - Titre REGIONAL ACCOMMODATION OFFICER		Signature x Corri
Telephone No. - N° de téléphone 902-496-5226	Facsimile No. - N° de télécopieur 902-496-3320	E-mail address - Adresse courriel CORRINA.ROGERS@PWGSC.GC.CA		Date 2014/05/28
14. Organization Security Authority / Responsable de la sécurité de l'organisme				
Name (print) - Nom (en lettres moulées) Locas, Lucie		Title - Titre SO		Signature L. Locas
Telephone No. - N° de téléphone 902-496-5630	Facsimile No. - N° de télécopieur 902-496-5077	E-mail address - Adresse courriel lucie.locas@pwgsc.gc.ca		Date 2014/6/02
15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached? Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?				[X] No / Non [ ] Yes / Oui
16. Procurement Officer / Agent d'approvisionnement				
Name (print) - Nom (en lettres moulées)		Title - Titre		Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel		Date
17. Contracting Security Authority / Autorité contractante en matière de sécurité				
Name (print) - Nom (en lettres moulées) Suzanne Hopkins		Title - Titre Contract Security Officer		Signature SHopkins
Telephone No. - N° de téléphone 613-954-0258	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel suzanne.hopkins@pwgsc-tpsgc.gc.ca		Date June 3/14

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

Canada

Respect ◆ Integrity ◆ Excellence ◆ Leadership

Serving GOVERNMENT, Serving CANADIANS.

Capacity Study

Dominion Public Building
1713 Bedford Row
Halifax, NS

Prepared by: Lori Arnold, Interior Designer
Date: June 9 , 2017
Revised: July 12, 2017 , Ann Marie Duggan

Table of Contents

PSPC Team

Diane Wade: Asset Manager

Cathy Stowe: Project Leader

Ron Cornelius: Project Manager

AnneMarie Duggan: Project Architect

Tracy Playford: Senior Interior Designer

Paul Dyer: Mechanical Engineer

Victor Melendez: Electrical Engineer

Larry Warren: Structural Engineer

Robert Surette: Elevators

1.0 Executive Summary

The object of this report is to determine if the Halifax GOCB can handle a building capacity of 471 full time employees (FTE's), which was determined by Client Accommodation Services, and to assess the impacts of this increase in building population on the mechanical, electrical, and structural systems as well as washrooms, exiting and elevators .
The Halifax Dominion Building has a current occupancy of 369 FTE's. (469 workstations)

A revised Urban Accommodation Strategy Update was completed January 2016. The main focus of the document was to reduce office accommodation costs through the recapture of surplus space. This will change the existing use of the building from a single tenant to a multi tenant building. The Halifax GOBC would be maximized by applying the Activity Based Workplace Space Utilization Factor (m2/employee) for PSPC, SSC and CSPS and Workplace 2.0 fit-up standards to PSC.

Washroom Requirements
The Halifax GOCB currently has water closet and sink counts which fall short of the required number based on potential occupant load per floor

1st Floor	Short one male and one female water closet and one sink in female washroom
2nd floor	Short two male and two female water closets and one sink in the female washroom
3rd Floor	Water closet count meets requirement; short one sink in male WR and two sinks in female WR
4th Floor	Short one male and one female water closet and one male sink and two female sinks
5th Floor	Short one male and one female water closet ; sink count meets requirement
6th Floor	Short one male and one female water closet ; sink count meets requirement
7th Floor	Short one male and one female water closet; sink count meets requirement

Mechanical Systems Overview:

Air conditioning and ventilation for the building is provided by multiple packaged rooftop variable air volume air handling units each equipped with a DX cooling coil. Supply air is distributed to terminal VAV boxes serving zones on each of the floors. Building heating is provided by perimeter hot water baseboard heaters. Control of the various heating/cooling zones within the building space is provided by a Direct Digital Control (DDC) system.

Structural Overview

The National Building Code of Canada and the Federal Office Building Standards both identify loads for general office accommodations, so the change from current office layouts to a Activity Based Workplace are not expected to change the general office floor loadings. However, the structural capacity must confirmed for any areas that are known to exceed the general office loads, such as high concentrations of typical file storage systems or moveable high density filing systems.
(Note for instance: Records and mail room relocating to the third floor)

2.0 Project Scope

The object of this study is to determine if the Halifax GOCB (Dominion Building) can handle a building population of 471 FTE's, which was determined by applying the Activity Based Workplace Space Utilization factor and Workplace 2.0 Fitup Standards (Workplace 2.0 for PCS only), and to assess the impacts of this building population on the existing mechanical, electrical and structural systems as well washrooms, building exiting and elevators.

3.0 The Halifax Dominion Public Building

The Dominion Public Building, constructed in 1935, is a Class 'B' office building prominently located in the Central Business District in the Halifax Regional Municipality in Nova Scotia. The Dominion Public Building has seven storeys and a basement as well as a seven-storey tower and provides a total area of 9,944.2 Um² / 11,581.2 Rm² of general purpose office, storage and special purpose space. BGIS manages the building under an Alternate Form of Delivery (AFD) contract. The main tenant in the building is Public Works and Government Services Canada (PWGSC), which occupies 93% of the space in the building.

Heritage Character Statement

The Dominion Public Building was constructed in 1935. A four storey addition was constructed in 1962. Public Works Canada is the custodian. FHBRO Building Report 89-42.

Reasons For Designation

The Dominion Public Building was designated Recognized because of its historical associations, its importance as a work of architecture, and its local and environmental significance. Any modifications to the buildings interior must respect the heritage character of the building.

The building is a very good example of a large Art Deco office building, and one of the first such designs to be produced by the Chief Architect's office. Executed in the Classical Modern style, the building exhibits characteristics of classicism in its basic composition, which is divided into three sections suggesting the base, shaft and capital of a classical column; and modernity in the Art Deco elements of its design: stepped massing, smooth stone finish and bands of abstract decoration. The vertically oriented stepped facade is also characteristic of Art Deco and gives the building a significant presence on Bedford Row.

The craftsmanship and materials of the Dominion Public Building are of high quality, with dressed sandstone and granite at the exterior and marble, terrazzo, mosaic and bronze fittings in the principal public spaces. The exterior and interior decorations are notable for their explicitly Canadian subject matter which reflects the desire of several Canadian designers for truly Canadian forms of expression.

The Dominion Public Building was the first sky-scraper to be constructed in Halifax, and it continued to dominate the skyline until the 1960s. It is a familiar landmark in the city.

Character Defining Features

The heritage value of the Dominion Public Building resides in all aspects of its Classical Modern design as found particularly on the exterior and the ground floor interior. The design of the building is notable for its carefully proportioned, stepped-back form, smooth wall surfaces of Wallace sandstone with polished granite at the base and main entrance, vertically-oriented window recesses, decorative detail, and architectural metals and fittings, as well as for the plan, finish and details of the principal public spaces.

The other facades of the building continue the stepped massing and strong verticality of the Bedford Row facade. This arrangement of the building masses is highly characteristic of the period and is an important feature of the building.

The facades are highlighted by simplified, but characteristic decorative carvings in the masonry, carried out in the stylized Art Deco mode, an approach to decoration which is typical of Classical Modern architecture. At the Dominion Public Building these include abstract geometric friezes and marine motifs such as waves, dolphins and sea horses. Typical of many Art Deco buildings, this decoration is concentrated at the street level, the roof-line and around the main entrance, the intervening space being without decoration. These features of the exterior are characteristic of classical Modern architecture and should be carefully protected and maintained. The masonry should be the subject of an ongoing maintenance program and appropriate conservation expertise involved in any programs of repair or restoration. Precedents of colour, proportion and material should be respected.

The exterior elevations have survived virtually intact except for the introduction of an intrusive doorway and out-of-scale light fixtures which flank the entrance. These elevations should be maintained with all their verticality, articulation, plainness or detail. The existing aluminum door and frame units are incompatible with the design of the facade of the building. When it becomes necessary to replace these doors, new units which are more compatible with the design intent and precedent would considerably enhance the building.

The alteration of any element of the exterior elevations would have a negative impact on the heritage character of the building. Any signage installed on the building should be designed using compatible forms and materials.

The main lobby and post office lobby is a striking example of Classical Modern architecture as applied to interior design. Despite some alterations the plan of the postal services area it is intact and in excellent condition. The plan, massing and proportions are carefully handled and the use of decoration is as stylized as it is on the exterior. The materials are of high quality throughout. These include the use of bronze doors, birch woodwork, polished marble walls in two shades of grey, coordinated terrazzo floors, carefully detailed coffered plaster ceilings, hexagon-motif light fixtures and elevator doors and hardware in bronze and stainless steel or nickel. The figures in mosaic and terrazzo, the bronze wicket screens and particularly the "Edward VIII" sign board give special interest to the space. The spaces, design and materials of the main lobby area have survived virtually intact to the present day; every effort should be made to preserve and protect the design integrity and the individual elements of this quality interior and to incorporate these features in any future use of the space.

The building lightwell is intact in all respects. As the major plan element of the building it should be retained to function as a source of light for the interior office spaces.

The quality of finishes and detailing on the upper floors is standard and unexceptional. Features of interest in these areas are the elevator lobbies and fire-separating doors. This configuration and the doors themselves should be protected and incorporated in any future development scheme. The remainder of the floor areas of the building could be managed with some flexibility.

Aside from minor modifications for accessibility, the setting of the building is virtually unchanged. Although minor modifications to the secondary elevations could be considered, modifications which would detract from the dominant massing of the building and its clean uncluttered lines must be resisted.

4.0 Halifax NS Geographic Accommodation Strategic Plan

A City Strategic Plan was revised for Halifax NS, the City Strategic Plan was developed to document the impact of the Deficit Reduction Action Plan (DRAP) on PSPC crown/lease portfolio for the Halifax area. The main focus of the document was to develop a plan to minimize vacancy in the crown owned assets, where feasible, and to identify specific projects necessary to provide the best value to the crown. This strategy will allow PSPC to meet its objectives of identifying space recapture opportunities and maximizing occupancy in Core Assets. The strategy recommended maximizing the occupancy in the Halifax GOCB, as one of its core assets, by moving tenants out of existing crown assets being released from inventory and leases which are expiring. The occupancy in the Halifax GOCB would be maximized by applying the Activity Based Workplace Space Utilization Factor and Workplace 2.0 fit-up standards(Workplace 2.0 for PSC only). The recommended option increases the building population from 369 FTE's to 471 FTE's.

5.0 Building Capacity Calculation

The Halifax GOBC (Dominion Building) has 369 FTE's currently in the building. The Space Management drawings from May 25 2016 identify 8,217.41 useable m2 and 10,827.82 rentable m2 in the building.

An individual Activity Based Workplace Space Utilization Factor calculation was done for the proposed tenants PSPC, SSC and CSPS and Workplace 2.0 calculation was done for PSC.

The total area required for 471 FTE's is calculated to be 7,228.9 useable m2.

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A summary of the proposed occupancy breakdown by client department (totaled by area and FTE's) is as follows:

The office space indicated below includes a circulation percentage of 35% and the Special Purpose Space (SPS) includes a circulation percentage of 10%.

Building Occupant	Um2 Office	Um2 SPS	Um2 Total	FTE	Comments
PSPC – Public Services Procurement Canada	3,948.2	437.5	4,385.7	333	SPS space not confirmed
SSC- Shared Services Canada	1,284.0	171.3	1,455.3	107	SPS has not been confirmed
Translation	84.0	0.0	84.0	7	AWB confirmed
PSC-Public Service Commission	243.4	360.8	604.2	14.0	W2.0 confirmed. No confirmation of sharing space
CSPS	120.0	579.7	699.7	10	ABW confirmed.FTE and SPS to be reviewed
Grand Total	**5,679.7**	**1,549.2**	**7,228.9**	**471**	

For this report, based on information from the Strategy, we have estimated the following number of FTE's for each floor:

Floor #	Occupant	FTE Count
7	PSPC	58
6	PSPC	52
5	PSPC	59
4	PSPC	104
3	PSPC,SPS*	67
2	CSPS, PSC,SSC	28
1	SSC, SPS	103
Basement	SPS	
Total		**471**

* Records Room & Mail Room

Also see Block Plans for recommended occupant locations throughout the building.

6.0 Building Systems Analysis

6.1 Mechanical System

HVAC system findings and recommendations:

Implications of Activity Based Workplace Space Utilization Factor on Mechanical:

The Activity Based Workplace Space Utilization Full Time Employee (FTE) count indicates an increase of occupants on many of the floors. An increase in floor occupancy will most likely have an impact on the air conditioning and ventilation loading of the space. The Activity Based Workplace Utilization Factor FTE count suggests an occupancy increase. This increased occupancy may represent additional cooling and ventilation load in the building. It is possible that the existing rooftop air handling units will not have the capacity to accommodate this increased loading. If this is the case, some of the existing rooftop units would have to be removed and replaced with larger units or additional units would have to be installed. Also, duct routing and space zoning (i.e. VAV boxes, temperature controls, diffusers, etc.) within the building will have to be revised to accommodate the new floor layouts.

Revised space layouts may require adjustments to the sprinkler system, however, it is expected that any revisions to this system will be minimal.

The existing heating systems serving the building would likely not have to be undergo significant revisions.

6.2 Electrical System

Power distribution:

Primary switch gear service entrance: The service entrance is rated for 2000A and is only using roughly 1000A load which means there is a lot of room for growth if required by the Activity Based Workplace Utilization Factor implementations, however, there may be limitations on the main feeders and distribution throughout each floor as it is unknown what the loading in each floor is at this present time. It is to be kept in mind that the 4th floor renovation did not require a feeder and distribution upgrade for that floor.

Major distribution transformers: Major transformers are existing in the building for many needs and, depending on the growth required, some of these transformers may need to be increased in capacity and be replaced.

Panel distribution: All distribution panels are still in good condition however depending on the number of circuits required some 42 cct panels may need to be upgraded to 66 or 72 cct panels if required.

Replacing or adding to the existing power ceiling grid: Junction boxes may need to be added in order to accommodate the extra number of workstations required with higher density of FTE’s.

The branch circuitry may need to be replaced in some location although most of it is thought to be replaced in the last major renovation in 1992.

Lighting system:

Lighting fixtures and source: The lighting system and design is old and should be replaced throughout the building including the 4th floor. Direct/indirect fixtures should be used with glare control. LED technology is acceptable as long as the correct fixture is specified.

Lighting control: The existing occupancy sensor per workstations control could be reused and expanded to match the new layout.

Communications:

Cabling: cabling for voice will not be required as most FTEs will switch to cellular service and cabling for data does not meet the new standards from communications so all would need to be replaced or use wireless routers as in the 4th floor renovation.

Communications tray: A new communications tray would need to be installed for all floors and replace the zone conduit system.

Emergency lighting and Exit sign Systems:
Emergency lighting: These will be provided by lighting fixtures being connected to back up generator except for the service rooms which should also have emergency battery packs.
Exist signs: These have just been replaced to the running man signs so they can be reused but may need to be increased depending on the layout.

Other systems
All other systems can be reused and expanded as required

6.3 Structural System

The Dominion Public Building was constructed in two phases with the drawings indicating the dates of the design as 1935 for the tower and 1962 for the addition.

The National Building Code of Canada and the Federal Office Building Standards both identify loads for general office accommodations, so the change from current office layouts to a Activity Based Workplace Utilization Factor are not expected to change the general office floor loadings. However, the structural capacity must confirmed for any areas that are known to exceed the general office loads, such as high concentrations of typical file storage systems or moveable high density filing systems. As the design loads are not identified on the original Dominion Public building drawings, structural design checks will need to be performed once areas that have atypical office loads have been identified. For typical Activity Based Workplace Space Utilization floor loads there should be no structural issues.

It should also be noted that the majority of the steel structure is encased in concrete, so the confirmation of member sizes and steel framing connection will not be possible in most cases.

6.4 Elevator System Description.
Also see Appendix B

The Bedford Row passenger elevator system consists of two (2) units equipped with overhead machine gearless traction devices with rated car capacity of 2,500 pounds. Both cars have a top rated speed of 500 fpm. The cars service the basement and 8 top floors. These elevators received a major retrofit in 2007. The AC motor/DC generator power system was replaced with DC SCR power inverter units. The main control system for both cars are duplex MCE non-proprietary microprocessor based control systems along with automatic selective collective. The landing door configuration was retained however the door operating system was upgraded with MCE Smartrac closed loop operators. The car interiors were modified with new car controls and total refinishing of the car interior. All hall and car fixtures were replaced with modern devices. Both cars are connected to the buildings emergency power loop.

The building has also a freight/service car located in the rear of the building. This device was recently upgraded with AC gearless permanent magnet new technology. The car's rated speed in 350 fpm. This car is capable of functioning as an alternate passenger car if and when required. This car services the basement floor and 7 top floors. It is also connected to the buildings emergency power loop.

A lift for persons with physical disabilities is located at the front entrance of the building. This unit can accommodate persons who need to have access from the front street steps up to the front lobby level.

The buildings people moving system is currently compliant with the CAN CSA B44 Safety Code for elevators and the CAN/CSA B651 Barrier Free design where applicable.

Current building population.

Based on information passed on by PSPC Interior Design folks, the basement has one occupant, the 1st floor has 80, the second floor has 92, the 3rd floor has 93, the 4th floor has 101, the 5th floor has 55, the 6th floor has 19, and the 7th floor has 40, with a total of 369.

ED 16200-2013 model traffic design criteria.

The ED 16200-2013: Elevators, Dumbwaiters, and Escalators best practice design guidelines recommends system analysis using the building's population/occupants to determine morning and noon peak design criteria listed in tables 3-4 and 3-5.

<u>Morning traffic peak:</u>

Average waiting time of 23 seconds being excellent, 30 seconds and over not so good.

<u>Noon traffic peak:</u>

Average waiting time of 30 seconds being excellent, 38 seconds and over not so good.

<u>Section 3.6 of the ED 16200-2013 recommends that:</u>

- 55% of the hall calls are answered in 20 seconds,
- 75% of the hall calls are answered in 30 seconds,
- 90% of the hall calls are answered in 50 seconds,
- 99% of the hall calls are answered in 99 seconds,
- 100% of the hall calls are answered in 180 seconds.

Current Elevator System Passenger Cars Traffic Study:

A traffic study was conducted by Lift Engineering Services on both Bedford Row passenger cars from Monday May 16th through the end of the day Friday may 20th, 2016. Data collected reflected average waiting times of less than 18 seconds during morning peak times and no longer than 24 seconds during noon peak times. These results are well within the recommended design criteria listed in ED 16200-2013. (See attached average wait time detailed report)

As for recommended minimum waiting times criteria listed in sections 3.6 of ED 16200-2013; again, the current elevators exceeded recommended values. (See attached wait time distribution report)

6.5 Exiting and Egress

RJ Bartlett Engineering Ltd (RJBEL) was retained by MAC Interior Design Inc. to perform the exiting and egress review for the Public Works and Government Services Canada (PWGSC) Dominion building.

Applicable Codes and Standards

The applicable Codes and Standards that have been considered for this review, with respect to exit and egress, include but are not limited to, the following:

- 2015 National Building Code (NBC).
- 2015 National Fire Code (NFC).

Observed areas of noncompliance with respect to the applicable exit and egress requirements are identified throughout this section as appropriate. As design drawings for the proposed floor plan layout following the renovation were not provided for review, confirming compliance with many of the applicable Code requirements will be the responsibility of the Design Team as the project progresses.

It is noted that a review of exit and egress features on the Basement Level is not included within the scope of this project.

6.5.1 Acceptable Solution Requirements – Egress and Exiting

<u>Occupant Load and Exit Capacity Calculations</u>

Occupant loads have been calculated using the occupant load factors provided in NBC Table 3.1.17.1. Table A below lists the occupant load factors used in this analysis. A summary of the calculated occupant loads for each floor area is provided in Table B .

Use of Space	Occupant Load Factor (m^2/Person)
Classrooms, Reading or Writing Rooms, or Lounges	1.85
Office Space	4.60[a]
Storage/Building Services	46.00

a) The Business/Personal Service space occupant load factor of 4.60 m^2/person was used to assess the capacity of block office space as in these blocks the proportion of Meeting Room space is unknown. Based on this, it

is the opinion of RJBEL that the 4.60 m^2/person factor is more appropriate than the
9.30 m^2/person for traditional office workstation areas.

Table A: Applicable Occupant Load Factors

It should be noted that the occupant loads presented in this report were based on floor areas reported on the block planning diagrams provided to RJBEL. This occupant load analysis should be considered preliminary as detailed floor plans were not provided for review.

Level	Use	Area[a] (m^2)	Factor (m^2/Person)	Occupant Load (Persons)
Basement	Building Services	993.5	46.00	22
	"EOAP"	37.5	4.60	9
	Special Purposes Space	196.5	46.00	5
	Available Space	367.1	1.85	199
	Total Basement Occupant Load			***235***
1	Building Services[b]	20.6	46.00	1
	Shared Services Canada	1,400.0	4.60	305
	Special Purposes Space	134.9	46.00	3
	Total Level 1 Occupant Load			***309***
2[c]	Canada School	699.7	1.85	379
	Public Service Commission	604.2	4.60	132
	Shared Services Canada	55.3	4.60	12
	Available Space	289.2	4.60	63
	Total Level 2 Occupant Load			***586***
3[c]	Building Services[b]	6.7	46.00	1
	Public Services and Procurement Canada and Translation	880.4	4.60	192
	Special Purposes Space	129.8	46.00	3
	Available Space	845.0	9.30	91
	Total Level 3 Occupant Load			***287***
4[c]	Atrium	114.4	1.85	62
	Public Services and Procurement Canada and Translation	1,364.3	4.60	297

Level	Use	Area[(a)] (m^2)	Factor (m^2/Person)	Occupant Load (Persons)
			Total Level 4 Occupant Load	***359***
5[(c)]	Public Services and Procurement Canada and Translation	769.9	4.60	168
			Total Level 5 Occupant Load	***168***
6[(c)]	Public Services and Procurement Canada and Translation	687.0	4.60	150
			Total Level 6 Occupant Load	***150***
7[(c)]	Public Services and Procurement Canada and Translation	768.1	4.60	167
			Total Level 7 Occupant Load	***167***
			Total Building Occupant Load	***2,261***

a) Areas were taken as noted on the block planning diagram.
b) Area of Building Services was reduced from the valve noted on the block diagram to not include vertical service shafts and/or exit stair cases. Reception areas were considered to be circulation spaces and were not assigned an occupant load.
c)Building Services area noted in the block diagram on this Level was not assigned an occupant load as the area appears to have been associated with atrium openings, exit stairs, and vertical service/elevator shafts.

Table B: Calculated Occupant Loads (Continued)

Exit capacities are to be calculated by dividing the width of doorways and corridors by 6.1 mm/person, and stairs by 8.0 mm/person (if steps have a rise not more than 180 mm and a run not less than 280 mm), or by 9.2 mm/person in all other cases (NBC Sentence 3.4.3.2.(1)). The exit capacity calculations are based on dimensions taken from the drawings provided. Refer to Table C below for a summary of the exit capacity calculations.

Level	Limiting Exit Component	Width (mm)	Exit Capacity Factor (mm/Person)	Exit Capacity (Persons)
Basement	NW Stair	1,232	9.2	133
	NE Exit Door	1,727	6.1	~~283~~ 133[(a)]
	Total Basement Exit Capacity			***266***
1	NW Stair	1,200	9.2	130
	NE Stair	1,134	9.2	123
	S Entrance Door	2,488	6.1	~~407~~ 253[(a)]
	Total Level 1 Exit Capacity			***506***
2	NW Stair	1,225	9.2	133
	NE Stair	1,134	9.2	123
	S Stair	1,123	9.2	122
	Total Level 2 Exit Capacity			***378***
3	NW Stair	1,225	9.2	133
	NE Stair	1,134	9.2	123
	S Stair	1,123	9.2	122
	Total Level 3 Exit Capacity			***378***
4	NW Stair	1,225	9.2	133
	NE Stair	1,134	9.2	123
	S Stair	1,142	9.2	124
	Total Level 4 Exit Capacity			***380***
5	NE Stair	1,134	9.2	123
	S	1,142	9.2	~~124~~ 123[(a)]
	Total Level 5 Exit Capacity			***246***
6	NE Stair	1,134	9.2	123
	S Stair	1,142	9.2	~~124~~ 123[(a)]
	Total Level 6 Exit Capacity			***246***
7	NE Stair	1,134	9.2	~~123~~ 122[(a)]

Level	Limiting Exit Component	Width (mm)	Exit Capacity Factor (mm/Person)	Exit Capacity (Persons)
	S Stair	1,123	9.2	122
			Total Level 7 Exit Capacity	***244***

a) No one exit is permitted to provide more than 50% of the exit capacity from a floor area (NBC Sentence 3.4.3.2.(7)).

Table C: Calculated Exit Capacities

Protected Floor Space Calculations

It is noted that the Dominion building contains two interconnected floor spaces. Levels 1 and 2 are interconnected via an open convenience stair located adjacent to the main lobby. Levels 3 through 7 are interconnected via a common atrium. NBC Subsection 3.2.8 requires additional protective measures be implemented for atriums/interconnected floor spaces, unless otherwise exempt. Levels 1 and 2 are exempt from these additional protective measures, however Levels 3 through 7 are not. A detailed review of the extent of compliance with these additional protective measures is not part of this project scope, except as it applies to exiting and egress (i.e. protected floor space and cumulative exit capacities).

In addition to occupant load and exit capacity, the provision of protected floor space needs to be given consideration due to the presence of the atrium on Levels 3 through 7. Protected floor spaces are to be provided by separating the protected floor space from the adjacent atrium/interconnected floor spac e with fire separations having 2 h fire-resistance rating. All openings between the protected floor spaces and interconnected floor space are to be protected with vestibules in conformance with NBC Sentence 3.2.8.4.(1).

NBC Articles 3.2.8.5. and 3.4.3.2. require protected floor space be provided for Levels 3 through 7 based on one of the following options, unless cumulative exit capacities are considered:

- 0.5 m^2/person if protected floor space is provided in the floor area (the protected floor space
- would have to be configured such that it is not necessary to enter the atrium/interconnected floor
- space to reach an exit), or

- 0.3 m^2/person if protected floor space is provided via the area of trends and landings within exit stairs.

Based on the understood program guide, protected floor space being provided on each floor area is likely not practical. Furthermore, based on the size of the existing exits stairs cumulative exit capacity is not possible. As a result, this analysis has considered that protected floor space will be provided based on the area of treads and landings within the exit stairs. Refer to Table D below for a summary of protected floor space for each Level.

Level	Protected Floor Space Area (m²)	Protected Floor Space Capacity Factor (m²/Person)	Protected Floor Space Capacity (Persons)
Basement	-	-	-
1	-	-	-
2	-	-	-
3	45.5	0.3	**151**
4	47.6	0.3	**158**
5	31.5	0.3	**105**
6	31.6	0.3	**105**
7	32.2	0.3	**107**

Table D: Protected Floor Space Capacity Calculations

As it relates to exiting and egress, it is noted that NBC Subsection 3.2.8. requires that exits opening into the atrium on Levels 3 through 7 be protected with vestibules that (NBC Sentence 3.2.8.4.(1)):

- Have doorways not less than 1.8 m apart,
- Are separated from the remainder of the floor area by a non-rated fire separation, and
- Are designed to limit the passage of smoke so that the exit stair does not contain more than 1% smoke by volume of contaminated air from the fire floor, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in accordance with NBC Subsection 1.1.3.

The NBC states that the occupant load of a floor area is determined based on the design element with the least capacity. Table E below summarizes the occupancy limitations applicable to each Level based on the most restrictive design element.

Level	Maximum Occupant Load (Persons)	Limiting Factor
Basement	235	Occupant Load
1	309	Occupant Load
2	378	Exit Capacity
3	151	Protected Floor Space
4	158	Protected Floor Space
5	105	Protected Floor Space
6	105	Protected Floor Space
7	107	Protected Floor Space

Table E: Occupant Load Restrictions by Level

It is recommended that posted occupant load signage be provided on each Level of the building to identify these occupancy restrictions. The management of these maximum occupant loads is the responsibility of the Owner.

Exit and Egress Requirements

The minimum required width of exit components serving this building is outlined in Table F (NBC Article 3.4.3.2.).

Description	Minimum Width (mm)
Exit Doorways	800
Exit Corridors, Ramps, and Passageways	1,100
Exit Stairs	1,100

Table F: Minimum Required Width of Exit Components

NBC Article 3.3.1.5. requires at least two egress doorways for all rooms and suites where:

- The intended occupant load is greater than 60 persons,

- The travel distance to an egress door exceeds 25 m,
- A floor area of the room is greater than 300 m^2 for office spaces, or
- A floor area of the room is greater than 200 m^2 for classrooms/training areas.

When two or more means of egress are required from a room or suite, NBC Article 3.3.1.5. requires that the egress doors be spatially separated from one another by a distance equal to not less than ⅓ of the maximum diagonal dimension of the room or suite.

NBC Article 3.3.1.11. requires a door providing access to exit from a floor area intended for an occupant load greater than 60 persons swing in the direction of travel towards exits. NBC Article 3.4.6.12. requires all exit doors to swing in the direction of exit travel. It is noted that the door leading into Vestibule 102 on Level 1 does not swing in the appropriate direction.

NBC Article 3.4.6.16. requires exit and egress doors in the following locations be equipped with listed "panic" hardware:

- All exit doors from a floor area with an occupant load greater than 100 persons,
- All egress doors serving rooms with an occupant load greater than 100 persons, and
- Discharge doors from all exit stairs.

NBC Sentence 3.3.1.9.(7). permits corridors to contain dead end portions provided they are not more than 6 m in length.
It is noted that the block diagrams appear to show portions of dead-end corridors exceeding 6 m in the northeast corner of the building. Dead-end portions of corridors greater than 6 m are not permitted and may be addressed by reconfiguring the suite boundaries.

NBC Sentences 3.3.1.13.(2). and 3.4.6.16.(1). require that all exit and egress doors be readily openable when moving in the direction of travel to exit, with not more than one releasing operation, without requiring keys or specialized knowledge. This also applies to doors with electric strikes.

Electromagnetic locks that do not incorporate latches, pins, or other similar devices to keep the door in a closed position are permitted to be installed on exit doors provided (NBC Sentence 3.4.6.16.(4)):

- The locking device, and all similar devices in the access to exit leading to the exit door, release upon actuation of the fire alarm signal,
- The locking device releases immediately upon loss of power controlling the electromagnetic locking mechanism and its associated auxiliary controls,
- The locking device releases immediately upon actuation of a manually operated switch readily

  accessible only to authorized personnel,

- A force of not more than 90 N applied to the door opening hardware initiates an irreversible process that will release the locking device within 15 s and not relock until the door has been opened,

- Upon release, the locking device must be reset manually by the actuation of the switch referred to above,

- A legible sign is permanently mounted on the exit door to indicate that the locking device will release within 15 s of applying pressure to the door opening hardware,

- Emergency lighting is to be provided at the door, and

- The total time delay for all electromagnetic locks in any path of egress to release is not more than 15 s.

NBC Article 3.4.6.18. states that doors providing access to floor areas from within exit stairs, other than doors equipped with electromagnetic locks in conformance with NBC Sentence 3.4.6.16.(4)., are not permitted to have locking devices to prevent entry/re-entry into any floor area from which the travel distance up or down to an unlocked door is no more than two storeys. The “cross-over” doors are to be identified by a sign on the stairway side to indicate that they are openable from that side. Locked doors intended to prevent entry into a floor area from an exit stair are to be identified by a sign on the stairway side to indicate the location of the nearest unlocked door in each direction of travel, and be openable with a master key that fits all door locking devices and is accessible to firefighters (master key to be kept in a designated location such as at the fire alarm panel). Alternatively, in lieu of providing a master key for locked stair doors, these doors could be provided with a wired glass panel not less than 0.0645 m^2 in area and located not more than 300 mm from the door opening hardware.

If electromagnetic locking devices are installed on doors providing emergency cross-over access to floor areas from within exit stairs in accordance with NBC Article 3.4.6.18., the following provisions are required to address non-fire emergency situations:

- The locking device is to release immediately upon the operation of a manual station for the fire alarm system located on the wall on the exit stair side not more than 600 mm from the door, and

- A legible sign with the words “re-entry door unlocked by fire alarm” in letters at least 25 mm high with a stroke of at least 5 mm is permanently mounted on the door on the exit-stair side.

It is understood that the Owner wishes to designate Levels 3 and 6 as cross-over floors. This would satisfy the requirements of NBC Article 3.4.6.18.

<u>Exit Locations</u>

NBC Article 3.4.2.1. requires that every floor area be served by at least two exits.

NBC Article 3.4.2.5. restricts the maximum travel distance to an exit throughout the building to not more than 45 m.

For floor areas and suites served by public corridors (i.e. constructed as either non-rated or rated fire separations), NBC Article 3.4.2.4. permits the travel distance to be measured from the egress door serving the suite.

It is noted that the travel distance to an exit on the Basement Level is currently exceeded by as much as 10 m in the central portion of the building. Creating a public corridor on this Level may not resolve all travel distance issues. It is recommended that this existing condition be reviewed with the Authority Having Jurisdiction (AHJ).

The travel distance to an exit on Level 1 will also exceed the maximum distance allowed unless a public corridor is provided. The maximum allowable travel distance could be exceeded by as much as 10 m from the southwest portion of the floor area (i.e. Rooms 1068/1069).

NBC Article 3.4.2.3. requires that individual exits serving a floor area be spatially separated from one another by a distance equal to not less than ½ of the maximum diagonal dimension of the floor area. The maximum required separation between exits is 9 m when served by a public corridor. The minimum required separation between exits is 9 m when not served by a public corridor.

Exit Through Lobbies

NBC Article 3.4.4.2. permits one exit from a floor area discharge to grade through a lobby provided:

- The lobby is not more than 4.5 m above grade,
- The travel distance from the exit stair door through the lobby to the exterior of the building is not more than 15 m,

  The lobby is not located within an interconnected floor space,
- Neither residential or industrial occupancies open directly into the lobby,
- The exit stair is separated from the lobby by a 2 h fire separation, and
- The lobby is separated from the remainder of the building by a non-rated fire separation.

It is noted that the south exit stair currently discharges through a lobby that is separated from the Level 1/Level 2 interconnected floor space by a glass partition. This partition was observed to have holes drilled through the glass in some areas. Although the presence of these holes compromises the integrity of the non-rated exit lobby separation, given the high ceilings in the exit lobby and Level 1 main lobby, and considering the elevation at which the holes were drilled, this is not considered to pose a significant risk to life safety. It is recommended that this existing condition be reviewed with the AHJ.

Exit Signage

NBC Article 3.4.5.1. requires every exit door to have a continuously illuminated exit sign placed over or adjacent to it that is visible from the approach, including directional signage at corridor intersections and throughout open floor areas intended for occupancy. Exit signs are required to consist of a green pictogram and a white or lightly tinted graphical symbol, meeting the colour specifications referred to in ISO 3864-1, "*Graphical Symbols – Safety Colours and Safety Signs – Part 1: Design Principles for Safety Signs in Workplaces and Public Areas*".

Exit signs are to be either internally illuminated powered by an emergency electrical power circuit, or externally illuminated by lighting powered by an emergency power circuit and be in conformance with CAN/ULC–S572, "*Photoluminescent and Self-Luminous Signs and Path Marking Systems*".

Emergency Lighting

NBC Sentences 3.2.7.3.(1) and (3) requires emergency lighting at an average illumination no less than 10 lx, with a minimum not less than 1 lx, be provided at floor or tread level in the following locations:

- Exits,
- Open floor areas providing primary access to an exit,
- Any corridors that will be used by the public, and
- Areas within the building where the public may congregate.

NBC Article 3.2.7.4. requires an emergency power supply (via power generator or batteries) be provided to maintain the emergency lighting for 30 min in the event that regular power supply is interrupted. Self-contained emergency lighting units, when used, are required to conform to CSA C22.2 No. 141, "*Emergency Lighting Equipment*".

Fire Safety Plan

As stated by the NFC, this building is required to have fire safety plan in place that addresses all facets of NFC Section 2.8. The fire safety plan is to be prepared in conjunction with the local fire department and AHJ.

6.6 Washrooms

6.6.1 Applicable Codes and Standards

The applicable Standard that has been considered for this review is the 2015 Canadian Labour Code – Occupational Health and Safety Regulations (OH&SR) for toilet rooms.

It is noted that these regulations exceed the minimum requirements of the NBC with respect to the number of toilets required.

6.6.2 Acceptable Solution Requirements – Washrooms

OH&SR Clauses 9.12.(2)(d), 9.12.(2)(e), and 9.12.(2)(f) require that:

- At least four toilets be provided for each sex where the number of persons of each sex exceeds 49, but is less than or equal to 74.

- At least five toilets be provided for each sex where the number of persons of each sex exceeds 74,

  but is less than or equal to 100.

- Where the number of persons of each sex exceeds 100, at least five toilets are to be provided; plus one toilet for every 30 persons in excess of 100.

For the purposes of determining washroom counts, the building's occupant load is to be assumed to be 50% male and 50% female, unless it can be justified otherwise.

OH&SR Article 9.19 requires that at least one sink be provided for every two toilets and/or urinals provided in a washroom.

Based on these provisions, Table H below summarizes the number of toilets and sinks required to serve the anticipated occupant load.

Level	Maximum Occupant Load (Persons)	Approx. Number of Persons of Each Sex		Toilets Required		Sinks Required	
		Male	Female	Male	Female	Male	Female
Basement	235	118	118	6	6	3	3
1	309	155	155	7	7	4	4
2	378	189	189	8	8	4	4
3	151	76	76	5	5	3	3
4	158	79	79	5	5	3	3
5	105	53	53	4	4	2	2
6	105	53	53	4	4	2	2
7	107	54	54	4	4	2	2

Table H: Washroom Calculation Summary

OH&SR Article 9.14. requires that washroom facilities be provided such that the travel distance from the most remote area served to a washroom is not more than 60 m, nor more than one storey above or below.

It is noted that OH&SR Sentence 9.12.(4). permits up to ⅔ of the required number of toilets in any male washroom be substituted for urinals.

The chart below summarizes the number of toilets and sinks existing and currently being utilized on each floor.

Level	Toilets Existing		Sinks Existing	
	Male	Female	Male	Female
1	6	6	4	5
2	6	6	4	5
3	6	6	4	5
4	6	6	4	5
5	3	3	2	2
6	3	3	2	2
7	3	3	2	2

Table X: Washroom Calculation Summary.

7.0 Class D Cost Estimate

See Appendix C

8.0 Halifax GOCB Existing Support Space

Halifax GOCB Exist. Support Space	Total #	Total Area
Quiet Room	4	29.1
Small Meeting Room	16	213.1
Medium Meeting Room	6	224.1
Large Meeting Room	1	56.4
Training Room	1	93.35
Shared Equip Room	N/A	N/A
Telecom Room	N/A	N/A
Printer Station	N/A	N/A
Open Collaborative Space	N/A	N/A
Undesignated Support Space	N/A	N/A
Total Area		**616.05**

9.0 Summary / Recommendations

Based on the information presented above it has been concluded that the Halifax GOCB can handle a building population increase from 369 FTE's to 471FTE's, which is the total number of FTE's

It has been determined that the mechanical and electrical systems can accommodate the population with some modifications. Some of these required modifications are base building upgrades, rather than fit-up items, that have already been identified in the Building Condition.

The building structural system will not be impacted by the increase in building population, although any areas of concentrated filing should be assessed on its impact on the structural integrity of the floor. Please note that Mail and Records relocation in this recommendation is the third floor which should be part of a structural assessment. Likewise it was determined that there will be no impact on the building exiting, or the elevators.

The current washroom count falls short of the calculation requirement based on the potential occupant load for each floor.

The Halifax Geographic Accommodation Strategy identifies opportunities to maximize the occupancy in core assets, the Halifax GOCB being identified as one of the core assets in the region. Based on this, and the conclusions above on the impacts of an increased building capacity, the recommended building tenant mix will increase the building population from 369 FTE's to 471 FTE's is recommended.

The building owner must post maximum occupant loads on each level of the building to identify occupancy restrictions. The management of these maximum occupant loads is the responsibility of the owner.

10.0 Approvals/Signatures

Prepared by:	Signature		
Please print:	Name	Position	Date

Approved by:	Signature		
Please print:	Name	Position	Date

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor

<u>Basement Floor Plan</u>

ACCESSORY A = 338.6 sq.m

BUILDING SERVICES = 993.5 sq.m

USABLE AREA = 601 sq.m

EOAP = 37.5 sq.m

TOTAL SPECIAL PURPOSES SPACE = 196.45 sq.m

REGIONAL ARCHIVES FILES	121.0 sq.m (102.7 sq.m ACTUAL)
GEOMATICS REQ EQ/FILES	49.5 sq.m
REG COMM EQUIP/OSME/ITS	25.95 sq.m

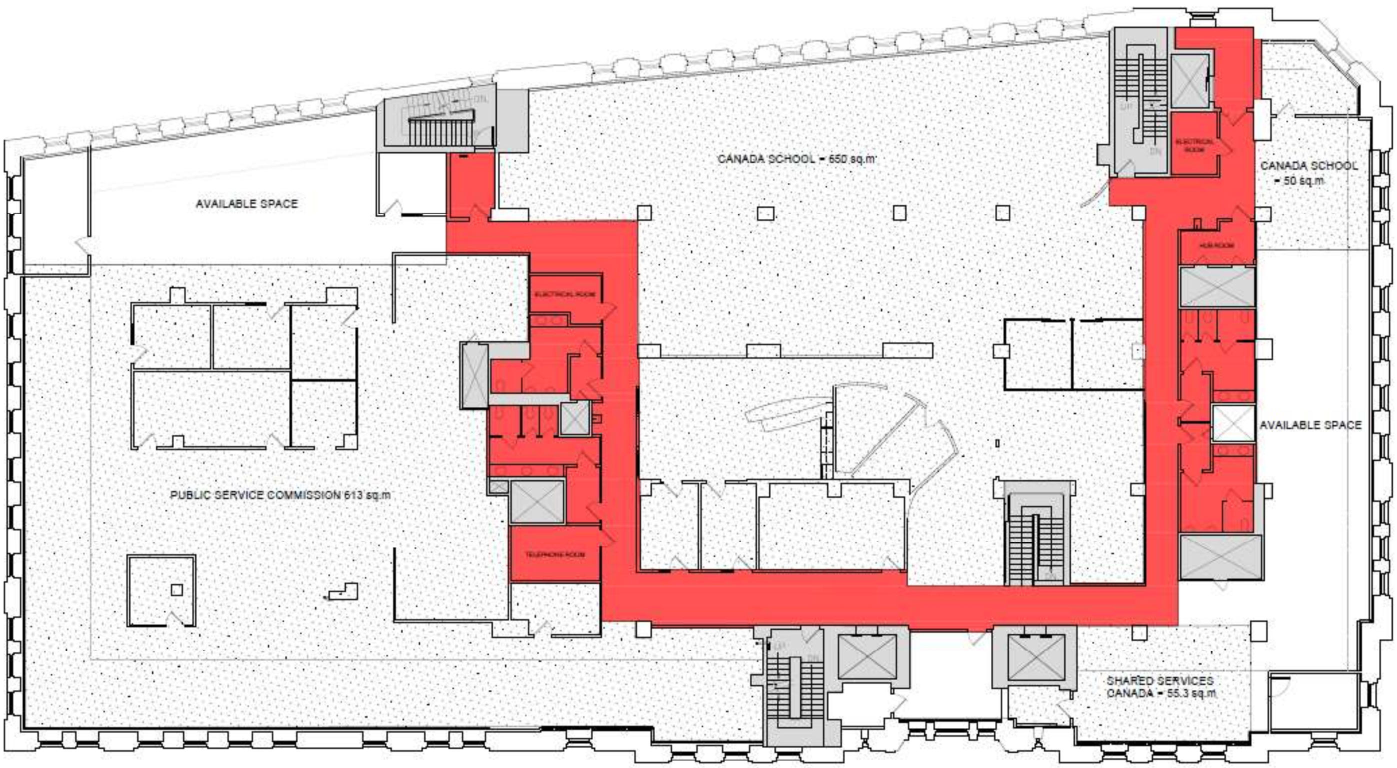
AVAILABLE SPACE = 367.05 sq.m
(INCLUDES REGIONAL TRAINING, BREAKOUT ROOM & RESOURCE CENTRE)

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor

First Floor Plan

ACCESSORY A = 251.4 sq.m	
BUILDING SERVICES = 446.5 sq.m	
USABLE AREA = 1534.9 sq.m	
SHARED SERVICES CANADA REQUIRES 1400sq.m ***	
TOTAL SPECIAL PURPOSE SPACE = 168.2 sq.m	
DATA CENTRE	88.4 sq.m
WCB	4.4 sq.m
(AVAILABLE FOR STORAGE/COMPUTER LABS)	42.1 sq.m
AVAILABLE SPACE = 0 sq.m	

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor



<u>Second Floor Plan</u>

(red)	**ACCESSORY A = 300 sq.m**
(grey)	**BUILDING SERVICES = 167.5 sq.m**
USABLE AREA = 1648.4 sq.m	
(dotted)	**CANADA SCHOOL = 699.7 sq.m**
(dotted)	**PUBLIC SERVICE COMMISSION = 604.2 sq.m**
(dotted)	**SHARED SERVICES CANADA REQUIRES 55.3 sq.m**
(blank)	**AVAILABLE SPACE = 289.2 sq.m**

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor

Third Floor Plan

ACCESSORY A = 320.6 sq.m

BUILDING SERVICES = 178.2 sq.m

USABLE AREA = 1506 sq.m

PSPC & TRANSLATION = 880.4 sq.m

TOTAL SPECIAL PURPOSES SPACE = 129.8 sq.m
REGIONAL RECORDS ROOM 107.8 sq.m
REGIONAL MAIL ROOM 22.0 sq.m

AVAILABLE SPACE = 845 sq.m

NOTE: CROSS-OVER FLOOR

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor

Fourth Floor Plan

ACCESSORY A = 314.5sq.m

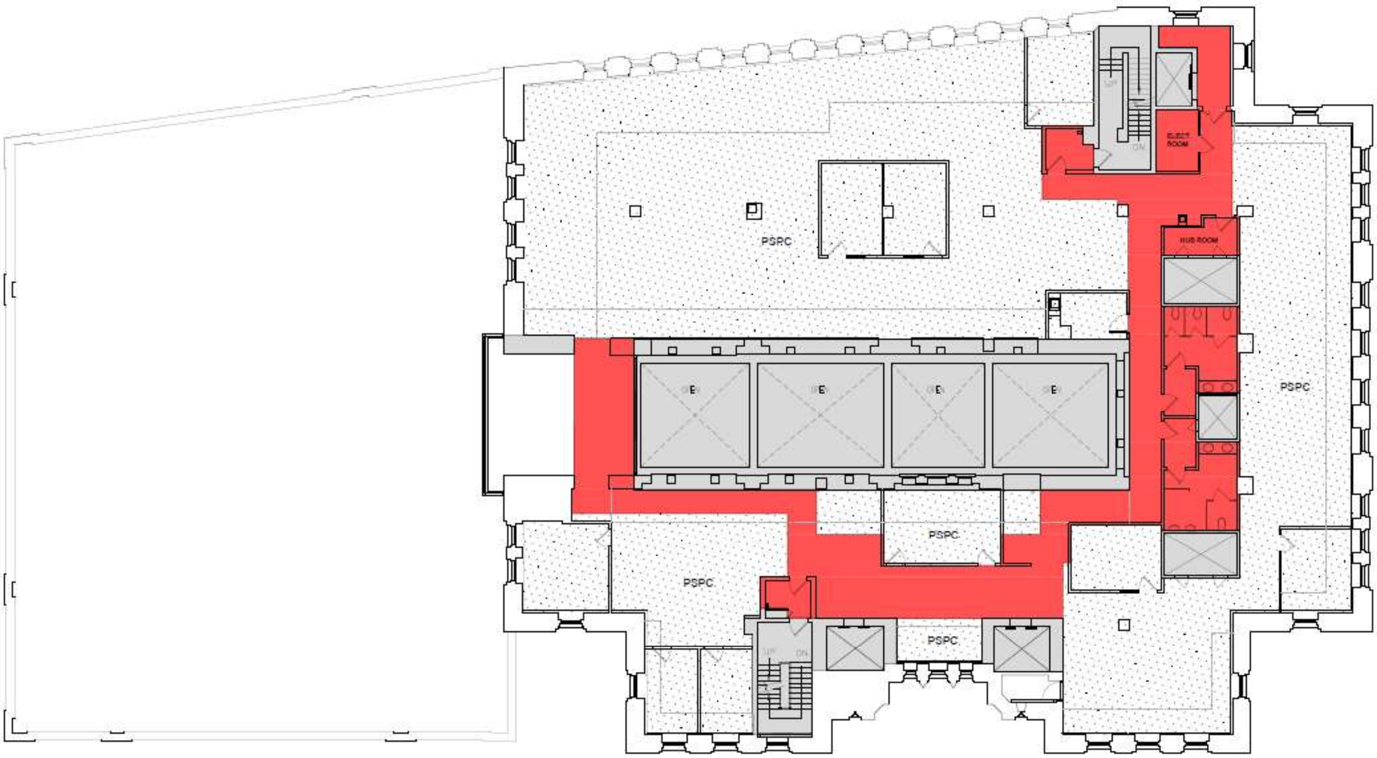
BUILDING SERVICES = 327.1sq.m

USABLE AREA = 1364.3 sq.m

PSCP & TRANSLATION = 1364.3 sq.m

AVAILABLE SPACE = 0 sq.m

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor



Fifth Floor Plan

ACCESSORY A = 204.4 sq.m

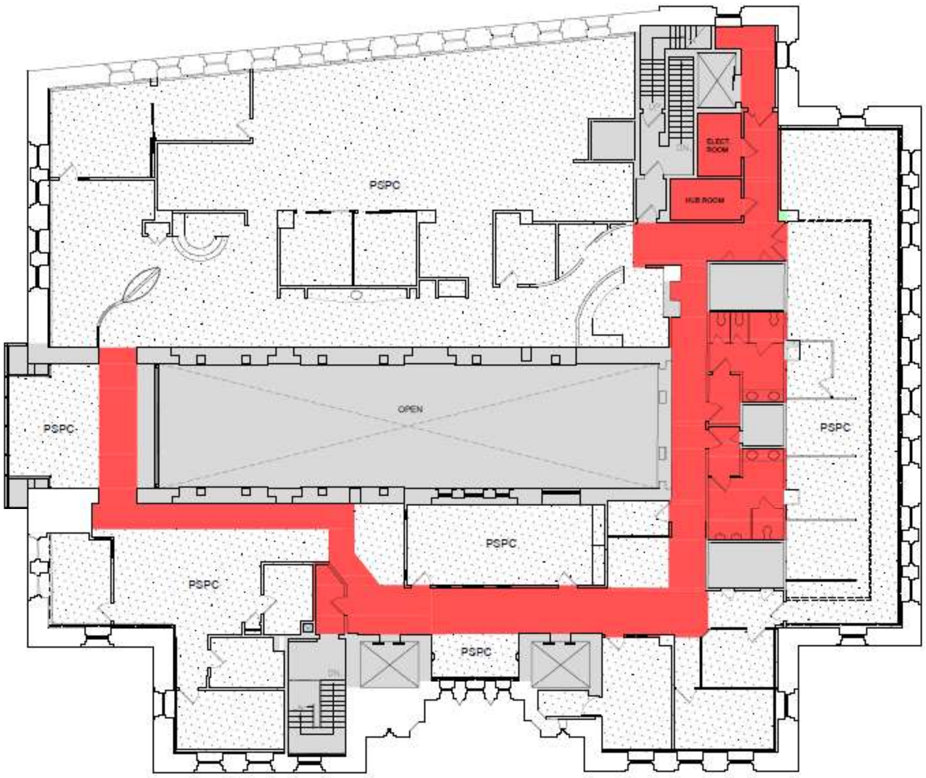
BUILDING SERVICES = 269.9 sq.m

USABLE AREA = 769.9 sq.m

PSPC & TRANSLATION = 769.9 sq.m

AVAILABLE SPACE = 0 sq.m

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor



Sixth Floor Plan

ACCESSORY A = 275.4 sq.m

BUILDING SERVICES = 310.9 sq.m

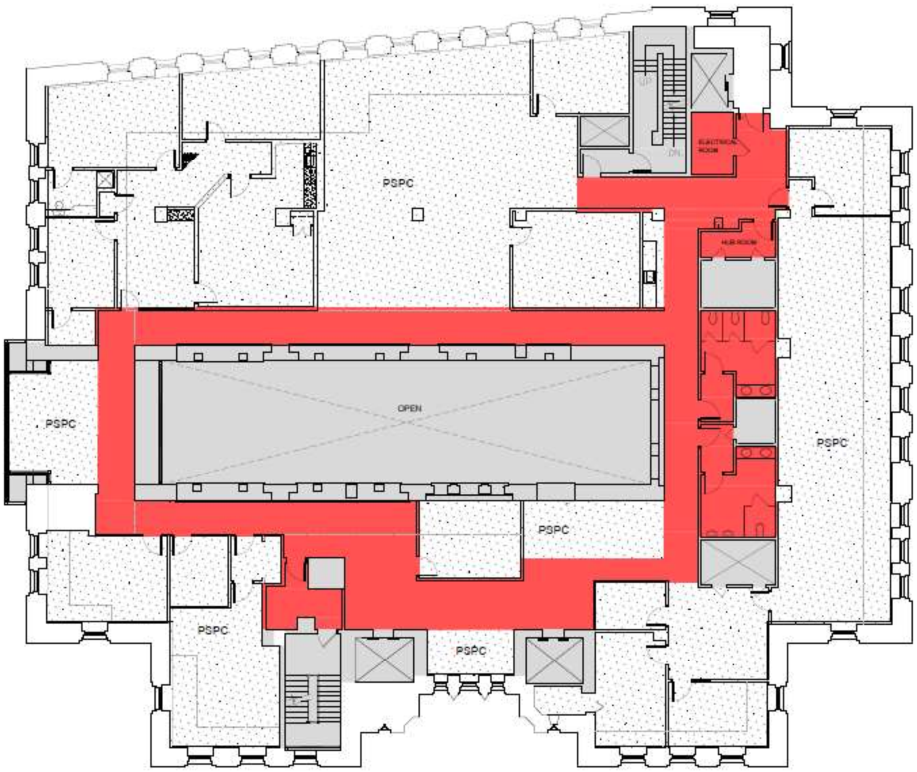
USABLE AREA = 687.0 sq.m

PSPC & TRANSLATION = 687.0 sq.m

AVAILABLE SPACE = 0 sq.m

NOTE: CROSS-OVER FLOOR

Appendix A:
Halifax Dominion Building – Block Plans, Space Allocations Per Floor



Seventh Floor Plan

ACCESSORY A = 197.4 sq.m

BUILDING SERVICES = 310.0 sq.m

USABLE AREA = 768.1 sq.m

PSPC & TRANSLATION = 768.1 sq.m

AVAILABLE SPACE = 0 sq.m

Appendix B :
Halifax Dominion Additional Information
Elevator Systems

PWGSC Elevator Systems
1713 Bedford Pass
Detailed Wait Time Distribution

Mon. May 16, 2016 through Fri. May 20, 2016

Avg. Cars	Count	Up Hall Calls	Seconds (Top of Range)	Down Hall Calls	Count	Avg. Cars
2.0	3	0.1%	Over 90	0.1%	3	2.0
2.0	3	0.1%	90	0.1%	2	2.0
2.0	2	0.1%	80	0.2%	5	1.8
2.0	3	0.1%	70	0.3%	6	2.0
2.0	13	0.5%	60	0.7%	16	2.0
2.0	35	1.5%	50	1.8%	42	2.0
2.0	70	2.9%	40	4.6%	109	2.0
2.0	121	5.0%	30	7.5%	179	2.0
2.0	858	35.8%	20	39.7%	942	2.0
2.0	558	23.3%	10	27.9%	661	2.0
2.0	733	30.6%	5	17.1%	406	2.0
	2399		Total		2371	

Report Time 12:00 AM to 11:59 PM

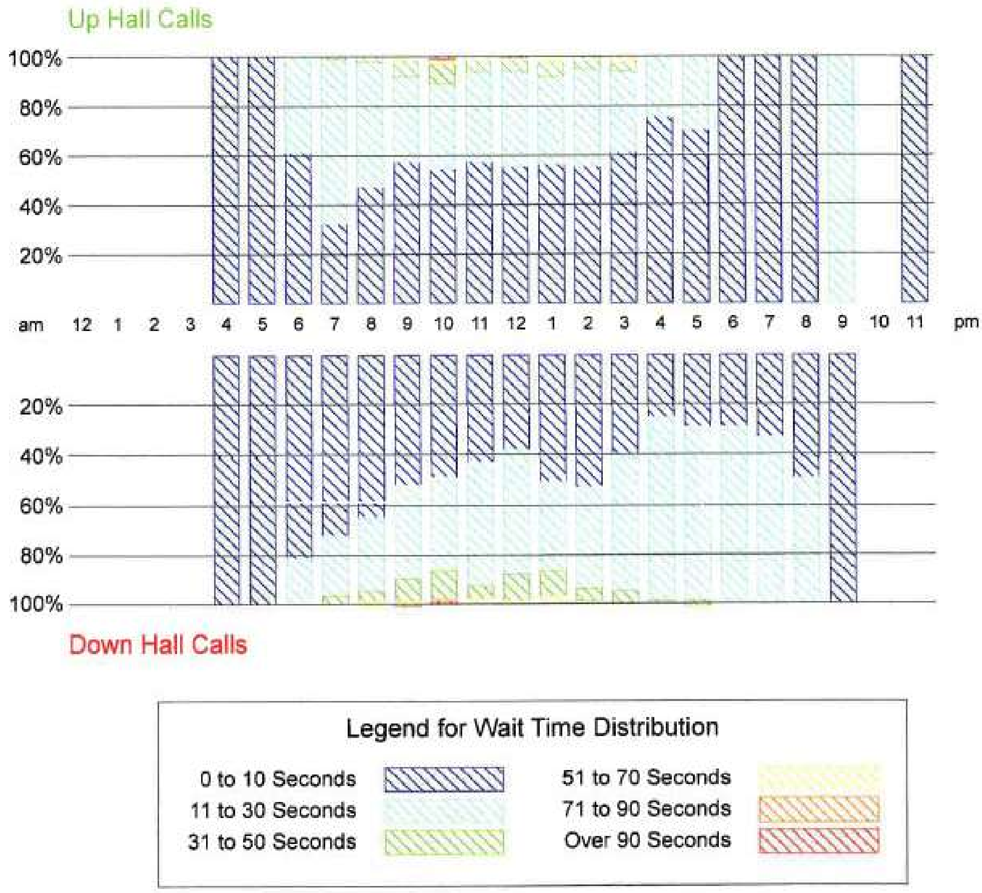
All Floors

Printed at 11:01 am - May 27, 2016
Lift-Net Elevator Monitoring

Page 5

PWGSC Elevator Systems
1713 Bedford Pass
Wait Time Distribution

Mon. May 16, 2016 through Fri. May 20, 2016



Printed at 8:58 am - May 27, 2016
Lift-Net Elevator Monitoring

Page 3

Ron Cornelius
Project Manager, Dominion Public Building
1713 Bedford Row,
Halifax, NS B3J 3C9

Ron,

The office spaces at the Dominion Public Building are expected to undergo changes that are intended to convert the space to occupy multiple Government of Canada tenants. In anticipation of this work, it was decided to perform a preliminary study on the ability of the floors to support abnormal office floor loads associated with collections of fixed filing and possibly moveable file storage units. The following text summarizes the activities undertaken for this study.

