

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
**Travaux publics et Services gouvernementaux
Canada**
Place Bonaventure, portail Sud-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6
FAX pour soumissions: (514) 496-3822

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

**Proposal To: Public Works and Government
Services Canada**

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

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

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

Comments - Commentaires

Title - Sujet Montréal-Arch. Réfection maçonnerie	
Solicitation No. - N° de l'invitation EE520-133132/A	Date 2013-02-05
Client Reference No. - N° de référence du client R.021798.100	
GETS Reference No. - N° de référence de SEAG PW-\$MTC-015-12259	
File No. - N° de dossier MTC-2-35327 (015)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-03-19	Time Zone Fuseau horaire Heure Normale du l'Est HNE
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Desmarais, Jacques	Buyer Id - Id de l'acheteur mtc015
Telephone No. - N° de téléphone (514) 496-3408 ()	FAX No. - N° de FAX (514) 496-3822
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: MINISTERE DES TRAVAUX PUBLICS ET SERVICES GOUVERNEMENTAUX CANADA ESC 2 - Parcs CST 2 - Parks 3, PASSAGE DU CHIEN D'OR QUEBEC Québec G1R 3Z8 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

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

Issuing Office - Bureau de distribution

Travaux publics et Services gouvernementaux Canada
Place Bonaventure, portail Sud-Est
800, rue de La Gauchetière Ouest
7 ième étage
Montréal
Québec
H5A 1L6

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

Public Works and Government Services Canada		Travaux publics et Services gouvernementaux Canada		N° du documentEE520-133132/A		Part - Partie 1 of - de 2 See Part 2 for Clauses and Conditions Voir Partie 2 pour Clauses et Conditions		
Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Montréal-Arch. Réfection maçonneri e	EE520	EE520	1	LOT	\$XXXXXXXXXXXX	.	

**REQUEST FOR PROPOSALS
(One Phase Procedure)**

No EE520-133132

**REQUEST FOR PROPOSALS FOR ARCHITECTURAL MULTIDISCIPLINARY SERVICES
AS PART OF THE PROJECT OF MANSORY REPAIRS OF THE CUSTOMS BUILDING**

105 McGill Street / 400 place d'Youville
Montréal, Quebec

Project no R.021798.100

Closing date: March 19th 2013

For information:

Jacques Desmarais

Supply specialist

Tel: (514) 496-3408

Fax: (514) 496-3822

E-mail: jacques.desmarais@tpsgc-pwsgc.gc.ca

Requested by:

Heritage Client Service Team

Publics Works and Government Services Canada

Quebec Region

January 2013

Refer to pdf file.



Travaux publics et
Services gouvernementaux
Canada

Public Works and
Government Services
Canada

REQUEST FOR PROPOSALS

(One Phase Procedure)

No EE520-133132

REQUEST FOR PROPOSALS FOR ARCHITECTURAL MULTIDISCIPLINARY SERVICES
AS PART OF THE PROJECT OF MANSORY REPAIRS OF THE CUSTOMS BUILDING
105 McGill Street / 400 place d'Youville
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Requested by:
Heritage Client Service Team
Publics Works and Government Services Canada
Quebec Region

January 2013

THIS PROCUREMENT CONTAINS A SECURITY REQUIREMENT

**REQUEST FOR PROPOSAL (RFP)
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The following is intended to clarify the general structure of the whole document.

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Agreement

Supplementary Conditions (SC)

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SUPPLEMENTARY INSTRUCTIONS TO PROPONENTS (SI)

SI1 INTRODUCTION

1. Public Works and Government Services Canada (PWGSC) intends to retain an individual consulting firm or joint venture to provide the professional services for the project as set out in this Request for Proposal (RFP).
2. This is a single phase selection process. The nature of the requirement and the anticipated limited number of response by the industry leads PWGSC to believe that this approach will not unduly force a large number of firms to expend an overall unreasonable amount of effort in response to PWGSC.
3. Proponents responding to this RFP are requested to submit a full and complete proposal. The proposal will cover not only the qualifications, experience and organization of the proposed Consultant Team, but also the detailed approach to the work, and the pricing and terms offered. A combination of the technical and price of services submissions will constitute the proposal.

SI2 PROPOSAL DOCUMENTS

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

All instructions, general terms, conditions and clauses identified in the RFP by number, date and title, are set out in the Standard Acquisition Clauses and Conditions Manual

<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>
issued by Public Works and Government Services Canada.

2. The following are the proposal documents:
 - (a) Supplementary Instructions to Proponents (SI);
R1410T (2013-01-28), General Instructions to Proponents (GI);
Submission Requirements and Evaluation (SRE);
 - (b) the general terms, conditions and clauses, as amended, identified in the Agreement clause;
 - (c) Project Brief / Terms of Reference;
 - (d) the document entitled "Doing Business";
 - (e) any amendment to the solicitation document issued prior to the date set for receipt of proposals; and

- (f) the proposal, Declaration/Certifications Form and Price Proposal Form.
3. Submission of a proposal constitutes acknowledgment that the Proponent has read and agrees to be bound by these documents.

SI3 QUESTIONS OR REQUEST FOR CLARIFICATION

Questions or requests for clarification during the solicitation period must be submitted in writing to the Contracting Authority named on the RFP - Page 1 as early as possible. Enquiries should be received no later than seven (7) working days prior to the closing date identified on the front page of the Request for Proposal. Enquiries received after that date may not be answered prior to the closing date of the solicitation.

SI4 CANADA'S TRADE AGREEMENTS

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

SI5 CODE OF CONDUCT AND CERTIFICATIONS - RELATED DOCUMENTATION

By submitting a bid, the Proponent certifies, for himself and his affiliates, to be in compliance with the Code of Conduct and Certifications clause of the R1410T (2013-01-28) General Instructions to Proponents (GI). The related documentation hereinafter mentioned will help Canada in confirming that the certifications are true. By submitting a bid, the Proponent certifies that it is aware, and that its affiliates are aware, that Canada may request additional information, certifications, consent forms and other evidentiary elements proving identity or eligibility. Canada may also verify the information provided by the Proponent, including the information relating to the acts or convictions specified herein, through independent research, use of any government resources or by contacting third parties. Canada will declare non-responsive any bid in respect of which the information requested is missing or inaccurate, or in respect of which the information contained in the certifications is found to be untrue, in any respect, by Canada. The Proponent and any of the Proponent's affiliates, will also be required to remain free and clear of any acts or convictions specified herein during the period of any contract arising from this bid solicitation.

Proponents who are incorporated, including those bidding as a joint venture, must provide with their bid or promptly thereafter a complete list of names of all individuals who are currently directors of the Proponent. Proponents bidding as sole proprietorship, including those bidding as a joint venture, must provide the name of the owner with their bid or promptly thereafter. Proponents bidding as societies, firms, partnerships or associations of persons do not need to provide lists of names. If the required names have not been received by the time the evaluation of bids is completed, Canada will inform the Proponent of a time frame within which to provide the information. Failure to comply will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

Canada may, at any time, request that a Proponent provide properly completed and Signed Consent Forms ([Consent to a Criminal Record Verification](http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html) form- PWGSC-TPSGC 229) (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>) for any or all

individuals aforementioned within the time specified. Failure to provide such Consent Forms within the time period provided will result in the bid being declared non-responsive.

SI6 SECURITY REQUIREMENT

This procurement contains a Security Requirement as described in the Supplementary Conditions – SC1.

SI7 WEB SITES

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.justice.gc.ca/en/E-5.401/index.html>

Federal Contractors Program (FCP)

<http://www.hrsdc.gc.ca/eng/labour/equality/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>

Code of Conduct for Procurement

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

Consent to a Criminal Record Verification (PWGSC-TPSGC 229 form)

<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>

Lobbying Act

<http://laws.justice.gc.ca/en/L-12.4>

Contracts Canada

<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 (2013-01-28), GC1 - General Provisions
 - R1215D (2011-05-16), GC2 - Administration of the Contract
 - R1220D (2011-05-16), GC3 - Consultant Services
 - R1225D (2012-07-16), GC4 - Intellectual Property
 - R1230D (2012-07-16), GC5 - Terms of Payment
 - R1235D (2011-05-16), GC6 - Changes
 - R1240D (2011-05-16), GC7 - Taking the Services Out of the Consultant's Hands, Suspension or Termination
 - R1245D (2012-07-16), GC8 - Dispute Resolution
 - R1250D (2012-07-16), GC9 - Indemnification and Insurance
 - (c) Project Brief / Terms of Reference;
 - (d) the document entitled "Doing Business";
 - (e) Security Requirement - Escort clause
 - (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 / Terms of Reference;
- (h) the document entitled “Doing Business”;
- (i) Security Requirements — Escort clause
- (j) the proposal.

SUPPLEMENTARY CONDITIONS (SC)

SC1 SECURITY REQUIREMENTS

Contractor personnel MAY NOT ENTER NOR PERFORM WORK ON sites where PROTECTED or CLASSIFIED information or assets are kept, without an escort provided by the department or agency for which the work is being performed.

SC2 LANGUAGE REQUIREMENTS

1. Communication between Canada and the Consultant shall be in the language of choice of the Consultant Team, which shall be deemed to be the language of the Consultant's proposal.
2. The Consultant's services during construction tender call (such as addenda preparation, tenderers' briefing meetings, technical answers to questions by bidders) shall be provided expeditiously in both languages, as necessary.
3. The Consultant's services during construction shall be provided in the language of choice of the Contractor. The successful Contractor will be asked to commit to one or other of Canada's official languages upon award of the Construction Contract and, thereafter construction and contract administration services will be conducted in the language chosen by the Contractor.
4. Other required services in both of Canada's official languages (such as construction documentation) are described in detail in the Project Brief.
5. The Consultant Team, including the Prime Consultant, Sub-Consultants and Specialists Consultants shall ensure that the services being provided in either language shall be to a professional standard.

SC3 APPROVAL PERIODS

1. Once the Consultant has completed the services under RS1 to RS3, and prior to commencing the other Required Services as an option for Canada, approvals for the commitment of funds and for contracts must be obtained. No costs will be charged by the Consultant owing to this waiting period.
2. Also, before the main construction contracts are awarded (RS5), approval for the commitment of funds must be obtained by the project manager. No costs will be charged by the Consultant owing to this waiting period.

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

SRE 1 GENERAL INFORMATION

1.1 Reference to the Selection Procedure

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

1.2 Calculation of Total Score

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

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

SRE 2 PROPOSAL REQUIREMENTS

2.1 Requirement for Proposal Format

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

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

2.2 Specific Requirements for Proposal Format

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

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

- Covering letter
- Consultant Team Identification (Appendix A)
- Declaration/Certifications Form (Appendix B)
- 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

Subject: The objective of the evaluation of the submitted proposals is to make sure that they meet the mandatory requirements, as well as to assess and score the proposed teams.

3.1 MANDATORY REQUIREMENTS

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

3.1.1 Licensing, Certification or Authorization

The proponent shall be an architectural firm authorized to provide the necessary professional services to the full extent that may be required by provincial or territorial law in the province of Québec.

3.1.2 Consultant Team Identification

The consultant team to be identified must include the following:

Proponent (prime consultant)

- Architect member in good standing of the *Ordre des architectes du Québec* (OAQ)

Key Sub-consultants / Specialists

- Structural engineer member in good standing of the *Ordre des ingénieurs du Québec* (OIQ);
- Mason also holding a valid general construction contractor licence issued by the *Régie du bâtiment du Québec* (RBQ);
- Proponent's resident site representative (architecture);
- Proponent's resident site representative (structural engineering).

The architect, the structural engineer, the mason, and the consultant resident site representatives must have a comprehensive knowledge of conservation principles, materials and techniques, as well as a broad experience in condition assessment, repairs, and restoration of old institutional masonry buildings for which, as much as possible, the heritage value is officially designated.

Other resources (not evaluated)

- Firm specialized in existing building surveys using 3D laser scanning;
- Electrical engineer;
- Mechanical engineer;

For these other resources, the name of the company and the name of key personnel assigned to the project must be indicated, but will not be evaluated as part of this request for proposals.

Should the proponent propose to offer multidisciplinary services which could normally be provided by a key sub-consultant, it must 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 Requirements with regards to security apply to this contract

Refer to the “escort” clause previously indicated in the Supplementary Conditions SC1 section.

3.2 RATED REQUIREMENTS

For every rated criteria, the projects submitted must be comparable to the masonry repairs project of the Montréal Customs Building, and relevant with regards to the following aspects:

- The institutional context;
- The heritage value;
- The scope (size and/or budget) and level of complexity.

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 three (3) completed projects (substantial completion certificate issued) undertaken within the last ten (10) years. Joint venture submissions are not to exceed the maximum number of projects.

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/conservation philosophy/approach to meet the intent, design challenges and resolutions.
- For every project presented, indicate how the architect made sure to conserve the heritage integrity of the building considering the objectives of the program and the constraints of the project
- Budget control and management - i.e. contract price & final construction cost - explain variation
- Project schedule control and management - i.e. initial schedule and revised schedule - explain variation
- Client references - name, address, phone and fax of client contact at working level - references may be checked
- Names of key personnel responsible for project delivery
- Awards received
- Demonstrate specific interest of the proponent for heritage buildings conservation, rehabilitation and restoration.

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.

This section mainly concerns the engineering firm and the masonry contractor.

Select a **maximum** of two (2) projects undertaken within the last ten (10) years per key sub consultant or specialist.

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.
- For every project presented, indicate how the architect made sure to conserve the heritage integrity of the building considering the objectives of the program and the constraints of the project
- Budget control and management - i.e. contract price & final construction cost - explain variation
- Project schedule control and management - i.e. initial schedule and revised schedule - explain variation
- Client references - name, address, phone and fax of client contact at working level - references may be checked
- Names of key personnel responsible for project delivery
- Awards received
- Demonstrate specific interest of the proponent for heritage buildings conservation, rehabilitation and restoration.

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.

In the current request for proposals, the key personnel is defined as follows:

3.2.3.1 *Representative of the proponent*

- Acts as the representative of the proponent (of the architectural firm or of the consortium) towards PWGSC's project manager and acts as the administrator in charge of the general management of the proponent's team;
- Is responsible for relations and communications between the proponent (architectural firm or consortium) and PWGSC's project manager. Addresses all contract issues related to the architectural, engineering and masonry services of the proponent towards PWGSC;
- Is responsible for the services offered by the proponent (architectural firm or joint venture) in order to meet the general objectives of the project.

Information that should be supplied for the representative of the proponent:

- Professional accreditation
- Accomplishments/achievements/awards
- Relevant experience, expertise, number of years experience
- Role, responsibility and degree of involvement of individual in two (2) past projects comparable to the one of the Customs Building

- For each project, describe the type of tracking and coordination that was performed in order to meet the various requirements (heritage, scope of work, budget, schedule)

3.2.3.2 *Project leader(s) and consultant resident site representative*

The architectural firm, the engineering firm and the masonry contractor will each have to designate a project leader who will be directly assigned to the execution of the current project.

The architectural firm and the engineering firm will each have to designate a resident site representative who will be directly assigned to the execution of the current project. In each case, the resident site representative should be a senior technician in architecture/structural engineering or an intermediate architect/structural engineer.

The co-ordinator or « team leader » role will be played by the architectural firm's project leader, to whom all members of the proponent's team should report to, and who himself/herself should report to PWGSC's project manager.

Information that should be supplied for each project leader and resident site representative:

- Professional accreditation (if applicable)
- Accomplishments/achievements/awards
- Relevant experience, expertise, number of years experience
- Role, responsibility and degree of involvement of individual in two (2) past projects comparable to the one of the Customs Building
- For each project, describe the type of tracking and coordination that was performed in order to meet the various requirements (heritage, scope of work, budget, schedule)
- Specific understanding from the architectural project leader (team leader) and resident site representative of masonry repairs, heritage conservation, and structural issues
- Specific understanding from the structural engineering project leader and resident site representative of masonry repairs and heritage conservation issues.

3.2.4 Understanding of the Project

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

Information that should be supplied:

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

3.2.5 Scope of Services

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

Information that should be supplied:

- Scope of Services - detailed list of services
- other resources - demonstrate how the proponent will provide services related to risk management (RS8), sustainable development (AS3) and waste management (AS4) / outsourcing to a specialized firm or in-house employee(s) with relevant experience
- 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.

Bear in mind that the objective of hiring such a multidisciplinary team is to obtain, among others, a balanced and comprehensive condition assessment of the masonry, combining in true co-operation the global perspective of the architect, the more specific viewpoint of the engineer, and the practical knowhow of the mason.

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

Information that should be supplied:

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

3.2.7 Design Philosophy / Approach / Methodology

The proponent should elaborate on aspects of the project considered to be a major challenge which will illustrate design/conservation philosophy / approach / methodology. This is the opportunity for the Proponent to state the overall design/conservation 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.

How, among others, the proponent plans to conserve the heritage integrity of the building while taking into consideration the other constraints of the project?

Information that should be supplied:

- Design/conservation Philosophy / Approach / Methodology
- Describe the major challenges, including conservation issues, and how your team approach will be applied to these specific 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 <i>Architectural firm</i>	1,0	0 - 10	0 - 10
Achievements of Key Sub-consultants / Specialists <i>Engineering firm (5 points maximum)</i>	0,5	0 - 10	0 - 5
<i>Masonry contractor (5 points maximum)</i>	0,5	0 - 10	0 - 5
Achievements of Key Personnel on Projects <i>Representative of the proponent</i>	0,4	0 - 10	0 - 4
<i>Project leader architecture</i>	1,0	0 - 10	0 - 10
<i>Project leader structural engineering</i>	0,7	0 - 10	0 - 7
<i>Project leader masonry</i>	0,7	0 - 10	0 - 7
<i>Resident site representative architecture</i>	0,8	0 - 10	0 - 8
<i>Resident site representative structural engineering</i>	0,4	0 - 10	0 - 4
Understanding of the Project	1,2	0 - 10	0 - 12
Scope of Services	0,8	0 - 10	0 - 8
Management of Services	0,8	0 - 10	0 - 8
Design Philosophy / Approach / Methodology	1,2	0 - 10	0 - 12
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:

NON RESPONSIVE	INADEQUATE	WEAK	ADEQUATE	FULLY SATISFACTORY	STRONG
0 point	2 points	4 points	6 points	8 points	10 points
Did not submit information which could be evaluated	Lacks complete or almost complete understanding of the requirements.	Has some understanding of the requirements but lacks adequate understanding in some areas of the requirements.	Demonstrates a good understanding of the requirements.	Demonstrates a very good understanding of the requirements.	Demonstrates expert understanding of the requirements.
	Weaknesses cannot be corrected	Generally doubtful that weaknesses can be corrected	Weaknesses can be easily corrected	No significant weaknesses	No apparent weaknesses
	Proponent lacks qualifications and experience	Proponent does not have minimum qualifications and experience	Proponent has minimum 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 all 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 project's needs	Sample projects generally not related to this project's needs	Sample projects generally related to this project's needs	Sample projects directly related to this project's needs	Leads in sample projects directly related to this project's needs
	Extremely poor, insufficient to meet performance requirements	Little capability to meet performance requirements	Minimum acceptable capability, should meet minimum performance	Satisfactory capability, should ensure effective results	Superior capability, should ensure very effective results

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

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

SRE 4 PRICE OF SERVICES

All price proposal envelopes corresponding to responsive proposals which have achieved the pass mark of fifty (50) points will be opened upon completion of the technical evaluation. 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:

1. The lowest price proposal receives a Price Rating of 100
2. 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.
3. 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. 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
- Proposal - one (1) original plus five (5) copies
- Front page of RFP
- Front page(s) of any solicitation amendment

In a separate envelope:

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

PROJECT BRIEF

This Project Brief is divided into two sections:

- **Description of Project**
- **Description of Services**
 - Project Administration (PA)
 - Required Services (RS)
 - Additional Services (AS)

For standards relating to the service provisions herein please refer to the document “Doing Business with A&ES”. The standards in “Doing Business with A&ES” must be adhered to in conjunction with this scope of services.

DESCRIPTION OF PROJECT

PD 1 PROJECT INFORMATION

Public Works and Government Services Canada (PWGSC) intends to retain a firm of architects, which will act as key consultant, and will form a multidisciplinary team completed by key sub-consultants (structural engineer and mason among others) for the provision of the services required for this project.

- 1.1 PWGSC Project Title:** Customs Building Masonry Repairs
- 1.2 Location of the Project:** 105 McGill Street / 400 place d’Youville, Montréal
- 1.3 PWGSC Project Number:** R.021798.100
- 1.4 Client / User:** Public Works and Government Services Canada (PWGSC)
- 1.5 PWGSC Project Manager:** Pierre-Hugues Mathieu

PD 2 PROJECT IDENTIFICATION

Intent: A summary of the key project information

2.1 Description

2.1.1 « Project Vision »

Considering the significance of the Customs Building, based as much on its size, its location and its federal heritage building designation, the objective of the current masonry repairs project is to perform, while respecting the principles and trade practices recognized in the field of conservation, the necessary work to maintain the integrity of the building for at least another century.

2.1.2 Information about the client

The Montréal Customs Building is owned by the Government of Canada, and more specifically by the department of Public Works and Government Services Canada (PWGSC). The property management is in the hands of the firm SNC-Lavalin O&M. In the case of the current masonry repairs project, PWGSC will be responsible of the project and construction work.

The building contains offices, warehouses and laboratories for various federal government departments, Canada Border Services Agency (CBSA), Canada Revenue Agency (CRA), Environment Canada (EC), and Public Works and Government Services Canada (PWGSC).

2.1.3 Short description of the existing building

The Montréal Customs Building was built in two stages, first with the eastern half (105 McGill) from 1912 to 1916 and the western half (400 place d'Youville) from 1934 to 1936, including the central avant-corps, the carriage entrance, and the lean-to on the corner of Marguerite-D'Youville and Normand streets.

Planned around a central entrance along the McGill Street façade, the first building was originally perfectly symmetrical, and primarily served as a warehouse with its huge opened spaces and receiving platforms on the eastern and western façades. Designed as early as the end of the 1910s, but erected almost twenty years later with some interior modifications, the extension, fitted with a monumental portico opening onto place d'Youville, primarily housed offices around a majestic long room and an interior light court above. Linked by a commanding central avant-corps to the south and a courtyard along Normand Street to the north, the two buildings together create a colossal ensemble close to 500 feet long and eight storeys high, occupying an entire city block of the Old Montréal.

With the exception of the laboratories and offices that have been inserted into 105 McGill, as well as inside the interior light court of 400 place d'Youville (above the long room), the building continues to be used for its original purpose (storage and offices).

2.1.4 Characteristics of structure and cladding, façade composition

The structure of 105 McGill is made of riveted steel columns and beams embedded in concrete, and the exterior walls are made of a thick solid brick backing clad in stone. In the case of 400 place d'Youville, the structure is made of reinforced concrete, and the exterior walls are made of an exterior stone cladding, a brick backing, an air space, and a terracotta block partition covered with plaster.

As for the exterior cladding, it is identical for both the original building and its extension, and comprises two types of stone: Grey granite from Stanstead on the two lower storeys, and buff sandstone from Wallace, Nova Scotia, on the upper storeys (2nd to 7th floor, as well as the original penthouses).

The first two storeys of the Customs Building create a massive arcade crowned by a deep cornice. Above, a monumental colonnade capped with ionic capitals stretches on four floors, together crowned by an architrave, an additional floor, as well as an imposing cornice that extends far in front of the façade. As for the corner avant-corps of the building, they create a colossal pilaster, underscored with deep chamfers and adorned with large rectangular flat crests, without inscriptions.

2.1.5 Constraints and challenges

The key consultant will have to take into consideration the following constraints and challenges:

Scope of the project

- Delays of approval for a project of this scope, combined with the current budget restrictions, could delay the beginning of the construction work.

Industrial security

- As in every federal building and more specifically at the Customs Building, due to the presence of tenants such as Canada Revenue Agency and the Canada Border Services Agency, anyone entering the building must be escorted by a guard (commissionaire). Visits and interventions inside the building will have to be carefully planned and co-ordinated with PWGSC's project manager in order to notify users and to provide for required escort at least (48) hours in advance.

Expertise in heritage conservation

- The professionals and contractors possessing adequate knowledge and knowhow to work on masonry repairs projects of heritage buildings are a rare and specialized workforce, and whose thoroughness is decisive when planning and executing such demanding and peaky work.
- The heritage value of the building being recognized by the Federal Heritage Buildings Review Office (FHBRO), the *ministère de la Culture et des Communications du Québec* (MCCQ) and the City of Montréal, the masonry repairs project will have to be approved by these three levels of government.

Simultaneous worksites

- Based on the schedule of the 105 McGill warehouse spaces conversion into office spaces, it is possible that the end of this project may overlap with the beginning of the masonry repairs. Also, the presence of two contractors on site could result in PWGSC not being able to delegate its principal contractor responsibility conferred by the CSST.

Stone procurement

- Although the quarries from which the original sandstone and granite for the building were extracted (Wallace, Nova Scotia, and Stanstead, Québec) both remains in operation today, the availability of stones of quality and dimensions similar to the existing ones remains to be confirmed, notwithstanding the delivery delays.

Noise, vibrations, dust, health and safety

- Masonry repairs are generally very noisy, cause vibrations and create substantial dust, all of which can disturb the occupants (especially the Environment Canada laboratories, in the present case) and neighbours, even more when work is extended over several months or a few years.
- Considering that work will be performed almost everywhere above the public way, the worksite will present a risk for the security of the occupants, passersby, and motorists.

Presence of asbestos

- Considering that the original plaster do contain traces of asbestos, the applicable precautions will have to be implemented during borings made inside the building as part of the detailed masonry condition assessment.

Illumination of the Building

- The Customs building was illuminated in 2011 as part of a partnership between the PWGSC and City of Montréal, and of the *Plan lumière* along McGill Street. The Heritage Client Service Team of PWGSC, which must approve all modifications made to the building, had recommended postponing the installation of the lamps after the masonry repairs, but the department preferred to proceed with the project immediately. Various measures were nonetheless implemented to mitigate the impact of the illumination on the integrity of the existing materials starting with the stone cladding.
- As part of the masonry repairs project, it will be required to either temporarily remove the lamps and electrical wiring, or to temporarily protect in place all this equipment. The selected strategy will have to take into consideration the partnership with the City of Montreal, as well as the impacts on the building, the lamps, the masonry repairs, as well as the money and efforts invested up to now.
- Required co-ordination with the City of Montréal will be conducted by PWGSC.

Site use

- In order not to disturb the occupants, borings to be performed inside during the condition assessment will have to be made **after** normal working hours.
- Considering the quasi-absence of available space on site and ob setback between the building and the sidewalk, worksite installations (scaffolding, cranes, delivery vehicles, trailers, and others) will necessarily encroach on the public way, along a very busy artery and of which a portion is dedicated for standing taxis (McGill Street), and along a public square currently under construction (place d'Youville). PWGSC will notify the City of Montréal with regards to the planned work and inconvenience that it may cause, and will try to negotiate a reasonable way of functioning. However, the general contractor will be responsible for permit requests.
- The building is currently occupied and will continue to be so during the entire length of the construction. Work will have to be performed during normal working hours, but could, partially and exceptionally, be carried out at night or during the weekend.

Planning

- Considering that the Customs Building is located in the Old Montréal and that several special events take place in this neighbourhood (such as *Montréal en lumière* every winter or the 375th anniversary of the city in 2017), work may have to be interrupted on some occasions. The various documents (call for tenders, schedule, risk management plan, etc.) will have to be prepared accordingly.

2.1.6 Key dimensions

Montréal Customs Building has a total usable area of 28 014 m², distributed on nine floors including the basement and the ground floor, and the site area is 6 308 m².

2.1.7 Implementation strategy

- Phase 1 - Design Development.

The masonry condition assessment of the Customs Building will be given to a multidisciplinary team of consultants conducted by an architect, helped by a structural engineer and a mason, all specialized in the condition assessment, repairs and restoration of heritage buildings made of traditional masonry.

The condition assessment report prepared by this team will have to be the equivalent to advanced preliminary drawings and specifications, in order to be used as a precise guide to prepare final drawings and specifications for tenders.

- Phase 2 - Construction Documents

The implementation of this second phase depends upon obtaining all required approvals, as well as adequate funding. Upon getting the green light, it is planned that the consultants will prepare final drawings and specifications for a public tender call.

The multidisciplinary team of consultants will remain the same as during stage 1, except for the mason.

- Phase 3 - Tender Call and Construction

The implementation of this third phase depends upon obtaining all required approvals, as well as adequate funding. Upon getting the green light, it is planned that the consultants will assist PWGSC during the call for tenders, and will supervise site construction.

The multidisciplinary team of consultants will remain the same as during stage 2.

Following a public call for tenders, the masonry repairs will be given to a specialized contractor qualified for the type of intervention to be performed on the building, and these repairs will be carried out on a three (3) year period.

Refer to item 2.3 hereafter for a description of the duration of each of these three phases.

2.2 Cost

The class D construction budget is estimated at 14.7 M\$, excluding GST.

2.3 Schedule

Although subject to correction, the following table will be used as a reference when preparing the execution calendar by the consultant.

At the request of the Departmental Representative, and in cooperation with the consultant, the schedule may be modified. However, the main stages of implementing the project are, on a tentative basis, as follows:

PRELIMINARY SCHEDULE

	STAGE	SERVICES	DURATION Month(s)	BEGINNING DATE	ENDING DATE
		Request for proposals (RFP)	5	Sept. 2012	Feb. 2013
		Evaluation of proposals	1	March 2013	March 2013
PHASE 1	RS 1	Analysis of Project Requirements, Revised Class D Estimate	8	April 2013	Oct. 2013
	RS 2	Design Concept, Class C Estimate			
	RS 3	Design Development, Class B Estimate			
		<i>Preliminary approval of the project by the Heritage CST of PWGSC, the City of Montréal, and the ministère de la Culture (MCCFQ)</i>	2	Nov. 2013	Dec. 2013
		<i>Presentation of the condition assessment report and update on the project orientations to the RIMB</i>	2	Nov. 2013	Dec. 2013
The implementation of the second phase depends upon obtaining all required approvals, as well as adequate funding.					
PHASE 2	RS 4	Construction Documents, Class A Estimate	4	Jan. 2014	April 2014
	AS 1	Bilingual Construction Documents	1	May 2014	May 2014
		<i>Final approval of the project by the Heritage CST of PWGSC, the City of Montréal, and the ministère de la Culture (MCCCFQ)</i>	2	May 2014	June 2014
		<i>Approval of the project by the RIMB</i>	2	May 2014	June 2014
The implementation of the third phase depends upon obtaining all required approvals, as well as adequate funding.					
PHASE 3	RS 5	Tender Call and Bid Evaluation	4	July 2014	Oct. 2014
		<i>Approval and Construction Contract Award by the Supply Operations Service</i>	1	Nov. 2014	Nov. 2014
		Contractor mobilization and worksite preparation (ex.: Reserving crane and scaffoldings, ordering stone and materials)	4	Dec. 2014	March 2015
	RS 6	Construction and Contract Administration	21 months on 3 years	March 2015	Oct. 2017
	AS 2	Resident Site Services during Construction			
COMMON 1 to 3	RS 8	Risk Management	Entire duration of the project	March 2013	Oct. 2017
	AS 3	Sustainable Development			
	AS 4	Waste Management			

PD 3 PROJECT BACKGROUND

3.1 Project background

Upon completion of drawings and specifications in 1995-1996, major work, valued at 3.2 M\$, was conducted from 1997 to 1999 by L.M. Sauvé to restore the exterior stone masonry of the Montreal Customs Building (105 McGill Street / 400 place d'Youville). However, in 2000, the lower corner of a granite pilaster, located close to one of the ground floor windows of 400 place d'Youville, broke and fell (these corners are placed approximately 1,5 m above street level). A report was then prepared by Jacques Bellefleur, architectural technician for Public Works and Government Services Canada (PWGSC), followed by some repair work (date unknown). However, other problems seem to have developed rapidly, considering that two reports were successively prepared. A first building envelope condition assessment report was prepared as early as 2005 by the Groupe JLA / Jacques Laberge architecte, as part of the conversion of the existing warehouse spaces into offices, followed by a second report in 2006 by Cardin + Ramirez & associés architects.

After the fall in 2007 of a previously repaired corner of a granite pilaster located below one of the 105 McGill ground floor windows, a third report was prepared in 2007-2008 by Régis Côté et associés architectes to assess the risk for public safety. Following this assessment, urgent repointing work was conducted by the masons of Atwill-Morin. Approaches were then made to initiate a new repair project but the latter came to a halt in 2008, with the completion of an Investment Analysis Report (IAR). No masonry intervention has been performed between 2008 and 2012.

In early September 2011, while an architect from the Heritage Client Service Team (CST) of PSWGSC was assessing the heritage integrity of the building, as part of the preparation of the Building Condition Report (BCR), it was found that some stones had moved, specifically along the avant-corps corners of 105 McGill. Considering the potential risk for public safety, this information was immediately shared with the building owner.

A second visit made on October 27, 2011, by the same architect from the Heritage CST of PWGSC in Quebec City, confirmed that urgent stabilization work was not required before winter, but that the current situation should be closely monitored during the upcoming months to make sure that stones do not move further under frost action. This visit also permitted to conduct a preliminary condition assessment of the masonry, and to confirm that major repair work will be required in the near future to stop current deteriorations, and secure the long term conservation of this heritage building's envelope. This said, to pave the way for the current mandate, a roundup document (see item 4.1 hereafter for complete reference) was prepared to:

- Highlight the main characteristics of the building to better understand the behaviour of its envelope;
- Summarize the file of the previous masonry restoration project;
- Summarize the previous expert reports, advice notes, as well as other documents issued with regards to the masonry condition of the building;
- Present the findings made during the preliminary masonry condition assessment of the building.

3.2 Summary of relevant findings and recommendations

Base on the roundup document mentioned in the previous section, it appears that:

- a. Some repairs made in 1997-1999 do not meet trade practise;
- b. the beneficial effects of this campaign have been much shorter than what is usually offered by interventions of this scope;
- c. Apart from the context of their respective mandates, previous expert reports present relevant findings and assumptions with regards to the condition of the masonry, but none of them offers a comprehensive understanding of the building's behaviour or a complete portrait of the situation;
- d. The main deteriorations observed during the preliminary condition assessment of the masonry performed in the fall of 2011 are the de-bonding and premature deterioration of the mortar joints, the repeated fracture of the lower corners of the pilasters, the erosion of some granite units, the exfoliation of several sandstone units, and the displacement of several stones at the corner avant-corps of 105 McGill and central avant-corps, stabilized, but resolved;
- e. The absence of waterproofed mortar joints currently allows water to infiltrate deep into the wall in several locations and, in the case of the displaced stones, to accumulate inside the cavities between the cladding and the brick backing. Not only contributing to the deterioration of the walls and, eventually, of the building's structure, this water, under freeze-thaw cycles, will continue to displace and destabilize stones, with the risk that fragments fall, injure passersby or damage other parts of the building;
- f. In order to ensure the safety of both occupants and public, to avoid putting at risk the physical integrity of the Montreal Customs Building and, simultaneously its heritage value, major masonry repairs are essential in the near future.

3.3 Historic character of the building

Since 1989, the Montreal Customs Building is a “recognized” building by the Federal Heritage Buildings Review Office (FHBRO), primarily based on:

- Its witness role in the sharp expansion of commercial trading during the first decade of the 20th century;
- Its masterly handled Beaux-Arts architecture (classical vocabulary and tripartite division of the façades : massive base, impressive colonnades, and prominent cornice), which makes an outstanding contribution to the McGill Street perspective, along which substantial prestigious buildings were erected in the early 20th century, in the spirit of the “City Beautiful” movement;
- The grand and theatrical enfilade composed of the exterior stair, the portico, the vestibule, the entrance lobby, and the long room (with its high volume wrapped with a mezzanine and capped with a semicircular skylight);
- The use of noble materials both outside (Canadian granite and sandstone, cast iron lamp posts, grills and cornice), and inside (various marbles, terrazzo, cast iron, detailed plaster mouldings), as well as the high quality of craftsmanship, as shown, among others, in the stone colonnades outside, and in the gorgeous decor of the entrance lobby and the long room inside.

The building is also part of the Montreal historic district (provincial jurisdiction), and of the Old Montreal outstanding heritage value area (municipal jurisdiction).

PD 4 EXISTING DOCUMENTATION

1. Federal Heritage Buildings Review Office (FHBRO)

- Useful link: http://www.pc.gc.ca/progs/beefp-fhbro/index_e.asp

The *Standards and Guidelines for the Conservation of Historic Places in Canada* (second edition) may be downloaded at no charge from this site.