It was felt the best way to accomplish this was to create a finite element model of the existing floor framing and impose library stack loads to see which portions of the floor were capable of carrying 7.2 kPa (150 psf). The model would allow this preliminary design to identify potential strong and weak areas that could help in better planning of the spaces. The model could also be used for future activities that may involve the entire building, such as seismic capacity studies or future expansions. Once locations have been determined for high density filing, the renovation consultant will still be responsible to perform detailed calculations for these areas reflecting the exact loading and structural conditions.

History

The Dominion Public building was built in 2 major stages, with several other smaller renovations and modification. The main part of the building was designed in 1935, the four storey annex added later in 1955 and the atrium modified in the 1990's. The original design drawings for the first 2 stages were used as the basis for the creation of the structural models.

Method

The drawings imported to AutoCad as a background and all of the framing was traced. Dimensions from the original drawings were used to scale the tracing to match one-to-one with the structural model. There are several draw backs to using this method to achieve accurate scale model, but the accuracy was thought to be sufficient for a preliminary study. Sources of errors could include: elements of original drawings not being to scale, distortions due to the digital scanning of the original drawings, and inaccuracies during the tracing process. Spot checked dimensions indicate the models are generally accurate to within 6 inches.

The supporting structure in both portions of the building are structural steel which has been encased in concrete, presumably for fire protection. This makes it very difficult if not impossible to economically confirm the structure with site observations. This also means that the connections between the elements are not available to view. The 1960 design drawings use structural steel elements that are quite easy to identify as they are generally wide flanged steel shapes that are still commonly used. The 1935 section used a mixture of BSB (British standard Beam) sections and built-up sections made of plate and angles. Calculations were performed to determine equivalent wide flange sections based on the section modulus and moment of inertia, and these equivalents were in turn used to simulate the section in the structural model. Tables of the equivalent sections used are presented in Appendix A.

Openings

There are numerous openings on the original design drawings that no longer exist. Drawings were not located indicating how and what materials were used to fill in these holes, so these areas should be avoided unless detailed analysis dictate they can support unusual loads. A detailed review of all existing drawings will be needed by the renovation consultant.

Atrium and links

Drawings were not located for the Atrium and links at the North end of the 1935 tower, so heavy loads should be avoided in these areas unless detailed design indicates their capacity is sufficient. If located, these portions of the structure will be added and the drawings updated.

Concrete Encasement

An area of the annex was analyzed to determine the typical load created by the concrete encasement. This load was calculated as a multiplier of the beam self-weights and used throughout the model. The concrete encasement has limited the ability to observe the condition of the stricture, but has also served to protect the structure. For the purposes of this study, it is assumed that the condition of the steel is excellent with no anticipated defects.

Connections

As the connections are unavailable to view it has been assumed that the connections are all of sufficient capacity to support the load of the floors and beams at or near their maximum capacity. For this reason, caution should be exercised used when approaching the upper limit of the structure.

Design Codes

No indication of design loads was found on a review of the original design drawings. It is assumed the design codes of the time were an allowable stress design. For this preliminary design the current steel codes were used, based on a limit-states strength design. The grades of the steel used were not located on the drawings, but the historical information provided in the steel handbook to estimate the grades of steel that were used. Serviceability limits states were not check as part of this preliminary study.

Hand calculations were performed on a random beam to ensure the accuracy of the model, and are attached as Appendix B

Conclusions

Recent architectural base-plans were used to illustrate areas that should be avoided. The areas of each floor that failed the design software code check with 7.2 kPa (150 psf) are shown as hatched areas on the drawings of Appendix C.

Please feel free to contact the undersigned if you have any questions.

Best Regards,

Larry Warren, P.Eng.

Appendix A

Table of Equivalent Beam Sizes

Size Noted On Drawings	S16.1 Handbook	AISC	StaadPro Equivalent
6 I @12.5	S150x19	S6x12	S150x19
7 x 4 BSB 16	W200x15		W200x15
8 x 4 NBSB @ 18	S200x27	S8x18	S200x27
9 x 3 I @ 17.46			c230x22
9 x 4 NBSB @ 21	W200x31		W200x31
10 FC @ 15.06	C250x23	C10x15	C250x23
10 x 3 BS U 19.28	c250x30		c250x30
10 x 4.5 NBSB @ 25	S250x38	S10x25	S250x38
10 x 5 BSB @ 30			w250x45
10 x 6 NBSB @ 40	w250x58		w250x58
12 x 5 BSB @ 23			w310x33
12 x 3.5 NBSC @ 25			w310x39
12 x 5 BSB @ 32	S310x47	S12x31	S310x47
12 x 5 FB @37.5			w310x52
13 x 5 C @ 35	S310x60.72		S310x60.72
13 x 5 NBSB @ 35	S310x60.73		S310x60.73
14 x 8 @ 70	S460x104		S460x104
15c @33.9			c380x50
15 x 3.5 I @ 40			w360x57
15 x 5.5 I @ 42.9	S380x64	S15x42	S380x64
15 x 6 NBSB @ 45	S380x74		S380x74
15 I @ 50			s380x74
15 x 6 BSB 59			w360x79
16 x 6 NBSB @ 50	W410x67		W410x67
6 x 4 x 3/8			6 x 4 x 3/8

Size Noted On Drawings		StaadPro Equivalent
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 5/16	w460x67
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 3/8	w460x74
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 7/16	w460x82
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 1/2	w460x89
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 9/16	w460x97
1 - PL 18 x 5/16	4 - L 3 1/2 x 3 1/2 x 5/8	w460x106
1 - PL 18 x 5/16	4 - L 4 x 3 1/2 x 9/16	w460x89
1 - PL 18 x 5/16	4 - L 4 x 3 1/2 x 1/2	w460x74
1 - PL 18 x 5/16	4 - L 4 x 3 1/2 x 11/16	w460x113
1 - PL 18 x 3/8	2 - L 4 x 3 1/2 x 5/8	mc460x86
1 - PL 18 x 3/8	2 - L 5 x 3 1/2 x 5/8	mc460x86
1 - PL 18 x 3/8	4 - L 3 1/2 x 3 1/2 x 5/16	W460x67
1 - PL 18 x 3/8	4 - L 4 x 3 1/2 x 7/16	W460x89
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 3/8	w530x74
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 7/16	w530x82
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 1/2	w530x92
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 9/16	w530x101
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 5/8	w530x109
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 11/16	w530x109
1 - PL 20 x 5/16	4 - L 3 1/2 x 3 1/2 x 3/4	w530x123
1 - PL 20 x 5/16	4 - L4 x 3 1/2 x 3/8	w530x82
1 - PL 20 x 5/16	4 - L4 x 3 1/2 x 7/16	w530x82
1 - PL 20 x 5/16	4 - L4 x 3 1/2 x 1/2	w530x92
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 3/8	w610x92
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 7/16	w610x92
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 1/2	w610x101
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 9/16	w610x113
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 5/8	w610x113
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 11/16	w610x125
1 - PL 24 x 5/16	4 - L 3 1/2 x 3 1/2 x 3/4	w610x140
1 - PL 24 x 7/16	4 - L 3 1/2 x 3 1/2 x 5/16	w610x92
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 3/8	w610x92
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 7/16	w610x101
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 1/2	W610x113
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 9/16	w610x113
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 5/8	w610x126
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 11/16	w610x125
1 - PL 24 x 5/16	4 - L 4 x 3 1/2 x 3/4	w610x140
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 5/16	w610x82
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 3/8	w610x92
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 7/16	w610x92
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 1/2	w610x101
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 9/16	w610x113
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 5/8	w610x113

1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 11/16		w610x125
1 - PL 24 x 3/8	4 - L 3 1/2 x 3 1/2 x 3/4		w610x140
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 5/16		w610x92
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 3/8		w610x92
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 7/16		w610x101
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 1/2		w610x113
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 9/16		w610x125
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 5/8		w610x125
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 11/16		w610x125
1 - PL 24 x 3/8	4 - L 4 x 3 1/2 x 3/4		w610x140
1 - PL 24 x 7/16	4 - L 4 x 3 1/2 x 3/4		w610x140
1 - PL 24 x 3/8	4 - L 5 x 3 1/2 x 9/16		w610x125
1 - PL 24 x 3/8	4 - L 5 x 3 1/2 x 5/8		w610x125
1 - PL 24 x 7/16	4 - L 5 x 3 1/2 x 3/4		w610x155
1 - PL 24 x 3/8	4 - L 6 x 4 x 13/16		w610x195
1 - PL 24 x 3/8	4 - L 6 x 6 x 11/16		w610x174
1 - PL 24 x 7/16	4 - L 6 x 6 x 13/16		w610x217
1 - PL 26 x 3/8	4 - L 5 x 3.5 x 9/16		w690x140
1 - PL 26 x 7/16	4 - L 5 x 3.5 x 5/8		w690x152
1 - PL 26 x 1/2	2 - L 4 x 4 x 3/4	1 - PL 8 1/2 x 5/8	W610x125
1 - PL 24 x 7/16	4 - L 6 x 4 x 3/4 LLV		w610x155
1 - PL 28 x 3/8	2 - L 6 x 4 x 5/8	2 - PL 14 x 7/16	W690x265
1 - PL 26 x 5/16	4 - L 3.5 x 3.5 x 5/16		w610x92
1 - PL 16 x 3/8	4 - L 3.5 x 3.5 x 7/16		w410x74
1 - PL 16 x 3/8	4 - L 4 x 3.5 x 7/16		w410x85
1 - PL 16 x 3/8	4 - L 4 x 3.5 x 1/2		w410x85
1 - PL 16 x 3/8	4 - L 4 x 3.5 x 9/16		w410x100
1 - PL 20 x 5/16	4 - L 5 x 3 1/2 x 5/8		w530x123
1 - PL 20 x 5/16	2 - L 5 x 3 1/2 x 5/8		w530x74
1 - PL 15 x 3/8	2 - L 6 x 3 1/2 x 9/16		w410x114
1 - PL 24 x 3/8	2 - L 6 x 4 x 13/16	2 - PL 14 x 7/16	W610x241

Appendix B

Manual Design Check

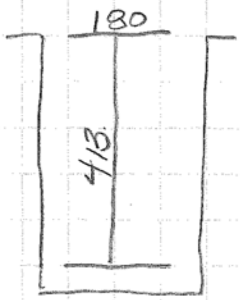
ANNEX FLOOR LOADS

DEAD LOAD

- FLOORING - CARPET. - 0.10 KPa.
- CONC. SLAB. - 4" - 2.40 KPa
- M+E ALLOWANCE - 0.25 KPa.
- CEILING - 0.10 KPa
- BEAM CONC. ENCASE. - NIL (USE SELF WT. MULTIPLIER OF 4.25).

AVERAGE FLOOR BEAM ~ 16 WF 50

ASSUME 2" ALL SIDES SCALES ~ 1.75 TO 2.00 in. ON SECTIONS



SELF WT. STEEL = 0.74 KN/m.

SELF WT. CONCRETE =

$= (50+180+50) \times (413+50)$

$= 0.13\, m^3/m \times 24\, KN/m^3$

$= 3.12\, KN/m.$

TOTAL $= 0.74\, KN/m + 3.12\, KN/m$

$= 3.9\, KN/m$

AVG. SPACING $\doteq$ 2.0 m.

UNIFORM ARE LOAD

$\frac{3.9\, KN/m}{2m} \doteq 2.0\, KN/m^2$

APPROXIMATE BY USING SELF WT FACTOR OF

$\frac{3.12\, KN/m}{0.74\, KN/m} = \underline{\underline{4.25}}$ CONCRETE ONLY. ADD 1.0 FOR STEEL WT. 5.25

REMAINING DEAD LOADS = 2.85 KPa $\doteq$ 60 PSF)

USE 5.25

BEDFORD ROW FLOOR LOADS. APRIL 13, 2017

MANUAL DESIGN CHECK OF STAAD PRO MODEL.

ARBITRARILY SELECTED:

- FIRST FLOOR DRAWING No. 27
- SPAN 22'-2" BETWEEN COLUMNS 52 + 53 $\Rightarrow$ 6.76 m
- 16" x 6" I @ 50#
- TRIBUTARY WIDTH. 22'-4"/3 = 7'-5 3/8"

DEAD LOAD

FLOORING - CARPET/TILES/TERRAZO	0.10 KPa
CONCRETE SLAB 4 1/2"	2.70 KPa
M+E ALLOWANCE	0.25 KPa
CEILING	0.10 KPa
BEAM. CONC. ENCASE. (SEE BELOW)	0 KPa / 3.15 KPa + SELF + CONC. ENCASE.

SCALED SECTIONS SHOWS THE CONCRETE COVER SURROUNDING BEAMS @ APPROXIMATELY 2" MINIMUM THICKNESS, so IN THIS CASE CONCRETE WILL BE

CONCRETE X-AREA $[(16" + 2") \times (6" + 2" + 2")] - 13.3 \text{ in}^2$ BEAM X-AREA

$(18" \times 10") - 13.3 = 167 \text{ in}^2 \Rightarrow 1.16 \text{ ft}^2$

$50 \text{ \#/LF} + (1.16 \text{ ft}^2 \text{ Conc.} \times 150 \text{ pcf}) = 223.6 \text{ plf}$ BEAM + CONC.

[COMPARED TO EARLIER ESTIMATE OF 5.25 x SELF. GIVES. 50 plf x 5.25 = 262.5 plf. OK
- CONSERVATIVE BY ≈ 15%. AND ONLY REPRESENTS 15% OF TOTAL LOAD]

CONVERT TO METRIC $262.5 \frac{lb}{ft} \times \frac{1 ft}{0.3048 m} \times \frac{4.448 N}{1 lb} = 3.83 \frac{KN}{m}$

BEDFORD ROW. FLOOR LOADS APRIL 13, 2017

MANUAL DESIGN CHECK OF STAAD PRO MODEL CONT'D

LIVE LOAD

USE LIBRARY STACK LOAD IN ACCORDANCE W/ NBCC 2015

LIBRARY STACK 7.2 KPa

FACTORED UDL TRIB. WIDTH = 2.27m

$1.25(3.15\,KPa \times 2.27m) + 1.25(3.83\,KN/m)$

$+ 1.5(7.2\,KPa \times 2.27m) = 8.938 + 4.788 + 24.516$

$= 38.2\,KN/m$

STEEL DESIGN

THIS BEAM SIZE WAS NOT LOCATED IN STEEL TABLES, SO THE PROPERTIES ARE ASSUMED TO BE W410X67 WHICH IS 16 1/8 X 7. @ 45 lb/ft.

$M_f = \frac{wl^2}{8} = \frac{38.2\,KN/m\,(6.76m)^2}{8} = \boxed{218.2\,KN\cdot m}$

$V_f = \frac{wl}{2} = \frac{38.2\,KN/m\,(6.76m)}{2} = \boxed{129.1\,KN}$

M_r = LATERALLY SUPPORTED = 367. KN·m W/ 300W.
SO MODIFY W/ $\frac{220\,mPa}{300\,mPa} = 0.73$ APPROX.

$\Rightarrow 367 \times 0.73 = 269.1\,KNm > 218.2\,KNm$ OK

$V_r = 643\,KN \times 0.73 = 469.4\,KN > 129.1\,KN$ OK

BEDFORD ROW FLOOR LOADS APRIL 19, 2012

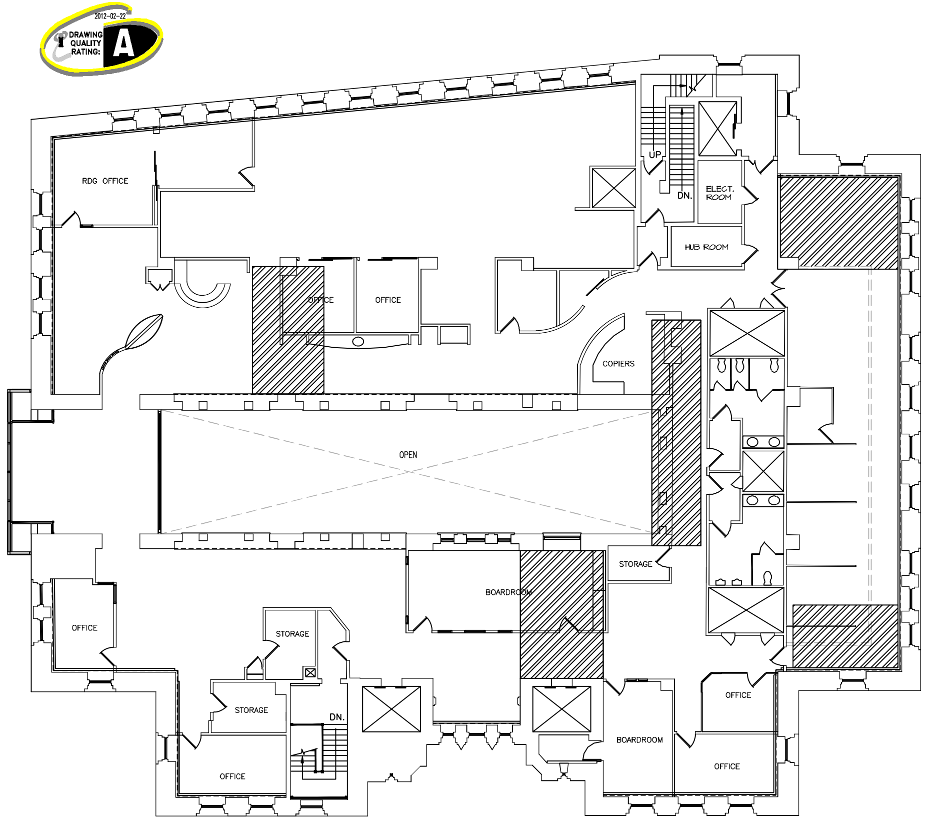
MANUAL DESIGN CHECK OF STAAD PRO MODEL CONT'D

COMPARE MANUAL WITH STAAD PRO MODEL

SIZE	W410X67	W410X67
SPAN	6.756 m (22'-2")	6.892 m
M_f	218.2 KNm	221.7 KNm
V_f	129.1 KN	128.7 KN
UNITY		

Appendix C

Base-plans with Hatched Caution Zones



SEVENTH FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

Note: Not all structural columns are shown within the drywall or marble cladded column enclosures.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions	date
A detail no. / no. du detail; B location drawing no. / sur dessin no.; C drawing no. / dessin no.	
project / projet	FLOOR LOAD STUDY DOMINION PUBLIC BUILDING 1713 BEDFORD ROW HALIFAX NOVA SCOTIA
drawing / dessin	FLOOR #7
designed / concu	L. WARREN
date	APR. 2017
drawn / dessine	L. WARREN
date	APR. 2017
approved / approuve	
date	
Tender / Soumission	
PWGSC Project Manager / Administrateur de projets TPSGC	
project number / no. du projet	
drawing no. / no. du dessin	A8 OF 8

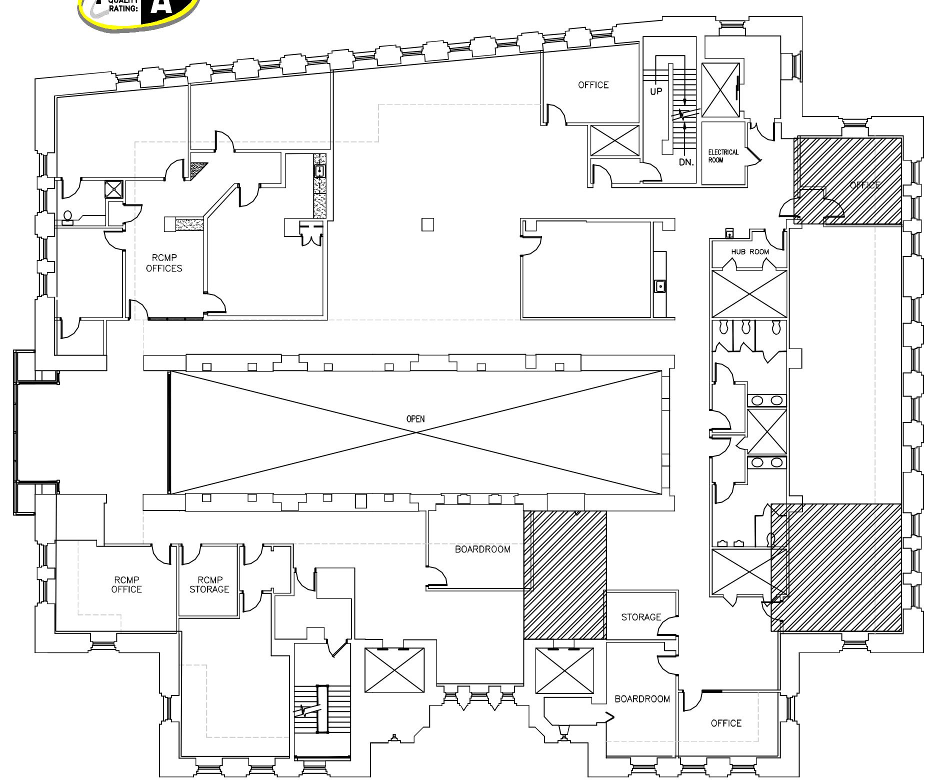
EDRM Document No. # 9642 Version 3

PWGSC B1

Plot Scale: 1:1

0 10 20mm 40 60 80 100 120 140 160 180 200mm

Public Works and Government Services Canada — Travaux Publics et Services gouvernementaux Canada



2012-02-22 DRAWING QUALITY RATING: A

SIXTH FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

revisions	date
A detail no. / no. du detail	
B location drawing no. / sur dessin no.	
C drawing no. / dessin no.	
project / projet	FLOOR LOAD STUDY DOMINION PUBLIC BUILDING 1713 BEDFORD ROW HALIFAX NOVA SCOTIA
drawing / dessin	FLOOR #6
designed / concu	L. WARREN
date	APR. 2017
drawn / dessine	L. WARREN
date	APR. 2017
approved / approuve	
date	
Tender / Soumission	
PWGSC Project Manager / Administrateur de projets TPSGC	
project number / no. du projet	
drawing no. / no. du dessin	A7 OF 8

EDRM Document No. # 7986 Version 3

PWGSC B1

Plot Scale: 1:1

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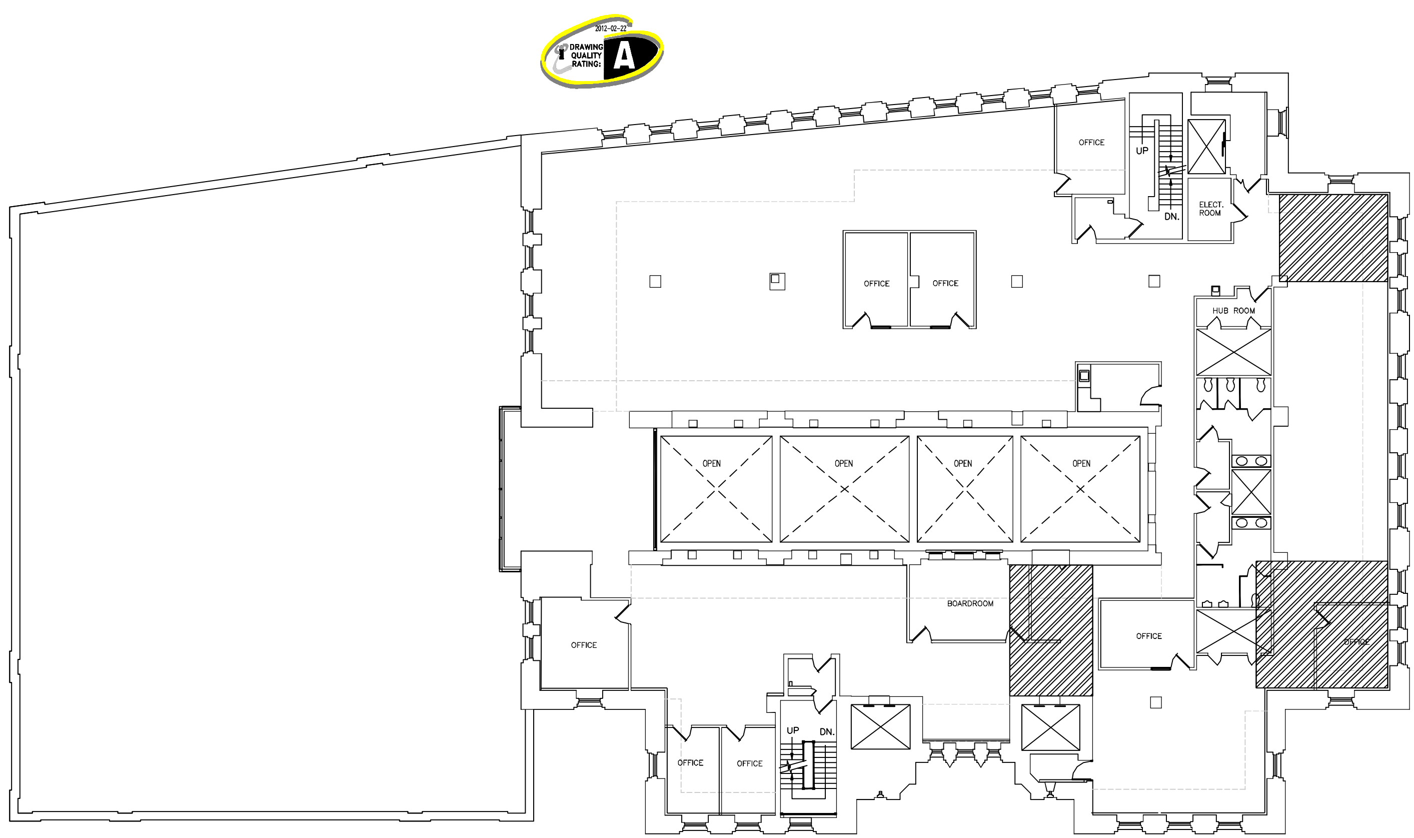


FIFTH FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

Note: Not all structural columns are shown within the drywall or marble cladded column enclosures.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions | date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet

FLOOR LOAD STUDY
DOMINION PUBLIC BUILDING
1713 BEDFORD ROW
HALIFAX
NOVA SCOTIA

drawing / dessin

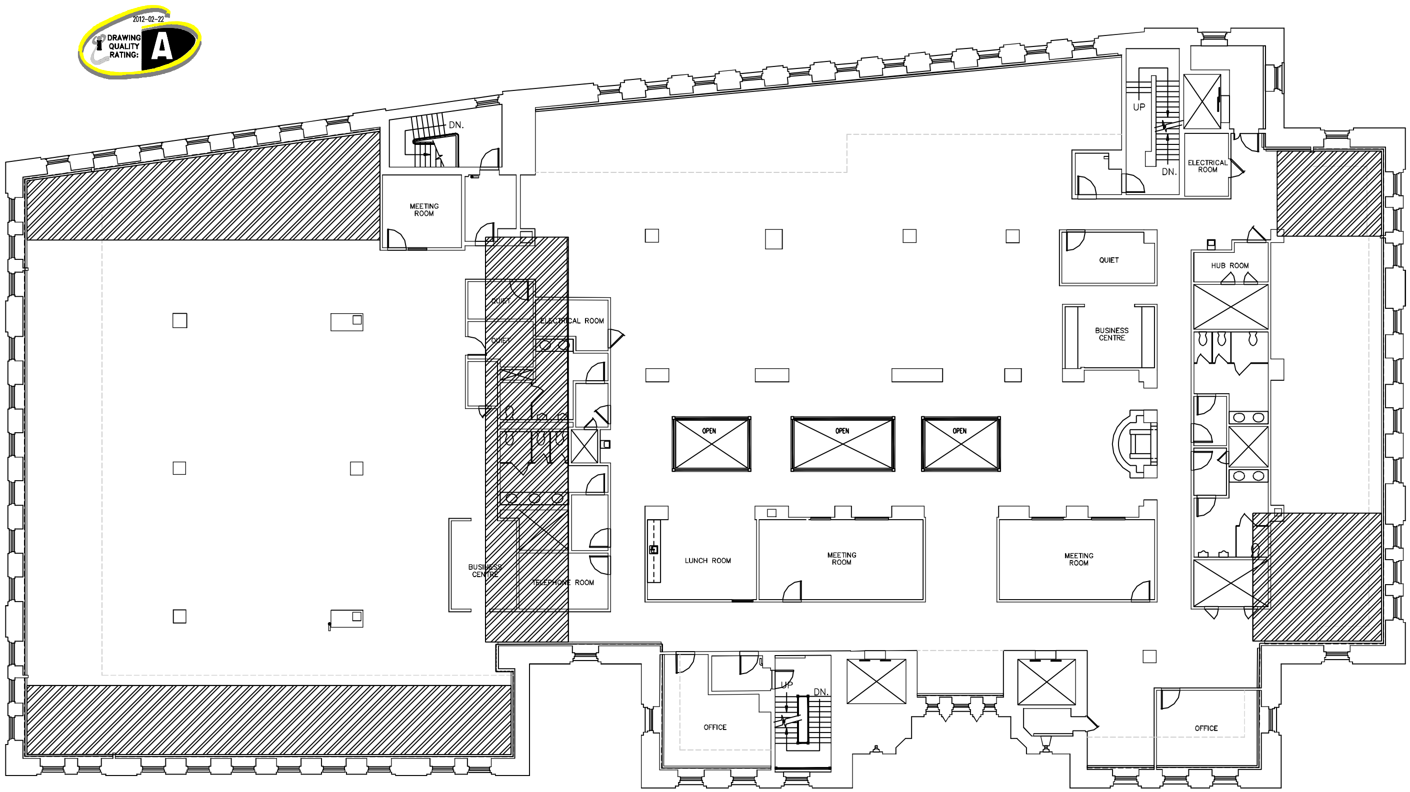
FLOOR #5

designed L. WARREN concu
date APR. 2017
drawn L. WARREN dessine
date APR. 2017
approved approuve
date
Tender Soumission
PWGSC Project Manager Administrateur de projets TPSGC
project number no. du projet
drawing no. no. du dessin
A6 OF 8

EDRM Document No. # 7985 Version 3

PWGSC B1

Plot Scale: 1:1



FOURTH FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

Note: Not all structural columns are shown within the drywall or marble cladded column enclosures.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions | date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet

FLOOR LOAD STUDY
DOMINION PUBLIC BUILDING
1713 BEDFORD ROW
HALIFAX
NOVA SCOTIA

drawing / dessin

FLOOR #4

designed L. WARREN concu
date APR. 2017
drawn L. WARREN dessine
date APR. 2017
approved approuve
date
Tender Soumission
PWGSC Project Manager Administrateur de projets TPSGC
project number no. du projet
drawing no. no. du dessin

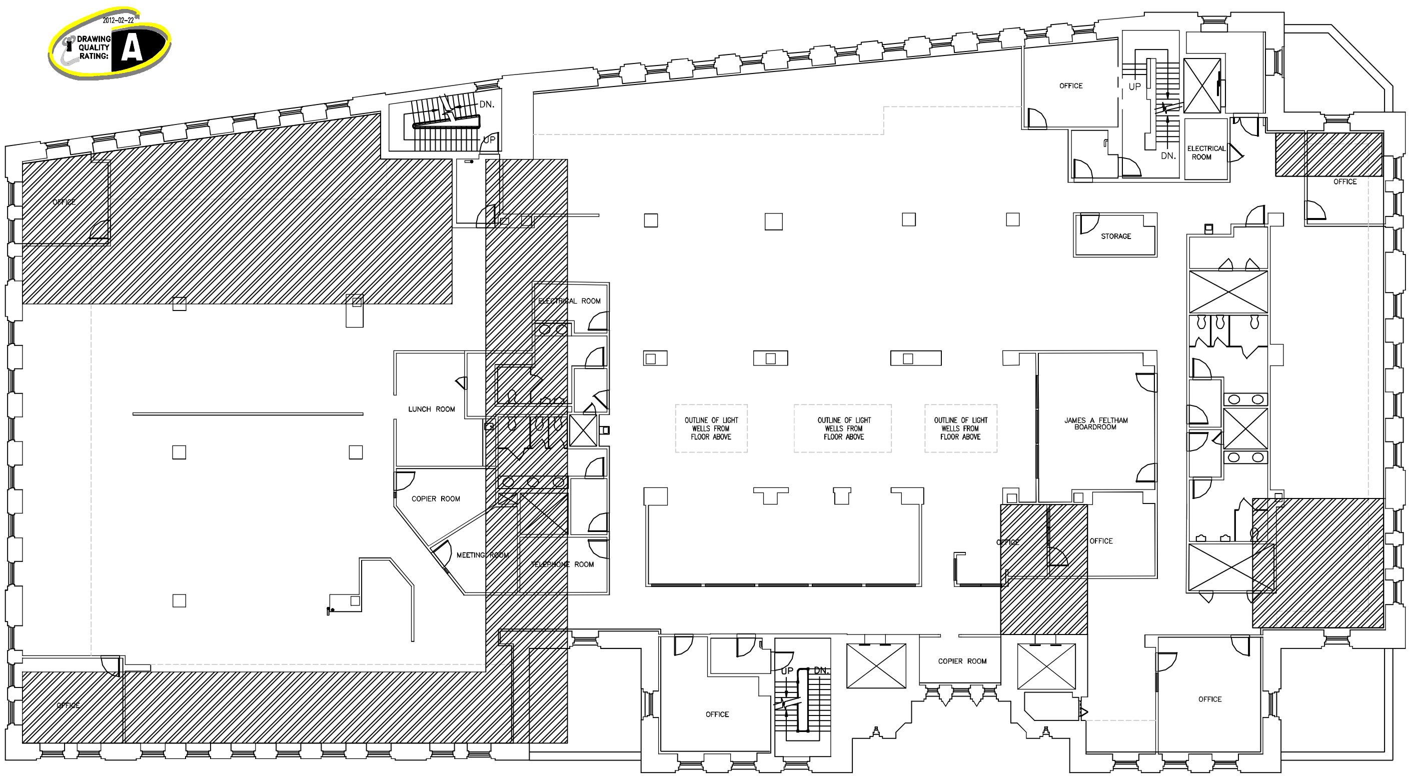
A5 OF 8

EDRM Document No. # 7983 Version 3

PWGSC B1

Plot Scale: 1:1

0 10 20mm 40 60 80 100 120 140 160 180 200mm



THIRD FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

Note: Not all structural columns are shown within the drywall or marble cladded column enclosures.

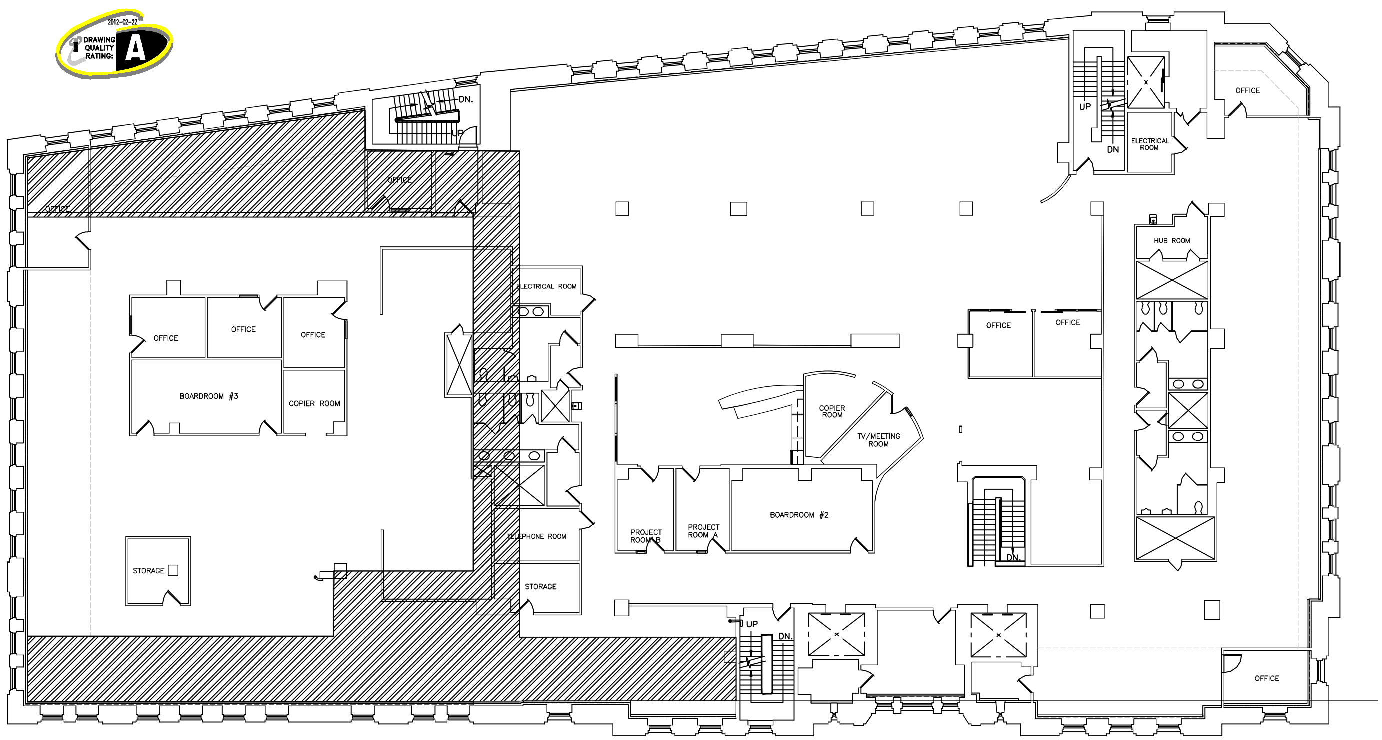
Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions	date
A detail no. / no. du détail; B location drawing no. / sur dessin no.; C drawing no. / dessin no.	
project	projet
FLOOR LOAD STUDY DOMINION PUBLIC BUILDING 1713 BEDFORD ROW HALIFAX NOVA SCOTIA	
drawing	dessin
FLOOR #3	
designed L. WARREN	concu
date APR. 2017	
drawn L. WARREN	dessine
date APR. 2017	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
drawing no.	no. du dessin
A4 OF 8	

TIDIS Document No. #6719 Version 3

PWGSC B1

Plot Scale: 1:1



SECOND FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

DRAWING QUALITY RATING: A 2012-02-22

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions		date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet
FLOOR LOAD STUDY
DOMINION PUBLIC BUILDING
1713 BEDFORD ROW
HALIFAX
NOVA SCOTIA

drawing / dessin
FLOOR #2

designed	L. WARREN	concu
date	APR. 2017	
drawn	L. WARREN	dessine
date	APR. 2017	
approved		approuve
date		
Tender		Soumission
PWGSC Project Manager		Administrateur de projets TPSGC
project number		no. du projet
drawing no.	A3 OF 8	no. du dessin

EDRM Document No. # 7981 Version 4

PWGSC 81

Plot Scale: 1:1

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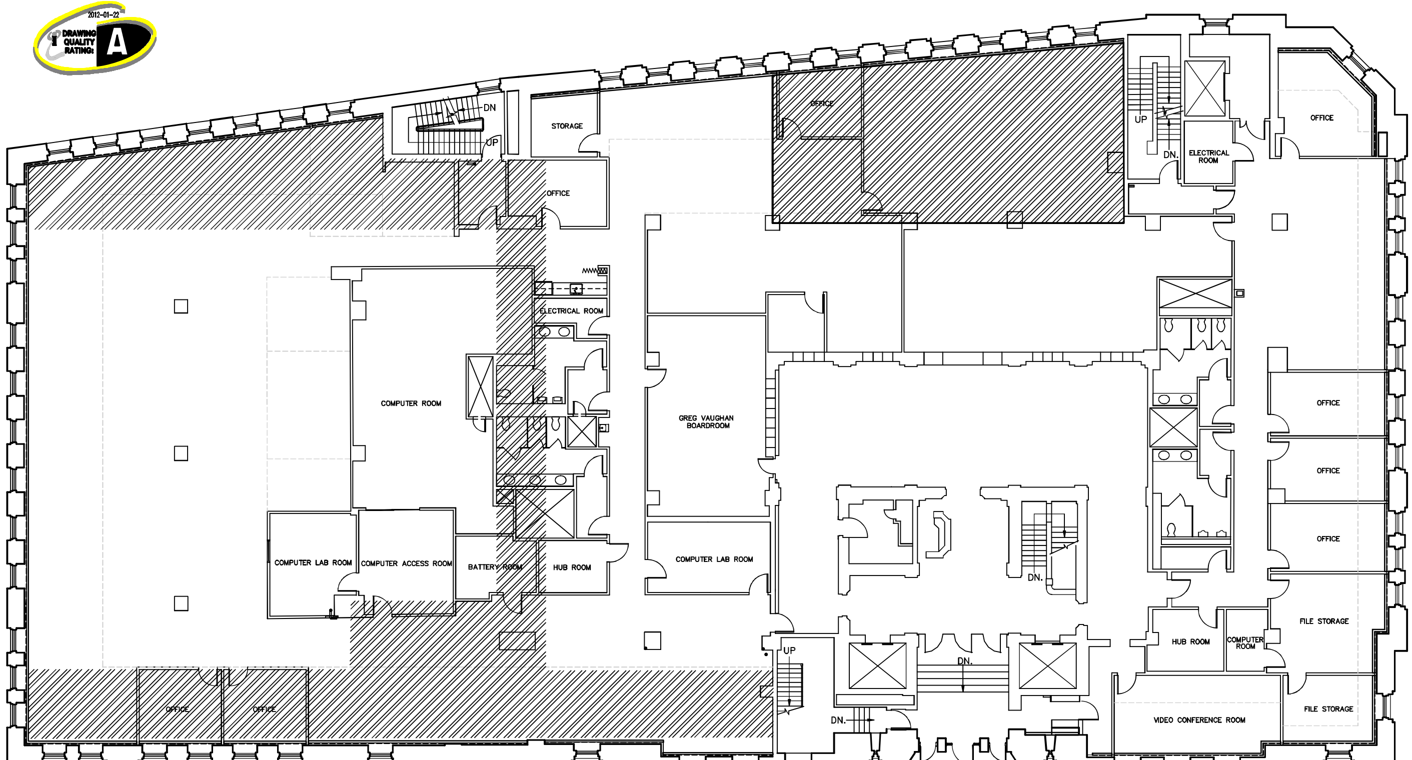
2012-01-22 DRAWING QUALITY RATING: A



FIRST FLOOR PLAN

SCALE : 1:100

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

revisions | date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet

FLOOR LOAD STUDY
DOMINION PUBLIC BUILDING
1713 BEDFORD ROW
HALIFAX
NOVA SCOTIA

drawing / dessin

FLOOR #1

designed	L. WARREN	concu
date	APR. 2017	
drawn	L. WARREN	dessine
date	APR. 2017	
approved		approuve
date		
Tender		Soumission
PWGSC Project Manager		Administrateur de projets TPSGC
project number		no. du projet
drawing no.	A2 OF 8	no. du dessin

EDRM Document No. # 7982 Version 4

PWGSC B1

Plot Scale: 1:1

0 10 20mm 40 60 80 100 120 140 160 180 200mm

Building Condition Report

Dominion Public Building (Bedford Row), Halifax, NS

May 2016

TABLE OF CONTENTS

Section / Subsection **Page**

Building Details and Narratives

Building History

The Dominion Public Building is located at 1713 Bedford Row, Halifax, Nova Scotia. The original building dates from 1936 and the addition dates from the mid1950's. It is a FHBRO "recognized" federal heritage building and its valued elements include its exterior, the former post office wicket area, main entrance foyer, elevator lobby and grand open stair. The building interior was extensively retrofitted in 1991. Throughout the mid 1990's to early 2000's, wall repairs were undertaken on various elevations of the main portion (floors 1-7) of the building. A restoration of the tower occurred in 2007-2009. In 2014 the 4th floor was renovated to the requirements of the Workplace 2.0 Program.

BCR Executive Summary

In March 2016, a team comprised of PSPC specialists from Architectural and Engineering Resources (A&ER) conducted inspections at the Dominion Public Building, Halifax, Nova Scotia. The inspection information was compiled into a consolidated Level 2 Building Condition Report (BCR) and 25 year event listing.

The BCR includes information related to three key elements (components), Architectural, Mechanical and Electrical. The BCR did not include Vertical Transportation as current information related to those systems is available as part of a separate report. The team consisted of the following personnel;

Architectural - John Owen - Project Architect
Mechanical – Stephen Wentzell - Mechanical Engineering Technologist
Electrical – Jim Dow – Senior Specialist - Electrical
BCR Coordinator – Jim Williamson

Note concerning Cost Estimates

The cost estimates within this report are Class "D". The cost estimates include: material and labour costs, construction contingencies of 15% and project soft costs (design/project management) of 30%.

<u>Overview Architectural &Structural Condition</u>

Most of the events (scopes of work) noted in the architectural component are for replacement (or extension) of the systems/ components at the end of their anticipated life cycle. However, there are also significant preventive maintenance items (with particular respect to the building walls and tower, given that this construction type must prevent water entry at its outer face (face seal construction) in order to prevent cyclical freeze/thaw events from deteriorating the grout joints.) Recommended scopes of work are projected out to a maximum 25 year horizon. An overview of the advised scopes of work are as follows for the architectural / structural disciplines:

1) SITE (subtotal $142,500):

Preventive Maintenance Items include: Undertake asphalt parking lot repairs ($23,000 in 2016)

Life Cycle Replacement Items include: Repave asphalt parking lot ($119,500 in 2021)

2) BUILDING EXTERIOR & INTERIOR (subtotal preventive maintenance items $2,715,500; subtotal life cycle items $9,196,000)

Preventive Maintenance Items include: Create channel in sub-basement floor slab to eliminate water ponding ($8,000 in

2016); 1st Tower Inspection Report/Repairs & Sealant Replacement ($210,000 in 2016); 2nd Tower Inspection Report/Repairs & Sealant Replacement ($210,000 in 2023); 3rd Tower Inspection Report/Repairs & Sealant Replacement ($210,000 in 2030); 4th Tower Inspection Report/Repairs & Sealant Replacement ($210,000 in 2037); 1st Main Bldg (floors Basement-7th) Inspection Report/Repairs & Sealant Replacement ($596,000 in 2024); 2nd Main Bldg Inspection Report/Repairs & Sealant Replacement ($596,000 in 2031); 3rd Main Bldg Inspection Report/Repairs & sealant Replacement ($596,000 in 2037); North Curtainwall Inspection Report/Repairs ($79,500 in 2016)

Life Cycle Replacement Items include: Replace vinyl tile flooring in basement telephone room ($11,500 in 2016); Refurbish entrance ramp ($38,000 in 2016); Replace remaining Overhead door dating from 1991 ($15,000 in 2016); Undertake remaining accessibility items from National Accessibility Audit ($252,000 in 2016); Replace upper level roof ($674,000 in 2016); Replace lower level roof ($372,000 in $372,000 in 2017); Replace man doors in parking garage ($24,500 in 2020); Repaint drywall/plaster walls & ceilings ($398,000 in 2020); Replace all carpet tile except for 4th floor ($809,000 in 2020); Replace linoleum flooring in basement ($61,000 in 2020); Apply floor coating in ptd concrete floor areas ($142,500 in 2020); Renovate all washrooms in building ($2,156,000 in 2020); Replace steel doors along Water St ($40,500 in 2036); Replace windows: floors basement to 7th ($2,458,000 in 2041); Replace suspended acoustic tile ceilings ($1,744,000 in 2041)

Total All Costs over 25 year horizon: $11,911,000

Overview Site Condition - Included in Architectural / Structural Overview above.

Compliance with Accessibility Standards - Included in Architectural/ Structural Overview.

Overview Mechanical Condition

HVAC

Three McQuay Roof Top Air Handling Units are located on the roof. These units have a average useful life of 25 years and will not require replacement until 2037.

Ventilation fans are distributed throughout the building. There are approximately 40 fans in total. All fans were installed in 1991 except the telephone room exhaust room fan and electrical vault fan. Fans are reported to be in good working condition but have reached the end of their useful life and require replacement in 2016.

General heating black iron piping throughout the building including backflow prevention. Heating piping systems were installed in 1991 during major renovation. It is reported that the building operators are finding leaks during start up and shut down of the heating system. Due to the age of the system and the problem associated with leaks it is recommended that the hot water piping be replaced by 2021.

There are two natural gas fired, Weil-McLain cast iron boilers. The units are in fair condition, were installed in 1991 and are reported to be working well. With an expected useful life of 30 years, they will be due for replacement in 2021. Cast iron boilers of this construction can work well past their useful life if well maintained. Further study will be required to determine if the useful life can be extended.

There are three steam humidifiers and two ultrasonic humidification systems. Humidification systems were all installed in 2001 and have an expected life of 15 years. The units are reported to be working as designed. It was reported that the ultrasonic humidifiers located in the ceiling space are virtually impossible to access and therefore service. These units should be replaced in 2016.

There is a Delta DDC building control system. The control system was installed in 1991 but has had multiple upgrades over the years. The system is reported to be in good working order. Due to the age of some of the components, it is recommended that the control system be evaluated for the need for upgrade.

PLUMBING

There are two 100 gallon, Giant domestic electric hot water heaters. Units are in good condition and were installed in 2005. These unit will not require replacement until 2025.

General plumbing piping throughout the building is copper.

There are four backflow prevention units in the building. They are located in the basement mechanical rooms and serve the domestic water supply, sprinkler system and boiler make up water.

Plumbing fixtures were installed in 1991 and are in fair condition. Fixtures will not require replacement until 2021.

There is a reverse osmosis water treatment system. This system treats the potable water in the building as well as the water used for the ultrasonic humidification systems. System was installed in 2001 with an addition in 2008. The system is reported to be good working condition and will not require replacement until 2021.

FIRE PROTECTION

The wet sprinkler system serves the basement up to the 8th floor. The system is reported to be in fair working condition. The building technician reported that the system has no certification stamp due to issues with the contractors changing during original construction. This is causing issues when having the system inspected. It is recommended that steps be taken to work toward receiving certification for the system. The system will require replacement in 2027.

A dry sprinkler system was installed during tower renovation in 2008. This system serves the unoccupied floors (9th floor and up). The system was installed in 2008 and will not require replacement until 2048.

Overview Electrical Condition

Exit Lighting – The exit lights were replaced in 2016. They are not expected to require replacement before 2036. If renovations take place i.e. Workplace 20.0, relocation of some exit lights could be necessary.

Emergency Lighting - All fixtures are at the end of their useful life. Emergency lights would be included in a Workplace 2.0 retrofit. No separate event has been included for the emergency lights.

Grounding Systems - Grounding system is in good condition at the time of the report. No replacement anticipated.

Fire Alarm System – The fire alarm system is a new Simplex addressable system. It is in new condition and showed no signs of any alert problems or alarm faults. Zoning and relocation of audible and visual alarms could be required if renovations take place.

Emergency Power System - The present system is new within the past five years. Annual full load testing is being done by maintenance staff and should continue.

Security System - Several areas contain cameras as part of the security system and a UCAN Lock systems. There is a card access system in place for the exterior doors. Changes are currently under way to add card access to various spaces within the building.

Primary Switch Gear - Presently in good condition and has undergone a major maintenance program in 2009. The service entrance equipment should remain in service for another 20 years. Replacement of the main electrical meter is recommended at an estimated cost of $10,000.

Secondary Switch Gear - Equipment is in good condition but requires the continuation of an annual and a 3-5 year maintenance program to confirm its proper operation and integrity. An event has been added to insure that the system receives a full maintenance service at an estimated cost of $25,000.

Secondary Transformers **–** All units were in operation at the time of inspection. All transformers show signs of significant heating consistent with high harmonic content on the 208/120 volt distribution. The heating is consistent with the building computer loads. Replacement of the transformers with harmonic mitigating transformers should be considered if the building undergoes a conversion to Workplace 2.0. Estimated cost is $225,000.

Cabling, Raceways and Bus Ducts - All evidence showed that the raceway and wire accessories were in good order at the time of inspection. The Maintenance Electrician has done a good job monitoring the ongoing electrical projects.

General Lighting - According to IES lighting standards the fixtures have reached the end of their useful life The current lighting systems is 25 years old A new lighting system should be installed as floors are upgraded to Workplace 2.0. Ttoal replacement cost is estimated to be $800,000.

Exterior Lighting - Existing fixtures are at their end of their useful life of 20 years. Replacement with LED type will provide the required lighting performance for this site and reduce the energy consumption by 50%. The estimated cost is $15,000.

Overview of Conveying, Vertical & Horizontal Transportation Condition

The 2 passenger elevators and the freight elevator have been recently upgraded and were not part of this BCR. A separate request has been made to the PSPC vertical transportation specialist, Robert Surette, for information related to the elevators and their current status and use patterns.

00. Property

00.1-010C10 Parking Area Steel Fence & Gate

Component Description

A painted steel gate and with concrete bollard supports and electronic pass swing arm system is located at the approach to the exterior parking area.

Component Condition & Anticipated Replacement Date

The system is in good condition and is not expected to have any replacements or major costs associated with it over the next 25 years provided periodic maintenance such as painting is carried out.

Element Condition: Good

March 2016. Fence and Traffic gate at Exterior Parking Area.

00.1-010C11 Flagpole

Component Description

The flagpole is an integral part of the domed roof of the tower.

Component Condition & Anticipated Replacement Date

The flagpole is in good condition. Having been addressed in the 2007-09 tower restoration, it is not expected to have any major repairs or costs associated with it over the next 25 years.

Element Condition: Good

March 2016.Flagpole is an integral part of the domed roof.

00.1-030C10 Reinforced Concrete and Granite Stone Retaining Wall

Component Description

A reinforced concrete and granite stone retaining wall occurs between the exterior parking area and Bedford Row.

Component Condition & Anticipated Replacement Date

The wall is in good condition. Approximately a decade ago (2006), a wall refurbishment project restored the integrity of the stone and steel grill work. With a service life of 40 years there are 30 anticipated years left in the renewal. There are no major work or costs associated with it anticipated for it over this time period provided periodic maintenance is undertaken on it.

Element Condition: Good

March 2016. Note granite stone portion of concrete reinforced retaining wall that occurs between the exterior parking area and Bedford Row.

00.2A-010 Paved Parking Lots

Component Description

An asphalt parking lot occurs at the north end of the site.

Component Condition & Anticipated Replacement Date

Being 25 years old the asphalt is in good condition except for some cracking which will permit water to deteriorate the system through cyclical freeze/ thaw action. It is advised to extend its service life by undertaking preventive maintenance on it.

Element Condition: Good

March 2016. Exterior Parking Lot.

RP Component life extension [00.2A-010 Paved Parking Lots]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Undertake asphalt parking area repairs	$23,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Asphalt repairs	$15,000	EACH	$15,000
2		1	Contingency 15%	$2,500	EACH	$2,500
3		1	Project Soft Costs 30%	$5,500	EACH	$5,500

Event Description

Undertake asphalt repairs to restore water resistant integrity to asphalt parking area.

Event Justification & Strategy

This action will prolong service life for an additional decade.

Implication of Event Deferral (Risks)

Cyclical deterioration will warrant replacement of asphalt sooner.

March 2016. Note cracks in asphalt.

CP Component replacement or new [00.2A-010 Paved Parking Lots]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2026	Replace asphalt in exterior parking area	$119,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace asphalt parking area.	$75,000	EACH	$75,000
2		1	Contingency 15%	$11,500	EACH	$11,500
3		1	Project Soft Costs 30%	$26,000	EACH	$26,000
4		1	Local Cost Factor 6%	$7,000	EACH	$7,000

Event Description

Replace asphalt in parking area.

Event Justification & Strategy

The asphalt is at the end of its anticipated service life.

Implication of Event Deferral (Risks)

Inconvenience and safety as deterioration increases.

01. Architectural & Structural

01.2-010C10 Frame - Concrete + Steel

Component Description

The building superstructure for both the main block (Floors 1-7) and the tower is a combination of steel and concrete encased steel.

Component Condition & Anticipated Replacement Date

The current condition varies throughout the entire structure:

The superstructure in the tower, having been addressed in the major 2007-2009 restoration, would be assumed in good condition. Exposed steel was treated to thwart rusting and expansion (jacking) of the steel if water was to contact it.

The steel in the remainder of the structure (main block: floors 1-7) is understood to vary from good or fair (for main structure) to fair (for shelf angles at windows and doors). It is believed previous renovations of the exterior walls (in the late 90's and early 2000's) resulted in some upgrades to exposed steel beams against rusting and jacking; however some areas would not have received similar treatment. The renovations were done on a cyclical basis with the various elevations having been undertaken at different years. Currently there is a project pending for 2016 to address the existing main block wall deficiencies which includes replacement of steel angle shelf angles at windows where required, some structural remediation and grout/ exterior sealant replacement. The cost of this project is estimated at $16 million which includes construction contingency as well as project soft costs.

Note : It is critical that the integrity of the exterior face of the building be kept throughout the life span of the building in order to preserve the building superstructure . This is achieved through a cyclical preventive maintenance plan to repair/replace grout as well as exterior sealants (caulking) in order to keep water from infiltrating into the wall system. This is advised to be undertaken once every 7 years which is just shy of the life expectancy for exterior good quality sealants. Once water enters, a deterioration cycle results through freeze/thaw changes and steel jacking of the structure; the stone masonry is moved as a result and the cycle is accelerated. The costs of remediation /repair projects increase rapidly the longer preventive maintenance repairs are deferred from a regular cycle. Evidence of this is starting to occur at the tower. See Section 01.3-010C60 :Limestone and Granite Exterior Walls for advised remediation events.

Element Condition: Fair

01.2-050C35 Loading Docks

Component Description

There is a loading dock area with leveller device in the north end of the basement adjacent the interior parking garage.

Component Condition & Anticipated Replacement Date

The loading dock area is in average condition and its finishes are sound. Refer to Mechanical Section for information on loading dock leveller.

Element Condition: Average

March 2016. Loading Dock Area.

01.3-060C01 Aluminum Doors

Component Description

Three anodized aluminum entrance doors occur at the main entrance.

Component Condition & Anticipated Replacement Date

They replaced earlier brass doors in 2009/2010. Being only 6 years old, they are in good condition and have a remaining service life of 44 years. Replacement date is anticipated in 2070 AD.

Element Condition: Good

March 2016. Main Entrance.

01.3A-050 Caulking

Component Description

Window / wall interfaces and other openings such as at doors, vents, etc. rely on exterior sealants (caulking) to maintain water resistance integrity at these areas of the exterior walls. This is known as a face seal wall system. It is crucial that sealants are replaced toward the end of their service life in order to prevent cyclical deterioration associated with water entry and freeze thaw cycling.

Component Condition & Anticipated Replacement Date

Sealant condition around the building ranges from good to fair to poor. Some sealants would be at the end of their anticipated service life now since the building elevations were treated on an elevation by elevation project basis. The average life of a good sealant is 8 years at most. The pending wall remediation project for 2016 will include sealant replacements however in subsequent replacements it is advised to include sealant replacement in with the events noted under Section 01.3-010C60 Limestone and Granite Exterior Walls. The costs include sealant replacement as well as inspection and repair of grout and stone.

01.4-010C15 Copper Roof Dome

Component Description

The tower dome was replaced with a copper roof in 2009.

Component Condition & Anticipated Replacement Date

It is assumed to be in excellent condition, being only 6 years old and no leaks or water entry associated with it. With an expected service life of 50 years, it is not expected to be replaced until 2059.

Element Condition: Excellent

March 2016: copper roof installed in 2007-2009 at tower.

01.4-010C45 PVC Membrane at Tower Trough Roofs

Component Description

There are four tower trough roof areas which result from a step back in each elevation of the tower. They are fitted with a PVC membrane roof and are sloped to a roof drain within the trough.

Component Condition & Anticipated Replacement Date

Having been installed at the time of the tower upgrade project in 2007-09, they are assumed to be in good condition. (They are beyond inspecting due to their location). With an expected service life of 25 years, they are not expected to be replaced for another 17 years. However given that they interface with the complex tower stonework, it is advised that they be inspected in with the cyclical tower inspections/ repairs recommended in Section 01.3-010C60 limestone and Granite Exterior Walls.

Element Condition: Good

March 2016. One of the four roof areas in the tower as a result of geometric set back in the elevations.

01.5-013C10 Washroom Partitions

Component Description

Pre-finished steel washroom partitions are located in the washrooms throughout the building.

Component Condition & Anticipated Replacement Date

The partitions are still in good condition despite having surpassed a suggested service life of 20 years. They are currently 25 years old. Functionally they are sound and aesthetically, their finishes are holding well. See Section 09.4S Washroom Renovations

Element Condition: Good

March 2016. Note: Washroom partitions

01.5-050C10 Hardwood Doors

Component Description

Doors in the office areas are stained hardwood doors with lever handle hardware.

Component Condition & Anticipated Replacement Date

Thedoors are in good condition. With a 50 year service life, they are not expected to be replaced for another 25 years in 2041.

Element Condition: Good

01.5-050C15 Metal Doors

Component Description

Service doors are pre-finished steel doors.

Component Condition & Anticipated Replacement Date

The steel doors are in good condition. With a service life of 60 years, they are not exepcted to be replaced for another 35 years in 2051 AD.

Element Condition: Good

01.5-060C05 Ceramic Wall Tile

Component Description

Ceramic wall tile occurs in the washrooms throughout the building.

Component Condition & Anticipated Replacement Date

The tile is in good condition. With a suggested service life of 40 years, it has another 15 years before it reaches that age. See Section 09.4S Washroom Vanities for event recommendation.

Element Condition: Good

March 2016. Note : Ceramic Wall tile. This is typical condition.

01.5-060C20 Stucco Finish (Atrium)

Component Description

A stucco finish occurs on some drywall features in the atrium at levels 3-6.

Component Condition & Anticipated Replacement Date

The finish is in good condition; however it is advised to repaint it in 2020 when the repainting of walls and ceilings is advised. This cost would be included in Section 01.5-060C15 Paint.

Element Condition: Good

March 2016. Note White Stucco Finish.

01.5-060C30 Marble Wall Finishes

Component Description

Marble wall finishes occur in the heritage lobby and former ticketing area as well as the open stairwell and entrance foyer. It is of significant value and must be protected against modifications.

Component Condition & Anticipated Replacement Date

The component is in good condition. No work or expenditures are foreseen for this element. Given its heritage value it irreplaceable.

Element Condition: Good

March 2016. Marble Walls in the heritage portions of the building interior.

01.5-070C10 Ceramic Floor Tile

Component Description

Ceramic floor tile occurs in washrooms throughout the building.

Component Condition & Anticipated Replacement Date

The floor tiles are in good condition however the grout joints are appearing soiled which is reasonable given their age of 25 years. With a suggested service life of 30 years, the floor tile has 5 years remaining before it is reached. See Section 09.4S Washroom Renovation for event recommendation.

Element Condition: Good

March 2016, Note: typical condition of ceramic floor tile.

01.5-070C15 Granite Tile Floor

Component Description

Granite Tile Flooring is used in the 4th floor atrium and in the west side stairwell on Bedford Row.

Component Condition & Anticipated Replacement Date

The granite tiles were installed in 1991 and are in good condition. With a suggested 50 year service life, they are not expected to be replaced until 2041.

Element Condition: Good

March 2016. Note Granite Floor Tiles in 4th floor Atrium.

01.5-070C65 Terrazzo Floor

Component Description

Terrazzo floors and stairs dating from 1936 occur in the Entrance Foyer, Former Postal Wicket Area, Main Elevator Lobby, inside the north stairwell on the Water St. Elevation as well as the Elevator Lobbies of the service elevator.

Component Condition & Anticipated Replacement Date

The terrazzo is in good condition and with regular maintenance, no work or costs are foreseen for it.

Element Condition: Good

March 2016. Note Terrazzo floor in Heritage Area.

01.5-070C75 Raised Floor Systems

Component Description

Raised floor systems occur in the Computer Areas of the Main floor.

Component Condition & Anticipated Replacement Date

The raised floor systems are in good condition. With a service life of 50 years they are halfway into it, with another 25 years remaining.

Element Condition: Good

01.5-080C10 Painted Gypsum Board & Plaster Ceilings

Component Description

Painted gypsum board walls and ceilings occur throughout the building.

Component Condition & Anticipated Replacement Date

Refer to Event Recommendation in Section 01.5-060C15 Paint.

Element Condition: Good

01.5A-110 Interior Stairs

Component Description

There are three egress stairwells, one open heritage stair and two stairs at the loading bay/interior parking garage.

Component Condition & Anticipated Replacement Date

All stairs are in good condition. With regular maintenance, no costs or work are foreseen for them.

Element Condition: Good

01.6A-025 Fixed Furnishings (Washroom Vanities)

Component Description

There are 27 vanities in the washrooms throughout the building. They are finished in plastic laminate sheeting.

Component Condition & Anticipated Replacement Date

Their condition can be described as good. The finish appears to be holding up well, this is a testament to the quality of the cleaning staff.

By a suggested service life 25 years, the vanities have now reached this mark. Functionally they will continue to provide sound service for many years to come. Aesthetically the plastic laminate finish will start to appear aged over the ensuing years. For event recommendation on treatment, see Section 09.4S Washroom Renovation.

Element Condition: Good

March 2016. Note Laminate covered vanity.

01.2-020C10 Slab on Grade – Concrete

Component Description

The loading dock, inside parking area and other basement areas as well as sub-basement levels have concrete slab on grade floor construction.

Component Condition & Anticipated Replacement Date

The slabs are in average condition with the exception of an area in the perimeter tunnel, whereby the removal of a sump pump resulted in hydrostatic water conditions which created ponding in a traffic area.

With this system, there is no feasible replacement date.

Element Condition: Average

RF Design Problems and Deficiencies [01.2-020C10 Slab on Grade - Concrete]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Create channel in slab from ponded area to sump pump to eliminate ponding	$8,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Trench channel from ponded area to sump pump	$5,000	EACH	$5,000
2		1	Contingency 15%	$1,000	EACH	$1,000
3		1	Soft Costs 30%	$2,000	EACH	$2,000

4	1	$0	EACH	$0

Event Description

A localized part of the tunnel has ponded water in a traffic area which resulted from hydrostatic pressure upon removal of a sump pump. By cutting into the slab and creating a shallow channel sloped toward a new sump pump outlet, the ponding can be eliminated and therefore eliminate safety concerns associated with the standing water in a traffic area.

Event Justification & Strategy

To improve safety, serviceability and functionality, undertake the steps outlined above.

Implication of Event Deferral (Risks)

Safety and functional concerns remain untreated.

March 2016. Area of tunnel where ponding water creates safety and functional concerns.

01.2-050C15 Exterior Stair & Ramp

Component Description

The main entrance stair / ramp is composed of concrete base, granite stone finish and steel handrail construction.

Component Condition & Anticipated Replacement Date

Although the stair has been rebuilt in the past decade, the extensive use of salts during harsh winter conditions continues to be detrimental to its integrity. The system is in poor condition again and needs refurbishment to restore its integrity.

Element Condition: Poor

Assessment Criteria	**Existence**
Loss of structural integrity	
Default	Yes
Visible settling or uplift	
Default	Yes

March 2016. Only stair on site at main entrance. Note ramp in background which is an integral p[art of the construction.

RP Component life extension [01.2-050C15 Exterior Stair & Ramp]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Repair / refurbish entrance ramp / stair.	$38,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Repair / restore ramp/stair.	$25,000	EACH	$25,000
2		1	Contingency 15%	$4,000	EACH	$4,000
3		1	Project Soft Costs 30%	$9,000	EACH	$9,000

Event Description

The ramp at the main stair is undergoing deterioration at the side support wall due to salt and freeze /thaw deterioration imposed on it during winter conditions.

Event Justification & Strategy

Disassemble, repair underlying structural concerns and reassemble to restore water resistant integrity of the sytem.

Implication of Event Deferral (Risks)

Safety concerns will result as the structure becomes increasingly undermined.

March 2016. Deterioration at ramp due to salts/ winter conditions.

01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up

Component Description

The exterior walls of the building are limestone masonry blocks (quarried near Cape Enrage NB) and keyed into a brick back-up which embeds around the superstructure. The limestone face occurs at floors 1 through to 7 and also for the entire Tower structure. The base (basement level) is faced in granite masonry and is believed to be backed by concrete wall.

Various exterior wall repair/ upgrade projects were undertaken on on the building:
-On the main building (Floors 1-7), the projects tended to be undertaken an elevation at a time. The most recent remediation projects for the main building (floors 1-7) occurred in the early to mid 2000's.
-On the tower, a full scale remediation was undertaken over the course of 2007-2009.

Component Condition & Anticipated Replacement Date

The condition of the exterior walls varies:

-For the main building (floors 1-7), the condition would vary from good to fair to poor depending on the particular area. A remediation project as noted is pending to correct exterior wall deficiencies in 2016.

-For the tower, the condition is thought to vary from good to fair. The reason it is thought to be in fair condition:
1) Just after 6-7 years of a restoration project (during the BCR inspection), grout pieces were observed at the base of the tower. Water having entered grout joints and going through freeze/thaw cycling would have deteriorated the grout to the point of expanding and pushing out pieces as water turns to ice. The amount observed was not huge (see photos in following event listing) but nevertheless as deterioration occurs the cycle accelerates as larger amounts of water can enter and freeze resulting in expansion. The forces are enough to destroy the integrity of the grout joint over time. The

more water that enters the joints, the faster the deterioration.
2) Water was observed on the inside of the tower near the entrance to the elevator on the 8th floor (south facing) and at the stairwell areas (southeast corner). BGIS staff also pointed out that water enters an area near the south elevator in the elevator room from overhead. (See photos in following event listing.) Exact causes of entry are unknown. The tower consists of walls and small roof areas (as it steps inward at various levels) as well as a domed copper roof so its geometry is complex and its multi-storey height expose it to much wind, wind vortexes and horizontally driven rain.

Two events are derived from the above:
1) A preventive maintenance inspection report on the tower once every seven years to address deficient areas to be repaired (such as mortar, exterior sealants, and interface components of wall / roof areas). The scope must involve accessing all areas of the tower walls in order to effectively assess deficient conditions. Since deterioration has already begun, it is advised to have this undertaken in 2016/17.
2) A preventive maintenance inspection report on the main building every seven years similar to the scope above for the tower. Since the tower already has a pending repair project for 2016/17, the start date for the main building is set for 2024.

Element Condition: Fair

March 2016. Limestone Masonry blocks of main building (fls1-7) and tower as well as granite blocks of base (basement level).

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Tower 1st Inspection Report / Repairs and Sealant Replacement	$210,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly

					Costs
1	1	Inspection report on Tower	$50,000	EACH	$50,000
2	1	Materials and labour to provide access to tower	$75,000	EACH	$75,000
3	1	Repair Contingency 50%	$63,000	EACH	$63,000
4	1	Replace exterior sealants	$10,000	EACH	$10,000
5	1	Local cost factor 6%	$12,000	EACH	$12,000

Event Description

Replace exterior wall sealants at all window / wall interfaces and other openings and undertake a preventive maintenance inspection of the tower over its entire wall surface area to detect deficiencies for repair in order to maintain optimal water resistance integrity. Have those deficiencies addressed at the time of the inspection since staging should already be in place.

Event Justification & Strategy

Cyclical deterioration accelerates quickly on the tower given its height, complex geometry, wind driven rains and freeze/thaw cycling. Water entry into the interior which already occurs (Refer to System description for details) will continually increase.

Implication of Event Deferral (Risks)

Deferral will result in rapid escalation of repair costs and increased water entry into the building.

March 2016. White pieces are bits of delaminated grout from joint deterioration in tower.

March 2016. Note complex geometry of tower.

March 2016. More grout pieces (white) fallen from Tower Wall Joints

01.3-060C18 Overhead Door

Component Description

There are 3 sectional overhead doors located at the parking area at the north face of the building.

Component Condition & Anticipated Replacement Date

Two are in good condition, having been replaced in 2013. They have a remaining service life of 17 years and are not expected to be replaced until 2034.

The remaining overhead door was installed in 1991 and is now approximately 25 years old. It is past an expected service life of 20 years.

Element Condition: Good


March 2016: Three Overhead doors at parking area.

CP Component replacement or new [01.3-060C18 Overhead Door]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Replace overhead door dating from 1991/92.	$15,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace one overhead door dating from 1991/92.	$10,000	EACH	$10,000
2		1	Contingency 15%	$1,500	EACH	$1,500
3		1	Project Soft Costs 30%	$3,500	EACH	$3,500

Event Description

Replace overhead door dating from 1991/92.

Event Justification & Strategy

It is past its expected service life.

Implication of Event Deferral (Risks)

Potential for malfunctions increase.

01.4-010C02 Integrated Atrium Barrel Vault and Curtainwall- frame and glazing

Component Description

A integrated barrel vaulted atrium and vertical curtain wall structure occurs along the central axis of the original building. It was installed as part of the 1991 building modernization / upgrade.

Component Condition & Anticipated Replacement Date

The structure is in good condition; the system is halfway through its service life of 50 years. No leaks are reported except for rather minor ones at the vertical portion facing toward the north. Also, at this location some thermo pane window units have lost their air tightness and condensation occurs within.

A remedial project was undertaken on the atrium to improve the detailing of the structure to the roof which was deficient and permitted water and air entry in a substantial way. Upon completion the deficiencies were rectified and the system performed as should without detrimental effects.

Element Condition: Good

March 2016. Barrel vaulted atrium system with vertical curtainwall at north end.

RF Design Problems and Deficiencies [01.4-010C02 Atrium type-Glass, frame and glazing]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Undertake level 3 assessment study of curtainwall deficiency/ replace glazing units.RF Design Problems and Deficiencies [01.4-010C02 Atrium type-Glass, frame and glazing]	$79,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Undertake level 3 study to determine and advise repair of curtainwall wher water has entered.	$35,000	EACH	$35,000
2		1	Contingency to replace condensated window units where required.	$30,000	EACH	$30,000
3		1	Project soft costs 30%	$10,000	EACH	$10,000
4		1	Local cost factor 6%	$4,500	EACH	$4,500

Event Description

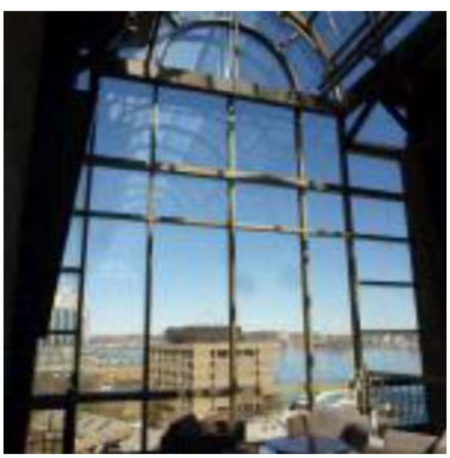
Undertake a level 3 assessment study of the area of north facing curtainwall where it is permitting water entry in localized areas and replace damaged glazing units where required.

Event Justification & Strategy

The Curtainwall integrity is not uniform in this area and it should be repaired to ensure its service life is not jepardized.

Implication of Event Deferral (Risks)

The expected service life of the system may falter. Poorer federal image results with fogged glazing due to condensation within damaged units.



March 2016. North end face of curtainwall.

01.4-010C20 Modified Bitumen, 2 ply Membrane Roof Assembly

Component Description

The roof system of the Bedford Row GOCB is a two tiered one:
- The lower roof over the 1950's era addition dates from the 1991/92 modernization and consists of 2 ply modified bituminous membrane over a fibreboard and sloped poly-isocyanurate insulation base. A bituminous, mopped felt, vapour barrier adheres the assembly to a concrete roof deck.
-The upper roof over the 1936 original building is subdivided by a portion to the north of the tower which dates from the 1991/92 modernization and consists of the same assembly as above. The remaining portion, to the south and east, was replaced in 2003 due to wind damage from Hurricane Juan. It was replaced with a similar system as above only with poly-styrene insulation in lieu of poly-isocyanurate insulation.

Component Condition & Anticipated Replacement Date

The condition of the lower roof is average for its age; the granulated surface is worn in places, showing the bituminous layer beneath in localized areas.Ultraviolet light will begin to generate cyclical deterioration as the bitumen is changed chemically. Given that the roof is now 25 years old, it has met a reasonable service life and it would be prudent to schedule roof replacement within the next two-three years.

The age and condition of the north portion of the upper roof is similar to the lower roof. It would also be prudent to schedule roof replacement for this area within the next two-three years.

The upper roof area (to the east and south of the tower) which was replaced in 2003 should have a remaining service life of 12 years; however observations (by this author) and actions that BGIS (formerly SNC Lavalin) have undertaken to maintain the roof, result in negating this. The concerns include:
-BGIS must keep observation of water retention within the roof at vented areas in an area south of the tower. Once they deem it critical enough, they have (and still need) to vacuum water out of the roof system. It is understood that they can remove numerous buckets of water out of the system when they undertake this exercise.
-BGIS indicate that there are still areas where water enters the building interior below the tower. The areas include: the hallway adjacent the boardrooms near the elevators and a storage room located in the legal suite to the north of the elevators.
-BGIS indicate that the south portion of roof exhibits a softness when walking upon it at certain times. When this author walked over the same areas in winter, it was observed as being rigid. This can be explained due to the freezing and thawing of water within the roof system which causes the fibreboard substrate to go from a firm (when frozen) to soft state (when thawed).

Needless to say, there is no integrity left in the south side roof system, besides the bitumen and felt vapour barrier over the concrete deck which is really the only effective component that is "acting" as a roof membrane. Given this, it is advised to replace this roof as soon as possible; there are too many unknowns as to how,what, and when building components are being detrimentally affected by this severely compromised roof system. (Note: the upper roof area to the east is in sound condition; however since all other areas are advised to be replaced, from a logistics perspective, it would be prudent to include this area as well.)

Element Condition: Poor

Assessment Criteria	**Existence**
Damaged openings or specialties	
Default	Yes
Damaged, deteriorated or inadequate roofing material	
Default	Yes
Leakage	
Default	Yes
Non code compliant	
Default	Yes
Water penetration	
Default	Yes

CF Design Problems and Deficiencies [01.4-010C20 Modified Bitumen, 2 ply membrane roof assembly]

Current event Year (YYYY)	**Brief Description (40 Characters)**	**Estimated Event Cost**
2016	Replace compromised upper level roof. (above 7th fl.)	$674,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace upper level roof	$425,000	EACH	$425,000
2		1	Contingency 15%	$64,000	EACH	$64,000
3		1	Project Soft Costs 30%	$147,000	EACH	$147,000
4		1	Location Factor 6%	$38,000	EACH	$38,000

Event Description

Replace upper level roof over 7th floor (original 1936 structure).

Event Justification & Strategy

The integrity of the roof system is compromised as a result of water entry within the assembly.

Implication of Event Deferral (Risks)

To date water has entered the interior in localized areas only however deferral could result in significant failure.

March 2016. Compromised roof area of Upper Level South Side.

01.5-070C60 Vinyl Floor Tile

Component Description

A small area of vinyl tile occurs in a basement room marked as Telephone Room on the as is building plans.

Component Condition & Anticipated Replacement Date

The vinyl tile floor is in poor condition. It is past its service life and is in disrepair. It is of vintage age and could possibly contain asbestos within its matrix. Although safe unless mechanically disturbed by cutting, etc.; it is advised to remove it using asbestos remediation procedures for asbestos containing vinyl tile to err on the safe side and replace it with a sheet linoleum flooring.

Element Condition: Poor

RP Component replacement or new [01.5-070C60 Vinyl Floor Tile]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Replace vinyl tile flooring in telephone room in basement.	$11,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace vinyl tile floor in telephone. Use asbestos abatement procedures for vinyl tile.	$7,500	EACH	$7,500

2	1	Contingency 15%	$1,500	EACH	$1,500
3	1	Project soft costs 30%	$2,500	EACH	$2,500

Event Description

Replace vinyl tile floor in basement telephone room using vinyl tile asbestos abatement procedures to err on the safe side.

Event Justification & Strategy

It is in disrepair.

Implication of Event Deferral (Risks)

Does not meet federal standard of expectation for working environment.

01.4-010C20 Modified Bitumen, 2 ply Membrane Roof Assembly

Component Description

The roof system of the Bedford Row GOCB is a two tiered one:
- The lower roof over the 1950's era addition dates from the 1991/92 modernization and consists of 2 ply modified bituminous membrane over a fibreboard and sloped poly-isocyanurate insulation base. A bituminous, mopped felt, vapour barrier adheres the assembly to a concrete roof deck.
-The upper roof over the 1936 original building is subdivided by a portion to the north of the tower which dates from the 1991/92 modernization and consists of the same assembly as above. The remaining portion, to the south and east, was replaced in 2003 due to wind damage from Hurricane Juan. It was replaced with a similar system as above only with poly-styrene insulation in lieu of poly-isocyanurate insulation.

Component Condition & Anticipated Replacement Date

The condition of the lower roof is average for its age; the granulated surface is worn in places, showing the bituminous layer beneath in localized areas.Ultraviolet light will begin to generate cyclical deterioration as the bitumen is changed chemically. Given that the roof is now 25 years old, it has met a reasonable service life and it would be prudent to schedule roof replacement within the next two-three years.

The age and condition of the north portion of the upper roof is similar to the lower roof. It would also be prudent to schedule roof replacement for this area within the next two-three years.

The upper roof area (to the east and south of the tower) which was replaced in 2003 should have a remaining service life of 12 years; however observations (by this author) and actions that BGIS (formerly SNC Lavalin) have undertaken to maintain the roof, result in negating this. The concerns include:
-BGIS must keep observation of water retention within the roof at vented areas in an area south of the tower. Once they deem it critical enough, they have (and still need) to vacuum water out of the roof system. It is

understood that they can remove numerous buckets of water out of the system when they undertake this exercise.
-BGIS indicate that there are still areas where water enters the building interior below the tower. The areas include: the hallway adjacent the boardrooms near the elevators and a storage room located in the legal suite to the north of the elevators.
-BGIS indicate that the south portion of roof exhibits a softness when walking upon it at certain times. When this author walked over the same areas in winter, it was observed as being rigid. This can be explained due to the freezing and thawing of water within the roof system which causes the fibreboard substrate to go from a firm (when frozen) to soft state (when thawed).

Needless to say, there is no integrity left in the south side roof system, besides the bitumen and felt vapour barrier over the concrete deck which is really the only effective component that is "acting" as a roof membrane. Given this, it is advised to replace this roof as soon as possible; there are too many unknowns as to how,what, and when building components are being detrimentally affected by this severely compromised roof system. (Note: the upper roof area to the east is in sound condition; however since all other areas are advised to be replaced, from a logistics perspective, it would be prudent to include this area as well.)

Element Condition: Poor

Assessment Criteria	**Existence**
Damaged openings or specialties	
Default	Yes
Damaged, deteriorated or inadequate roofing material	
Default	Yes
Leakage	
Default	Yes
Non code compliant	
Default	Yes
Water penetration	
Default	Yes

CP Component replacement or new [01.4-010C20 Modified Bitumen, 2 ply membrane roof assembly]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2017	Replace roof over 1950's annex.	$372,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace roof over 1950's addition	$235,000	EACH	$235,000
2		1	Contingency 15%	$35,000	EACH	$35,000
3		1	Project soft costs 30%	$81,000	EACH	$81,000
4		1	Local cost factor 6%	$21,000	EACH	$21,000

Event Description

Replace lower roof over the 1950's addition.

Event Justification & Strategy

It has reached the end of a reasonable expected service life.

Implication of Event Deferral (Risks)

The integrity of the roof will become increasingly more problematic to maintain.

March 2016. Lower roof area over 1950's addition.

01.3-060C10 Steel Doors

Component Description

Six painted exterior steel doors occur at the main block (floors: basement -7th). Five are single doors, one is a double door. They occur at the parking area facing George St (3) and along Water Street (3).

Two exterior steel doors occur in the tower and one in the east stairwell on the roof.

Component Condition & Anticipated Replacement Date

They were installed at the time of the major building modernization in 1991-1992. With a service life of 45 years, they are expected to be replaced in another 20 years (2036 AD). However the 3 in the parking garage are wearing prematurely due to corrosion and are advised to be replaced in 2020.

The tower doors were replaced in the tower project of 2007-09 and are in good condition. With a 45 year service life, they are expected to be replaced in another 37 years (2053 AD).

Element Condition: Fair

Assessment Criteria **Existence**

Physical damage or deterioration

Default Yes

The bases of the doors in the parking garage are rusting leading to a shortened service life.

RP Component replacement or new [01.3-060C10 Steel Doors]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2020	Replace mandoors in parking garage (3).	$24,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace 3 steel mandoors in parking garage	$15,000	EACH	$15,000
2		1	Contingency 15%	$2,500	EACH	$2,500
3		1	Project soft costs 30%	$5,500	EACH	$5,500
4		1	Location Factor 6%	$1,500	EACH	$1,500

Event Description

The 3 steel mandoors in the parking garage are rusting at the base due to salts used in winter conditions.

Event Justification & Strategy

Replace the doors in 2021 since their service lives are shortened in this location.

Implication of Event Deferral (Risks)

Premature failure of doors will occur (due to harsh conditions of location).

March 2016. Note rusting at base of steel door in parking garage.

March 2016. Note rusting at base of door.

01.5-060C15 Paint

Component Description

Plaster and drywall ceilings and walls throughout the building are painted.

Component Condition & Anticipated Replacement Date

The paint is wearing and is in average to fair condition (with the exception of the 4th floor which was done in 2014). The age of the paint is nearing, or reached or surpassed its suggested 10 year service life. It is advised to to repaint these areas in 2020 at the time of carpet replacement in order to achieve a co-ordinated professional aesthetic.

Element Condition: Average

CP Component life extension [01.5-060C15 Paint]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2020	Repaint plaster & drywall walls and ceilings within bldg [01. 5-060C15 Paint]	$398,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Repaint walls and ceilings	$250,000	EACH	$250,000
2		1	Contingency 15%	$38,000	EACH	$38,000
3		1	Project soft costs 30%	$87,000	EACH	$87,000
4		1	Local cost factor 6%	$23,000	EACH	$23,000

Event Description

Repaint drywall and plaster walls and ceilings throughout the building with the exception of the 4th floor.

Event Justification & Strategy

The paint finishes have surpassed a reasonable service life.

Implication of Event Deferral (Risks)

Aesthetics and the work environment suffer.

01.5-070C05 Carpet Tile Flooring

Component Description

Carpet tiles are used throughout the open floor areas containing offices and cubicles throughout floors 1-7 and in the corridor areas .

Component Condition & Anticipated Replacement Date

The condition of carpet tiles varies:

-The 4th floor received a 2.0 Fit-Up in 2016 and at that time, new carpet tiles were installed, They are in excellent condition and have 8 years remaining in their suggested service life.
In the remainder of the six floors:
-carpet tiles were replaced approx. 6-7 years ago in the work areas containing cubicles and offices; they are in good condition and have 3-4 years remaining in their suggested service life.
- carpet tiles were replaced 10-11 years ago in the public areas (outside the work areas). They have met a reasonable service life.

The work areas represent the vast majority of floor area. Since the public areas are a small percentage of area in comparison , it is advised to replace all carpet tiles throughout the floor areas (except 4th floor) at the same time to achieve a co-ordinated professional aesthetic.

Element Condition: Fair

March 2016. 4th floor 2.0 Fit-Up. Note carpet tile flooring.

CP Component replacement or new [01.5-070C05 Carpet Tile Flooring]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2020	Replace all carpet tile (except for 4th fl)	$809,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace carpet tiles in bldg except 4th fl.	$510,000	EACH	$510,000
2		1	Contingency 15%	$77,000	EACH	$77,000
3		1	Project Soft Costs 30%	$176,000	EACH	$176,000
4		1	Local Cost Factor 6%	$46,000	EACH	$46,000

Event Description

Replace all carpet tile (except 4th floor) throughout the building.

Event Justification & Strategy

The tile is at the end of a reasonable service life.

Implication of Event Deferral (Risks)

The aesthetics and working environment suffer.

March 2016. 7th floor. Carpet in public carpet and note carpet in boardroom at left.

01.5-070C25 Linoleum Floor

Component Description

Linoleum sheet flooring is used throughout the building for either heavily out door trafficked areas such as the basement corridors and former cafeteria queuing area to photo copier areas , lunch rooms/ eating areas on the other floors.

Component Condition & Anticipated Replacement Date

With the exception of the 4th floor linoleum (dating from 2014), the linoleum in the other areas dates from 1991. It is in good to average condition and is still functionally sound. However, with a suggested service life of 25 years, this has now been met.

Given that majority of the linoleum occurs in the basement level and that the other floor areas have only sporadic usage of the material which (would no doubt be only replaced at the time of larger layout retrofits), the event recommendation for this item includes only replacement in the basement area. It has also been scheduled to occur in 2020 to coincide with the other interior finish upgrades recommended. This would eliminate potential damage to it from demolitions and construction traffic associated with the upgrade work.

Element Condition: Average

CP Component replacement or new [01.5-070C25 Linoleum Floor]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2020	Replace linoleum flooring in basement.	$61,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace linoleum flooring in basement level	$38,000	EACH	$38,000
2		1	Contingency 15%	$6,000	EACH	$6,000
3		1	Project Soft Costs 30%	$13,500	EACH	$13,500
4		1	Local Cost factor 6%	$3,500	EACH	$3,500

Event Description

Replace linoleum in basement.

Event Justification & Strategy

The linoleum has surpassed its suggested service life.

Implication of Event Deferral (Risks)

The linoleum will lose its aesthetic appeal and eventually undertake mechanical damage.

01.5-070C35 Painted Concrete Floor

Component Description

Painted concrete floors occur in the basement and sub-basement service and storage areas and in telephone/ electrical/ storage rooms on floors 1-7 as well as the south side stairwell on the Water St elevation.

Component Condition & Anticipated Replacement Date

The painted floors on floors 1-7 are in good condition and will remain so being in very light traffic areas; no costs or work is foreseen for these areas.

For the basement and sub-basement levels, the majority of the painted floor area is worn, being in heavy traffic areas. The conditions vary from good to fair. It is difficult to determine ages of various areas but they would range from over to under the suggested service life of 10 years. It would be prudent to identify an overall cost and then break out for particular years depending on further review. An event recommendation takes this approach. A longer lasting floor topping is advised and costed and is scheduled for 2020 to coincide with the other finish upgrades recommended to occur and keep it from being damaged from construction traffic from the other finish upgrade work.

Element Condition: Fair

March 2016. Painted concrete floor in basement.

CP Component life extension [01.5-070C35 Painted Concrete Floor]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2020	Apply long lasting floor emulsion coating at painted concrete floors in basement / sub/ basement.	$142,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Apply a longer lasting emulsion floor coating to concrete floors in basement and sub-basement.	$90,000	EACH	$90,000
2		1	Contingency 15%	$13,500	EACH	$13,500
3		1	Project Soft Costs 30%	$31,000	EACH	$31,000
4		1	Local Cost factor 6%	$8,000	EACH	$8,000

Event Description

Repaint painted concrete floors with a longer lasting floor emulsion coating which will stand up to heavy traffic and abrasion. This would eliminate it from damage due to heavy construction traffic

Event Justification & Strategy

The paint finish is past a reasonable service life.

Implication of Event Deferral (Risks)

Functionality and ease of cleaning is compromised.

01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up

Component Description

The exterior walls of the building are limestone masonry blocks (quarried near Cape Enrage NB) and keyed into a brick back-up which embeds around the superstructure. The limestone face occurs at floors 1 through to 7 and also for the entire Tower structure. The base (basement level) is faced in granite masonry and is believed to be backed by concrete wall.

Various exterior wall repair/ upgrade projects were undertaken on on the building:
-On the main building (Floors 1-7), the projects tended to be undertaken an elevation at a time. The most recent remediation projects for the main building (floors 1-7) occurred in the early to mid 2000's.
-On the tower, a full scale remediation was undertaken over the course of 2007-2009.

Component Condition & Anticipated Replacement Date

The condition of the exterior walls varies:

-For the main building (floors 1-7), the condition would vary from good to fair to poor depending on the particular area. A remediation project as noted is pending to correct exterior wall deficiencies in 2016.

-For the tower, the condition is thought to vary from good to fair. The reason it is thought to be in fair condition:
1) Just after 6-7 years of a restoration project (during the BCR inspection), grout pieces were observed at the base of the tower. Water having entered grout joints and going through freeze/thaw cycling would have deteriorated the grout to the point of expanding and pushing out pieces as water turns to ice. The amount observed was not huge (see photos in following event listing) but nevertheless as deterioration occurs the cycle accelerates as larger amounts of water can enter and freeze resulting in expansion. The forces are enough to destroy the integrity of the grout joint over time. The more water that enters the joints, the faster the deterioration.
2) Water was observed on the inside of the tower near the entrance to the elevator on the 8th floor (south facing) and at the stairwell areas (southeast corner). BGIS staff also pointed out that water enters an area near the south elevator in the elevator room from overhead. (See photos in following event listing.) Exact causes of entry are unknown. The tower consists of walls and small roof areas (as it steps inward at various levels) as well as a domed copper roof so its geometry is complex and its multi-storey height expose it to much wind, wind vortexes and horizontally driven rain.

Two events are derived from the above:
1) A preventive maintenance inspection report on the tower once every seven years to address deficient areas to be repaired (such as mortar, exterior sealants, and interface components of wall / roof areas). The scope must involve accessing all areas of the tower walls in order to effectively assess deficient conditions. Since deterioration has already begun, it is advised to have this undertaken in 2016/17.
2) A preventive maintenance inspection report on the main building every seven years similar to the scope above for the tower. Since the tower already has a pending repair project for 2016/17, the start date for the main

building is set for 2024.

March 2016. Limestone Masonry blocks of main building (fls1-7) and tower as well as granite blocks of base (basement level).

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2023	Tower 2nd Inspection Report/Repairs and Sealant Replacement	$210,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for Tower	$50,000	EACH	$50,000
2		1	Materials /labour to provide access	$75,000	EACH	$75,000
3		1	Repair contingency 50%	$63,000	EACH	$63,000
4		1	Replace sealants	$10,000	EACH	$10,000
5		1	Local cost factor 6%	$12,000	EACH	$12,000

Event Description

Same narrative as 2016 event.

Event Justification & Strategy

Same narrative as 2016 event.

Implication of Event Deferral (Risks)

Same narrative as 2016 event.

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2024	Main Bldg 1st (B-7th fl) Inspection Report/ Repairs and Sealant Replacement.	$596,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for Main Block (flrs basement-7)	$50,000	EACH	$50,000
2		1	Materials/Labour to provide access	$150,000	EACH	$150,000
3		1	Repair Contingency 50%	$137,000	EACH	$137,000
4		1	Replace exterior sealants	$225,000	EACH	$225,000
5		1	Local cost factor 6%	$34,000	EACH	$34,000

Event Description

Replace exterior wall sealants at all window / wall junctures and other wall openings and undertake a preventive maintenance inspection of the main block (floors1-7) over its entire wall surface to detect deficiencies for repair in order to maintain optimal water resistance integrity. Have those deficiencies addressed at the time of inspection while access scaffolding is in place.

Event Justification & Strategy

Cyclical deterioration accelerates quickly given wind driven rain and freeze thaw cycle conditions.

Implication of Event Deferral (Risks)

Deferral will result in escalating repair costs and increased water entry into the building.

March 2016 Plaster blow out in Tower Elevator machine Room from water entry.

March 2016. Note Blue containers used to contain water leaks near elevator equipment.

March 2016. Note In tower elevator machine room, residues from plaster left behind as water from leaks through the tower construction has evaporated.

March 2016 Water entry at ceiling in Elevator machine Room in Tower.

March 2016. Evidence of water ingress since in southeast corner of tower stairwell.

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2030	Tower 3rd Inspection Report / Repairs and Sealant Replacement	$210,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for tower	$50,000	EACH	$50,000
2		1	Materials / labour for Access	$75,000	EACH	$75,000
3		1	Repair contingency 50%	$63,000	EACH	$63,000
4		1	Replace sealants	$10,000	EACH	$10,000
5		1	Local cost factor 6%	$12,000	EACH	$12,000

Event Description

Same narrative as 2016 event

Event Justification & Strategy

Same narrative as 2016 event

Implication of Event Deferral (Risks)

Same narrative as 2016 event

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2031	Main Bldg 2nd (B-7th fl) Inspection / Repair Report and Sealant Replacement	$596,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for Main Block	$50,000	EACH	$50,000
2		1	Material/ labour for access	$150,000	EACH	$150,000
3		1	Repair contingency 50%	$137,000	EACH	$137,000
4		1	Replace sealants	$225,000	EACH	$225,000
5		1	Local cost factor 6%	$34,000	EACH	$34,000

Event Description

Same narrative as 2023 event for Main Block.

Event Justification & Strategy

Same narrative as 2023 event for Main Building.

Implication of Event Deferral (Risks)

Same narrative as for 2023 event for main building.

01.3-060C10 Steel Doors

Component Description

Six painted exterior steel doors occur at the main block (floors: basement -7th). Five are single doors, one is a double door. They occur at the parking area facing George St (3) and along Water Street (3).

Two exterior steel doors occur in the tower and one in the east stairwell on the roof.

Component Condition & Anticipated Replacement Date

They were installed at the time of the major building modernization in 1991-1992. With a service life of 45 years, they are expected to be replaced in another 20 years (2036 AD). However the 3 in the parking garage are wearing prematurely due to corrosion and are advised to be replaced in 2020.

The tower doors were replaced in the tower project of 2007-09 and are in good condition. With a 45 year service life, they are expected to be replaced in another 37 years (2053 AD).

Element Condition: Fair

Assessment Criteria **Existence**

Physical damage or deterioration

Default Yes

The bases of the doors in the parking garage are rusting leading to a shortened service life.

RP Component replacement or new [01.3-060C10 Steel Doors]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2036	Replace steel mandoor (3) along water St elevation.	$40,500

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace 3 mandoors along Water St side of building.	$25,000	EACH	$25,000
2		1	Contingency 15%	$4,000	EACH	$4,000
3		1	Project soft costs 30%	$9,000	EACH	$9,000
4		1	Location factor 6%	$2,500	EACH	$2,500

Event Description

Replace 3 steel mandoors located along water st side of Building. One of them is a double door.

Event Justification & Strategy

The expected service4 life has been met.

Implication of Event Deferral (Risks)

Potential for malfunction increases.

March 2016. Note double man door (and single man door to the right).

01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up

Component Description

The exterior walls of the building are limestone masonry blocks (quarried near Cape Enrage NB) and keyed into a brick back-up which embeds around the superstructure. The limestone face occurs at floors 1 through to 7 and also for the entire Tower structure. The base (basement level) is faced in granite masonry and is believed to be backed by concrete wall.

Various exterior wall repair/ upgrade projects were undertaken on on the building:
-On the main building (Floors 1-7), the projects tended to be undertaken an elevation at a time. The most recent remediation projects for the main building (floors 1-7) occurred in the early to mid 2000's.
-On the tower, a full scale remediation was undertaken over the course of 2007-2009.

Component Condition & Anticipated Replacement Date

The condition of the exterior walls varies:

-For the main building (floors 1-7), the condition would vary from good to fair to poor depending on the particular area. A remediation project as noted is pending to correct exterior wall deficiencies in 2016.

-For the tower, the condition is thought to vary from good to fair. The reason it is thought to be in fair condition:
1) Just after 6-7 years of a restoration project (during the BCR inspection), grout pieces were observed at the base of the tower. Water having entered grout joints and going through freeze/thaw cycling would have deteriorated

the grout to the point of expanding and pushing out pieces as water turns to ice. The amount observed was not huge (see photos in following event listing) but nevertheless as deterioration occurs the cycle accelerates as larger amounts of water can enter and freeze resulting in expansion. The forces are enough to destroy the integrity of the grout joint over time. The more water that enters the joints, the faster the deterioration.
2) Water was observed on the inside of the tower near the entrance to the elevator on the 8th floor (south facing) and at the stairwell areas (southeast corner). BGIS staff also pointed out that water enters an area near the south elevator in the elevator room from overhead. (See photos in following event listing.) Exact causes of entry are unknown. The tower consists of walls and small roof areas (as it steps inward at various levels) as well as a domed copper roof so its geometry is complex and its multi-storey height expose it to much wind, wind vortexes and horizontally driven rain.

Two events are derived from the above:
1) A preventive maintenance inspection report on the tower once every seven years to address deficient areas to be repaired (such as mortar, exterior sealants, and interface components of wall / roof areas). The scope must involve accessing all areas of the tower walls in order to effectively assess deficient conditions. Since deterioration has already begun, it is advised to have this undertaken in 2016/17.
2) A preventive maintenance inspection report on the main building every seven years similar to the scope above for the tower. Since the tower already has a pending repair project for 2016/17, the start date for the main building is set for 2024.

Element Condition: Fair

March 2016. Limestone Masonry blocks of main building (fls1-7) and tower as well as granite blocks of base (basement level).

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2037	Tower 4th Inspection Report/Repairs and Sealant Replacement	$210,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for Tower	$50,000	EACH	$50,000
2		1	Materials/ Labour to access	$75,000	EACH	$75,000
3		1	Repair contingency 50%	$63,000	EACH	$63,000
4		1	Replace sealants	$10,000	EACH	$10,000
5		1	Local cost factor 6%	$12,000	EACH	$12,000

Event Description

Same narrative as 2016 event.

Event Justification & Strategy

Same narrative as 2016 event.

Implication of Event Deferral (Risks)

Same narrative as 2016 event.

CP Component life extension [01.3-010C60 Ext.Walls - Limestone & Granite, keyed brick back-up]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2037	Main Block 3rd (B-7th fl) Inspection Report/ Repairs and Sealant Replacement	$596,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Inspection Report for main block	$50,000	EACH	$50,000
2		1	Materials /labour for access	$150,000	EACH	$150,000
3		1	Repair contingency 50%	$137,000	EACH	$137,000
4		1	Replace sealants	$225,000	EACH	$225,000
5		1	Local Cost factor 6%	$34,000	EACH	$34,000

Event Description

Same narrative as for 2016 Main Bldg. event

Event Justification & Strategy

Same narrative as for 2016 Main Bldg. event.

Implication of Event Deferral (Risks)

Same narrative as for 2016 Main Bldg. event.

01.3-070C01 Aluminum Windows

Component Description

Exterior windows throughout the main building and tower are pre-finished aluminum, vertically hung operable units with thermo pane glazing and an opaque spandrel panel above.

Component Condition & Anticipated Replacement Date

The windows were installed in 1991 with the exception of the tower. With a service life of 50 years, they are not expected to be replaced until 2041.

The windows in the tower were replaced in the retrofit of 2007-2009. They are not expected to be replaced until 2057.

Element Condition: Average

March 2016. Typical Widows.

CP Component replacement or new [01.3-070C01 Aluminum Windows]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2041	Replace windows (floors: basement to 7th).	$2,458,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		417	Remove /replace windows	$3,000	EACH	$1,251,000
2		1	Scaffolding/access costs	$300,000	EACH	$300,000
3		1	Contingency 15%	$233,000	EACH	$233,000
4		1	Project Soft Costs 30%	$535,000	EACH	$535,000
5		1	Location Factor 6%	$139,000	EACH	$139,000

Event Description

Replace aluminum windows in the main block of the building (floors : basement level to 7)

Event Justification & Strategy

The expected 50 year service life for aluminum windows is at an end.

Implication of Event Deferral (Risks)

Potential malfunctions will increase.

March 2016. Typical windows.

01.5-080C30 Suspended Acoustic Panel Ceiling

Component Description

The vast majority of ceilings throughout the building are suspended acoustic tile ceiling systems. They date from 1991.

Component Condition & Anticipated Replacement Date

The suspended systems are in good condition. They are halfway through a service life of 50 years. Unless electrical / mechanical systems in and above the ceilings are not required to be replaced in a large way or major refits are undertaken, it is not feasible to replace the system. An event recommendation is given for the 50 year age mark; at this time it can be assumed a major building refit will occur.

Element Condition: Good

CP Component replacement or new [01.5-080C30 Suspended Acoustic Panel Ceiling]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2041	Replace suspended acoustic panel ceilings throughout bldg.	$1,744,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Replace suspended ceiling systems throughout building	$1,100,000	EACH	$1,100,000
2		1	Contingency 15%	$165,000	EACH	$165,000
3		1	Project soft costs 30%	$380,000	EACH	$380,000
4		1	Local Cost factor 6%	$99,000	EACH	$99,000

Event Description

Replace ceiling systems throughout the building.

Event Justification & Strategy

Their service life has been met.

Implication of Event Deferral (Risks)

Federal standard of expectation suffers.

09. Renovations

09.3S Accessibility

Component Description

The building was audited over the course of PWGSC's National Accessibility Audit completed in 2009 under a parliamentary directive. It was also an AIP project. Upon follow up inspection in Feb 2012 work had been undertaken however some items still remain in order for the building to be deemed 100% compliant to federal obligations.

Building compliancy against the federal accessibility policy currently scores 81.3% for both the B651-95 standard and the B651-04 standards. The cost to address all remaining deficiencies is $252,000. This includes General Overhead and Profit of 25% and a design Allowance of 20%.

Component Condition & Anticipated Replacement Date

The building can be considered to be of a high standard in regard to federal barrier free accessibility requirements. The only remaining large item is the ramp on the route to the parking garage in the basement. Its slope is too steep. Considering that it dates from 1936 and is part of the original structure and located in a very tight area surrounded by service areas and washrooms, it is a difficult item to deal with. Planning options as well as operational considerations should be undertaken to determine the best way forward for this item.

CF Accessibility [09.3S Accessibility]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	Undertake remaining accessibility items from 2009 National Audit	$252,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Undertake remaining audit items	$252,000	EACH	$252,000

09.4S Washroom Renovation

Component Description

There are 16 core multi-unit washrooms in the building and one individual washroom in the former RCMP suite on the 6th floor.

Component Condition & Anticipated Replacement Date

The washrooms are in good condition. Barrier free access is of a very high standard (although some work is still identified in the Accessibility Audit to meet the B651-04 exactly; See Section 09.3S Accessibility) and finishes are holding up well given their age and accessories, fixtures and furnishings are sound.

The following summarizes the architectural finishes in years of age for the washrooms:
Ceramic Tile Walls .... Current age 25 Suggested service life 40......15 years remaining
Ceramic Tile Floors...................................... Current age 25 Suggested service life 30......5 years remaining
Pre-finished Washroom Partitions................ Current age 25 Suggested service life 20......5 years past
Washroom Vanities..................................... Current age 25 Suggested service life 25......0 years remaining

The only comments this author has concerning aesthetic condition are:
-the grout in the ceramic floor is becoming soiled in appearance, perhaps the grout could be refinished to upgrade the appearance of the floors since the tile itself is in good condition,
-the plastic laminate finish on the vanities will start to appear worn over the next decade,
-in respect to the 4th Floor 2.0 exercise, the general appearance of the washrooms appears dated in relation to that of the overall floor area.

Note: The partitions and the vanities could conceivably be upgraded without replacing the ceramic wall and floor tile. The floor tile grout joints could also be regrouted without replacing the floor. It is conceivable to undertake a partial upgrade of the washrooms without gutting the washrooms entirely. Toilet fixtures, ceilings , wall and floor finishes (except for floor grout) could be saved. The cost would be a significant fraction of total washroom renovation.

However, if management wishes to modernize the look to be cohesive with retrofitted 2.0 floor areas and to establish an upper magnitude of cost for core washroom treatment in conjunction with it, an event is listed to address total washroom renovation.

March 2016. View of 4th floor Mens South washroom.

CP Component replacement or new [09.4S Washroom Renovation]

Current event Year (YYYY)	**Brief Description (40 Characters)**	**Estimated Event Cost**
2020	Completely renovate the washrooms throughout the building.	$2,156,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1		1	Allowance to renovate 17 washrooms within the bldg. ($80K per room)	$1,360,000	EACH	$1,360,000
2		1	Contingency 15%	$204,000	EACH	$204,000
3		1	Project Soft Costs 30%	$470,000	EACH	$470,000
4		1	Local cost factor 6%	$122,000	EACH	$122,000

Event Description

Undertake washroom renovation / modernization of the 16 core mutli-unit washrooms and one in the former RCMP suite. Ensure co-ordination of finish aesthetics to compliment the existing and future anticipated 2.0 Upgrades.

Event Justification & Strategy

Flloor tile will have reached the end of its suggested life; washroom partitions and vanities have surpassed their expected life expectancies. Wall tile will be 75% through its suggested life expectancy.

Implication of Event Deferral (Risks)

Aesthetics become dated and the environment becomes less appealing.

03. Mechanical

03.3A-010 Plumbing Piping

Component Description

General plumbing piping throughout the building is copper piping.

There are four backflow prevention units in the building. They are located in the basement mechanical rooms and serve the city water supply, sprinkler system and boiler make up water.

Multiple (35) floor drains throughout the building. They are located in wash rooms, kitchen and sub basement area.

Component Condition & Anticipated Replacement Date

Copper plumbing piping was replaced in 2008 due to leaks. This will not require replacement until 2048.