2. Heritage character statement of the Montreal Customs Building

- Useful link: <http://www.historicplaces.ca/en/rep-reg/place-lieu.aspx?id=10647&pid=0>

3. Roundup document

- Godbout, Léïc (March 31, 2012, revised in November 2012). *Montreal Customs Building, 105 McGill Street / 400 place d'Youville, Preliminary condition assessment of the masonry*, Heritage Client Service Team (PWGSC), 81 pages.

This document is available in appendix.

4. Plans and previous expert reports

- A copy of the available plans, previous expert reports and other relevant reference documents will be provided to the proponent's team once the latter will have been selected.

PD 5 PROGRAM

While performing its mandate, the consultant will have to meet, among others, the following requests (see sections "Required Services" (RS) and "Additional Services" (AS) for a more detailed description):

As part of Phase 1:

- Review and analyze all the documentation available;
- Perform a complete survey of the façades using a 3D laser scan to generate precise images on which every stone unit of the building can be identified;
- Perform a thorough inspection to assess in detail the condition of the masonry, as well as the condition of the others components of the building envelope;
- Perform exploratory borings outside to confirm the wall composition and assess in depth the condition of the envelope in locations where elements are currently especially deteriorated;
- Perform exploratory borings inside to compare the evolution of the wall condition with previous borings drilled in 2005;
- Prepare a report including the description and analysis of the deteriorations observed, the complete inventory of repairs to be made, as well as a recommendation with regards to the preferred approach to perform the required work, while respecting the spirit of the *Standards and Guidelines for the Conservation of Historic Places in Canada* (second edition);
- This first phase of the mandate will be executed by a multidisciplinary team conducted by an architect (proponent/key consultant), but also composed of a structural engineer and a mason (sub consultants), all specialized in the condition assessment, repair, and restoration of heritage buildings of traditional masonry.

As part of Phase 2 (only if the project receives all required approvals and adequate funding):

- Prepare final drawings and specifications for tenders for the masonry repairs, based on the approach defined during the first phase of the project;

- This second phase of the mandate will be executed by the architect and structural engineer who were involved in the first phase, as well as with help of any other specialist, as required. However, the mason will not be permitted to participate.

As part of Phase 3 (only if the project receives all required approvals and adequate funding):

- Assist the Department during the tendering process and execution of the work (management of the construction contract), and inspect on a continuous basis the execution of the repairs on the worksite;
- Develop and implement a preventative maintenance program of the building envelope of the Montreal Customs Building;
- This third phase of the mandate will be executed by the architect and structural engineer who were involved in the first phase, as well as with help of any other specialist, as required. However, the mason will not be permitted to participate, apart from performing the actual repairs (if selected through the public call for tenders).

The consultant will have to work in cooperation with the representatives of PWGSC in order to ensure that the anticipated interventions meet the rules, policies, laws and requirements of the Departments involved.

The project manager of PWGSC will act as the authority, and will rely on the Heritage Client Service Team of PWGSC; a multidisciplinary team including architects, engineers and landscape architects specialized in this domain.

PWGSC's project manager will also be helped by the PWGSC's Property and Facilities Manager responsible for the Montreal Customs Building.

PWGSC is responsible for coordinating the environmental management of these projects with the Canadian Environmental Assessment Act (CEAA), the preliminary characterization, and development of mitigation measures to be implemented.

These various specialists will form the project management team. The consultant must integrate the various mitigation measures planned by the stakeholders of PWGSC at every stage of the project (study, drawings and specifications for tenders, construction).

PD 6 PROJECT OBJECTIVES

Intent: an elaboration of the project objectives

6.1 Quality

6.1.1 Design Principles - General

The Department expects the Consultant to maintain a high standard of architectural design, based upon recognized contemporary design/heritage conservation principles. All design elements, planning, architectural, engineering and landscaping, must be fully co-ordinated, and consistent in adherence to good design principles.

The level of quality is to be consistent with other Government of Canada Buildings.

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

Quality of materials and construction methods shall be commensurate with the type of building and the budget. Avoid experimental materials. Take into account the total life-cycling of the building.

Operating costs must be kept to a minimum and reflect the projected operating costs in the cost plan.

6.1.2 Design Principles - Specific

Typical Elements:

- Restoration, renovation of historic structures – federally “recognized” building, located inside the Montreal historic district (provincial jurisdiction), and of the Old Montreal outstanding heritage value area (municipal jurisdiction).

6.2 Sustainable Development

The Canadian Federal Government has begun a series of initiatives to ensure that sustainable development principles are built into the policy of all federal organizations.

Public Works and Government Services Canada (PWGSC) like all federal departments require to have a Sustainable Development Strategy (SDS). Real Property Services Branch of PWGSC has developed their Strategy Plan, that sets out principles, goals and actions for integrating sustainable development principles into its policies and operations. The Branch has established the following sustainable development goals under the issues of management, leadership and operation.

6.3 Waste Management

The Construction, Renovation, and Demolition (CRD) Non-hazardous Solid Waste Management Protocol to which Real Property Services (RPS) is bound, provides directions on the undertaking of non-hazardous solid waste management actions for CRD projects. The protocol is designed to meet the requirements of federal and provincial policies and the objectives of the RPS Sustainable Development Strategy (SDS) as these relate to non-hazardous solid waste generated in CRD projects.

For all Real Property Services projects where the area exceeds 2,000 m², a solid waste management program must be implemented. This requirement exists by regulation in the province of Ontario and by policy for the rest of Canada. For projects where the area is less than 2,000 m², a preliminary waste management evaluation of the economic feasibility of a waste management program must be carried out.

The results from the RPS CR&D waste management pilot projects have been very positive. Based on these results and results obtained from similar projects that have been completed by other organizations, the following can be said:

- Approximately 50% to 95% of the waste generated during CR&D projects can be diverted from landfill through reduction, reuse, and recycling initiatives.
- Approximately 40,000 tonnes of waste are produced for every one billion dollars that is spent on construction projects.
- Contractors and projects managers must plan for extra project time when implementing CR&D waste diversion initiatives. However, added labour hours costs can be recuperated and a savings of up to 30% of the waste management costs (approximately 10% of the total project budget) can be

achieved through reduced tipping fees, avoided haulage costs, and the sale of reusable and recyclable materials.

6.4 Code Compliance

Codes, regulations, by laws and decisions of “authorities having jurisdiction” will be observed. In cases of overlap, the most stringent will apply.

The Consultant shall identify other jurisdictions appropriate to the project.

6.5 Risk Management

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

6.6 Health and Safety

Public Works and Government Services Canada (PWGSC), recognizes the responsibility to ensure the health and safety of all persons on Crown construction projects and the entitlement of both federal employees and private sector workers to the full protection afforded them by occupational health and safety regulations.

In keeping with the responsibility and in order to enhance health and safety protection for all individuals on federal construction sites, PWGSC will voluntarily comply with the applicable provincial/territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.

6.7 Heritage

Considering that:

- The Customs Building was “recognized” in 1989 by the Federal Heritage Buildings Review Office (FHBRO), and it continues to contribute to the prestige of McGill Street, based on its use and history, its size, strategic location, as well as the quality of its architecture and materials.

The masonry repairs project of the Customs Building will have to:

- Respect the characteristics related to the original design of the building;
- Respect the *Standards and Guidelines for the Conservation of Historic Places in Canada* (second edition), good practice of the domain, as well as the recommendations of the authorities having jurisdiction on the Customs Building in this matter.

PD 7 ISSUES

7.1 Major Cost Issues

Effective cost estimating and cost control, from the commencement of project design through to construction completion, is of prime importance and shall be provided by professional quantity surveyors. The class C and Class B cost estimates shall be submitted in elemental cost analysis format.

The class “A” cost estimate shall be submitted in trade cost breakdown format. Cost estimates shall have a summary plus full back-up showing items of work, quantities, unit prices and amounts.

In addition, cost estimates, whatever category, must include the following elements:

- Project Cost Estimate Summary;
- Detailed Cost Estimate, following the elemental cost analysis format or the trade cost breakdown format (depending on category). Present costs of each construction phase separately (if required);
- Estimate Back-Up Detail (basis for escalation, inflation and contingency calculations, description of information obtained and used in the estimate of the most important elements;
- Listing of notable exclusions (if applicable);
- Listing of items/issues carrying significant risk;

As for cost control, it must be regularly checked to provide continuous cost monitoring, timely identification and early warning of all changes that affect or potentially affect the estimated construction costs of the project

Should the estimates fall short of or exceed the Construction Cost Plan, the Consultant team shall fully advise the Departmental Representative, submit to PWGSC proposed alternative design solutions and revise the most recent estimate.

PWGSC will review all aspects of the Cost Specialist's work on a continuing basis to determine the validity and completeness of the information provided. In the event PWGSC 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.

No acceptance or approval by PWGSC, 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.

7.2 Major Time Issues

The control and monitoring of the project schedule are key activities which must be given to experienced and qualified project leaders. The schedule must be presented following an approved method, and it must be regularly updated. PWGSC's project approval stages must also be taken into consideration, and the schedule will have to be revised based on the actual duration of these authorization processes. The same applies with regards to the contribution of every consultant, resource and/or discipline.

7.3 Heritage

The selection of appropriate solutions and quality control of the construction work are key activities which must be given to experienced and qualified consultants. Decisions must be documented and be based upon the spirit of the *Standards and Guidelines for the Conservation of Historic Places in Canada* (second edition).

PD 8 CONSULTANT SERVICES

The consultant team for this project must be capable of providing the following services:

Architecture	structural engineering
time control	waste management
cost control	risk management
sustainable development	masonry
heritage	electrical engineering
3D laser scanning survey	mechanical engineering

DESCRIPTION OF SERVICES

PA 1 PROJECT ADMINISTRATION

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

1.1 PWGSC Project Management

The Project Manager assigned to the project is the Departmental Representative.

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, Public Works and Government Services Canada and the Client Departments.

Public Works and Government Services Canada 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.

1.2 General Project Deliverables

Where deliverables and submissions include summaries, reports, drawings, plans or schedules, five (5) hard copies shall be provided for each document plus three (3) access free copies in .dwg and .pdf format shall be provided on a compact disk or a USB key unless otherwise specified.

1.3 Lines of Communication

Unless otherwise arranged with Project Manager, the Consultant shall communicate with the Project Manager only. There shall be no direct official contact between client departments and the Consultant.

During construction tender call, Public Works and Government Services Canada conducts all correspondence with bidders and makes the contract award.

1.4 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.

1.5 Meetings

The Project Manager shall arrange meetings on a regular basis to be held in Montréal throughout the entire project development period, for all members of project team, including representatives from:

- Public Works and Government Services Canada
- Consultants
- Department(s) occupying the building

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

During phase 1 (Design Development), plan for a minimum of seven (7) meetings;

During phase 2 (Construction Documents), plan for a minimum of five (5) meetings;

During phase 3 (Tender Call and Construction Work), meetings will be held on site (once every two week).

1.6 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 meeting or respond to inquiries within one (1) day.

1.7 Submissions, Reviews and Approvals

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

Heritage Client Service Team (CST) PWGSC

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

Municipal and provincial authorities (MPA)

- Submission Format: based on current municipal and departmental requirements
- Submission Schedule: when completed work has been forwarded to the Project Manager
- Expected Turnaround Time: 2 months
- Number of Submissions: until approval has been received

Regional Investment Management Board (RIMB)

- Submission Format: report, drawings and specifications, oral presentation
- Submission Schedule: when completed work has been forwarded to the Project Manager
- Expected Turnaround Time: 2 months
- Number of Submissions: two (2)

Reviews and Approvals Table By PWGSC		PM/ Heritage CST		MPA		RIMB	
		R	A	R	A	R	A
PHASE 1	RS1 Analysis of Project Requirements						
	<i>Work plan for surveys, inspections and borings</i>	x	x				
	<i>Revised class D estimate</i>	x	x				
	RS2 Design Concept						
	<i>Condition assessment report 50% completed (preliminary)</i>	x	x				
	<i>Class C cost estimate(s)</i>	x	x			x	x
	RS3 Design Development						
	<i>Condition assessment report 90% completed (final)</i>	x	x				
	<i>Condition assessment report 100% completed (final)</i>	x	x	x	x	x	x
	<i>Class B cost estimate(s)</i>	x	x	x	x	x	x
PHASE 2	RS4 Construction Documents						
	<i>Plans and specifications for tender call 75% completed</i>	x	x				
	<i>Plans and specifications for tender call 99% completed</i>	x	x				
	<i>Class A cost estimate(s)</i>	x	x	x	x	x	x
	<i>Final tender call documents</i>	x	x	x	x	x	x

Key

R = Review

A = Approval

1.8 Official Languages

This project requires services in both official languages. Refer to the Supplementary Condition section of this Request for Proposal document entitled “Language Requirements”.

REQUIRED SERVICES

RS 1 ANALYSIS OF PROJECT REQUIREMENTS

Not applicable

To avoid any doubling, the analysis of project requirements has been merged into the required services (RS) 3 - Design Development (see hereafter).

RS 2 DESIGN CONCEPT

Not applicable

To avoid any doubling, the analysis of project requirements has been merged into the required services (RS) 3 - Design Development (see hereafter).

RS 3 DESIGN DEVELOPMENT

3.1 INTENT

Subject: The objective of the following services is – by performing a survey, a detailed inspection, borings, and a thorough analysis – to clarify the condition of the masonry and envelope of the Montreal Customs Building, and then confirm the scope of work and develop an intervention approach.

More specifically, with regards to the objectives usually presented in the section on the analysis of project requirements (required services - RS 1):

- The purpose of this stage is to ensure the consultant has reviewed and integrated all the project requirements, identified and evaluated conflicts or problems, provide alternative strategies, presented and received approval on a Project scope, delivery process, schedule and estimate required to deliver a cohesive quality project. This approved deliverable will become the Project Scope of Services and will be utilized throughout the project to guide the delivery.

More specifically, with regards to the objectives usually presented in the section on the design concept (required services - RS 2):

- To translate the project requirements into space perimeters. To explore a minimum of three intervention approaches and analyze them against priorities and program objectives previously identified. Out of this process, one intervention approach will be recommended to proceed to Design Development

More specifically, with regards to the objectives usually presented in the section on the design development (required services - RS 3):

- To further develop one of the intervention approaches or a combination of the intervention approaches presented at the Design Concept stage. The selected approach will have to be approved by PWGSC prior to design development.

- 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 and such other elements as may be appropriate.

3.2 SCOPE OF SERVICES

3.2.1 *Generalities*

With regards to the generalities usually presented in the section on the analysis of project requirements (required services - RS 1):

- Visit the building/site and verify the availability and capacity of services needed for the project
- Attend project start up meeting
- Analyze the project requirements/program
- Review all available existing material related to the project
- Review the proposed project schedule for verification that all milestone dates are achievable
- Review the cost plan/budget for verification that the costs are realistic and achievable
- Identify and verify all authorities having jurisdiction over the project
- Identify the codes, regulations and standards that apply
- Be attentive to minimize environmental impacts in a manner is consistent with the project objectives and economic constraints
- Review potential for environmental impacts and application of the Canadian Environmental Assessment (CEA) Act

With regards to the generalities usually presented in the section on the design concept (required services - RS 2):

- Present a minimum of three intervention approaches which are viable and have potential for development
- Analyze each solution with regard to the project goals including cost and schedule
- Recommend one option for further development with all supporting background and technical justifications

With regards to the generalities usually presented in the section on the design development (required services - RS 3):

- Obtain written approval from Project Manager for development of one of the proposed intervention approaches
- If any alterations are demanded, document all required changes, analyze the impact on all project components, and resubmit for approval if required
- Expand and clarify the Concept Design intent for each design discipline
- Present the design materials to the client, design review or other committees as indicated by the project manager
- Present the design to the government or local authorities where required
- 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 the consideration with special attention to the impact on tenants
- Continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project
- 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.

Inspections and borings, as much outside as inside, will have to be jointly performed by the project leaders in architecture, structural engineering and masonry, and not by an intern or a technician.

3.2.2 *Analysis of the Available Documentation*

The proponent's team must:

1. Carefully study the following roundup document, and take into consideration its recommendations:
 - Godbout, L  ic (March 31, 2012, revised in November 2102). *Montreal Customs Building, 105 McGill Street / 400 place d'Youville, Preliminary Condition Assessment of the Masonry*, Heritage Client Service Team, PWGSC, 81 pages.

This report constitute the main reference document in the context of the present mandate, and will serve as a comparative benchmark with regards to the quality and thoroughness that are expected from the detailed assessment report that will be prepared by the consultant and sub consultants.

2. Review the official documents that describe the heritage value of the building:
 - MacFarlane, Kate (1988). *Customs House, 105 McGill Street, Montr  al, Quebec*, Architectural History Branch for the Federal Heritage Buildings Review Office, Building Report no 88-179, 26 pages;
 - Federal Heritage Buildings Review Office (1992). *Montreal Customs House, 105 McGill Street*, Heritage Character Statement no 88-179, 2 pages.
3. Examine the original plans, sections and elevations provided in PDF format by PWGSC, and take time to adequately understand how the building was designed and how its envelope behaves. These documents include:
 - Unknown author (purported date: 1912). *Examining Warehouse, Montreal, P.Q.*, plans, p. 1 to 16, and 19 to 28;
 - Ewart, David (June 1912). Montr  al, P.Q., *Examining Warehouse, Specifications*, Chief Architect, Department of Public Works, document no 24041, 39 pages;
 - Fuller, T.W. (August 1934). *Public Building, Montreal, P.Q., Job No 953*, p. 1 to 7, 9 and 10, 12 to 16, 21 to 30, and 32;
4. Examine the drawings and specifications of the masonry restoration project executed in 1997-1999, including:
 - Jean J. K. Boutros architecte (March 1996, drawings for tenders). *  difice des douanes, 400 place d'Youville - 105 McGill, Restauration de la ma  onnerie*, project no 662989, pages A01 to A18;
 - TPSGC (March 1996). *Restauration de la ma  onnerie,   difice f  d  ral, 105 rue McGill et 400 place d'Youville, Montr  al (Qu  bec)*, specifications of project no 662989, call for tenders no 3961-113-1.
5. Analyse the previous expert reports provided in (PDF ?) format by PWGSC, including:
 - Bellefleur, Jacques (August 15, 2000). *105 McGill/400 pl. d'Youville, Montr  al (Qu  bec), Rapport no 1, Bris de pierre de granit au bas des fen  tres du rez-de-chauss  e des deux   difices*, Architecture and Engineering Services Centre of Expertise, PWGSC, 12 pages;
 - Groupe-conseil JLA / Jacques Laberge architecte (May 31, 2005). *  tude de l'enveloppe verticale (rapport d  finitif),   difice f  d  ral des douanes, 400-105 McGill, Montr  al*, 210 pages;
 - Cardin + Ramirez & associ  s architectes (June 9, 2006). *L'enveloppe verticale (compl  ment d'  tude),   difice f  d  ral des douanes, 400-105 McGill, Montr  al*, 32 pages and appendix;
 - R  gis C  t   et associ  s architectes (November 30, 2007). *Rapport pr  liminaire d'inspection de la ma  onnerie,   difice des douanes, 400 place d'Youville - 105 McGill*;

- Régis Côté et associés architectes (April 24, 2008). *Rapport d'inspection complète - État de la maçonnerie, Édifice des douanes, 400 place d'Youville - 105 McGill.*
6. Review the drawings and elevations of the building provided in Autocad format. These documents will be provided for reference only, and will have to be updated following the laser scanning survey (see the following item);

3.2.3 Laser Scanning Survey

The proponent's team must:

1. Submit for approval to the Departmental Representative all relevant information (name, experience in projects of similar type and scope, references) with regards to specialized firms capable of performing such a survey. These firms will have to demonstrate a good understanding of the nature and scope of the mandate, that they have the equipment required, and that they master the software used to translate the data into the expected result;
2. Define the mandate, proceed with call for tenders, and hire a specialized firm to perform a laser scanning survey of the entire building, including the original penthouses on the roof and at the corner of Normand and Marguerite-D'Youville Streets. This survey will have to:
 - a. Provide drawings for every façade of the building, to scale, in Autocad 2D format files;
 - b. Provide images of photographic quality, in black and white, of every façade of the building, in ".jpeg" format. It has to be possible to insert these images into an Autocad file, to scale them, and to annotate them to identify stones and to indicate the scope of work;
 - c. Be precise enough to identify, number and size every stone unit. The texture of the stones, the mortar joints and the ornamental elements must therefore, among others, be clearly visible.
3. Provide every safe means of access (scaffolding, basket, crane or else) required to perform the laser scanning survey, and combine them, as much as possible, with those required for the inspection and borings. In order to get the survey of the portions of the cladding located above the cornices, request the authorization of adjacent owners to perform a portion of the survey from their roof or else;
4. Request from the City of Montreal a permit to occupy the public way. Plan for appropriate delays while preparing the schedule;
5. Coordinate every building inspection activity with PWGSC in order to notify the users, and to be escorted by a commissioner (inside and on the roof, among others). On site, also plan for some co-ordination with SNC-Lavalin O&M;
6. This survey should be performed as soon as possible at the beginning of the mandate in order to have the images in hand during the inspection.

3.2.4 On-site Inspection

The proponent's team must:

1. Perform a complete and thorough inspection in order to assess the condition of the masonry and of the other components of the building envelope. The following list of activities is without limitations, and it is the proponent's responsibility to assess every necessary exterior and interior elements.

- a. Outside the building, this inspection will have to include, without limitations, the following tasks:
- Visually inspect the condition of mortar joints and of every single stone unit to confirm the presence of any defect or deterioration (exfoliation, erosion, cracks, fractures, etc.). This includes, without limitations, elements such as the stone cladding, parapets, cornices, colonnades, lintels, pediments, sculpted elements, access ramp, and stairs;
 - Probe every stone unit using a mason's hammer to detect cavities and/or delamination, especially in the case of stones placed bed out;
 - Perform exploratory borings from outside, at a minimum into the southeast and northwest corner avant-corps of 105 McGill, in order to better understand the causes of the stone cladding displacements, and to assess the condition of the brick backing behind. Also confirm the type of anchors installed behind the plugs, as well as the colour of the original mortar joints
 - Study the role of thermal expansion on the steel structure, especially on the façades exposed to sunlight on the corner avant-corps of 105 McGill, in relation to the fact that cladding stones are piled on a height of seven storeys, without intermediate supports (in order to clarify the displacements observed). Similarly, explore the possibility that stones push on one another, especially on the west façade of the northwest corner avant-corps of 105 McGill;
 - Perform a detailed analysis of the displacements observed along the pillars, and semicircular arches;
 - Explore the possibility that the load of the pillars located between the ground floor and first floor openings is such that it contributes to the fracturing of the lower corners of the pilasters;
 - Photograph each deteriorated stone for which an intervention is required, number the ".jpeg" format file according to the numbering of stones, and file by façade, provide all these photos on a compact disk or a USB key in appendix to the report;
 - Take advantage of the means to access the façades to assess the condition of the doors and windows;
 - Photograph each door and window, number the ".jpeg" format file according to the numbering of doors and windows, and file by façade, provide all these photos on a compact disk or a USB key in appendix to the report;
 - Assess the condition of the roofing, of all parapets, cornices, as well as of their membranes and flashings;
 - Confirm the presence of a coating on the façades, especially inside the courtyard, or that an irregular cleaning of the stones was carried out;
 - Carry a detailed condition assessment of all exterior cast iron elements, such as the grill doors of the portico, the grills protecting the transom above the two entrance doors, the display case between the two entrance doors, the decorative grills on the walls of the portico, the two lampposts framing the entrance of 400 place d'Youville, the grills that protect the basement (the original ones in cast iron and the ones installed more recently in wire mesh) and ground floor windows (except for the grills of the carriage entrance, restored only a few months ago);
 - Assess the condition of any other element in contact with the exterior masonry (curtain wall behind the carriage entrance grills, marquees, signage, ashtrays, lamps, wiring, piping, handrails) and for which the removal and reinstallation could be required during future masonry repair work.
- b. Inside the building, this will have to include, without limitations, the following tasks:
- Assess the severity of the cracks observed in the concrete covering of some of the steel beams and in some floor slabs of 105 McGill, in the portico ceiling of 400 place d'Youville, as well as inside the lean-to that gives access to the underground parking;
 - Visit the building inside to understand its characteristics, with a special attention to the locations where significant deteriorations have been observed outside;

- Trace back the borings made in 2005, reopen them and check what is happening. Assess the presence of air movements inside the cavities located between the exterior wall and the terracotta blocks partition (400 place d'Youville). Check the presence of a water infiltration on the 3rd floor on the façade along Marguerite d'Youville Street, as well as the possibility that a brick course on the interior side of the exterior wall would not be properly supported (105 McGill). Take time to spot check ceiling spaces, and to drill additional exploratory borings if required;
 - Explore the role of ventilation and air conditioning on the pressure maintained inside the building, and check the presence of condensation, infiltrations and specific deteriorations around the windows (without necessarily conducting a new thermographic study);
 - Check how windows are installed, considering that they are apparently stuck between the stone cladding and the interior finish sheathing (insulation and gypsum plasterboards) – not mentioning the dropped ceilings, and could only be removed outwardly in the event of the their future replacement;
 - Assess the condition of the foundations (visible portions in the basement), as well as the presence of infiltrations in the basement.
2. Provide every safe means of access required to perform the inspection, and combine them, as much as possible, with those required for laser scanning survey and borings. The use of a basket and/or a crane is mandatory in order to inspect every element at close range (inspection using binoculars or made from upper floors is insufficient).
 3. Request from the City of Montreal a permit to occupy the public way;
 4. Coordinate every building inspection activity with PWGSC in order to notify the users, and to be escorted by a commissionaire (inside and on the roof, among others). On site, also plan for some co-ordination with SNC-Lavalin O&M;
 5. Systematically record (text, table, sketches, annotated plans and photographs) the findings, and prepare a table presenting a list of every stone unit (to be numbered on the drawings and/or on the images generated from the laser scanning survey), their deteriorations, and the type of repairs required (see deliverables hereafter).

3.2.5 Exterior Exploratory Borings

The proponent's team must, without limitations:

1. Indicate on the elevations the borings (curettage, stripping, removal/reinstallation of stone units or other) required to confirm the composition of the exterior walls and/or to assess in depth the condition of the envelope in locations where elements are displaced or especially deteriorated. Submit this document for approval to the Departmental Representative prior to any boring. At a minimum, remove and reinstall some stones of the southeast and northeast corner avant-corps of 105 McGill, in order to better understand the causes of stone cladding displacement. The objective is to gather as much information as possible in order to define an intervention approach as precise as possible, and to minimize surprises during construction;

2. Indicate on a plan the location of the required exploratory excavations to assess the condition of the masonry below ground level. Submit this document for approval by the departmental representative prior to any excavation. At a minimum, plan for an excavation along the eastern façade of each building (105 McGill and 400 Place d'Youville), the first one inside the Normand courtyard and the second one in the former docking area along Marguerite-D'Youville Street (in order to remain within federal property boundaries);
3. Issue the required instructions to have these exploratory borings and excavations performed by the contractor-mason who is a member of the team.
4. Draw upon the expertise of the contractor-mason as much for analysing the observed deteriorations, as for proposing solutions. This does not, however, relieve the professionals from the obligation of conserving a critical eye, and to carry their on analysis taking the whole situation into consideration;
5. If required, call upon the advice of manufacturers of mortar and masonry restoration products. This does not, however, relieve the professionals from the obligation of conserving a critical eye, and to carry their on analysis taking the whole situation into consideration;
6. Provide every safe means of access (scaffolding, basket, crane or else) required to perform borings, and combine them, as much as possible, with those required for the laser scanning survey and inspection;
7. Request from the City of Montreal a permit to occupy the public way;
8. Coordinate every building inspection activity with PWGSC in order to notify the users. On site, also plan for some co-ordination with SNC-Lavalin O&M;
9. Plan for the on-site presence of the Departmental Representative during the exterior exploratory borings (minimum of two [2] days), in order to observe and discuss with him the condition of the stone cladding and of the envelope components behind the cladding using all access means put in place by the contractor-mason;
10. Systematically record (text, table, sketches, annotated plans and photographs) the type, scope and exact location of every boring finally executed, as well as the findings for each of them.

3.2.6 Interior Exploratory Borings

The proponent's team must, without limitations:

1. Trace back the (8) borings made in 2005 (based on the information provided in the report of Groupe-conseil JLA), reopen them, check what is happening, and document (measurements, drawings and photographs).
2. Assess the presence of air movements inside the cavities located between the exterior wall and the terracotta blocks partition (400 place d'Youville). Check the presence of a water infiltration on the 3rd floor on the façade along Marguerite d'Youville Street, as well as the possibility that a brick course on the interior side of the exterior wall would not be properly supported (105 McGill). Take time to spot check ceiling spaces, and to drill additional exploratory borings if required (plan for at least four (4), 610 x 610 mm). Make good with identical finishes upon completion of the borings.

3. Coordinate every inspection activity inside the building with PWGSC in order to notify the users, and to be escorted by a commissionaire. On site, also plan for some co-ordination with SNC-Lavalin O&M. Consider the fact that these borings will have to be made after the building's occupants normal office hours in order to minimize disturbance.
4. Due to the presence of asbestos traces in the original plaster, follow the procedure and implement the required precautions as defined by PWGSC's environmental services when borings will disturb this material. More precise information with regards to the work procedures to be respected is not yet available, but the "low" risk method is considered for now;
5. Leave borings open during a reasonable period of time, in order to observe and discuss on site the condition of the walls with the Departmental Representative;
6. Systematically record (text, table, sketches, annotated plans and photographs) the type, scope and exact location of every boring finally executed, as well as the findings for each of them.

3.2.7 *Thermographic Study*

It is not required to conduct a new thermographic study in the context of the current mandate.

3.2.8 *Other Tasks*

The proponent's team must make the following verifications:

1. Check with relevant quarries the availability and dimensions of stones that can be cut in Standstead grey granite and Wallace buff sandstone, obtain samples, and confirm prices and delivery times. Explore the possibility of buying stone prior to tenders;
2. Check with specialized providers the possibility of installing and using an elevating work platform on masts, with adjustable outriggers to reach every section of the walls, considering the presence of the cornices and colonnades;
3. Assist the departmental representative during the preparation of the project documents to get the approval of other jurisdictions, i.e. the City of Montreal and the ministère de la Culture et des Communications (MCCQ);
4. Assess the possibility of installing aluminum "butterfly" snow guards on one or more cornices or another more compatible and efficient type of snow guards (previous studies will be provided).

3.2.9 *Preliminary and Final Reports*

The proponent must provide a preliminary report and a final report. The detailed content of these reports is described hereafter in detail at item 3.3. However, the following text summarizes the intent of these two documents.

1. Prepare a preliminary report synthesizing the information gathered during the inspection and survey, and establish a summary of the progression and orientation of the project.

In this first phase, the objective is to identify all deteriorations, as well as all the repairs required, in order to get a complete portrait of the current situation. This also requires identifying all challenges and constraints related to the characteristics of the building, site and occupancy, which could have an

impact on the construction work. The multidisciplinary team will therefore have to work in a flexible and open manner, and avoid taking for granted a given scenario, eliminating potential options, or multiplying scenarios unduly. A minimum of three intervention approaches will have to be presented, justifying the rationale for eliminating other scenarios (it must be possible to understand the process).

The architect, the engineer and the mason shall work in close cooperation, and the report will have to integrate the contribution of each field of expertise.

Interventions approaches will also have to be discussed between the proponent's team and PWGSC, and they will have to be approved by PWGSC before being formally included into the preliminary report.

2. Prepare a final report presenting all the information gathered during the detailed condition assessment of the masonry, and recommend an intervention approach taking into consideration both a comprehensive analysis of this information and other factors influencing the conduct of repair work of this scope (ex.: work spread over time, contractor mobilization cost, disturbance of occupants, blocking the public way, funding available).

Although the various intervention approaches will have to be presented and justified, the objective is to propose one that is realistic and balanced, that takes into consideration the commitment of the department to ensure the long term conservation of the building while including constraints related to the context of the project. To achieve this, a tight coordination will have to be established between the proponent's team and the PWGSC's project manager.

In addition to the required texts, the report will have to correspond to advanced preliminary drawings and specifications (refer to the detailed list of elements to be included at item 3.3 hereafter), meaning final drawings and specifications for tenders at least at 50%. They will thus serve as a precise guide for finalizing the drawings and specifications for tenders. The final report has to be clear and comprehensive enough to avoid being questioned or having to conduct additional tests, which could postpone the finalization of plans and specifications for tenders.

3.3 DELIVERABLES

This section includes deliverables usually described in the required services RS 1 and RS 2, in addition to those required at stage RS 3. Only the final report shall be bilingual, i.e. that the document shall be presented in its original version and translated in the other official language (see also hereafter additional services AS1 - Bilingual Construction Documents). The text and supporting photographs and tables shall be presented in separate documents (one French version and one English version). However, depending on the bulk of information presented on the drawings, the latter may be bilingual.

3.3.1 Work Plan

The consultant shall provide, without limitations, the following deliverables organized in the form of a work plan, no later than six (6) weeks after the contract has been awarded:

- Written identification of the problems, conflicts or other perceived information/clarifying assumptions for the acknowledgment of the project manager;
- A calendar indicating the dates and duration of the surveys, borings (inside and outside), and inspections in order to perform the detailed condition assessment of the masonry;
- For every façade of the building, an elevation showing the location and dimensions of the borings planned into the masonry walls (from outside);

- For every floor of the building, a plan showing the location and dimensions of the borings planned into the masonry walls (from inside);
- Confirmed or revised schedule;
- Revised class “D” cost estimate;
- List of all team members involved.

3.3.2 *Preliminary Report*

The consultant will provide, without limitations, the following documents in the form of a preliminary report (when the detailed condition assessment of the masonry is 50% completed):

a) Text

- A text summarizing, for every element of the building envelope (roofing, flashings, masonry, doors and windows, cast iron elements, other elements attached to the façades, etc.) the main deteriorations observed supported with relevant photographs. The causes of the deterioration shall be identified whenever possible or, at least, the most plausible assumptions shall be presented. Should the cause remain unknown, this should be clearly stated;
- A text summarizing the characteristics of the existing structural system of the building and of its masonry wall composition, by comparing the reference documents with the results of the borings performed both inside and outside;
- A text summarizing the characteristics of the existing exterior lighting system, and assessing both the benefits and disadvantages of taking down and storing the fixtures during construction, and to reinstall them afterwards, or of protecting everything in place;
- A text summarizing the characteristics of the existing ventilation system, and assessing the measures to be implemented to keep dust away from some openings during construction;
- A text summarizing the analysis of the possibility of installing aluminum “butterfly” snow guards or another more compatible and efficient type of snow guards on one or more cornices;
- A text summarizing the main interventions required (preliminary updating of the scope of work based on the findings of the detailed assessment performed on site);
- Taking into consideration environmental protection strategies in developing various intervention approaches, perform the environmental assessment, and prepare the prerequisite examination report on the Canadian Environmental Assessment (CEA) Act (including comments on every proposed concept option);
- A draft of the main recommendations and of the various proposed intervention approaches, as well as a preliminary analysis of these approaches in order to identify an optimum intervention approach;
- A class C cost estimate.

b) Graphic support

- Elevation of every façade of the building, based on the 3D laser scanning survey;
- Plan of every floor showing the location of the existing exterior light fixtures, as well as all other related electrical installations;
- Floor plans (basement and roof with penthouses, among others), showing the location of the main mechanical installations, specifically the air intakes and outlets.

This document shall be submitted to the departmental representative who will review it and provide comments that shall be taken into consideration by the consultant, and integrated in the final report (see hereafter).