Back flow preventers were installed in

Floor drains were installed in 1991 and will require replacement in 2031.

Element Condition: Average

03.5A-030 Specialty Fire Protection Systems

Component Description

Dry sprinkler system installed during tower renovation in 2008. This system serves the unoccupied floors (9th floor and up).

Component Condition & Anticipated Replacement Date

System was installed in 2008 and will not require replacement until 2048.

Element Condition: Good

03.1A-024 Computer Cooling AHU

Component Description

Two (2) Leibert Model # FH199A-B00 A/C units. Units are located in room 133 and provide cooling to the computer room.

Component Condition & Anticipated Replacement Date

Unit were installed in 1991 and are in poor condition. The condensing units are heavily deteriorated. These units are due for replacement in 2016.

Element Condition: Poor

Assessment Criteria	**Existence**
Corrosion	
Default	Yes

CP Component replacement or new [03.1A-024 Computer Cooling AHU]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	CP Component replacement or new [03.1A-024 Computer Cooling AHU]	$385,088

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	32	Base Rate for Material and Labour	$8,050	Cool tons	$257,600
2	03. Mechanical	32	Construction Contingency	$1,207	Cool tons	$38,624
3	03. Mechanical	32	Average Total Project Soft Costs	$2,777	Cool tons	$88,864

Event Description

Replace Leibert computer room cooling units.

Event Justification & Strategy

Unit are in poor condition and have reach the end of their useful life. New units should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase the chance of system failure leading increase temperature in the computer room.

03.1A-030 Ventilation Fans

Component Description

Various ventilation fan throughout the building. There are approximately 40 fans in total. The fans serve various functions throughout the building including; electrical, server, wash room, electrical vault, loading bay and penthouse exhaust. Their are also vestibule pressurization fans to that operate in case of fire to clean the stairwell of smoke.

Component Condition & Anticipated Replacement Date

All fans will installed in 1991 except the telephone room exhaust room fan and electrical vault room fan. Fans are reported to be in good working condition but have reached the end of their useful life and require replacement in 2016.

Element Condition: Poor

CP Component replacement or new [03.1A-030 Ventilation Fans]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	CP Component replacement or new [03.1A-030 Ventilation Fans]	$47,410

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	10	Base Rate for Material and Labour	$3,171	EACH	$31,710
2	03. Mechanical	10	Construction Contingency	$476	EACH	$4,760
3	03. Mechanical	10	Average Total Project Soft Costs	$1,094	EACH	$10,940

Event Description

Replace various ventilation fans throughout the building.

Event Justification & Strategy

Ventilation fans have reached the end of their useful life and require replacement. New fan should be sized for the current exhaust requirements. Replacement may provide an increase in cost saving, performance, and reduce energy consumption. The event should be completed in stages to reduce the effect on tenants.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to a reduction in the ability to exhaust air throughout the building.

03.1A-032 Humidifiers

Component Description

Three steam humidifiers (1-National Model # SK-306M and 2-National Model #SK-314M) located is rooms 158, 204 and room 250 serves RTU's 2 and 3
Two ultrasonic humidification systems (Stulz Model# ENS7200) located in the ceiling space of rooms 524 and 615 serve RTU 1.

Component Condition & Anticipated Replacement Date

Humidification systems were all installed in 2001 and have an expected life of 15 years. The units are reported to be working as designed. It was reported that the Ultrasonic humidifiers located in the ceiling space are virtually impossible to access and therefore service. These units should be replaced in 2016.

Element Condition: Poor

CP Component replacement or new [03.1A-032 Humidifiers]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	CP Component replacement or new [03.1A-032 Humidifiers]	$25,070

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5	Base Rate for Material and Labour	$3,354	EACH	$16,770
2	03. Mechanical	5	Construction Contingency	$503	EACH	$2,515
3	03. Mechanical	5	Average Total Project Soft Costs	$1,157	EACH	$5,785

Event Description

Replace building humidification systems.

Event Justification & Strategy

Units are nearing the end of their useful life and will require replacement. It is important that new systems are accessible for service. Replacement should take place in the summer months when systems are not in use.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to a reduction in the ability to humidify air throughout the building.

03.1A-045 HVAC Pumps

Component Description

Heating pumps located in the Mechanical Room.

Pumps 1 and 2 - Primary boiler circulator (Armstrong model # 3X3X8 4380)
Pumps 3 and 4 - Perimeter heating circulator (Armstrong model # 4300-1VS8 0408-010.0)
Pump 5 - Heat exchanger circulator (Armstrong model # 4300 1V6-6 0406-003.0)
Pump 6 - Glycol heating circulator (Armstrong model # 4300 1V6-10 0410-010.0)
Pump 7 - Glycol supply pump (Armstrong model # 1.5X1X6 4030)
Pump 8 - Lobby heating circulator (Armstrong model # 816032-QQQ)

There is also a glycol heat recovery pump located on the 8th floor (Grundfos model # UP-43-110F Model B)

Pump associated with the buildings revise osmosis system will be included as part of the reverse osmosis system.

Component Condition & Anticipated Replacement Date

Pumps 3/4/5/6/7/8 were replaced in 2013 and are reported to be in excellent working condition. These pumps will need to be replaced in 2038.

Pumps 1/2 were installed in 1991 and are in poor condition. The units reached the end of their useful life in 2016 and will need to be replaced.

Element Condition: Average

CP Component replacement or new [03.1A-045 HVAC Pumps]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	CP Component replacement or new [03.1A-045 HVAC Pumps]	$40,120

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	20	Base Rate for Material and Labour	$1,342	Hp	$26,840
2	03. Mechanical	20	Construction Contingency	$201	Hp	$4,020
3	03. Mechanical	20	Average Total Project Soft Costs	$463	Hp	$9,260

Event Description

Replace boiler circulation pumps 1 and 2.

Event Justification & Strategy

Units will be at the end of their useful life and will require replacement. New units should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption. The event should be completed during the summer when the requirement for heat, and therefore the effect on tenants, is minimal.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of heat throughout the building.

03.2A-020 Direct Digital Control

Component Description

Delta DDC building control system.

Component Condition & Anticipated Replacement Date

Controls system was installed in 1991 but has had multiple upgrades over the years. The system is reported to be in good working order. Due to age of some of the components, It is recommended that the control system be evaluated for the need for upgrade.

Element Condition: Fair

RP Component life extension [03.2A-020 Direct Digital Control]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	RP Component life extension [03.2A-020 Direct Digital Control]	$19,870

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	10	Base Rate for Material and Labour	$1,329	pt	$13,290
2	03. Mechanical	10	Construction Contingency	$199	pt	$1,990
3	03. Mechanical	10	Average Total Project Soft Costs	$459	pt	$4,590

Event Description

Review building control systems for upgrades required to extend the life of the system.

Event Justification & Strategy

Control system was originally installed in 1991 but has undertaken multiple upgrades over the past years. A more detailed system review is required to determine the requirements to extend the life of the system.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to a reduction in the ability to control systems throughout the building.

03.5A-050 Sprinkler Systems

Component Description

Wet sprinkler system. Serves the basement up to the 8th floor.

Component Condition & Anticipated Replacement Date

System is reported to be in fair working condition. The building technician reported that the system has no certification stamp due to issues with the contractors changing during original construction. This is causing issues when having the system inspected. It is recommended that steps be taken to work toward receiving certification for the system. The system will require replacement in 2027.

Element Condition: Fair

CF Fire and Safety Code [03.5A-050 Sprinkler Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2016	CF Fire and Safety Code [03.5A-050 Sprinkler Systems]	$10,000

Event Description

Sprinkler system certification

Event Justification & Strategy

Due to contractor changing during construction, the wet sprinkler system has not been officially certified. This is an issue when trying to have the system inspected annually. A study to determine if the system can be certified is recommended.

Implication of Event Deferral (Risks)

Problems annually when completing inspections.

03.1A-010 CHP Related Heat Exchangers

Component Description

Armstrong (model # W-118-46-1S) shell and tube hot water/glycol heat exchanger. This unit receives water from the boiler and supplies glycol to roof top AHU heating coils and unit heaters throughout the buildings unconditioned spaces.

Component Condition & Anticipated Replacement Date

The unit was cleaned in 2013 and is reported to be working as designed. Due to the age of the unit it will require replacement in 2021.

Element Condition: Fair

CP Component replacement or new [03.1A-010 CHP Related Heat Exchangers]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2021	CP Component replacement or new [03.1A-010 CHP Related Heat Exchangers]	$52,420

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	5	Base Rate for Material and Labour	$7,013	EACH	$35,065
2	03. Mechanical	5	Construction Contingency	$1,052	EACH	$5,260
3	03. Mechanical	5	Average Total Project Soft Costs	$2,419	EACH	$12,095

Event Description

Replace hot water/glycol heat exchanger.

Event Justification & Strategy

System will be at the end of its useful life and will require replacement in 2021. New unit should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption. The event should be completed during the summer when the requirement for heat, and therefore the effect on tenants, is minimal.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of heat to AHU's and unit heaters.

03.1A-040 Heating & Cooling Piping Systems

Component Description

General heating black iron piping throughout the building including backflow prevention.

Component Condition & Anticipated Replacement Date

Heating piping systems were installed in 1991 during major renovation. It is reported that the building operators are finding leaks during start up and shut down of the heating system. Due to the age of the system and the problem associated with leaks it is recommended that the hot water piping be replaced by 2021.

Element Condition: Poor

Assessment Criteria	**Existence**
Corrosion	
Default	Yes
Leakage	
Default	Yes

CP Component replacement or new [03.1A-040 Heating & Cooling Piping Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2021	CP Component replacement or new [03.1A-040 Heating & Cooling Piping Systems]	$1,308,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	12000	Base Rate for Material and Labour	$73	m²	$876,000
2	03. Mechanical	12000	Construction Contingency	$11	m²	$132,000
3	03. Mechanical	12000	Average Total Project Soft Costs	$25	m²	$300,000

Event Description Replace heating piping systems.

Event Justification & Strategy

Heating piping is starting to leak and is reaching the end of its useful life. Repairing leaks as they happen is wasteful as the entire system must be drained to complete repairs. Replacing the entire system will reduce downtime and will save money by eliminating leaks. This event should take place in the summer and be completed in stages to reduce the effect on tenants. The event should be carried out at the same time as the boiler replacement as these system are nearing the end of the useful life and the same time.

Implication of Event Deferral (Risks)

Event deferral could lead to water damage due to leaks, decreased performance, and increase chance of system failure leading to loss of heat throughout the building.

03.1A-050 Boilers

Component Description

Two natural gas fired Weil-McLain cast iron boilers - model # BL 1588WF. The boilers provide hot water to all baseboard heaters, and the glycol heat exchangers that supply the roof top AHU's heating coils and the tower, garage, and loading dock space heaters. The units were originally oil-fired and were converted to natural gas in 2008. Boilers located in the basement mechanical room. The units are in fair condition as they were installed in 1991 and are reported to be working well. With an expected useful life of 30 years, they will be due for replacement in 2021.

Component Condition & Anticipated Replacement Date

The boilers are reported to be working well with no issues reported. They will be due for replacement in 2021. Cast iron boiler of this construction can work well past their useful life if well maintained. Further study will be required to determine if the useful life can be extended.

Element Condition: Fair

CP Component replacement or new [03.1A-050 Boilers]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2021	CP Component replacement or new [03.1A-050 Boilers]	$308,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	4000	Base Rate for Material and Labour	$51	Bhp	$204,000
2	03. Mechanical	4000	Construction Contingency	$8	Bhp	$32,000
3	03. Mechanical	4000	Average Total Project Soft Costs	$18	Bhp	$72,000

Event Description

Replacement of both cast iron boilers. Costing tool quantities have been modified to better represent actual costs.

Event Justification & Strategy

Units will be at the end of their useful life and will need to be replaced. New units should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption. The event should be completed during the summer when the requirement for heat, and therefore the effect on tenants, is minimal.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of heat throughout the building.

03.3A-015 Plumbing Fixtures and Accessories

Component Description

Plumbing fixtures throughout the building.
24 - Urinals
52 - Toilets
32 - Automatic sinks
23 - Manual sinks
11 - Water coolers

Component Condition & Anticipated Replacement Date

Plumbing fixtures were installed in 1991 and are in fair condition. Fixtures will not require replacement until 2021.

Element Condition: Fair

CP Component replacement or new [03.3A-015 Plumbing Fixtures and Accessories]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2021	CP Component replacement or new [03.3A-015 Plumbing Fixtures and Accessories]	$300,188

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	142	Base Rate for Material and Labour	$1,414	EACH	$200,788
2	03. Mechanical	142	Construction Contingency	$212	EACH	$30,104
3	03. Mechanical	142	Average Total Project Soft Costs	$488	EACH	$69,296

Event Description

Replace plumbing fixtures throughout the building.

Event Justification & Strategy

Fixtures will be at the end of their useful life and will require replacement. Fixtures have been well maintained and may last another 10 years past replacement date. A more detailed review of the condition is recommended closer to the replacement date to determine which fixtures require replacement.

Implication of Event Deferral (Risks)

Possible failure of the fixtures or poor esthetics.

03.3A-040 Water Treatment Systems

Component Description

Reverse Osmosis water treatment system. This system treats the potable water in the building as well as the water used for the ultra sonic humidification systems.

Component Condition & Anticipated Replacement Date

System was installed in 2001 with an addition in 2008. The system is reported to be good working condition and will not require replacement in 2021.

Element Condition: Average

CP Component replacement or new [03.3A-040 Water Treatment Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2021	CP Component replacement or new [03.3A-040 Water Treatment Systems]	$63,820

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	10	Base Rate for Material and Labour	$4,269	sum	$42,690
2	03. Mechanical	10	Construction Contingency	$640	sum	$6,400
3	03. Mechanical	10	Average Total Project Soft Costs	$1,473	sum	$14,730

Event Description

Replace Reverse Osmosis water treatment system.

Event Justification & Strategy

System and components will be at the end of their useful life and will require replacement. The work should be done during unoccupied hours as it will effect the potable water in the building.

Implication of Event Deferral (Risks)

Possible loss of potable water in the building.

03.1A-047 Chemical Feed System

Component Description

220L glycol tank and glycol fill pump. System provides glycol to the Armstrong shell and tube heat exchanger.

Component Condition & Anticipated Replacement Date

System is in good condition and will not require replacement in 2023.

Element Condition: Good

CP Component replacement or new [03.1A-047 Chemical Feed System]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2023	CP Component replacement or new [03.1A-047 Chemical Feed System]	$12,764

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	2	Base Rate for Material and Labour	$4,269	sum	$8,538
2	03. Mechanical	2	Construction Contingency	$640	sum	$1,280
3	03. Mechanical	2	Average Total Project Soft Costs	$1,473	sum	$2,946

Event Description

Replace glycol tank and pump system.

Event Justification & Strategy

Units will be at the end of their useful life and will require replacement.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of condition air throughout the building.

03.3-025C05 Domestic Hot Water Tanks

Component Description

Two 100 gallon Giant domestic electric hot water heaters. The units are located in room 042 and room 133B.

Component Condition & Anticipated Replacement Date

Units are in good condition, installed in 2005. These unit will not require replacement until 2025.

ACL Level: ACL 2 - Check List

Element Condition: Average

CP Component replacement or new [03.3-025C05 Domestic Hot Water Tanks]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2025	CP Component replacement or new [03.3-025C05 Domestic Hot Water Tanks]	$25,738

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	757	Base Rate for Material and Labour	$23	L	$17,411
2	03. Mechanical	757	Construction Contingency	$3	L	$2,271
3	03. Mechanical	757	Average Total Project Soft Costs	$8	L	$6,056

Event Description

Replacement of two electric domestic hot water tanks.

Event Justification & Strategy

Units will be at the end of their useful life and will require replacement. New units should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of hot water throughout the building.

03.5A-050 Sprinkler Systems

Component Description

Wet sprinkler system. Serves the basement up to the 8th floor.

Component Condition & Anticipated Replacement Date

System is reported to be in fair working condition. The building technician reported that the system has no certification stamp due to issues with the contractors changing during original construction. This is causing issues when having the system inspected. It is recommended that steps be taken to work toward receiving certification for the system. The system will require replacement in 2027.

Element Condition: Fair

C Physical [03.5A-050 Sprinkler Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2027	C Physical [03.5A-050 Sprinkler Systems]	$576,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	12000	Base Rate for Material and Labour	$32	m²	$384,000
2	03. Mechanical	12000	Construction Contingency	$5	m²	$60,000
3	03. Mechanical	12000	Average Total Project Soft Costs	$11	m²	$132,000

Event Description

Replace sprinkler system at the end of its useful life.

Event Justification & Strategy

System will be at the end of its useful life and will require replacement. Due to the effect on building operations this replacement will need to be carried out in stages to reduce effect on tenets.

Implication of Event Deferral (Risks)

Possible loss of sprinkler during emergency.

03.3A-020 Plumbing Pumps

Component Description

Sump pumps located in loading dock,freight elevator tunnel, room 030, workshop room 027, and the tunnel.

Component Condition & Anticipated Replacement Date

Pumps were all replaced 2008. These pumps will not require replacement until 2028.

Element Condition: Average

CP Component replacement or new [03.3A-020 Plumbing Pumps]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2028	CP Component replacement or new [03.3A-020 Plumbing Pumps]	$23,336

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	4	Base Rate for Material and Labour	$3,903	EACH	$15,612
2	03. Mechanical	4	Construction Contingency	$585	EACH	$2,340
3	03. Mechanical	4	Average Total Project Soft Costs	$1,346	EACH	$5,384

Event Description

Replace building sump pumps.

Event Justification & Strategy

Pumps will be at the end of their useful life and will require replacement. The pumps in the freight elevator and loading dock are located in a confined space and therefore require special consideration when replacing.

Implication of Event Deferral (Risks)

Loss of pumps could lead to flooding.

03.1A-020 Duct Systems

Component Description

General ventilation and distribution duct systems.

Component Condition & Anticipated Replacement Date

Duct are reported to be in average condition. They were installed in 1991 and will require replaced in 2031.

Element Condition: Average

CP Component replacement or new [03.1A-020 Duct Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2031	CP Component replacement or new [03.1A-020 Duct Systems]	$1,884,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	12000	Base Rate for Material and Labour	$105	m²	$1,260,000
2	03. Mechanical	12000	Construction Contingency	$16	m²	$192,000
3	03. Mechanical	12000	Average Total Project Soft Costs	$36	m²	$432,000

Event Description

Replace general ventilation and distribution duct systems.

Event Justification & Strategy

Duct work will be at the end of its useful life and will need replacement. Work will need to be done in stages so as not to effect indoor air quality for building occupants.

Implication of Event Deferral (Risks)

Deferral of event could lead to reduce air quality and efficiency.

03.4A-060 Diesel Generator Fuel Supply Systems

Component Description

Emergency diesel generator 909 liter storage tank and associated fuel supply systems.

Component Condition & Anticipated Replacement Date

Tank is estimated to be installed around 2001. Very little information available on site. This tank should be replaced 2031.

Element Condition: Good

CP Component replacement or new [03.4A-060 Diesel Generator Fuel Supply Systems]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2031	CP Component replacement or new [03.4A-060 Diesel Generator Fuel Supply Systems]	$157,171

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	1	Base Rate for Material and Labour	$105,131	sum	$105,131
2	03. Mechanical	1	Construction Contingency	$15,770	sum	$15,770
3	03. Mechanical	1	Average Total Project Soft Costs	$36,270	sum	$36,270

Event Description

Replace tank for diesel generator.

Event Justification & Strategy

System information on-site is not available. It is assumed the tank will be due for replacement in 2031. This tank should be assessed for useful life remaining before replacement.

Implication of Event Deferral (Risks)

Possible risk of loss of emergency power is tank systems fail. Also an increase risks of fuel leaks.

03.1A-025 Roof Top AHU - Heat&Cool

Component Description

Three McQuay Roof Top Air Handling Units located on the roof.

RTU#1 - 100 Ton McQuay model # RPS100CSW, serves floors 5/6/7.
RTU#2 - 90 Ton McQuay model # RPS090DLW, serves basement level and shares floors 1/2/3/4 with RTU3.
RTU#3 - 90 Ton McQuay model # RPS090DLW, serves floors 1/2/3/4.

Component Condition & Anticipated Replacement Date

All three units were replaced in 2012 and are in good condition. These units have a average useful life of 25 years and will not require replacement until 2037.

Element Condition: Good

CP Component replacement or new [03.1A-025 Roof Top AHU - Heat&Cool]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2037	CP Component replacement or new [03.1A-025 Roof Top AHU - Heat&Cool	$2,093,000

Cost Lines

Assembly Number	Source	Qty	Description	Unit Cost	Unit of Measure	Assembly Costs
1	03. Mechanical	280	Base Rate for Material and Labour	$5,000	Cool tons	$1,400,000
2	03. Mechanical	280	Construction Contingency	$750	Cool tons	$210,000
3	03. Mechanical	280	Average Total Project Soft Costs	$1,725	Cool tons	$483,000

Event Description

Replace roof top air handling units at the end of their useful life.

Event Justification & Strategy

Units will have reached the end of their useful life and will require replacement. New units should be sized for the current load requirements. Advances in technology may provide an increase in cost saving, performance, and reduce energy consumption. The event should be completed in three stages to reduce the effect on tenants.

Implication of Event Deferral (Risks)

Event deferral could lead to decreased performance, and increase chance of system failure leading to loss of conditioned air throughout the building.

04. Electrical

04.3A-020 Exit Lighting

Component Description

Standard exit lights. They are to the current standard (running man).

Component Condition & Anticipated Replacement Date

Light were replaced in 2016. Not expected to require replacement before 2036.

Element Condition: Excellent

04.3A-040 Emergency Lighting

Component Description

90% of the building emergency lighting is ceiling 2'x4', three lamp fixtures. There are a few areas that contain battery power Emerge-lite pack lighting with remote heads. Last major upgrade was 1991.

Component Condition & Anticipated Replacement Date

All fixtures are at the end of their useful life. Emergency lights would be included in a Workplace 2.0 retrofit. No separate event has been included for the emergency lights.

Element Condition: Average

04.4A-010 Grounding Systems

Component Description

Grounding consists of 1 - #3/0 green RW90 Xlink conductor in a one inch conduit.

Component Condition & Anticipated Replacement Date

Grounding system is in good condition at the time of the report. No replacement anticipated.

Element Condition: Good

04.5A-010 Fire Alarm System

Component Description

Fire System is a new Simplex addressable system. The system is a Class B conventional system which is fully operational.

Component Condition & Anticipated Replacement Date

Current fire alarm system is in new condition and showed no signs of any alert problems or alarm faults.

04.5A-020 Emergency Power System

Component Description

Emergency Power System is a 400 KW Kohler Generator the unit model is a 600 Volt 3 phase 4 wire generator.

Component Condition & Anticipated Replacement Date

The present system is new within the past five years. Annual full load testing is being done by maintenance staff and should continue.

Element Condition: Good

04.5A-040 Security System

Component Description

Several areas contain cameras as part of the security system and a UCAN Lock systems. Also there is a card access system in place for the exterior doors.

Component Condition & Anticipated Replacement Date

New system in good condition.

Element Condition: Good

04.1A-010 Primary Switch Gear

Component Description

Main Service is a 600/347 volt 2000 amp system located in the basement electrical room. The service is fed from a high voltage vault adjacent the electrical room. The vault and all the equipment is owned and maintained by NSPC.
There are four fused distribution cells and one dedicated feed to the roof top mechanical equipment. There are three electrical meters that monitor the main service, mechanical equipment and the emergency equipment.

Component Condition & Anticipated Replacement Date

Presently in good condition and has undergone a major maintenance program in 2009. The main electrical meter has failed to communicate any data. The meter should be replaced as soon as money is available this year The service entrance equipment should remain in service for another 20 years .

Element Condition: Good

R Operational [04.1A-010 Primary Switch Gear]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2017	R Operational [04.1A-010 Primary Switch Gear]	$10,000

Event Description

Replace the main electrical meter. The main electrical meter relays all data from the other two meters and its own data to the logging computer This meter also monitors the harmonic content of the power in the building 600 volt system Once the meter is activated the electrical 600 volt system can be reviewed for harmonic content.

Event Justification & Strategy

If the meter is not replaced information will not be available for harmonic analysis. Building electronic equipment requires an analysis to ensure there are no severe amounts of Harmonics present within the building power distribution system.

Implication of Event Deferral (Risks)

Deferral of replacement of meter will limit the analysis of the power quality. Important equipment may shut own without warning and will shorten the life cycle of the electrical distribution system.

04.2A-010 Secondary Switchgear

Component Description

Equipment was last upgraded in 1991. Life cycle for equipment is another 20 years and greater especially if the current maintenance program is continued. Complete Maintenance overhaul in 2016 is required to ensure integrity of equipment.

Component Condition & Anticipated Replacement Date

Equipment is in good condition but requires the continuation of an annual and a 3-5 year maintenance program to confirm its proper operation and integrity.

Element Condition: Good

R Operational [04.2A-010 Secondary Switchgear]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2017	R Operational [04.2A-010 Secondary Switchgear]	$25,000

Event Description Electrical equipment has not had a full maintenance since 2010 and is past the requirement for full maintenance. Remove all covers and panels of the existing electrical equipment. Clean all equipment.

Event Justification & Strategy

Regular preventive maintenance will extend the equipment useful life. Full maintenance has not been done since 2010.

Implication of Event Deferral (Risks)

Deferral of the proper maintenance program will shorten the life cycle of the equipment and could without warning shut down critical equipment.

04.2A-020 Secondary Transformer

Component Description

Transformer units are typical dry core type 600/120/208volt, 3 phase 4 wire and are currently undergoing an annual and 3-5 year maintenance program. All units were in operation at the time of the visit.

Component Condition & Anticipated Replacement Date

All transformers show signs of significant heating consistent with high harmonic content on the 208/120 volt distribution. The heating is consistent with the building computer loads.

Element Condition: Fair

RP Component replacement or new [04.2A-020 Secondary Transformer]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2017	RP Component replacement or new [04.2A-020 Secondary Transformer]	$225,000

Event Description

Overall harmonic mitigating transformers should replace the existing transformers as the space is changed to work place 2.0 this will ensure clean reliable power to the work desk for the next 20 years. Cost is for complete replacement of the secondary transformers. Transformer could be replaced on one for one basis at $18,000 each.

Event Justification & Strategy

To ensure the integrity of the electrical equipment.

Implication of Event Deferral (Risks)

Risk of equipment failure.

04.2A-050 Cabling, Raceways & Bus Ducts

Component Description

All vertical and horizontal raceways are rigid and EMT conduit. Ceiling area also contains piping and armored cable drops.

Component Condition & Anticipated Replacement Date

All evidence showed that the raceway and wire accessories were in good order at the time of the visit. The Maintenance Electrician has done a good job monitoring the electrical projects.

Element Condition: Average

RO Electrical [04.2A-050 Cabling, Raceways & Bus Ducts]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2017	RO Electrical [04.2A-050 Cabling, Raceways & Bus Ducts]	$10,000

Event Description

Some vertical cable in the electrical rooms and communication rooms require basic clean up to ensure the integrity of the building electrical distribution. Ceiling cable distribution requires clean up and proper supports and installation throughout building areas.

Event Justification & Strategy

Canadian Electrical Code requirements and best practices dictates the installation and proper raceway distribution and supports.

Implication of Event Deferral (Risks)

Deferral of the proper installation of raceway distribution will eventually lead to poor voltage and equipment failure.

04.3A-010 General Lighting

Component Description

General lighting consists of 347 volt 2x4 fixtures T8 CFI models last upgraded in 1991. The lighting panels are with Douglas switches and Delta controls with individual motion controls.

Component Condition & Anticipated Replacement Date

According to IES lighting standards once the light fixtures have reached twenty years of operation then the fixtures have reached the end of their useful life The current lighting systems is 25 years old A new lighting system should be installed as floors are upgraded to Workplace 2.0 standard.

Element Condition: Fair

CP Component replacement or new [04.3A-010 General Lighting]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2018	CP Component replacement or new [04.3A-010 General Lighting]	$800,000

Event Description

A new lighting system should be installed as floors are upgraded to Workplace 2.0 standard. Cost is approximately $160,000 per floor

.

Event Justification & Strategy

Replace lighting as floors are converted to Workplace 2.0.

Implication of Event Deferral (Risks)

Inefficient lighting, additional electrical consumption and additional GHG emissions.

04.3A-030 Exterior Lighting

Component Description

Exterior lighting is typical exterior perimeter sodium vapor fixtures that were all working and are presently on a timing system.

Component Condition & Anticipated Replacement Date

Existing fixtures are at their end of their useful life of 20 years. Replacement should be scheduled in 2017.

Element Condition: Poor

CP Component replacement or new [04.3A-030 Exterior Lighting]

Current event Year (YYYY)	Brief Description (40 Characters)	Estimated Event Cost
2018	CP Component replacement or new [04.3A-030 Exterior Lighting]	$15,000

Event Description

Replacement with LED type will provide the required lighting performance for this site and reduce the energy consumption by 50%. The main entrance heritage fixtures should remain and only the lamps be upgraded.

Event Justification & Strategy

Existing fixtures are at their end of their useful life of 20 years. Replacement with LED type will provide the required lighting performance for this site and reduce the energy consumption by 50%.

Implication of Event Deferral (Risks)

Potential failure. Increased energy consumption.

Halifax, Nova Scotia
Dominion Public Building
1713 Bedford Row

HERITAGE CHARACTER STATEMENT

The Dominion Public Building was constructed in 1935. It was designed by a team under Supervising Architect Eric Temple of the Chief Architect's Branch of the Department of Public Works. A four storey addition was constructed in 1962. Public Works Canada is the custodian. ~~See~~ FHBRO Building Report 89-42.

Reasons For Designation

The Dominion Public Building was designated Recognized because of its historical associations, its importance as a work of architecture, and its local and environmental significance.

Built under the Public Works Construction Act, the Dominion Public Building is a significant example of projects undertaken by the federal government to stimulate local economies during the Great Depression.

The building is a very good example of a large Art Deco office building, and one of the first such designs to be produced by the Chief Architect's office. Executed in the Classical Moderne style, the building exhibits characteristics of classicism in its basic composition, which is divided into three sections suggesting the base, shaft and capital of a classical column; and modernity in the Art Deco elements of its design: stepped massing, smooth stone finish and bands of abstract decoration. The vertically oriented stepped facade is also characteristic of Art Deco and gives the building a significant presence on Bedford Row.

The craftsmanship and materials of the Dominion Public Building are of high quality, with dressed sandstone and granite at the exterior and marble, terrazzo, mosaic and bronze fittings in the principal public spaces. The exterior and interior decorations are notable for their explicitly Canadian subject matter which reflects the desire of several Canadian designers for truly Canadian forms of expression.

The Dominion Public Building was the first sky-scraper to be constructed in Halifax, and it continued to dominate the skyline until the 1960s. It is a familiar landmark in the city.

Character Defining Features

The heritage value of the Dominion Public Building resides in all aspects of its Classical Moderne design as found particularly on the exterior and the ground floor interior. The design of the building is notable for its carefully proportioned, stepped-back form, smooth wall surfaces of Wallace sandstone with polished granite at the base and main

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Dominion Public Building (Continued)
1713 Bedford Row

entrance, vertically-oriented window recesses, decorative detail, and architectural metals and fittings, as well as for the plan, finish and details of the principal public spaces.

The exterior of the building exhibits the massing and strong vertical orientation which is typical of the "stepped, set-back" Art Deco skyscraper of the 1920s and 30s. The main Bedford Row elevation of the Dominion Public Building is made up of a recessed central tower which is flanked by lower office blocks which project to the sidewalk on either side. The building's strong vertical orientation is further strengthened by narrow, double-hung and casement windows which, singly and in pairs, are set in vertical recesses which extend the height of the building. Slit windows in the central tower further emphasize its height.

The other facades of the building continue the stepped massing and strong verticality of the Bedford Row facade. This arrangement of the building masses is highly characteristic of the period and is an important feature of the building.

The impact of the 1962 addition to the building was minimized by limiting its height to four storeys, and by using similar materials, compatible massing and a simplified facade with "punched" windows. This approach resulted in a compatible neighbour.

The facades are highlighted by simplified, but characteristic decorative carvings in the masonry, carried out in the stylized Art Deco mode, an approach to decoration which is typical of Classical Moderne architecture. At the Dominion Public Building these include abstract geometric friezes and marine motifs such as waves, dolphins and sea horses. Typical of many Art Deco buildings, this decoration is concentrated at the street level, the roof-line and around the main entrance, the intervening space being without decoration. These features of the exterior are characteristic of classical Moderne architecture and should be carefully protected and maintained. The masonry should be the subject of an ongoing maintenance program and appropriate conservation expertise involved in any programs of repair or restoration. Precedents of colour, proportion and material should be respected.

The exterior elevations have survived virtually intact except for the introduction of an intrusive doorway and out-of-scale light fixtures which flank the entrance. These elevations should be maintained with all their verticality, articulation, plainness or detail. The existing aluminum door and frame units are incompatible with the design of the facade of the building. When it becomes necessary to replace these doors, new units which are more compatible with the design intent and precedent would considerably enhance the building.

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The alteration of any element of the exterior elevations would have a negative impact on the heritage character of the building. Any signage installed on the building should be designed using compatible forms and materials.

The main lobby and post office lobby is a striking example of Classical Moderne architecture as applied to interior design. Despite some alterations the plan of the postal services area it is intact and in excellent condition. The plan, massing and proportions are carefully handled and the use of decoration is as stylized as it is on the exterior. The materials are of high quality throughout. These include the use of bronze doors, birch woodwork, polished marble walls in two shades of grey, coordinated terrazzo floors, carefully detailed coffered plaster ceilings, hexagon-motif light fixtures and elevator doors and hardware in bronze and stainless steel or nickel. The figures in mosaic and terrazzo, the bronze wicket screens and particularly the "Edward VIII" sign board give special interest to the space. The spaces, design and materials of the main lobby area have survived virtually intact to the present day; every effort should be made to preserve and protect the design integrity and the individual elements of this quality interior and to incorporate these features in any future use of the space.

The building lightwell is intact in all respects. As the major plan element of the building it should be retained to function as a source of light for the interior office spaces.

The quality of finishes and detailing on the upper floors is standard and unexceptional. Features of interest in these areas are the elevator lobbies and fire-separating doors. This configuration and the doors themselves should be protected and incorporated in any future development scheme. The remainder of the floor areas of the building could be managed with some flexibility.

Aside from minor modifications for accessibility, the setting of the building is virtually unchanged. Although minor modifications to the secondary elevations could be considered, modifications which would detract from the dominant massing of the building and its clean uncluttered lines must be resisted.

1994.05.24

FEDERAL HERITAGE BUILDINGS REVIEW OFFICE

BUILDING REPORT: 89-42

TITLE: The Dominion Public Building
1713 Bedford Row
Halifax, Nova Scotia

SOURCE: Martha Phemister, Architectural History Branch

INTRODUCTION

The Dominion Building is a conspicuous element of Halifax's downtown community (Figure 1).[1] Constructed in 1935 to fight a depression economy, it was owned and administered by the Canada Post Corporation (CPC) for many years. The CPC has moved its administrative offices to Purdy's Wharf II Tower leaving the building vacant, save for public access to the main floor postal boxes. Negotiations are underway to transfer the property back to Public Works Canada, who will assess the feasibility of moving their own offices into the building, with an occupancy date of 1 April 1991. An extensive renovation program, amounting to millions of dollars, would have to be undertaken. One of the few federal examples of the Art Deco style in Canada, its value is retained on the ground floor and the exterior. It is similar in style and scale to the Dominion Buildings at London, Ontario (FHBRO 89-90) and Winnipeg, Manitoba (FHBRO 89-109), not yet evaluated by the FHBRO.

HISTORICAL ASSOCIATIONS

Thematic

The 1935 Halifax Dominion Building was built as part of a federally-generated building program, unprecedented in Canada's history and designed to respond to the depressed economic climate of the 1930s. This period saw the erection of a number of large-scale federal, or "Dominion,"[2] buildings in urban centres across the country. This Dominion building was constructed in 1935, a year after the passage of the Public Works Construction Act (PWC Act). Like others of similar scale, the Halifax building paved the way, architecturally and symbolically, for a new era of modern design and helped to elevate the reputation of government-sponsored building and its role as patron. Additionally, types such as this reflected immediate concerns for the economic climate of the day and remain as symbols of this fiscal responsibility.

The stockmarket crash and economic decline that began in May of 1929 continued well into April of 1933.[3] Capital investment in construction, machinery and equipment, perceived to be a mainstay of Canada's hoped-for economic recovery, plummeted to its lowest level that year, causing "a main drag on the economy."[4] Although the slide halted by 1934, Prime Minister R. B. Bennett initiated a special program of public works "to provide jobs and accelerate the economy" and to be financed under the somewhat unorthodox issuance of a dominion bank note, before the official opening of the Bank of Canada in 1935.[5] The PWC Act allocated $40 million for 185 projects and placed dominion buildings in urban areas with a high concentration of unemployment,[6] among them Regina, Winnipeg ($1,500,000), London ($1,500,000) and Halifax ($500,000).[7]

The act did little to boost the construction industry but actively encouraged the employment of local tradesmen.[8] For the Halifax Dominion Building, over half of the 20 sub-contractors were from the Maritimes. The act further maximized its guidelines for manual labour by stipulating that foundations be dug by hand rather than by steamshovel, thus satisfying relief proponents that "an idle machine does not go on the dole and doesn't vote, but an idle man does."[9] Both arms of the construction industry, steel and concrete, were to be favoured equally.

The Halifax Dominion skyscraper reflected a design departure in the Department of Public Works, nudged out of its conservatism by the influence of mainstream architects employed on government commissions.[10] It additionally responded to a broader diversification in federal roles and functions in its large, multi-storied format. In its 14 stories, it concentrated the services of Income Tax and Customs; Departments of Interior, Agriculture and Trade and Commerce; Public Works, Transport; Censorship; Marine Radio Station and the Post Office. For Halifax, a construction project of this magnitude was a dramatic symbol of the government's determination to take charge of the economy and bring an end to unemployment.

Person/Event

There is no person or event of significance associated with the history of the Halifax Dominion Building.

Local Development

On its completion in 1937, the Halifax Dominion Building was heralded by the Engineering and Contract Record as "one of the most impressive buildings in the Maritimes" and the "last word in beauty, modern utility and permanence."[11] The supervising architect, S. P. Dumaresq, boasted that his project "the new Federal building in Halifax, though not as large as many buildings of the neighboring south is one of the largest in Canada and is almost as fine as any on the continent".[12] While its role in the community as a "tribute to progress" may have been overstated, this impressive skyscraper was by no means out of step with the history of Halifax. Throughout its history, Halifax has been dependent on national and global affairs. Its original appointed role as a military/government outpost encouraged the growth of a "metropolitan maturity"[13] out of proportion to its small size, and far in advance of other Atlantic coast cities. The scale and sophistication of the Halifax building, therefore, melded well with this tradition. As the first skyscraper in the city, it visually dominated the skyline until highrise development of the 1960s and the advent of the tall bank tower, among them the Royal Bank (1968) and the Bank of Montrèal (1972).

ARCHITECTURE

Aesthetic Design

The Halifax Dominion Building (Figures 3 to 8) exhibits features of the Modernistic style, employed prolifically in the construction of the "set-back" skyscraper of the 1920s and 1930s. Although initially conceived of as an "outside" commissioned work such as the London, Ontario and Winnipeg Dominion Buildings, the Halifax Dominion Building became, through a turn of events, one of the first in-house Art Deco designs emanating from the Chief Architect's Office, after the passage of the Public Works Construction Act.[14] Its austerity in appearance and plainness typified this provenance.

The seven-storey structure, rising to 14 stories at the tower apex, contains both the massing and decoration of the Art Deco and the visual impact of buildings designed under the influence of the New York Zoning Law of 1916. Particularly appropriate to the urban setting, the interpretation of this style was characterized by a symmetry and balance, flat volumetric compositions, smooth lines and the use of modern decorative elements. The lack of equal treatment to all four elevations makes the Halifax Dominion Building a noteworthy, but plainer and more austere, example of its type.

Occupying an entire city block, it was designed to conform to a basic square grid (slightly wedge-shaped), although a 1962 four-storey addition has extended the north elevation outward (see Figure 7).[15] While the structure is contained in a massive 144 feet by 122 feet, its visual bulk is minimized by breaking up the design into smaller masses that build up toward the domed tower. This new approach to massing kept the building within human scale at its street facade and added variety to the design.

The lowest storey is expressed as a separate unit, with its granite-faced surface and Art Deco entranceway denoting the base of the building. The next twelve stories, sheathed in ochre-coloured Wallace sandstone, are expressed in a system of "step-backs" which, despite the modern tones to the building, cling to a classicized tri-partite division. A central three-bay tower rises in niche-like style, with three-bay office blocks flanking each side and rising to the tower roof, which narrows in ziggurat fashion to considerably smaller proportions at the top. To emphasize the vertical nature of these blocks, the windows are set within recesses and the whole is crowned by the stepped-back tower design. The vertical thrust and intended smooth lines of the wall surface are interrupted, however, by the noticeable pointing of the Wallace sandstone veneer and the rather somber colour of the stone itself.

The decorative approach of the Halifax Dominion Building falls within proscribed Art Deco programs, although on a simplified scale. The iconography, meant to carry symbolic meaning for these stripped-down modernistic structures, was typically based on Canadian themes, in this case, that of nautical and maritime motifs (see Craftsmanship and Materials). Many Art Deco buildings concentrated the ornamentation at street level and at the roofline, with the intervening space devoid of decoration. This had the effect of lending scale at close range and set a certain tension between the entranceway and the roofline. Thus, the enhanced entranceway of the Halifax Dominion Building (Figure 5) is set within a two-storey entry pavilion with a decorative, patterned band of "sound waves" on the entranceway surround, patterned bronze window grates, and a secondary frieze bronze panel with the name "Post Office" carved in relief. A tertiary frieze panel above the entry doors completes the effect, along with bronze light fixtures, the name "Dominion Public Building" and a Coat of Arms on a raised parapet above. The architrave moulding is defined by an alternating pattern of fluting and stylized floral pattern with anchors marking the corner. Dolphins, waves, ships and seahorses provide relief to the broad expanses of sandstone walls, but on a minimized scale.

There were variations in the way architects dealt with the "step-back" requirements, such as the less successful tower arrangement of the building mass in the Regina Federal Building (Figure 15). The Halifax Dominion Building shares with other Canadian Art Deco buildings a carefully developed relationship to the street, although a corner entrance, such as that of the London Dominion Building (Figure 17), might have allowed a better vantage point to fully appreciate its decorative program. The whole is suffused by a classicism yet without the overt use of the classical orders, as in the strong tripartite division of the Windsor Federal Building. The set-back skyscraper was a type used for commercial building, as seen in the 1929 Alfred Building (Figure 16), Montreal, with similar treatment of the tripartite regressions, growing progressively smaller to the top in a strong, smooth statement of architectural mass.

This federal design type first appeared in plans for the Dominion building at London and Winnipeg. While these two are more classical in spirit, their wall treatment was distinctly modern and the smooth, crisp surface of the finished stone wall was much in contrast to the Halifax Dominion Building. In its massing and limited decorative program the Halifax Dominion Building is nevertheless an identifiable and important federal essay in the Art Deco style.

Functional Design

In its application of steel-cage construction, high-speed elevators and the slender tower format, universally in use by the early 1920s,[16] the Halifax Dominion Building was not innovative in the Canadian context. Its functional merit rested with structural and theoretical concepts imported from Europe and popularized in New York's most notable skyscrapers, the Chrysler Building, the RCA Victor Tower and the Waldorf-Astoria, all built between 1928 and 1931.[17] It was based on the use of a structural skeleton, generally of steel, that could be covered by a thin, non-structural skin. This free-standing wall was set virtually at the wall surface and was designed to express, in visual terms, the nature of the construction.

The layout of the Halifax Dominion Building (Figure 13) conforms to the efficient operating of the various departments occupying the building. Customs warehouse and some postal responsibilities were housed in the basement area with access to the exterior by automatic doors on two sides. The regional offices of Customs and Excise, Trade and Commerce, Revenue and Agriculture occupied the upper stories. Internally, the plan is reflected on the outside, with the fifth to seventh floors configured in a U-shape and covering the whole area of the building, with an additional seven floors, rising in progressively smaller fashion in the tower. The plan allowed for high-speed passenger elevators, a spiral parcel chute and mail handling by trucks expedited by a system of loading platforms, with motor-operated sliding steel doors. Three banks of elevators serviced the seven floors, with two of them running to the ninth floor and a smaller automatic one servicing as far as the twelfth floor (these latter floors represent the constricted space of the tower). The inclusion of an elevated walkway for monitoring postal staff and other "modern" features may have added to its efficient use.

Craftsmanship and Materials

The mix of building textures and materials on this Art Deco building well matched the dictates of the Public Works Construction Act, which aimed to give equal work to all arms of the construction trade. The building features a judicious mix of granite, bronze, marble, copper, brass and steel. It was set securely on 62 reinforced concrete footings, each sunk to solid rock.[18] Sructural support is provided by a steel frame comprised of columns and floor beams (patented under the "Kane" system of steel construction). The application of concrete to fully encase the posts and of reinforced concrete for floor slabs added to the structural strength and additionally balanced the work of both arms of the construction trades, as encouraged by the PWC Act. The exterior is faced with sawn Wallace sandstone, backed with terra-cotta. The outside tower, sheathed in copper, has a cast iron finial.

Interior detailing in the public service areas of the Halifax Dominion Building was of a high standard and is still intact. The sumptuously-appointed marble lobby is accessed through grand bronze doors, set in an imposing granite two storey motive, on the Bedford Row front. There are cast and shallowly etched bronze panels above the door and in keeping with the "spirit of the Maritimes" a major decorative feature is the marble mosaic of the fishing schooner "Bluenose," under full sail. All doors throughout the public places on the ground floor are of solid bronze while the woodwork featured Nova Scotia birch.

The interior ornamentation highlighted the use of a variety of materials and local craftsmanship. As described in the Public Works Annual Report for 1935, the elevator halls and corridors were given terrazzo floors with marble borders and dadoes. The vestibule stair hall and post office public lobby have a moulded and panelled plaster ceiling with marble dado, and terrazzo panels in the floor, with marble borders and bases. The main steps have marble treads and risers, and balustrade and newels up to the second floor. The interior partitions were of terra cotta and the interior basement walls of brick.

Recent renovations and upkeep have been necessary. These include a roof replacement, completed in 1985; the original double-hung windows have posed problems, coming out of place and falling to the ground and necessitating replacements on the upper stories; possible leakage behind the large sandstone tiles, which, like others in the area, are susceptible to the acid rain and salt misting endemic to maritime regions. Original, intact features include elevators, brass appointments, mosaic work, washrooms, light fixtures, plaster stairwells, postal wickets (Figure 20) and office lay-out, on the majority of the office floors.

Designer

The design of the Halifax Dominion Building emanated the Chief Architect's Branch of the Department of Public Works (see Plan, Figure 12). An initial design for a federal building in Halifax, of classical and neo-georgian elements, was commissioned from architect J. L. Kingston in August of 1934 (Figure 11). This plan proved to be unsuitable and a project team under supervising architect Eric Temple, of the Chief Architect's Branch, then took over the project as part of an in-house design program. It was one of the more grand scale projects originating with this government department.

ENVIRONMENT

Site

The location of the Halifax Dominion Building is in the central business district (Figures 2, 21, 22). Unlike other neighboring structures, it does not orient towards the harbour, which has influenced the city's historical dependence on the water. It was designed to face the 1931 Bank of Nova Scotia (designed by John Lyle), still in existence on the other side of Bedford Row, so its present "constricted" siting on this city block remains unchanged (Figure 23). The four-storey 1962 addition on the north end is the only significant change to the site.

Setting

The setting of the Halifax Dominion Building is a .327 ha. area on a fully-occupied city block (Figure 24). It is a large prime downtown site and is situated among a number of commercial properties (Figure 23). While port-related functions were located along the waterfront, government and retail functions occupied the upper streets. The area is characterized by a number of other sandstone-clad structures, both solid and veneer, in the immediate area. The Art Gallery of Nova Scotia, for example, has been re-surfaced and repointed and the Bank of Nova Scotia (former head office) has similarly been cleaned and repointed, according to PWC officials.[19] The nearby Provincial Building, of sandstone, has not been subjected to a cleaning and retains a rather unappealing demeanour. The Halifax Dominion Building was the first highrise in Halifax. As part of the cityscape, its stature is equivalent to that of the nearby 16-storey Bank of Montreal and the 13-storey Royal Bank buildings and it therefore retains a visual prominence on the Halifax skyline.

Landmark

The 1974 Views Bylaw places restrictions on Halifax building heights in order to preserve an unobstructed view from Citadel Hill. This commendable bylaw has prevented buildings such as the Halifax Dominion Building from being dwarfed by office towers of staggering proportion, thereby preserving its visual impact and significance. Its distinctive cupola recalling that of St. Paul's Church is a familiar sight to Haligonians and serves to distinguish it from other tall structures in the central business district. It has been registered under the Nova Scotia Heritage Property Act (January 1990) as a "rare example of a particular style" and is regarded as an asset to the surrounding buildings.[20] The Halifax Dominion Building is part of an office zone of provincial and federal government offices and is well known to workers in downtown Halifax as the "old post office".

Endnotes

1. While Public Works Canada refers to this building as the Bedford Row Federal Building, its more common name is simply the "old post office" or the federal building.

2. The term "Dominion" was perhaps more in keeping with the Canadian context than "Federal" building, a term used in the United States.

3. See Robert B. Bryce, Maturing in Hard Times. Canada's Department of Finance through the Great Depression (Kingston and Montreal: McGill-Queen's University Press, 1986), The Institute of Public Administration of Canada, p. 59. See also Kenneth Buckley, Capital Formation in Canada, 1896-1930 (Toronto: McClelland and Stewart, 1955), The Carleton Library Series, No. 77, p. 65. This theory was developed in the landmark history of the depression by A. E. Safarian in his 1953 The Canadian Economy in the Great Depression. He argued that Canada's incomplete recovery from the Depression was due, not to external factors, but to a lack of business investment in construction.

4. Bryce, p. 59.

5. See Bryce, op. cit., p. 59. The expenditure on such works was limited to only $40 million and was mostly made during 1935, adding only perhaps about one-tenth to total expenditures on new construction that year. The equivalent to this program in the United States, the New Deal's Public Works Administration, oversaw the construction of some 1,300 buildings.

6. Prime Minister R. B. Bennett explained this make-work philosophy to an incensed Victoria City Council, which questioned the favoritism shown to large urban centres. In his words, the act was enacted:

> to provide work at centres where unemployment is greater, but it is not a measure to provide buildings on a per capita basis or merely for the purpose of expending money. Thus, the largest expenditures are in cities like Montreal, Toronto and Vancouver, where the urgent necessity for additional facilities affords the opportunity for supplying of a public need, and, at the same time, giving employment...The wants of Victoria with respect to public buildings are very limited, as you are well aware. In fact, it is better supplied than most communities. If we are to emerge from this depression, it must be on the basis of a realization of all parts of a country that effective action must be taken to meet the situation where the necessities are greatest.

Quoted from "The Mayor of Victoria Complains About the Public Works Act, 1934", D. Leeming to R. B. Bennett, Telegram, 26 June, 1934, reply, 27 June, 1934, University of New Brunswick Library. Quoted in Michiel Horn, ed., The Dirty Thirties. Canadians in the Great Depression (Toronto: Copp Clark Publishing Co., 1972).

7. The London and Winnipeg Dominion Buildings, by contrast, were allocated a sum of $1,500,000 each, while the Halifax Building was funded by a sum of $500,000. 185 projects were included in Schedule A of the Act. The funding provided for a range of depression works across the country, from repairs to wharfs and docks, Marine Department works, dry docks, Indian residential schools, harbour improvements and numerous public buildings. See Canada. 24-25 George V. Public Works Construction Act 1934.

8. Among the companies that received contracts as a result of the Halifax commission were Robb Engineering of Amherst, Nova Scotia, the Architectural Bronze and Iron Works of Toronto, the Mathews Conveyor Company (for the spiral mail chute bag) and the Canadian Metal Window and Steel Products, Toronto (for the Fenestra steel windows). For a complete listing see "Construction Features of the Dominion Public Building in Halifax, N. S." Engineering and Contract Record Vol. 50, No. 80 (July 7 1937), pp. 26-29.

9. "A Member of Parliament Warns Against the Use of Machinery in Public Construction Projects", Letter to R. K. Finlayson, quoted in Michiel Horn, The Dirty Thirties, op. cit., p. 293.

10. See Janet Wright, Building in the Bureaucracy. Architecture of the Department of Public Works 1927-1939. Thesis submitted for A Master of Arts (Art History), Queen's University, 1989; and her discussion of "Government Building," well outlined in The Canadian Encyclopedia, Vol. II (Edmonton: Hurtig Publishers), pp. 755-757.

11. See "Construction Features of the Dominion Public Building in Halifax, N. S." Engineering and Contract Record, op. cit.

12. S. P. Dumaresq, "The New Federal Building" Port and Province (November 1937), p. 17.

13. George A. Nader, Cities of Canada: Profiles of Fifteen Metropolitan Centres Volume II, (Macmillan of Canada, 1976), p. 28.

14. The timing of the awarding of the second contract to architect S. P. Dumaresq of Halifax came on 10 October, 1935, days before the defeat of Bennett in the federal election. This would dismiss, therefore, speculation that any form of patronage was involved, a point discussed by J. Wright. As she argues, "although most contracts had been signed prior to the election there were a few cases where architects, who had been appointed under [Bennett's] Conservative government, were quickly dismissed and replaced by other architects selected by the new Liberal government." See Wright, Building in the Bureaucracy, op. cit., p. 85

15. This addition was designed by Downie, Baker and Ahearn of Halifax.

16. For a discussion of these innovative technologies see Don Vlack, Art Deco Architecture in New York 1920-1940 (Toronto: Fitzhenry and Whiteside, 1974), p. 77.

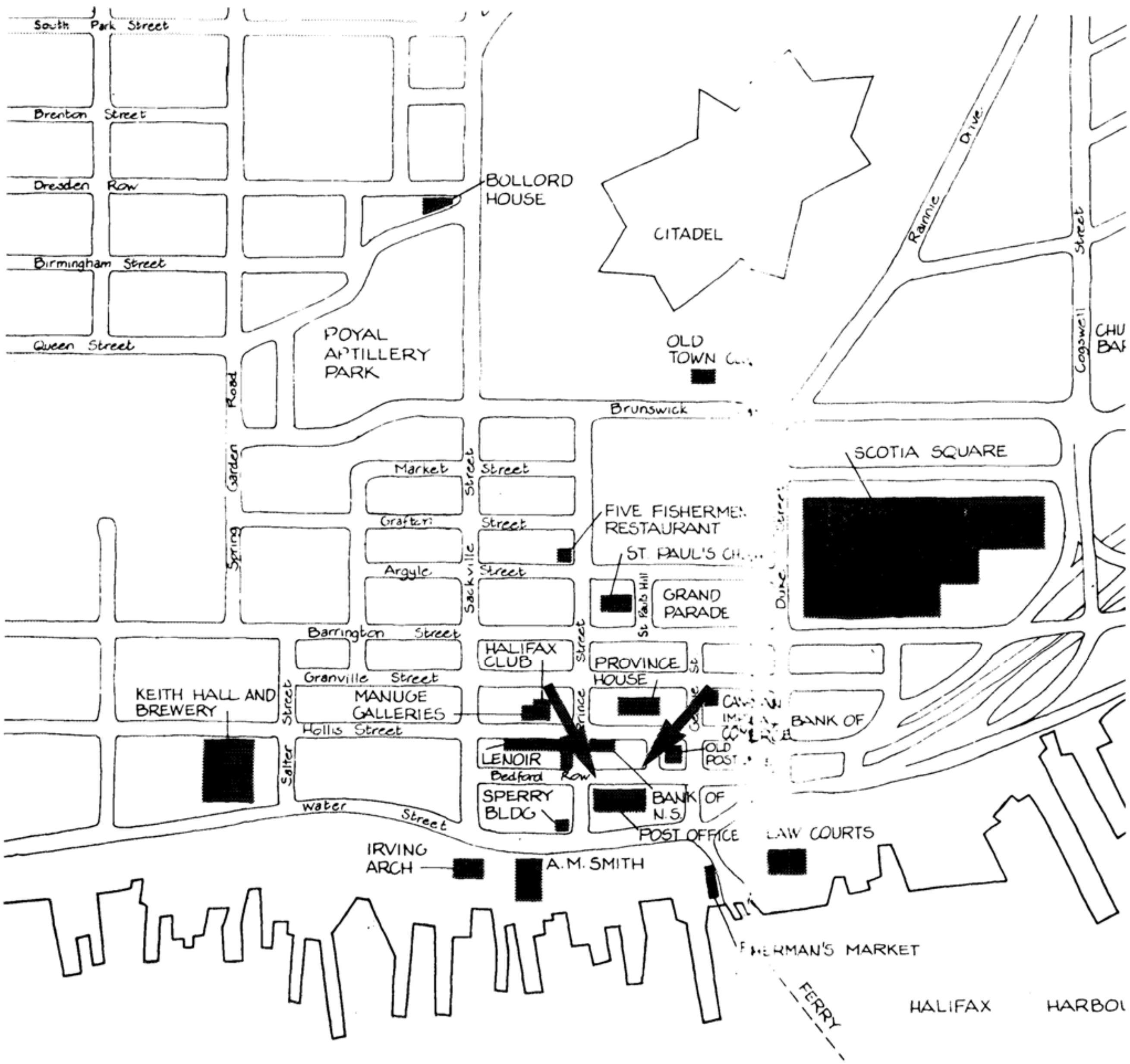
17. See Cervin Robinson and R. H. Bletter, The Skyscraper Style. Art Deco New York (New York: Oxford University Press, 1975), p. 38.