3.3.3 *Final report*

Generally, the consultant will provide in the form of a final report (when the detailed condition assessment of the masonry is 90% completed) a more detailed version of the preliminary report previously presented. More specifically, and without limitations, the consultant shall provide the following deliverables:

a) Text

- A summary of the report (executive summary);
- A reminder of the mandate and context of the present project;
- A text presenting the methodology used to prepare the report, the list of the documents consulted, how surveys, inspections and borings were conducted, with dates, names and roles of the team members involved;
- A summary of the analysis of the documentation provided/consulted (without repeating the content of the preliminary condition assessment report prepared by the Heritage HST of PWGSC, the consultants shall demonstrate their understanding of the structure and wall composition of the building, as well as of the behaviour of this assembly);
- A text presenting, for every element of the building envelope (roofing, flashings, masonry, doors and windows, cast iron elements, other elements attached to the façades, etc.) the full spectrum of findings made supported with relevant photographs. The causes of the deterioration shall be identified whenever possible or, at least, the most plausible assumptions shall be presented. Should the cause remain unknown, this should be clearly stated. This text shall also assemble a comprehensive version of the summaries provided in the preliminary report with regards to the existing structural system of the building and of the masonry wall composition (comparing plans and borings), the existing exterior lighting system (remove and reinstall or protect in place), the ventilation system (openings to be protected during construction), and the possibility of installing snow guards on one or more cornices;
- The text shall demonstrate that the findings and recommendations made by the structural engineer and the mason are well understood, and that they have been integrated into the definition of an intervention approach. However, the text of the structural engineer and of the mason (if applicable) shall be presented in full in appendix;
- A text presenting all the interventions required (updating the scope of work based on the findings of the detailed assessment performed on site);
- A text presenting the main conclusions of the detailed masonry condition assessment, as well as recommendations;
- A text presenting a thorough analysis of the various proposed intervention approaches, as well as the recommendation of an optimum intervention approach supported with appropriate justifications;
- A revised schedule, explaining differences, if applicable, with regards to the working calendar originally envisioned;
- A class “B” cost estimate. It shall be possible to distinguish aesthetic interventions from those related to the integrity of the building;
- In an appendix to the report, preliminary specifications, based on the National Master Specifications, including a table of content of the entire document, as well as the following detailed sections:
 - a) Worksite installations (and/or any other relevant section concerning specific building and site constraints);
 - b) All relevant sections concerning masonry repointing work, as well as stone and brick dismantling, repairs (mortars and veneers), replacement and cleaning in historic structures
- In an appendix to the report, the requirements related to commissioning, specifically when reinstalling the light fixtures and wiring;
- A list of the documents to be included into the project archives.

- For every façade of the building, a drawing and/or an image, to scale, resulting from the laser scanning survey, and showing:
 - a. Plate no 1: Stones for which interventions are required. Each stone shall be numbered and clearly identified, for example using a hatching if the information is presented on a drawing (rather than on an image);
 - b. Plate no 2: The type of deterioration altering each stone. The key can for example identify each type of deterioration using a specific colour;
 - c. Plate no 3: Areas where repointing of the mortar joints is essential, for example a light grey hatching if the information is presented on a drawing (rather than on an image).
 These plates shall be presented in A1 or A0 paper format, as well as in electronic version. Drawings shall meet the requirements of the latest PWGSC's Quebec Region CADD (computer-aided design and drafting) standard. The title box template will be provided early in the project;
- Perform the same exercise using a reflected ceiling plan for every portion of the building which is cantilevered or protruding;
- On the same elevations or on clean ones if clearer, number all doors and windows with reference to the table describing the deteriorations observed and the repairs required, previously
- Site plan showing the building and the adjacent existing elements (access, parking, docking area, specific installations and urban furniture around the building, public ways, underground public services, and any other relevant element/information that shall be taken into consideration when installing construction facilities);
- Floor plans including all disciplines, and showing details for any element required to make design decisions and to assess the cost of the project;
- Wall sections and relevant details for any specific intervention (architecture, structure, masonry) which, at this stage, requires an illustration or explanation (ex.: typical interventions, consolidation of the masonry backing).

This document shall be submitted to the departmental representative who will review it and provide comments that shall be taken into consideration by the consultant, and integrated in the final report (100% completed). PWGSC nonetheless expects the proponent's team to perform a thorough quality review of all documents submitted. Documents or portions of documents for which PWGSC will consider the quality to be inadequate will be immediately returned to the proponent, who will have to perform the appropriate corrections and submit the revised documents within 72 hours. This remark applies to ALL deliverables described in the Required Services (RS) and Additional Services (AS) sections.

The presentation of the final report (100% completed) revised to the satisfaction of the departmental representative terminates phase 1 of the project, as previously described in the implementation strategy and calendar.

RS 4 CONSTRUCTION DOCUMENTS

4.1 INTENT

To prepare drawings and specifications setting forth in detail the requirements for the construction and final cost estimate of the project. Construction documents shall be elaborated based on the proponent's final report, described in the previous section (RS3 - Design Development), and which is equivalent to advanced preliminary drawings and specifications (meaning final drawings and specifications for tenders at least at 50%).

- 75% indicates substantial technical development of the project - well advanced 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 pre-permit purposes
- Develop project specific Systems Operations Manual (SOM)
- Final Submission incorporates all revisions required in the 99% version and is intended to provide PWGSC with complete construction documents for tender call.

4.2 GENERAL

Activities are similar at all three stages; completeness of the project development should reflect the stage of a submission.

Scope and Activities:

- Obtain Project Manager's approval for Design Development submissions (75%, 99% and final)
- Confirm format of drawings and specifications
- Clarify, if required, or recall special procedures selected in the final report (i.e. phased construction)
- Submit drawings and specifications at the required stages (75%, 99%)
- Provide written response to all review comments and incorporate them into Construction Documents where required.
- Advise as to the progress of cost estimates and submit updated cost estimates as the project develops
- Update the project schedule
- Prepare a final Class "A" estimate
- Review and approve materials and construction processes specifications to meet sustainable development objectives.

4.3 DETAILS

Scope and Activities:

4.3.1 Technical and Production Meetings

- Production of construction documents will be reviewed during the meetings arranged by Project Manager and Consultant.
- Representatives from Client Department(s) and PWGSC support staff will be present as arranged by the Project Manager.
- Consultant shall ensure that his staff and the sub-consultant representatives attend the technical and production meetings as required.
- Consultant shall arrange for all necessary data, progress prints, etc.
- Consultant shall prepare minutes of the meetings and distribute copies to all participants.

4.3.2 Progress Review

- As work progresses on construction drawings, submit drawings, schedules, details, pertinent design data and updated Cost Plan and Project Schedule as required.
- Specifications and an index of specifications. The specifications shall consist of typed and edited PWGSC amended NMS sections, PWGSC in-house master specs sections and NMS sections.

4.4 DELIVERABLES

Deliverables are similar at all three stages; completeness of the project development should reflect the stage of a submission.

4.4.1 75 % Submission:

- Complete draft of specification and working drawings.

- Draft of technical requirements (reference samples for materials, colors, and others).
- Draft of site information (results of exploratory excavations performed at RS3).
- Draft of support data, studies, calculations, etc., required by PWGSC Engineering disciplines for final checking and record.
- Draft of updated Cost Plan and Project Schedule.

4.4.2 99% Submission:

- Complete specifications and working drawings.
- 99% Commissioning plan and Systems Operations manual
- One copy of the technical requirements (reference samples for materials, colors, and others).
- One copy of site information (results of exploratory excavations performed at RS3).
- One copy of support data, studies, calculations, etc., required by PWGSC Engineering disciplines for final checking and record.
- One copy of updated Cost Plan and Project Schedule

4.4.3 Final Submission:

- This submission incorporates all revisions required by the review of the 99% submission. Provide the following:
 - Complete set of originals of the working drawings.
 - Complete sets of original specifications.
 - Class “A” estimate
 - Complete set of technical requirements (reference samples for materials, colors, and others).
- As a safeguard against loss or damage to the originals, retain a complete set of drawings in reproducible form and one copy of specification.

Submission to PWGSC’s examining committee

- Following 75% and 99% submissions, plan a meeting with PWGSC’s examining committee to discuss comments and orientations.
- Submit and obtain approval from PWGSC’s examining committee on plans and specifications before tender call.

PWGSC expects the proponent’s team to perform a thorough quality review of all documents submitted. Documents or portions of documents for which PWGSC will consider the quality to be inadequate will be immediately returned to the proponent, who will have to perform the appropriate corrections and submit the revised documents within 72 hours.

RS 5 TENDER CALL, BID EVALUATION & CONSTRUCTION CONTRACT AWARD

5.1 INTENT

To obtain and evaluate bids from qualified contractors to construct the project as per the Tender Documents. To award the construction contract according to government regulations, including Federal Rules for Bid Depositories.

5.2 GENERAL

Scope and Activities:

- Attend tenderers briefing meeting(s)
- Prepare addenda based on questions arising in such meetings for issue by the Project Manager

- Provide the Project Manager with all information required by tenderers to fully interpret the Construction Documents. The Project Manager will issue the addenda to all participants.
- Keep full notes of all inquiries during the bidding period and submit same to Project Manager at the end, for PWGSC records.
- Assist in tender evaluation by providing advice on the following:
 1. The completeness of tender documents in all respects.
 2. The technical aspects of the tenders.
 3. The effect of alternatives and qualifications which may have been included in the tender.
 4. The tenderers capability to undertake the full scope of work.
 5. The availability of adequate equipment to carry out the work.
- If PWGSC decides to re-tender the project, provide advice and assistance to the Project Manager
- Revise and amend, at your cost, the construction documents to bring the cost of the work within the limits stipulated
- Examine and report on any cost and schedule impact created by the issue of tender / contract addenda

5.3 DELIVERABLES

- Originals of drawings and specifications
- Electronic copies of drawings and specifications
- Addenda where needed
- Changes to the documents, if re-tendering is necessary
- Updated cost estimate or schedule

RS 6 CONSTRUCTION AND CONTRACT ADMINISTRATION

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 GENERAL

Scope and Activities:

- During the implementation of the project, act on PWGSC'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 PWGSC 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
- Determine the amounts owing to the Contractor based on the progress of the work and certify payments to the contractor
- Act as interpreter of the requirements of the Contract Documents
- Provide cost advice during construction
- Advise the Project Manager of 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 Department Representative
- Indicate any changes or material/equipment substitutions on Record Documents
- During the twelve (12) month warranty period, investigate all defects and alleged defects and issue instructions to the Contractor
- Conduct a final warranty review

- PWGSC will provide the proponent and the contractor with the required official forms templates.

6.3 DETAILS

Scope and Activities:

6.3.1 Construction Meetings

- Immediately after contract award, arrange 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 Project Manager.
- Call job meetings as frequently as required (one meeting minimum every two weeks), commencing with the construction briefing meeting. In addition to PWGSC's project manager, the meetings should include the general contractor's superintendent, the proponent's project leader, the proponent's resident site representatives, main sub-subcontractors, affected sub-consultants and Supply Operations Service representatives as required. Prepare minutes of the meeting and distribute copies to all participants. The Project Manager may invite client Departments to attend any of these meetings.

6.3.2 Project Schedule

- Obtain Project Schedule as soon as possible after contract award and ensure proper distribution.
- Review the scope of work and the Contractor's approach to construction operations, and review the information for adequacy and accuracy by comparing it to the Construction Schedule developed by the Consultant prior to Contract Award. The Consultant will formally report his findings and recommendations to the Departmental Representative.
- Monitor the approved construction schedule, take necessary steps to ensure that the schedule is maintained 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.

6.3.3 Time Extensions

- Only the Departmental Representative may approve any request for Time Extensions. Approval will be issued in writing by the Project Manager.

6.3.4 Cost Breakdown

- Obtain from the Contractor a detailed cost breakdown and submit to the Departmental representative ten (10) days at the latest following construction contract award. This detailed cost breakdown will be the same used with the first payment claim, as well as all the following payment claims.

6.3.5 Sub-contractor Changes

- The Contractor is required to use the sub-contractors listed on the tender form unless a change is authorized by the Departmental Representative. Changes are only considered when they involve no increase in cost. Review all requests for changes of sub-contractors, and submit recommendations to the Project Manager.
- When sub-contractors have not been listed on the Tender Form, obtain the list from Contractors not later than 10 working days after date of award.

6.3.6 Labour Requirements

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

- The Consultant shall ensure that a copy of the Labour Conditions for the Contract is posted in a conspicuous place on site.

6.3.7 Bylaw Compliance

- Ensure that construction complies with applicable bylaws and regulations.
- Matters pertaining to the Department of Human Resources and Skills Development Canada shall be referred to the Departmental Representative.

6.3.8 Construction Safety

- All construction projects that are occupied by federal employees during construction are subject to the Canada Occupational Health and Safety Regulations as administered by Human Resources and Skills Development Canada.
- Fire safety provisions during construction must comply with FCC Standards 301 and 302, administered by the Fire Commissioner of Canada.
- 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 (refer to relevant sections in the specifications, and especially to the health and safety clauses specific to PWGSC's Quebec Region).
- Ensure the Contractor is mandated to provide all required coordination, isolation, protection and reinstatement of the fire protection and suppression systems throughout construction. Notify the Property Manager each time the fire protection and suppression systems are bypassed and advise of estimated reinstatement time. Ensure the Contractor is mandate to provide Watchman Service as defined in FC 301 and by the Fire Commissioner

6.3.9 Site Visits

- Provide construction inspection services other than those covered by the site resident representatives. Ensure compliance with 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 covered up.
- Assess quality of work and identify in writing to the Contractor and to the Departmental Representative all defects and deficiencies observed at time of such inspections.
- Inspect materials and prefabricated assemblies and components at their source or assembly plant, as necessary for the progress of the project.
- Any directions, clarifications or deficiency list shall be issued in writing to PWGSC.

6.3.10 Clarifications

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

6.3.11 Progress Reports

- Report to the Departmental Representative regularly on the progress of the work. Submit weekly reports. These reports shall be clear and concise, presented in a 8 ½"x 11" format, and illustrated with photographs when relevant. They must provide an overview of the main activities performed during the week by the general contractor and subcontractors, clearly present any issue or problem raised during construction work, as well as modifications and/or solutions planned and/or implemented, and their impact on the quality of the work, and on the project's schedule and cost.

6.3.12 Work Measurement

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

6.3.13 Detail Drawings

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

6.3.14 Shop Drawings and technical data sheets

- During the project, all shop drawings and technical data sheets can be circulated in electronic format (PDF).
- On completion of project forward three paper copies and one electronic PDF version of reviewed shop drawings and technical data sheets to the Departmental Representative. Ensure that shop drawings include the project number and are recorded in sequence.
- Verify the number of copies of shop drawings and technical data sheets required. Consider additional copies for Client's departmental review.
- Shop drawings and technical data sheets 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 and technical data sheets.

6.3.15 Inspection and Testing

- If required, the Consultant shall obtain various inspection and testing services from specialized firms.
- Prior to tender, provide Departmental Representative with recommended list of tests to be undertaken, including on site and factory testing
- When contract is awarded, assist Departmental Representative in briefing testing firm on required services, distribution of reports, communication lines, etc.
- Review all test reports and take necessary action with Contractor when work fails to comply with contract.
- Immediately notify Project Manager 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.

6.3.16 Training

- If required, the Consultant shall obtain various training services from specialized firms.
- Prior to tender, provide Departmental Representative with recommended list of training to be undertaken

6.3.17 Construction Changes

- The Consultant does not have authority to change the work or the price of the Contract.
- All changes which affect cost or design concept must be approved by the Departmental Representative.
- Upon Departmental Representative approval obtain, through a contemplated change notice, detailed quotations from the Contractor. Review prices and forward promptly recommendations to the Departmental Representative.
- The Departmental Representative will issue Change Orders to the Contractor, confirming the approval of the detailed quotation, with copy to Consultant.
- All changes, including those not affecting the cost of the project, will be covered by Change Orders.
- The practice of "trade offs" is not allowed.

6.3.18 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 for processing.

6.3.19 Materials On Site

- The Contractor may claim for payment of material on site but not incorporated in work.
- Material must be stored in a secure place designated by the Departmental Representative.
- Detailed list of materials with supplier's invoice showing price of each item must accompany claim; Consultant shall check and verify the list.
- Items shall be listed separately on the Detail Sheet after the break-down list and total.
- As material is incorporated in the work the cost must be added to the appropriate Detail item and removed from the material list.

6.3.20 Acceptance Board

- Inform the Departmental Representative when satisfied that the project is substantially completed. The Consultant shall ensure that his representative, his sub-consultant representative, his resident site representatives, Contractor and major sub-trades representatives shall form part of the Project Acceptance Board and attend all meetings as organized by the Departmental Representative.

6.3.21 Inspection at substantial completion of the work

- The 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.

6.3.22 Certificates of substantial performance

- Payment requires completion and signing, by the parties concerned, of the following documents:
 1. Certificate of substantial performance
 2. Cost Breakdown for Fixed Price Contract
 3. Cost Breakdown for Unit or Combined Price Contract
 4. Inspection and Acceptance
 5. Statutory Declaration - Certificate of substantial performance
 6. Certificate from the Commission de la santé et de la sécurité du travail (CSST).
- Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Departmental Representative for processing.

6.3.23 Building Occupation

- The Department or Client Department may occupy the building after the date of substantial performance as indicated by the Acceptance Board. The acceptance date is normally that of the Certificate of substantial performance issued to the Contractor. As of the acceptance date, the Contractor may cancel the Contract Insurance, and the Departmental Representative or Client Department (as the case may be) assumes responsibility for:
 - Security of the work(s).
 - General maintenance and cleaning of the work(s).
 - Maintenance of the site. (Except any landscaping maintenance covered by the contract.)

6.3.24 Operation and Maintenance Data Manual

- Not applicable.

6.3.25 Instruction of Operating Personnel

- Not applicable.

6.3.26 Keys

- Not applicable.

6.3.27 Inspection at completion of the work

- Inform the Departmental Representative when satisfied that all work under the contract has been completed, including the deficiency items. Inspection and Acceptance as a result of the Inspection at substantial completion of the work. The Departmental Representative reconvenes the Acceptance Board which makes a final inspection of the project. If everything is satisfactory the Board makes final acceptance of the project from the Contractor.

6.3.28 Certificate of completion

- The final payment requires completion and signing, by the parties concerned, of the following documents:
 1. Certificate of Completion
 2. Cost Breakdown for Fixed Price Contract
 3. Inspection and Acceptance
 4. Statutory Declaration Certificate of Completion
 5. Cost Breakdown for Unit and/or Combined Price Contract
 6. Compensation Clearance Certificate from the Commission de la santé et de la sécurité du travail (CSST)
 7. Hydro Certificate
- Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Departmental Representative for processing.

6.3.29 Take-over

- The official take-over of the project, or parts of the project, from the Contractor is established by the PWGSC Project Team which includes the Consultant and the Client Department. The date of the Certificate of substantial performance and the 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 Departmental Representative with 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.

6.3.30 As-Built and Record Drawings and Specifications

- Following the take-over, obtain as-built marked-up hard copy from the Contractor:
 - Show significant deviations in construction from the original Contract drawings, including changes shown on Post-Contract Drawings, changes resulting from Change Orders or from On Site Instructions.
- Check and verify all as-built records for completeness and accuracy and submit to PWGSC.
- Produce Record Drawings by incorporating As-Built information into project drawings.
- Submit Record Drawings and Specifications in number and format required by the Consultant Agreement within [8] weeks of final completion.
- Provide a complete set of final shop drawings.

6.4 DELIVERABLES

- Written reports from site visits including persons involved
- Written reports on the progress of the work and the cost of the project at the end of each month
- Additional detail drawings when required to clarify, interpret or supplement the Construction Documents
- Post contract drawings
- Certificate of substantial performance and the Certificate of Completion, as well as the related list of work and corrections to be completed.
- As built records
- Warranty deficiency list
- Report on Final Warranty Review

RS 7 COMMISSIONING THE FACILITY

Not applicable.

RS 8 RISK MANAGEMENT

The consultant is to provide support to the Project Manager in identifying risks throughout the project life cycle.

See “Doing Business with A&ES” for Risk Management “Definitions” and “Checklist”.

Risk Management Process:

- Identify risk events based on past experience and using proposed checklist or other available lists;
- Qualify/quantify probability of risk event (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. This is the real added-value of risk management); and,
- Implement risk mitigation.

ADDITIONAL SERVICES

AS 1 BILINGUAL CONSTRUCTION DOCUMENTS

Construction Documents in both official languages as required.

Bilingual Requirements:

- The Consultant shall prepare the final version of the masonry condition assessment report, as requested in Required Services (RS) 3 - Design Development, in both official languages of Canada, because this document will be provided as reference during tender call for construction;
- The Consultant shall prepare all construction documents in Canada's two official languages.
- The languages are considered equal in status; neither is considered to be a translation of the other.
- The Consultant shall be responsible for the accuracy and completeness of translations and the consistency of documents.
- It is standard practice to produce a single set of drawings (originals) on which written information is shown in both languages and separate written documents for each language for tendering, records drawings, operating and maintenance documentation.

AS 2 RESIDENT SITE SERVICES DURING CONSTRUCTION

2.1 Description of Services

The purpose of the Resident Site services is to ensure the presence the Consultant's full-time representative on site to inspect, co-ordinate and monitor all aspects of the work during the construction of the facility, and liaise with the contractor, Public Works and Government Services Canada and other agencies as appropriate to the work. More than one person may be required to suit the hours of construction.

The Consultant Resident Site representative is responsible for providing full time (including overtime) resident inspection for all aspects of the project, maintaining daily records of all construction work placed. He is to ensure constant communication amongst PWGSC's Project Manager, the consultant's project leader, the key sub-consultant's project leader, the resident site representative of the key sub-consultant, the Property manager designated by PWGSC (if applicable), Contractor, and sub-trades.

The Consultant Resident Site representative shall be directly responsible to the Consultant.

The Consultant Resident Site representative shall become thoroughly familiar with the Contract documents, the National Building code and all Fire Commissioner of Canada Standards for Construction operations (incl. FCC No. 301 dated June 1982 and the Standard for Welding and Cutting FCC No. 302 dated June 1982). He shall also be aware of all Provincial and Municipal standards for the health and safety of construction workers.

The Consultant Resident Site representative shall become thoroughly familiar with the requirements of the Consultant Project Brief and project responsibilities of others which relate to his services.

More specifically, site supervision by the proponent's team must, at a minimum, take the following form:

- Continuous presence on site (100% of the time) of a senior architectural technician or of an intermediate architect, who will act as the resident site representative in architecture, but who will also be responsible for the global supervision of the site work (representative of the proponent/prime consultant);
- Regular presence on site (minimum once [1] a week or as needed) of a senior technician in structural engineering or of an intermediate structural engineer, who will act as the resident site representative in structural engineering. During intensive work periods concerning the structure of the building or having a direct impact on the structural stability of the massive masonry work, this presence shall be continuous (100% of the time);
- Occasional presence on site of technical support (architecture and engineering), to assist the site supervision team (measuring, surveys, etc.);
- Occasional presence on site (minimum once [1] a week) of a senior architect (project leader) and of a senior structural engineer (key-sub-consultant), who will act as technical advisors (these services are already included in the previous section RS6).

2.2 Specific Duties and Responsibilities

Provide full time resident inspection, co-ordination and monitoring during the construction work and be responsible to the consultant. In addition, the departmental representative may delegate additional responsibilities subject to consultants agreement.

Maintain daily records of all construction work placed and ensure constant communication amongst PWGSC's Project Manager, the consultant's project leader, the key sub-consultant's project leader, the resident site representative of the key sub-consultant, the Property manager designated by PWGSC (if applicable), Contractor, and sub-trades

Considering the potential impacts on the project's costs and schedule, any request from the Property manager designated by PWGSC or directly from the occupants shall be treated politely, but with all the appropriate precautions and with the approval of PWGSC's Project Manager.

Co-ordinate and direct an assistant as approved by PWGSC, if required.

In case of emergencies, the Consultant Resident Site representative is empowered to stop the work, or give orders to protect the safety of the workers or Crown property. He must then immediately notify the Departmental Representative.

2.3 Inspection and Reporting

The Consultant Resident Site representative shall inspect all phases of the work in progress, for the purpose of bringing to the attention of the Contractor, after checking with the Consultant, and Departmental Representative any discrepancies between the work, the contract documents and accepted construction procedures. He shall keep a daily log of such inspections and shall issue a weekly written report to the Consultant, both for distribution, in the form directed. The Resident Site representative shall make any other reports or surveys as may be requested by the Project Manager through the Consultant.

2.4 Interpretation of the Contract Documents

Interpretation of the contract documents shall be the responsibility of the Consultant. The Consultant may, however, have the Resident Site representative provide him with information regarding job conditions and may require him to relay day-to-day instructions to the contractor.

It shall be the duty of the Resident Site representative to assist the Consultant and further inform the Consultant of any anticipated problems which may delay the progress of the work. The method of relaying such information shall be determined by the Consultant.

2.5 Changes in the Work

The Resident Site representative shall not authorize or order any change in the work which will constitute a change in design or in the value of the contract except as delegated by the Departmental Representative.

The Consultant may call upon the Resident Site representative to assist in the evaluation of changes in the work, where a knowledge of job conditions is required.

2.6 Communication & Liaison

The Resident Site representative shall:

1. Convey the Consultant's instructions regarding the required standards of workmanship to the Contractor(s);
2. Specifications, confer and obtain guidance on these findings with the Consultant. The matter is then to be brought to the attention of the Contractor's Superintendent. Although informal discussions with Sub-trade Superintendents are usually permissible, (but only with the agreement of the Contractor), the Resident Site representative should not deal directly with foreman or tradesmen, or interfere with the progress of the work.
3. Communicate formally with the contractor via memorandum form only. When this form is issued the Resident Site representative must immediately file copies with PWGSC and the Consultant.
4. Contact the Consultant immediately when it is apparent that information or action is required of the Consultant, e.g. general instructions, clarifications, sample of shop drawing approvals, requisitions, contemplated change orders, site instructions, details, drawings, etc.
5. Accompany PWGSC representatives on inspections and report to the Consultant requirements, comments or instructions of the PWGSC's forces. Note that the Resident Site representative should encourage such requirements, comments or instructions to be provided to him in writing.
6. Consider and evaluate any suggestions or modifications to the documents advanced by the Contractor and immediately report these to the Consultant with comments.
7. Ensure that PWGSC and the Consultant are notified promptly when key pieces and/or components of materials and equipment are delivered, so that these parties can arrange for the appropriate personnel to have an opportunity to inspect same prior to installation.

The Resident Site representative will investigate, schedule and approve in writing, all temporary or permanent connections into any of the buildings' systems prior to the work being done. He shall provide advanced forecasts and advise the Departmental Representative of any interruption of normal building services with a minimum 24 hours notice prior to the work being undertaken, where this work cannot be done during the silent hours.

2.7 Daily Log

The Resident Site representative shall keep a daily log recording:

1. Weather conditions, particularly unusual weather relative to construction activities in progress;
2. Major material and equipment deliveries;
3. Daily activities and major work done;
4. Start, stop or completion of activities;
5. Presence of inspection and testing firms, tests taken, results, etc;
6. Unusual site conditions experienced;
7. Significant developments, remarks, etc;
8. Special visitors on site;
9. Authorities given contractor to undertake certain or hazardous works
10. Environmental incident
11. Reports, instructions from Appropriate Authorities Response Actions.

Note: The log is the personal property of the Resident Site representative. Copies of the log book, certified as copies, are to be provided to PWGSC and consultant at the end of the project.

2.8 Weekly Records

The Resident Site representative shall prepare weekly reports for the Consultant in the form directed:

1. Progress relative to schedule;
2. Major activities commencing or completed during the week; main activities now in progress;
3. Major deliveries of materials and/or equipment;
4. Difficulties which may cause delays in completion;
5. Materials and labour needed immediately;
6. Cost estimates of work completed and materials delivered (cost plus contracts);
7. Outstanding information or action required by Consultant or PWGSC;
8. Work force;
9. Weather;
10. Remarks;
11. Accidents on site;
12. Life safety or building hazards caused by the work, the contractor or his agents.

2.9 Site Records

The Resident Site representative shall maintain orderly and updated files at the site for the use of the PWGSC, Consultant and himself as follows:

1. Contract and Tender Documents.
2. Approved Shop Drawings.
3. Approved Samples.
4. Samples.
5. Site Instructions.
6. Contemplated Change Orders.
7. Change Orders.
8. Memoranda.
9. Test and Deficiency Reports.
10. Correspondence and Minutes of Meeting.
11. Names, addresses, telephone numbers of Client representatives, Consultant and all Contractors, sub-trades key personnel associated with the contract; including home telephone numbers in case of emergencies.

In addition, the Resident Site representative shall maintain an updated progress schedule.

A reproduction of the original contract drawings shall be carefully preserved and shall be kept marked up to date with all addenda, change orders, site instructions, details, as-built conditions, etc., issued subsequent to the award of the contract.

2.10 Inspection of the Work

The Resident Site representative shall make on site observations and spot checks of the work to determine whether the work, materials and equipment conform with the contract documents and supplementary conditions. The Site consultant's representative shall advise the Contractor of any deficiencies or unapproved deviations via memorandum and report immediately to the Consultant and PWGSC Departmental Representative any of these on which the Contractor is tardy or refuses to correct.

The Resident Site representative shall arrange for the Consultant's architectural, structural, mechanical, electrical and other consultants to make the periodic inspections required by the Consultant's contract, and for these inspections to be made timely with respect to the progress of the work.

The Resident Site representative shall also report if materials and equipment are being incorporated into the project prior to approval of relative shop drawings or samples.

The Resident Site representative shall assist in the preparation of all deficiency reports, interim, preliminary, and final, in collaboration with the PWGSC and Consultant's representatives.

The Resident Site representative shall be responsible for the measurement of all work to be done on a unit-cost basis.

2.11 Site Meetings

The Resident Site representative shall attend all job-site meetings.

2.12 Inspection and Testing

The Resident Site representative must see that the tests and inspections required by the contract documents are conducted, and should observe these tests and report the results in the daily log.

The Consultant should be notified if the test results do not meet the specified requirements, or if the Contractor does not have tests undertaken as required.

2.13 Emergencies

In the case of emergency where safety of persons or property is concerned, or work is endangered by the actions of the contractor or the elements, to safeguard the interests of PWGSC, the Resident Site representative shall stop the work, if required, or give orders for remedial work. He shall also immediately send a written notice to the Contractor of the possible hazard, and contact both the consultant's project leader and PWGSC's Project manager.

2.14 Limitations

The Resident Site representative shall not:

1. Authorize deviations from the contract documents.
2. Conduct tests.
3. Approve shop drawings or samples.
4. Advise the user-client in any matter without obtaining guidance from the Consultant.
5. Accept any work or portions of the building.
6. Enter into the area of responsibility of the Contractor's Field Superintendent.
7. Stop the work unless convinced that an emergency exists as noted above.

2.15 Hazardous Construction Operations

The Contractor shall under no circumstances undertake hazardous operations. Should some operation present a potential hazard, the Contractor shall implement all necessary precautions and acts to safeguard the life safety of the workers and building occupants, as well as the Crown property. Any infractions may result in the Resident Site representative stopping the work.

2.16 Building Security

Special precautions must be taken at all times to prevent unauthorized entry of the building. The Resident Site representative is to ensure that all contractor-made openings and means of access, are firmly secured when the contractor leaves the site.

The Resident Site representative will liaise closely with the Consultant and PWGSC Departmental Representative on all security and/or safety problems that may arise due to the contractor's operations.

AS 3 SUSTAINABLE DEVELOPMENT

Sustainable Development and the Role of Government

Since 1987, the Canadian Federal Government has begun a series of initiatives to ensure that sustainable development principles are built into the policy of all federal organizations. By December 1997, all federal government departments are required to have a *Sustainable Development Strategy* (SDS). Department Ministers are required to update their SDS every three years and to report annually on progress towards sustainable development.

Public Works and Government Services Canada (PWGSC)

On 2 April 1996, the department's Business Board approved a general approach and guiding principles for the development and implementation of the PWGSC Sustainable Development Strategy.

Real Property Services (RPS), a branch of PWGSC, has developed their strategy and is in the process of developing regional action plans. It is a strategy that sets out principles, goals and actions for integrating sustainable development principles into its policies and operations. The following principles and goals are from the Real Property Services Sustainable Development Strategy.

Real Property Services Principles

1. To sustain our natural resources, by ensuring sustainable use of renewable resources and efficient use of non renewable resources.
2. To protect the health of Canadians and of ecosystems, by managing the risks associated with toxic substances, by protecting representative areas, and by developing effective warning and adaptive response capability to both natural and human-caused disasters.
3. To meet our international obligations, by contributing to the protection of the ozone layer, the reduction of greenhouse gas emissions, and the conservation of biodiversity.
4. To improve our quality of life and well-being, by fostering improved productivity through environment efficiency, and by supporting innovation towards sustainable development..

Real Property Services Goals

Considering the above within the context of RPS's mandate, the Branch has established the following Sustainable Development Goals under the issues of management, leadership and operations:

1. RPS will integrate a comprehensive environment management system into its overall management framework to demonstrate due diligence, and to ensure that environmental performance is achieved and sustained according to established objectives.
2. RPS Will continue to provide environmental leadership, through:
 - a) Research, development, and transfer of cost-effective and timely means of meeting environmental requirements, and of achieving RPS sustainable development goals and clients objective; and
 - b) Communication of knowledge to promote sustainable development.
3. RPS will reiterate its priority to meet or exceed applicable environmental statutes, regulations, and policies; and pursue a pollution prevention approach in all aspects of its operations. In support of the above, RPS will continue the development and implementation of best practices placing a special focus on the following operational issues:
 1. Toxic or hazardous substances and waste management
 2. Ozone depleting substances management
 3. Non-hazardous solid waste reduction
 4. Energy and water efficiency in facilities
 5. Contaminated sites management
 6. Land and marine / fresh water activities management
 7. Environmental activities

Real Property Operational Goals

Goal 3.1: Toxic or Hazardous Substance and Waste Management

Real Property Services (RPS) will continue to the prevention, reduction and, where possible, the elimination of impacts of toxic or hazardous substances and wastes on human health.

Design consequences

- Handling of Polychlorinated Biphenyls (PCBs) when replacing electric lighting installations;
- Specification of environmentally sound building materials
- Specification of low maintenance systems and finishes;

Goal 3.2: Ozone Depleting Substances Management

RPS will phase out the use of ODSs to respond to the deadlines laid out in the 1987 “Montréal Protocol on Ozone Depleting Substances” and its subsequent amendments:

Design consequences

- Reduction or elimination of ozone depleting substances.

Goal 3.3: Non-Hazardous Solid Waste Reduction

RPS will:

- Facilitate the reduction of construction, renovation and demolition waste.

Design consequences:

- Specification of renewable, recycled content, durable and maintainable materials;
- Conscious design and construction planning to minimize construction and demolition waste.

Goal 3.4: Energy and Water Efficiency in Facilities

RPS will:

- Contribute to the use and promotion of more efficient, environmentally friendly alternative sources of energy to heat, cool, ventilate and provide lighting and power facilities. It will also promote the efficient use of water.
- Reduce gas emissions to respond to Canada’s Kyoto Convention commitments.

Design consequences:

- Improve building energy efficiency;
- Higher energy performance standards, use of clean; renewable energy sources;
- Specification of low embodied energy (total energy used in growing, extracting, manufacturing, and transport of a product) building materials;
- Use of low water consumption appliances and water efficient landscaping strategies.

Goal 3.5: Contaminated Sites Management

RPS will contribute to the prevention, reduction and, where possible, the elimination of negative impacts of contaminated sites on humans and the environment.

Goal 3.6: Land and Marine / Fresh Water Activities Management

RPS will contribute to the prevention, reduction and, where possible, the elimination of negative impacts on humans and the environment in their land and marine / fresh water activities.

Design consequences:

- Greater understanding about implications of building construction and operation of site;
- Construction practices which reduce environmental impact and construction waste.

Goal 3.7: Environmental Management

RPS will complete and implement an Environmental Management System (EMS) that will:

- Support the integration of environmental issues into the RPS management framework;
- Facilitate the harmonization of environmental issues with RPS clients and tenants.

Design consequences:

- Greater coordination of design team and communication among all parties;
- Improved metering and reporting to facilitate the auditing and reporting process;
- Comprehensive, reliable and visible environmental strategies.

Approach

- The approach of this environmental component is to view the built environment and the natural environment as integral and interdependent. It is an attempt to address building and environmental concerns in a holistic manner.
- Within this context, the role of management in the development process takes on special significance. Like the natural environment, a facility is more than the sum of its parts. It is a system. A facility can boast many ‘green’ features, but unless there is an overall vision and skilled people to carry out the plan, it falls short. An “environmental vision” and team approach is crucial to sustainable building. This approach involves team members educated in green building practices and open lines of communication between team members. The role of management in the three stages of building, (design, construction and operations) is crucial in establishing a vision statement that embraces sustainable principles and an integrated building approach. The management of the project activities, ensures that team members use a multidisciplinary approach in which the interrelated impacts of design, systems and materials are recognized.