18. An additional expenditure of $4,299 was authorized for further excavation work on the building, to a depth at which bedrock was anticipated. It was found necessary to remove a quantity of loose laminated rock before the bed-rock was reached and for which reason footings had been designed. National Archives of Canada, RG 11, Department of Public Works. Volume 3267, "Public Works Estimates", 8 January 1936.

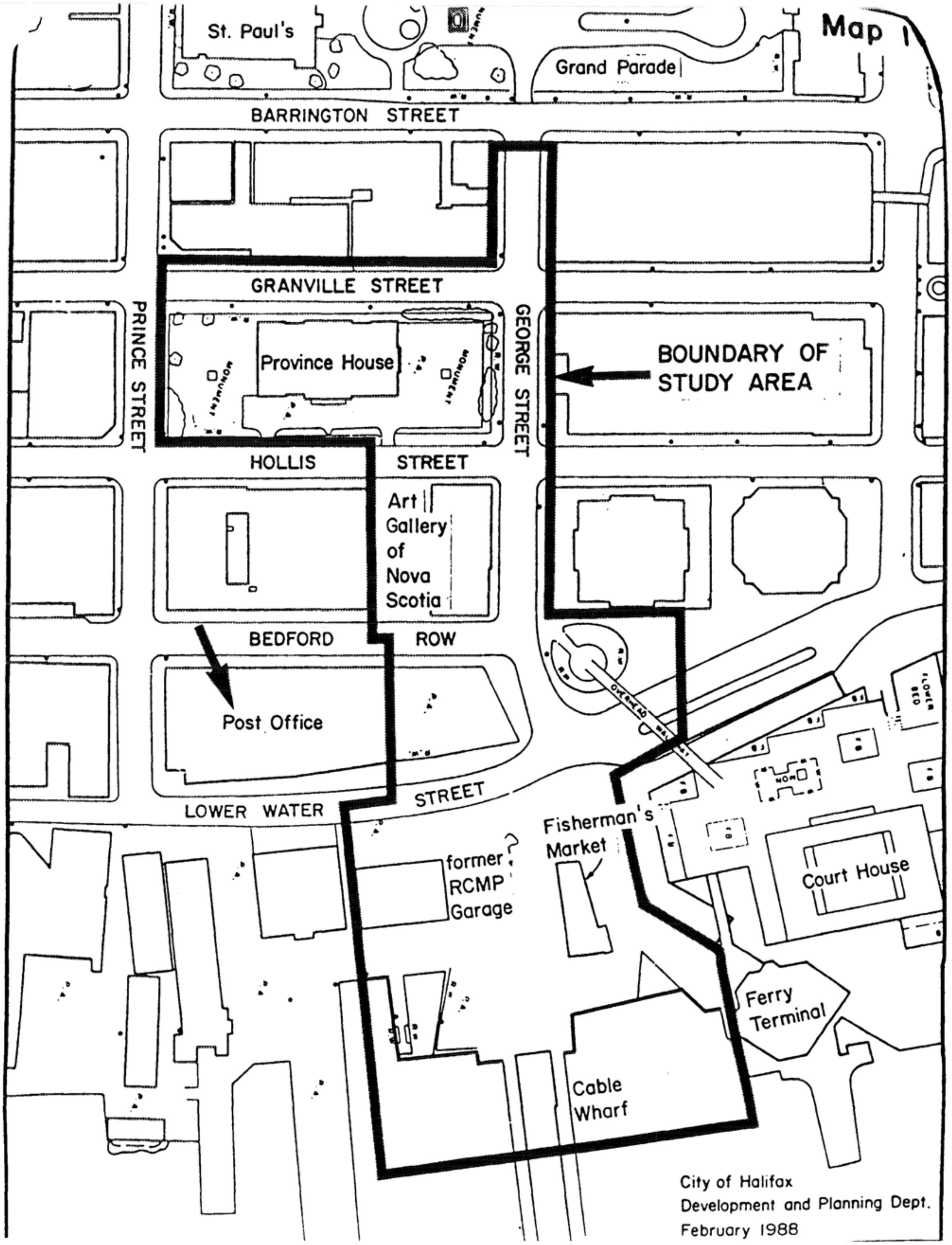
19. Conversation with Don Macdonald, Property Development Officer, Atlantic Regional Office, PWC, 21 March 1990 and with David Mackenzie, Property Development Officer, Atlantic Regional Office, PWC, 20 March 1990.

20. Information from "A Research Brief", Heritage Advisory Committee, City of Halifax, 1989.

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA



1 Location of the Halifax Dominion Building, Bedford Row, Halifax, Nova Scotia; built 1935 by Department of Public Works under the Public Works Construction Act (1934). (Exploring Halifax and the South Shore of Nova Scotia, 1976.)



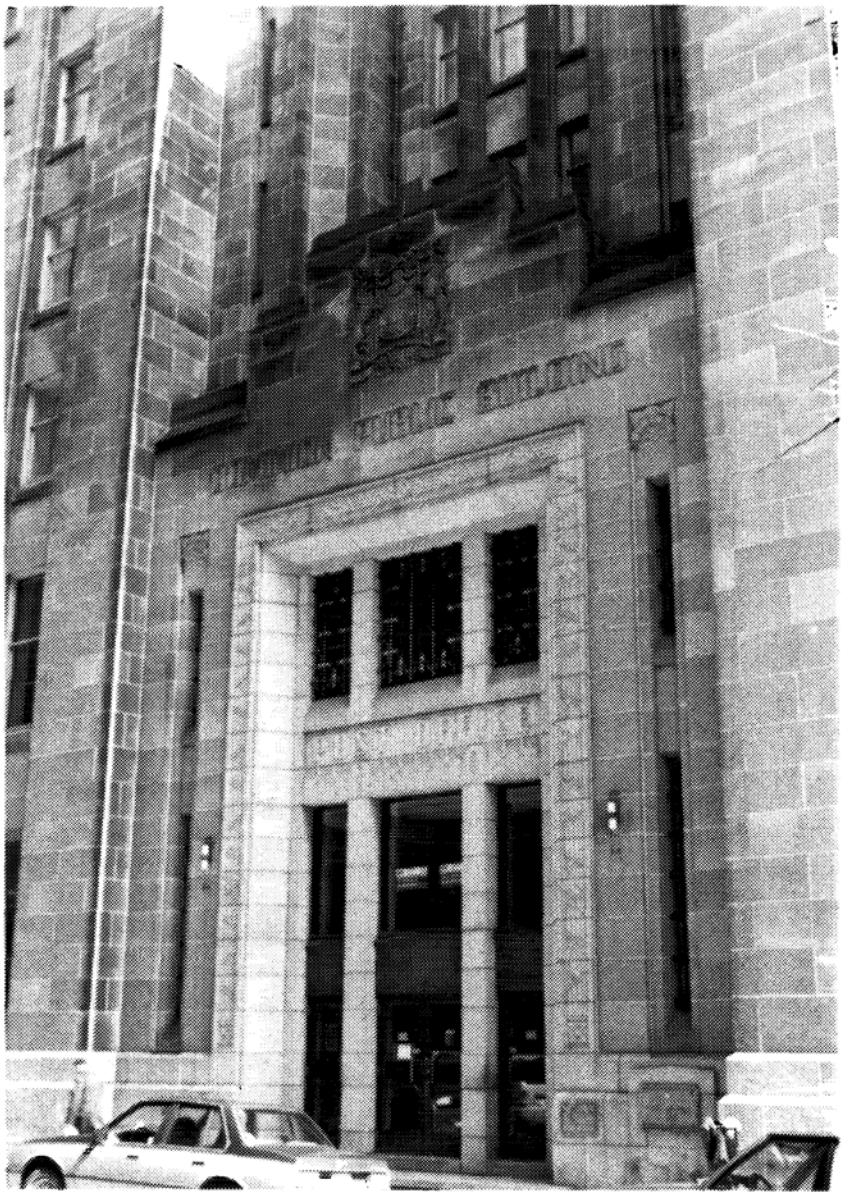
2 The Halifax Dominion Building (Post Office) at corner of Bedford Row and Prince Street, in close proximity to the Art Gallery of Nova Scotia and Province House. (Public Works Canada.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA

3 Front (west) elevation of the Halifax Dominion Building; designed by the Chief Architect's Branch, Department of Public Works; taken 1990. (Courtesy of Bill Naftel, Public Works, Halifax.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA

4 Façade of the Halifax Dominion Building facing on Bedford Row; upper storeys with central inverted U-shape and step-back arrangement of the building mass. (Courtesy of Bill Naftel, Public Works, Halifax, 1990.)

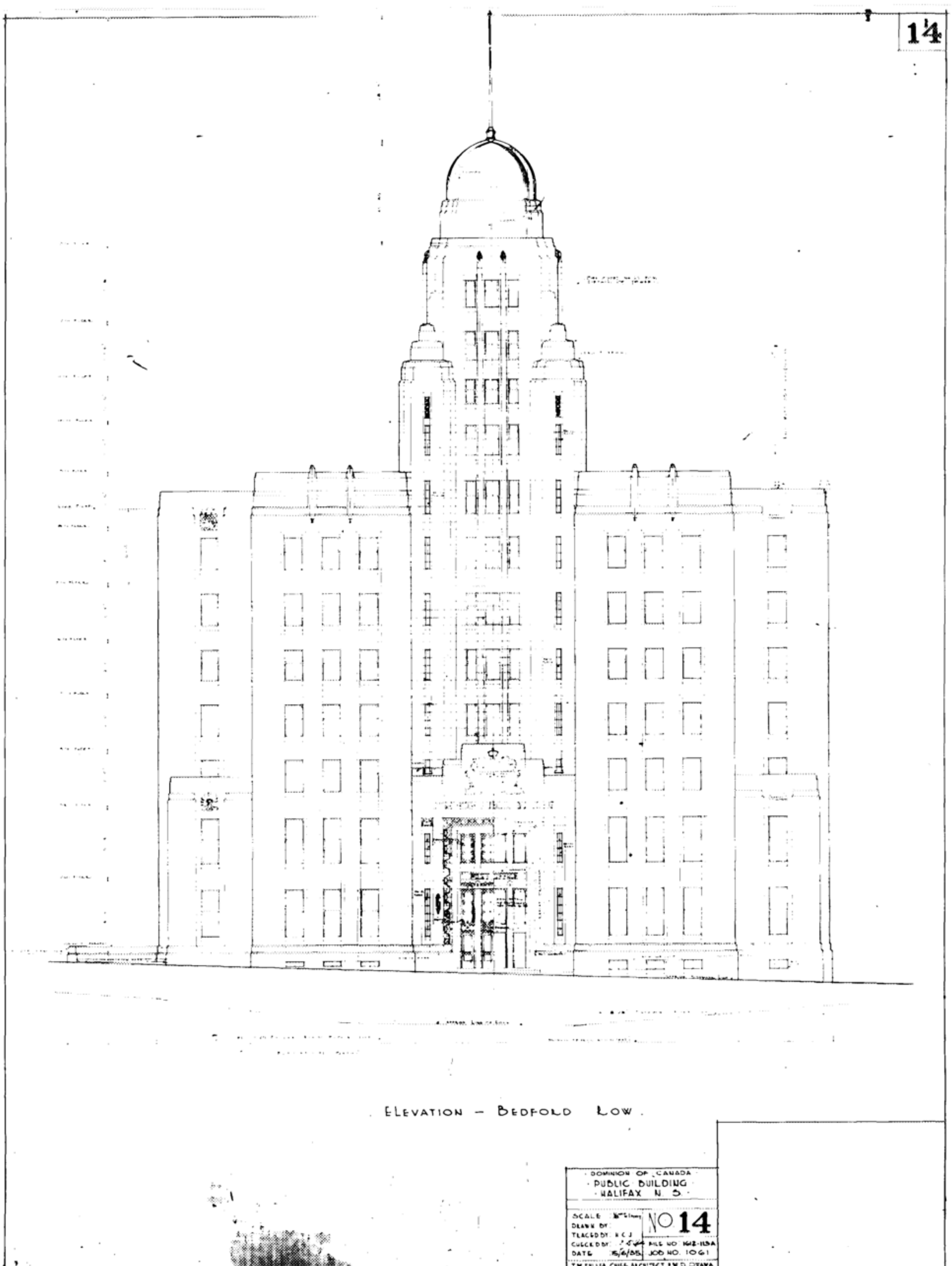


5 Two-storey entry pavillion on Bedford Row, with intact Art Deco decoration, bronze light fixtures, raised lettering and coat of arms. (Courtesy of Bill Naftel, Public Works, Halifax, 1990.)

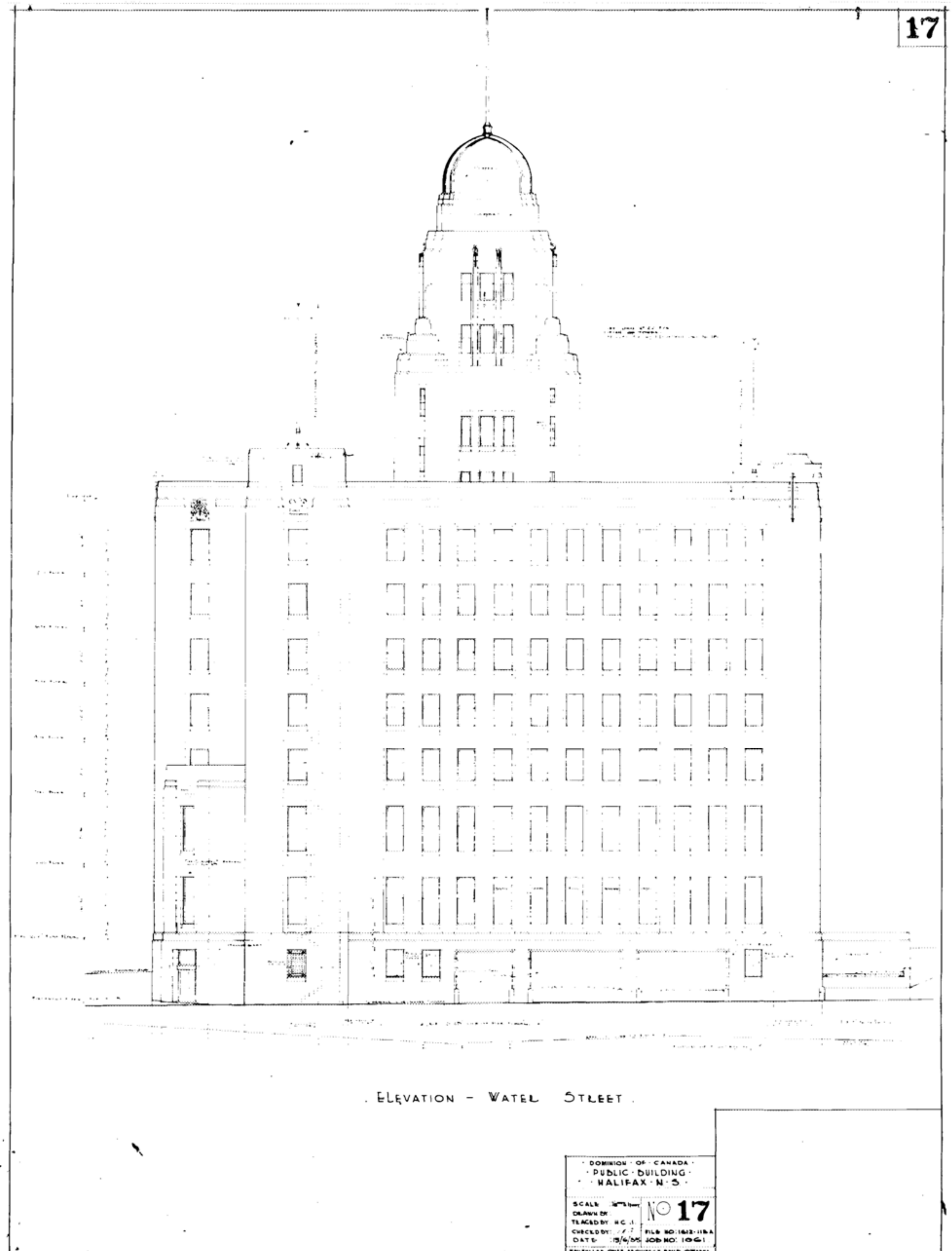
6 South-east corner of the building with side entry and rear loading doors for mail delivery. Note street grade, granite-faced foundation and once-cleaner aspects of the Wallace sandstone. (Courtesy of Bill Naftel, Public Works, Halifax, 1990.)

7 1962 four-storey addition to the north side of the Halifax Dominion Building; taken 1962. (National Archives, PA 135522.)

8 The Halifax Dominion Building; south-west elevation; 1937 view, after its completion. (National Archives, PA 124522.)



9 DPW plan of the front elevation of the building, before the 1962 addition; drawn 1935. (Courtesy of Records Disposal, Public Works, Tupper Building.)

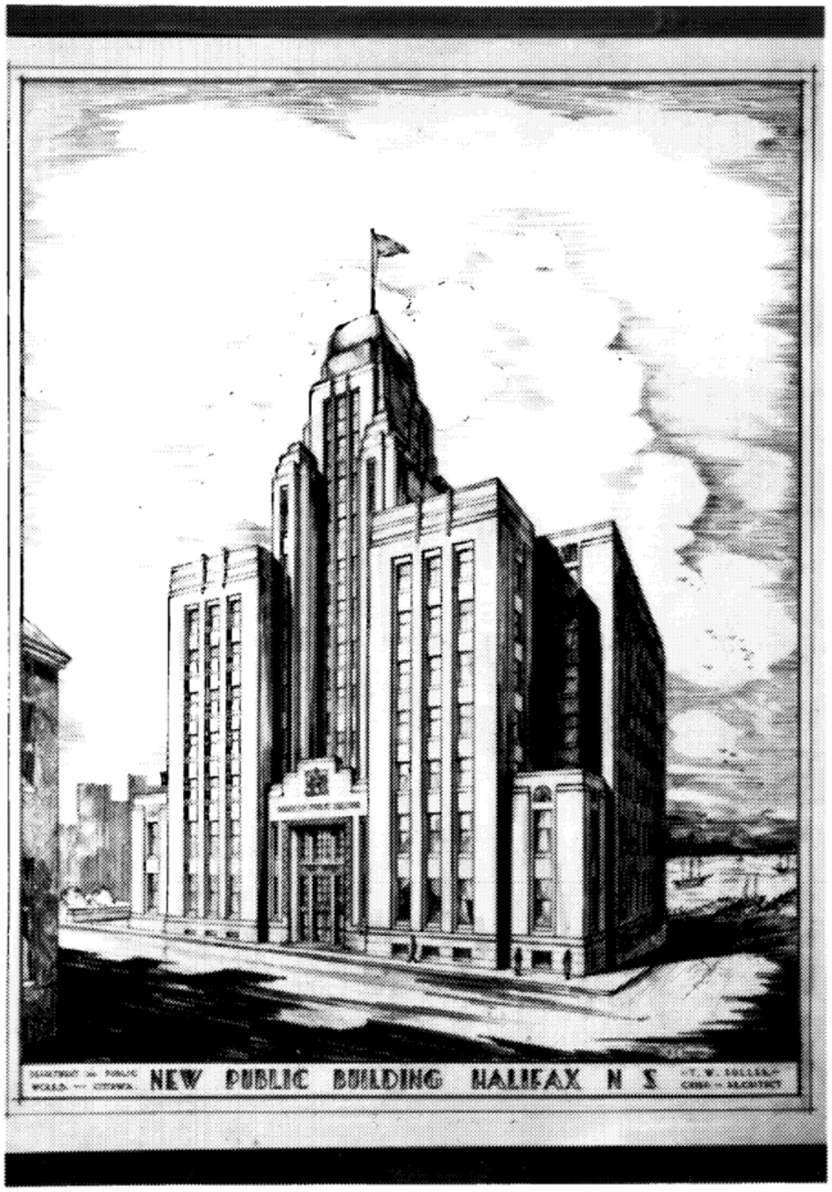


10 Rear elevation; drawn in 1935; showing automatic loading doors. (Courtesy of Records Disposal, Public Works, Tupper Building.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA

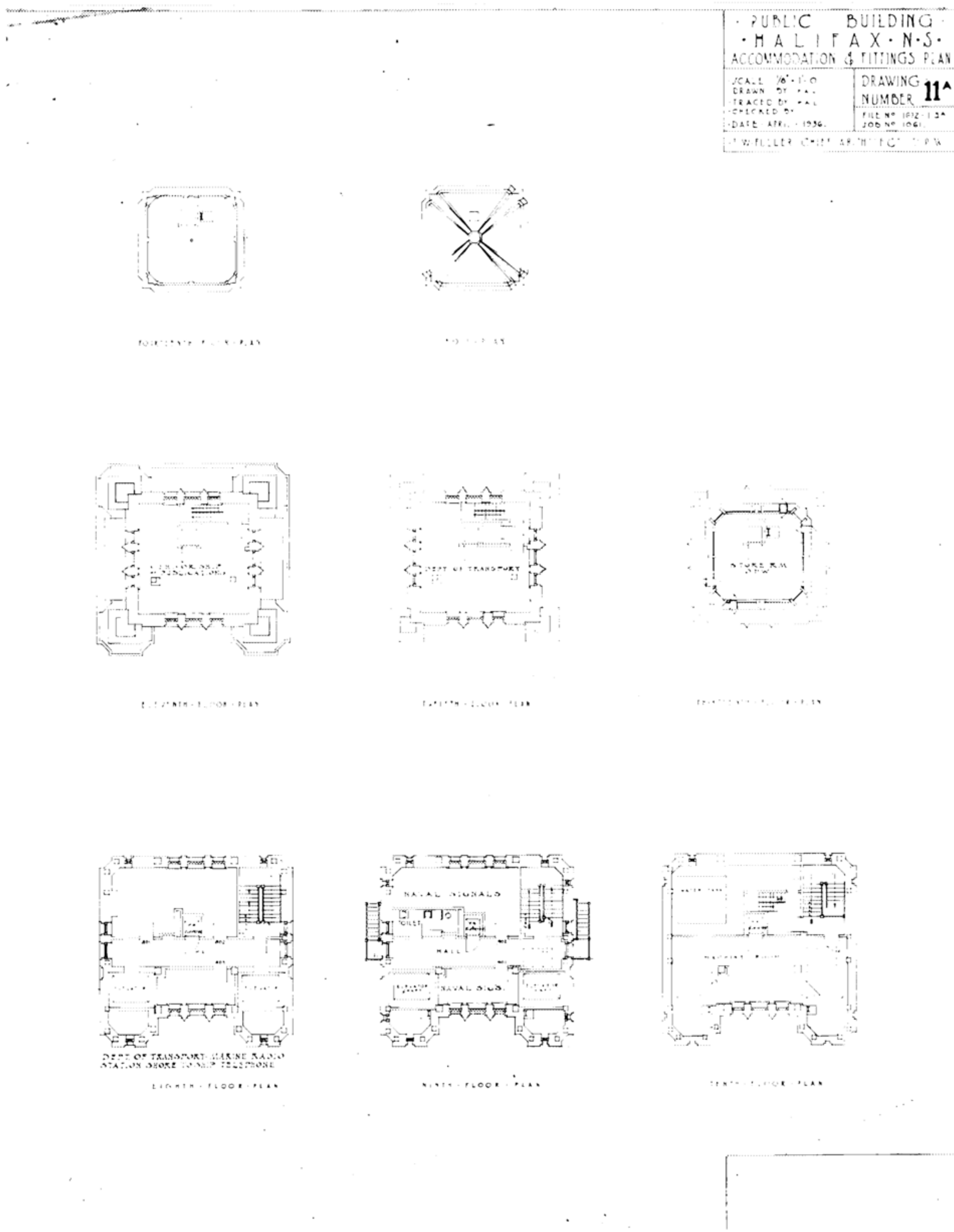
11 "Proposed Halifax Dominion Building, Halifax"; initial design (subsequently rejected); designed by J. L Kingston but rejected in favour of the plan by R. C. Jarvis, Department of Public Works, Ottawa. (National Archives, PA 124521.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA



12 Accepted design for the Halifax Dominion Building; drawn by R. C. Jarvis, Department of Public Works. (National Archives, PA 124517.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA



13 Functional floor plan of the Dominion Building, with progressively smaller regressions from the eight through to the fourteenth floors; drawn in 1935. (Courtesy of Records Disposal, Public Works, Tupper Building.)

15 Regina Federal Building, Regina, Saskatchewan; built 1935-37; designed by Reilly and F. Portnall. (CIHB, 1981.)

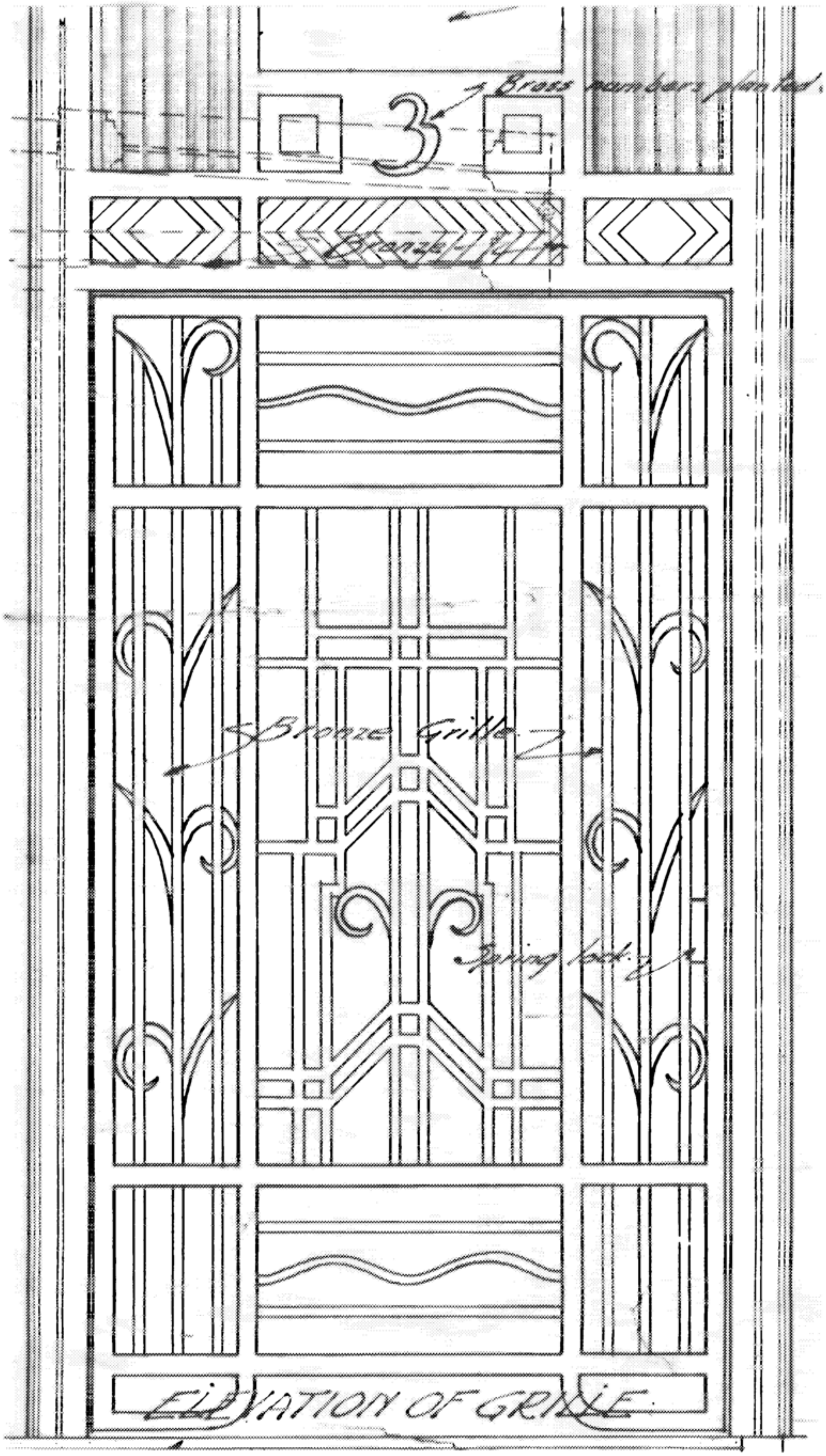
16 Alfred Building, place d'Armes, Montreal, P. Q.; designed by E. I. Barott; built 1929; a commercial interpretation of the Art Deco. (from Claude Bergeron, Architectures du XXe Siecle au Québec, 1989, p. 38.)

17 London Dominion Building, London, Ontario; built 1935-37; Watt and Blackwell and Moore. (National Archives, PA 124500.)

18 Winnipeg Dominion Building, Winnipeg, Manitoba; built 1934-1937; G. W. Northwood, architect. (National Archives, PA 124530.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA

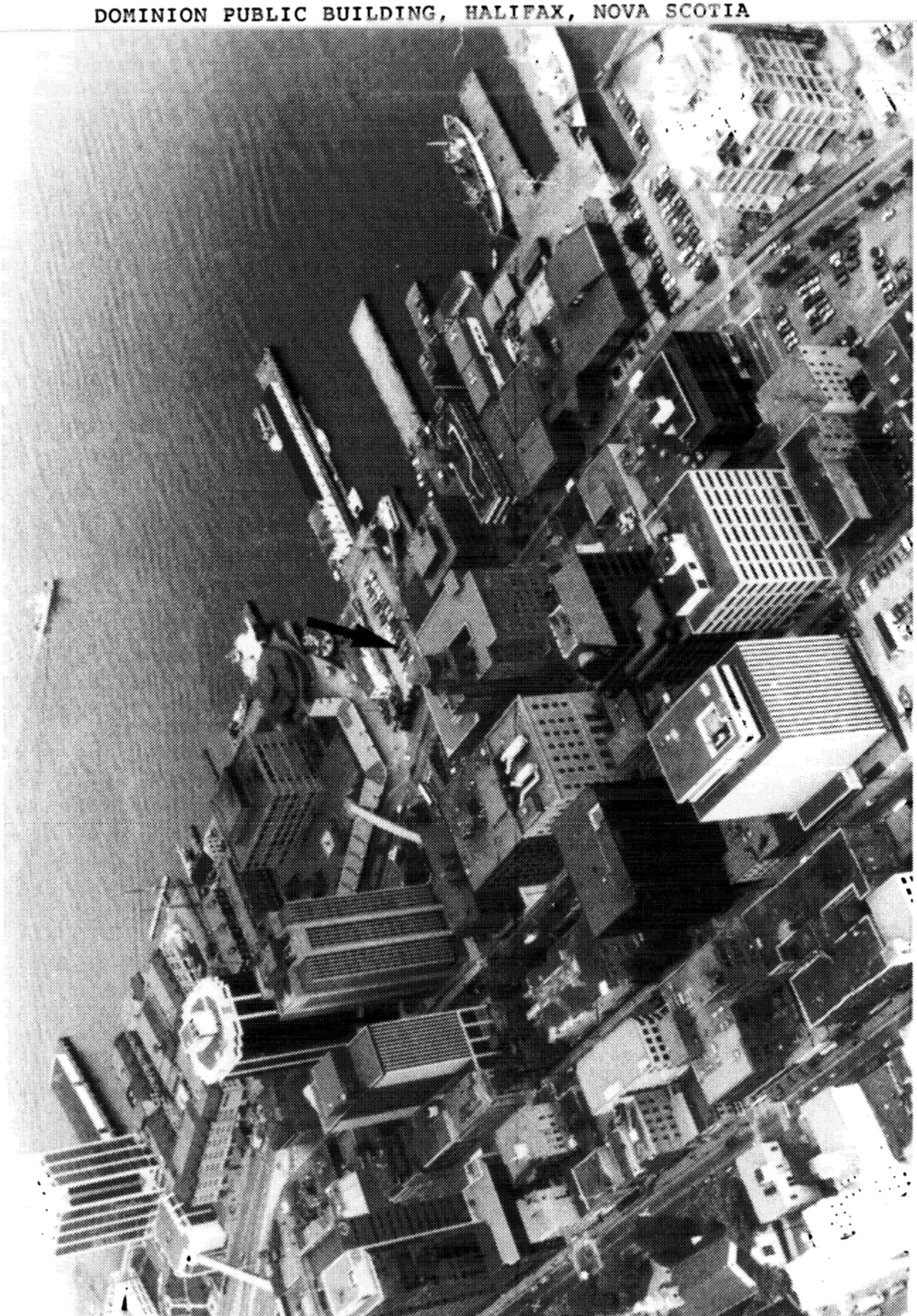
19 Interior detailing, with marble floors, bronze doors, light fixtures; taken 1937. (National Archives, PA 124525.)



20 Detail of interior postal wicket. (Courtesy of Records Disposal, Public Works, Tupper Building.)

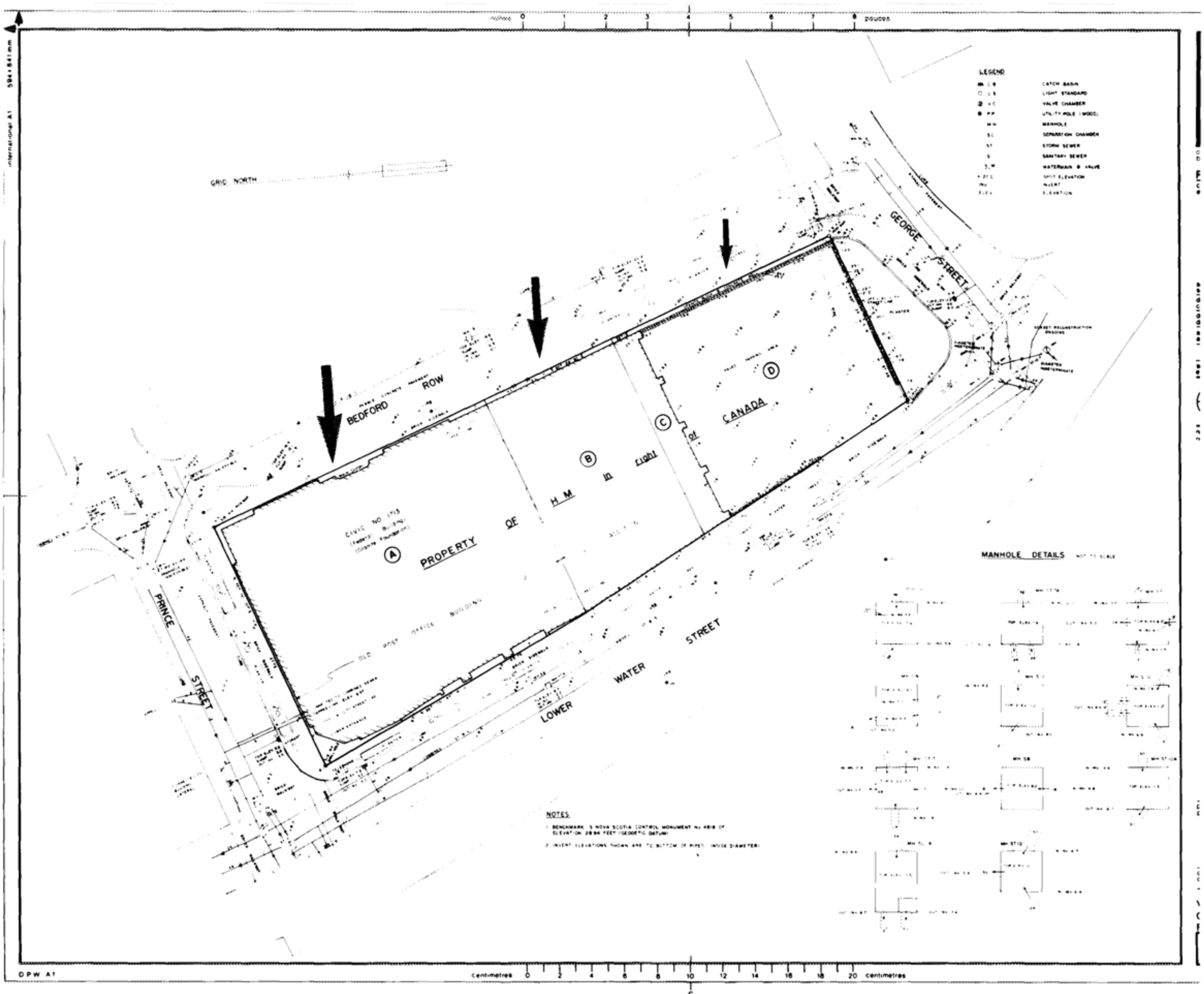
21 View form the south-east, indicating the close proximity to the harbour; taken 1990. (Courtesy of Bill Naftel, Public Works, Halifax.)

22 View from the north-east showing the prominence of the building on the skyline; taken 1990. (Courtesy of Bill Naftel, Public Works, Halifax.)



23 Aerial view of Halifax, with location of the Halifax Dominion Building indicated by arrow. Note the constricted position of the facade, in close proximity to the 1931 Bank of Nova Scotia buiding across the street on Bedford Row. Tall bank towers to the north are the new Royal Bank and Bank of Montreal. (Public Works Canada.)

DOMINION PUBLIC BUILDING, HALIFAX, NOVA SCOTIA



24 Site plan of the block between Bedford Row, Lower Water Street, George and Prince. A indicates original 1935 portion; B indicates 1962 addition; D indicates paved parking. (Public Works Canada; S-965-T. Real Estate Services.)

Form Title:	Commissioning Oversight Requirements and Scope of Work for 3rd Party Commissioning Agent		
Document #:	COMM 302 02 RP1	**Revision #:**	5

Portfolio	**Portfolio Name**	**Date**
34	Atlantic	June 15, 2017
Building ID	**Building Name**	
GOC00001	DOMINION PUBLIC BUILDING	
Project #	**Project Name**	
R.063820.005	Dominion Public Building Renovation	

Project Description

Not provided by PSPC at time of writing this SOW so this is a general SOW for a 3rd Party Cx Agent to be submitted with the RFP.

Regulatory Requirements

<u>Applicable Codes and Standards, Policies, Guidelines, Design and Construction Documents Requirements</u>

The list provided below is not limitative. The following list shall not alleviate the Contractor's liability to perform the work(s) in accordance with all applicable laws, codes and statutory regulations, nor does it alleviate the Contractor's responsibility to provide formal and proper notification to Brookfield Global Integrated Solutions when any direction is received that is contrary to any law, code, regulation, statute or any other mandatory or legal requirement.

- Canada Labour Code Part II – Occupational Health and Safety.
- Canada Occupational Health and Safety Regulations.
- Brookfield Global Integrated Solutions Health & Safety Policies and Procedures
- Provincial Occupational Health and Safety Act
- Provincial Safety Code for the Construction Industry
- All applicable Provincial regulations respecting health and safety.
- National Building Code of Canada (NBCC).
- National Fire Code of Canada (NFCC).
- Provincial Construction Code.
- National Fire Protection Association (NFPA) standards.
- Canadian Environmental Protection Act (CEPA).
- Canadian Environmental Assessment Act (CEAA).
- Canadian Electrical Code (CEC) – CSA C22.1.
- CAN/ULC S1001-11 Integrated Systems Testing of Fire Protection and Life Safety Systems and Fire Protection Commissioning.
- PWGSC National Performance Standards for Office Buildings (NPS) – May 2016.
- ANSI/ASHRAE/IES Standard 90.1-2013 -- Energy Standard for Buildings Except Low-Rise Residential Buildings.
- ASHRAE standards, handbooks, and guidelines.

Commissioning Requirements and Scope of Work for Commissioning Agent

The commissioning process was selected as the quality process for the project planning, design, construction and operation. The commissioning process provides a plan, procedure and documentation allowing the verification and confirmation that the built work and/or facility meets the Project Requirements.

This document provides a record of the project Commissioning Requirements and Scope of Work for Commissioning Agent. This document forms part of the project Request for Proposal (RFP) for Commissioning Agent.

The commissioning process selected for the project is summarized below. The project commissioning team will include the appointment of a Third Party Commissioning Agent. The commissioning process to be implemented for the project will include the preparation, implementation and update of a commissioning plan and manual by a Third Party Commissioning Agent. The Model/Pre-Design Phase Commissioning Plan and Specifications will be provided by the Commissioning Oversight Manager. The requirement is for the Commissioning Agent to use and update this format to become the design phase Commissioning Plan forming part of the contract documents and ultimately the Final Commissioning Plan and Manual (Final Report) at the project completion and close-out.

The commissioning program, services and documentation shall adhere to the following standards, policies and guidelines as appropriate for the scope of work.

-BGIS COMM 101-00-RP1 Commissioning Oversight Management Policy.
-PWGSC Commissioning Manual CP-1 - 4th Edition – November 2006.
-PWGSC Commissioning Guidelines CP.3 to CP.13.
-CSA Z320 Building Commissioning Standards and Check Sheets,

-ASHRAE Guideline 0 – The Commissioning Process.
-ASHRAE Guideline 1 – The HVAC Commissioning Process.
-BCxA – Handbook, Samples and Templates.
-PECI – Model Commissioning Plans and Specifications,
-PECI - Templates and Sample Documents.
-PECI - Sample Functional Tests and Checklists.-

The commissioning program, services and documentation for life-safety and fire protection systems shall also adhere to the following standards.
-CAN/ULC S1001-11 Integrated Systems Testing of Fire Protection and Life Safety Systems and Fire Protection Commissioning.

Composition, Roles and Responsibilities of the Commissioning Team and Commissioning Participants	
The Commissioning Oversight Manager has selected the following composition for the project Commissioning Team. The general roles and responsibilities of the Commissioning Team members are summarized below. The commissioning team shall consist of;	
☒	**Commissioning Authority - BGIS Commissioning Oversight Manager and PSPC Cx Manager;** The Commissioning Oversight Manager is responsible for providing oversight and quality assurance of the project commissioning activities and documentation. The Commissioning Oversight Manager maintains the overall responsibility for the project commissioning and ensures the performance and completion of commissioning in the delivery of a fully functional and operational project. The Commissioning Oversight Manager provides planning and technical support and advice on the project and O&M matters and coordinates the commissioning services and activities from the project initiation/planning phase to acceptance and close-out. During the design stage, the Commissioning Oversight Manager reviews all aspect of the design from their early development to final contractual documents. During the project implementation, acceptance and close-out, the Commissioning Oversight Manager provides quality assurance, monitors and reviews commissioning services, deliverables and documentation including training.
☒	**PSPC Project Manager;** The Project Manager maintains the overall responsibility for managing the project, and for ensuring that the implemented project meets the requirements defined in the Project Requirements document and subsequently, the Investment Analysis Report (IAR) recommendation. From a commissioning perspective, the project manager is responsible for ensuring that where applicable, the commissioning forms part of, and is contractually included in and carried out in the project they manage.
☒	**BGIS Property Manager;** The Property Manager represents the client/owner (PSPC), and building operator. The Property Manager is responsible for the daily management and operation of the facility and its tenants. The Property Manager takes the management and operation responsibilities for the completed project after it has been accepted by the project team.
☒	**Consultant / Design Professional;** The Consultant maintains the overall responsibility for the project conceptual design, the contract documents, its construction/implementation, its performance, and conformance to applicable regulatory, codes and standards requirements. During the planning phase, the project consultant reviews the project Requirements Document and references specifying the project objectives, and its functional and operational requirements. The project consultant complete its investigation and prepares the project Investment Analysis Report (IAR), documenting the project Design Intent and recommendation. During the design phase, the consultant prepares the contract documents and integrates the commissioning process requirements and specifications, prepares and submits the project Basis of Design document, coordinates required interfaces between the trades divisions, systems and assemblies, reviews and incorporate as appropriate the Commissioning Team comments from submittal reviews. During the project implementation, acceptance and close-out phase, the consultant participates in the training of O&M personnel, reviews and comment commissioning test procedures and reports, reviews and prepares record documents and deliverables, recommends acceptance of the project to the project manager.
Composition, Roles and Responsibilities of the Commissioning Team and Commissioning Participants	

☒	**Third Party Commissioning Agent;** The Commissioning Agent is responsible for the development, implementation and update of the project Commissioning Plan and specifications, as well as the commissioning reports and documentation. The Commissioning Agent also organizes and monitors the commissioning activities, supervises and witnesses the completion of all commissioning inspection, verification and testing. The Commissioning Agent collects the commissioning data, prepares and submit reports to the Commissioning Authority. The Commissioning Agent regularly submits update of the Commissioning Issues Log to the Commissioning Authority. The Commissioning Agent assembles the final commissioning documentation and submits the completed final Commissioning Plan and Manual to the Commissioning Authority for review and acceptance and recommends acceptance of the project equipment, systems and assemblies.
☒	**Contractors and subtrades;** The Contractor is responsible for the construction and installation in accordance with contractual documents. From a commissioning perspective, the contractor is responsible to coordinate and carry-out the commissioning inspection, start-up and functional performance testing in accordance with the contract documents and commissioning specifications and provides to the Commissioning Agent the commissioning data/results and documentation. The contractor is also responsible for the development of the Commissioning Schedule and the coordination of the commissioning activities and subtrades.
☒	**Manufacturers and Equipment Suppliers;** The Manufacturers and/or Equipment Suppliers are responsible for providing all information pertaining to the specifications, performance, Installation Operation and Maintenance (IOM), Installation and Start-Up checklists/reports templates, and warranty requirements of the supplied products, equipment, systems, and assemblies. When specified, the Manufacturer or its approved representative is responsible to carry-out the product specific commissioning inspection, start-up and functional performance testing as detailed in the contract documents. The Manufacturer or its approved representative may also be required to provide specific training and/or demonstrations of operation and performance.
☒	**Independent testing specialists(s) / contractor;** Air balancing, etc….

Extent of Commissioning

The BGIS Commissioning Oversight Manager was not shared the scope of this project so is not capable at this time to identified the building systems and equipment for which the commissioning process shall apply. The PSPC Cx Manager can further elaborate in the RFP. The table below was kept as an example only.

Unless indicated otherwise, the sampling rate shall be 100% of the applicable systems and equipment.

[Select and copy applicable divisions (NMS divisions), systems and equipment type from the NMS Commissioning Plan Section 01 91 31, 198 Extent of Commissioning. Add specific systems and equipment as applicable to the project. Add and clearly identify, where applicable, the requirements for Integrated Systems Testing indicating the systems and equipment that the IST shall include. The Model Commissioning Plan and Specifications (section 01 91 31, 1.8 and 1.16) shall be edited to match the extent of commissioning and IST presented in the table below.]

☒	*Example;* *Fire and Life Safety Systems – Fire Protection (division 21);* *-Wet sprinkler system.* *-Standpipe and hose system.* *-Fire pump.*
☒	*Electrical systems and equipment (division 26);* *-Low voltage distribution system and equipment.* *-Emergency power generator.* *-Transfer switch and controllers.*
☒	*Electronic safety and security systems (division 28);* *-Fire Alarm system and ancillaries.*
☒	*Integrated Systems Testing, including;* *-Fire Protection system.* *-Electrical system and equipment.* *-Fire Alarm system and ancillaries.*
☒	[Other as applicable]

Commissioning Requirements and Scope of Work for Commissioning Agent

1.0 Commissioning Agent's Responsibilities

1.1 The Commissioning Agent is being engaged to provide commissioning services on the project with the objective to review and ensure that the built work, systems and equipment are planned, designed, installed, tested, optimized and capable of being operated and maintained in conformance with the Project Requirements, the consultant's/design professional Basis of Design, and any other requirements set forth in the contract documents. The Commissioning Agent maintains the overall responsibility for the development, implementation and update of the project Commissioning Plan and specifications, as well as the commissioning reports and documentation. The Commissioning Agent also organizes and monitors the commissioning activities, supervises and witnesses the completion of all commissioning inspection, verification and testing. The Commissioning Agent collects the commissioning data, prepares and submit reports to the Commissioning Authority. The Commissioning Agent regularly submits update of the Commissioning Issues Log to the Commissioning Authority. The Commissioning Agent assembles the final commissioning documentation and submits the completed final Commissioning Plan and Manual to the Commissioning Authority for review and acceptance and recommends acceptance of the project built work, systems, equipment and assemblies.

The Commissioning Firm shall designate a Commissioning Agent representative with demonstrated experience in the commissioning of building systems. The Commissioning Firm represents that is thoroughly familiar with, and fully understands the project and commissioning requirements and that has all necessary architectural and/or engineering (as applicable) education, skill, knowledge and experience required for the services provided here under.

The appointment of a Commissioning Authority and Commissioning Agent does not permit the Consultant/Design Professional to abrogate its contractual professional responsibilities, including performing the required site supervision and reviews ensuring that the built work conforms to Project Requirements, Design Intent, Contract Documents and applicable regulatory requirements, codes and standards.

The commissioning scope of work and services to be performed apply to the project specific systems and equipment to be commissioned identified on the **Extent of Commissioning**.

2.0 Planning Phase Services

2.1 Attend the project start-up and planning phase meetings.

2.2 Review the Project Requirements documents, including the Requirements Document and the Commissioning Scope of Work for Consultant and Commissioning Agent, including the Model/Pre-design Commissioning Plan and Specifications.

2.3 Review the consultant Basis of Design (BoD) including all and any schematic design documents, and comment on their completeness and the ability to achieve the Project Requirements for the applicable built work, systems, equipment and assemblies.

2.4 Provide recommendations for improved functionality, efficiency, operability, maintainability and cost savings.

Commissioning Requirements and Scope of Work for Commissioning Agent

3.0 Design Phase Services

3.1 Attend the project design phase meetings.

3.2 Prepare and update the Design Phase Commissioning Plan and Specifications along with the Consultants 66% and 99% design progress submissions. The commissioning specifications shall include detailed descriptions of the responsibilities of all parties including contractor, sub-trades, manufacturers and specialist testing contractors for each and all commissioning activities; details of the commissioning process; reporting and documentation requirements including formats; alerts to coordination issues; commissioning issues log and deficiency resolution; pre-functional checklists and startup requirements; the functional testing process; specific functional test requirements and procedures; testing equipment and instrumentation requirements, acceptance criteria for each of the applicable project systems, equipment and assemblies.

3.3 At each of the design phase progress submissions (33%, 66%, 99%, and Tender), review and comment the plans and specifications with respect to their completeness in all aspects of the Commissioning Process. This also includes the review of the plans and specification for compliance with the Project Requirements, Consultant/Design Professional Basis of Design, as well as industry standards for the facility type, coordination and constructability.

3.4 Develop project, systems, equipment, assemblies specific commissioning forms including, as applicable, *Pre-Functional Checklists, *Start-Up Checklists, *Functional Performance Testing Procedures and Report Templates, and *Integrated System Testing Procedures and Report Templates. These requirements apply to each and all of the project specific systems and equipment to be commissioned identified on the **Extent of Commissioning**. Include the forms as part of the Commissioning Forms specification section (01 91 33) submissions.

3.5 Develop the Commissioning Issues Log form to be used throughout the project construction, acceptance and close-out.

3.6 Verify and confirm that the design and contract documents include all devices, components, instrumentation required for the performance of the commissioning and to properly document the performance of each applicable equipment, systems and/or assemblies.

3.7 Verify and confirm the adequacy and completeness of the HVAC Testing, Adjusting and Balancing (TAB) specifications, as well as other relevant equipment and systems Execution and Field Quality Control specifications.

3.8 Coordinate the integration of the commissioning process requirements, the commissioning plan and specifications, and the commissioning forms to the project Specifications with the consultant/Design Professional.

3.9 Along with the Commissioning Oversight Manager, the Facility Maintenance Supervisor, the Consultant/Design Professional, and where applicable, the facility controls contractor, coordinate a controls requirements and integration meeting. Develop and coordinate the Building Automation System (BAS) trend parameters and requirements necessary for the performance of the commissioning. Discuss integration and interface issues between systems and equipment controls.

3.10 Prepare and submit the completed Design Phase Commissioning Plan, Specifications and forms to the Commissioning Oversight Manager for review and approval. Review all Commissioning Oversight Manager's comments and revise documentation accordingly. Obtain approval prior to releasing the documentation to the Consultant/Design Professional for integration in the Tender contract documents.

3.11 Assemble the Commissioning Team and hold a meeting for the presentation and review of the complete commissioning process, including the completed Design Phase Commissioning Plans, Specifications and Commissioning testing procedures and forms.

Commissioning Requirements and Scope of Work for Commissioning Agent (cont…)

4.0 Construction, Acceptance and Close-Out Phase Services

4.1 Attend the project job showing / pre-bid meeting. Present the project commissioning process and requirements. Answer to commissioning related questions to the Commissioning Authority.

4.2 Attend the project construction, acceptance and close-out phase meetings, including commissioning team meetings.

4.3 Review the applicable contractor submittals and shop drawings from commissioning, integration, performance, operation and maintenance perspectives. Review the equipment manufacturer specific Installation, Operation and Maintenance manuals (IOMs), Start-Up instructions and checklists, and other relevant manufacturer documentation. Identify issues. Submit Shop Drawings Review forms and comments to the Commissioning Oversight Manager.

4.4 Revise, adapt and update, as applicable, the Commissioning Plan test procedures and Commissioning Forms (Pre-Functional, Start-Up, Functional Performance Testing and Integrated Systems Testing) to suit the approved equipment specificities.

4.5 Revise, adapt and update, as applicable, the Commissioning Plan test procedures and Commissioning Forms (Pre-Functional, Start-Up, Functional Performance Testing and Integrated Systems Testing)to reflect changes made to system and equipment during construction and acceptance phase, such as those directed by Request For Information (RFIs), Site Instructions, and Change Notice by the Consultant/Design Professional.

4.6 Coordinate the integration of commissioning activities into the project construction schedule with the contractor.

4.7 Schedule regular commissioning coordination meetings with contractor, sub-trades and other Cx Participants (Controls contractor, TAB contractor, Manufacturer Representatives, Specialist Testing Contractors, other as applicable). Lead meetings, prepare and distribute minutes.

4.8 Perform site visits and inspection to review component, equipment and system installations in preparation for the completion of the Pre-Functional/Installation Verifications and Checklists.

4.9 Monitor and witness the performance of the Pre-Functional/Installation Inspections and Testing completed by the contractor. Review contractors Pre-Functional/Installation Reports for accuracy and completeness. Identify deficiencies, issues and required corrective actions. Prepare final reports and checklists using approved forms and confirm readiness of equipment and systems for start-up. Submit reports to the Commissioning Oversight Manager for review and approval.

4.10 Monitor and witness the performance of the Start-Up Verifications completed by the contractor, manufacturer representative or specialist testing contractor as applicable. Review contractors Start-Up Reports for accuracy and completeness. Identify deficiencies, issues and required corrective actions. Prepare final Start-up Reports with the start-up reports, data, results, adjustment and setting provided by the contractor and confirm adequacy of equipment or system operation and/or readiness of equipment and systems for Functional Performance Testing (FPT).

4.11 Monitor and witness system and assembly Functional Performance Testing and Integrated Systems Testing (IST) performed by the contractor. Supervise and coordinate the commissioning team members and participants in completion of the testing. Gather and verify all test results, data, and other relevant information. Prepare Commissioning FPT and IST reports using approved forms. Document deficiencies and actions items stemming from the FPT and IST. Recommend acceptance or rejection of individual systems and/or equipment commissioning. Submit completed Functional Performance Testing and Integrated Systems Testing Reports to the Commissioning Oversight Manager for review and approval.

4.12 Regularly review the contractor's record drawings (mark-ups) for accuracy with respect to the installations. Report issues to the Commissioning Oversight Manager.

4.13 Review contractor's Operation and Maintenance (O&M) Manual, As-Built Drawings, finalized product and equipment schedules, and other ''Close-out'' documents related to commissioned systems and equipment. Review for completeness, accuracy and updates including modifications made during the project.

4.14 Review the proposed training program from the contractor. Attend contractor provided training, review completeness and adequacy with the trainees supervisor. Recommend training acceptance or issues to the Commissioning Oversight Manager.

Commissioning Requirements and Scope of Work for Commissioning Agent

4.15 Prepare the Final Commissioning Process Report. The Report shall be organized as follow and include;

I. An Executive Summary report that includes a list of the Commissioning Process team members and participants, roles and responsibilities, brief building and project description, brief of the Project Requirements and Basis of Design, overview of commissioning and testing scope and methods. For each commissioned system and equipment, the report should contain the disposition of the commissioning agent regarding the adequacy of the systems and equipment meeting the Project Requirements, Basis of Design and contract documents in the following areas;
  a) Installed equipment specifications,
  b) Equipment and systems installation,
  c) Systems and equipment operation, functional performance, efficiency, optimization,
  d) Adequacy for operation and maintenance, serviceability,
  e) Documentation.
  f) Operator training

II. Final update and status of the Commissioning Issues Log(s). All outstanding deficiencies, issues and non-compliance items shall be specifically listed. Each item shall be referenced to the specific test, inspection, trend log report from which it is identified and documented. Include recommendations for corrective actions, improvements, optimization, systems and equipment operation parameters, performance and efficiency, future actions, commissioning process changes, recommissioning, etc.

4.16 Assemble all final commissioning documentation, and prepare the Final Commissioning Manual. Submit the Manual to the Commissioning Oversight Manager for Review and Approval. The Final Commissioning Manual related documents shall be compiled in a searchable electronic format (PDF) and shall include;

I. Final Commissioning Process Report,
II. Project Requirements document,
III. Basis of Design,
IV. Schematic Design documents,
V. Construction Drawings,
VI. As-Built/Record Drawings,
VII. As-Built Single-Line Diagram(s),
VIII. As-Built product and equipment schedules,
IX. Commissioning Specifications,
X. Commissioning Reports (PF, SU, TAB, FPT, IST, Controls, BAS Trend Logs Reports, Data Loggers Reports, other as applicable),
XI. Operator Training Records,
XII. Computerized Maintenance Management System (CMMS) Equipment Forms,
XIII. Other relevant project reports and correspondence,
XIV. Systems and Equipment Manuals;
  a) One set of applicable shop drawings (including transmittals, and review forms and approvals),
  b) Installation, Operation and Maintenance manuals,
  c) Performance Data Sheets (updated to *as commissioned* operating condition if applicable),
  d) Other relevant manufacturer's literature, brochures, product bulletins, technical information,
  e) Equipment specific warranties,
  f) System Operation Manuals / Standard Operating Procedures (SOP).

Commissioning Requirements and Scope of Work for Commissioning Agent

5.0 <u>Post-Occupancy / Operations Phase Services</u>

5.1 Review and propose corrective measures for systems and equipment not operating in accordance with the Project Requirements, and the design and operating parameters set out in the Basis of Design and Contract Documents.

***Notes on the requirements for the development and use of Commissioning Forms (PF, SU, FPT, IST);**

Pre-Functional Inspections/Verifications (PF) and Start-Up Checklists (SU);

- When available from the equipment manufacturers, the Installation, Operation and Maintenance (IOM) instructions, and the manufacturer's installation and Start-Up check lists are acceptable and should be used. As deemed necessary by the Commissioning Oversight Manager/Specialist, supplemental verifications and additional data could be required for specific project conditions and such verifications and data shall be documented on same or separate forms.

Functional Performance Testing (FPT) and Integrated System Testing (IST);

-The functional performance testing (FPT) shall include and cover operating the system and components through each of the written sequences of operation, and other significant modes and sequences, including startup, shutdown, unoccupied mode, manual mode, staging, miscellaneous alarms, power failure, security alarm when impacted and interlocks with other systems or equipment. Sensors and actuators shall be calibrated during pre-functional check listing by the installing contractors, and spot-checked by the commissioning agent during functional testing.

-Tests on respective HVAC equipment and systems shall be executed, if possible, during both the heating and cooling season. However, some overwriting of control values to simulate conditions shall be allowed. Functional Performance Testing shall be done using conventional manual methods, control system trend logs, and where appropriate or required with data loggers. FPT shall be done to provide a high level of confidence in proper system function, as deemed appropriate by the Commissioning Authority.

-The Functional Performance Testing procedures and reports shall allow for the complete review and analysis of the systems and equipment performance, operating parameters and sequence.

BGIS Commissioning Oversight Manager	Signature
Daniel Desjardins	

BGIS	FORM

Form Title:	Commissioning Oversight Risk Assessment and Evaluation		
Document #:	COMM 301 01 RP1	**Revision #:**	6

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Portfolio	Portfolio Name	Date
34	Atlantic	June 15, 2017
Building ID	Building Name	
GOC00001	DOMINION PUBLIC BUILDING	
Project #	Project Name	
R.063820.005	Dominion Public Building Renovation	

Projects Where Commissioning IS Required (Medium to High Risk Projects)	**Applicable**
New buildings/engineering assets	☐
Special-purpose buildings	☐
Projects with estimated costs exceeding $2M	☐
Projects with floor area exceeding 10,000 m_2	☐
Fit-up Projects requiring replacement/upgrade of mechanical, electrical and architectural systems	☒
Replacement/upgrade of mechanical and electrical equipment	☐
Life-safety equipment replacement or upgrade	☐
Major upgrades to heritage buildings	☐
Upgrades to meet accessibility requirements	☐
New building automation system (BAS) / component installation	☐
New fire alarm system	☐
Upgrade/replacement of building envelope	☐
Upgrades to vertical/horizontal transportation systems	☐
New roof membrane with existing roof-mounted electrical / mechanical equipment	☐

Projects Where Commissioning is NOT Required (Low Risk Projects)	**Applicable**
Office furniture upgrade	☐
New carpets	☐
New roof membrane – without roof mounted electrical/mechanical equipment	☐
Fit-up work not requiring replacement/upgrade of mechanical, electrical and/or architectural systems	☐
Minor Building envelope work	☐
Interior painting	☐
Routine maintenance work	☐
Landscaping	☐
Replacement of plumbing fixtures	☐

The Commissioning Oversight Manager/Specialist assessment of the project based on the Project Managers Requirement Document, taking into consideration the project value, scope, size and technical complexity, either does or does not represent a high risk project which requires the addition of a Third Party Commissioning Agent.

Justification/comments as follows:

The PSPC Cx Manager has confirm that a 3rd Party Cx Agent will be engaged to work on this project which would have been a BGIS recommendation as well based of anticipated complexity of the building modernization project.

Commissioning and Oversight services will be required on this project:	
Yes, there is a medium to high risk to the project, if commissioning oversight is not performed	☒
No, there is a low risk to the project	☐

The Commissioning Scope Of Work will be completed by:	
Design Consultant (Medium Risk)	☐
Third Party Commissioning Agent (High Risk and require a Commissioning Plan)	☒

BGIS Commissioning Oversight Manager	Signature
Daniel Desjardins	

Portfolio	Portfolio Name	Date
34	Atlantic	June 15, 2017
Building ID	Building Name	
GOC00001	DOMINION PUBLIC BUILDING	
Project #	Project Name	
R.063820.005	Dominion Public Building Renovation	

Part 1 – Project Requirements

This document complements the project Requirements Document and forms part of the project Request For Proposal (RFP) for Consulting Services.

Commissioning Services SOW

The Commissioning Oversight Manager/Specialist has reviewed the applicability of commissioning for the project and provides the following recommendation on requirements for commissioning: **Part 2A –Commissioning Requirements and SOW for Consultants on projects requiring a Third Party Commissioning Agent**

Part 2A - Commissioning Requirements for Consultant

1.0 Consultant's Responsibilities (Refers to the project Consultant/Design Professional)

1.1 In accordance with the RFP for Consulting Services, the Consultant maintains the overall responsibility for the project conceptual design, the contract documents, its construction/implementation, its performance, and conformance to applicable regulatory, codes and standards requirements. The responsibility that the built work and/or facility meets the Project Requirements and applicable regulatory and codes and standard requirements resides with the project Consultant/Design Professional. With regards to the commissioning process, the consultant is being mandated to; review the Project Requirements; document and update the project Design Intent and Basis of Design documents including the details of the proposed design solutions; prepare the contract documents and integrate the commissioning process requirements and specifications; coordinate required interfaces between the trades divisions, systems and assemblies; review and incorporate as appropriate the commissioning team members comments from submittal reviews; review and comment on the commissioning test procedures, progress reports and Cx issues log; review and recommend acceptance of the commissioning test data and results; reconcile design and construction issues, errors and omissions; review, accept and prepare record and close-out documents and deliverables; participate in the training of O&M personnel; recommend acceptance of the project built work and systems to the Project Manager and Commissioning Authority.

The appointment of a Commissioning Authority and Commissioning Agent does not permit the Consultant to abrogate its contractual professional responsibilities, including performing the required site supervision and reviews ensuring that the built work conforms to Project Requirements, Design Intent, Contract Documents and applicable regulatory requirements, codes and standards.

2.0 Planning Phase Commissioning Services

~~2.1~~ Review the Project Requirements documents in conjunction with this document.

3.0 Design Phase Commissioning Services

3.1 Submit design submissions to the Commissioning Oversight Manager for review.
3.2 Review and comment on the Commissioning Plan, Specifications and testing procedures with 3rd party Cx agent.
3.3 Specify and verify that the operation and maintenance of the systems and equipment are adequately detailed in the contract documents to ensure the proper implementation and performance commissioning.
3.4 Specify and verify that the design and contract documents include all devices, components, instrumentation required for the performance of the commissioning and to properly document the performance of each applicable equipment, systems and/or assemblies.
3.5 The consultant must identify all CMMS numbers for equipment affected by the project and show them on the plans.
3.6

4.0 Construction, Acceptance and Close-Out Phase Services

4.1 Attend commissioning team meetings.
4.2 Develop and submit list of shop drawings to be reviewed, to the Project Manager and Commissioning Oversight Manager. Review the contractor submittals and shop drawings. Coordinate and reconcile the review comments and approval with the Commissioning Team prior to issuing Review Forms and Approvals to the Contractor. All submittals and shop drawings reviews shall be forwarded to the Project Manager and Commissioning Oversight Manager and not directly to the contractor unless otherwise directed by the Project Manager.
4.3 Perform site supervision and reviews ensuring that the built work conforms to Project Requirements, Design Intent, Contract Documents and applicable regulatory requirements, codes and standards and submit to Project Manager and Commissioning Oversight Manager.
4.4 Attend start-up of equipment, review start-up report and confirm readiness to proceed to the performance verification phase.
4.5 Review performance verification forms with 3rd party Cx agent. Ensure each form shows specific testing conditions for each piece of the equipment/systems being tested.
4.6 Attend commissioning meetings prior commencement of performance verification.
4.7 Review and comment on the commissioning progress reports and Cx issues log.
4.8 Review and comment on the commissioning test reports, data and results. Confirm that the tests and reported results meet the Project Requirements, Basis of Design and Contract Documents.
4.9 Review and propose corrective measures for system and equipment not operating in accordance with the design parameters set out in the Basis of Design and Contract Documents.
4.10 Participate in the training of the operation and maintenance personnel and/or end users.
4.11 Review and comment on the contractor’s record documents (including but may not be limited to As-Built Drawings, diagrams, and schedules).
4.12 Prepare the project As-Built drawings. Submit to the Commissioning Oversight Manager for review.
4.13 Review and comment on the contractor’s Operation and Maintenance manual and data.
4.14 The consultant shall also be responsible to update the building’s existing HVAC SOPs, Halocarbon SOPs and other sections of the BMM as applicable. Coordinate this with BGIS Property Manager.
4.15 Consultant to update the existing Electrical SLDs and provided printed color copies to be posted in the electrical rooms, number of copies to be determined at job showing.
4.16 Review and comment on the Final Commissioning Report and Manual.
4.17 If complete, recommend acceptance of the project built work, system and equipment to the Project Manager.

5.0 Post-Occupancy / Operations Phase Services

Review and propose corrective measures for systems and equipment not operating in accordance with the Project Requirements, and the design and operating parameters set out in the Basis of Design and Contract Documents.

Part 2B - Commissioning Requirements and Scope of Work for Consultant

Not Applicable.

Regulatory Requirements

Applicable Codes and Standards, Policies, Guidelines, Design and Construction Documents Requirements

The Consultant's is liable to perform the work(s) in accordance with all applicable laws, codes and statutory regulations in effect at the time where the project is implemented. The Consultant's is responsible to provide formal and proper notification to Brookfield Global Integrated Solutions when any direction is received that is contrary to any law, code, regulation, statute or any other mandatory or legal requirement in effect.

PWGSC Departmental Policy DP039 - Use of the National Master Specification (NMS)

- The most current version of the NMS should be used as the base document for the production of the commissioning specifications component of the project manuals for all new construction and renovation work done for or by PWGSC.
- When preparing the commissioning sections, use the latest release of the National Master Specification (NMS) to the maximum extent to which it is applicable in accordance with the Departmental Policy, subject to the consultant's overriding responsibility for the content of the construction project specification. Edit, amend and supplement the NMS as required to produce a project manual that is appropriate and specific to the circumstances of the project and free from conflict and ambiguity.

Computerized Maintenance Management System (CMMS)

All contract work shall comply with the requirements of the PWGSC CMMS;

- It is a requirement to provide CMMS inventory sheets for all major components or systems.
- Record and submit CMMS numbers for all components or systems to be removed or replaced as part of this project prior to removal.
- Collect and record all CMMS data for all new or relocated equipment being installed, replaced, removed from or taken out of service from existing inventory of equipment.
- Inventory sheets will include all product data, serial and model numbers, equipment description, and location.
- Facility operation and maintenance supervisor will assist the Contractors by providing CMMS sequential numbers.
- Provide fully completed inventory data sheets for all new equipment two (2) weeks prior to seeking approval for proposed component identification.
- All CMMS inventory sheets are to be added in to the O&M Manual.
- CMMS applies to all major components or systems. Minor items such as switches, thermostats, etc., are not to be inventoried under the CMMS. The Commissioning Oversight Manager will provide clarification to the Contractors upon request.
- Specifications shall hold the contractor responsible for providing all required CMMS data and inventory sheets to the commissioning oversight manager or specialist.

The commissioning program, services and documentation shall adhere to the following standards, policies and guidelines as appropriate for the scope of work. -BGIS COMM 101-00-RP1 Commissioning Oversight Management Policy. -PWGSC Commissioning Manual CP-1 - 4th Edition – November 2006. -PWGSC Commissioning Guidelines CP.3 to CP.13. -CSA Z320 Building Commissioning Standards and Check Sheets, -ASHRAE Guideline 0 – The Commissioning Process. -ASHREA Guideline 1 – The HVAC Commissioning Process. -BCA – Handbook, Samples and Templates.

BGIS Commissioning Oversight Manager	Signature
Daniel Desjardins	

Public Services and Procurement Canada
Services publics et Approvisionnement Canada

Canada

TECHNICAL REFERENCE FOR OFFICE BUILDING DESIGN

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Revisions

Version	Date	Description
1.0	May 27, 2016	Original issuance.
1.1	March 6, 2017	Issuance of draft version to Federal / Industry Real Property Advisory Council (FIRPAC) for consultation. The document is renamed to the Technical Reference for Office Building Design, and has a re-written general section, and various edits to the technical content.
2.0	April 3, 2017	Issuance for use under the RPB Policy Framework. Contains edits to technical content of the electrical section, additional requirements for accessible washrooms, improved translations of the French version and minor edits to the scope.

Table of Contents

1 General

1.1 How to Use This Document

This document describes both the general approach to the design of Public Service and Procurement Canada (PSPC) custodial office buildings, and the technical aspects that apply to each major discipline involved in the design. These objectives must always be balanced against all other government objectives including, but not limited to, security, accessibility, sustainability, heritage conservation and end user requirements.

When using this technical reference, apply common sense and ensure best value to Canadians. The application of this document must always be interpreted and considered, both at the scoping stage and throughout design development, by a project team following an integrated design approach to question the validity of each of its components against the problem at hand.

This technical reference is a generic document, while appropriate project-specific requirements can be found in the request for proposal (RFP).The technical reference should be applied to new buildings in their entirety and to renovations of existing buildings, given their constraints, to the greatest extent possible. In its application to renovations of existing buildings, the document is not intended to be applied retroactively. As such, the opportunity to incorporate changes to meet these objectives should be considered as part of the scope of all renovation projects that involve related aspects of planned work. The requirements in this document should not be considered as justification to initiate a project but as minimum requirements.

1.2 Effective Date

April 3, 2017

1.3 Cancellation

This document supersedes *National Performance Standards (NPS)*, and draft Real Property Branch (RPB) *Federal Office Building Standard* (FOBS).

1.4 Authority

This document is issued under the authority of the Director General (DG) Technical Services, Real Property Branch (RPB), Public Services and Procurement Canada (PSPC).

1.5 Context

This document is issued pursuant to the *Department of Public Works and Government Services Act* which states that the roles, duties and functions of the department's minister include:

- the construction, maintenance and repair of public works, federal real property and federal immovable;
- the provision of accommodation and other facilities for departments; and
- the provision to departments of advice on or services related to architectural or engineering matters affecting any public work, federal real property or federal immovable.

The document also supports the PSPC *Sustainable Buildings Policy* and complements *Government of Canada Workplace 2.0 Fit-up Standards*.

1.6 Scope

This technical reference applies to construction projects undertaken by PSPC or by the private sector on behalf of PSPC on crown owned buildings for which PSPC is custodian and for which the predominant use is office accommodations. This includes buildings predominantly used to offer office space categories such as general administrative, secure administrative, quasi-judicial office space, and call/contact centres.Variances from this technical reference must be justified in writing and submitted for acceptance to the regional PSPC office for Architecture and Engineering Services (AES).

The requirements of this document are not retroactive to existing buildings but do apply to renovation projects to the extent practical given existing conditions.

1.7 Purpose

The purpose of this document is to establish baseline building design and technical requirements for office buildings in order to ensure:

- office buildings are built to a high level of quality that meet operational needs;
- office building requirements are clearly defined and applied consistently by private sector service providers and PSPC staff;
- the design and construction of office buildings contributes to meeting Government and PSPC sustainability targets;
- design excellence;
- sound stewardship of our federal identify; and
- the design and construction of office buildings presents best value to the crown.

1.8 Enquiries

Enquiries about this document should be directed to the Director of Architecture and Engineering Services, Technical Services, Real Property Branch, Public Services and Procurement Canada at: TPSGC.dgbisag-rpbaes.PWGSC@tpsgc-pwgsc.gc.ca.

2 General Design Objectives

Most of the interactions between the federal government and Canadians occur in buildings delivered by PSPC. The quality of these buildings must project a consistent and positive image of the Government of Canada to the public. Design solutions must:

- meet the standards prescribed in this document, and where standards cannot be met, alternative solutions must be provided;
- satisfy the immediate occupancy needs outlined in the functional program and strive to anticipate future building uses; and
- make building systems adaptable to future uses and changing priorities.

The general design objectives noted below must be incorporated and applied to all design solutions for office buildings:

- functional suitability
- health, safety, universal accessibility, and security
- sustainable and enduring development
- creativity, innovation, and technical competence
- inspiring and attractive
- financial performance based on life-cycle costing
- heritage conservation
- environmentally responsible

2.1 Functional Suitability

Ensure design solutions are appropriate to their use and consider the performance of the asset over its entire life.

Design solutions must:

- respond effectively and efficiently to the operational requirements of the project;
- respond effectively to site-specific context and conditions considering urban design and landscape architecture;
- meet local urban design and planning guidelines; and
- be flexible and adaptable.

2.1.1 Code and Standard Versions

The design solutions must comply with all applicable federal laws, regulations and the codes referenced therein. This document references many codes and standards in a dynamic manner, meaning that for all codes and standards referenced, refer to the latest version published. For a full listing of codes and standards referenced in this document, refer to section 13.This is not an exhaustive list of all applicable codes and standards.

2.1.2 Provincial Requirements

When provincially mandated inspections are required in order to facilitate a utility connection or ensure safety of a system through a provincial inspection, the provincially adopted version of a code or standard may be applied to the project.

2.2 Sustainable and Enduring Development

PSPC is committed to the principles of sustainable development in all of its operations. The principles of sustainability must be incorporated in all phases of project delivery, especially in the initial stages when most of the key decisions are made. The building's design for energy use must be optimized through an integrated design approach with all disciplines. It must also meet the performance requirements outlined below as well as those listed throughout this document.

Ensure design solutions maximize a sustainable approach aimed at:

- improving the social value to support more livable communities;
- creating economic efficiencies; and
- reducing our environmental footprint by reducing, recycling, and reusing.

Design solutions must:

- meet the Leadership in Energy and Environmental Design (LEED) Gold for new buildings, alternately Level 4 Green Globes, and meet the *National Energy Code of Canada for Buildings*;
- meet the LEED Silver for renovations, alternately Level 3 Green Globes, and meet the *National Energy Code of Canada for Buildings*;
- utilize passive solar design to maximize the energy performance potential of the building and occupant comfort;
- be tailored to the local climate to ensure the durability and high performance of building systems;
- have an effective choice of building materials and systems to ensure durability and meet pre-determined durability targets set out for each project;
- be consistent with the Federal Sustainable Development Strategy (FSDS); and
- Comply with CSA-S478-95 Guidelines on Durability in Buildings.

2.3 Creativity, Innovation, and Technical Competence

Ensure design solutions demonstrate creativity, innovation, and technical competence in their approach to the functional program and context. However, only proven solutions are acceptable.

Design solutions must:

- maximize project potential as it relates to program requirements for the building and site;
- be innovative and creative in the problem-solving response to program and site constraints;
- demonstrate technical competence in the integration of design, building science, and engineering disciplines; and
- provide best value to the Crown over the life cycle of an asset.

2.4 Inspiring and Attractive

Ensure design solutions take into consideration the physical expression of the asset and contribute positively to the local context.

Design solutions must:

- enhance the immediate environment, both for direct users and the broader community;
- be recognizable as a federal office building, reflecting a positive image of the Crown and its core value of long-term sustainability;
- integrate visually within the unique context of the area; and
- provide clarity and consistency of architectural form and detailing.

2.5 Financial Performance Based on Life-Cycle Costing

Ensure design solutions demonstrate the balance between capital construction costs, operational costs, and sustainability.

Design solutions must:

- demonstrate best value to the Crown from the use of a life-cycle approach to the financial performance of the asset from construction to demolition; and
- be evaluated using life-cycle cost analysis according to industry best practice.

2.6 Heritage Conservation

The requirements of this document are not retroactive, however, major rehabilitation projects of federal heritage buildings should seek to address as many of the principles outlined within this document as possible while still respecting the *Standards and Guidelines for the Conservation of Historic Places in Canada*.

2.7 Environmentally Responsible

PSPC must meet applicable environmental legislation and policies. PSPC is committed to sustainable development, applying it across all business practices, in compliance with environmental laws and regulations, in using environmentally beneficial products and services, and in using resources in a sustainable manner.

The essential principles of environmentally responsible design and construction include:

- Site - Optimize site potential
- Energy - Minimize non-renewable energy consumption
- Materials - Use efficiently environmentally preferable products
- Water - Protect and conserve water
- Indoor Environmental Quality - Enhance indoor environmental quality
- Operations and Maintenance - Optimize operational and maintenance practices over the full life cycle of the facility

These principles serve as the basis for planning, programming, budgeting, construction, commissioning, operation, maintenance, decommissioning of all new PSPC facilities, and for major renovation and alteration of existing buildings and facilities.

2.7.1 Prohibited Materials

The use of the following materials is prohibited on all PSPC projects:

- products containing asbestos;
- products containing pure formaldehyde;
- products containing polychlorinated biphenyls;
- products containing chlorinated fluorocarbons;
- solder or flux containing more than 0.2 percent lead and domestic water pipe or pipe fittings containing more that 8 percent lead; and
- Surface coatings with a concentration of lead in excess of 0.009 percent by weight, as per the *Hazardous Products Act's* Surface *Coating Materials Regulations*.

2.7.2 Demolition/Remediation

Paint must be tested for lead content when alteration or demolition requires sanding, burning, welding or scraping painted surfaces. Do not abate lead-based paint when a painted surface is intact and in good condition, unless required for alteration or demolition. In child care centers, test all painted surfaces for lead and abate surfaces containing lead-based paint.

2.7.3 Removal of Asbestos-Containing Materials

Asbestos abatement is under the jurisdiction of provincial governments and PSPC applies processes and procedures that are consistent with the relevant requirements and regulations. Ensure that the asbestos management plan meets all applicable requirements.

Prior to design in a facility to be renovated, a building evaluation should be performed by a qualified inspector including a review of previous inspection reports and a site inspection. If asbestos damage or the possibility of asbestos disturbance during construction activity is discovered, an asbestos management plan shall be proposed and implemented. (Ref. DP 057, Asbestos Management).

All design drawings and specifications for asbestos abatement shall be produced by a qualified specialist. In general, projects should be designed to avoid or minimize asbestos disturbance. The environmental standards vary in each provincial / territorial jurisdiction and should be supplied by PSPC.

All PSPC construction work that disturbs asbestos shall be performed using appropriate controls for the safety of workers and the public.

2.7.4 Fuel Storage Systems

Storage tank systems must comply with applicable *Canadian Environmental Protection Act* (CEPA). The owner of the storage tank system must identify and register the storage tank system with Environment Canada. Under the Regulations, both the owner and the operators of storage tank systems must comply with the Regulations. The owners and operators both share the responsibility to prevent leaks and spills, report spills, implement emergency response and exercise due diligence in everyday actions.

Storage tank systems are also regulated under one or more of the following federal regulations: the *Canadian Council of Ministers of the Environment (CCME) Code of Practice*, the *National Fire Code of Canada* and the Installation for oil-burning equipment, CSA B-139-09.

If a leak is detected / discovered, the owner or operator (i.e. the property manager or his representative) shall notify Environment Canada and the provincial authority and provide all information requested.

2.7.5 Compliance with the Canadian Environmental Assessment Act (CEAA)

The *Canadian Environmental Assessment Act* (CEAA) assesses the impacts of a project on the surrounding environment which includes the natural environment, health, socio-economic conditions, and the physical and cultural heritage. Its purpose is to promote sustainable development to ensure that environmental impacts of projects are minimized and that the process is open and participatory.

An Environmental Assessment (EA) is a planning and decision making tool which is used to predict and identify environmental effects before they occur, plan mitigation to be incorporated into project design and determine whether a project should proceed. Ensure that EA checklist requirement is completed.

3 Site

The site provides the first impressions to Canadians of a federal office building. The Real Property Branch (RPB) is a custodian of real property assets and a provider of general-purpose office accommodations to federal departments. RPB’s goals include:

- meeting the custodial requirements of accommodation as per Treasury Board standards;
- ensuring that provincial and municipal official plans, zoning bylaws, urban design guidelines, and other priorities are considered for the site development in the delivery of the real property program;
- meeting applicable environmental legislation and policies to ensure protection and preservation of ecological zones and habitats; and
- meeting the various site-development requirements of Leadership in Energy and Environmental Design (LEED) or Green Globes pre-established for the project.

3.1 Site-Specific Analysis

A site-specific analysis report must be prepared for each project illustrating that the above goals have been reviewed and evaluated as part of developing an integrated strategy. The site analysis must demonstrate a clear understanding of the existing site conditions.

3.2 Urban Design

The federal government is committed to working closely and collaboratively with Canada’s communities in support of local planning priorities while meeting sustainable objectives. The federal government’s intent is to support the quality of life of communities with appropriate, sensitive urban design.

3.2.1 Design Objectives

Urban design is important to ensure an appropriate “fit” of the facility within the urban environment. The building’s form and adjacent open space areas must be integrated to ensure a cohesive, sensitive solution. Urban design objectives include:

- demonstrating compatibility with the physical characteristics of the area and the environment surrounding it, including neighbouring land uses;
- enhancing the quality of life of the community by:
    - linking, where possible, with the public transit system and including bicycle and pedestrian pathways to reduce stress on the existing transportation system; and
    - preserving and protecting the ecological features and the heritage and cultural values of the community;
- supporting the livable qualities of the neighbourhood and community by:
    - building massing that includes adequate setbacks proportional to the existing neighbourhood, supporting the integration of the building into the local context;
    - providing appropriate pedestrian sidewalk widths to include and support trees, rest areas with benches, and other site features to generate a lively pedestrian culture to ensure accessibility for all users; and
    - illustrating a respect for human scale and use at the street level;
- integrating into the existing streetscape by:
    - orienting the front of the building to the main thoroughfare and providing an open space in front of the façade where the main entrance is located;

- creating an animated and transparent ground-floor level along commercial street frontages such as maximizing the use of clear glazing at public entrance areas and lobbies;
- incorporating elements to aid in the reduction of wind tunnel and wind shearing effects at grade levels around the building;
- integrating site furniture (benches, waste receptacles, light standards), plantings, and bus shelters with the building's design to assist in improving the functionality of the streetscape and neighbourhood;
- locating service entrances away from active public streetscapes, and if space is limited, designing service entrances so they are screened from the street in order to preserve the sense of place and aesthetic appeal of the streetscape, while ensuring that there is no manoeuvring or backing in from the street; and
- the use of crime prevention principles through environmental design for the planning of the site, including taking advantage of opportunities for passive surveillance and territorial control.

3.2.2 Master Planning

Master planning is fundamental for the appropriate organization and development of sites. For federal precincts, campuses, office complexes, and office buildings, a master planning exercise must be undertaken for the project site area. At a minimum the following elements must be studied:

- the site's capacity to accommodate the building or building complex's functional, operational, and experiential components;
- the natural and built environment, including topography and climatic conditions;
- the surrounding context of the site in relation to:
    - rural, suburban, and urban core contexts;
    - neighbourhood and streetscape typologies;
    - heritage designations;
    - servicing;
    - emergency access; and
    - public transit opportunities;
- the projected growth and development of the surrounding area;
- the on-site circulation of employees, business operations, functional requirements, public transit links, and general public use;
- all applicable legislation and standards as well as local municipal official plans, technical standards, and bylaws for the site and adjacent land areas and urban fabric; and
- project-specific costs, risks and other issues associated with the site's development.

Furthermore, master planning for a multiple-building complex or campus must incorporate open areas, which can be either adjacent to the building or at another location as determined by the site master plan. In addition, security elements must be integrated with the site design and building design.

3.3 Landscape Architecture

The intent of landscape architecture design for federal office buildings is to provide integrated design and technical solutions to create liveable and sustainable environments. At varying scales of planning, design, and management, design strategies must encompass innovative and creative built-site infrastructure utilizing natural landscape elements to support and enhance federal office buildings.

3.3.1 Design Objectives

The objective of this section is to establish sound landscape architectural design requirements for federal office buildings. Sites for federal office buildings range in scale from single buildings in urban and rural settings to large campuses, precincts, and districts. Landscape architecture design objectives are to:

- create a well-developed site that will support and enhance the building's function and operation;
- enhance the user's outside experience;
- enhance the linkages and connections with the adjacent streetscapes and neighbourhoods;
- support and enhance sustainable best practices to strengthen the inter-relationship of the landscape and building with the environment through the use of green infrastructure; the reducing, recycling, and reusing of materials; and other sustainable practices and strategies;
- support and enhance the social values by applying universal accessibility best practices for all main access and exit points to buildings and sites, parking, and other amenities; and
- ensure low-maintenance solutions to create operational efficiencies.

3.3.2 Site Design

Site design strategies must utilize the local climate and environment to reduce operational costs and support an effective functional program for employees and the public by:

- demonstrating how sun radii, wind, topography, and vegetation are used to create microclimates to enhance the experience of the site and building for the occupants and visitors;
- illustrating how scale and massing of the building and its infrastructure, such as parking structures and circulation systems, will not negatively impact adjacent open spaces or streetscapes or critical view lines to and from the site;
- demonstrating how the design of the exterior circulation systems and site amenities supports the building's functionality, such as selecting appropriate locations for principal building entrances and key destination points that are easily identifiable when approaching the building; and
- demonstrating how wayfinding and orientation systems are efficient and effective and assist in preserving the cultural and aesthetic values of the landscape surrounding the building.

3.3.3 Technical Requirements

3.3.3.1 Site Areas

Site areas around buildings must encourage interaction with the environment and social interaction of the occupants as well as support recreation activities. The outdoor space must be:

- designed with natural landscaping materials selected to reduce impervious "hardscape" elements;
- designed using native plants to limit maintenance requirements and promote biodiversity;
- integrated with vegetative elements to create a dynamic landscape throughout the year that takes in consideration the four seasons;
- focused on eliminating the use of potable water for irrigation and using where required grey water irrigation systems and plantings, which require little to no irrigation;
- planned with trees placed to provide shaded rest areas and assist in achieving reductions in heat and glare on hard surfaces, as well as to contribute to the general enhancement of pedestrian health and comfort; and

- planned with the intent of integrating planting in and around the building and parking area in order to promote visual surveillance for safety and security.

3.3.3.2 Circulation

Convenience and clarity of the exterior circulation system is a priority. Exterior circulation must be planned to achieve the following objectives:

- demonstration of a clear design strategy for pedestrian, bicycle, vehicular, service delivery, construction, emergency, security, and exterior material-handling circulation routes; intersections; staging areas; vehicular laybys; drop-off areas for building occupants; parking areas; as well as waste and snow storage areas;
- provision of space for drop-off zones and waiting areas for pedestrians and vehicles;
- integration with existing walkways, paths, and vehicular circulation networks; and
- demonstration of parking areas and circulation routes that maximize sustainable best practices to reduce impacts on the natural environment for stormwater and heat absorption.

3.3.3.3 Vegetation

Vegetation strategies must include:

- conservation and enhancement of existing natural areas and restoration of damaged areas to provide habitat and promote biodiversity;
- reinstatement of trees removed from the site on a ratio of two new trees for every tree removed; and
- integrated pest management using, where possible, natural predators to control infestations and monitoring programs where infestations have occurred.

3.3.3.4 Site Grading

Grading strategies must demonstrate an integrated approach to the site and building and adjacent land areas. There must be no negative impacts to riparian zones, ecologically sensitive landscapes, existing trees and shrubs that will be remaining, and adjacent land areas not owned by the federal government.

Site grading must:

- reuse materials, where possible, through efficient excavation;
- minimize the transport and placing of excavated materials to limit compaction;
- avoid the potential for settlement resulting from compression of the underlying soils;
- minimize the need for retaining walls;
- minimize the need for constructing cut slopes; and
- minimize the need for removal of topsoil or other organic soils including fill materials.

3.3.3.5 Site Drainage

The site drainage planning must include the development of a strategy to minimize the volume of stormwater and snowmelt runoff going to municipal systems, and to improve water quality. The approach should if possible be based on the historical conditions of ecosystems in the region.

In all cases, the design of site drainage must minimize the negative impacts of site grading strategies to municipal infrastructure, adjacent landscapes, surface water bodies, and below-ground water tables through:

- the use of above- and below-ground, sustainable green infrastructure stormwater control systems and site design such as the elimination of concrete curbs;
- incorporation of an integrated stormwater retention and detention system for the roof in order to reduce stormwater runoff and, where applicable, to provide irrigation;
    - for example, implementing a green roof or rainwater harvesting strategy should be considered, the viability and effectiveness of which must be clearly demonstrated;
- the provision of grey water irrigation to assist on-site vegetation growth if irrigation is required; and
- the provision of proper drainage to eliminate standing water that is at risk of harbouring mosquitoes or other disease-carrying insects.

For all projects, the following criteria must be respected:

- all surface stormwater runoff must be addressed on-site;
- a major drainage system must be designed to address a 1:100 year storm event;
- where a minor drainage system is required, it must be designed to address a 1:5 year storm event; and
- storm drainage systems must rely on gravity flow wherever possible.

3.3.3.6 Soil Erosion

Site planning and design must include strategies to control and minimize soil erosion, waterway sedimentation, and airborne dust. The site plan and sedimentation control plan for all land-related construction activities must:

- conform to the erosion and sediment control requirements of the provinces and municipalities; and
- mitigate risk of erosion of the embankments and sloped areas, especially those that could impact riparian zones, waterways, and stormwater retention ponds.

3.3.3.7 Site Furniture

The design and provision of site furnishings and shaded rest stops are an important aspect of site planning. The requirements of the functional program must be met and the selection of furnishings must:

- fit with the design concept for the building and surrounding site;
- be made of durable long-lasting materials; and
- require little or no maintenance.

3.3.3.7.1 Bicycle Storage

Secured bicycle storage for 5% or more of the regular building occupants should be provided within 60 m of the building. Bicycle racks should be placed in a location that is convenient to riders, such as a parking garage, parking lot or near a building entry. Bicycle racks should be located to avoid potential conflicts between cyclist and pedestrian traffic and also ensure that users do not cut across turf or planting areas. This location should be highly visible by building occupants, security personnel, security monitoring systems or by general traffic or in a secure (locked) area for use only by employees. Racks should have provisions for locking bicycles to them. Bicycle racks should be compatible with other site furnishings and with the architectural and landscape design. Bicycle storage requirements should also be reviewed in conjunction with local regulations.

Materials for outdoor bicycle racks should be very durable and resistant to vandalism. Movable racks can be an important component in effective outdoor spaces. However operational considerations must be given as to the risk of theft and their storage. Metals that require repainting should not be permitted.

3.3.3.8 Site Lighting

Site lighting designs must achieve necessary light pollution reduction. Refer to section 8, Electrical Engineering, for additional requirements. Designs must:

- support the reduction of light fixture glare;
- support the reduction of light trespass to adjacent sites;
- support a balance between providing good visibility and meeting security concerns while respecting the character of a site, streetscape, and neighbourhood; and
- respect light hierarchies as per master planning and urban design requirements.

3.4 Civil Engineering

3.4.1 Design Objectives

The civil engineering design objectives associated with site development for both new construction and existing buildings include:

- aligning with provincial and municipal requirements found in official plans, zoning bylaws, technical standards, and other design and technical guidelines for the development of sites;
- integrating the project requirements of the utility and services authorities having jurisdiction, including those related to equipment installation, access, maintenance, and replacement;
- locating piping for all systems under dedicated service corridors or vehicular circulation routes to ensure year-round accessibility for maintenance;
- addressing trenching to minimize differential frost settlement of the cuts, reduce the settlement effects of trenches and pipes, as well as ensure frost protection of the pipes;
- controlling stormwater and sanitary sewage to meet the discharge standards of the authority having jurisdiction over the receiving outlet;
- sizing sanitary systems to accommodate “peak waste flow,” including long-term development forecasts as well as allowances for infiltration following municipal guidelines; and
- providing sanitary systems separate from stormwater systems.

3.4.2 Water Supply Services

The planning and design of water supply services for a campus must include the requirements to use a loop system fed from more than one source and to configure the entire distribution network to ensure redundancy of supply. Buildings must also have two feeds to ensure redundancy.

Service connections for individual site and building water supply must meet following design and technical requirements:

- the system design must confirm the available flow rates from the surrounding system;
    - flow rate testing and hydraulic analysis must be completed as part of the design to confirm capacities and pipe sizing;

- flow and pressure requirements for site fire protection demands must be met, including the requirements of:
  - the National Building Code of Canada;
  - the National Fire Protection Association NFPA 24: *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*; and
- domestic water demands (peak and average) must be met;
- service lines to buildings are to be grounded as required by the *Canadian Electrical Code,* specifically the use of 3.0 m minimum metallic, continuous ductile iron or copper piping outside the building footprint is the preferred method of grounding;
- modular wall seals must be provided at water service entries to buildings; and
- cathodic protection of water mains and associated appurtenances must be provided based on soil and groundwater conditions and municipal standards.

3.4.3 Stormwater Management Services

Stormwater management services must be integrated with landscape architectural requirements for surface water flows. Refer to section 3.3.3.5, Site Drainage, for specific requirements. The gravity-based system must have as a minimum:

- pipe flow velocity within a range of 0.6 m/s to 3 m/s under full flow conditions;
- optimization of on-site water detention; and
- stormwater system components that meet the following requirements:
  - catch basin leads must be a minimum of 200 mm in diameter;
  - maintenance holes must be a minimum of 1200 mm in diameter;
  - sumps must be provided in maintenance holes and catch basins; and
  - safety platforms must be provided in maintenance holes that are more than 5.0 m deep.

3.4.4 Site Grading

Site grading must be integrated with landscape architectural design requirements. Refer to municipal requirements and to section 3.3.3.4, Site Grading, for detailed requirements.

3.4.5 Sanitary Services

On campuses, the sanitary sewer system design for individual buildings must be integrated with landscape architectural design requirements.

In rural areas, follow the requirements of the provincial and municipal authorities having jurisdiction for septic systems for on-site sewage treatment. Cesspools are not permitted.

The sanitary system of individual sites and buildings must be sized to accommodate “peak waste flow” as well as the long-term needs of the site. The system must meet the following design and technical requirements:

- cleanouts are to be located in the interior of the building, and maintenance holes must be provided where exterior access is required;
- municipal requirements as well as local guidelines of leakage allowances must be followed, and these design values for extraneous flow rates must be included in calculating peak sanitary flows; and

- pipe velocity flow rates must be confirmed after construction and data must be submitted as part of the commissioning process;
- sanitary system components must meet the following requirements:
    - sanitary sewers must be a minimum of 200 mm in diameter;
    - maintenance holes must be a minimum of 1200 mm in diameter;
    - maintenance holes must be benched;
    - external drop pipes must be provided for maintenance holes where the inlet elevation exceeds 600 mm or in accordance with the local authority having jurisdiction; and
    - safety platforms must be provided in maintenance holes that are more than 5.0 m deep.

4 Architecture and Interior Design

4.1 Design Objectives

The site, setting, and appearance of a federal building contribute to the image of the Government of Canada. In this context, the base building design of a federal building and its interior public spaces must contribute to the overall architectural value of the building. The main building signage and flagpoles must also be integrated into the design of the building.

Federal buildings must have a load factor ranging from 1.1 to 1.3 based on the 2010 American National Standards Institute / Building Owners and Managers Association ANSI/BOMA Z65.1-2010: *Office Buildings: Standard Methods of Measurement* using Method B. Buildings must also meet the following technical performance standards with reference to other detailed requirements in sections 6, Mechanical Engineering, and 8, Electrical Engineering:

- the building must meet a maximum air leakage rate of 0.20 air changes of building volume per hour at the standard building pressure of 50 N/m2, and all buildings must undergo air leakage testing to confirm that this target level of airtightness is met;
- the building must be designed to minimize stack effect, and solutions to achieve these objectives must be identified; and
- the building design service life is to be a minimum of 50 years according to CSA S478: *Guideline on Durability in Buildings*.

4.2 Building Common and Service Areas

4.2.1 Entrances

The building must be designed to direct the visitor to a principal entrance, which must be conveniently located, have a grade-level approach based on existing site conditions, as well as be clearly articulated on the exterior of the building. Secondary and tertiary entrances must also be clearly articulated on the exterior of the building.

Building entrances must meet the following design and technical requirements:

- have a canopy for weather protection, sized for sheltering and for emphasizing the main entrance;
- have weather protection for secondary and tertiary entrances;
- provide conventional swing doors and a vestibule at the principal and secondary entrances, revolving or sliding doors may;
- provide a personnel door for exterior overhead door locations;
- incorporate building and wayfinding signage in compliance with the applicable treasury board federal identity policies, including standard federal signage mounted on a prominent facade and a flagpole mounted on a facade or the rooftop;
- deploy solutions to inhibit the buildup of dirt and moisture in the lobby;
- deploy solutions to maintain the integrity of the security of the lobby; and
- incorporate appropriate decorative or accent lighting to support the design concepts.

4.2.2 Lobbies

The main building lobby must provide a welcoming impression to Canadians visiting the office building and reflect a positive identity for the federal government. Lobbies must meet the following design and technical requirements:

- be clearly visible from the exterior of the building both in the daytime and at night;
- have the elevator lobby and main building lobby located such that they are visible from the building entrance vestibules;
- be laid out to allow a continuous flow of pedestrian traffic with space large enough to accommodate all employee traffic during peak hours;
- provide interlink ground floor entrance areas from the street and the parking lot areas;
- accommodate circulation requirements that include additional floor area for a visitor and a security desk approximately 24 m^2 in size as well as surrounding area for security screening;
- accommodate the placement of reception and security control functions to provide visual supervision and physical control of the lobbies, including elevator lobbies and escalator lobbies;
- be designed to adhere to security requirements (see section 10, Security);
- utilize durable interior finishes for all areas and high-impact-resistant finishes for areas with heavy pedestrian traffic, using finishes that can be easily cleaned and maintained (painted gypsum wallboard [GWB] is not considered durable);
- have appropriate decorative or accent lighting to support the design concepts; and
- at least one accessible washroom must be provided in close proximity to areas where public events may be held.

4.2.3 Building Core and Support Spaces

The core is the central area of the floor plate, which includes elevators, exit stairs, washrooms, mechanical and service shafts, as well as electrical rooms. The elevator lobby and the main building lobby must be designed as an interconnected reception area.

Planning for building cores must establish distances to perimeter glazing following Leadership in Energy and Environmental Design (LEED) requirements, with the workstations located no more than 12 m from the window wall.

Planning of office floor plates must be flexible to allow the subdivision of typical floors into a minimum of two separate tenant areas while not compromising life safety for occupants.

There must be an acoustic separation of sound transmission class (STC) 52 between the building core and occupant areas.

Requirements for building support areas and inter-relationships determined by the functional program must be achieved in the design.

4.2.3.1 Elevators

All occupied areas of a federal multi-story building must be served by at least one passenger elevator. Elevator cab sizes, class, and service capacity are to be determined through an elevator traffic capacity, wait times, and system analysis. Elevators must meet the following design and technical requirement:

- passenger elevators, if more than one, must be grouped in banks of at least two for efficiency;
- travel distances from a given office or workstation to an elevator must not exceed 60 m;
- the location of stairs and their design within buildings must be inviting and encourage their use rather than elevators, to the fullest extent feasible;
- if no separate freight or service elevator is provided, one passenger elevator must be designated as a service elevator;
- a freight elevator must be provided for midrise and higher office buildings;

- a minimum ceiling height of 2.7 m is required in service elevator cabs, and freight elevators must have a ceiling height of no less than 3.7 m;
- elevator wait times must be no more than 24 to 27 seconds during the morning peak time and no more than 31 to 35 seconds during the noon peak time;
- the number of passenger elevators must be determined by the elevator traffic and system analysis;
- provide shuttle elevator(s) from the ground floor lobby to below grade parking with fully automatic operation with selective-collective operation. Capacity must be based on anticipated traffic flow and system analysis; and
- where equipment penthouses are provided, service elevators must provide access to that level.

A non-proprietary elevator control system must be used, and the PSPC project manager must define the extent of control. Destination control systems must be used. Security controls must be installed with override systems as required by the functional program.

Passenger elevator finishes must be focal points for the interior design of the building. Finishes for all surfaces must be durable, easily replaced, and low-maintenance. Door surfaces must be durable, scratch-resistant, and easily replaced. Inside and outside finishes must be coordinated with adjacent wall surfaces.

All finishes for service elevators must meet the service-level requirements for durability, and walls and ceilings must be metal. Flooring must durable, non-slip, easily maintainable, and replaceable.

In passenger elevators, recessed downlights or indirect fixtures must be used. Freight elevators must have recessed ceiling light fixtures.

All elevators must meet the requirements for firefighters emergency operation, with the service elevator designated as the dedicated firefighters elevator for the building.

4.2.3.2 Stairways (Open for Convenience)

Open stairways that connect lobby and atrium spaces must use a similar materials palette as the lobby space. Open risers are not to be provided.

4.2.3.3 Mechanical and Electrical Rooms

Mechanical and electrical equipment rooms must be designed with adequate aisle space and clearances around equipment to accommodate maintenance and equipment replacement. These rooms must meet the following criteria:

- mechanical rooms must be located to minimize heat and sound transmission to other parts of the building;
- mechanical spaces must be large enough to allow for a safe working environment and provide adequate area for maintenance service requirements and for future expansion;
- equipment rooms must have hoists, rails, and fasteners for chains to facilitate installation or removal of heavy equipment;
- easy access must be provided to roof-mounted equipment by an elevator cab stop or a large stairway to facilitate maintenance, and temporary ladders, steep stairwells, and ship’s ladders must not be used;
- main mechanical and electrical equipment rooms (such as mechanical penthouses or basement rooms) must not be less than 3.6 m clear in height from the underside of the structure;

- doorways and corridors to the building exterior must be of adequate size to permit the replacement of equipment; and the path may include knock-out panels, hoists, and provisions for cranes but must allow equipment replacement;
- mechanical and electrical rooms must be accessible from non-occupied spaces such as corridors;
- primary substations (electrical vaults) or rooms containing the main secondary switchgear must not be located below garage ramps, washrooms, or janitor closets or be at an elevation that requires sump pumps for drainage;
- transformer vault rooms and emergency generator rooms must be located following the requirements of the local authority having jurisdiction;
- floor-mounted electrical and mechanical equipment such as switchgears, main building transformers, motor control centres and generators, chillers, boilers, pumps, air-handling units, electric motors, motor starters, and tanks must be set on concrete housekeeping pads, curbs, or saddles at least 100 mm thick and at least 100 mm wider on all sides than the equipment they support; and
- fuel tanks or storage tanks must have a housekeeping pad that incorporates a raised barrier of adequate volume for spill containment.

4.2.3.4 Vertical Shafts

Vertical shafts for running pipes, ducts, and flues must be located adjacent to other building core elements. In addition:

- shafts must be straight vertical runs for services;
- shafts must be sized 20% larger in area to accommodate planned expansion of the systems; and
- bus ducts require a raised containment curb edge at floor slab penetrations, and sleeves are to continue to 75 mm above the floor slab.

4.2.3.5 Washrooms

Washrooms must be located adjacent to vertical shafts at the building core. At least one washroom on each floor must be accessible, meeting the requirements of CSA B 651 *Accessible Design for the Built Environment*.

They must be designed with water-resistant, easily maintainable, durable finishes on all walls and floors. A mirror must be provided above each sink, or a continuous mirror provided across the entire sink area.

All washroom partitions must use durable, easily maintainable materials and must be ceiling- or wall-hung. Separation partitions between urinals must be provided. Each washroom must have two recessed waste receptacles, in stainless steel, one for paper towels and one for garbage. Washroom plumbing fixtures must be of a low-flow specification in all areas except basement areas.

4.2.3.6 Change Rooms, Showers, Locker Rooms

Change rooms with lockers must be located as part of washroom areas associated with relevant LEED credit. If provided, the planning of the change rooms must include lockers and benches. The showers must be separate showers and visually separated from the locker areas. All finishes must be water-resistant, easily cleanable, and maintainable.

4.2.3.7 Custodial Spaces

Custodial spaces must be provided to support the operation and maintenance of the building and include building maintenance storage rooms, stockrooms, and maintenance workrooms. Provide a minimum area of 20 m^2 in the basement, on the ground floor adjacent to loading docks, and in the rooftop penthouse. Coordinate requirements with the functional program.

4.2.3.8 Janitor Closets

Janitor closets must be directly accessible from the office floor corridor and discretely located near the washroom facilities.

4.2.3.9 Recycling Centres

Corridor areas must be provided with multi-material waste and recycling recesses. A minimum of three containers is typical: one each for recyclables, mixed recyclables, and compostables. However, the requirements must be confirmed with building management. A minimum of one station per floor or one station per 1000 m^2 must be provided.

4.2.3.10 Waste Management Rooms

Waste management rooms and equipment must be secured and adjacent to loading docks or service entrances and meet the following requirements:

- be sized to accommodate the required functions of central collection, separation, and storage of garbage, recycling, and compostable materials;
- have areas sufficient for the storage of anticipated waste material volumes generated during a three-day building occupancy period;
- have refrigerated areas for compostable materials;
- accommodate all governmental requirements pertaining to waste reduction and waste audit programs; and
- facilities that use waste containers picked up by vendors must have at least one internal loading berth for the waste containers.

4.2.4 Building Management Spaces

Property management, building systems technicians, and building cleaning operations teams must have offices next to the security control centre. Approximately 15 m^2 must be allocated for this standard office space. Refer to the requirements of the building-specific functional program.

4.2.4.1 Security Control Centre

The security control centre must be located adjacent to the main lobby. Approximately 20 m^2 must be allocated for this room, which will require rough-in of specialized conduit in the floor slab and ceiling areas for the workstations. Rough-ins are also required for the building automation system (BAS), the emergency power system, as well as the fire alarm annunciator panel.

Planning for a security command centre and inspection station must be considered if it is not required at the time of building design. The security control centre design criteria outlined above must be used in conjunction with the Royal Canadian Mounted Police (RCMP) physical security guide G1-013: *Security Control Centre Space Requirements*.

4.2.4.2 Loading Docks, Shipping, and Receiving

The loading docks and shipping and receiving areas are to be available to PSPC at all times. These areas must be convenient to service or freight elevators so that service traffic is segregated from the main passenger elevator lobbies and public corridors. They must be fully inside the building and include staging areas. Other requirements include the following:

- loading docks must be located for easy access by service vehicles and be separate from the main public entrances to the building;
- trucks and trailers that remain outside the building must have expandable environmental seals provided to separate interior unloading areas from the exterior;
- dock levellers and one scissor lift must be provided to accommodate the variety of bed heights of service vehicles;
- the edges of loading docks must be protected with edge guards and bumpers; and
- spot lighting must be provided to illuminate the inside of trailers for the loading and unloading activities.

4.2.5 Structured Parking

Parking is to be exterior on-grade parking, interior below-grade parking, or standalone structured parking. The general management criteria are contained in the Real Property Branch *Custodial Parking Policy* and *Custodial Parking Procedure*. Design and technical requirements include the following:

- structures and parking spaces must be laid out for maximum efficiency;
- parking stalls must be full-sized, and compact vehicle-sized parking stalls are not to be provided;
- two-way aisles must have a minimum width of 6.7 m, one-way aisles a minimum width of 3.6 m, and parking spaces must be a minimum of 2.6 m wide and 5.2 m long;
- preferential parking spaces are to be provided for accessible parking and for electric vehicles with charging stations;
- accessible parking spaces must be adjacent to access aisles that are part of an accessible route to the building or facility entrance;
- access aisles and entrance platforms to elevator lobbies are to use bollards and guardrails to safeguard routes;
- entrances and enclosures of elevator lobbies must be located so that they are visible from the interior of the parking facility, and must have a glazed wall area that is a minimum 50% of the total wall area;
- structural elements must not intrude upon the required stall dimensions, columns must not be located within 610 mm of the required aisle (except where the aisle has no stalls perpendicular to it), and each stall must have direct access to an aisle;
- the entire length of the entrance and exit ramps must be protected from snow and ice, and snow and ice must not accumulate on the ramps;
- all vehicular entrances to structured parking are to be secured with overhead doors or grilles that must be electric-powered, on an emergency power circuit, and operated by card-readers or other means of remote control;
- garage openings must have a minimum width of 3.6 m and a minimum height of 2.4 m, and must be monitored by video camera;

- the clear height throughout the vehicular accessible areas of a parking structure must not generally be lower than 2.25 m; and
- a headache bar, with signage indicating the clear height, must be provided in front of each garage opening and mounted slightly lower than the clear height of the parking garage.