- The environmental component of the project brief works under the premise that many of the solutions to sustainability in development can be achieved with a low-tech approach. Through careful orientation of a building with respect to sun, wind and land and special consideration of materials, sustainable development is possible.
- Although it is understood that there are specific environmental problems that need special attention (such as ozone depletion), this document is an attempt to change attitudes as well as address specific environmental problems. It does not take a “damage control” attitude, but rather a “pollution prevention” approach. It is primarily organized around seven environmental issues. These issues are: management, air, water, land, material, energy and waste. It is also a means of addressing the RPS sustainable development goals in relation to the project brief organization of Design Submission, Working Document Submission (at 75% and 99% stages) and the Contract Supervision.
- This document is in a checklist format, which allows the consultant to systematically address each issue. The consultant should respond to the following checklist points in an environmental strategy in a written or graphic form.
- Finally this document approaches environmental sustainability with a “best-effort” approach. At a minimum, Public Works and Government Services Canada will attempt to accommodate all federal clients in facilities that are as ‘green’ as can be.

ISSUE: PROJECT MANAGEMENT

- GOAL**
- Greater coordination of design team and communication among all parties.
 - Improved metering and reporting to facilitate the auditing and reporting process.
 - Comprehensive, reliable and visible environmental strategies.
 - The role of management in the building process takes on special significance. An “environmental vision” and team approach is crucial to sustainable building. This involves team members educated in green building practices and open lines of communications between team members. The management of the project activities ensures that team members use a multidisciplinary approach in which the interrelated impacts of design, system and materials are recognized.
 - The checklist is management tool which allows each point to be address in the environmental strategy.

CONCEPT AND DESIGNS SUBMISSIONS

- Include in the Project Team an Environmental Coordinator. Note: This could be a sub-consultant or be the dual responsibility of another team member. Include documentation of the environmental project coordinator’s qualifications.
- Identify the potential opportunities (green technologies), implementation strategies practices or procedures, for making cost-effective environmental contributions in the realm of office space provision or its use.

- Determine the cost effective means of implementing these potential opportunities when concerning base building, lease fit-up, operations or maintenance.
- Respecting the lines of communication protocol, the consultant is to meet with the PWGSC Environmental Project Team Member.
 - To establish whether or not environmental aspects of the design will be coordinated through an environmental sub-consultant to the Consultant;
 - To review the requirements for the environmental component of the concept design;
 - To present for review the environmental component of the concept design.
- The submission requirement for the environmental component of the concept design include an environmental strategy consisting of:
 - An indication of the primary opportunities which the project represents for environmental conservation.
 - An indication of the primary areas where effort will be expended to achieve environmental conservation.
 - An indication of the macro decisions which have been made with respect to environmental conservation.
 - An indication of the alternatives to those macro decisions which have been considered and rejected, including why they were rejected.
 - This submission will be presented to the design review committee as part of a total concept submission.
- Obtain formal approval from PWGSC for the environmental component of the concept and design submission.

WORKING DOCUMENT SUBMISSIONS

- Respecting the lines of communication protocol, the Consultant is to meet with Environmental Project Team Member:
 - To present for review and approval the environment component of the working documents at the 75% and 99% stages;
- Incorporate NMS sections with most recent environmental updates.
- The contractor is to provide a consultant with an environmental protection plan

CONTRACT SUPERVISION

- The Environmental Coordinator will table progress of the Environmental Strategy as a separate agenda during the project meeting.
- The contractor is to provide the consultant with an environmental protection plan for the construction process.
- Consultant and contractor to ensure that all sub-contractors are advised of the environmental objectives of this project.

ISSUE: **AIR**

- GOAL
- Toxic or hazardous substances and waste management;
 - Ozone depleting substances management;
 - Provide healthy and comfortable indoor air.

CONCEPT AND DESIGN SUBMISSIONS

- Identify the large volume materials with measured off gassing (VOC) emission rates which will be utilized in the renovation and indicate how each material will be addressed with respect to reducing it's off gassing potential within the building.
- Do not use foam plastic insulation blown in with ozone depleting CFC's
- Coordinate planning considerations affecting interior air movement.
- Design to minimize the effect of noise.
- Review available data and establish the types and levels of pollution that are likely to be encountered in the outdoor air, take such data into consideration when designing air handling air systems and when selecting materials for the exterior skin of the building.
- Provide air locks and pressurization to reduce entry of contamination from outside sources.

WORKING DOCUMENT SUBMISSIONS

- Indicate that materials considered for the renovation have been reviewed with respect to their potential causes/sources of emissions contributing to IAQ problems and that such material have been excluded from/limited in scope of use in the working documents. Select building materials with positive IAQ ratings.
- Review the potential for stack emissions and sulfur dioxide to be encountered by building materials utilized on the exterior of the building. Select building materials which are resistant to environmental pollution.
- Review contemplated construction sequences to ensure that the occurrences of major events causing dust within the building during construction are minimized.
- Specify environmentally responsible products such as:
 - Paints which do not contain mercury, lead, hexavalent chromium or cadmium compounds water based paints with reduced volatile, preservative and solvent content and reduced VOC emissions ; Consider paints recommended by the Environmental Choice Program and paints which carry the EchoLogo label or equivalent. Paints merit special consideration as they are single largest contributor to internal VOC emissions.
 - Adhesives and glues which have low emission during curing;

- Consider caulking materials, solvents, adhesives, finishes, retardants, sealers and waxes with low VOC emissions. For indoor use acrylic and latex caulking are preferred.
- Specify materials with reduced formaldehyde content.
- Consider as to whether or not Material Safety Data Sheets (MSD Sheets) can be utilized as a means of monitoring the amounts of VOC's in materials which are accepted in design.

CONTRACT SUPERVISION

- Review construction practices to ensure that workers are protected from dust.
- Review construction practices to ensure that workers' exposure to fumes, which may contribute to environmental sensitivities, are minimized. Ensure that workers wear carbon face masks or respirators when applying paints and other coverings. Provide temporary ventilation as required for products utilized.
- Review construction practices to minimize the impacts of construction dust on adjacent properties. Surrounding sites could be adversely impacted by blowing dusts from exposed soil, dust escaping from sandblasting activities and over spray from sealants and paints which may be utilized on the outside of the building.
- Shop drawing review is to include, when appropriate, test results from ASTM D51116, Guide for Small Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials Products and Material Safety Data Sheets.

ISSUE: **WATER**

GOAL

- Reduction of impacts on marine / freshwater activities.

CONCEPT AND DESIGN SUBMISSIONS

- Determine the direction of parking lot runoff and possible

WORKING DOCUMENT SUBMISSION

- Not applicable.

CONTRACT SUPERVISION

- Review practices to minimize the impacts of construction on adjacent water bodies, water supplies, and wastewater systems.
- Ensure no polluting substances are released into any water bodies.

ISSUE: **LAND**

- GOAL
- Reduction / elimination of soil contamination and human caused erosion.
 - Toxic or hazardous substance management

CONCEPT AND DESIGN SUBMISSIONS

- Review the site history to determine the potential for hazardous materials to exist on site. Reports may be available from PWGSC.

WORKING DOCUMENT SUBMISSION

- Not applicable.

CONTRACT SUPERVISION

- Review practices to ensure erosion is minimized or eliminated during construction.

ISSUE: **ENERGY**

- GOAL
- Energy efficiency in facilities.

CONCEPT AND DESIGN SUBMISSIONS

- Not applicable.

WORKING DOCUMENT SUBMISSION

- Not applicable.

ISSUE **MATERIAL**

- GOAL
- Conservation of renewable and nonrenewable resources.
 - Application of 3R concepts (reduce, reuse, recycle) for reduction of waste.

CONCEPT AND DESIGN SUBMISSIONS

- Consider measures to reduce the amount of materials used in the project
- Carry out an audit and identify the materials and equipment within the building which will be dismantled and which will be reused in the renovation.
- Carry out an audit and identify the materials and equipment within the building which will be dismantled and which will be recycled.
- Propose contractual means of ensuring that recyclable materials and equipment are recycled.

WORKING DOCUMENT SUBMISSION

- Specify materials that do not contribute to environmental sensitivities and do not contain hazardous substances.
- Specify materials with recycled content. Specify materials meeting Ecologo standards or equivalent for recycled content. Do not specify recycled materials where data indicates that recycled content or recycled product has potential to compromise IAQ characteristics.
- Specify (when viable choices exist) materials with low embodied energy.
- Propose initiatives to incorporate low energy embodied materials as substitutes for material which would normally be specified.
- Specify durable materials with low maintenance finishes.
- Review materials considered for the design and indicate that nonrenewable resources are not being utilized in the renovation. Do not specify depletable and nonrenewable resources. It is important to note that this objective remains an ideal to pursue and that in the case of specific materials, no renewable, but essential to the execution of the project (such as stone for example), exceptions shall be granted.
- Utilize sections of the NMS that have been environmentally enhanced.
- Consultant must provide rationale for use of all materials based on recycled content, embodied energy, durability, etc.

CONTRACT SUPERVISION

- Meet with subcontractor and installers to ensure that all installation of materials meet with environmental objectives.

ISSUE

WASTE

GOAL

- Toxic and hazardous waste management;
- Non-hazardous solid waste reduction;
- Elimination of the concept of waste through increased reduction, reuse and recycling.

CONCEPT AND DESIGN SUBMISSIONS

- Review the condition and potential for exposure to lead base paint which currently exists within the building. Prepare recommendations.
- Submit a plan for dismantling of building materials including source separation. Specify dismantling processes.
- Identify large volume materials which will be removed from the building and site and propose recycling options.
- Propose a means of reducing construction waste destined for landfill. List construction debris materials that are to be source separated at the construction site.

- Treat the building demolition as an exercise in building dismantling, rather than demolition, in order to obtain recyclable assets. Revenue producing recyclable cash flow assets shall be removed from the building during the dismantling phase of the work and shall be recycled. Recycled architectural materials such as: ferrous metals, non ferrous metals, doors, demountable partitions, cabinets, interior trim, tracks and blinds, carpet, windows, limestone, brick, and speed tile (crushed or filled), and mechanical items such as: equipment, wiring, receptacles, switches, power poles, conduit and fixtures.
- Consider allowing the contractor to sell recyclable materials on the construction site.
- List recycled materials which are proposed to be utilized in the renovation. List only those materials which are replacements for materials which would normally be specified.
- Reduction in the amount of material used is the primary issue concerning waste. If less material is used in the design, less will be waste in the future.

WORKING DOCUMENT SUBMISSION

- Specify dismantling and recycling rather than demolitions.
- Include spaces required for materials to be recycled.
- Consider on site selling of recovered material that won't be reused in the design.
- List materials which will not be recycled. Indicate approximate volumes of those materials.
- Refer to section 017421 of the NMS, Construction/Demolition Waste Management and Disposal.

CONTRACT SUPERVISION

- Inspect and report regarding contractor's disposal practices for paints, solvents and pressure treated wood scraps.
- Construction waste is to be sorted on site by types as has been determined to be practical in regard to the potential for recycling each individual material.
- The working documents are to ensure that all personnel on site are aware of the expectations regarding waste recycling. The working documents are to ensure that labelled waste bins for recycling of waste materials produced by all sub-contractors are provided on site.
- Indicate the degree to which recycling objectives were achieved.

AS 4 WASTE MANAGEMENT

Waste Management Specialist - key responsibilities:

- Designated Substance Report - identifies the types and locations of materials present at a site that constitute hazardous/dangerous/controlled substances under the applicable regulatory regime and recommends procedures for the proper disposal.
- Waste Audit - determines the types and volumes of construction materials that will be produced as surplus to the project. (Mandatory in the province of Ontario)
- Waste Management Workplan - describes the procedures to maximize the recovery and the value of those materials identified in the Waste Audit, including on-site practices, procedures and potential destinations for the materials recovered. (Mandatory in the province of Ontario)
- Training - includes presentation of a mandatory training session to be given prior to the commencement of the work on site and attendance at a midpoint update meeting, convened by the project manager, to discuss progress and problems of the Waste Management Workplan.
- Waste Management Report - documents the recovered construction materials to ensure that the results anticipated in the Waste Audit and Waste Management Workplan are realized to the highest degree possible. It records the results at the end of the project.

APPENDIX

APPENDIX A – TEAM IDENTIFICATION FORMAT

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

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

I. Prime Consultant (Proponent - Architect):

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

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

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

II. Key Sub Consultants / Specialists:

Structural Engineer

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

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

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

Mason

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

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

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.....
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III. Other resources:

Electrical Engineer

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

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

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Mechanical Engineer

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

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Specialist in 3D laser scanning surveys

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

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

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.....

APPENDIX B - DECLARATION/CERTIFICATIONS FORM

Project Title: Masonry Repairs to the Customs Building
105 McGill Street / 400 Place d'Youville, Montréal

Name of Proponent:

Street Address:

Mailing Address:
(if different than street address)

City:

City:

Prov./Terr./State:

Prov./Terr./State:

Postal/ZIP Code:

Postal/ZIP Code:

Telephone Number: ()

Fax Number: ()

E-Mail:

Procurement Business Number:

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

Federal Contractors Program (FCP) - Certification

Pursuant to GI 12, The Proponent must complete the following certification.

1. The Proponent, or, if the Proponent is a joint venture the member of the joint venture, certifies its status with FCP, as follows:

The Proponent or the member of the joint venture

- (a) () is not subject to the FCP, having a workforce of less than 100 full- time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada,
- (b) () is not subject to the FCP, being a regulated employer under the Employment Equity Act, S.C. 1995, c.44;
- (c) () is subject to the requirements of the FCP, having a workforce of 100 or more full time or part-time permanent employees, or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC (having not bid on requirements of \$200,000 or more);
- (d) () is subject to the FCP, and has a valid certificate number as follows: _____ (e.g. has not been declared an ineligible contractor by HRSDC).

Please check the appropriate item above. Further information on the FCP is available on the HRSDC Web site.

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

Former Public Servant (FPS) - Certification

Contracts with 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 with FPS, proponents must provide the information required below.

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, in the context of the fee abatement formula, 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 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

Is the Proponent a FPS in receipt of a pension as defined above?

YES (☐) NO (☐)

If so, the Proponent must provide the following information:

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

Work Force Reduction Program

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 reduction 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 the Goods and Services Tax or Harmonized Sales Tax.

Certification

By submitting a proposal, the Proponent certifies that the information submitted by the Proponent in response to the above requirements is accurate and complete.

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 so inform the Proponent and provide the Proponent with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the proposal non-responsive.

APPENDIX C - PRICE PROPOSAL FORM

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

PROPONENTS SHALL NOT ALTER THIS FORM

Project Title: Masonry Repairs to the Customs Building
105 McGill Street / 400 Place d’Youville, Montréal

Name of Proponent:

The following will form part of the evaluation process:

◆ **Percentage based fee** (R1230D [2012-07-16], GC 5 - Terms of Payment)

PHASE 1 – DESIGN DEVELOPMENT

- RS 1 - Analysis of Project Requirements
- RS 2 - Design Concept
- RS 3 - Design Development

PHASE 2 – CONSTRUCTION DOCUMENTS

- RS 4 - Construction Documents

PHASE 3 – TENDER CALL AND CONSTRUCTION WORK

- RS 5 - Public Tender Call
- RS 6 - Construction Contract Management

COMMON SERVICES DURING ALL PHASES (1 TO 3)

- RS 8 - Risk Management
- AS 3 - Sustainable Development
- AS 4 - Waste Management

Firm percentage fee _____%

Indicative estimate of construction costs (class D): X 14.7 M\$

MAXIMUM FOR PERCENTAGE FEES _____\$

The actual percentage fee for Required Services will recognize the variability of the Construction Cost Estimate as the project develops (refer to formula specified in GC 5.2 Fee Arrangement(s) for Services). Payments will be made as specified in GC 5.4 Payments for Services.

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

♦ **Time Based Fees** (R1230D [2012-07-16], GC 5 - Terms of Payment)

Resident Site Services During Construction (AS2)*	ESTIMATED HOURS Column A	HOURLY RATES** Column B	TIME BASED FEE Columns A x B
Resident site representative for the architect (proponent/main consultant) based on 40 hours per week X 90 weeks	3 600	\$......	\$......
Resident site representative for the structural engineer (key-sub-consultant) based on 8 hours per week X 90 weeks	720	\$......	\$......
On-site technical support (architecture and engineering, to assist resident site representatives (measuring, survey, etc.) based on 2 hours per week X 90 weeks	180	\$......	\$......
MAXIMUM TIME BASED FEES			\$......

*Payment will be based on actual hours spent. Travel time and/or expenses will not be reimbursed separately.

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

♦ **DISBURSEMENTS**

At cost without allowance for mark-up or profit, supported by invoices/receipts - see clause R1230D (2012-07-16), GC 5 - Terms of Payment, section GC5.12 Disbursements:

- 3D Laser scanning survey\$
- Borings outside and inside the building\$
- Translation of the final masonry condition assessment report\$
- Translation of documents for tenders
(AS 1 - Bilingual Construction Documents)\$
- Other required disbursements such as laboratory testing (allowance)10 000.\$

MAXIMUM FOR DISBURSMENTS\$

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

TOTAL COST OF SERVICES FOR PROPOSAL EVALUATION PURPOSES

Carry here the total amounts previously indicated.

▪ Percentage based fee\$
▪ Time Based Fees\$
▪ Disbursements	<u>.....\$</u>

GRAND TOTAL OF RATED FEES AND DISBURSEMENTS\$

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

The following will NOT form part of the evaluation process

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

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

THE FOLLOWING HOURLY RATES MAY BE USED FOR FUTURE CONTRACT AMENDMENTS

Principals

Name	\$ per hour
.....	\$.....
.....	\$
.....	\$
.....	\$
.....	\$.....
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$
.....	\$.....
.....	\$
.....	\$
.....	\$
.....	\$.....

APPENDIX C - PRICE PROPOSAL FORM (CONT'D)

Staff

Name / Position	\$ per hour
.....
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END OF PRICE PROPOSAL FORM

APPENDIX D – DOING BUSINESS

**ANNEXE E – ROUNDUP DOCUMENT WITH REGARDS TO THE PRELIMINARY
CONDITION ASSEMENT OF THE MASONRY**

Doing Business

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Appendices

Appendix 'A'	Checklist for the Submission of Construction Documents
Appendix 'B'	Sample Addendum Format
Appendix 'C'	Sample Index for Drawings and Specifications
Appendix 'D'	User Manual on Directory Structure and Naming Conventions Standards for Construction Tender Documents on CDROM, dated May 2005
Appendix 'E'	Basic Reference Guide on Converting Construction Drawings into Portable Document Format (PDF), dated May 2005

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/cadd-standards/text/index-e.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 (www.pwgsc.gc.ca/nms) also links to other documents references in the NMS under its "Links" feature.

6 Specifying Materials

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

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

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

Acceptable Materials: set up the paragraph format as follows:

Acceptable Materials:

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

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

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

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

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

"Designated Contractor

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



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

"Designated Contractor

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

and in Part 2 as "Materials

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

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

"Acceptable materials

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

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

7 Unit Prices

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

Use the following wording:

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

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

Sample of Unit Price Table:

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

- (a) The Price per Unit and the Estimated Total Price must be entered for each Item listed.
- (b) Work included in each item is as described in the referenced specification section.

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

8 Cash Allowances

Construction contract documents should be complete and contain all of the requirements for the



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

9 Warranties

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

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

Delete all references to manufacturers' guarantees.

10 Scope of Work

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

11 Summary and Section Includes in Part -1 General of Section

Do not use "Summary" and "Section Includes."

12 Related Sections

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

13 Index

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

14 Regional Guide

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

15 Health and Safety

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

16 Designated Substances Report

Include "Section 01 14 25 - Designated Substances Report"

17 Subsurface Investigation Reports

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

Subsurface investigation report(s)

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

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

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

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

18 Experience and Qualifications

Remove experience and qualification requirements from specification sections.

19 Prequalification and Pre-award submissions

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

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

20 Contracting Issues

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

Remove all references within the specifications, to the following:

- General Instructions to Bidders
- General Conditions
- CCDC documents
- Priority of documents
- Security clauses
- Terms of payment or holdback
- Tendering process
- Bonding requirements
- Insurance requirements

- Alternative and separate pricing
- Site visit (Mandatory or Optional)
- Release of Lien and deficiency holdbacks

DRAWINGS

1 Title Blocks

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

2 Dimensions

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

3 Trade Names

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

4 Specification Notes

No specification type notes are to appear on any drawing.

5 Terminology

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

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

6 Information to be included

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

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

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

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

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

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

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

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

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

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

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

ADDENDA

1 Format

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

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

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

2 Content

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

DOCUMENTATION

Translation

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

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

Consultant shall provide:

- Per construction document submission, a completed and signed Checklist for the Submission of Construction Documents. See Appendix 'A'.
- Specification: originals printed one side on 216 mm x 280 mm white bond paper.
- Index: as per Appendix 'C'
- Addenda (if required): as per Appendix 'B' (to be issued by PWGSC).
- Drawings: reproducible originals, sealed and signed by the design authority.
- Tender information:
 - Including a description of all units and estimated quantities to be included in unit price table.
 - Including a list of significant trades including costs. PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.
 - Government Electronic Tendering System (MERX): Consultants to provide an electronic true copy of the final documents (specifications and drawings) on one or multiple CD-ROM in Portable Document Format (PDF) without password protection and printing restrictions. The electronic copy of drawings and

specifications is for bidding purposes only and do not require to be signed and sealed. See Appendix 'D' and Appendix 'E'.

PWGSC shall provide:

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

SECTION 4 CLASSES OF CONSTRUCTION COST ESTIMATES USED BY PWGSC

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

Class 'D' (Indicative) Estimate:

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

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

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

Class 'C' Estimate:

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

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

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

Class 'B' (Substantive) Estimate:

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

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



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

Class 'A' (Pre-Tender) Estimate:

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

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

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

SECTION 5 TIME MANAGEMENT

1 Time Management, Planning, and Control

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

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

PWGSC presently utilizes the Primavera Suite software and MicroSoft Project for its 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 than 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.

There 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.

Work Breakdown Structure (indent tree):

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 April 22, 2008

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.			
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 Identify if non-restrictive, non-trade name “prescription” or “performance” specifications are used.			
6c Indicate if a list of acceptable materials have been used.			
6d The term “Acceptable Manufacturers” is not used.			
6e Indicate if sole sourcing has been used.			
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 The project quantity and configuration, dimensions and construction details are included.			
6b 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 certifying that all items noted above have been addressed, should it be found during the tendering of these documents or implementation of the project, that the items above were not properly addressed, my firm will be responsible to resolve all related issues at my firm's expense and may receive an unsatisfactory consultant performance evaluation which could have an impact on my firm's ability to obtain work from PWGSC in the future.

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.

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

APPENDIX 'D'

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

Issued by:

Real Property Contracting Directorate

PWGSC

May 2005

Last Updated: June 3, 2008

Version 1.0

PREFACE

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

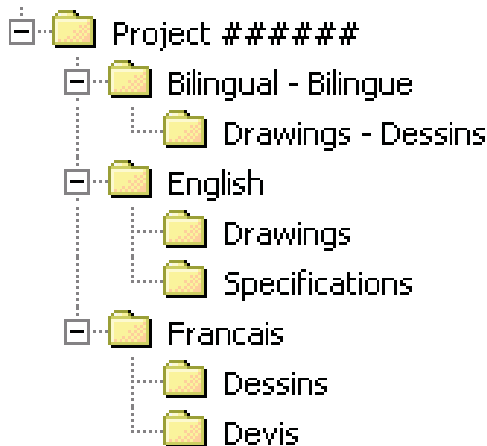
There is therefore a need to adopt a common directory structure and file-naming convention to ensure that the information made available to contractors electronically and in hard (printed) copy is in accordance with the sequence adopted in the real property industries, both for design and construction.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

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

1. DIRECTORY STRUCTURE

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

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



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

- The “*Project #####*” folder is considered the 1st Tier of the Directory Structure where *#####* represents each digit of the Project Number. The Project Number must always be used to name the 1st Tier folder and it is always required. Free text can be added following the Project Number, to include such things as a brief description or the project title;
- The “*Bilingual - Bilingue*”, “*English*” and “*Français*” folders are considered the 2nd Tier of the Directory Structure. The folders of the 2nd Tier **cannot** be given any other names since GETS uses these names for validation purposes. At least one of the “*Bilingual - Bilingue*”, “*English*” and “*Français*” folders is always required, and these must always have one of the applicable sub-folders of the 3rd Tier;
- The “*Drawings - Dessins*”, “*Drawings*”, “*Specifications*”, “*Dessins*” and “*Devis*” folders are considered the 3rd Tier of the Directory Structure. The folders of the 3rd Tier **cannot** be given any other names since GETS also uses these names for validation purposes. There must be always at least one of the applicable 3rd Tier folder in each document.

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

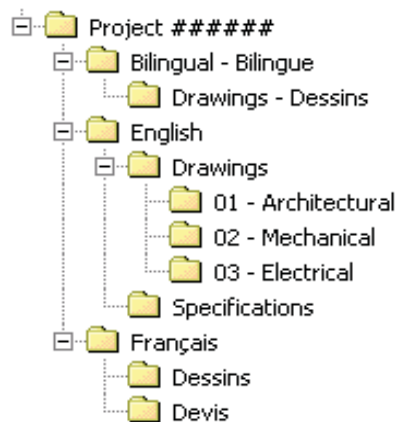
1.2 4th Tier Sub-Folders for Drawings

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

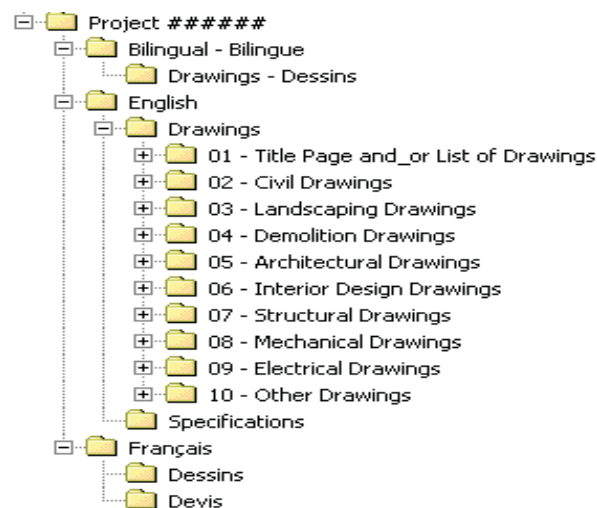
Because the order of appearance of the sub-folders on the screen will also determine the order of printing, it is necessary to start with a number the identification name of the sub-folders in the “*Drawings – Dessins*”, “*Drawings*” and “*Dessins*” folders.

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

Examples of 4th Tier sub-folders for drawings:



or



1.2.1 Naming Convention

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

For the “*Drawings*” and “*Dessins*” folders:

- Y

Where:

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

Y = The title of the folder

Example: 03 – Mechanical

For the “*Drawings - Dessins*” folder:

- Y - Z

Where:

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

Y = The English title of the folder

Z = The French title of the folder

Example: 04 - Electrical - Électricité

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

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

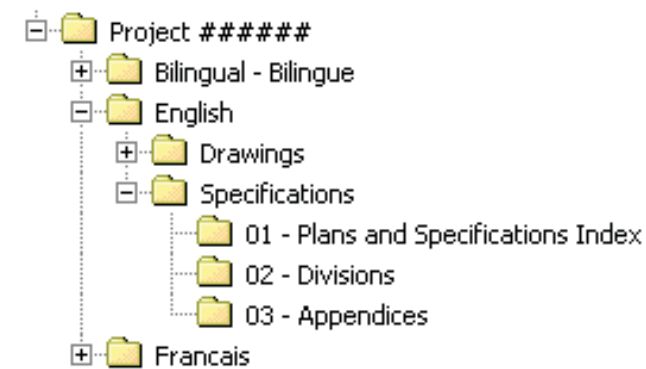
- The alphanumerical sorting is done on an ascending order;
- The alphanumerical order of the sub-folders determines the order of appearance on the screen as well as the order of printing (as an example: all the drawing PDF files in the 01 sub-folder will be printed in alphanumerical order before the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

1.3 4th Tier Sub-Folders for Specifications

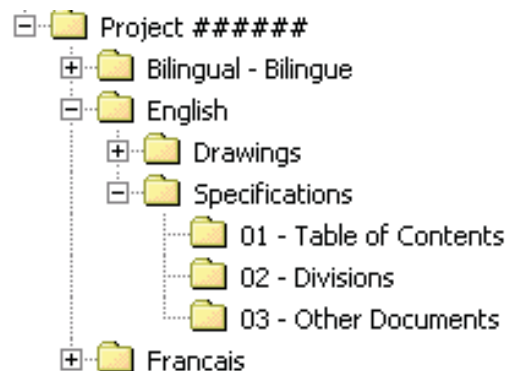
The “*Specifications*” and “*Devis*” folders must have 4th Tier sub-folders created to reflect the various elements of the specifications.

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

Examples of 4th Tier sub-folders for specifications:



or



1.3.1 Naming Convention

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

For the “*Specifications*” and “*Devis*” folders:

- Y



Where:

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

Y = The title of the folder

Example: 02 – Divisions

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

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

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

2. NAMING CONVENTION FOR PDF FILES

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

2.1 Drawings

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

X### - Y

Where:

X = The letter or letters from the drawing title block ("A" for Architectural or "ID" for Interior Design for example) associated with the discipline

= The drawing number from the drawing title block (one to three digits)

Y = The drawing name from the drawing title block (for bilingual drawings, the name in both English and French is to appear)

Example: A001 - First Floor Details

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

The following important points about drawings are to be noted:

- The drawing PDF files within each sub-folder are sorted alphanumerically for both displaying and printing. If there are more than 9 drawings in a particular discipline the numbering must use at least two numerical digits (i.e. A01 instead of A1) in order to avoid displaying drawing A10 between A1 and A2. The same rule applies when there are more than 99 drawings per discipline i.e. three digits instead of two must be used for the numbering (for example M003 instead of M03);
- If drawing PDF files are included in the “*Bilingual - Bilingue*” folder, these cannot be included as well in the “*English*” and/or “*Français*” folders;
- If drawings not associated with a particular discipline are not numbered (Title Page or List of Drawings for example), these will be sorted alphabetically. While this does not represent a problem if there is only one drawing in the sub-folder, it could disrupt the order when there are two or more drawings. If the alphabetical order of the drawings name does not represent the order on the hard copy set, the drawings are to be named as per the following standard convention when converted in PDF format to ensure proper display and printing order.

- Y

Where:

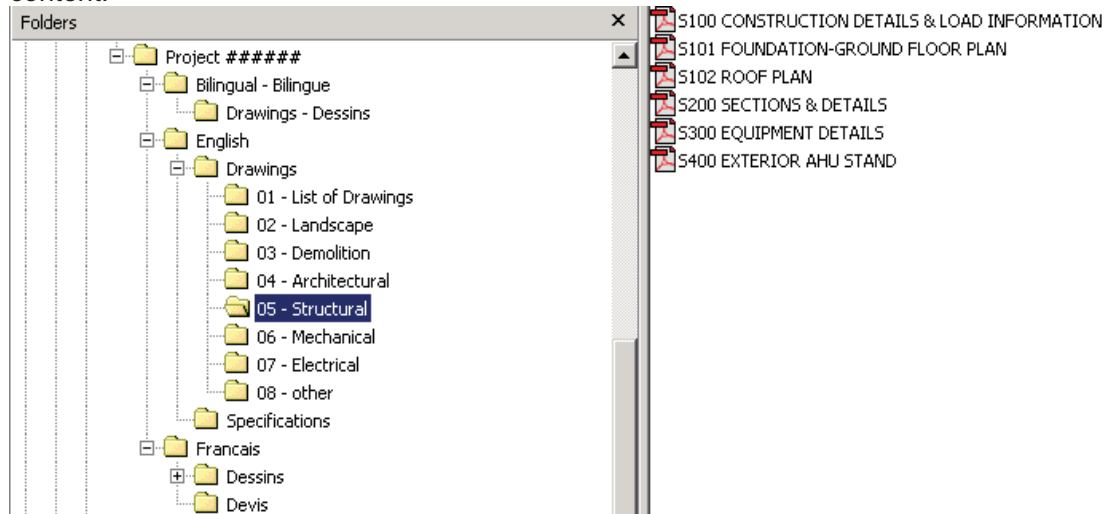
= A two digit number ranging from 01 to 99 (leading zeros must be included)

Y = The name of the drawing

Example: 01 - Title Page
 02 - List of Drawings

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

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



2.2. Specifications

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

2.2.1 Documents other than Specifications Divisions

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

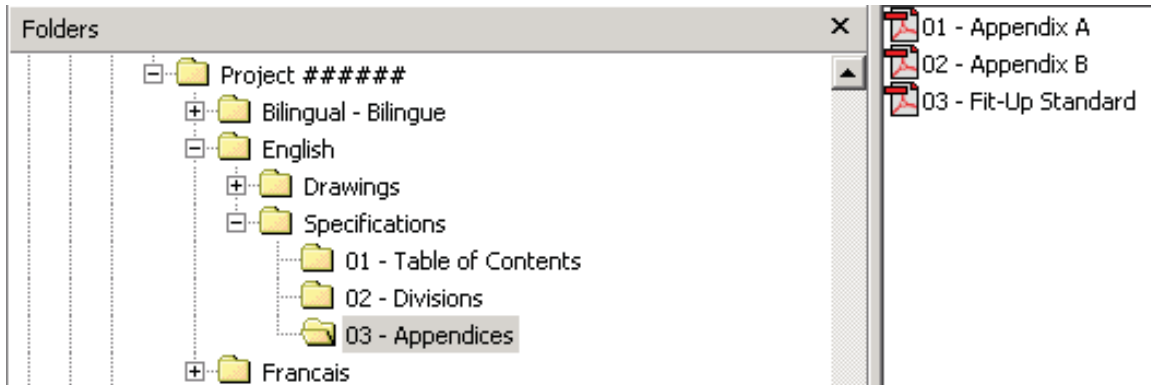
- Y

Where:

= Two digit number ranging from 01 to 99 with leading zeros required
 Y = Name of the document

Example: 01 - Plans and Specifications Index

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



2.2.2 Specifications Divisions

The Specifications Divisions must be named as follows:

Division ## - Y

Where:

Division ## = The actual word “*Division*” followed by a space and a two digit number ranging from 01 to 99 (with leading zeros required)

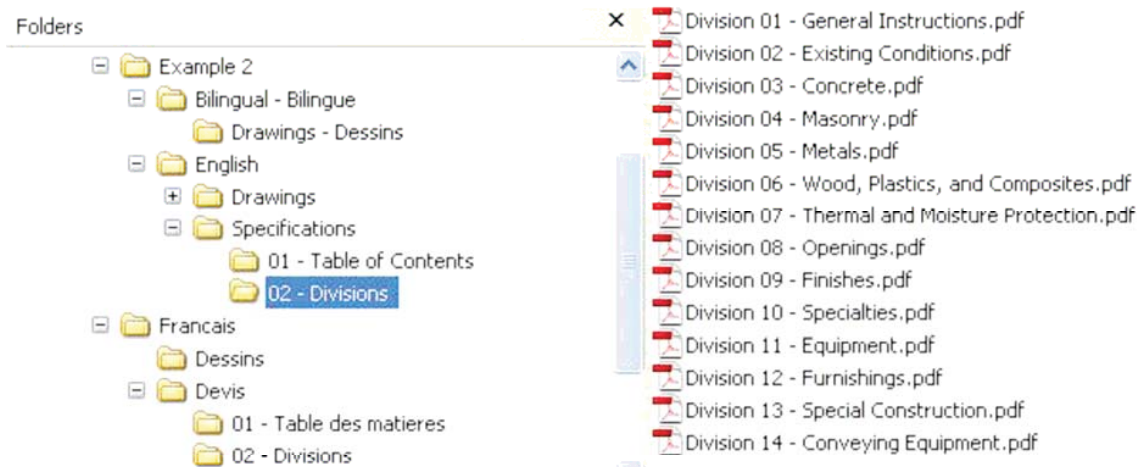
Y = Name of the Specifications Division as per **CSC/CSI MasterFormat™**

Example: Division 05 – Metals

The following important point about specifications is to be noted:

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

Example of a “Divisions” sub-folder content:



3. CD-ROM LABEL

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

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

Example:

Project 123456 / Projet 123456
 Repair Alexandra Bridge / Réparation du pont Alexandra
 Documents for Tender / Documents pour appel d’offres
 CD 1 of/de 1

APPENDIX 'E'

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

Issued by:
Real Property Contracting Directorate
PWGSC

May 2005 Last 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 be 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 through 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.