Pedestrian walkways must link the exterior structured parking or outdoor parking area with the building entrance. Passive landscape techniques must be used to prevent vehicles from encroaching upon pedestrian walkways. In addition, pedestrian crossings of vehicular circulation lanes must be identified.

4.3 Building Envelope

The objective is to have a building envelope that provides an effective separation between the interior and exterior environments to ensure the comfort of occupants and meet passive solar and energy consumption goals. The exterior enclosure must have a high level of refinement in the aesthetic expressed by the proportions, scale, and relief as well as the materials and colours used.

4.3.1 Exterior Wall Assemblies and Components

The exterior building envelope must be designed in accordance with the “rainscreen” principle. Face-sealed envelope systems must not be used. The envelope must meet or exceed the requirements established in the CSA S478: *Guideline on Durability in Buildings*. Design and technical requirements include the following:

- walls must have a minimum 50-year full service life and at least 30 years of service life prior to a major rehabilitation;
- windows must have a minimum 25-year full service life and at least 15 years of service life prior to a major rehabilitation of gasket and seal replacements;
- roofs must have a minimum 20-year full service life;
- the exterior wall design must provide complete control of the migration of heat, air, and moisture through the building enclosure, and minimizing risk of moisture-related failures must be prioritized in the design of exterior walls;
- the cladding design must have the means to evacuate moisture from the wall assembly and must comply with the American Society of Heating, Refrigerating and Air-Conditioning Engineers ASHRAE 160: *Criteria for Moisture-Control Design Analysis in Buildings;*
- the percentage of vision glazing and the energy performance characteristics of glazing selected for facades must reflect passive solar design best practices, and vision glazing is not to exceed a maximum of 40% of the envelope areas;
- curtain walls must be a pressure-equalized rainscreen design;
- curtain walls and windows must use high thermal performance thermally broken, metal frames with high-performance glazing units;
- metal and glass cladding systems must meet the requirements of the American Architectural Manufacturers Association and CSA Group’s AAMA/CSA 101-A440 *North American Fenestration Standard / Specification for Windows, Doors, and Skylights* in terms of maximum air leakage, as well as meet the performance class AW40;
- opaque wall assemblies must be a pressure-equalized rainscreen design and must reduce thermal bridging to a minimum, to less than 5% maximum of the wall area;
- window wall assemblies are not permitted for multi-storey buildings; and

- a thermal analysis of the window systems must be provided based on the National Fenestration Rating Council's NFRC 500: *Procedure for Determining Fenestration Product Condensation Resistance Values*.

Soffits are totally exposed to weather and must therefore be designed to be resistant to the migration of heat, air, and moisture from the exterior to the interior environments. They must be designed to:

- resist displacement due to wind uplift;
- allow for access to operable equipment; and
- be airtight and insulated to limit condensation on the enclosure materials.

In addition, equipment or distribution systems that may be affected by weather must not be located inside soffits.

4.3.2 Exterior Sun Control

Passive solar principles and techniques must be used with facade and glazing designs to maximize responsiveness to climatic conditions. The base building envelope should be designed and constructed to passively manage solar heat gain, daylight, and glare with the use of passive sun-shading devices. Architectural features in the form of a projection from the face of the building must not cause ice accumulations that could represent a risk to the public.

Provision for repair, maintenance, and window cleaning, must be part of the exterior sun-control system design.

4.3.3 Glazing

The choice and thickness of double- or triple-glazed glass windows and the selection of glazing coatings and type of insulating gas in the air spaces must be based on climate, energy conservation, and security requirements.

Minimize the use of highly reflective glass that produces mirror images to avoid creating glare that would impact the surrounding streets and buildings.

Comply with legislation that aims to reduce danger to migratory birds.

The design of the building must include provisions for cleaning the interior and exterior surfaces of all windows, as per the CAN/CSA Z91-M90: *Safety Code for Window Cleaning Operations*, as amended from time to time.

4.3.4 Interior Sun Control

All windows on general office floors must have manually operated fabric roller shades to control the amount of daylight and heat gain in the office space. The type of shade, fabric, and neutral colour must be consistent throughout the building. The light filtering capacity must range from 0% to a maximum 14% openness factor. Openness factors must be selected and located on facades to achieve optimum effectiveness based on building orientation and exposure.

The interior fabric must be resistant to degradation by temperature variations and colourfast when in direct sunlight. The fabric must be stain- and mould-resistant and dimensionally stable. All fabric and hardware must be heavy-duty commercial grade, with a minimum warranty of 5 years.

Provide remote-operation controls for coverings on clerestory and atria windows. Ensure that systems and techniques are proposed for servicing for cleaning, maintenance, repair, and replacement.

4.3.5 Exterior Doors

Entrance doors must be constructed of heavy-duty materials that can withstand continuous high traffic. The exterior side of one leaf of a double-door entrance must have a lock guard or astragal to prevent tampering or break-in.

Doors used for egress only must not have any operable exterior hardware.

4.3.6 Bird Control Devices

Building design strategies must include techniques to manage bird control and reduce opportunities for nesting.

Design facades to meet the best practices contained in the *Bird-Friendly Development Guidelines* and the *Bird-Friendly Development Rating System* published by the City of Toronto (*www.toronto.ca/lightsout/pdf/development_guidelines.pdf*).

4.3.7 Window Washing Equipment

Building design must include suitably engineered systems for window washing equipment. The design applies to buildings of three stories or 12 m and higher, and must conform to the technical requirements found in the CAN/CSA Z91-02: *Health and Safety Code for Suspended Equipment Operations.*

4.3.8 Roofing Systems

Roofing systems and below-grade waterproofing systems require assemblies that are highly resistive to physical damage, including impact and water-entrapment resistance. Single-ply systems can only be used where the system is fully adhered to a solid structural surface. General principles that must be met include the following:

- roofing design, including metal flashing and trim, must follow the recommendations of the Canadian Roofing Contractors' Association (CRCA) and provincial roof associations;
- roof membranes are to be 2-ply, fully adhered membranes, and loose-laid and single-ply roof membranes must not be used;
- all inverted roof assemblies including green roofs must incorporate suitable wiring systems to facilitate the use of the electric field vector mapping (EFVM) non-destructive testing method to test for leaks in the waterproof membrane;
- roofing is to be sloped to drains and to avoid ponding on the surface of a membrane;
- the exterior surface of parapet walls and penthouses must be consistent and integrated with the envelope assembly materials;
- roof insulation must be installed in a minimum of two layers to maximize thermal breaks;
- permanent access via stairs to all roof levels must be provided to facilitate recurring inspection and maintenance, and the use of ship's ladders is not permitted;
- there must be continuity of the roof waterproof membrane and the wall air barrier;
- noise-emitting roof-mounted equipment must be screened with noise-abating panels;
- roof-mounted equipment must be housed in penthouses or screened by walls;
- roof-mounted equipment must be set back from the roof edge to minimize visibility and allow access for maintenance and repairs;
- critical roof-mounted equipment must be installed to permit roof system replacement or maintenance without disruption of equipment performance;
- pitch pocket details are not acceptable;

- no building element may be supported by the roofing system except walkways;
- exposed waterproof membranes on roofing assemblies must be protected by walkways along routes to and around rooftop equipment and all public/building user activity;
- roof-mounted devices, such as antennae, lightning rods, flagpoles, and roof anchors, must be integrated into the building structure and roof design; and
- all podiums and rooftop areas providing access to building occupants and the public must have protected waterproof membranes and insulation, as well as structural assemblies that will withstand the structural loading of planned activities and parapet heights that will address occupancy requirements.

4.3.9 Skylights and Sloped Glazing/Atria

These public area architectural features at the entrance and lobby spaces pose particular challenges for operations and maintenance. They must meet the following requirements:

- skylight design must follow the requirements of the American Architectural Manufacturers Association (AAMA) / Window and Door Manufacturers Association (WDMA) standard AAMA/WDMA 1600/I.S.7-00: *Skylights and Space Enclosures*;
- skylight placement must be calculated to prevent glare or overheating in the building interior;
- skylight and sloping glazing design must also incorporate the pressure-equalized rainscreen (PER) principle, which is based on the principle of pressure equilibrium;
- condensation gutters and a path for the condensation away from the framing must be incorporated; and
- design strategies must be provided for the cleaning of all sloped glazing and skylights, including access and equipment required for both exterior and interior faces.

4.3.10 Thermographic and Air Pressure Testing

The design intent for the exterior building envelope must be verified with thermal and air performance testing. Building enclosure commissioning must be undertaken by testing and reporting on airtightness based on the following standards and guidelines published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); the National Institute of Building Sciences (NIBS); and ASTM International:

- ANSI/ASHRAE 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*;
- ASHRAE Guideline 0: *The Commissioning Process*;
- NIBS Guideline 3: *Building Enclosure Commissioning Process*; and
- ASTM E2813: *Standard Practice for Building Enclosure Commissioning*.

Thermographic inspections must be performed at pressurized and depressurized environmental conditions on the finished construction and before occupancy. Other applicable testing methodologies must be followed to verify that the actual construction and specified requirements have been met for the integrity of the air, vapour barrier, and waterproof membrane assemblies within the building enclosure.

Enclosure airtightness testing on all five faces of the building must be undertaken to confirm airtightness achievements. All five faces must meet the airtightness maximum air leakage of 1.27 $L/s{\cdot}m^2$ at 50 mPa, following ASTM E779: *Standard Test Method for Determining Air Leakage Rate by Fan Pressurization* and ASTM E1827: *Standard Test Methods for Determining Airtightness of Buildings Using an Orifice*

Blower Door, as noted in ANSI/ASHRAE 189.1: Standard for the Design of High-Performance Green Buildings.

4.4 Architectural Components

4.4.1 Partitions

Partition assemblies have construction and acoustic requirements that must be met as identified by the following requirements in addition to those of the functional program:

- tolerances for deflection and long-term creep must be designed at the top of structures abutting partition walls;
- partition finishes used at the perimeter of a humid space, such as a bathroom, basement, or limited air control area, must be resistant to moisture, mould, and mildew;
- shower areas must use water-durable and mould-resistant partition materials as the substrate; and
- physical security control area walls must include full-height 18 gauge expanded metal mesh as part of the assembly.

4.4.2 Interior Doors

Interior doors must meet the durability requirements, functional program requirements, and the following additional standards, including those published by the Steel Door Institute (SDI), Window and Door Manufacturers Association (WDMA), and Door and Hardware Institute (DHI):

- heavy-duty doors and frames must be used that meet the Level 2 rating per ANSI/SDI 250.4: *Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors*, and all doors and frames should be certified with the Underwriters Laboratories of Canada (ULC) label, factory-primed, and prepared for hardware installation;
- door hardware must meet the Best Grade requirements of the Canadian General Standards Board (CGSB);
- wood doors must be constructed to ANSI/WDMA I.S. 1A: *Interior Architectural Wood Flush Doors* and ANSI/DHI A115-W: *Wood Door Hardware Standards, Hardware Preparation*; and
- doors leading to high-traffic areas must be 70% glazed.

4.4.3 Acoustic Treatment

Acoustic performance must meet project requirements as well as the following:

- the sound transmission class (STC) rating must include careful and extensive sealing of all joints and apertures between components around and passing through the separation, both above and below the partitions; and doors and other openings must use sound attenuation techniques appropriate to the STC;
- ceiling tiles must have a minimum noise reduction coefficient (NRC) or sound absorption average (SAA) coefficient of 0.75 and a minimum ceiling articulation class (CAC) rating of 180;
- reverberation time control in the main lobby areas must not be higher than 0.7 seconds at 500 Hz; and
- performance must comply with the “Maximum Ambient Noise Levels” table and evaluation standards found in the PSPC standard [MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*].

4.4.4 Graphics and Signage

Graphics and signage must meet the requirements set by the *Policy on Communications and Federal Identity*.for the application of the Coat of Arms and flag symbol with bilingual titles, and the use of the "Canada" wordmark. For design standards, refer to the *Federal Identity Program Manual* issued by the Treasury Board as well the following requirements:

- signs for washrooms, elevators, stairwells, emergency exits, and doors of main corridors must comply with the tactile signage section of the *Federal Identity Program Manual*;
- for heritage buildings, signage must be compatible with the original signage design, using the materials, finishes, colours, typefaces, size, and scale as a guide for the new signage design; and
- all equipment and piping in maintenance rooms and in mechanical and electrical rooms, must be provided with signage.

4.5 Interior Design Components

PSPC provides finished interior service and occupant areas as part of the base building. Refer to the functional program for detailed requirements.

4.5.1 Carpet Tile

Commercial-grade carpet tiles must be specified for all base building areas that will be used for general-purpose office space and other functional areas as defined in the functional program. Carpet tile products must comply with the following minimum performance standards:

- for optimum performance, products must be of tufted-loop construction, with a multi-colour/textured pattern and a minimum of 4 fibre colours, with colour selection to take into consideration the ability to mask soiling and staining;
- yarn must be 100% solution dyed nylon or a combination of maximum 30 % yarn dyed, with permanent static control, permanent soil-hiding fibre cross-section with a modification ratio no greater than 2.2 and stain resistance that must be permanent and able to resist trafficking and numerous hot-water extractions without losing its effectiveness;
- carpet fibre must be a minimum pile weight of 576 g/m^2 with sufficient density to ensure long-term resistance to matting and crushing;
- water-based releasable adhesives are to be used that are best suited for the project or for environmental or flexibility reasons;
- carpet tile backings must be chosen based on project application and longevity;
- carpet tile must be certified by the Carpet and Rug Institute (CRI) Green Label Plus standard and must contain a minimum of 40% recycled material, use recovered materials, and be recyclable;
- all existing carpet being removed from buildings must be recycled; and
- during carpet removal, dust control procedures must be followed using high-efficiency particulate air (HEPA) filters.

4.5.2 Other Flooring

Primary public entrance areas to the building and lobbies, including elevator lobbies, must be finished with hard surfaces and with high-density and low-porosity materials chosen for their non-slip characteristics, low moisture absorbency, and hydrophobic nature. The high traffic volume of these areas must meet durable building standards to exceed a 50-year life cycle and be easy to maintain.

Secondary and support areas of the building, as well as high-traffic or service areas where acoustics are not a concern and higher-end finishes are not required as defined in the functional program, must be finished with resilient flooring. Products must be chosen for their durability, recyclability, low volatile organic compound (VOC) emission, low embodied energy, and low toxicity.

4.5.3 Wall Finishes

Primary public entrance areas to the building and lobbies, including elevator lobbies, must be finished for the full height of the walls using materials that exceed the 50-year life-cycle standard of durable building standards. Wall finishes must have a high density and low moisture absorbency, and these hard surfaces are to be chosen for their ease of maintenance. Painted gypsum board is not considered a durable finish.

Wall surfaces in heavy-traffic circulation areas must be treated with materials that are chosen for their impact resistance and low-maintenance character.

4.5.4 Material Finishes - Ceilings

A variety of options are possible for ceiling treatments. For general office spaces, at a minimum suspended acoustic tiles must be used and the following requirements must be met:

- standard office spaces within heritage buildings must maintain the heritage character of the spaces, including general volumetrics and the characteristics of finish materials;
- new suspended ceilings in standard office spaces proposed within heritage buildings must maintain full clearance at the existing windows; and
- washrooms must have full-length cove lighting above the counters or a lighting design that delivers a soft and uniform wall wash.

4.5.5 Architectural Woodwork

All wood products must be certified either by Forest Stewardship Council (FSC) Canada, the Sustainability Forestry Initiative (SFI), or to the CSA Group *Sustainable Forest Management System (SFM) standard*. The requirements are as follows:

- built-in furniture and casework provided in the main building lobby must be heavy-duty; and
- those provided in other areas must be designed for normal use.

5 Structural Engineering

The *National Building Code of Canada* (NBC) serves as the basis for the structural design of office buildings.

Furthermore, the *Treasury Board Policy on Management of Real Property* serves as the basis for structural design because it places protection of the heritage character of federal buildings on an equal footing with other considerations related to real property management and it is within this policy that departmental obligations and responsibilities are defined. The Treasury Board policy stipulates that departments must manage the buildings they administer so as to conserve their heritage character throughout their lifecycle.

5.1 Design Objectives

The structural engineering design objective for office buildings is to provide an economical and efficient structure to meet the functional requirements and to fulfill the following additional requirements:

- the limit state design (LSD) method must be used for all structural design following the requirements of the NBC;
- for existing buildings, guidance provided in the Commentary L of ‘Application of NBC Part 4 of Division B for the Structural Evaluation and Upgrading of Existing Buildings’ of the “User’s Guide – NBC 2010 Structural Commentaries” must be considered;
- the design for seismic protection must conform to the *Real Property Services Policy on Seismic Resistance of PWGSC Buildings*;
- alterations to and additions to heritage buildings shall be achieved by providing sustainable solutions while respecting the heritage value of the site in accordance with the *Standards and Guidelines for the Conservation of Historic Places in Canada*;
- design service life must be established per the CSA S478-95: *Guideline on Durability in Buildings*;
- flexibility to accommodate likely future functional requirements must be identified and integrated into the structural design; and
- the use of rainwater detention on building roofs for stormwater management must be minimized.

5.2 Structural Risk Management Statement

A structural risk management (SRM) statement must be prepared and submitted at each stage of the project. Documentation and submission requirements must be in accordance to the PSPC publication *Doing Business with Real Property Branch (RPB).*

The structural vulnerability of the building and critical building elements for the following areas of potential risk must be identified:

- Environmental loads (wind, rain, snow, ice, geotechnical and site such as hydrostatic pressures, temperature effects, corrosive environment)
- Seismic protection (main structure and non-structural elements, i.e. Operational and Functional Components or OFCs)
- Serviceability requirements (vibration, deflection, fire protection, potential lack of proper maintenance)
- Security concerns (blast threat, progressive collapse prevention)
- Sustainability consideration
- Heritage protection concerns

- Other areas of identified structural risk

Each of these risks and their potential impacts must be included in the SRM statement. The SRM must include statements describing how each of these risks will be mitigated and/or minimized.

Scenarios related to a change in structural conditions or actions should be specified in the structural risk management plan in order to identify possible critical situations for the structure. Each scenario is characterized by a predominant process or action and, where appropriates, by one or more accompanying processes or actions. The identification of scenarios represents the basis for the assessment and design of interventions to be taken to ensure structural safety and serviceability.

The SRM statement must also include a summary description of the structural systems and design loads.

5.3 Floor Loads

Office floor loads must be designed for 3.8 kPa live load unless higher values are required for localized loads such as moveable filing systems.

Live-load reductions must not be used for horizontal framing members, transfer girders supporting columns, and columns or walls supporting the top floor or roof.

5.4 Parking Structures

New parking structures must be designed in accordance with the CSA S413*: Parking Structures* standard.

6 Mechanical Engineering

6.1 Design Objectives

Mechanical products and systems must be properly coordinated with architectural, structural, civil, electrical and other building systems based on whole building design concept and life-cycle review.

Mechanical design must be based on proper selection and application of sustainable, high-performance heating, ventilation, and air-conditioning (HVAC), plumbing and drainage systems and technologies to enhance overall building performance.

Meeting the National Energy Code of Canada is a minimum requirement. Based on specific project requirement and desired Green Building rating (LEED, Green Globes etc.), the design team must target for a higher energy performance.

6.2 Mechanical Environmental Requirements

Mechanical environmental requirements must satisfy PSPC's MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*, including but not limited to, the following:

- indoor design temperature;
- relative humidity operating limits;
- operating temperature range;
- outdoor design temperature;
- minimum outdoor air ventilation rate;
- flushing of air for new constructions and major renovations;
- provision of outdoor air to flush out the building on a floor-by-floor basis;
- indoor air contamination control; and
- acceptable acoustical environment.

All HVAC systems shall include devices to measure and control minimum outdoor air flow.

For spaces not listed in MD 15000 section 5.1, Acceptable Acoustical Environment, the maximum noise levels must not exceed the levels specified by the National Joint Council *Occupational Health and Safety Directive*, Part VII, Noise Control (Levels of Sound).

6.2.1 Building Pressurization

Design systems to ensure proper building pressurization. Ensure control of proper space pressure of the building to manage moisture, water vapor, airborne contaminants and potential for mold growth. The building automation system (BAS) must alarm when the building pressurization drops below a predetermined low limit.

A negative pressure must be maintained relative to the surrounding spaces in areas where exhaust systems are used or an indoor air quality contaminant source is located. Design space and building pressurization to ensure that the maximum door opening forces do not exceed *National Building Code of Canada* limits. Ensure that stack effect is controlled during both natural and mechanical ventilation strategies.

6.3 HVAC Systems

6.3.1 General Requirements

At least three distinct HVAC options must be considered at the pre-design or design concept stages complete with life cycle costing including capital costs, maintenance and operations costs, and replacement costs. The options analysis must consider low energy consumption and address advantages and disadvantages of each option. The selected HVAC system will have low maintenance costs and be known to have proven durability and high performance in the industry.

The energy consumption for each HVAC option shall be obtained by using industry recognized energy simulation software. Submit proposed energy simulation software at early stages of design for approval.

The general requirements of the HVAC systems are:

- HVAC products and systems have an integrated whole building design approach based on Life Cycle evaluation.
- The evaluation of high performance and sustainable design strategies must be carried out during the Investigation and Report (I&R) or initial conceptual design stage.
- Energy/Heat recovery systems must be incorporated when required by applicable code or when feasible based on Life Cycle Evaluation.
- High-occupancy and highly variable occupancy areas must be provided with demand-controlled ventilation (DCV) systems with CO_2 sensors.
- HVAC systems must be capable of automatically maintaining space comfort conditions for all building load variations during the heating and cooling seasons.
- HVAC systems shall include devices to measure and control minimum outdoor air flow.
- Building pressurization control dampers are to be located as close to the air-handling unit as possible, and must be motorized and connected to the BAS.
- Noise generating HVAC components such as dampers and coils are located outside private offices to minimize disturbances.

6.3.2 Supply, Return, and Exhaust Fans

All fans must bear the Air Movement and Control Association (AMCA) seal, and performance must be based on tests made in accordance with the ANSI/AMCA 210: *Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating* standard. Fans must be selected based on optimum efficiency, required horsepower as well as sound power level ratings at full-load and part-load conditions. Fan motors must not run at overload anywhere on their operating curves; they must be selected for a 1.15 service factor and fan shafts must operate below the first critical speed.

Variable-speed operation of supply and exhaust fans must be accomplished through the use of variable-speed drives and inverter duty-rated motors. For smaller fans, electronically commutated motors (ECMs) may be used for variable-speed operation.

Fans must be provided with proper vibration isolation, thrust resistant supports or devices, grease box or extended grease lines, belt or coupling guard, inlet and outlet safety screen, companion flanges, flow measuring system and any other accessories necessary for particular application. Fans must be statically and dynamically balanced.

6.3.3 Air-Handling & Air-Distribution Systems

Air Handling Units must have double-walled insulated low leakage casing construction.

Other internal features like internal flow measurement and control, integrated mixing box, integrated energy/heat recovery system, internal LED service lights, thermal break, low leakage insulated dampers, factory installed DDC controls, redundant fans or fan arrays, dehumidification control and single point power must be provided based on specific application requirements

The air-handling unit and its internal components must comply with applicable Air-Conditioning, Heating, and Refrigeration Institute (AHRI) standards.

Individually finned tube coils must be certified to the AHRI 410: *Forced-Circulation Air-Cooling and Air-Heating Coils* standard, and the number of rows and fin spacing must be selected to allow effective cleaning. Select dehumidifying coils for no more than negligible water droplet carryover beyond the drain pan at design conditions. They must also be equipped with mist eliminators designed for low static pressure losses.

Selection of heating and cooling coils must consider the following:

- select heating and cooling coils to optimize system performance and energy efficiency;
- select proper coil headers and fin spacing for effective cleaning;
- minimize or eliminate water droplet carryover downstream from the dehumidification coils;
- provide adequate distance to downstream equipment from the dehumidification coils;
- provide mist eliminators where necessary; and
- provide coil slope for drainage;

Air Handling Units must be provided with double insulated stainless steel drain pans complete with indirect connection to waste systems and deep trap seals suitable for the system pressure.

Provide air filters in accordance with MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*.

Low-leakage AMCA-certified volume control dampers must be utilized for outside air mixing boxes where necessary. Use high-efficiency, low-pressure drop air blenders when proper mixing may not be possible within the air-handling unit. The location of air blenders must be selected based on actual site conditions.

Access doors must be provided for all internal sections of an Air Handling Unit to facilitate proper operation, inspection, service and maintenance. Access door construction must be similar to the Air Handling Unit casing construction.

Air – Distribution System must be designed and constructed in accordance with SMACNA and ASHRAE.

VAV terminal units, VAV diffusers, Grilles, Diffusers, Registers and other components must be properly selected for specific application. Air – Distribution systems must be designed for low pressure drop to minimize over all fan energy use without compromising on comfort at full load and part load conditions.

6.4 Humidification and Water Treatment Systems

Design humidification levels must be coordinated with the overall mechanical HVAC and envelope design to prevent condensation on the interior surfaces, control water vapour migration into the exterior wall assembly, and ensure adequate building pressurization. Analysis of local water supply shall be part of the humidification system design to identify the type of water treatment systems required for the humidification equipment.

Humidification systems must also comply with the requirements of PSPC's MD 15161: *Control of Legionella in Mechanical Systems*.

6.4.1 Humidifiers

Humidification systems must comply with the following requirements contained in section 5.12, Humidifiers and Water-Spray Systems, of the American Society of Heating, Refrigerating and Air-Conditioning Engineers standard ANSI/ASHRAE 62.1: *Ventilation for Acceptable Indoor Air Quality*:

- Make-up water for humidification systems must originate directly from a domestic cold-water source. Air-washer systems are not permitted for humidification purposes.
- Direct steam injection type humidifiers must not be used.

Humidifiers must be CSA-approved and be certified by the Underwriters Laboratories of Canada (ULC-listed) where applicable.

A high-level humidity safety switch as well as a flow switch must be integrated with each humidification system and tied into the BAS.

6.4.2 Water Treatment Systems

Systems requiring water treatment include the following:

- open and closed hydronic systems including cooling towers;
- potable water;
- boiler feed water;
- spray washers;
- humidification systems;
- grey water systems; and
- decorative water systems (fountains, ponds).

Design water treatment systems for the control of microbiological activity including *Legionella* control as well as slime production, dissolved solids precipitation, scaling, and corrosion protection in accordance with MD 15161: *Control of Legionella in Mechanical Systems*.

The chemical feed system must have self-contained microprocessor controls capable of communicating with the BAS. The methods used to treat the system's make-up water must follow the guidelines in the ASHRAE *Handbooks*. Manual addition of chemicals is not permitted.

6.5 Hydronic Systems

Closed-loop systems must include an expansion tank and a pressure-relief valve. Hydronic systems that use a common return system for both hot water and chilled water must not be used. Hydronic systems that use a common distribution system to supply both heated and chilled water are acceptable provided that the system is designed to allow a dead band between change-over from one mode to the other of at least 8 °C outdoor air temperature.

Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection (e.g. cooling towers) and heat addition (e.g. boilers) must have controls that are capable of providing a heat-pump water supply temperature dead band of at least 11 °C between initiation of heat rejection and heat addition by the central devices (e.g. cooling tower, boiler).

Refer to the CAN/CSA B214: *Installation Code for Hydronic Heating Systems* for detailed information on hydronic systems and components.

6.5.1 Expansion Tanks

Use only diaphragm-type expansion tanks in hydronic systems that are pre-charged to reduce the tank size. Consider operational and maintenance constraints when selecting a suitable location for the expansion tank.

6.5.2 Pipes and Valves

Hydronic system designs must be properly sized with two-way control valves for variable-flow to minimize the pressure drops and reduce pump energy in systems with multiple heating/cooling coils. Closed-loop piping system designs must incorporate pressure-balancing controls, pressure independent balancing valves, expansion tanks and required accessories. Isolation valves must be provided on all equipment and devices, including the following:

- main piping branches;

- heat exchangers (including chiller evaporators and condensers);
- heating and cooling coils;
- terminal units; and
- control valves.

The horizontal supply and return pipe network feeding floor perimeter heating systems shall be located at the bottom of the heaters as opposed to being at the top in order to prevent air entrainment inside the coils, prevent noise, provide proper heating and reduce maintenance labor costs related to the purging of the coils.

Provide local strainers for all terminal units, heating and cooling coils, and heat exchangers. Isolation and shut-off valves greater than 65 mm Ø must be high-performance butterfly valves, and those below 65 mm Ø must be ball valves. Isolation valves must also be provided for zones off vertical risers and major horizontal branches.

Provide flexible pipe connectors as required to prevent transmission of noise and vibration through piping systems. The use of grooved pipe connections is not permitted.

6.5.3 Hydronic Pumps

Design the hydronic pumping system to meet the following requirements:

- inverter duty-rated pump motors for variable-flow systems;
- provide best efficiency point (BEP) selection for the most frequently used flow rate (not the maximum flow rate);
- full flow range pumping capability without any overload conditions;
- maximum 1800 r/min for pump drives;
- chillers with corresponding primary chilled-water pumps and condenser-water pumps;
- sufficient pumping capacity for the stand-by pump(s) to maintain building operation in accordance with the requirements of the business continuity plan;
- sufficient space around each pump for the removal of the bearing unit and impeller without interfering with the operation of any other system;
- mechanical seals and labyrinth seals for all pump rotating assemblies;
- fully independent hydronic pumping systems capable of individual isolation without impacting operations;
- automatic bypass valves for variable primary-only chilled water systems, to ensure that the minimum flow through the chiller is always maintained; and
- variable-flow pumping systems in accordance with the requirements of ANSI/ASHRAE 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*.

6.5.4 Vents and Drains

System drainage connections must be provided at all low points in the hydronic system, at each heating and cooling coil, and at each terminal unit.

Automatic air vents must only be used in accessible spaces, such as mechanical rooms where maintenance personnel can observe them.

Use manual air vents at terminal units and other less accessible high points, at all localized high points in the system, and at each heating coil.

Where hydronic systems are exposed, coordinate with architectural finishes to ensure maintainability.

6.6 Heating Systems

6.6.1 Heating Plants

New buildings or existing buildings undergoing major renovations must be designed to use low-temperature hot water heating systems from dedicated Hot Water Boiler System.

In cases where Central heating and cooling plant (CHCP) steam from District Energy Heating System is the only option, buildings must use steam-to-low-temperature-hot-water heat exchangers as part of energy transfer stations (ETSs). The building heating system must be designed for supply water of maximum 60 °C and return water of minimum 35 °C. Central Heating and Cooling Plant (CHCP) steam must not be distributed throughout any building as a heating medium.

For heat exchange systems, provide accessibility to all components without interfering with the operation of other systems and equipment, including the replacement of the tube bundle and/or disassembly of components. Piping networks must include the following:

- isolating and drain valves;
- piping design that account for thermal stresses;
- piping supports with provisions for thermal movement; and
- non-condensable gas elimination.

Double-wall heat exchangers must be used in domestic hot water heating applications. Plate heat exchangers must be used for waterside economizer applications.

6.6.2 Dedicated Boiler Hot Water Heating Systems

Hydronic hot water heating boilers must incorporate lower operating pressure and lower operating temperature for increased operating efficiencies.

Boilers must be located in a dedicated mechanical room with all provisions made for breeching, flue stack, and combustion air complete with an outdoor air intake. For high-rise applications, locate boilers in the rooftop penthouse to reduce static pressure on boilers.

Hot water heating systems must be designed for redundancy. Dedicated backup capacity must comply with requirements for business continuity plans in conformance with PSPC'S *DP 001: Policy for Emergency Preparedness in Public Works and Government Services Canada* and the Treasury Board of Canada Secretariat's *Operational Security Standard - Business Continuity Planning (BCP) Program*.

While designing dedicated hot water heating systems, incorporate the following:

- high efficiency packaged boiler designs;
- factory pre-assembled components and controls;
- modular design (allowing the isolation of any boiler without interfering with the operation of any other boiler);
- separate specifications for control and relief valves to limit pressure and temperature;
- smart boiler and heating system controls integrated with BAS;
- minimum boiler efficiencies as per the *National Energy Code of Canada for Buildings*;
- boiler systems complete with all required auxiliaries, including expansion tanks, heat exchangers, water treatment, and air separators;
- control and piping arrangements that protect the boiler from thermal shock;
- pipe sizing in compliance with the ANSI/ASHRAE 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*;

- primary heating sources for a building that do not include electric resistance heating and/or electric boilers, except when justified by a life-cycle costing analysis or when utilizing renewable energy sources;
- sodium/potassium-free (Na-K-free) gas valve actuators;
- breeching, vents, stacks, and chimneys, in compliance with the National Fire Protection Association standards NFPA 54: *National Fuel Gas Code* and NFPA 211: *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*;
- factory-fabricated, field-assembled breeching, vents, stacks, and chimneys; and material types, ratings, and distance to adjacent building materials that are in compliance with NFPA 54 and NFPA 211; and
- heat transfer fluid that is free of ethylene glycol.

6.7 Cooling Systems

Cooling systems must be designed in compliance with the CAN/CSA B52: *Mechanical Refrigeration Code.*

Refrigeration systems, the choice of refrigerant, and leak mitigation measures must comply with the ANSI/ASHRAE 15: *Safety Standard for Refrigeration Systems* and ANSI/ASHRAE 34: *Designation and Classification of Refrigerants.*

Domestic cold water must not be used for cooling systems. Only acceptable refrigerants are to be used, in accordance with the CAN/CSA B52: *Mechanical Refrigeration Code.*

6.7.1 Chilled Water Systems

Ensure that the cooling plant controls are integrated with the chillers, cooling towers and distribution system for overall maximum integrated efficiency.

Chillers must meet the CAN/CSA C743: *Performance Standard for Rating Packaged Water Chillers* for energy efficiency requirements. Chiller performance must be certified by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI).

Demonstrate that life-cycle costing (LCC) has been used as the basis for the selection or omission of the following:

- variable-frequency drive (VFD) centrifugal, screw, or scroll chillers;
- water cooled or air cooled chillers
- magnetic bearing chillers
- waterside economizer (free cooling) systems
- heat recovery or heat pump chiller if required for specific application
- thermal storage solutions;
- absorption chillers;
- centrifugal chillers with oil-free compressors;
- rotary screw chillers; and
- scroll chillers.

Chilled water system designs must incorporate the following:

- vibration isolation and seismic control measures;
- flexible piping and conduits;

- common header design for chilled water, with provisions to sequence chillers according to load requirements;
- expansion tanks, heat exchangers, water treatment, and air separators for all auxiliaries;
- recirculation/bypass control valves on chiller condenser piping to maintain the manufacturer's minimum incoming condenser water temperature;
- pressure and temperature gauges, flow and energy-use meters, including adequate illumination, along with isolation valves to allow servicing while in operation;
- microprocessor-based controls capable of communicating with the BAS;
- Provisions for the BAS to sequence chillers to match the cooling load;
- chiller operating limit controls;
- chiller safety controls;
- chiller freeze-protection controls;
- chiller flow controls;
- control panels with self-diagnostic capability and integral safety controls;
- control panels with displays that include the following:
  - run time
  - operating parameters including set-points
  - electrical low-voltage alarm
  - phase-protection loss alarm
  - peak demand limiting controls
  - input/output coefficient of performance (COP)
- BAS-connected chiller leak detection and remote alarming;
- BAS-connected freeze protection, including hard-wired, low-limit switches for all freeze-prone coils;
- piping connections that include isolating and drain valves on chilled water and condenser water loops;
- minimum flow alarm through the chiller when the chiller is operating;
- piping designs that incorporate provisions for the thermal movement of piping and the reduction of thermal stresses on the chiller; and
- air-elimination accessories including a purge system that operates without affecting chiller operations.

Dedicated backup capacity must comply with requirements for business continuity plans in conformance with PSPC's DP 001: *Policy for Emergency Preparedness in Public Works and Government Services Canada (001)* and the Treasury Board of Canada Secretariat's *Operational Security Standard - Business Continuity Planning (BCP) Program*.

Chiller units must be connected to a common header that allows for adequate isolation of individual units without interruption of service to the remaining units.

Cooling systems with a capacity less than 175 kW (50 tons) require a life-cycle cost analysis for incorporating or omitting cooling towers or evaporative condensers. The chilled water system design must maximize chilled water temperatures and minimize condenser water temperatures to achieve the greatest heat recovery rates and highest efficiencies.

Each chiller must be designed to permit refrigerant recovery during servicing and repair.

Chlorofluorocarbon (CFC) refrigerants are not permitted. For acceptable non-CFC refrigerants, refer to the Federal Halocarbon Regulations and the Ozone-Depleting Substances Regulations under the *Canadian Environmental Protection Act*.

6.7.2 Cooling Towers

Cooling tower designs must incorporate the following:

- wet bulb design temperatures that meet the parameters specified in the ASHRAE 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*;
- *Legionella* abatement strategies, including microprocessor controls capable of communicating with the BAS;
- performance certified by the Cooling Technology Institute (CTI) under the STD-201: *Certified Cooling Towers* standard;
- cooling tower fan power requirements that comply with ASHRAE 90.1;
- supply piping connected to a manifold to allow for any combination of equipment use;
- equalization piping between cell basins for multiple tower designs complete with isolation valves between cells;
- ladders and platforms for ease of inspection and replacement of components;
- control strategies for the prevention of “dead heading” with variable-speed pumps when the pump is operated in parallel with other pumps;
- clean-outs for sediment removal and flushing from basins;
- de-icing capability for operations in subfreezing climates;
- provisions in subfreezing climates for draining all piping during shut-downs using indoor drain-down basins;
- heat-tracing and thermal insulation for exterior piping subject to freezing;
- manual shut-down capability;
- basin heaters for all-weather waterside economizers;
- heat tracing above and below grade (down to 900 mm) for all condenser water piping operated in subfreezing climates;
- fibreglass, polyvinyl chloride (PVC), or stainless steel construction for condenser piping, cooling tower basins, and housings, free of bolted or riveted connections;
- vibration and sound isolation in accordance with the CTI STD-201 standard for cooling towers located on building structures;
- cooling tower elevations that maintain the required net positive suction head on condenser water pumps;
- 1200 mm minimum clear space beneath the bottom of the lowest structural member, piping, or sump on all rooftop installations (to allow re-roofing under the tower); and
- BAS-connected temperature and pressure sensors for chilled and condenser water pipes connected to the waterside economizer, with automated controls for waterside economizers and sequenced with the operating chillers to match the load requirements.

6.8 Plumbing Systems

Plumbing systems include domestic cold water supply (DCWS), domestic hot water supply (DHWS), and domestic hot water recirculation (DHWR) systems, plumbing fixtures, traps, sanitary waste and vent systems, and stormwater systems. Design the plumbing systems to meet the *National Plumbing Code of Canada*.

When designing plumbing systems, consideration must be given to the reuse of existing systems by confirming the condition of existing piping prior to re-use. To be fit for re-use, piping systems must satisfy the requirements outlined in this document as well as those contained in the applicable codes listed in section 13 in the Mechanical Codes, Standards, and Legislation section.

Hot water heaters, tanks, heat exchangers and pumps are to be located in mechanical rooms. Demonstrate that life-cycle costing (LCC) has been used as the basis for the selection or omission of heat recovery, instantaneous heating systems, high efficiency heating equipment, and renewable heat sources.

6.8.1 Plumbing Fixtures

All plumbing fixtures must be provided with stated water efficiency ratings and must comply with accessibility requirements as specified in the Treasury Board of Canada Secretariat *Accessibility Standard for Real Property*, the CAN/CSA B651: *Accessible Design for the Built Environment* standard, and the PSPC *Real Property Branch Accessibility Procedure*.

6.8.2 DCWS, DHWS, and DHWR Systems

The domestic water system must be designed to prevent the following:

- water hammer,
- cross-contamination,
- surge,
- erosion,
- noise, and
- cavitation.

In addition, the DCWS, DHWS, and DHWR systems must be designed to include the following:

- lead-free materials for all piping and fixtures in accordance with the CSA B125.1: *Plumbing Supply Fittings* standard;
- bacterial and/or chemical treatment of raw water supplies to be used for potable water services, and as an additional precaution, drinking fountains and water-bottle filling stations equipped with in-line filters capable of removing lead, to meet Health Canada's *Guidelines for Canadian Drinking Water Quality*;
- a DHWR system when hot water availability exceeds 15 seconds at the furthest fixture from the heating source;
- a maximum hot water temperature of 40 °C at showerheads; and
- *Legionella* controls in accordance with MD 15161: *Control of Legionella in Mechanical Systems*.

6.8.3 Sanitary Waste and Vent Systems

Provide separate sanitary and storm sewer runs to the property line, even in instances where the municipal sewers combine sanitary and storm sewers. Comply with the waste treatment requirements of the authority having jurisdiction.

Floor drains connected to the municipal sewer system or discharging into the environment must include safeguards to prevent discharges of hazardous materials where the incidence of discharges occurring is likely, such as in mechanical rooms and workshops.

Provide floor drains with materials and accessories adapted to the following specific building areas:

- cast iron drains and nickel-bronze strainers for public washrooms and other public areas;
- cast iron drains, stainless steel sediment buckets, and stainless steel funnel-type strainers for kitchens and dishwashing areas;
- large-diameter cast iron drains with funnel-type strainers in equipment rooms, with the drains located appropriately to eliminate horizontal runs of drain piping;
- large cast iron or concrete basins for parking garages installed in conjunction with heavy-duty cast iron grates to incorporate sand and oil interceptors; and
- trench drains or roadway inlets for ramps exposed to rainfall.

Provide trap seal primers for all floor drains where drainage is not routinely expected from spillage, cleaning, or rainwater. Provide floor drains with adequate cleanouts and plumbing vents in accordance with plumbing codes.

Only use sewage pumps where gravity drainage is not possible. If sewage pumps are required, only the lower floors of the building must be connected to the sewage pump; fixtures on the upper floors must use gravity flow to provide drainage to the public sewer.

Sewage pumps must be non-clog, screenless, grinder-type duplex pumps, with each discharge not less than 100 mm in diameter, complete with alternators and connected to the emergency electrical power grid.

Septic tanks and disposal fields must comply with all requirements of the authority having jurisdiction.

6.8.4 Stormwater Drainage Systems

Roof drains and overflow drains must be cast iron body type with high dome grates designed to provide adequate drainage.

Elevator shaft sumps must be fitted with sump pumps connected to the emergency power grid. Sump pump pits must be independent from elevator pits.

Stormwater lift stations and sump pumps must only be used where gravity drainage to municipal storm sewers is not possible. Stormwater lift stations and clear water sump pumps must be non-clog, screenless duplex pumps, with each discharge complete with alternators and connected to the emergency electrical power grid. Sump pumps must be complete with sealed cover plates, vents, inspection manholes, and access to level controls.

6.9 Advanced Metering System

Data management must focus on key performance indicators to be meaningful and useful for the implementation of the energy management system (EnMS) as described in the CAN/CSA-ISO 50001: *Energy Management Systems* standard.

Advanced metering systems must be installed in all new construction and major renovation projects to collect information on the consumption of electricity, gas, water, and other utilities (e.g. steam, chilled water).

The metering system must include meters, communications networks, and data management capabilities. Data from variable-frequency drives larger than 3.75 kW must be networked to the advanced metering system.

The advanced metering system must be networked to, or form part of, the building automation system (BAS). It must record data at a frequency no less than hourly (similar trigger points are also acceptable) and store the data in a central repository. The system must be able to show daily, monthly, and annual totalled readings and provide for combined readings to show total energy consumed for the period.

The system must include energy tracking for the whole building (and selected subsystems) by displaying the actual energy consumption in comparison to a baseline (either estimated or established). This data must be available on demand on the central operator workstation, and must be available in a form that allows for the ability to generate advisories to management when normal tolerances are not being maintained.

The advanced metering must record at a minimum the following information:

- electrical components:
  - phase voltages, phase currents, and power consumption (kW) readings for the following:
    - all risers;
    - motor control centres;
    - lighting panels;
    - power distribution panels;
    - telecommunication rooms; and
    - emergency loads (on the load side of the transfer switches);
  - line voltages, line currents, and power consumption (kW) readings for all feeders to the following:
    - motor loads over 15 kW;
    - all major mechanical equipment such as chillers, air-handling units, and pumps; and
    - all spaces planned to be leased;
- for mechanical components and subsystems:
  - electrical, gas and other fuels consumption;
  - domestic water consumption;
  - cooling tower water consumption;
  - steam and/or hot water;
  - chilled water (Energy/BTU metering); and
  - individual water flow or energy-measuring devices provided for chilled water lines serving computer rooms.

The water flow and airflow measuring devices must meet the requirements of the ANSI/ASHRAE 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*.

6.9.1 Power Monitoring

In addition to, or as part of, the above listed metering, power monitoring must also form part of the advanced metering system. The power monitoring must be installed in the primary switchgear (if present and Crown-owned) as well as the main secondary switchgear, and must measure, at a minimum, the phase voltage, phase current, power consumption, power factor, and harmonic distortion.

6.10 Building Automation Systems

The building automation system (BAS) must have a non-proprietary design to monitor, control, and report on all mechanical, environmental-control, and energy-consuming systems, and must be based on Ethernet BACnet TCP/IP network, native BACnet controllers and other devices. The BAS must be able to provide an integrated platform for intelligent, smart and high performing building

The BAS must include as a minimum:

- controllers;
- sensors and other field devices (use smart sensors and devices where feasible);
- Networks;
- Computers;
- All necessary software components including energy management;
- engineering;
- new wiring;
- complete graphical package, including dashboards;
- installation;
- programming;
- start-up;
- commissioning;
- as-built and documentation;
- warranty and maintenance; and
- any devices or accessories to make a complete system.

The BAS must comply with ANSI/ASHRAE 135: *A Data Communication Protocol for Building Automation and Control Networks* and ANSI/ASHRAE 135.1: .Method of Test for conformance to BACnet

The system must utilize direct digital control (DDC) technology with networked distributed processing, and be user-programmable in the field for all required automated functions.

The BAS must provide means for direct access to all setpoints, trends, and objects using BACnet protocol (BACnet/IP or native BACnet). The “As-built” documentation must provide the list of all setpoints, trends, and objects with explanation of their function and/or meaning.

In addition, visual and audible identification of BAS alarm signals must be provided in the security control room during unoccupied periods. However, such alarms must not be integrated with the fire and security systems.

Existing proprietary systems can be used in existing buildings only after a detailed life-cycle cost analysis has been done that can justify the continued use of such proprietary systems or non-BACnet systems.

6.10.1 Operator Work Stations

The primary operator work station (OWS) must be capable of displaying information from the BAS as well as the advanced metering system

The main OWS and secondary OWS must be listed by the BACnet Testing Laboratories (BTL) as either a BACnet Advanced Operator Workstation (B-AWS) or a BACnet Operator Workstation (B-OWS).

6.10.2 Controllers

Standalone, microprocessor-based, fully programmable control units must include the following features:

- the use of BTL-listed DDC controllers only;
- microprocessors (CPUs) with memory and hardware sufficient for the installation and for at least a 25% expansion of capability for each controller controlled by the master controller;
- a controller power supply that accepts local power and provides all conditioning necessary for reliable, fail-safe operation;
- a battery-backed real-time clock accurate to ± 5 seconds/year with 72-hour backup;
- battery-backed RAM with 72-hour backup;
- network interface to other controllers;
- network interface allowing access by operators (including access via OWSs); and
- automatic, complete recovery after a power failure.

6.11 Mechanical Systems for Special Spaces

6.11.1 Entrance and Lobbies

Positively pressurize the entrance vestibule relative to atmospheric pressure to minimize infiltration. Ensure that exterior door operations are not adversely affected and remain within acceptable limits, in conformance with the *National Building Code of Canada*.

6.11.2 Elevator Machine Rooms

Maintain space temperature conditions, as required by equipment specifications and in accordance with the American Society of Mechanical Engineers (ASME) / CSA Group (CSA) standard ASME A17.1/CSA B44: *Safety Code for Elevators and Escalators*. Consider the use of secondary chilled water for cooling, and the use of elevator machine room heat exhausting for heating the remaining building. Ensure that the elevator design minimizes the draw of interior air through the stack effect.

6.11.3 Mechanical and Electrical Rooms

All mechanical, electrical, and telecommunication equipment rooms must be maintained with room space conditions, such as ventilation, heating, and cooling, as required by PSPC's MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*.

Install equipment in a manner that the servicing of any equipment will not require shut-down of other equipment. Identify operational requirements and redundancy requirements where applicable at early stages of design.

The location of water lines must comply with the requirements of the *Canadian Electrical Code*.

All telecommunications rooms must be ventilated and cooled in accordance with the requirements of the Telecommunications Industry Association (TIA) / Energy Information Administration (EIA) standard ANSI/TIA 569: *Telecommunications Pathways and Spaces* and its addenda.

6.11.4 Computer Room Cooling and Ventilation

Provide computer room ventilation in accordance with PSPC's MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*.

Provide high performance, low energy cooling system. Cooling systems must be evaluated based on specific use and application of computer rooms.

Identify operational requirements and redundancy requirements where applicable at early stages of design. Demonstrate that an evaluation based on life-cycle costing (LCC) has been used as the basis for the selection or omission of the use of heat recovery and or water side economizer (free cooling) systems.

6.11.5 Service Areas

Requirements for mechanical systems in service areas include the following:

- janitor closets must not be used for the location of any equipment;
- air dampers on mechanical ventilation systems serving transformer rooms and emergency generator rooms require limit switches tied into an alarm for the damper position. The damper position must be interlocked with its ventilation fan;
- the construction, ventilation, and equipping of all rooms containing refrigeration units, such as chiller equipment rooms, must comply with the ANSI/ASHRAE 15: *Safety Standard for Refrigeration Systems*, the ANSI/ASHRAE 34: *Designation and Classification of Refrigerants*, as well as the CAN/CSA B52: *Mechanical Refrigeration Code*;
- indoor parking garages must include supply and exhaust systems activated by carbon monoxide detectors, and must use energy recovery systems where justified by a life-cycle costing analysis;
- the design of the HVAC for the indoor parking areas must include a life-cycle costing analysis of energy recovery systems and of variable air flow systems;
- mailrooms must have independent HVAC systems to deal with the potential for chemical/biological contamination;
- uninterruptible power supply (UPS) battery rooms must be ventilated/exhausted directly to the outdoors at a rate that is in compliance with code requirements and the manufacturer's recommendations, and in addition:
  - the exhaust system must be connected to the emergency power distribution system;
  - fans must be explosion-proof; and
  - ductwork must consist of a dedicated, negative pressure system of corrosion-resistant material; and
- high-occupancy and highly variable occupancy areas must be provided with demand-controlled ventilation (DCV) systems with CO_2 sensors, with enthalpy energy recovery and de-humidification systems provided where justified by a life-cycle costing analysis.

6.12 Fuel Storage Systems

For fuel storage systems refer to section 8.11.1 Emergency Generator System and 2.7.4 Fuel Storage Systems.

6.13 Miscellaneous Requirements

6.13.1 Acoustical Insulation

Provide acoustical insulation where required to satisfy the requirements listed in Table 5-1, Maximum Mechanical Noise, in PSPC's MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*.

Acoustic treatment of fan noise must be incorporated at the air-handling unit by using duct silencers on the supply and return ducts. The treatment must not use fibre insulation on the interior surfaces of the ductwork upstream of the air terminal units.

6.13.2 Identification of Mechanical Systems

All piping and ductwork systems in new constructions or major renovations must be identified in accordance with the Workplace Hazardous Materials Information System (WHMIS) manual issued by Health Canada, which represents Canada's national standard for hazard classification and communication.

6.13.3 Outdoor acoustical treatments

Air intakes, exhausts, mechanical rooms, cooling towers, air-handling units, emergency generators, and waste-handling equipment must have noise attenuation provisions, where required, to achieve compliance with noise restrictions at the property line.

7 Fire Protection Engineering

7.1 Design Objectives

The design objective of life and safety systems is to ensure the health and safety of federal employees in the event of an emergency. Fire protection and suppression systems must comply with the *National Building Code of Canada* and *National Fire Code of Canada*.

All sites on or off municipal services must be evaluated and strategies provided to address issues related to health and safety. Municipal installations must meet the National Fire Protection Association's NFPA 1142: *Standard on Water Supplies for Suburban and Rural Fire Fighting* and other appropriate NFPA standards that stipulate water requirements for supplying fire suppression systems. Issues to be addressed include the following:

- evaluation of pressure and flow rates to determine their adequacy;
- evaluation of pressure and/or flow rates based on 10 years of projected deterioration (or increase in demand due to population growth); and
- evaluation of the use of fire pump(s) and/or booster pump(s) feeding from a private tank or reservoir.

7.2 Specialized Functions for Base Building and Tenants

Office buildings may have tenants who have requirements related to specialized functions in addition to the base building requirements. These functions must be integrated into the base building system. Furthermore, general storage facilities within base buildings must meet the requirements of the NFPA 13: *Standard for the Installation of Sprinkler Systems* and the NFPA 231: *Standard for General Storage.*

Specialized tenant functions identified in the functional program may include one or more of the following:

- the storage arrangements and protection of a rack storage facility, which must meet the requirements of NFPA 13, NFPA 231, and NFPA 231C: *Standard for Rack Storage of Materials*;
- the storage arrangements and protection of an inflammable and combustible liquid storage area, which must meet the requirements of the *National Fire Code of Canada*, the NFPA 30: *Flammable and Combustible Liquids Code*, and the applicable Factory Mutual (FM) Global Property Loss Prevention Data Sheets;
- facilities having high-value or mission-essential electrical equipment, mainframe computers, or network equipment with the potential for high dollar loss and/or business interruption, which must be designed and installed in accordance with NFPA 75: *Standard for the Fire Protection of Information Technology Equipment*;
- Sprinkler systems such as wet, dry, deluge or pre-action as required for the type of occupancy and approved by Departmental Representative; and
- fire protection requirements for cooling towers, which must meet the requirements of NFPA 214: *Standard on Water-Cooling Towers*.

7.3 Sprinkler Systems

Sprinkler systems must meet all of the requirements below, which supersede the design requirements of NFPA 13: *Standard for the Installation of Sprinkler Systems*:

- all sprinklers installed in any new construction or renovation projects must be listed by a nationally recognized testing facility such as Underwriters Laboratories of Canada (ULC);

- all quick-response glass bulb sprinklers must be equipped with a protective device to reduce damage prior to installation, and the protective device must be removed after the sprinkler is installed;
- all sprinkler escutcheons installed in any new construction or renovation projects must be ULC-listed equipment;
- flow control (on-off) sprinklers must not be installed in any new construction or renovation projects;
- all automatic sprinklers installed less than 2 m above the floor must be equipped with sprinkler guards to provide protection against accidental damage;
- black steel piping and/or copper tubing must be used for all wet-pipe sprinkler piping;
- chlorinated polyvinyl chloride (CPVC) sprinkler piping must not be used;
- galvanized (internal and external) sprinkler piping must be used for all dry-pipe sprinkler systems;
- steel pipe sizes 50 mm and smaller must comply with the specifications in Schedule 40 and must be threaded;
- steel pipe sizes larger than 50 mm must at a minimum comply with the specifications in Schedule 10;
- piping less than Schedule 40 must be roll-grooved;
- threadable lightwall pipes must not be used;
- piping having a corrosion-resistant ratio less than one must not be used;
- plain-end fittings must not be used;
- automatic sprinklers must be installed in all new construction projects and in all renovation projects:
    - this includes elevator machine rooms, boiler rooms, mechanical equipment rooms, walk-in freezers and cold rooms, essential electronic facilities, electrical closets, telephone closets, emergency generator rooms, uninterruptible power service and battery rooms, electrical switchgear rooms, transformer vaults*, and telephone exchange (private automatic branch exchange [PABX]) rooms;
        - * note that sprinklers can be omitted in the transformer vault if the vault is provided with a 3-hour fire separation; however, appropriate fire protection devices must be provided in the vault as required by the local utility and authority having jurisdiction; and
    - all electrical equipment must be provided with a sprinkler-proof enclosure;
- all sprinkler systems must be wet-pipe sprinkler systems unless installed in areas subject to freezing or as directed by the project-specific program;
- in areas subject to freezing, dry-pipe sprinkler systems or dry pendent sprinklers must be installed, heat must be provided in the space, and/or sprinkler piping must be rerouted;
    - do not use heat tape on sprinkler piping;
- antifreeze sprinkler systems must not be installed in any new construction or renovation projects;
- damage to motors, switchgear, electronic equipment, direct digital control (DDC) and alarm panels, computers, etc., must be minimized by applying spray fireproofing;
- sprinklers installed in electrical rooms and electrical closets must be equipped with sprinkler guards to provide protection against accidental damage;
- sprinklers in historically significant spaces must be carefully placed to minimize damage to ornamental materials, and in addition:

    - detailed drawings must be developed for architecturally sensitive areas, showing precise sprinkler locations and finishing notes as necessary to ensure proper installation; and
    - sprinklers must be centred and placed symmetrically in relation to ornamental patterns and architectural features that define the space, such as arched openings;
- sprinklers and escutcheons must match the original architectural surfaces or hardware; and
- oxidized brass or bronze heads are recommended for use in deeply coloured (unpainted) woodwork.
    - in elaborately decorated ceilings, heads must be camouflaged by custom coating and by omitting escutcheon plates, and in such cases, low-profile, quick-response sprinklers are preferred.