Montreal Customs Building
105 McGill / 400 place d'Youville

Preliminary Masonry Condition Assessment



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Note: Originally written in French, this document is a translated version by its author.

Cover page: West Elevation of 400 place d'Youville,
T.W. Fuller, Chief Architect,
Department of Public Works, Canada,
August 1934, excerpt from plans, p. 12.

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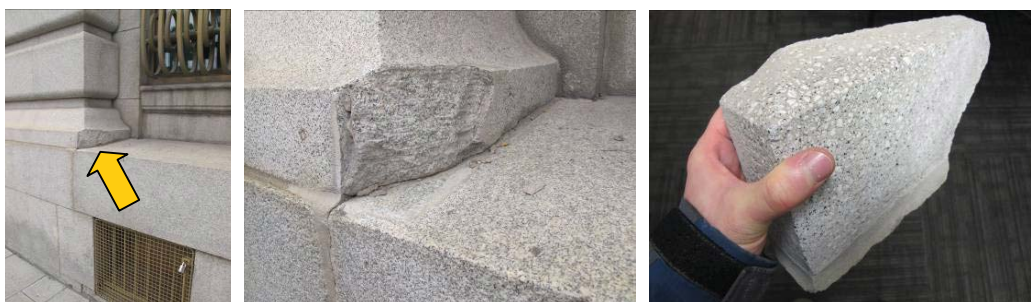
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1. INTRODUCTION

1.1 Context¹

Upon completion of drawings and specifications in 1995-1996, major work, valued at 3.2 M\$, was conducted from 1997 to 1999 to restore the exterior stone masonry of the Montreal Customs Building (105 McGill Street / 400 place d'Youville). However, in 2000, the lower corner of a granite pilaster, located close to one of the ground floor windows of 400 place d'Youville, broke and fell (these corners are placed approximately 1,5 m above street level). A report was then prepared by Jacques Bellefleur, architectural technician for Public Works and Government Services Canada (PWGSC), followed by some repair work (date unknown). Nonetheless, other problems seem to have developed rapidly, considering that two reports were successively prepared. A first building envelope condition assessment report was prepared as early as 2005 by Groupe JLA / Jacques Laberge architecte, as part of the conversion of the existing 105 McGill warehouse spaces into offices, followed by a second report in 2006 by Cardin + Ramirez & associés architectes.

After the fall of a previously repaired corner of a granite pilaster located below one of the 105 McGill ground floor windows (*figures 1 to 3*), a third report was prepared in 2007-2008 by Régis Côté et associés architectes to assess the risk for public safety. Following this assessment, urgent repointing work was conducted by the masons of Atwill-Morin. Approaches were then made to initiate a new repair project but the latter came to a halt in 2008, at the Investment Analysis Report (IAR) stage. No masonry intervention has been performed between 2008 and 2012.



Figures 1, 2 and 3 Fractured corner, at ground floor level from a 105 McGill west façade pilaster, which fell in 2007 (spall currently kept in SNC-Lavalin's offices located in the basement).

In early September 2011, while an architect from the Heritage Client Service Team (CST) of PSWGSC was assessing the heritage integrity of the building, as part of the preparation of the Building Condition Report (BCR), it was found that some stones had moved, specifically along the avant-corps corners of 105 McGill (*figures 4 to 7*). Considering the potential risk for public safety, this information was immediately shared with the building owner.

¹ See section 1.2 hereafter for the list of documents consulted to prepare this summary.



Figures 4, 5, 6 and 7 South and east façades of the southeast corner avant-corps, east façade of northeast corner avant-corps, west façade of northwest corner avant-corps (September 2011).

A second visit made on October 27, 2011, by the same architect from Heritage CST of PWGSC in Quebec City, confirmed that urgent stabilization work was not required before winter, but that the current situation should be closely monitored during the upcoming months to make sure that stones do not further move under frost action.

This visit also permitted to conduct a preliminary condition assessment of the masonry, and to confirm that major repair work will be required in the near future to stop current deteriorations, and secure the long term conservation of this heritage building's envelope.

This said, while a multidisciplinary team of consultants is being hired to make a detailed condition assessment of the masonry, propose an intervention approach, and prepare documents similar to advanced preliminary drawings and specifications, which will then be used to prepare final documents for tenders, the objectives of this report are to:

1. Highlight the main characteristics of the building in order to better understand the behaviour of its envelope;
2. Summarize the file of the previous masonry restoration project;
3. Summarize the previous expert reports, notifications, as well as other documents issued with regards to the masonry condition of the building;
4. Present, more thoroughly than in the email sent on October 31, 2011, the findings made during the preliminary masonry condition assessment of the building on October 27 (as well as on November 22, 2011, and February 16, 2012).

1.2 Methodology

1.2.1 Information about the Building

The following reference documents were examined to describe the main characteristics of the Customs Building:

- Unknown author (purported date: 1912). *Examining Warehouse, Montreal, P.Q.*, plans, p. 1 to 16, and 19 to 28;
- Ewart, David (June 1912). *Montréal, P.Q., Examining Warehouse, Specifications*, Chief Architect, Department of Public Works, document no 24041, 39 pages;
- Fuller, T.W. (August 1934). *Public Building, Montreal, P.Q., Job No 953*, p. 1 to 7, 9 and 10, 12 to 16, 21 to 30, and 32;
- MacFarlane, Kate (1988). *Customs House, 105 McGill Street, Montréal, Quebec*, Architectural History Branch for the Federal Heritage Buildings Review Office, Building Report no 88-179, 26 pages;
- Federal Heritage Buildings Review Office (1988). *Édifice des douanes, 105 rue McGill*, Heritage Character Statement no 88-179, 3 pages;
- Heritage Client Service Team (2011, draft). *Édifice des douanes, dossier technique patrimonial* (technical data sheet, original drawings, period photographs, photographic survey).

Stated, among other sources, in Appendix 1 of the report prepared by Cardin + Ramirez & associés architectes (see sections 1.2.3 and 4.3 hereafter), the following drawings apparently exist, but have not been located and thus examined yet:

- Original wall sections and details, scale ½ inch = 1 foot (pages 15 and 18 of the original drawings).

1.2.2 Review of the Previous Masonry Restoration Project

Drawings and specifications were examined to better understand the scope of previous restoration work:

- Roger Leblanc architecte (September 7, 1995). *Édifice des douanes, 400 place d'Youville - 105 McGill, Réfection de la maçonnerie*, project no 662989, pages 1 to 10;
- Jean J. K. Boutros architecte (March 1996, drawings for tenders). *Édifice des douanes, 400 place d'Youville - 105 McGill, Restauration de la maçonnerie*, project no 662989, pages A01 to A18;
- TPSGC (March 1996). *Restauration de la maçonnerie, Édifice fédéral, 105 rue McGill et 400 place d'Youville, Montréal (Québec)*, specifications of project no 662989, call for tenders no 3961-113-1;
- TPSGC (1996-2003). *Restauration de la maçonnerie, Édifice fédéral, 105 rue McGill et 400 place d'Youville, Montréal (Québec)*, call for tenders file, addenda, bid analysis, change orders (no 1 to 35), payment requests, and contractor performance assessment for project no 662989, call for tenders no 3961-113-1;
- Bigras & Lefebvre architecte (March 30, 2001, drawings for tenders). *400 place d'Youville, Montréal (Québec), Restauration de l'entrée principale*, project no 206015, pages A-01 to A-06.

1.2.3 Review of Previous Expert Reports

The following expert reports were examined to take into consideration previous findings and recommendations:

- Bellefleur, Jacques (August 15, 2000). *105 McGill/400 pl. d'Youville, Montréal (Québec), Rapport n° 1, Bris de pierre de granit au bas des fenêtres du rez-de-chaussée des deux édifices*, Architecture and Engineering Services Centre of Expertise, PWGSC, 12 pages;
- Groupe conseil JLA / Jacques Laberge architecte (May 31, 2005). *Étude de l'enveloppe verticale (rapport définitif), Édifice fédéral des douanes, 400-105 McGill, Montréal*, 210 pages;
- Cardin + Ramirez & associés architectes (June 9, 2006). *L'enveloppe verticale (complément d'étude), Édifice fédéral des douanes, 400-105 McGill, Montréal*, 32 pages and appendix;
- Régis Côté et associés architectes (November 30, 2007). *Rapport préliminaire d'inspection de la maçonnerie, Édifice des douanes, 400 place d'Youville - 105 McGill*;
- Régis Côté et associés architectes (April 24, 2008). *Rapport d'inspection complète - État de la maçonnerie, Édifice des douanes, 400 place d'Youville - 105 McGill*.

Stated in various PWGSC's documents, the following report apparently exists, but has not been located and thus examined yet:

- Roger Leblanc architecte (August 1995). *État de la maçonnerie*, 76 pages.

1.2.4 Review of other Documents Available

The following documents were examined to better understand the most recent advances made with regards to the masonry of the Customs Building:

- Lemay, Danielle (November 15, 2008). *Rapport d'analyse de l'investissement, Édifice fédéral, 400 Youville / 105 McGill, Montréal, rejointoiment des façades*, PWGSC, 15 pages;
- Riberdy, Jacques (May 14, 2010). *Note au dossier, 400 Youville / 105 McGill, Projets de réfection de maçonnerie et modification des entrepôts* (minutes of a meeting held the previous day), PWGSC, 2 pages;
- Godbout, Léïc (September 16, 2011). *Édifice des douanes de Montréal, 105 McGill / 400 place d'Youville, Évaluation de l'intégrité patrimoniale dans le cadre du rapport sur l'état de l'immeuble*, Heritage Client Service Team (PWGSC), 6 pages.

1.2.5 Site Visit

The first building visit took place on October 27, 2011 with Pierre-Hugues Mathieu, project manager, and Léïc Godbout, architect, both from the Heritage CST of PWGSC in Quebec City. A visual inspection was conducted from street level, various floors, and the roof, using binoculars when necessary. Exploratory borings made inside the building in 2005 had all been closed back, and only one of them could be located on the ground floor of 105 McGill (but was not reopened).

The second visit took place on November 22, 2011, with Jean-Benoit Saint-Laurent, senior project manager, and Léïc Godbout, both from the Heritage CST of PWGSC in Quebec City. With the help of SNC-Lavalin maintenance team, two service spaces, located on the 6th floor of 400 place d'Youville, as well as one exploratory boring, drilled on the 5th floor of 105 McGill sometimes over the previous few weeks, were inspected. A third visit was made on February 16, 2012, to monitor any evolution in the displacement of the stones. Finally, the findings made by Léïc Godbout during the visits of August 31 and September 1, 2011, as part of the heritage integrity assessment of the building, were also included.

2. KNOWING THE BUILDING

2.1 Short Description of the Building²

The Montreal Customs Building was built in two stages, first with the eastern half³ (105 McGill) from 1912 to 1916 and then the western half (400 place d'Youville) from 1934 to 1936, including the central avant-corps, the carriage entrance, and the lean-to on the corner of Marguerite-D'Youville and Normand streets, which leads through a ramp to a parking garage in the basement (*figure 8*). The original building (105 McGill) was designed by E.L. Horwood under the supervision of David Ewart, Public Works Department chief architect, assisted by associated architect Alfred Hector Lapierre, and built by general contractor P. Lyall & Sons Construction Ltd.⁴ As for the extension (400 place d'Youville), drawings prepared twenty years earlier by Horwood, Ewart and Lapierre, were updated by Public Works Department chief architect, T. W. Fuller, with the help of associated architect Dalbé Viau. Construction work was carried out by general contractor A. Janin Building Co. Ltd.

Planned around a central entrance along the McGill Street façade, the first building was originally perfectly symmetrical, and was primarily used as a warehouse with its huge opened spaces and receiving platforms on the eastern and western façades. Designed as early as the end of the 1910s, but erected almost twenty years later with some interior modifications, the extension, fitted with a monumental portico opening onto place d'Youville, primarily housed offices around a majestic long room and an interior light court above. Linked by a commanding central avant-corps to the south and a courtyard along Normand Street to the north, the two buildings together create a colossal ensemble close to 500 feet long and eight storeys high, including the ground floor but excluding the basement, occupying an entire city block of Old Montreal.

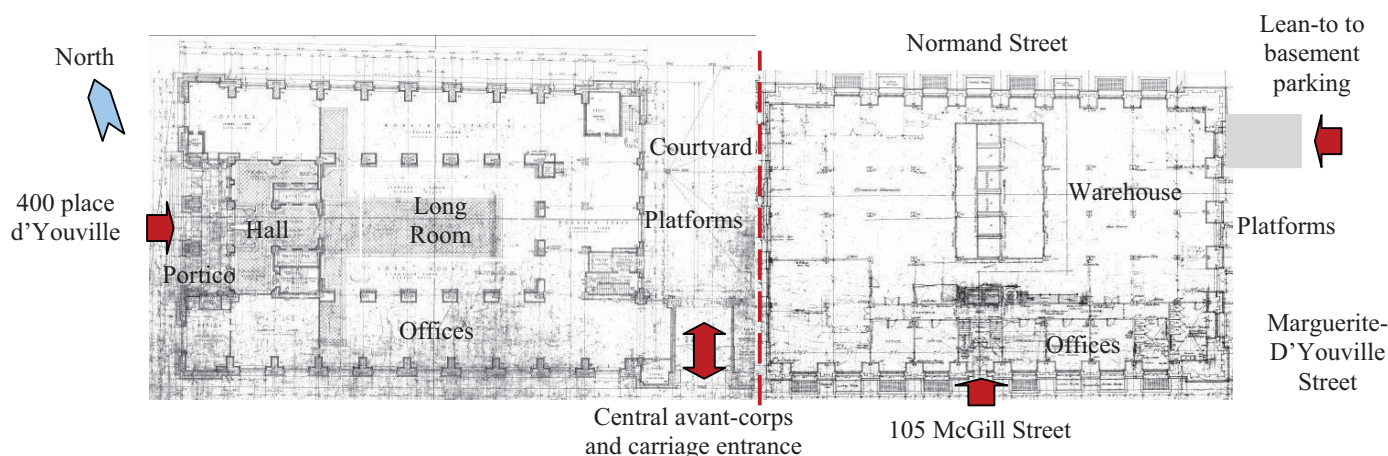


Figure 8 Schematic combination of the original ground floor plan of the first building (105 McGill, right) and of its extension (400 place d'Youville, left).

² This description (section 2.1), as well as the following reminder (section 2.2) are taken from the heritage integrity assessment conducted by the Heritage CST of PWGSC in 2011, by the same author as for this report.

³ In relation to the river and the mountain, 105 McGill is often located to the south and 400 place d'Youville to the north of the city block they occupy. However, McGill Street is definitely oriented along an east-west axis.

⁴ P. Lyall & Sons Construction Ltd. has apparently also built two of the Customs Building's neighbours: The Grand Trunk Building in 1902 (360 McGill) and the McGill Building in 1912 (485 McGill), before undertaking, from 1916 to 1922, the reconstruction of Centre Block on Parliament Hill in Ottawa.

Outside, the ensemble maintains a highly consistent style thanks to the seamless treatment of the façades, and the use of identical materials (*figure 9*). Inside, notwithstanding significant modifications to the layout, the distribution of original functions is still noticeable and, above all, the entrance lobby (*figure 10*) and the long room remain relatively intact.



Figures 9 and 10 Façade along McGill Street and details of bronze vestibule inside the entrance lobby (400 place d'Youville).

2.2 Heritage Character Reminder

Since 1989, the Montreal Customs Building is a “recognized” building by the Federal Heritage Buildings Review Office (FHBRO), primarily based on:

- Its witness role in the sharp expansion of commercial trading during the first decade of the 20th century;
- Its masterly handled Beaux-Arts architecture (classical vocabulary and tripartite division of the façades : massive base, impressive colonnades, and prominent cornice), which makes an outstanding contribution to the McGill Street perspective, along which substantial prestigious buildings were erected in the early 20th century, in the spirit of the “City Beautiful” movement;
- The grand and theatrical enfilade composed of the exterior stair, the portico, the vestibule, the entrance lobby, and the long room (with its high volume wrapped with a mezzanine and capped with a vaulted skylight);
- The use of noble materials both outside (Canadian granite and sandstone, cast iron lamp posts, grills and cornice), and inside (various marbles, terrazzo, cast iron, detailed plaster mouldings), as well as the high quality of craftsmanship, as shown, among others, in the stone colonnades outside, and in the gorgeous decor of the entrance lobby and the long room inside.

The building is also part of the Montreal historic district (provincial jurisdiction), and of the Old Montreal outstanding heritage value area (municipal jurisdiction).

2.3 Envelope Description

2.3.1 Stone Source

The Customs Building exterior cladding is made of two different types of stone: Grey granite on the two lower storeys (*figure 11*), and buff sandstone on the upper storeys (2nd to 7th floor, as well as for the original penthouses, *figure 12*). In both cases, the sourcing of the stone raises some questions.



Figures 11 and 12 Existing granite and sandstone claddings.

a. Granite

The 1912 drawings simply indicate “granite”, and the specifications “Stanstead grey granite” (p. 13), but a paper published in the September 1916 *Construction* magazine indicates that the granite would have been extracted from the “Laurentians”⁵. In his book *Montréal, son histoire, son architecture*⁶, Guy Pinard mentions that the granite was extracted from the Standstead Granite Co. quarry, which is confirmed by the data card from the Old Montreal building inventory, indicating that the grey granite comes from Stanstead, in the Eastern Townships, Québec⁷. The Standstead Granite Co. was bought out in 1963 by the “Rock of Ages” company⁸, and the latter continues to mine this quarry today⁹, although mainly for manufacturing funeral monuments. Other quarries producing construction stones remain in activity in the area, such as the Salt & Pepper, which is mined by Granite DRC.

b. Sandstone

The 1912 plans indicate “Mirimichi Stone”¹⁰, a place which apparently does not exist in Canada, and which rather suggests Miramichi in New Brunswick (Miramichi is properly spelled on page 13 of the specifications). However, the same paper taken from the September 1916 *Construction* magazine indicates that the sandstone would be coming from Wallace in Nova Scotia. Two additional papers support this assumption, stating that the cladding is composed of “Nova Scotia sandstone of a light color”¹¹ and that, in the case of the 400 place d'Youville, “the cut sandstone was extracted from Wallace, Nova Scotia, and dressed in Phillipsburg, Québec”¹².

⁵ Unknown author (September 1916). *New Customs Examining Warehouse, Montreal*, *Construction*, vol. 9, no 9, pages 289 to 292.

⁶ Pinard, Guy (1988). *Montréal, son histoire, son architecture*, Vol. 2, Éditions La Presse, pages 228 to 234.

⁷ See: http://www.vieux.montreal.qc.ca/inventaire/fiches/fiche_bat.php?sec=l&num=38, consulted on Nov. 4, 2011.

⁸ See: <http://www.rockofagescanada.com/fr/history.htm>, consulted on August 27, 2012

⁹ See: <http://www.rockofages.com/en/quarry-blocks/granites/standstead-gray>, consulted on August 27, 2012.

¹⁰ « Examining Warehouse, Montreal, P.Q., Elevation on McGill Street », p. 12.

¹¹ Unknown author and date. Vol. (?), no 10, p. 230.

¹² Unknown author (November 21, 1936). *Un bel ensemble de matériaux canadiens*, Le Canada (loose translation).

This source is further confirmed in the data card from the Old Montreal building inventory, as well as on the Internet site of Wallace Quarries Ltd. (*figures 13 and 14*)¹³, a quarry which remains in operation today. It is also relevant to note that the contractor who built 105 McGill, P. Lyall & Sons Construction Ltd., bought this quarry in 1912, the same year that the construction of the building began.



Figures 13 and 14 Period photographs (unknown date) of quarrying activities at the Wallace quarry in Nova Scotia.

2.3.2 Masonry Workmanship

Based on the 105 McGill specifications:

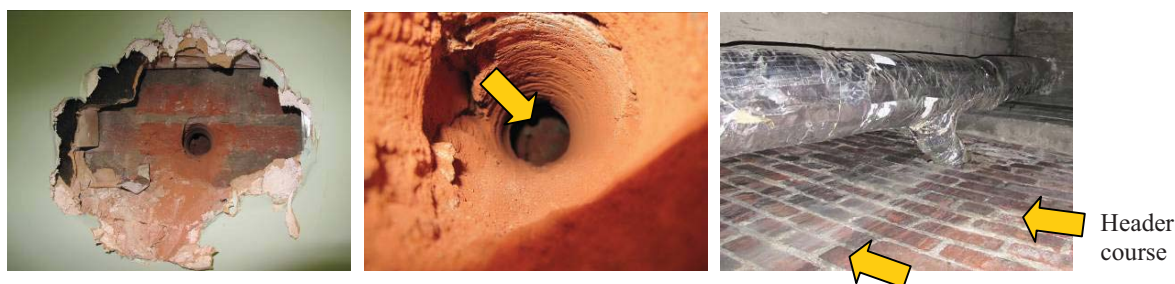
- a. The stones must be set in their natural or quarry bed, and “well flushed up with Portland cement mortar, composed of three measures of clear grit sand and one of cement mixed with pure water on a boarded floor” (p. 12);
- b. Upon completion, “clean down the entire stonework with wire brushes, muriatic acid and clean water and all external joints to be cleaned out to an average depth of $\frac{3}{4}$ -inch, and then neatly flush pointed in white non-staining cement mortar” (p. 12). Based on the mortar scraps collected on November 22, 2011, on the ground floor of the 105 McGill south façade, close to the central avant-corps, the surface mortar, presumably put in place in 1997-1999, is grey. However, the mortar located deeper behind is black (*figure 15*), which raises questions with regards to the colour of the original joints;



Figure 15 Black mortar scraps collected behind the more recent grey joints of the ground floor granite cladding.

¹³ See: <http://www.wallacequarries.com/history.html>, consulted on November 4, 2011.

- c. "All granite to be dressed with patent hammer eight blades to the inch, and all sandstone to be tooled six bats to the inch" (p. 12);
- d. All stones "to be well and properly bonded into backing, having all and any requisite dowels, cramps, tie, rods, &c" (p. 12). Farther, "[...] cornices, plinths, bands, blocking courses, &c., to be well cramped together [...] and securely tied to backing with $\frac{1}{2}$ inch iron straps, where necessary" (p. 12), and "the dressed stonework to be cramped together [...] with zinc or copper cramps, sunk or run in with lead or crude brimstone" (p. 13). It is worth noting that, even if not shown in the original drawings (with the exception, in the case of 400 place d'Youville, of a section shown at figure 47, between the concrete edge beam et and the upper stone cornice), all these metallic anchors may have rusted, expanded, and destabilized the stone cladding in locations exposed to humidity due to water infiltrations;
- e. "Build at least two thorough bond stones to every superficial yard of masonry" (p. 12). This does not match what was built, since the stone layout is apparently entirely of stretcher courses;
- f. "The walls, chimneys, backing to face stonework, &., [...] (except pressed brick) [are] to be built of the best approved quality of hard brick, free from saline matter, and true in shape" (p. 15). Based on the boring (diameter of 2 inches) made on the south face of the southeast corner of the 5th floor¹⁴, the backing is in fact composed of several brick walls. Behind the gypsum plasterboards, steel furrings, vapour barrier, original « buff pressed bricks » finish (see section 2.3.4a hereafter), and a $1\frac{1}{4}$ inch air space, is found a first 12 inches thick brick wall (*figure 16*), followed by a 6 inches cavity and by another brick wall (less than 12 inches thick, but which could not be measured, as the boring shrinks to a diameter of $\frac{1}{2}$ inch, *figure 17*);
- g. "All brickwork to be executed in approved bond, four courses of stretchers and one course of headers" (p. 13). Finally, "all brickwork [is] to be built in best quality of cement mortar composed of one of Portland cement to three of clean sharp sand mixed with measure" (p. 14). The alternating brick pattern could not be confirmed for 105 McGill. However, it was observed inside 400 place d'Youville, this time between the concrete beams, as confirmed thanks to two services spaces on the 6th floor, one on the south façade (*figure 18*) and the other on the north façade.



Figures 16, 17 and 18 Boring on the south face of the southeast corner of 105 McGill, on the 5th floor, cavity between the first 12 inches thick wall and the next one (with the boring shrinking to $\frac{1}{2}$ inch), one header course every four stretcher courses, on the 6th floor of 400 place d'Youville.

¹⁴ Drilled by SNC-Lavalin in the fall of 2011, as requested by PWGSC (refer to 5.2 hereafter).

2.3.3 Façade Composition¹⁵

The cladding of the first two storeys is composed of massive stones with rounded edges and deep chamfers. It forms a colossal arcade, the ground floor and first floor windows being united into a single opening capped with a semicircular arched lintel (*figure 19*). The basement windows are tucked in small groupings and lined up on these openings, but they are much smaller and cut into a flat plinth.

A deep cornice divides the two lower storeys from the upper portion of the building, and bears a monumental colonnade, stretching from the 2nd to the 5th floor, capped with ionic capitals. These are connected with an architrave crowned with another narrow cornice. Above, between the 6th and the 7th floor, a third cornice (hereafter identified as the main cornice, in accordance with the 1912 specifications), is adorned with cast iron dentils and prominent modillions, extending far in front of the façade. Finally, on top of the 7th floor, a fourth and last cornice, much more modest, serves as the resting base for the parapet.

As for the building's corner and central avant-corps, they each form a giant pilaster, underscored with deep chamfers and adorned with large rectangular flat crests without inscriptions, on the 1st and 7th floor.

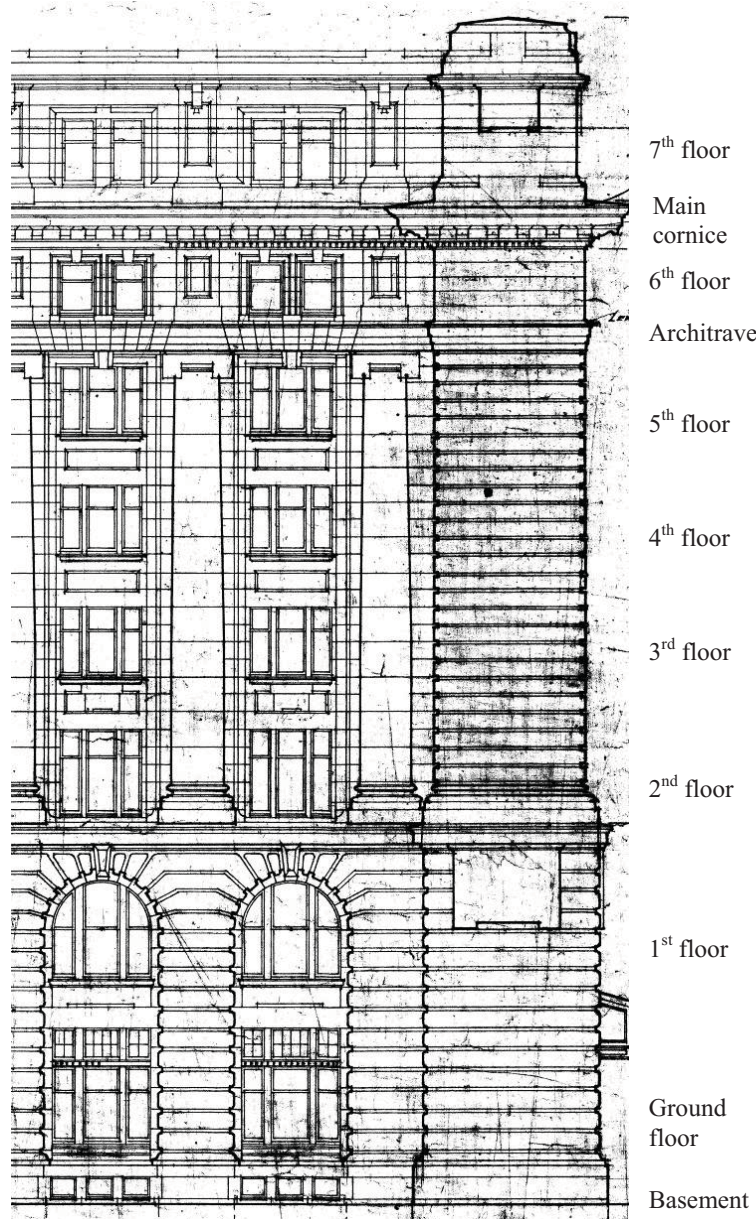


Figure 19 Southeast corner avant-corps and first two bays at the eastern end of the 105 McGill south façade (from the original drawings, p. 12).

¹⁵ The floor numbering used here, and throughout this document, follows the numbering of the original 105 McGill drawings. For consistency, it has also been applied to the 400 place d'Youville, notwithstanding the fact that the drawings for the latter identify the ground floor as the first floor.

2.3.4 Foundation Construction

a. 105 McGill

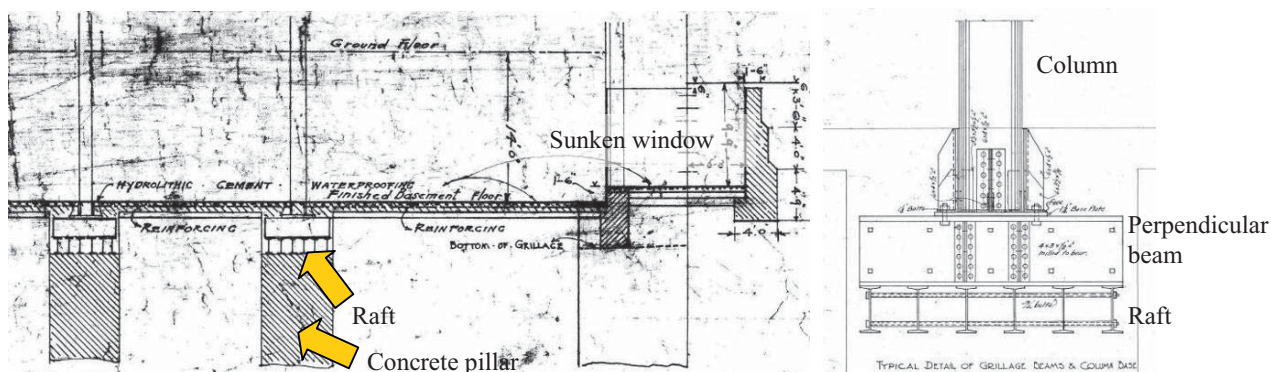
According to Guy Pinard, in his book *Montréal, son histoire, son architecture*¹⁶, the contractor that built 105 McGill:

“faced major obstacles¹⁷ as soon as work began due to a stratified underground containing alternating layers of hard and soft clays, resulting from the close proximity of the small Saint-Martin river, piped in today underneath Place D’Youville.

It was quickly concluded that it would be impossible to pump out all the water without permanently damaging the adjoining streets and buildings. To firmly anchor the piers into the rock bed 80 feet below street level, pneumatic boxes had to be used. [...] And to further resist the vertical thrust coming from the body of water located below the building, the contractor built a 12 inches thick reinforced concrete slab.”¹⁸

One of the twenty (20) “government borings” drilled by the Department, using the wash-pipe method, confirms the presence of clay, but locates the rock bed just a little above 50 feet below ground floor level (original drawings, p. 1). As for the specifications, they indicate that the reference level for the base of the concrete pillars is “forty-five and a half feet (45 ½') below curb level” (p. 3), and requires a separate price per cubic yard for all additional or withdrawn excavation in reference to this level.

Based on the original drawings, the foundations are thus composed of 67 concrete piers¹⁹ resting on bed rock, likely put in place thanks to pneumatic boxes, and connected with a raft foundation made of steel beams embedded in concrete (“grillage beams”, *figure 20*), on which a perpendicular beam distributes the load coming from the columns attached above (*figure 21*). As for the sunken windows planned for the basement, they were apparently never installed.



Figures 20 and 21 Cross section (excerpt, p. 18), connection of column and raft foundation of steel beams (p. 27).

¹⁶ Pinard, Guy (1988). *Montréal, son histoire, son architecture*, Vol. 2, Éditions La Presse, p. 230 (loose translation by L. Godbout).

¹⁷ This presumably justifies the fact that construction work stretched beyond the 30 months planned in the specifications (p. 3).

¹⁸ The same thickness is also mentioned in the specifications (p. 9).

¹⁹ Based on the title of the drawing, and considering that the hatching pattern, used for both slab and piers, identifies the same material.

Specifications (p. 10) also require the protection of the interior face of all exterior walls with a waterproof layer, made of hydrolithic cement, 5/8 inch thick for walls and 1 inch thick for floors. This work must be, in addition, guaranteed during a period of three (3) years.

b. 400 place d'Youville and central avant-corps

In the absence of structural drawings and again according to Guy Pinard, the foundations of 400 place d'Youville and of the central avant-corps have apparently been erected using the same method as for 105 McGill, which would be consistent considering that this portion of the building is located even closer to the small Saint-Martin river. As confirmed, "The managers decided to build the northern [western] portion as soon as possible, and the contractor Lyall was awarded the contract on May 1st, 1919. However, construction work was stopped as soon as the construction of the piers was completed, due to the lack of funding."²⁰ The use of massive piers is also apparently confirmed in the architectural drawings (*figure 22*).

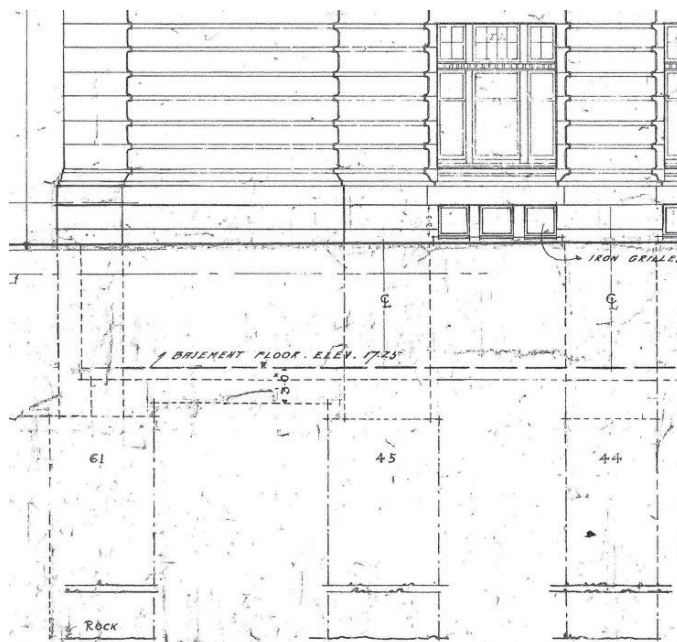


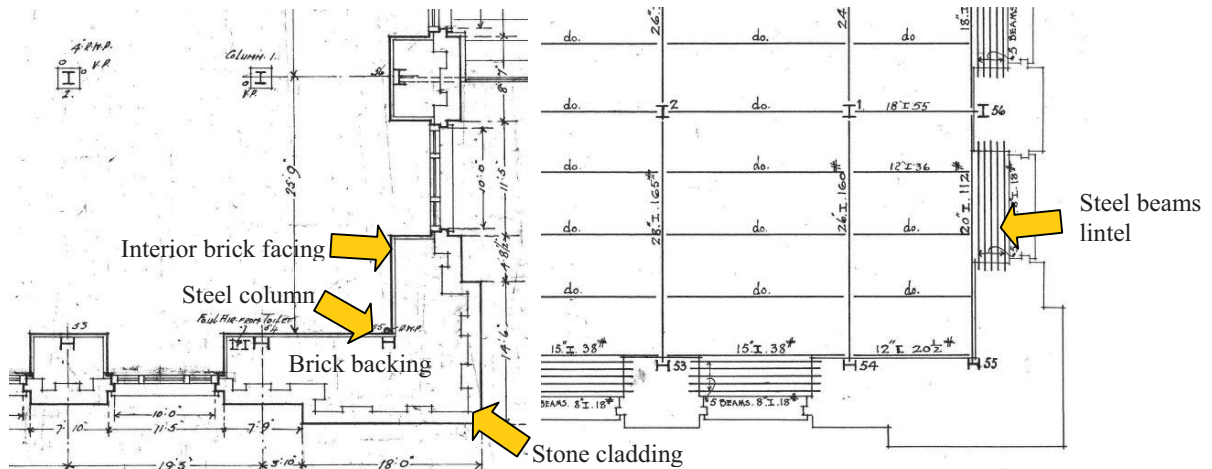
Figure 22 Piers down to bed rock below the north façade (excerpt from the original drawings, p. 13).

²⁰ *Op. cit.*, p. 231 (loose translation by L. Godbout).

2.3.5 Wall Construction

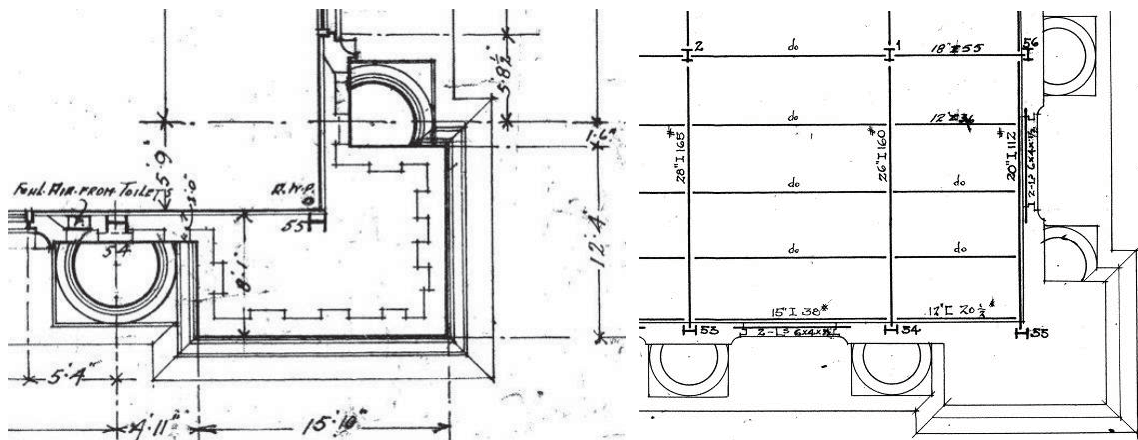
a. 105 McGill

Based on the original drawings, the structure of 105 McGill is made of riveted steel beams and columns embedded in concrete, and the exterior walls are made of a thick solid brick backing clad in stone. At the perimeter, the steel-concrete structure is embedded in the solid masonry walls, including columns (*figure 23*) and beams, as well as lintels located above the openings (*figure 24*).



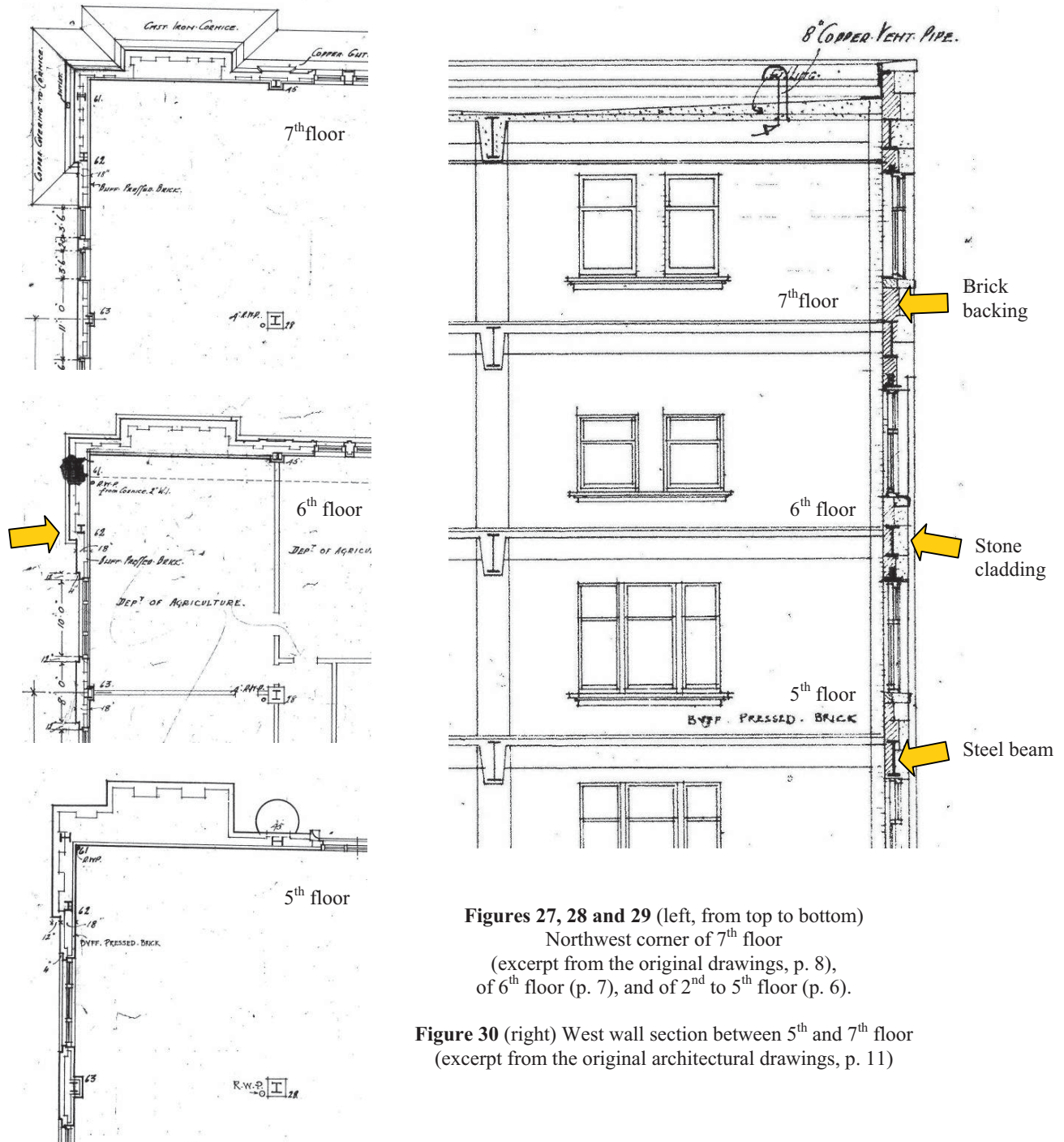
Figures 23 and 24 Southeast corner of the 1st floor,
 as shown in the original architectural (p. 4) and structural (p. 21) drawings.

At the corners and below the engaged columns, the masonry apparently supports its own load on the entire height of the building, which is approximately 120 feet, based on the fact that the steel structure is located immediately behind (*figures 25 and 26*).



Figures 25 and 26 Southeast corner of the 2nd floor,
 as shown in the original architectural (p. 5) and structural (p. 22) drawings.

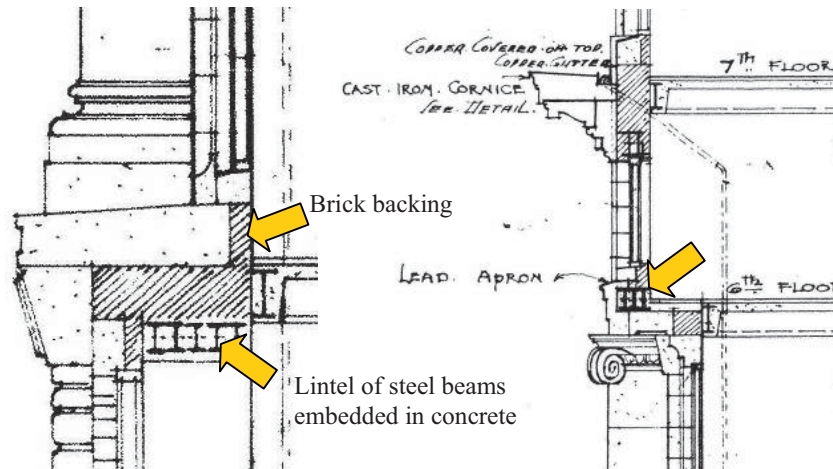
If solid walls are generally very thick on the north, east and south façades (beyond 9 feet for the corner avant-corps at ground floor level), they shrink to the absolute minimum on the west façade lining the courtyard, where the steel structure is directly in contact with the cladding (*figures 27 to 30*) .



Figures 27, 28 and 29 (left, from top to bottom)
 Northwest corner of 7th floor
 (excerpt from the original drawings, p. 8),
 of 6th floor (p. 7), and of 2nd to 5th floor (p. 6).

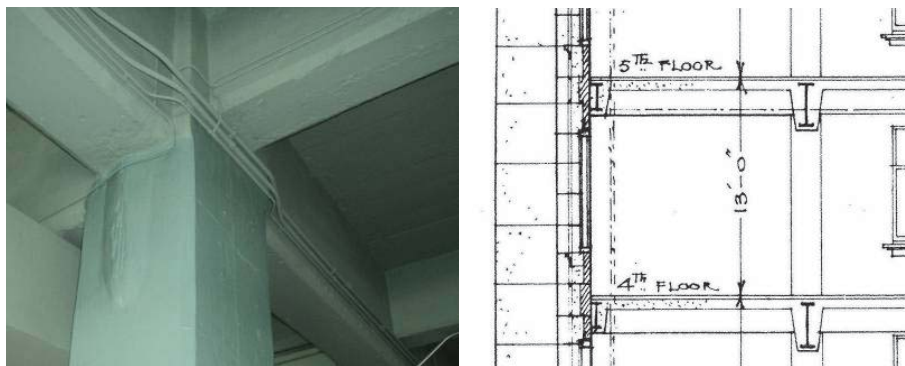
Figure 30 (right) West wall section between 5th and 7th floor
 (excerpt from the original architectural drawings, p. 11)

In section, five steel lintels bear, above each first floor opening, the deep cornice that divides the two lower storeys from the upper portion of the building (*figure 31*), and three lintels located above the engaged columns are entirely concealed within the architrave (*figure 32*).



Figures 31 and 32 Lintels below and above the colonnade, on the eastern façade (excerpts from the original drawings, p. 11)

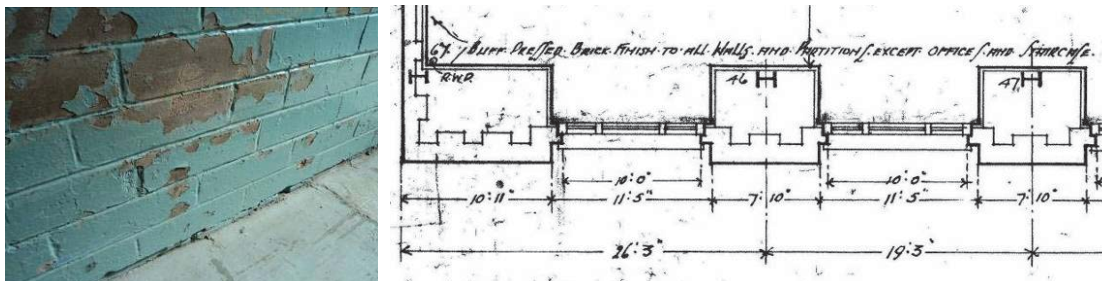
Inside, the concrete covering is clearly visible in the warehouse spaces (*figure 33*), and the orientation of the main and secondary beams matches the pattern shown in the drawings (*figure 34*).



Figures 33 and 34 Column and beams connection on 5th floor, and in the original drawings (excerpt, p. 11)

Although the following information could not be confirmed, the 1912 specifications indicate that all « steel used in reinforcing concrete shall be square bars or square bars twisted or deformed. [...] floor slabs to be 5 inches thick and the roof slab 4 inches thick. [...] there must be 2 inches of concrete covering all steel work » (p. 11) to provide, among others, fire protection to the structure. The document also specifies that the “whole of the floor and roof slabs to have steel reinforcement embedded in the concrete slabs, to rest on top of steel beams, and to be $\frac{3}{4}$ inch from bottom of slab midway between beams” (p. 21).

As for the interior “buff pressed brick” facing indicated on the drawings, and which is today only visible on the ground floor (*figure 35*), it was originally exposed everywhere, except inside offices and stairways where terracotta blocks were finished with plaster (*figure 36*).



Figures 35 and 36 Exposed buff pressed brick on the ground floor, southwest corner of the 1st floor (excerpt, p. 4).

The visible portions match the description included in the specifications, which indicates that the “whole of the internal facing brick on exterior and partitions [...] to be of light buff pressed brick, to be the best quality of A No. 1, bedded in approved mortar, with joints 3/16-inch thick and pointed to approval [...]” (p. 16). The same applies to a note appearing in *Construction* magazine, which indicates that, inside, “[...] the lining is all of dry pressed buff brick, about a half million of which were supplied from the work of the Toronto Pressed Brick & Terra Cotta Co. of Milton, Ont. for the purpose.”²¹ Therefore, the letters “T” and “P”, appearing on every brick (*figure 37*), could be the first portion of an abbreviation identifying the manufacturer.

However, an item of the specifications requesting that the facing “be well bonded to the backing every fifth course by a stretcher and header alternating [...]” (p. 16) could have been replaced with the installation of metal ties, between the solid wall and interior brick facing (*figure 38*).

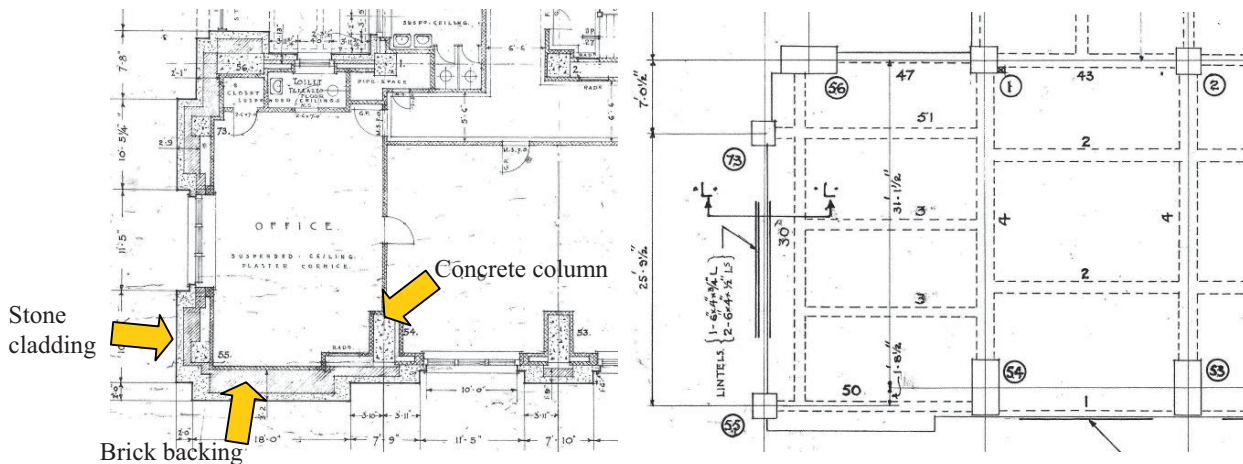


Figures 37 and 38 Brick fragments from the boring drilled on the 5th floor in the southeast corner of 105 McGill, metal tie between the solid wall and the interior facing in the same location.

²¹ Unknown author and date, *Construction*, p. 230.

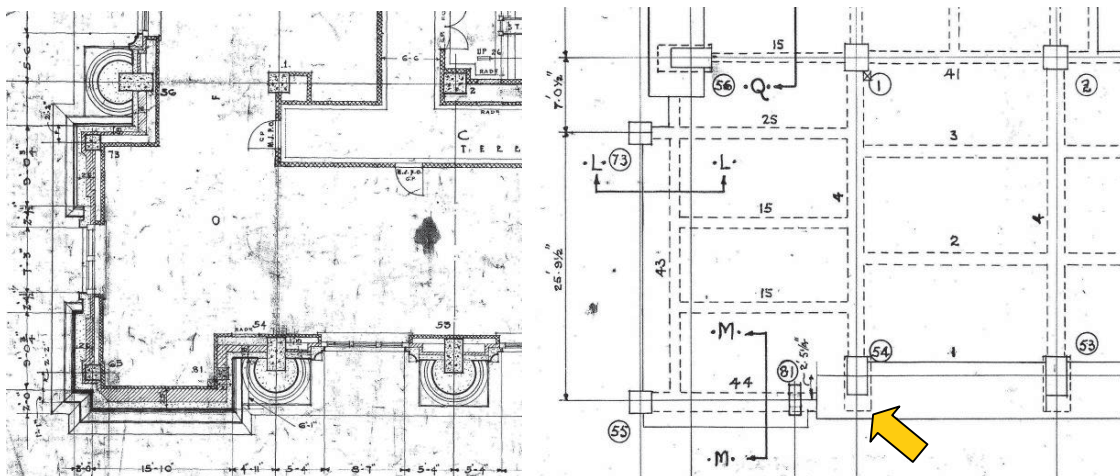
b. 400 place d'Youville

Based on to the original drawings, the 400 place d'Youville structure is made of reinforced concrete, and the exterior walls are made of an exterior stone cladding, a brick backing, an air space, and a terracotta block partition covered with plaster (*figures 39 and 40*). The concrete structure is always isolated from the wall by a cavity, except at corners and behind the engaged columns, where it is embedded in the brick backing or the stone cladding.



Figures 39 and 40 Southeast corner of 1st floor,
 as shown in the original architectural (p. 3) and structural (p. 22) drawings.

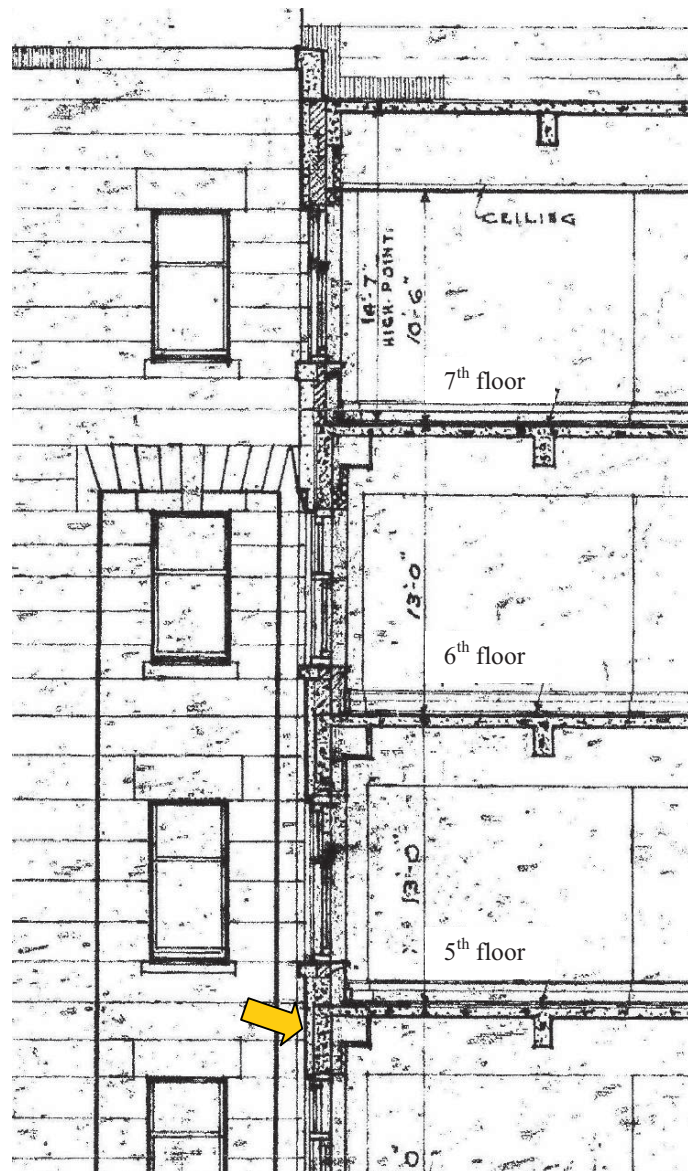
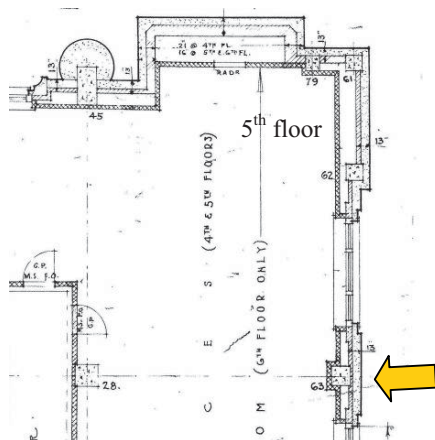
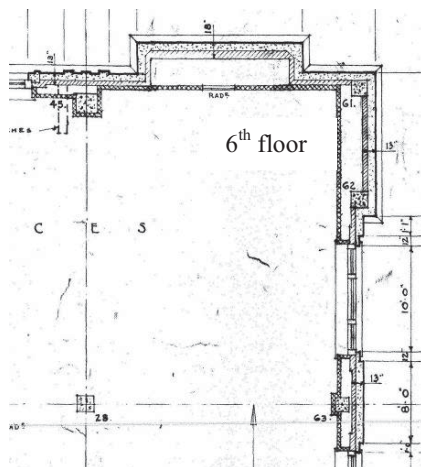
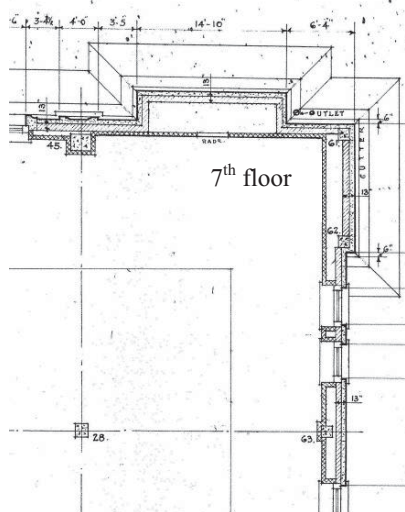
Therefore, if the concrete structure is carrying floors, the corner avant-corps masonry apparently support their own load on the entire height of the building (*figure 41*), based on the fact that beams are located immediately behind (*figures 41 and 42*). However, the engaged columns load is largely supported by the first floor concrete columns below (*figure 42*).



Figures 41 and 42 Southeast corner of 2nd floor,
 as shown in the original architectural (p. 4) and structural (p. 23).

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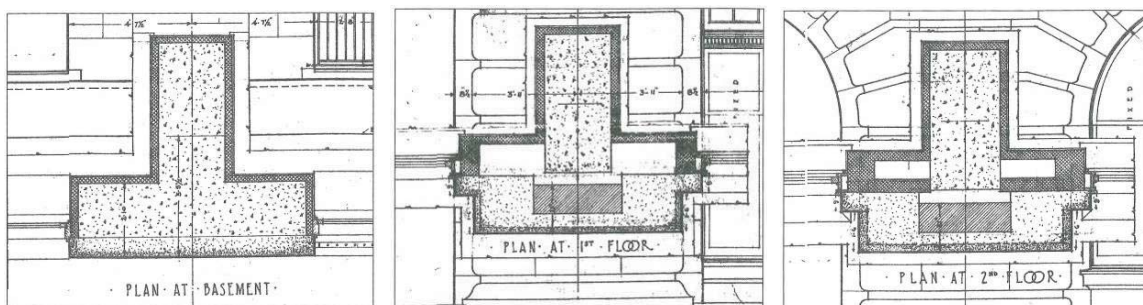
As in the case of 105 McGill, the 400 place d'Youville wall thickness is reduced to an absolute minimum on the eastern façade lining the courtyard, putting the concrete edge beams directly in contact with the cladding (*figures 48 to 51*).



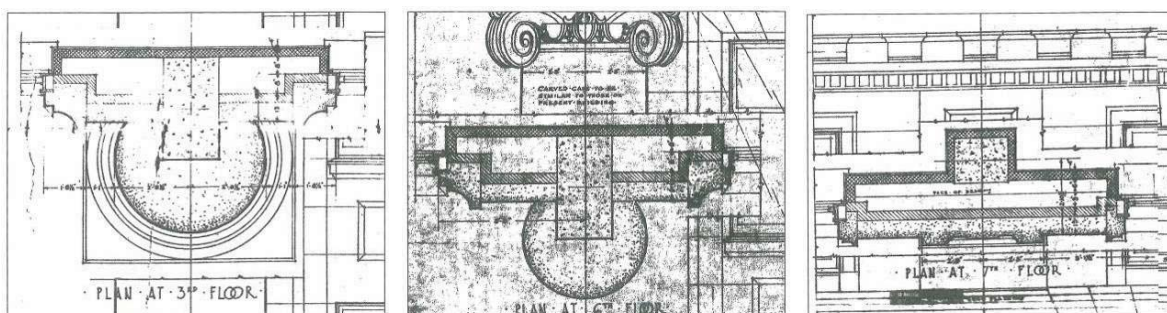
Figures 48, 49 and 50 (left, from top to bottom)
 Northeast corner of 7th floor
 (excerpt from the original drawings, p. 7),
 of 6th floor (p. 6) and of 2nd to 5th floor (p. 5).

Figure 51 (right) West wall section between 5th and 7th floor
 (excerpt from the original drawings, p. 10).

The more detailed sections-elevations confirm that the concrete structure is directly in contact with the stone cladding at basement level (*figure 52*), as well as with the engaged columns from the 2nd to the 5th floor²² (*figures 55 and 56*). On the ground floor and 1st floor, the stone cladding is isolated from the concrete structure by a cavity, but is backed with a small pillar, presumably made of bricks (*figures 53 and 54*). From the 2nd to the 7th floor, a cavity separates the terracotta blocks partition from the stone cladding, but the latter is apparently backed by a brick wythe (*figures 55 to 58*). Finally, the cavity is apparently not continuous on the entire height of the building, since the exterior wall planes change in at least three locations (ground floor and 1st floor / 2nd to 5th floor / 6th and 7th floor).



Figures 52, 53 and 54 Section-elevation of basement, ground floor and 1st floor (excerpts from the original drawings, p. 15).



Figures 55, 56 and 57 Section-elevation of 2nd, 5th and 6th floor (excerpts from the original drawings, p. 15).

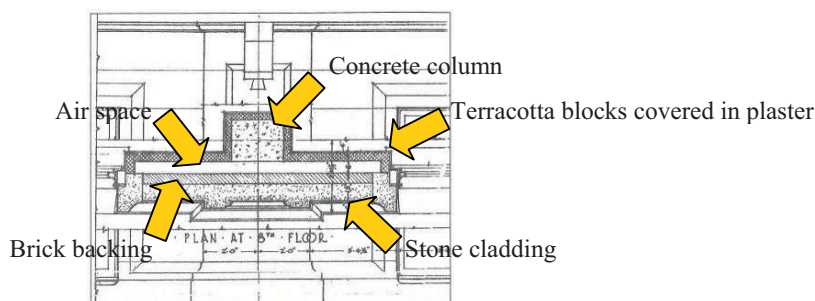
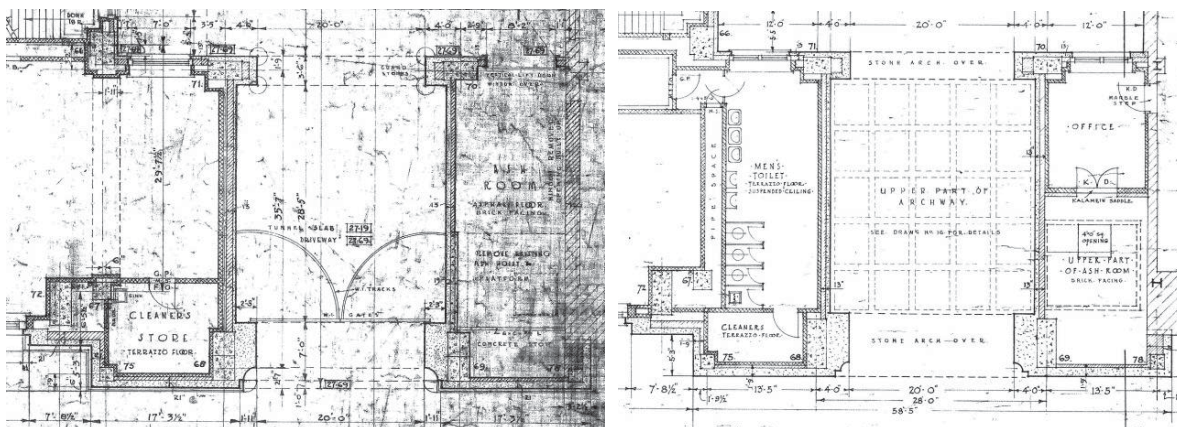


Figure 58 Section-elevation of 7th floor (excerpt from the original drawings, p. 15).

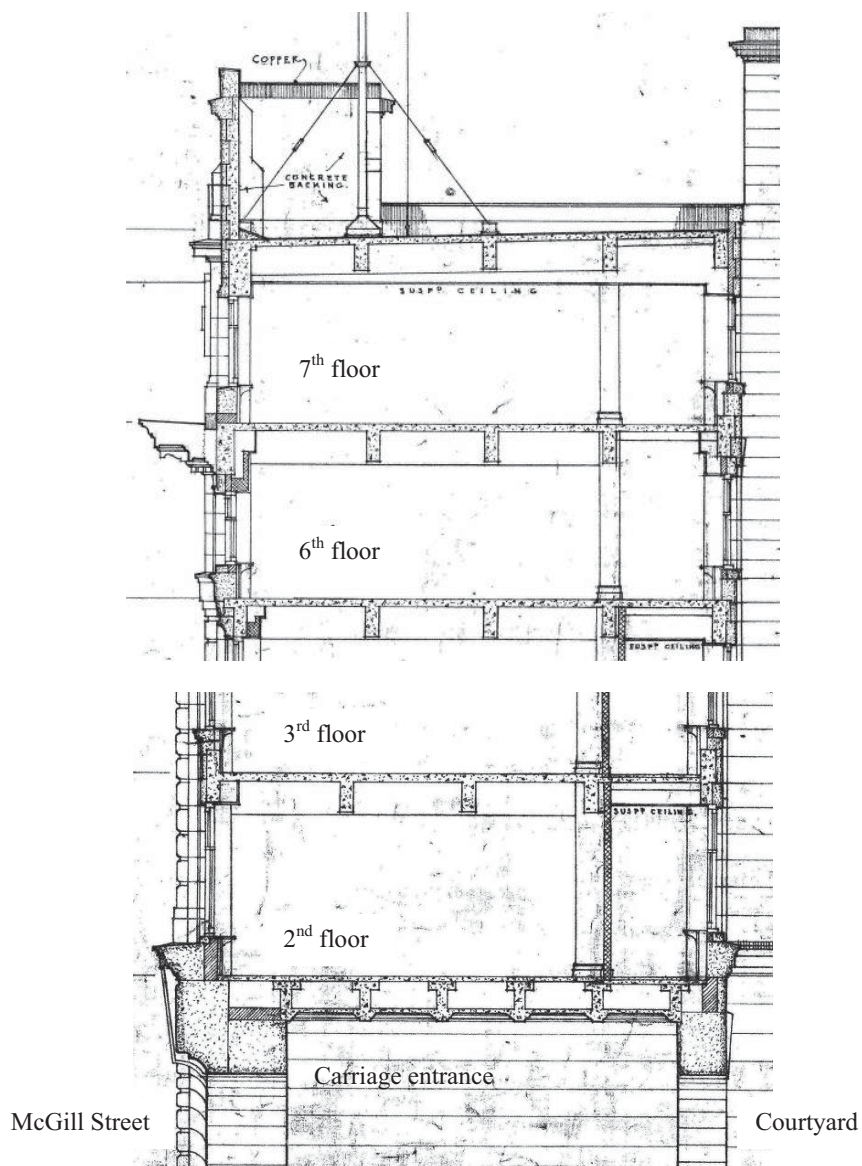
²² As opposed to the drawings for 105 McGill where the floor numbering begins above the ground floor, those for 400 place d'Youville identify the ground floor as the first floor, which explains why the building is described as having eight storeys instead of seven.

Built simultaneously to 400 place d'Youville, the central avant-corps also has a concrete structure. On the ground floor and 1st floor, the exterior walls are composed of a stone cladding, one brick wythe, and terracotta blocks finished with plaster (*figures 59 and 60*), although from the 2nd to the 7th floor, a cavity separates the brick wythe from the terracotta blocks (*figures 61 and 62*). However, regardless of the floor level and whether the façade is facing the street or the courtyard, the concrete structure is everywhere directly in contact with the stone cladding.



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All this is confirmed in section where the same edge beam system partially or totally supports the cladding load, except for the semicircular arches of the carriage entrance which are entirely made of stone (*figure 63*), and for the 7th floor exterior wall which rests entirely on the edge beam, but is also completely in front of it at roof level (*figure 64*).



Figures 63 and 64 Cross section through 2nd and 3rd floors (bottom), as well as through 6th and 7th floors (top) of the central avant-corps (excerpts from the original drawings, p. 14).

2.3.6 Other Elements

With regards to the main cornice and roof, the specifications require, among others, that:

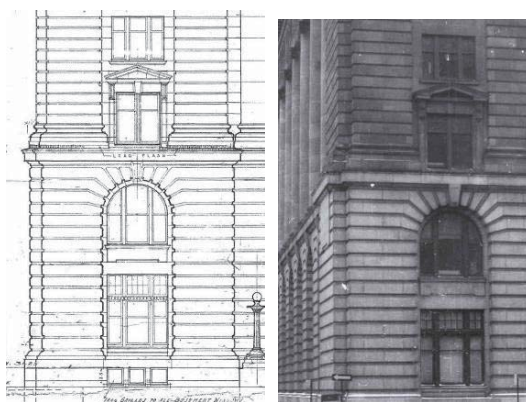
- a. "Cover the top of the main cornice with 1 1/4" x 3 inch dressed tongued and grooved boarding [...]" (p. 24);
- b. "The boarding on main cornice to be covered with one layer tar paper and this with copper" (p. 22). Notes on the drawings confirm this information, indicating that the flashings of the parapets are made of copper (with lead counter flashings), but that the flashing of the narrow cornice between the 5th and the 6th floor is made of lead. There is no indication with regards to the cornice located at the base of the engaged columns;
- c. The roofing will be made of six plys of 16 oz. roofing felt, saturated with bitumen, and covered with coal tar pitch and finally with lake or river gravel (400 lbs. per 100 square feet), of such grade that no particle shall exceed 5/8 of an inch. "Contractor to give guarantee that these roofs are perfectly water-tight for a period of five years" (p. 22).

Today, with the exception of the copper flashing of the corner avant-corps parapets, all other parapet and cornice flashings have apparently been replaced during the masonry restoration work of 1997-1999 (elastomeric membrane on 2nd and 7th floor, tin coated copper on 6th floor and at the parapet base, copper on corner avant-corps parapets). As for the roofing, it was replaced at 400 place d'Youville at the end of the summer in 2011, and work is ongoing at 105 McGill, with a new EPDM membrane in both cases.

As for the windows, it is indicated, among numerous details prescribed in the specifications, that:

- a. "The pulley stiles and parting strips ["English sashes", meaning double hung sash] and interior finish to be of oak in office portion of building and ash in the warehouse, the remainder to be of clear white pine, including sash" (p. 24);
- b. "Provide and set to all windows in the office, storm sash 1 3/4 thick of pine" (p. 24).

The windows of 400 place d'Youville have apparently respected the same requirements (*figures 65 and 66*). However, all original wood windows have been replaced with gold-coloured aluminum windows, around 1970 for 105 McGill, and around 1990 for 400 place d'Youville.



Figures 65 and 66 West façade of 400 place d'Youville (excerpt from original drawings, p. 12), same location at the end of the 1960s or in the early 1970s (City of Montreal Archives).

3. REVIEW OF THE PREVIOUS MASONRY RESTORATION PROJECT

The objective of this section of the report is to trace back interventions made during the last major restoration campaign, which stretched from 1996 to 2003, in order to better understand the scope of work, the methods and materials used, and what could have caused the premature deterioration observed today.

3.1 Specifications (1996)

Based on the specifications for tenders (section 01005, page 1) and the unit price schedule of the bidding slip, the scope of work of the masonry restoration included, among others²³:

- a. The complete repointing of the sandstones, from the 3rd [2nd] floor up to the roof parapet, penthouses included;
- b. The partial repointing of the ground floor and 1st floor granite stones;
- c. The complete repair of chipped, perforated stones, and/or honeycombed, and making good previous repairs;
- d. Repairing cracked stones with epoxy injections;
- e. Repairing exfoliated stones;
- f. Remodelling mouldings below the capitals of seven 105 McGill west [south] façade columns;
- g. Remodelling corner stones, at window jambs;
- h. Repairing window jambs;
- i. Anchoring stone into 333, 457, 533 and 635 mm thick walls;
- j. Removing and reinstalling seven (7) types of displaced stones;
- k. Removing, anchoring and reinstalling coping stones on six (6) corner avant-corps parapets;
- l. Complete cleaning of the masonry [granite and sandstone];
- m. Completely removing existing caulking around windows, supplying and installing new caulking;
- n. Removing copper and lead flashings as well as existing waterproofing membranes of marquees [cornices], and supplying and installing new copper flashings and elastomeric membranes;
- o. Waterproofing all horizontal masonry surfaces;
- p. Replacing the granite floor slabs inside the 400 place d'Youville portico;
- q. Restoring the cast iron grillage doors at the entrance of 400 place d'Youville [removed to be restored in a workshop] and of Normand street window grills, as well as painting all other window grills [work on site only].