7.4 Fire Alarm Systems

Fire alarm systems must meet all of the following special requirements, which are in addition to those contained in the above listed codes and standards:

- have a non-proprietary, open protocol for interoperability with other building systems;
- be monitored by the building automation system in a one-way, read-only manner; and
- be standalone systems able to function independently of other building systems.

In addition, fire protection conduits must meet the requirements set out in section 32 of the *Canadian Electrical Code*.

7.5 Fire Pumps and Accessories

7.5.1 Fire Pump Design and Installation

When a fire pump is necessary to supplement water flow and pressure, it must be sized to comply with the appropriate NFPA standards:

- NFPA 13: *Standard for the Installation of Sprinkler Systems*;
- NFPA 14: *Standard for the Installation of Standpipe and Hose Systems*; and/or
- NFPA 20: *Standard for the Installation of Stationary Pumps for Fire Protection*.

Fire pumps must be designed for manual and/or automatic shut-down. Manual shut-down must ensure that the pump does not shut down prematurely before controlling the fire. Automatic shut-down is only permitted when activated by a low water level shut-off device.

7.5.2 Fire Pump Controller

The fire pump controller must be completely assembled, wired, and tested by the manufacturer before shipment from the factory. The status and condition of all fire pump units must be monitored by and signalled at the fire pump controller, and the status of the fire pump must be monitored by the fire alarm system.

7.5.3 Jockey Pump

A jockey pump (or pressure maintenance pump) must be utilized where it is desirable to maintain a uniform or relatively high pressure on the fire protection system. Jockey pumps must be sized to make up the allowable leakage rate within 10 minutes.

8 Electrical Engineering

8.1 Design Objectives

The electrical engineering design objectives are to provide a safe, reliable, and maintainable electric power system for office buildings. The electrical system design must meet the following objectives:

- be sized to meet the anticipated loads of the building;
- be coordinated in terms of interrupting capacity, device and cable ratings, fault levels, and protective relaying;
- allow safe maintenance, minimizing shock and arc flash hazards for maintenance personnel; and
- support power conservation initiatives.

8.2 Design Studies

8.2.1 Electrical Load Analysis

An electrical load study must be performed for new office building construction as well as renovation projects where modifications to the electrical distribution system may result in overload conditions. The report must analyze the building loads, including scenarios for normal use, off-hour use (nighttime and weekends), emergency scenarios, and different seasons.

8.2.2 Short Circuit, Device Evaluation and Coordination Study

A short circuit, device evaluation, and coordination study must be performed for new office building construction as well as renovation projects where modifications to the electrical distribution system may result in protective devices not being coordinated, or in equipment being subjected to short circuit currents greater than their ratings. If series-rated equipment is used, it must be marked in a clear and conspicuous manner to ensure it is replaced with equipment of the same type and rating.

All electrical equipment panels containing interrupting devices must be labelled with the assembly short circuit current rating. Over-current devices (breakers, fuses, relay, etc.) and overload devices must be coordinated and have settings adjusted as per the coordination study.

8.2.3 Arc Flash Study

An arc flash study must be performed for new building construction as well as renovation projects where modifications to the electrical distribution system may result in the need to update existing safety labelling.

The study must be performed in accordance with the CSA Z462: *Workplace Electrical Safety* standard. Safety labels, also in accordance with CSA Z462, must be applied on all panel boards, motor control centres, switchgear, and major electrical equipment. Labels must comply with the *Official Languages Act*, including bilingual labels for regions prescribed under subsection 35(2) of the Act.

8.3 Site Utility

In buildings where low voltage is economically justifiable for the site utility, new building construction projects should have the utility company furnish power at the main utilization voltage (i.e. 600/347 V or 208/120 V).

In the case of larger buildings, or office building campuses where it is impractical or uneconomical to use low voltage, high voltage (over 750 V) may be used.

Redundant services should be requested from the utility if a cost-benefit analysis finds the redundant connection to be warranted. Redundant service should be requested for larger building (over 25,000 m^2 of floor space).

8.3.1 Substation Ownership and Demarcation Points

PSPC prefers that substations be utility-owned. However, the project details along with discussions with the local utility company will dictate the ownership of the substation and the placement of the ownership and operational demarcation points. Projects involving large buildings and campus locations may require PSPC to own substations due to cost benefits, security requirements, operational requirements, or agreement with the local utility.

8.3.2 Electrical Service

An underground service must be used to supply office buildings where conditions allow. The underground service must be installed in a concrete-encased duct bank. Cables must be selected based on all aspects of the cable operation and must comply with the requirements of the local utility.

8.3.3 Underground Cable and Conduit

Direct buried cables must not be used. Instead, buried conduits appropriate to the site conditions must be used to facilitate the modification and repair of electrical distribution.

8.3.4 Concrete-Encased Duct Banks

Concrete-encased duct banks must be used where many circuits follow the same route, for runs under permanent hard pavements, and where service reliability is paramount, such as at service entrances.

The duct bank installation must comply with the *Canadian Electrical Code*. For new building construction, spare ducts for planned future expansion must be provided. In addition, extra ducts equivalent to a minimum of 25% (of the total ducts) must be provided for unknown future expansion.

Ducts must be routed so as to avoid other underground utilities, foundations, and structures. They must have watertight seals where they enter into buildings, and must slope toward manholes.

8.3.5 Electrical Manholes

Manholes must be spaced such that pulling tension on cables will not exceed amounts that may damage the cable integrity. Furthermore, manholes must be provided with the following:

- cable racks;
- sumps;
- hardware for cable pulling (irons, inserts etc.);
- labelling on all cables; and
- grounding.

Manholes must be large enough to have all conductors secured on cable racks and must provide adequate working space around the conductors.

Separate manholes must be provided for:

- low-voltage cables (not exceeding 750 V);
- high-voltage cables (exceeding 750 V); and
- telecommunications cables.

Electrical handholes may be used for low-voltage feeders (below 750 V), branch circuits, and telecommunications pathways.

8.4 Primary Distribution

Primary power distribution systems consist of transformers, cables, switchgear, and associated equipment and operate at high voltage (over 750 V). For projects in which PSPC-owned primary power distribution systems are being installed, i.e. typically large buildings or campuses, the following design requirements must be met:

- use an open-loop or primary selective system architecture for redundancy if the system supplies over 25,000 m^2 of floor space and/or if the building contains mission-critical equipment such as data centres; and
- provide a minimum spare capacity of 25% above the design demand load as determined according to the *Canadian Electrical Code*.

8.4.1 Primary Substation

Primary substations must be located so that radio frequency interference will not interfere with telecommunications frame equipment. Oil-filled transformers located in underground vaults must not be positioned directly adjacent to or beneath an exit way. No building drainage system may pass through the ceiling of the room containing the primary substation.

8.4.1.1 Primary Substation Transformers

PSPC-owned primary transformers must be installed in compliance with the *Canadian Electrical Code* and the *National Building Code of Canada*. The efficiency of the transformers must meet or exceed the following applicable CSA standards:

- CAN/CSA C802.1: *Minimum Efficiency Values for Liquid-Filled Distribution Transformers*;
- CAN/CSA C802.2: *Minimum Efficiency Values for Dry-Type Transformers*; and
- CAN/CSA C802.3: *Minimum Efficiency Values for Power Transformers*.

Ensure that transformer noise levels which will not cause interference in working areas.

8.4.1.2 Primary Substation Switchgear

PSPC-owned primary switchgear should be provided with draw-out type circuit breakers of the air, vacuum, or SF6 type, or with fused-air interrupter switches, and must comply with the following design requirements:

- include energy-reducing maintenance switching or other effective means of reducing arc flash hazard during maintenance activities such as remote operation;
- be built according to the CSA C22.2 NO. 31: *Switchgear Assemblies* standard and meet the requirements of the local utility, including any metering requirement;
- include a mimic bus to show bussing, contacts, overcurrent devices, and instrumentation;
- all bussing must be copper; and
- include power monitors and advanced metering as per section 6.9, Advanced Metering System.

8.5 Secondary Distribution

Secondary power distribution systems consist of transformers, cables, switchgear, switchboards, and associated equipment and operate at 600/347 V, 208/120 V, or for small buildings at single phase 240/120 V.

Either spot networks (when available) or a secondary selective circuit arrangement must be provided if either of the following applies:

- the building is over 10,000 m^2; or
- the building contains mission-critical equipment such as data centres.

8.5.1 Secondary Switchgear

Secondary switchgear must meet the following design requirements:

- comply with the CSA C22.2 NO. 31: *Switchgear Assemblies* standard;
- have a main service disconnect;
- include hardware to lock out all breakers and switches;
- only use draw-out type breakers for breakers 800A and above;
- have an enclosure that is sprinkler-proof in areas protected with sprinklers;
- contain a ground bus throughout;
- have spare space and ampacity of 25% (for new installations);
- contain energy-reducing maintenance switching if arc flash is a risk for maintenance;
- have the state of each breaker (open/closed) monitored by the building automation system; and
- include advanced metering as per section 6.9, Advanced Metering System.

8.5.2 Distribution Switchboards

Distribution switchboards must meet the following design requirements:

- comply with the CSA C22.2 NO. 244-05: *Switchboards* standard;
- have a main service disconnect;
- have spare space and ampacity of 25% for new installations; and
- contain advanced metering for feeders to panel boards measuring current and totalizing watt-hours as per section 6.9, Advanced Metering System.

8.5.3 Secondary Transformers

Secondary transformers must be installed in compliance with the *Canadian Electrical Code* and the *National Energy Code of Canada for Buildings*. The transformers must conform to the following applicable CSA standards:

- CAN/CSA C802.1: *Minimum Efficiency Values for Liquid-Filled Distribution Transformers*; and
- CAN/CSA C802.2: *Minimum Efficiency Values for Dry-Type Transformers*.

Transformer should be selected based on the following requirements:

- secondary transformers supplying large nonlinear loads must be K-rated or oversized in order to prevent overheating due to harmonics;
- Dry type transformers are preferred for primary voltages of 5 KV or lower where insulation, coordination and protection satisfactory to the Power Supply Authority can be obtained;
- Liquid cooled transformers are preferred for voltages above 5 kV and for loads greater than400KVA at 600V/120-208V;
- Transformer noise levels must not cause interference in working areas; and
- Copper windings are preferred for liquid filled transformers.

8.5.4 Motor Control Centres (MCC)

Motor control centres must meet the following design requirements:

- comply with the CSA C22.2 No. 14: *Industrial Control Equipment* standard;
- be provided with metering and power monitoring as per section 6.9, Advanced Metering System*;*
- have operator controls as per section 8.10, Operator Controls;

- include interlocks to prevent multiple motor loads with high inrush current from starting simultaneously, in order to prevent nuisance tripping of breakers and to avoid placing excessive loads on transformers or the emergency power supply system
- the MCC is elevated off the ground;
- the use of combination starters is preferred; and
- use motor control centres where they provide an economical and practical grouping of controls.

8.5.5 Motor Control

Electric motors control must meet the following criteria:

- The transient voltage drop from motor starting must be kept below utility limits, this can be done via soft starters, VFDs, or other means.
- Motors must be protected with thermal overload protection of the manual reset type. Built –in overloads in the motor are not acceptable.
- Three-phase motors must be provided with a manually operable disconnecting means which can be locked-out.
- The control scheme be coordinated with the mechanical consultant.

8.5.5.1 Variable-Frequency Drives (VFD)

In cases where motor speed is controlled to various set points, variable-frequency drives (VFD) must be used for all motors greater than 3.7 kW (5 hp). Harmonic distortion generated by VFDs must be mitigated as per section 8.5.10, Power Quality. Data from VFDs for motors over 3.7 kW must be networked to the advanced metering system as per section 6.9, Advanced Metering System. VFDs, conductors, and motors must be coordinated in accordance with manufacturer's requirements.

8.5.6 Electrical Motors

Electric motors must meet the following criteria:

- the efficiency must comply with the *National Energy Code of Canada for Buildings*;
- electric motors 746W and over must be three-phase;
- motor windings preferred in copper when efficiency is superior and when smaller size is a factor.

8.5.7 Elevator and Escalator Power

Electrical design standards in elevators and escalators must comply with the following codes and standards:

- *National Building Code of Canada*;
- *Canada Occupational Health and Safety Regulations,* Part IV, Elevating Devices;
- CAN/CSA B44: *Safety Code for Elevators and Escalators*; and
- CAN/CSA B355: *Lifts for Persons with Physical Disabilities*.

Elevators must be powered from a breaker or fused disconnect located in the elevator machine room that is equipped with hardware for lockout.

8.5.8 Panelboards

Panelboards must comply with the CSA C22.2 No. 29: *Panelboards and Enclosed Panelboards* standard. Separate panelboards must be used for regular power supplying:

- lighting;

- general-purpose receptacles and miscellaneous loads;
- telecommunications systems; and
- mechanical loads (heating, ventilation, and air-conditioning).

Panels powered by emergency power may contain mixed loads.

Panelboards must be of the bolt-on, circuit breaker types. Multi-pole breakers must have a single handle. Each circuit must be clearly labelled with a durable typewritten directory within the panel. All panelboards must be fitted with lock-type doors and door-in-door trim.

Panelboards supplying the main telecommunications room, also known as distributor room C, must be provided with a surge protection device (SPD) with a surge rating of no less than 50 kA per phase (25 kA per mode).

All new panelboards must be provided with minimum 25% spare ampacity and 25% spare overcurrent devices. Where practical, recessed panelboards should have additional spare, empty conduits extending to ceiling spaces.

8.5.9 Secondary Distribution Conductors

Either copper or aluminum conductors may be used for the following equipment:

- motor windings; and
- distribution transformer windings.

Only copper conductors must be used for the following equipment:

- bus ducts;
- switchgear bussing;
- switchboard bussing; and
- cables and conductors.

8.5.10 Power Quality

The building’s electrical system must comply with the standards set by the local utility for power-line flicker, total harmonic distortion, and power factor, as well as with the requirements outlined in the following sections.

8.5.10.1 Power Factor

The system design must maintain a minimum power factor of 0.9 lagging. Power factor correction equipment should be utilized when required. If utilized, power factor-correcting capacitors must be properly labelled, complete with listed discharge times for servicing.

8.5.10.2 Electromagnetic Interference

Take precautions to minimize extremely low frequency electromagnetic interference by avoiding the use of single conductor armored cables and taking into consideration potential impact of electromagnetic interference when locating transformer equipment.

8.5.10.3 Total Harmonic Distortion

Total harmonic distortion must not exceed limits set by the utility or interfere with electronic equipment in the building. If it exceeds these limits or interferes with electronic equipment, the distortion must be mitigated. Suitable mitigation measures include, but are not limited to, the following:

- varying equipment operating settings;
- selection of equipment that produces lower amounts of harmonics, such as drives with more pulses;

- selection of equipment with built-in mitigation;
- passive filters;
- isolation transformers; and
- active conditioning equipment.

8.6 Branch Circuits

All branch circuit wiring must be copper and no smaller than No. 12 AWG.

8.6.1 Lighting Branch Circuits

Lighting branch circuits must be 120 V, or Power Over Ethernet (POE) for new construction. Existing installation at 347 V may remain but conversion to 120 V or POE should be considered subject to life cycle costing including the cost of the conductors, equipment, maintenance, and operation.

8.6.2 Receptacle Branch Circuits

Standard receptacles must be duplex, CSA 5-15R, commercial grade, unless otherwise required by code. Emergency power receptacles must be red. Isolated grounding receptacles must be orange. The colour of standard receptacles, switches, and faceplates must be coordinated with the architectural colour scheme.

Receptacles for housekeeping must be CSA 5-20R suitable for 15/20 A and must be placed in walls around permanent cores or corridors. The distance between receptacles in corridors must be 15 m or less, and receptacles must be located within 7.5 m from the corridor ends.

Emergency power receptacles must be provided in all electrical closets and in the main mechanical and electrical equipment rooms if an emergency power system is available. Each piece of mechanical equipment located either in the interior or exterior of a building must have access to a receptacle placed no more than 7.5 m away.

Receptacle faceplates must be labelled on the exterior with a typewritten machine-made label indicating the panel and the number of the circuit that feeds the receptacle.

8.7 Grounding and Lightning Protection

8.7.1 Grounding System

The ground source for the electrical power system must have resistance to ground of less than 5 ohms, as confirmed by the fall-of-potential ground testing method outlined in the Institute of Electrical and Electronics Engineers (IEEE) Standard 81: *IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System.*

Electrical rooms must be fitted with a bonding bus interconnected with the building's grounding system with a minimum of 25% spare terminals or holes for future bonding. All low-voltage power distribution systems must be supplemented with a separate bonding conductor. Each stack of electrical and telecom closets will have its own vertical dedicated ground riser conductor.

8.7.2 Lightning Protection

Lightning protection requirements must be determined in accordance with the latest edition of the CAN/CSA B72-M87: *Installation Code for Lightning Protection Systems*.

Lightning arrestors must be installed on the transformer primary terminals of the main electrical service (subject to agreement with the local utility if the substation is utility-owned).

Surge protection devices compliant with Underwriters Laboratories (UL) standard UL 1449: *Standard for Surge Protective Devices* must be installed on the secondary switchgear with a minimum surge current capacity of 240 kA per phase (120 kA per mode), and must be installed on each switchboard with a minimum surge current capacity of 120 kA per phase (60 kA per mode).

8.8 Placement of Electrical Rooms

Electrical rooms must meet the architectural and interior design requirements listed in section 4.2.3.3, Mechanical and Electrical Rooms, and must support the efficient vertical and horizontal distribution of power and control systems.

Electrical closets must be stacked vertically to the greatest extent possible. If an electrical room contains transformers or other heat-generating equipment, adequate cooling and/or ventilation must be provided so that environmental requirements are met as per section 6.2, Mechanical Environmental Requirements.

Electrical rooms in new building construction must have adequate sleeves installed for future modifications. At a minimum, two capped 100 mm spare sleeves through the structural floors must be installed. All floor sleeve penetrations must extend 100 mm above the finished floor.

8.9 General Workmanship

Electrical installations must be of good workmanship, this requires electrical equipment to:

- be securely and permanently fastened and or supported;
- be installed level, and plumb;
- have cable and conduit be installed parallel to and perpendicular to building lines;
- have a neat and finished appearance; and
- have corrosion protection adequate for the environment.

8.9.1 Seismic Design

Electrical equipment must be laterally restrained for seismic load requirements as outlined in section 5, Structural Engineering, and the *National Building Code of Canada*.

8.9.2 Building Raceways

Raceway systems used in buildings must comply with the *Canadian Electrical Code* and local regulations.

8.9.3 Wiring Methods

Risers for regular power and emergency power must be combined with other core elements to form compact groups and to maximize usable floor space. Bus duct risers must have a 100 mm curb around floor penetrations to prevent water from running down the bus duct. New bus ducts should be totally enclosed. Sprinklers must not aim water at ventilated or open bus ducts.

Conceal raceways for horizontal electrical distribution systems within the concrete slab, in the ceiling plenum, or in a raised floor if one is present. Concrete encased tubing and conduit, electrical metallic tubing, rigid conduit, cable tray, or modular wire distribution systems are acceptable. The minimum conduit size for power and lighting circuits shall be 21 mm. Permanent tags should be provided to feeders at pull and junction boxes. For motors and equipment subject to vibrations or movement provide flexible connections.

In office areas, install zone distribution boxes near anticipated loads to service workstations in compliance with the circuit loading requirements outlined in the *Government of Canada Workplace 2.0 Fit-up Standards*.

8.10 Operator Controls

Commanding and signalling devices must comply with the national standard CAN/CSA Z431: *Basic and Safety Principles for Man-Machine Interface, Marking and Identification - Coding Principles for Indicators and Actuators*. This standard applies to both physical operator controls and human-machine interfaces (HMIs) that form part of a building automation system.

All wired operator controls (e.g. push buttons, selector switches, and pilot lights) must be extra low voltage (below 30 V).

8.10.1 Colour Coding

Motor control and HMI colour coding must comply with the CAN/CSA Z431 standard.

The CAN/CSA Z431 standard allows information to be imparted from three different perspectives:

- the condition of the process;
- the state of the equipment; and
- the safety of persons, property, and/or the environment.

Display colours and shapes for HMIs and operator controls must be from the perspective of the condition of the process or the state of the equipment. From these perspectives, green indicates a normal/operational state.

From the perspective of the safety of persons and property, green indicates a safe condition, and indicating devices must only be applied locally to facilitate service or maintenance (e.g. a green light placed near a door to indicate that it is safe to enter). In addition, indicating devices must include clear labelling to ensure correct interpretation.

8.10.2 Operating Controls Labeling and Language Policy

Labelling on operator controls (mechanical indicators) and HMIs must make use of symbols as per CAN/CSA Z431. Any words used on controls or in HMIs must comply with the *Official Languages Act*, including bilingual signage for regions prescribed under subsection 35(2) of the Act.

8.11 Emergency Electrical Power Supply

All facilities must have an emergency electrical power system for life safety if required by the *National Building Code of Canada* and in accordance with the *Canadian Electrical Code*.

Self-contained battery units may be used for emergency light fixtures in buildings where an emergency generator is not required for other systems.

8.11.1 Emergency Generator System

If required, an emergency generator system must consist of a central engine generator with a separate distribution system with one or more automatic transfer switches (ATSs). The emergency generator system must be provided in accordance with the latest version of the CSA C282: *Emergency Electrical Power Supply for Buildings* standard.

In addition to CAN/CSA C282, the fuel system must also meet the requirements of the latest version of the CAN/CSA B139 Series: *Installation Code for Oil-Burning Equipment*. The base building generator fuel day tank must meet the following requirements:

- have a sufficient quantity of fuel to operate the engine for a minimum of 2 hours of running time at full load;
- be within the proximity of the generator in an appropriately fire rated room; and

- be automatically refilled from a main storage tank with sufficient capacity to operate the engine for a minimum of 12 hours' running time at full load.

The purpose of the tank requirements is to facilitate safe evacuation in an emergency and to protect government assets.

The emergency distribution system must be designed so that emergency power sources cannot under any condition back-feed energy into the de-energized normal system. A permanent system must be provided to allow safe and fast connection of a portable load bank to test the generator full load.

The emergency system status and alarms must be transmitted to the building automation and fire alarm systems.

8.11.2 Emergency Power Loads

At a minimum, emergency electrical power supply must be provided for the following loads (other loads may be added as required):

- life-safety load:
    - exit lighting
    - emergency lighting
    - fire alarm system
    - fire control centre
    - smoke control systems
    - fire pumps, and suppression system
    - high-rise stairway pressurization fans
    - elevators
    - generator auxiliaries (fuel pump, control power, etc.)
- essential building load:
    - lighting:
        - security perimeter lighting
        - lighting for main electrical room, electrical closets, security rooms, fire control centre, telecommunications rooms, and generator room
    - mechanical:
        - mechanical control systems
        - sump pumps
        - sewage pumps
        - exhaust fans removing toxic, explosive, or flammable fumes
        - hydronic heating system (if applicable)
    - telecommunications:
        - telecommunications room emergency receptacles
        - telecommunications rooms back-up power system (UPS)
        - building controls:
        - building automation system
        - advanced metering system
        - security systems

    - electrical:
        - emergency power receptacles
- miscellaneous:
    - horizontal sliding doors in public spaces
    - other associated equipment designated by code
        - essential client loads

8.11.3 Automatic Transfer Switch (ATS)

All automatic transfer switches (ATSs) supplied and installed for the base building and/or tenant must be provided in accordance with the CAN/CSA C282: *Emergency Electrical Power Supply for Buildings* standard and must have the following features:

- both automatic and manual operation;
- network connection to the building automation system;
- dedicated ATSs for:
    - life-safety loads;
    - essential buildings loads; and
- manual bypass isolation switch to permit electrical bypass and isolation of the ATS without interrupting the load (to either the normal or emergency power).

8.11.4 Uninterruptible Power Supply System

Uninterruptible power supply (UPS) systems generally do not form part of the base building but are tenant-owned and -operated. Tenant requirements for UPS systems must be considered in the base building design.

UPS installations that may adversely affect the power quality in the building must include forms of mitigation such as filtering, isolation transformers, and active filtering.

Rooms containing UPS batteries must have sufficient ventilation in order to prevent the accumulation of any vented hydrogen from reaching hazardous levels as per section 6.11.5, Service Areas. Hydrogen detection sensors must be installed in areas where hydrogen is most likely to accumulate. They must also be networked to the building automation system.

Base building UPS systems (non-client-owned), if required, must meet the following requirements:

- have an input power factor of above 0.8;
- have an output power factor of above 0.8;
- have an efficiency of above 90%;
- include a maintenance bypass switch; and
- be interconnected to the building automation system for monitoring status, voltages, and currents.

8.12 Lighting

Lighting must be designed to assist in defining the overall building architecture, meet organizational safety and security requirements, as well as meet the multiple task requirements of individuals in different types of spaces within the building.

Anticipated and existing tasks must be determined with input from clients and PSPC. Default lighting levels are listed in Table 1 and Table 2 at the end of this section. The lighting design must also be in accordance with the [Government of Canada Workplace 2.0 Fit-up Standards](#).

8.12.1 Lighting Design Requirements

Lighting design must provide appropriate levels of illumination for performing tasks easily and comfortably. Lighting must satisfy both quantity and quality aspects demanded by the work environment, by providing the following:

- visual comfort to promote workers' well-being;
- visual performance to promote high levels of visual task execution; and
- visual safety to permit safe movement within the work environment.

The lighting system should also be energy efficient, complying with the *National Energy Code of Canada for Buildings* (NECB).

The following requirements must be adhered to in terms of illuminance, luminance ratio, and colour rendering:

8.12.1.1 Illuminance and Luminance Ratio

Light levels must comply with the illuminance and luminance ratio requirements outlined in Table 1 and Table 2 at the end of this section. For specific areas not found in these tables, and for applications other than typical office environments, refer to the Canada Occupational Health and Safety Regulations of the *Canada Labour Code*, *the National Building Code of Canada*, and *The Lighting Handbook* published by the Illuminating Engineering Society (IES). When there are discrepancies between the three sources, the *Canada Labour Code* takes precedence.

8.12.1.2 Colour Rendering and Temperature

For all lighting, lamps must be selected with a colour rendering index (CRI) not less than 80 and a correlated colour temperature (CCT) less than or equal to 4100 °K.

8.12.2 Lighting Power Density

Lighting power densities (W/m^2) must comply with the requirements contained in the latest edition of the *National Energy Code of Canada for Buildings* (NECB). This applies to new and existing buildings where the base building lighting system is being physically replaced.

While individual areas may deviate in power loading from the recommended values, the total power budget for lighting for the building or overall space must not be exceeded unless justified by the client's operational requirements. The total power budget for the project must be documented in the investment analysis report (IAR), and a demonstration must be provided showing that implementation of the proposed design will not exceed the budget.

8.12.3 Day Lighting

To reduce energy consumption by the illumination system, day lighting (also called daylight harvesting) must be considered for all new construction and major retrofits. The IAR must identify whether day lighting is to be implemented. If implementation is not feasible, the report must include a justification for not implementing day lighting.

Day lighting systems in work areas must utilize continuous dimming rather than simple on-off operation to minimize distraction to workers.

8.12.4 Flexibility and Servicing Accessibility

The lighting design must allow easy servicing of the luminaries and replacement of lamps, drivers and ballasts. It must also be possible to economically modify the lighting system post occupancy to meet the required lighting levels.

8.12.5 General Luminaires Criteria

Luminaires and associated fittings must be of standard commercial design, the use of LED lighting is recommended. Designers must use components that are proven (capable of demonstrating the required performance in relevant projects), readily available, technologically current, user-friendly, and that provide convenient operation, ease of maintenance, and energy efficiency. Custom-designed fixtures should only be installed to meet heritage requirements.

Ballasts, when used, must have a sound rating of “A” for all areas occupied by personnel, and must conform to the CAN/CSA C654: *Fluorescent Lamp Ballast Efficacy Measurements* standard and local electrical authority requirements. Ensure that all voltage drops are within the manufacturer’s specification for the lamps being controlled. Ballasts must be electronic and energy-efficient with a minimum power factor of 0.95, and have a maximum total harmonic distortion (THD) of 10%.

Exit signs must be of the light-emitting diode (LED) type and meet the requirements of the CAN/CSA C860: *Performance of Internally Lighted Exit Signs* standard. Location and symbols must be in accordance with the *National Building Code of Canada*.

8.12.6 Specific Lighting Applications

Emergency lighting must be installed and meet the performance requirements of the *National Building Code of Canada* and Part VI of the *Canada Occupational Health and Safety Regulations*. In addition to these requirements, emergency battery-powered lighting must also be provided in main mechanical and electrical rooms, generator rooms, and automatic transfer switches rooms.

Equipment room light fixtures must be located so that lighting is not obstructed by tall or suspended pieces of equipment.

Lighting fixtures must be provided at all building entrances and exits. Exterior lighting fixtures must be connected to the emergency lighting circuit.

Luminaires in parking areas must be placed so that they maintain the required vehicle clearance.

8.12.7 Light Pollution Reduction

The exterior lighting design must comply with the light pollution reduction requirements listed in the latest version of the Leadership in Energy and Environmental Design (LEED) building certification program. This requires defining lighting zones as per the Illuminating Engineering Society (IES) and International Dark-Sky Association (IDA) *Model Lighting Ordinance (MLO)*, and selecting luminaires with an appropriate luminance, shielding, and orientation so that backlight, uplight, and glare (BUG) are in compliance with LEED requirements.

8.12.8 Lighting Controls

8.12.8.1 Lighting Controls Requirements

Lighting controls in office spaces must be designed to meet the latest *National Energy Code of Canada for Buildings* (NECB). Lighting control zones must not exceed the maximum requirements of NECB or one 15 A circuit, whichever is smallest.

The selection of manual control, dimmable control, localized automatic control, microprocessor lighting control, networked control, or any combination of the four is a fundamental design choice and is dependent on a number of factors. These include the frequency of use, available day lighting, normal or extended work hours, and the use of open or closed office plans. The designer must provide descriptions and a rationale for the chosen scheme.

A local means of override must be provided in every area to ensure continuing operations when required.

8.12.8.2 Microprocessor and Networked Lighting Controls

Lighting control systems must function on an open protocol to avoid vendor lock-in, and must be able to integrated with the with building automation, and/or security systems.

8.12.8.3 Lighting Controls for Specific Applications

Building entrance lighting and wall-mounted access security lighting must be controlled by an on-off photocell sensor to activate the lights from dusk to dawn.

All exterior lighting not designated to operate from dusk to dawn must be controlled by a photocell and a time switch, or by the networked lighting control system.

Interior garage lighting should be reduced during off building hours when motion sensors do not detect movement, as an energy-saving measure. This energy saving measure should exclude security lighting within garages.

8.12.9 Base Building Light Levels

Base building light levels must meet the more stringent of the minimum levels outlined in the *Canada Occupational Health and Safety Regulations (COHSR)* of the *Canada Labour Code*, the National Building Code *of Canada*, and those provided in the tables at the end of this section. If specific areas are not found in the tables, then refer to the IES publication *The Lighting Handbook*, latest edition.

8.12.9.1 Interior Lighting Calculation Parameters

Typical default parameters to be used in interior lighting calculations are as follows:

- luminaire ambient temperature: 1.0
- voltage to luminaire: 1.0 (electronic ballast)
- ballast factor: 0.9 (manufacturer's data takes precedence)
- burnouts: 1.0
- lamp lumen depreciation: 0.9 (manufacturer's data takes precedence)
- luminaire dirt depreciation: 0.9 (for office spaces)
- light reflectance values: 80-50-20 (ceiling, walls, and floor respectively, assuming light colours)

8.12.9.2 Illumination Levels Interior Spaces

Illumination levels for interior spaces are listed in Table 1. It should be noted that COHSR requirements for illumination levels at task positions of 1000 lux for cartography, plan reading or difficult visual tasks and 500 lux for operating business machines, typing, reading or writing should be met during space fit-up, as per the Workplace 2.0 Fit-up Standards via task lighting.

Table 1: Base Building Interior Illumination Levels

Location	Minimum Average Illumination (lx)[a]	Maximum Uniformity Ratio (avg : min)[b]	Maximum Uniformity Ratio (max : min)[c]
General Office Spaces	425	2:1	5:1
Meeting rooms, boardrooms, conference rooms, file storage areas, training rooms, and reception areas	300	2:1	
Library, general lighting	300	2:1	
Common areas (public spaces, lounges, lobbies, atriums, washrooms, and elevator lobbies)	150	2:1	
Food preparation areas	500	1.5:1	
Lunchrooms and cafeterias	150	3:1	
Electrical and mechanical rooms	200	3:1	
Telecommunications rooms	500	3:1	
Frequently used corridors, stairways, and elevators	100	2:1	
Infrequently used corridors and stairways	50	2:1	

Notes:

[a] Illumination levels for interior office spaces are expressed as the minimum acceptable values of average maintained horizontal illuminance level (lx) over the working plane at each workstation or at floor level for support spaces (based on carpeted areas). To ensure a uniform approach and yield consistent results, measurement of lighting levels must be made in accordance with the document *Measurement of Lighting Levels in the Workplace – Canada Occupational Health and Safety Regulations, Part VI, 928-1-IPG-039*.

[b] The uniformity ratio is given at a task plane height over an entire room or space, except for general office spaces, food preparation areas, and meeting rooms where it is over the task area.

[c] Throughout entire work space comprising the task areas.

8.12.9.3 Illumination Levels for Exterior Spaces

Base building exterior light levels must meet the more stringent of the minimum levels outlined in the *Canada Labour Code* and those provided in the exterior lighting level table below.

Lighting levels must also meet security requirements as determined by performing a threat and risk assessment as per *the Policy on Government Security* published by the Treasury Board of Canada Secretariat and RCMP guidelines as outlined in section 10, Security.

Table 2: Exterior Illumination Levels

<table>
<tr><th>Location</th><th>Minimum Average Illumination (lx)[a]</th><th>Maximum Uniformity Ratio (avg : min)</th><th>Maximum Uniformity Ratio (max : min)</th></tr>
<tr><td colspan="3">Grounds</td><td rowspan="19">10:1</td></tr>
<tr><td>Pedestrian walkways</td><td>10</td><td>4:1</td></tr>
<tr><td>Pedestrian walkways and vehicular intersection</td><td>30</td><td>3:1</td></tr>
<tr><td>Vehicular traffic</td><td>10</td><td>4:1</td></tr>
<tr><td>Vehicular intersections</td><td>30</td><td>3:1</td></tr>
<tr><td>Building Entrances and Exits</td><td></td><td></td></tr>
<tr><td>Frequently used building entrances and exits</td><td>100</td><td>2:1</td></tr>
<tr><td>Infrequently used building entrances and exits</td><td>50</td><td>2:1</td></tr>
<tr><td colspan="3">Open Parking</td></tr>
<tr><td>Vehicular traffic</td><td>10</td><td>4:1</td></tr>
<tr><td>Vehicular intersections</td><td>30</td><td>3:1</td></tr>
<tr><td>Vehicular parking</td><td>10</td><td>4:1</td></tr>
<tr><td>Pedestrian walkways</td><td>10</td><td>4:1</td></tr>
<tr><td colspan="3">Covered Parking</td></tr>
<tr><td>General parking and pedestrian areas</td><td>50</td><td>4:1</td></tr>
<tr><td>Ramps and corners during daytime</td><td>100</td><td>4:1</td></tr>
<tr><td>Ramps and corners during nightime</td><td>50</td><td>4:1</td></tr>
<tr><td>Entrance areas[b] during daytime</td><td>500</td><td>4:1</td></tr>
<tr><td>Entrance areas[b] during nighttime</td><td>50</td><td>4:1</td></tr>
</table>

Notes:

[a] Illumination levels for exterior commercial office building spaces are expressed as the minimum acceptable values of average maintained horizontal illuminance levels (lx) over the usable area at pavement level.
To ensure a uniform approach and yield consistent results, measurement of lighting levels must be made in accordance with the document *Measurement of Lighting Levels in the Workplace – Canada Occupational Health and Safety Regulations, part VI, 928-1-IPG-039*.

[b] The entrance area is defined as the portal or physical entrance to the covered portion of the parking structure and 15 m beyond the edge of the covering into the structure.

9 Telecommunications Systems

9.1 Telecommunication Spaces

Telecommunication spaces must meet the following requirements:

- be stacked vertically to the greatest extent possible;
- be serviced from electrical panels supplying only telecommunications systems;
- be located in dry spaces not subject to flooding from natural sources or building water sources such as washrooms or janitor closets; and
- include required architectural features outlined in the Telecommunications Industry Association (TIA) standard TIA 569: Telecommunications Pathways and Spaces, such as backboards, ceiling heights, and door sizes.

9.2 Telecommunication Entrance Facility

The entrance facility must be within a dedicated enclosed room. However, the room may also serve as a service provider space or access provider (PSPC or contractor) space if the access provider equipment is kept secure with a locked barrier such as a wire mesh to prevent unauthorized access.

The entrance facility must be powered by at least two dedicated 20A, 120 V duplex receptacles on emergency power if an emergency power system is available.

9.3 Telecommunications/Distributor Room

Telecommunications rooms, also referred to as distributor rooms, must be dedicated and not contain electrical equipment for power distribution other than panels supplying the room or related equipment. A minimum of one telecommunications room must be provided per building floor, with additional rooms provided in accordance with ANSI/TIA 569.

Each room must contain at least two dedicated 20A, 120 V duplex receptacles on emergency power if an emergency power system is available, and must provide convenience receptacles on the perimeter of the room every 1.8 m.

9.4 Telecommunication Raceway System

Backbone and horizontal telecommunication raceways must meet the requirements of ANSI/TIA 569 and be installed with sufficient separation distance from power raceways to mitigate the effects of electromagnetic interference (EMI) as per ANSI/TIA 569.

9.5 Service Entrance Pathway

Service entrance pathways must meet the requirements of the ANSI/TIA 758: *Customer-Owned Outside Plant Telecommunications Infrastructure Standard*.

9.6 Telecommunication Grounding and Bonding System

Telecommunication equipment must have a dedicated grounding and bonding system as per ANSI/TIA 607: *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises* (and addenda). The system must be bonded to the building grounding system.

The telecommunications room must be fitted with copper bonding bus connections interconnected with the building's grounding system with a minimum 25% spare capacity for future bonding. Telecommunication grounding and bonding conductors must be copper.

10 Security

10.1 Design Objectives

The security design must protect facilities and be flexible to allow integration of tenant-funded requirements, both baseline and enhanced. The security design must also comply with all applicable policies, standards and guidelines from Public Services Procurement Canada, Treasury Board Secretariat, Royal Canadian Mounted Police, and the Communications Security Establishment.

10.2 Threat and Risk Assessment

In order for a security system to be effective it needs to be developed based on an understanding of the actual threats and risks it is designed to control. Prior to developing the security elements on an office building project, a Threat and Risk Assessment (TRA) must be completed. The threat and risk assessment process is intended to evaluate a building, its assets, the tenants, the threats against the building and the occupants, and the performance of safeguards against these threats.

10.3 Security Site Brief & Security Design Brief

For new office building construction projects, develop a Security Site Brief (SSB). A Security Design Brief (SDB) must also be developed for all new construction projects and renovation projects which materially impact building security. Refer to G1-005: *Guide to the Preparation of Physical Security Briefs* for details on developing these two briefs. The two documents cover detailed security requirements for life safety and emergencies, site, building design, building layout, electronic access control, electronic intrusion detection, closed circuit television / video equipment, security control centre, secure rooms, vaults, sensitive discussion areas, telecom and data links.

Federal tenants may have specialized functional programs that will guide the fit-up of space within the base building. In this case, the specialized functions must be integrated into the base building systems and design.

11 Definitions

Advanced metering system	A system that collects time-stamped data from meters via a communications network, providing useful data for energy use management, procurement, and operations.
Advanced meters	Meters that have the capability of measuring and recording data at least hourly, and can relay the information to an advanced metering system.
BACnet or BACnet standard	A data communications protocol for building automation and control networks that allows devices from different vendors to interoperate, or work together, on the same network. It is an International Organization for Standardization (ISO) global standard developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). BACnet communication requirements are defined by the ANSI/ASHRAE 135 standard and all current addenda and annexes.
Base Building	The building shell including finished floors, structure, exterior envelope, interior core and demising walls, finished ceilings complete with lighting, and other building systems consistent with the designed function and planned general use of the building.
Building automation system	A modern building control system that optimizes the start-up and performance of a building's mechanical systems, including the alarm, lighting, security, energy monitoring, and heating, ventilation, and air-conditioning (HVAC) systems. The building automation system (BAS) greatly increases the interaction between the subsystems of a building and improves occupant comfort, lowers energy use, and allows off-site building control.
Commissioning	A process of ensuring that all systems in a building are installed, functionally tested, and capable of being operated and maintained to perform in conformity with design intent. Control system commissioning requires a point-to-point check and detailed documentation of each parameter. Commissioning includes a complete functional test of the sequence of operation for each piece of equipment.
Duct bank	Two or more conduits (ducts) routed together.
Extra low voltage	Voltage below 30 V.
Fit-up	Alterations and improvements to the base building or base building systems in order to prepare the accommodation for occupancy by a department.

Handhole	A below-grade enclosure that allows personnel to reach in (but not enter) for the purpose of operating, installing, and maintaining electrical cables.
High voltage	Voltage above 750 V.
Low voltage	Voltage between 30 V and 750 V
Major Renovation	A renovation that involves substantial work to several base building elements at the same time or to an individual base building element at any given time.
Manhole	A below-grade enclosure that personnel may enter for the purpose of operating, installing, and maintaining electrical cables.
Office building	Structures predominantly used to offer office space categories such as general administrative, secure administrative, quasi-judicial office space, and call/contact centres.
Primary distribution	A power distribution system that consists of transformers, cables, switchgear, and associated equipment and operates at high voltage (over 750 V), used to distribute power in large buildings or at campus locations.
Project Team	Project Teams are an internal vehicle to PSPC for the communication of pertinent and essential information relative to the development, implementation and ongoing activities of a project. The size and make-up of project teams is determined by the Project Leader and based on the size, complexity and type of real property project. Refer to the roles and responsibilities for project teams in the NPMS for further details.
Secondary distribution	A power distribution system that consists of transformers, cables, switchgear, and associated equipment and operates at 600/347 V, 208/120 V, or for small buildings at single phase 240/120 V.

12 Acronyms and Abbreviations

AABC	Associated Air Balance Council
ADM	Assistant Deputy Minister
AHRI	Air-Conditioning, Heating, and Refrigeration Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	ASTM International (formerly American Society for Testing and Materials)
ATS	automatic transfer switch
BAS	building automation system
BEP	best efficiency point
BHMA	Builders Hardware Manufacturers Association
BOMA	Building Owners and Managers Association
BUG	backlight, uplight, and glare
CCT	correlated colour temperature
CEC	*Canadian Electrical Code*
COE	centre of expertise
COHSR	Canada Occupational Health and Safety Regulations
CRI	Carpet and Rug Institute
CRI	colour rendering index
CRN	Canadian Registration Number
CSA	CSA Group (formerly Canadian Standards Association)
CTI	Cooling Technology Institute
DALI	digital addressable lighting interface
DCWS	domestic cold water supply
DDC	direct digital control
DHI	Door and Hardware Institute
DHWS	domestic hot water supply
EIA	Electronics Industries Alliance
EnMS	energy management system
FAR	floor-area ratio
FIPP	*Federal Identity Program Policy*

FSDS	Federal Sustainability Development Strategy
HMI	human machine interface
HVAC	heating, ventilation, and air conditioning
IAR	investment analysis report
IAQ	indoor air quality
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society of North America
IESNA	Illuminating Engineering Society of North America
IWCA	International Window Cleaning Association
LCC	life-cycle costing
LED	light emitting diode
NBC	*National Building Code of Canada*
NEBB	National Environmental Balancing Bureau
NECB	*National Energy Code of Canada for Buildings*
NPMS	National Project Management System
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NIBS	National Institute of Building Sciences
NJC	National Joint Council
OPC	open protocol connectivity
OWS	operator work station
PWGSC	Public Works and Government Services Canada
RCMP	Royal Canadian Mounted Police
RPB	Real Property Branch
SDI	Steel Door Institute
SFI	Sustainability Forestry Initiative
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
STC	sound transmission class
TAB	testing, adjusting balancing
TBS	Treasury Board of Canada Secretariat
THD	total harmonic distortion
TIA	Telecommunications Industry Association
UL	Underwriters Laboratories
ULC	Underwriters Laboratories of Canada

UPS	uninterruptible power supply
VFD	variable-frequency drive
VOC	volatile organic compound
WHMIS	Workplace Hazardous Materials Information System

13 General Codes, Standards, and Legislation

- *Canada Labour Code*
- *Canada Labour Code*, Part II, Canada Occupational Health and Safety Regulations
- *Canadian Environmental Protection Act*
- *Department of Public Works and Government Services Act*
- *Policy on Communications and Federal Identity*
    - *Federal Identity Program Manual*
- *Federal Real Property and Federal Immovables Act*
- *Government of Canada Workplace 2.0 Fit-up Standards*
- Municipal/local utility regulations
- *National Building Code of Canada* and supplements
- *National Energy Code of Canada for Buildings*
- *National Fire Code of Canada*
- *National Plumbing Code of Canada*
- *Official Languages Act*
- PWGSC *Sustainable Buildings Policy*
- Treasury Board *Fire Protection Standard*
- CAN/CSA Z-234.1-*Canadian Metric Practice Guide.*
- CAN/CSA B651: *Accessible Design for the Built Environment* standard;

13.1 Architectural Codes, Standards, and Legislation

- AAMA/CSA 101-A440 *North American Fenestration Standard / Specification for Windows, Doors, and Skylights*
- AAMA/WDMA:1600/I.S.7: Skylights and Space Enclosures
- ANSI/BOMA Z65.1: *Office Buildings: Standard Methods of Measurement*
- ASHRAE 160: *Criteria for Moisture-Control Design Analysis in Buildings*
- CAN/CSA B651: *Accessible Design for the Built Environment*
- City of Toronto *Bird-Friendly Development Guidelines* and *Bird-Friendly Development Rating System*
- CSA S478: *Guideline on Durability in Buildings*
- CSA Z809 *Sustainable Forest Management*
- NFRC 500: *Procedure for Determining Fenestration Product Condensation Resistance Values*
- *Real Property Branch Accessibility Procedure*
- Real Property Branch *Custodial Parking Policy and Custodial Parking Procedure*
- *RPB Policy on the Stewardship of Federal Heritage Buildings*
- *Standards and Guidelines for the Conservation of Historic Places in Canada*
- Treasury Board Secretariat *Accessibility Standard for Real Property*

13.2 Window Washing Standards

- ANSI A39.1: *Safety Requirements for Window Cleaning*
- ANSI/IWCA I-14.1: *Window Cleaning Safety Standard*

- ASME A120.1: *Safety Requirements for Powered Platforms and Traveling Ladders and Gantries for Building Maintenance*
- CAN/CSA Z91-02: *Health and Safety Code for Suspended Equipment Operations* (2002 most recent revision)
- CAN/CSA Z91-M90: *Safety Code for Window Cleaning Operations*

13.3 Structural Codes, Standards, and Legislation

- CAN/CSA S413: *Parking Structures*
- CAN/CSA S832: *Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings*
- CSA S478: *Guideline on Durability in Buildings*
- PWGSC *Doing Business with Real Property Branch (RPB)*
- *Real Property Services Policy on Seismic Resistance of PWGSC Buildings*
- *Standards and Guidelines for the Conservation of Historic Places in Canada*

13.4 Civil Codes, Standards, and Legislation

- Site services follow provincial and municipal standards

13.5 Mechanical Codes, Standards, and Legislation

- AABC *National Standards for Total System Balance*
- AHRI 410: *Forced-Circulation Air-Cooling and Air-Heating Coil*
- ANSI/AHRI 880: *Performance Rating of Air Terminals*
- ANSI/AMCA 210: *Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating*
- ASHRAE Guideline 0: *The Commissioning Process*
- ASHRAE Guideline 4: *Preparation of Operating and Maintenance Documentation for Building Systems*
- ASHRAE handbooks:
    - *Handbook—HVAC Applications*
    - *Handbook—Fundamentals*
    - *Handbook—Refrigeration*
    - *Handbook—HVAC Systems and Equipment*
- ANSI/ASHRAE/IES 100: *Energy Efficiency in Existing Buildings*
- ANSI/ASHRAE 105: *Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions*
- ANSI/ASHRAE 111: Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems
- ANSI/ASHRAE 135: *BACnet - A Data Communication Protocol for Building Automation and Control Networks*
- ANSI/ASHRAE 15: *Safety Standard for Refrigeration Systems*
- ANSI/ASHRAE/ACCA 180: *Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems*

- ANSI/ASHRAE 189.1: Standard for the Design of High-Performance Green Buildings
- ANSI/ASHRAE 34: *Designation and Classification of Refrigerants*
- ANSI/ASHRAE 52.2: *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*
- ANSI/ASHRAE 55: *Thermal Environmental Conditions for Human Occupancy*
- ANSI/ASHRAE 62.1: *Ventilation for Acceptable Indoor Air Quality*
- ANSI/ASHRAE/IES 90.1: *Energy Standard for Buildings Except Low-Rise Residential Buildings*
- ANSI/BHMA A156 Series Standards
- ANSI/DHI A115-W: *Wood Door Hardware Standards, Hardware Preparation* the DHI industry association
- ANSI/SDI 250.4: *Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors*
- ANSI/WDMA I.S. 1A: *Interior Architectural Wood Flush Door*
- ASME UPV: *Code for Unfired Pressure Vessels*
- ASME BPVC: *Boiler and Pressure Vessel Code*
- ASTM E1827: *Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door*
- ASTM E2813: *Standard Practice for Building Enclosure Commissioning*
- ASTM E779: *Standard Test Method for Determining Air Leakage Rate by Fan Pressurization*
- *Canadian Environmental Protection Act*, Ozone-Depleting Substances Regulations
- *Canadian Environmental Protection Act*, Federal Halocarbon Regulations
- CAN/CSA B139 Series: *Installation Code for Oil-Burning Equipment*
- CAN/CSA B149.1: *Natural Gas and Propane Installation Code*
- CAN/CSA B149.2: *Propane Storage and Handling Code*
- CAN/CSA B214: *Installation Code for Hydronic Heating Systems*
- CAN/CSA B355: *Lifts for Persons with Physical Disabilities*
- CAN/CSA B44: *Safety Code for Elevators and Escalators*
- CAN/CSA B52: *Mechanical Refrigeration Code*
- CAN/CSA B64: *Backflow Preventers and Vacuum Breakers*
- CAN/CSA C743: *Performance Standard for Rating Packaged Water Chillers*
- CAN/CSA Z204: *Guideline for Managing Indoor Air Quality in Office Buildings*
- CAN/CSA-ISO 50001: *Energy Management Systems*
- CSA standards for commissioning
- CTI STD-201: *Certified Cooling Towers*
- *Federal Halocarbon Regulations*
- MD 15000: *Mechanical Environmental Standard for Federal Office Buildings*
- MD 15161: *Control of Legionella in Mechanical Systems*
- NIBS Guideline 3: *Building Enclosure Commissioning Process*
- NJC *Occupational Health and Safety Directive*
- *PWGSC Commissioning Policy*

- *PWGSC Commissioning Manual* and PWGSC Commissioning Guidelines
- SMACNA HVAC Air Duct Leakage Test Manual

13.6 Fire Protection Engineering

- CAN/ULC S524: *Standard for the Installation of Fire Alarm Systems*
- CAN/ULC S536: *Standard for Inspection and Testing of Fire Alarm Systems*
- CAN/ULC S537: *Standard for Verification of Fire Alarm Systems*
- NFPA 1142: *Standard on Water Supplies for Suburban and Rural Fire Fighting*
- NFPA 13: *Standard for the Installation of Sprinkler Systems*
- NFPA 14: *Standard for the Installation of Standpipe and Hose Systems*
- NFPA 20: *Standard for the Installation of Stationary Pumps for Fire Protection*
- NFPA 211: *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*
- NFPA 214: *Standard on Water-Cooling Towers*
- NFPA 231: *Standard for General Storage*
- NFPA 231C: *Standard for Rack Storage of Materials*
- NFPA 24: *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*
- NFPA 30: *Flammable and Combustible Liquids Code*
- NFPA 54 / ANSI Z223.1: *National Fuel Gas Code*
- NFPA 75: *Standard for the Fire Protection of Information Technology Equipment*
- NFPA 96: *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*

13.7 Electrical Codes, Standards, and Legislation

- CAN/CSA C282: *Emergency Electrical Power Supply for Buildings*
- CAN/CSA C654: *Fluorescent Lamp Ballast Efficacy Measurements*
- CAN/CSA C802.1: *Minimum Efficiency Values for Liquid-Filled Distribution Transformers*
- CAN/CSA C802.2: *Minimum Efficiency Values for Dry-Type Transformers*
- CAN/CSA C802.3: *Minimum Efficiency Values for Power Transformers*
- CAN/CSA B72-M87: *Installation Code for Lightning Protection Systems*
- CAN/CSA C860: *Performance of Internally Lighted Exit Signs*
- CSA C22.1: *Canadian Electrical Code*, Part I
- CSA C22.2: *Canadian Electrical Code*, Part II
- CSA C22.3: *Canadian Electrical Code*, Part III
- CAN/CSA Z431: *Basic and Safety Principles for Man-Machine Interface, Marking and Identification – Coding Principles for Indicators and Actuators*
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- CSA Z462: *Workplace Electrical Safety*
- IEEE Standard 81: *Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System*
- IES: *The Lighting Handbook*
- *Measurement of Lighting Levels in the Workplace – Canada Occupational Health and Safety Regulations, Part VI, 928-1-IPG-039*

- Provincial electrical codes and regulations
- UL 1449: *Standard for Surge Protective Devices*

13.8 Telecommunication Codes, Standards, and Legislation

- ANSI/TIA 568.1: *Commercial Building Telecommunications Infrastructure Standard* (and addenda)
- ANSI/TIA 569: *Telecommunications Pathways and Spaces* (and addenda)
- ANSI/TIA 606: *Administration Standard for Telecommunications Infrastructure* (and addenda)
- ANSI/TIA 607: *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises* (and addenda)
- ANSI/TIA 758: *Customer-Owned Outside Plant Telecommunications Infrastructure Standard*

13.9 Security Codes Standards, and Legislation

- Public Services Procurement Canada
  - DP 051: *Departmental Security Program Policy*
  - DP 052: *Corporate Security Program Policy*
- Treasury Board of Canada Secretariat:
  - *Operational Security Standard on Physical Security*
  - *Operational Security Standard - Business Continuity Planning (BCP) Program*
  - *Operational Security Standard - Readiness Levels for Federal Government Facilities*
  - *Policy on Government Security*
  - *Security and Contracting Management Standard*
  - *Security Organization and Administration Standard*
  - *Standard for Fire Safety Planning and Fire Emergency Organization*
- Royal Canadian Mounted Police:
  - G1-005: *Guide to the Preparation of Physical Security Brief*s
  - G1-013: *Security Control Centre Space Requirements*
  - G1-028: *Security Use of Mobile Shelving*
  - *Harmonized Threat and Risk Assessment Methodology (hosted by Communications Security Establishment Canada [CSEC])*