²³ Items in brackets are precisions inserted by the author of this report.

More particularly, the specifications mention, among others, the following technical features:

- a. The mortar specified for repointing work is Betomix Plus 1-1-6, N type, by Daubois (section 04401, item 2.1.2);
- b. The epoxydic resin based mixture used as an injection grout to repair cracked stones was a two component system offering a low viscosity mix (section 04406, item 2.1.2);
- c. The restoration mortar specified to repair stones, cracked stones due to epoxy injection, exfoliated stones, and hole filling after the installation of anchors was M70 by Jahn International Inc. (section 04405, item 2.1.2, section 04406, item 2.1.3, section 04407, item 2.1.2, section 04408, item 2.1.2);
- d. Surfaces damaged on a depth less than 6 mm were to be redressed with a fine bushhammer finish (25 teeth per inch hammer for granite) without using restoration mortar (section 04407, item 3.1.2);
- e. Surfaces damaged on a depth more than 6 mm were to be refinished with restoration mortar M70 by Jahn (section 04407, item 3.1.3);
- f. All anchors specified were to be of stainless steel (section 04409, item 2.1.1);
- g. Stone cleaning included soaking stone surfaces first with a light water jet over a 24 hour period, then using a pressure water jet, 2750 to 4150 kPA (400 to 600 lb/po²) with a 20 litres/minute flow (section 04523, items 3.1.4 et 3.1.5);
- h. The coating specified to weatherproof the horizontal surfaces (window sills, column bases and capitals, and all other projecting masonry) was colourless silane-siloxane based (section 07180, items 1.2.1 and 2.1.1).

3.2 Drawings (1995 and 1996)

The drawings prepared in 1995 by Roger Leblanc essentially focus on identifying the various deteriorations, whereas the documents prepared in 1996 by Jean Boutros list the required repair work. About these drawings, it should be mentioned that:

- a. In the case of the granite cladding, the mortar joints are more deteriorated close to the sidewalk, along the semicircular arches crowning the openings, and below the cornice at the column's base;
- b. In the case of the sandstone cladding, all mortar joints are in bad condition, but are even more deteriorated above the narrow architrave cornice, thus on the 6th and 7th floor, as well as at parapet level on the central and corner avant-corps;
- c. Several lower corners of the granite pilasters are fragmented with opened mortar joints below, but only four (4) are broken;

- d. To stabilize the numerous displaced stones of 105 McGill corner avant-corps, installing anchors is the only intervention planned (no dismantling or reassembling), and is limited to the southeast corner (17 on the west face, *figure 67*, and 9 on the east face, *figure 68*)²⁴, and to the northwest corner (14 on the west face, *figure 69*). No anchors are planned in the northeast corner avant-corps;
- e. Ten (10) anchors are planned to stabilize stones of the central avant-corps, primarily in the upper portion of the southeast corner, and ten (10) additional anchors are planned at parapet level (*figure 70*);



Figures 67, 68, 69 and 70 South and east façades of 105 McGill (excerpts from pages A09 and A08), west façade and central avant-corps south façade of 105 McGill (excerpts from pages A07 and A09).

²⁴ The triangular symbol numbered 2 indicates the location of the anchors to be installed.

- f. It is planned to entirely dismantle and reassemble the corner avant-corps parapet stones, by attaching them with anchor plates, following the construction of a new concrete block backing (cells filled with concrete mixture), and the installation of a new concrete coping (see note 8, *figure 71*);

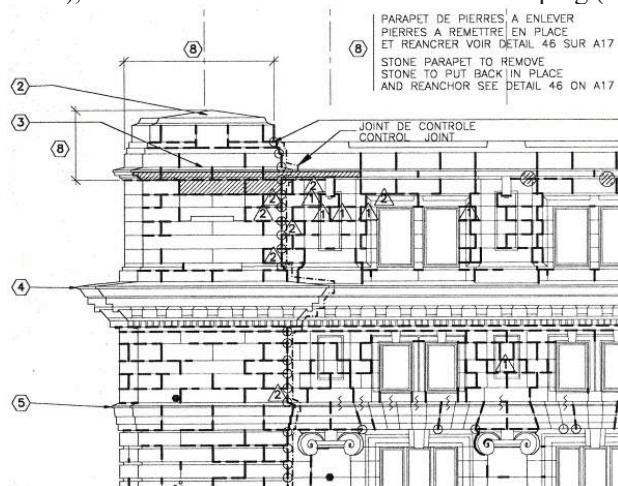


Figure 71 Parapet to be dismantled on the southwest corner of 400 place d'Youville south façade (from page A01).

- g. The other stones to be removed and reinstalled primarily include window sills, but also some jambs and lintels;
- h. Copper flashings were to be removed and reinstalled on the corner avant-corps parapets, but they were finally replaced. The copper flashings lining the façades have been kept in place as planned;
- i. On the cornice at the parapet's base, a new copper flashing was to be installed, but it is rather what looks like a tin coated copper flashing that was finally installed (same applies to the narrow cornice which divides the 5th from the 6th floor, to the extension inside the courtyard of the cornice located at the base of the columns, as well as to the central avant-corps parapet);
- j. On the main cornice, which divides the 6th from the 7th floor, the existing elastomeric membrane is replaced with a new one;
- k. On the deep cornice located at the base of the engaged columns, the existing elastomeric membrane is replaced with a new one, lined with a copper flashing;
- l. The copper flashings of the penthouses are kept in place;
- m. At the top of each column, the flare below the capital is remodelled using restoration mortar (*figure 72*);

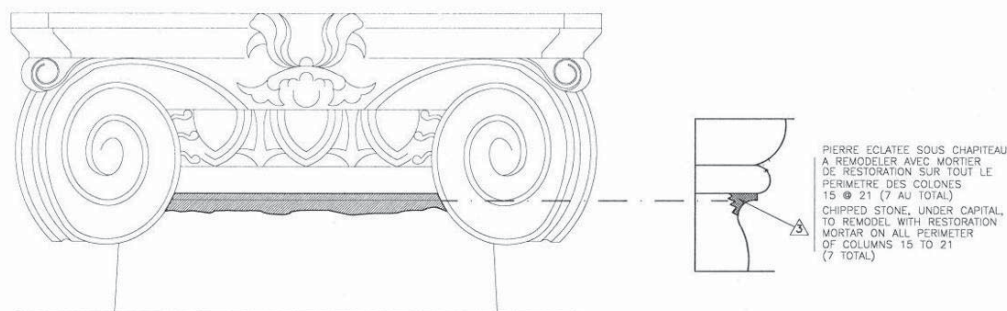


Figure 72 Remodelling of the flare below the capitals (detail 25, page A09).

n. Based on the planned detail for the anchors, the latter were of the injectable type or Cintec (*figure 73*);

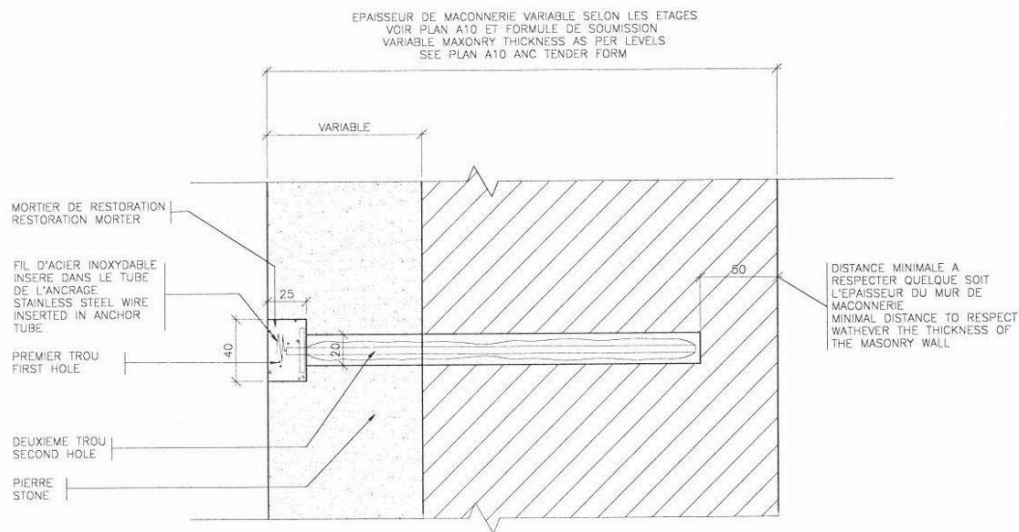


Figure 73 Typical anchor (detail 53, page A17).

- o. Vertical mortar joints are replaced with a sealant joint, backed by a compressible filler, in every inward corner of the central and corner avant-corps, but also where the central avant-corps meets the two buildings, inside the courtyard, as well as where the exterior wall meets the back of every engaged column.

3.3 Addenda (1996)

Only one addendum, issued on May 17, 1996, adds, among others, the following clarifications:

- a. The number of lower granite pilaster corners to be repaired is raised to eleven (11);
- b. The contractor-mason is now not only requested to have fifteen years of experience, but these have to be in the field of historic and heritage building restoration;
- c. The specified masonry cleaning product is Sure Klean's reinforced restoration cleaner, and the water pressure jet for surface rinsing is raised to 600 kPa (1000 lb/po²);
- d. Although the locations where this method is to be used are not mentioned, it is now requested to also use the "façade gommage" cleaning process patented by Thomann-Hanry (spraying of glass residues or special fine particles, organic or mineral of 15, 50 ou 90 microns, with the help of low pressure compressed air);
- e. The coating specified to waterproof the horizontal surfaces is Weather Seal Siloxane by Sure Klean at a rate of 100 sq. ft./gallon;
- f. Without identifying which, it is now required to replace all rusted parts of the cast iron grillage doors, jambs and door frames with elements of identical shape and dimensions;
- g. It is no longer required to duplicate the flush-mounted door tracks in the paving of the new portico.

3.4 Worksite Documents (1996 to 1999)

The masonry restoration project file includes tender documents, bid analysis, changer orders (see section 3.5 hereafter), and payment requests. It sheds light on the context within which the project unfolded, of which the main stages were:

- a. The masonry restoration project bidding process (project no 662989, contract no 3961-113-1) was launched on April 26, 1996, and the bid opening took place on May 30, 1996;
- b. During the following days, precisions were requested from the two bidders with regards to their experience and to similar jobs that they had previously executed. It finally appears that the contractor C. Ricci & Fils did not have the required experience;
- c. Simultaneously, due to lack of funding, the award of the contract was delayed by the deputy minister for several months, but the two bidders nonetheless extended their bid bonds, as requested by PWGSC;
- d. The contractor C. Ricci & Fils eventually withdrew his bid on March 14, 1997. PWGSC then contemplated the opportunity of launching a new bidding process, but finally decided to award the contract to the second bidder, L.M. Sauvé (1964) ltée. The contract was signed on May 16, 1997, and construction began the following summer or fall;
- e. Construction was entirely completed on October 21, 1999.

3.5 Change Orders (1997 to 1999)

Thirty-five (35) change orders (CO) were issued during construction. They confirm that the scope of work was modified, among other ways, as follows:

- CO no 1 requires that (24) steel lintels crowing the north façade windows of 400 place d'Youville be treated against rust (Blue Steel product) and painted (Galvicon and finish coating). CO no 19 requires the same intervention for the (70) steel lintels crowing the south and west façades of 400 place d'Youville;
- CO no 2 requires that four stones located close to and on the north face of the northeast corner avant-corps of 400 place d'Youville be repaired (cornice at the base of parapet, two corner stones on the avant-corps, and torus at the base of the first column - *figure 74*);

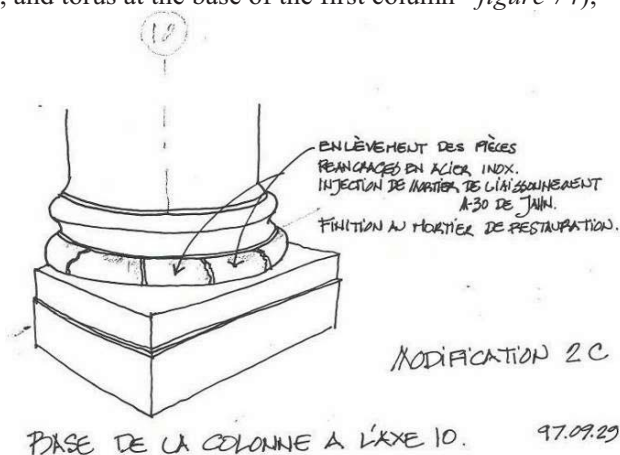


Figure 74 Sketch showing how to repair cracks in a torus at the base of one of the columns.

- CO no 3 requires that sealant joints be removed between glazing and glazing bead of all the building's windows (20 950 lin. ft.), and the installation of new joints using Spectrem II from Tremco;
- CO no 4 requires that flexible control joints be installed in every inward corner of the courtyard (southwest, southeast and northeast), on the entire height of the building;
- CO no 5 requires that a drip (saw cut) be added under all lintels of the 8th floor (93) windows. The sketch attached to the document (*figure 75*) however shows the 5th floor window lintels, at the same level as the capitals of the engaged columns;

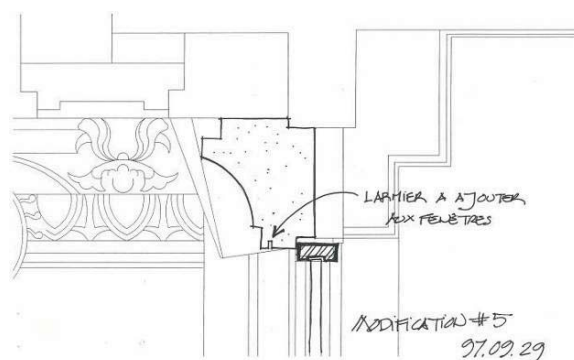


Figure 75 Sketch showing the saw cut to be made under the 5th floor window lintels.

- CO no 6 requires that the scope of work be reduced for parapets no 3 (north face of the northeast corner avant-corps of 400), no 4 (north face of northwest corner avant-corps of 105) and no 5 (northeast corner avant-corps of 105), which means that “it has not been necessary to partially dismantle the waterproofing system along the parapets, and the scope of the masonry backing demolition was reduced”. It is also required that copper flashings, which were to be kept in place, now be replaced. Same for CO no 34, but for parapets no 1, 2 (southwest and northwest corners of 400) and 6 (southeast corner of 105), while keeping the concrete copings;
- CO no 8 requires that the existing acrylic waterproofing, likely put in place in the 1970s, and identified thanks to a laboratory analysis, be removed from the façades along Normand Street. The products to be used are stripper no 505 and cleaner no 101G from Dietrich. CO no 20 requires that all the other façades receive the same treatment;
- CO no 9 requires that the installation of a water-repellent waterproofing on the horizontal stone surfaces be canceled;
- CO no 10 requires the repair of a higher number of stones exfoliated on a depth of 6 mm, but without indicating the location of these surfaces. CO no 13 requires the same modification (1826 m² on the north façade of 400, 10 492 m² on the north façade of 105, and 1000 m² on the west façade of 105. Same for CO no 33, concerning sandstone units, but without indicating the exact location;
- CO no 12 requires that two additional stones be removed, put back in place, and anchored on the south façade of the courtyard, which corresponds to the west façade of 105;
- CO no 15 requires that four (4) copper drains located on the main cornice be replaced, and that denticles be consolidated on the “south Normand elevation”, which corresponds to the north façade of 105 McGill. Same for CO no 30, on the south façade of 105 McGill;
- CO no 16 now requires that all cast iron grills protecting the basement windows be removed, that window sills be consolidated, that sealant joints be replaced around the windows, and that grills be reinstalled while reinforcing starting bars and anchors;
- CO no 17 requires that more type 3 and 4 stones be removed and put back in place on the south (7 units) and west façade (10 units) of 400 place d'Youville;
- CO no 18 requires additional repointing for the granite cladding of the south (405 lin. m) and west façade (214 lin. m) of 400 place d'Youville. The same applies for CO no 21, but on the south façade of the central avant-corps (129 lin. m), and on the north façade of 105 McGill (434 lin. m). The same applies for CO no 26, but on the southwest and northwest corner avant-corps of 400 place d'Youville (110 lin. m in each location), and on the west façade of 400, including the portico (450 lin. m). Same for CO no 32, again on the west façade of 400 place d'Youville (206 lin. m);
- CO no 22 requires that the fractured base (torus?) of one of the engaged column be repaired on the south façade of 400 place d'Youville (6th from southwest corner);

- CO no 23 requires that the “changes in level” be rectified on the deep cornice at the base of the engaged columns, only on the three most visible façades, but photographs taken during construction show that this modification has also been made along Normand Street (*figures 76 and 77*)²⁵. The presence of these stone “strips” thus appears to confirm, in the absence of flashings on the original drawings, that this cornice was initially unprotected;



Figures 76 and 77 Removal of the stone “strips” on the deep cornice at the base of the columns, patching the surfaces damaged in the process, here along Normand Street.

- CO no 24 requires that modifications be made to adequately ventilate the space between the stone and the waterproofing cladding located behind the parapet of the central avant-corps. The contractor’s bid and the sketches however define the scope of work as the addition of a nailing base made of plywood panels, covered with 15 lbs. tar paper and metal cladding;
- CO no 25 requires that ten (10) additional stones be removed and put back in place on the north façades of both 105 McGill and 400 place d'Youville;
- CO no 27 requires that the cast iron grills protecting the ground floor windows of 105 McGill be removed, in order to replace the sealant joints around the windows;
- CO no 29 requires that the number of cracks to be injected be raised (50 lin. m.), as well as the number of deeply exfoliated sandstone units to be repaired (6,5 m²). These interventions are scattered throughout, but the most extensive zones are located on the north façade of 105 McGill;
- CO no 35 requires that the fragmented lower corners of the granite pilasters be repaired (anchoring the conserved fragments, removing repairs previously made using epoxy, remodeling of the disappeared corners);
- CO no 36 requires that the copper flashings damaged due to ice removal, likely conducted during the January 1998 ice storm, be repaired (work completed in the fall of 1999).

3.6 Subsequent Interventions (2001 and 2002)

3.6.1 Main Entrance Restoration

Included in the drawings and specifications prepared in 1996 for the masonry restoration project, the main entrance restoration of 400 place d'Youville has apparently not been cancelled neither in the addendum or change orders. However, more detailed plans prepared by Bigras & Lefebvre architecte, and issued for tenders on March 30, 2001, tend to indicate that these were delayed. The interventions planned, and that were actually completed, at least partially based on the observations made on site, mainly included:

²⁵ Photos attached to change order no 23.

- a. Replacing the granite pavers, removing and reinstalling the existing steps, replacing mortar beds, repairing the concrete slab and stair, putting in place new concrete toppings and a new membrane, as well as repointing pavers and steps;
- b. Removing, polishing, and reinstalling all stainless steel railings and handrails;
- c. Inverting the opening outward of one of the cast iron grill doors located in the northern arch of the portico;
- d. Removing and putting back in place displaced pavers and stones of the access ramp, and repointing all mortar joints.

3.6.2 Repairs to the Engaged Columns

Following the bursting of a stone at the top of a column in the spring of 2002, urgent repairs were undertaken in order to “solve the top flare fracturing problem of [48] columns” of both 105 McGill and 400 place d'Youville. The project file indicates that:

- a. A contract was awarded on October 23, 2002 (project no 214891, contract EF937-020021/001/MTC) to L.M. Sauvé (1964) ltée. However, in the absence of any drawing, it is difficult to assess the exact nature and scope of the proposed work;
- b. The consultants were Fernando Pellicer and Pascal Létourneau from Duchesnes & Fish / DFS architectes;
- c. A first change order was issued on November 18, 2002, to secure, consolidate and repair a cracked capital stone (no 105-18), to conduct a preventive inspection of the perimeter of 400 d'Youville, and to carry additional repairs to the vertical joints of the horizontal belt course;
- d. A second and last change order was issued on July 3, 2003, to consolidate a column (400-1), a pedestal (column 400-4, *figure 78*)²⁶, a torus (column 400-5), and a window lintel under the belt course between columns 400-1 et 400-2, with stainless steel threaded rods embedded in HY-150 sealing mortar, and Jahn restoration mortar on top to hide the repair.

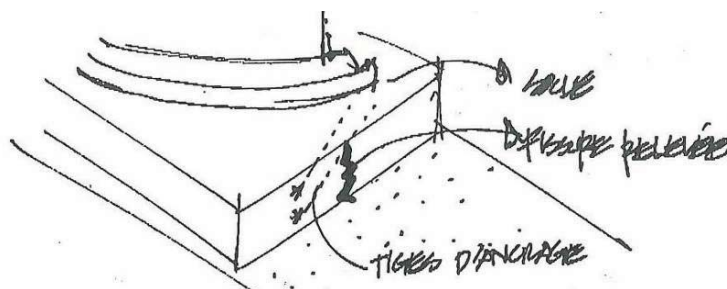


Figure 78 Proposed repair of a column pedestal.

²⁶ Sketch attached to CO no 2 and prepared by Pascal Létourneau from Duchesnes et Fish / DFS architectes.

4. REVIEW OF PREVIOUS EXPERT REPORTS

The objective of this section of the report is to trace back the main findings and recommendations made in previous expert reports, in order to better understand the various actions taken up to now, and to identify the recurring elements.

4.1 Jacques Bellefleur, PWGSC (2000)

Prepared after the corner of a granite pilaster broke and fell close to one of the ground floor windows of 400 place d'Youville along McGill Street, the main findings and conclusions of this report are that:

- a. Around fifteen cracks were observed (9 on McGill Street and 6 on Normand Street), all located where repairs were made the previous year, i.e. in the lower corners of the pilasters, on each side of the ground floor windows;
- b. All adjacent mortar joints, although repointed the previous year, are de-bonded or deteriorated;
- c. The damages would have been caused by the vibration generated from heavy traffic, concentrated loads in the lower portion of the exterior wall and pilasters, as well as stress caused by sunlight and freeze-thaw cycles;
- d. It is recommended to repair the damaged stones, and replace the mortar joints with a sealant joint backed with a compressible filler;
- e. Repair work has apparently been conducted following this report (unknown scope).

4.2 Groupe conseil JLA / Jacques Laberge architecte (2005)

The main findings and conclusions of this report are that:

1) In the case of the 105 McGill Street building:

- a. Borings confirm that the exterior walls are made of a load bearing brick wall clad with stone outside and parging inside, without any air space (which does not exactly matches the boring drilled in 2011 on the 5th floor, see 2.3.2);
- b. At the end of the 1990s, metal furring (25 mm), a vapour barrier membrane (non continuous) and gypsum plasterboards (16 mm) were added on the interior side of the wall. However, the vapour barrier is interrupted thus not leaktight, especially around windows;
- c. Traces of deterioration around windows (sealant joints), mainly in the courtyard (presence of humidity behind the wall, based on the thermographic study), points to the existence of infiltrations, but the report does not specify whether these are still active. Mould has been observed on the interior face of the vertical envelope;
- d. The interior face of the windows was cold during winter, creating condensation, and ice in some places at the base of the frames;
- e. The thermographic study indicates that the entire building is apparently under negative pressure (due to the exhaust vents of Environment Canada laboratories, as confirmed by the repeated fires during the roofing repairs of 2011);
- f. A self-adhesive membrane has been installed (date and reason unknown) where the ceiling concrete slab meets the interior partition, on the 3rd, 4th and 5th floors. Water infiltration was however visible on the 3rd floor along the Marguerite d'Youville Street façade;
- g. Cracks have been observed in some concrete beams and slabs;
- h. On the 3rd floor, the brick whyte on the inside face of the exterior wall is apparently unsupported in one location.

2) In the case of the 400 place d'Youville building:

- a. Borings confirm that the exterior walls are made of a load bearing wall (exterior stone cladding and brick wall) and a terracotta partition finished with plaster, with an air space in between, which only partially matches the original drawings, see 2.3.5b;
- b. At the end of the 1990s, steel studs, insulation (50 mm), a vapour barrier and gypsum plasterboards (16 mm) were added on the interior side of the wall;
- c. Humidity "effects" were observed on the window sills and frames of the façade along the courtyard (ice in one location on the 3rd floor);
- d. In the basement, the wall surfaces were damp in some locations, mainly below the windows;
- e. The thermographic study indicates that the building is under negative pressure from the ground floor up to the 5th floor, and under positive pressure on the 6th and 7th floor (see 4.2 1) e));
- f. Convection movements were observed inside the cavities located between the exterior wall and the terracotta partition, mainly at ground floor level and inside service spaces.

4.3 Cardin + Ramirez & associés architectes (2006)

The main findings and conclusions of this report are that:

- a. As the inspection was carried out during a wet snow episode, the stone clad façades were very wet (but without specifying that sandstone is a very porous stone);
- b. The humidity rate inside the building is apparently maintained between 30 and 40 %, and the temperature between 20 and 23.5 degrees Celsius;
- c. Mortar joints are very deteriorated, many of them are opened, and fractured mortar scraps pile up on the cornices (but repointing is recommended only for 25% of the mortar joints);
- d. The three façades around the courtyard show a higher number and more significant signs of humidity than elsewhere, especially on the back façade of the central avant-corps, between the two buildings, which never receives direct sunlight;
- e. There are apparently infiltrations along the joint above the flashing of the cornices. Recommends that the existing detail be modified (but the proposed detail facilitates ponding and infiltration);
- f. The depth of the window sills apparently precludes the heat of the radiators from reaching the windows, increasing the risk of condensation;
- g. It is recommended to drill openings at the top and at the base of the walls to create a communication between the air space located between the exterior wall and the terracotta blocks partition, and the rooms, in order to push the dew point towards the exterior (but without considering that moist air would then be directly in contact with the colder interior face of the exterior wall);
- h. It is recommended that weep holes be created to allow water infiltrated inside the masonry wall to escape (although the exterior walls are not of the rain screen type);
- i. In the 105 McGill building, there is apparently water in the basement along the foundation wall;
- j. In the basement of 400 place d'Youville, the gypsum plasterboards were damp around three of the window frames. These windows being stuck at the top of the room, there is apparently little air movement around them, which facilitates condensation.

4.4 Régis Côté et associés architectes (2007 and 2008)

The main findings and conclusions of this report are that:

- The granite cladding is generally in good condition, except for the deterioration of the stone surfaces, especially at the base of the wall along McGill Street, and for the repeated fracturing of the lower corners of the pilasters, on each side of the ground floor windows;
- The mortar joints of the granite cladding are generally in good condition, except for the vertical joints of the cornice separating the 1st floor from the 2nd floor, and for the vertical joints located below the ground floor windows around the courtyard, for the joints located close to the ground and below the ground floor pilasters, and for the vertical joints of the first stone course, which are all debonded or opened;
- The lower corners of the pilasters, on each side of the ground floor windows, apparently repeatedly fracture due to water running along and infiltrating the mortar joints, which then breaks joints and stones due to frost-thaw cycles. Furthermore, test samples (*figure 79*)²⁷ confirmed that the repairs specified in 1997-1999 have not been carried out as requested (*figures 80 and 81*);

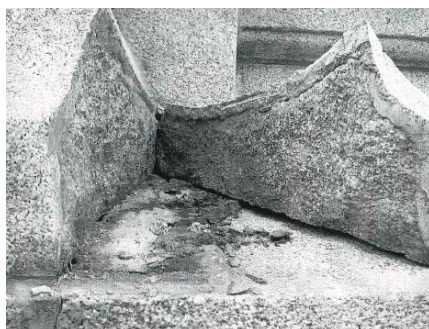
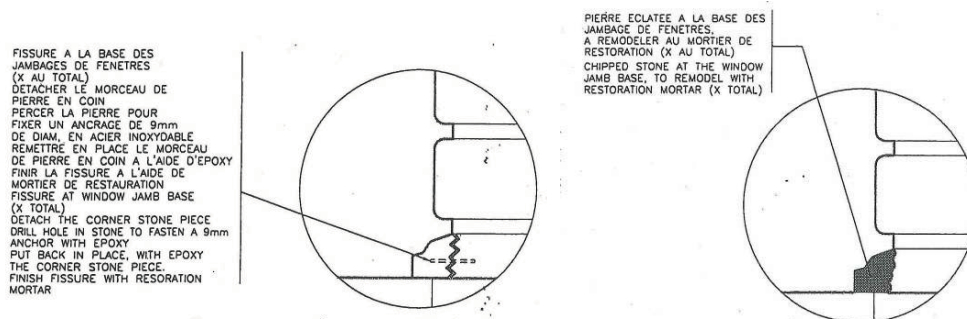


Figure 79 Test sample showing the absence of the specified anchors and the random application of epoxydic binder on stones to be glued together.



Figures 80 and 81 Details showing the proposed repair of the lower corners of the pilasters (drawing no 27 and 26 taken from the drawings for tenders, 1996).

²⁷ Régis Côté et associés architectes (November 30, 2007). *Rapport préliminaire d'inspection de la maçonnerie, Édifice des douanes, 400 place d'Youville - 105 McGill*, p. 5.

- d. The sandstone cladding is friable or is peeling primarily at the base of the corner avant-corps and of the engaged columns (especially on the north and west façades of 400 place d'Youville), at the top of the corner avant-corps and above the carriage entrance of the central avant-corps. This deterioration has apparently aggravated since 1997-1999, but without precisely identifying the cause (water dripping and infiltrations, condensation inside the exterior wall ?);
- e. Notwithstanding the major repair work carried out in 1997-1999, the majority of the sandstone cladding mortar joints are de-bonded, friable or opened, and this in a more accentuated manner at the six (6) corner avant-corps of the building, around the lower portion of the windows, immediately below the main cornice, as well as along the parapets. The mortar joints of the columns are in better condition, but nonetheless friable, and those located around four (4) openings have been replaced with sealant. Site tests have confirmed that repointing carried out in 1997-1999 have been done only on a depth of 10 mm, and that the mortar was not properly bonded with the stone. Lab tests have confirmed a constant chemical composition and amount of binding agent in the mortar, but a considerable variability in compressive strength, likely due to a lack of hydration during curing;
- f. Five (5) stones are displaced, especially at the corner of McGill and Marguerite-D'Youville streets (*figure 82*)²⁸, and at the corners of the central avant-corps;

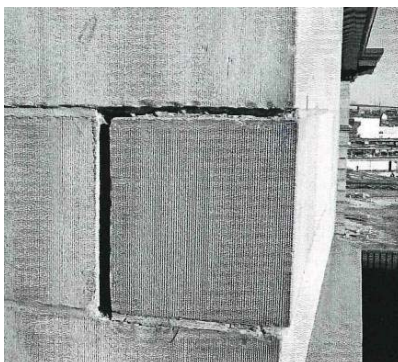


Figure 82 Displaced stone on the 5th floor of the southeastern avant-corps, at the corner of McGill and Marguerite-D'Youville streets.

- g. The absence of a waterproof joint between the base of the exterior wall and the sidewalk allows water to run along the foundations;
- h. The cornice membranes and flashings are in good condition, but moisture stains and the deterioration of mortar joints indicate that the joint above the flashing is apparently not waterproof everywhere;
- i. Sealant joints around windows and the control joints of the building are in good condition;
- j. It is recommended to check the presence of excessive humidity inside the cavities between the exterior wall and the interior partition, especially at the corner and central avant-corps, and to drill openings into partitions if required to allow air movement (as previously suggested, see section 4.3, item "g");
- k. The cost of the proposed work is estimated at approximately 2 M\$ and the duration of the work, carried out in a single stage, to seven (7) months;
- l. Urgent repair work, mainly repointing, were awarded to the contractor Atwill-Morin following this report.

²⁸ Régis Côté et associés architectes (April 24, 2008). *Rapport d'inspection complète - État de la maçonnerie, Édifice des douanes, 400 place d'Youville - 105 McGill*, photo no 13, p. 8.

5. REVIEW OF OTHER DOCUMENTS AVAILABLE

5.1 Investment Analysis Report (2008)

This document indicates, among others, that:

- a. The stone façades were entirely repointed at a cost of 3,2 M\$ in 1997-1999;
- b. The possibility of replacing the exterior cladding was raised, but was rejected considering the quality of the existing materials and their heritage character;
- c. Repointing of the more damaged portions was carried out in the fall of 2008 to waterproof the envelope and secure the structural integrity of the building (no work description could be found, but the interventions have apparently been carried out, at least partially, based on the observations made on site);
- d. A major masonry repair project, estimated at 4,5 M\$, is to be launched for the same reasons, and the first step will be to hire consultants specialized in traditional masonry conservation and restoration to identify the causes of the mortar joints premature deterioration;
- e. A major project to convert the warehouse spaces of 105 McGill into office spaces is underway and work should be completed in 2010-2011 (finally started during the summer of 2012), but the relocation of the laboratories will wait until 2015;
- f. The possibility that two contractors work simultaneously, one inside and the other outside the building, could present a risk in terms of responsibility;
- g. Qualification criteria for consultants specialized in traditional masonry conservation and restoration will be decisive for the success of the project;
- h. The challenge of supplying sandstone is considered as a risk;
- i. Continuous work site supervision is recommended.

5.2 Note to File (2010)

This document indicates, among others, that:

- a. Several hypotheses were provided in previous reports, but no final conclusion could be reached;
- b. No decision was made with regards to the installation of a vapour or air barrier, or the implementation of specific measures, as part of the 105 McGill warehouse spaces conversion project;
- c. An additional exploratory boring, from the inside, will be conducted in the west façade exterior wall, at the southwest corner of the 5th floor, to confirm the presence of cavities in which there would be air movement (such a boring has been made, as observed during the November 22nd, 2011, visit and described in section 2.3.2, but rather on the south façade at the southeast corner of 105 McGill).

5.3 Heritage Integrity Assessment (2011)

This assessment primarily aimed to identify modifications made to the Custom Building and those which threatened its heritage integrity, rather than to perform a detailed condition assessment. However, the main findings with regards to the masonry have been built into the preliminary condition assessment of the masonry presented hereafter (refer to section 6), to avoid repetitions and considering that the author of the present document is the same as for this assessment.

6. PRELIMINARY MASONRY CONDITION ASSESSMENT

As indicated in the introduction, a multidisciplinary team of consultants will soon be hired to conduct a detailed condition assessment of the masonry, and to propose an intervention approach for future repair work. While waiting for this in-depth expertise, the following pages present the observations made during the preliminary assessment conducted by the Heritage CST based in Quebec City (visits of August 31st, September 1st, October 27th, and November 22nd, 2011, as well as of February 16th).

6.1 Granite Cladding

ENTRANCES

- Stones located close to the ground around the entrance doors of the building, for both the 400 place d'Youville and 105 McGill buildings, are eroded by de-icing salt;
- In the case of 105 McGill, this also considerably affects the interior marble door casings.



- The two original lampposts that frame the 400 place d'Youville entrance show several traces of rust, staining the stones below.



- Stones are rust stained in every location where the handrails are attached to the exterior wall;
- Some stones located above are also rust stained, but the reason is less clear.

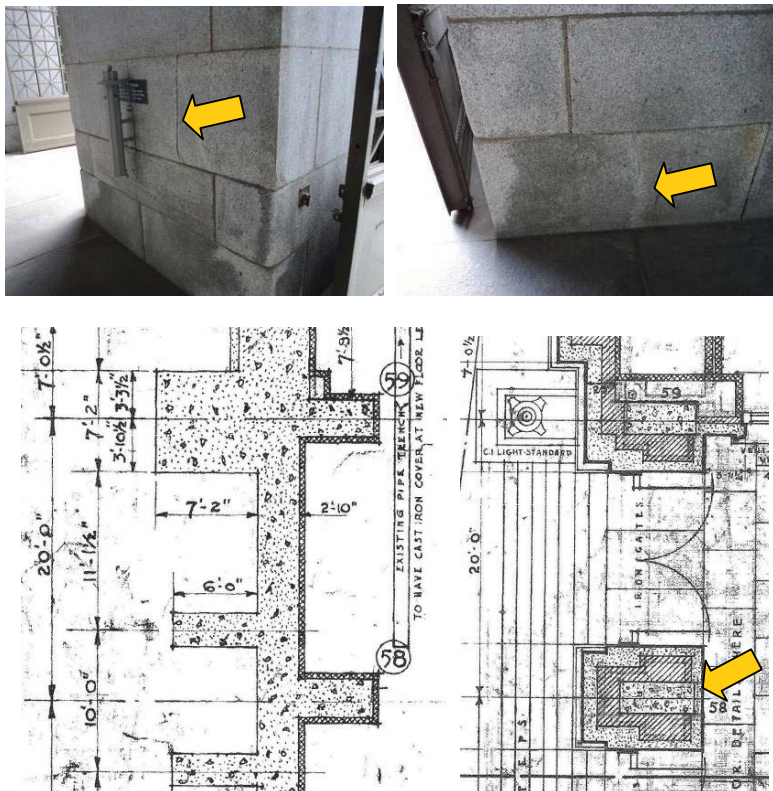


PORTICO / 400 PLACE D'YOUVILLE

- Along the semicircular arches that crown each of the three openings of the portico, several stones are displaced and the width of the mortar joints increases near the top;
- Outside, the stones are sagging and slightly protruding;
- Similar displacements are visible inside the portico.



- Behind the pillars of the portico, several mortar joints are de-bonded or opened, some stones are deeply cracked and others are slightly displaced;
- Based on the original drawings (pages 1 et 2), the foundations do not entirely support the pillars above. Also, each pillar is made of a concrete column embedded on three faces with a brick backing, and clad with granite. However, behind the pillars, the cladding is apparently directly in contact with the concrete column.



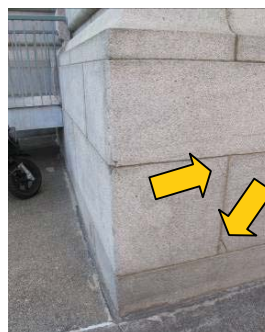
PORTICO / 400 PLACE D'YOUVILLE (continued)

- The bronze elements that adorn the portico (the two wall grills, the two grills protecting the transom windows above the entrance doors, and the display case) are all generally in good condition;
- Some stones close to these elements are drilled with former anchors, and stones where ashtrays have been installed are stained with glue.



PLINTH

- At the southeast corner of 105 McGill, the mortar joints are de-bonded, and the corner stone at the base of the wall is displaced (eastward);
- At the northeast corner of 105 McGill, two stones are fractured.

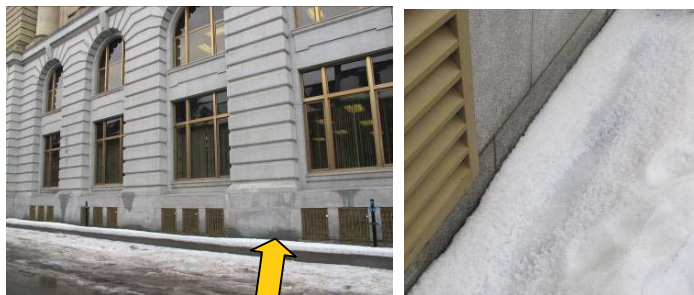


- Stones located along the plinth, especially on Normand Street, are eroded by de-icing salt, striped, rust stained and fractured in some places, likely due to snow removal along the sidewalk;
- Several stones peel and many mortar joints are opened, especially along McGill Street.



PLINTH (continued)

- Stones located close to the ground are also splashed by rain and melting snow dripping from the cornice that separates the two lower storeys from the upper portion of the building, and which bounces back against the wall after reaching the sidewalk.



- Several lower corners at the base of the openings are fractured and, above, the anchors of the wire mesh grilles installed in front of the original cast iron grilles are located very close to the face of the stones;
- There is moss in the joint where the wall meets the sidewalk;
- Yellow triangles painted on some of the stones, mainly at the northwest and northeast corners of the building, indicate an unidentified reference system.



PILASTERS

- With its cyma reversa profile, the base stone extends outside the axis of the pilasters, and the pressure difference thus created weakens this flare and incidentally the corners. Moreover, the mortar joints perpendicular to the façade are spalled, facilitating water infiltrations, which results, in the long term, in the fracturing of most corners, notwithstanding the repairs made during the 1997-1999 campaign.



PILASTERS (continued)

- Some castings have held adequately, but several mortar joints have been replaced with sealant;
- Right below, some vertical mortar joints are backed with a compressible filler, here on the 105 McGill south façade.



CORNER AVANT-CORPS

- With their numerous inside corners, the corner avant-corps are apparently more subject to snow build-up. Also, stones located below the cornice that separates the two lower storeys from the upper portion of the building are more exposed to dripping melting snow and the resulting ice build-up.



CLADDING

- Several vertical mortar joints are opened where the south façade meets the central avant-corps, among others;
- Elsewhere, all vertical mortar joints located along inside corners have been replaced with sealant;
- Several mortar joints are also opened around the bases that support the original lampposts, at the entrance of 400 place d'Youville.



CLADDING (continued)

- Several stone lintels located above the ground floor windows, especially on the south façade of 400 place d'Youville, are deeply fractured. The vertical mortar joint above the crack is de-bonded along the pattern protruding below the window sill;
- Several stones are moisture or soil stained.



- Some stones are stained and bear drill holes where former signs where, such as at the corner of Normand Street and place d'Youville among others;
- Some letters are almost erased, but remain visible on a stone located inside the courtyard, at the northwest corner of 105 McGill.



OPENINGS

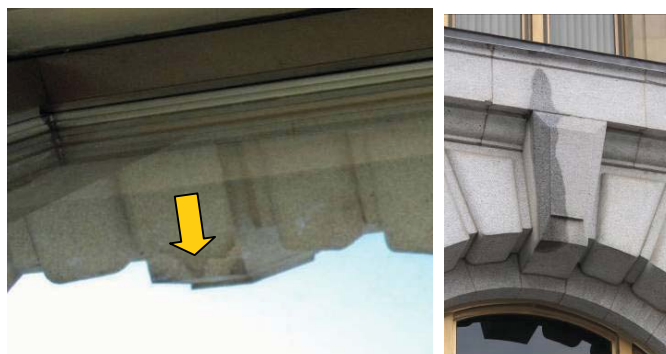
- Above the main entrance of 105 McGill, the mortar joints around the key have been replaced with sealant;
- Directly above the main entrance pediment of 105 McGill, the window sill is fractured.



- Some keys are displaced at the top of the semicircular arches that crown the large openings framing the ground floor and first floor windows (here on the north façade of 400 place d'Youville);
- Some keys are eroded (here on the south façade 105 McGill).



- Most keys are moisture and soil stained, a phenomenon accentuated, among others, by rain and melting snow dripping from the cornice above.



OPENINGS (continued)

- At 400 place d'Youville, the stone lintels, which crown the ground floor windows, are reinforced with a steel lintel. Some rust stains are visible where steel meets stone;
- Several window sill stones are peeling;
- Several mortar joints located at the ends of the window sills are de-bonded and disaggregated.



- The edges of several window sills are eroded and/or cracked (the lamp brackets are attached to the lower window mullion and not into the stone).



- Below the ground floor window sills, several stones are disaggregated along the deep shelf that crowns the plinth;
- If many stones have indeed a substantial size, some of them are no more than four (4) or five (5) inches thick, as it is the case on each side of the delivery platforms inside the courtyard.



CORNICE

- Some stones are cracked along the cornice that separates the 1st floor from the 2nd floor.



CENTRAL AVANT-CORPS

- At the base of the central avant-corps corners, the mortar joints are de-bonded and opened;
- Where the central avant-corps meets the 105 McGill building, several stones are fractured.

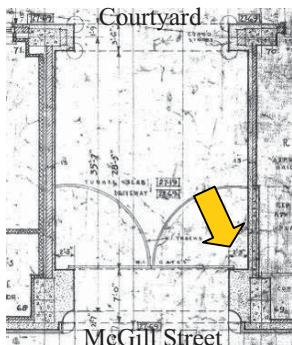


- On each side of the carriage entrance, several mortar joints are opened;
- The lower corners of the pilasters are fractured, close to the opening of the carriage entrance.



CENTRAL AVANT-CORPS / CARRIAGE ENTRANCE

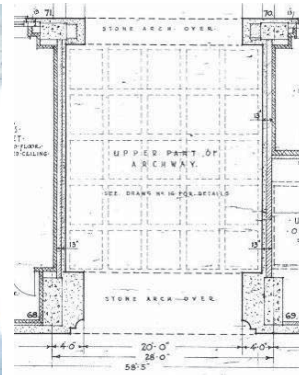
- On each side of the semicircular arch of the carriage entrance, close to McGill Street, clipped and rusted anchors indicate the original location of the large cast iron grills, now fixed in place in front of a curtain wall that blocks the mouth of the passage;
- The original hooks of the grills remain in place, here on the west wall.



- On the western side of the carriage entrance, an enclosed area made of wire mesh doors suspended from a massive steel beam is used to store fuel.



- At the northern end of the carriage entrance, mortar joints around the key of the semicircular arch are larger than elsewhere;
- As for the ceiling of the carriage entrance, the uniform coat of parging is different from the pattern created by the concrete cofferings shown on the original drawings, which could be an indication that the original ceiling underneath is in bad condition and/or has been insulated and covered.



CENTRAL AVANT-CORPS / CARRIAGE ENTRANCE (continued)

- At the centre of the semicircular arch of the carriage entrance, close to McGill Street, at least one stone is rust stained;
- Along the semicircular arch of the carriage entrance, close to the courtyard, several stones are rust stained in locations where electrical conduits and junction boxes were previously placed;
- Inside the courtyard, on the north wall of the central avant-corps, several stones are rust stained where a vent and a louver have been cut through the wall.



- At the base of the semicircular arch close to the courtyard, bollards show signs of impact (one of them has been repaired), and are stained. Cleaning tests made during the summer of 2011 proved unsuccessful.



COURTYARD

- Stones are stained above the small marquee that protects the exterior door of 400 place d'Youville (the marquee is not shown on the original drawings);
- All stones to which conduits or wiring are attached are rust stained around the anchors;
- Several holes have been filled under the stairwell window (east façade of 400 place d'Youville), and the lower north corner of the latter is fractured;
- Close to the ground, stones are eroded by de-icing salt, and numbers have been painted in some locations.

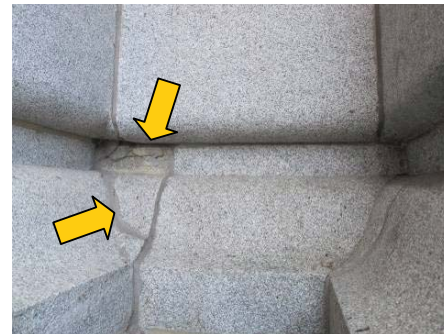


LEAN-TO ON MARGUERITE D'YOUVILLE STREET

- The lean-to located at the northeast corner of 105 McGill and which gives access to the underground parking was added in 1934-1936, along with the construction of 400 place d'Youville. When this modification was made, and in order to create “a bulkhead over the ramp, a portion of the first floor was removed and raised about 2 feet.”²⁹;
- One of the stones of the northeast corner is fractured along the mortar joints.



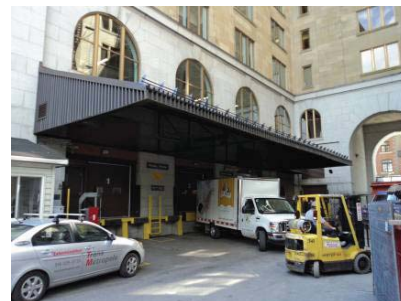
- Inside, cracks in the concrete foundations and brick walls indicate a displacement;
- And this displacement apparently ripples through outside, where the north wall of the lean-to meets the eastern façade of the 105 McGill, as at least one stone is fractured and disaggregated.



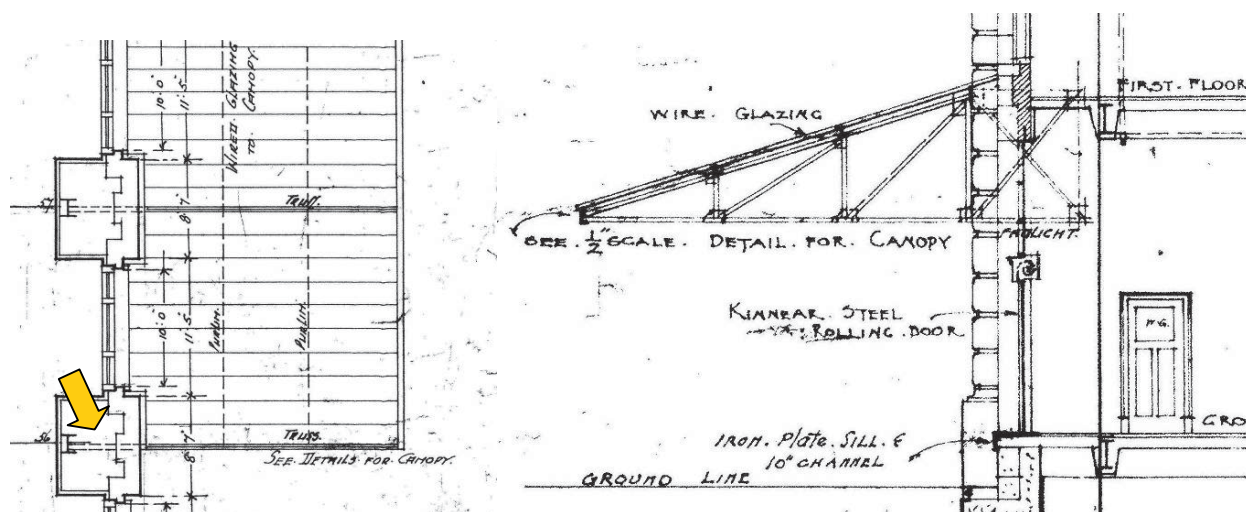
²⁹ Department of Public Works (1937). *Annual Report*, p. 22.

MARQUEES

- In anticipation of the warehouse spaces conversion and roof repairs of 105 McGill, the marquee located along Marguerite-D'Youville Street was demolished in August 2011 (under its corrugated metal cladding, the identical one located in the courtyard remains in place).



- The ends of the steel trusses, which are embedded into the wall and connected to the steel columns inside, remain in place (excerpts from the original drawings, p. 4 and 11).



- The junctions between the steel structure and the stone cladding are no longer protected;
- Around the marquee, stones are stained by soil and bird droppings.



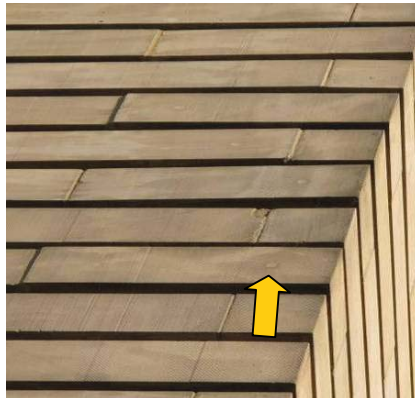
6.2 Sandstone Cladding

CORNER AVANT-CORPS

- Above the cornice that separates the two lower storeys from the upper portion of the building, almost every stone that forms the base of the pilasters is significantly exfoliated;
- These stones are splashed by rain and melting snow dripping down from the cornice above;
- In some locations, plugs betray the presence of anchors.



- Several stones are displaced along the southeast, northeast and northwest corner avant-corps of the building, meaning that they protrude from the face of the wall by a few inches, and that, in some cases, they rotate outwardly. These displacements suggest the presence of cavities between the stone cladding and the brick backing;
- Plugs betray the fact that many stones have been anchored, here on the south façade of the southeast corner avant-corps of 105 McGill;
- Although most mortar joints are de-bonded from the stones, they follow the direction of the displacements, which indicates that the latter did not occur recently. For now, the stones above are apparently heavy enough to refrain displaced stones from protruding farther. The displacements are nonetheless more accentuated in the upper portion of the pilasters (shown by the larger width of the mortar joints), where there is less weight above.

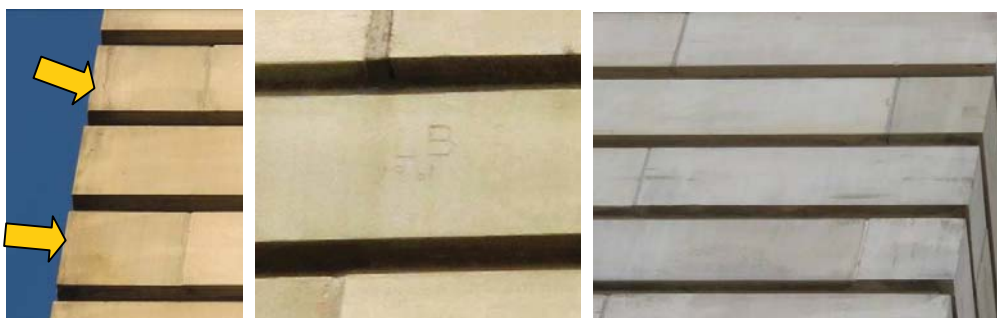


CORNER AVANT-CORPS (continued)

- When comparing observations made on October 27, 2001, with those made on February 16, 2012, stone displacements are apparently ongoing, considering that the gap between some of them has increased (here on the east façade of the northeast corner avant-corps);
- At fifth floor level on the southeast corner avant-corps, one stone is completely detached from the adjacent ones.



- On the eastern façade of the southeast corner avant-corps, at least two stones are cracked at third floor level;
- Also in this location, but on the 5th floor, a stone bears the initials “L.B.” and the date « 1961 », which could indicate that masonry repairs were carried out at that time;
- In several locations, such as on the north façade of the northeast corner avant-corps, the colour of the mortar joints varies from light beige to dark grey, indicating several repointing campaigns and/or possibly the use of different products.



- Higher, above the small cornice that separates the 5th from the 6th floor, several stones are also displaced (here on the southwest inside corner of the southeast corner avant-corps of 105 McGill);
- Plugs indicate that many stones have been anchored, here on the south façade of the southeast corner avant-corps of 105 McGill. In the same location, the width of the mortar joints increases with height, and several of them are de-bonded, here following a steplike pattern matching the displaced stones.

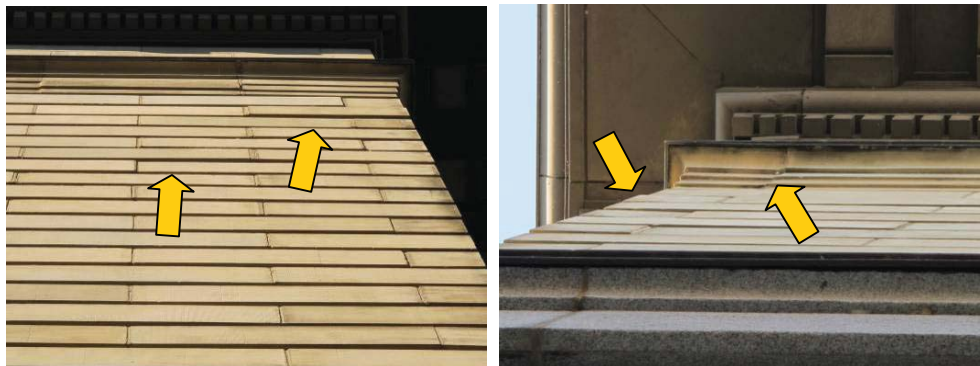


CORNER AVANT-CORPS (continued)

- The displacement of several corner avant-corps stones is especially dramatic at night at the southeast corner of the building, when the illumination emphasizes cast shadows (here in October 2012).



- On the eastern façade of the northeast corner avant-corps of the 105 McGill, many mortar joints are opened and several stones are displaced, again in a more accentuated manner in the upper portion of the pilasters (the width of the mortar joints increases with height), where there is less weight above. These displacements suggest the presence of cavities between the stone cladding and the brick backing;
- These displacements ripple through the northern façade of the northeast corner avant-corps.



CORNER AVANT-CORPS (continued)

- On the western façade of the northwest corner avant-corps of 105 McGill, several stones are displaced along the pilaster, including below the architrave's cornice, which separates the 5th from the 6th floor. These displacements suggest the presence of cavities between the stone cladding and the brick backing;
- In the inside corner, most of the north façade flush joint cladding apparently tips back from the pilaster's plane, an impression perhaps accentuated by the displacement of the architrave that separates the 5th from the 6th floor, and the distortions in the main cornice above.



- On the north face of the northwest corner avant-corps of 105 McGill, some stones are moisture stained;
- On the north face of the northwest corner avant-corps of 400 place d'Youville, water likely infiltrated through the top of the main cornice was running down along the 6th floor wall on February 16, 2012.



CORNER AVANT-CORPS (continued)

- Most of the stones of the cornice located at the base of the parapet, at the top of the 7th floor, are damaged and stained from moisture and efflorescence (here at the northeast inside corner of the southeast corner avant-corps, but also in a more accentuated manner at the northwest corner of the northwest corner avant-corps of 105 McGill). Mortar joints are also larger in this location than elsewhere or simply opened.



- Vertical joints on each side of the flat crests have been replaced with sealant, and their width increases as they reach the cornice above.



COLONNADES

- Most stones located at the base of the engaged columns are exfoliated, and some of them are fractured, a phenomenon accentuated, among others, by melting snow dripping down from the cornices above.



- Only one fractured corner, along McGill Street, is detached and rests on top of the column's base.



- Several window sills, some stones located between the columns and the corner avant-corps, as well as at the base of some columns, are stained by birds droppings.

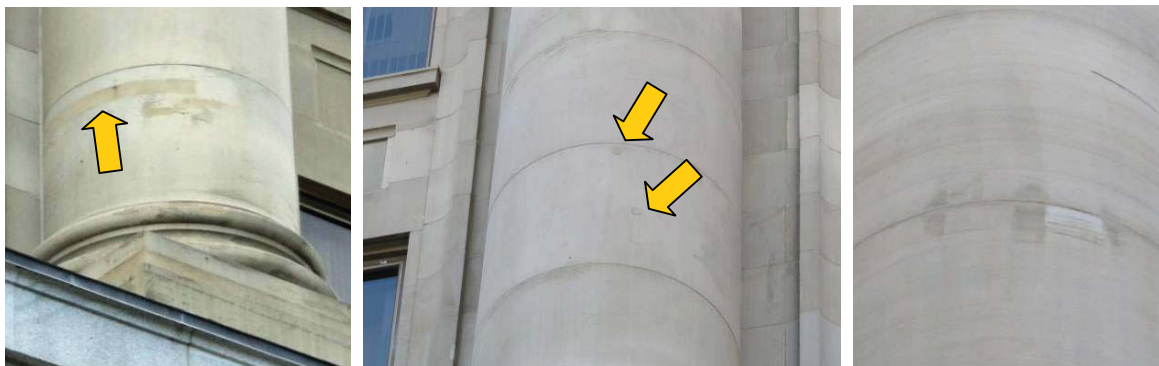


COLONNADES (continued)

- Some columns have scars or natural streaks.



- Some of these natural defects have apparently been repaired, here on the northern façade of 400 place d'Youville;
- On this same façade, plugs indicate the presence of anchors;
- And touch-ups with restoration mortar indicate some interventions along the mortar joints between drums, perhaps due to excessive pressure between the stones.

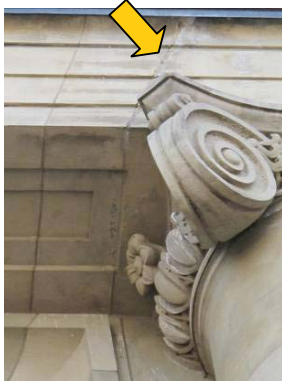


- Some capitals are cracked where they meet the architrave;
- Immediately above the flare at the top of the columns, the edges of a lighter colour indicate that they have all been remodelled using restoration mortar.

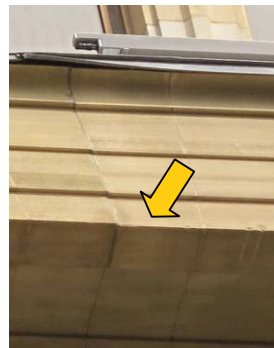


COLONNADES (continued)

- Above the columns, the architrave is stained with moisture and efflorescence, and several mortar joints are opened, here on the northern and southern façades of 105 McGill;
- On the western façade of 400 place d'Youville, the mortar joints of the architrave have been replaced with sealant above the capitals.

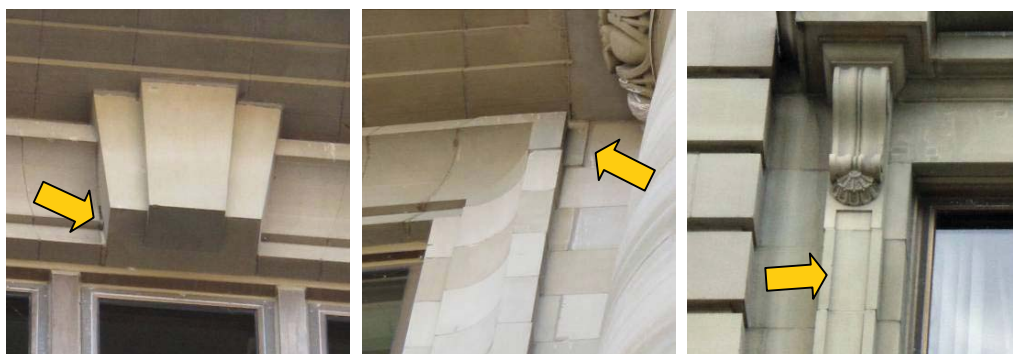


- There are infiltrations in the architrave both above the columns and at the centre of each span;
- Some of the architrave's keys are sagging.



CLADDING

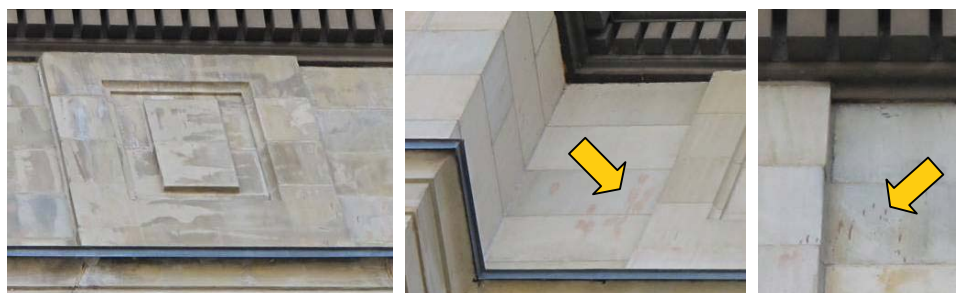
- Below the architrave, several mortar joints around the keys crowning the 5th floor openings are larger or opened, or have been replaced with sealant;
- Some stones are displaced in the upper jamb corners, , and vertical mortar joints, between the columns and jambs, increase in width as they reach the architrave;
- On the western façade of 400 place d'Youville, the pilaster supporting the pediment of one of the 2nd floor window is slightly twisted.



- At the centre of the northern façade of 400 place d'Youville, water likely infiltrated through the main cornice had run down along the 6th floor wall, and frozen into ice (November 22, 2011).



- Along the northern façade of 105 McGill, stones are stained with irregular patterns, which could indicate the presence of a coating, or of a previous cleaning intervention that would not have carefully maintained a constant distance between the nozzle and the wall, and that would have been conducted randomly;
- Rosy stains are visible close to the northeast corner avant-corps of 105 McGill, as well as some paint drops.



OPENINGS

- Some window sills are pitted, especially on the western façade of 400 place d'Youville;
- Above some of the openings, especially of 400 place d'Youville, stone lintels have natural streaks, while others are moisture stained where they meet the window;



- Almost all mortar joints located in the lower corners of the openings, on all façades, are de-bonded, disaggregated and/or opened;
- Some sealant joints are also de-bonded around windows;
- The mortar is sometimes entirely disappeared from the joint, but scraps remain on the window sill;
- Several joints have been filled using sealant;
- In many locations, the portion of the stone located between the window sill and the first joint above has been repaired with mortar, but is now disaggregated.



PARAPETS

- Most parapet stones are exfoliated and moisture, soil and copper stained. Some are fractured;
- Almost all mortar joints are de-bonded and disaggregated.



- Some mortar joints are especially deteriorated and/or opened, indicating that some stones could eventually entirely de-bond and slide outwardly. Simultaneously, in most of these worst cases, plugs indicate the presence of anchors;
- In the case of 400 place d'Youville, the upper portion of the parapets is apparently vented, as indicated by the presence of small air intakes.



CENTRAL AVANT-CORPS / CORNERS

- At least two stones are displaced between the 4th and the 5th floor;
- At least one vertical joint is entirely opened below the main cornice;
- Some corner stones are cracked, and some have been repaired.



CENTRAL AVANT-CORPS / CLADDING AND PARAPET

- In the central bay of the central avant-corps, the ends of all window sills are disaggregated and moisture stained, and all mortar joints are at least partially opened;
- At least two stones are displaced in the central portion of the parapet, several are stained with moisture and efflorescence, and some have been repaired with new pieces of a contrasting colour.



- The back and the buttresses of the central avant-corps parapet are covered with a corrugated steel cladding. The condition of the concrete wall behind (based on the original drawings and a photograph from June 5, 1998, right) is unknown.



- Almost all parapet stones are significantly exfoliated, on all three outward façades, resulting in the loss of the original combed finish;
- Almost all mortar joints are de-bonded, disaggregated and/or opened.



COURTYARD / CORNER AVANT-CORPS

- Some stones are slightly displaced on the eastern façade of the northeast corner avant corps of 400 place d'Youville and, in a significantly more accentuated manner, on the northwest corner avant-corps of 105 McGill, both at mid-height and at the level of the cornice that separates the 5th from the 6th floor. These displacements suggest the presence of cavities between the stone cladding and the brick backing;
- On the western façade of the northwest corner avant-corps of 105 McGill, regularly placed plugs (two per stone, neatly centered) indicate the presence of anchors, but several others smaller repairs along the joints are more enigmatic.



- Some stones are also displaced below the cornice that separates the 5th from the 6th floor. However, plugs indicate the presence of double-stacked anchors (two per stone);
- Several mortar joints are opened at the level of the cornice located at the base of the parapet.



COURTYARD / CLADDING

- Some stones are slightly displaced on the eastern façade of 400 place d'Youville;
- The three façades delineating the courtyard are stained with irregular patterns, which could indicate the presence of a coating, or of a previous cleaning intervention that would not have carefully maintained a constant distance between the nozzle and the wall, and that would have been conducted randomly;
- Stones immediately above the cornice that separates the two lower storeys from the upper portion of the building are significantly moisture stained, especially on the western façade of 105 McGill.



- On the eastern façade of 400 place d'Youville, stones show signs of repairs where an elevating work platform was anchored during the late summer of 2011.



- On the eastern façade of 400 place d'Youville, at least one stone is significantly exfoliated.



COURTYARD / OPENINGS

- As for the façades along the street, almost all mortar joints located in the lower corners of the openings are debonded, disaggregated and/or opened. Several have been filled using sealant;
- Some window sills have been repaired using repointing mortar or reconstruction mortar;
- On the northern façade of the central avant-corps, moss is forming along window sills, as well as where the stone cladding meets the flashing of the cornice that separates the two lower storeys from the upper portion of the building (the yellow and black debris comes from the roof repairs work).

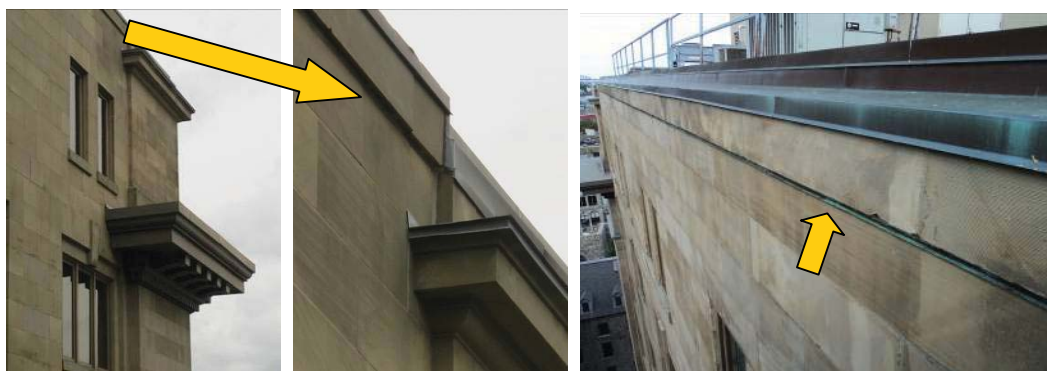


- Some stones bear black stains, especially above or close to the windows;



COURTYARD / PARAPET

- At least one stone is displaced along the eastern façade parapet of 400 place d'Youville;
- In the case of 105 McGill, a copper flashing is placed under the top stone course, in addition to the flashing protecting the top of the wall.



ORIGINAL ROOF PENTHOUSES

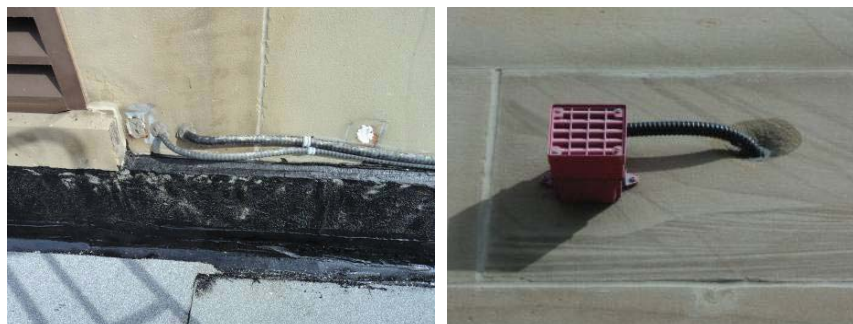
- Over the years, the concrete penthouses of 105 McGill (above the elevators and the now blocked off skylight which originally lit naturally the freight elevators mechanical room) have been absorbed into the construction of new penthouses clad with corrugated steel. However, notwithstanding the construction of a similar penthouse on the roof of 400 place d'Youville, the two original penthouses remain clearly visible;
- If some stones have a combed finish, especially along the eastern façade that faces the courtyard (repointing work was carried out in this location in August 2011, unfortunately damaging the edges of the stones), the majority of the other stones have a smooth finish;
- If corner stones are apparently thicker, others are no more than four (4) inches thick.



- The sandstone cladding of the penthouses shows very strong natural veining, and the colour varies considerably from one stone to another, from grey to bright yellow, with all the nuances of beige;
- Some stones are pitted and/or have natural streaks.



- Several stones have been damaged when holes were drilled to run various cables.



6.3 Other Elements

ROOFING

- The original roofing (six plies of roofing felt, saturated with bitumen, and covered with coal tar pitch and lake or river gravel) has been replaced with an elastomeric membrane (repair work underway), including on the roof of the skylight that lit the mechanical room above the freight elevators;
- All basins were modified following the construction of several additions around the original penthouses.



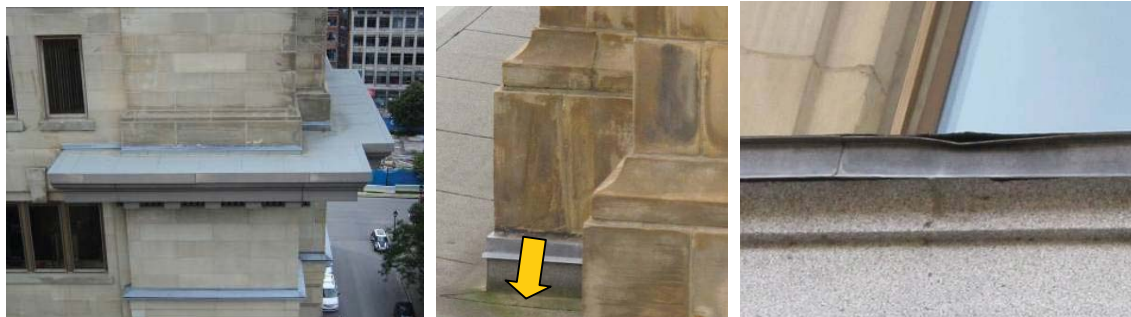
FLASHING

- Many sealant joints along copper flashings, recently replaced in the case of the corner avant-corps, are dry and perforated;
- Notwithstanding attempts to generously seal the flashings covering the parapets of the corner avant-corps or to mechanically fasten the flashings to the central avant-corps parapet, openings are visible in some locations, and opened mortar joints above allow infiltrations behind the sheet metal.



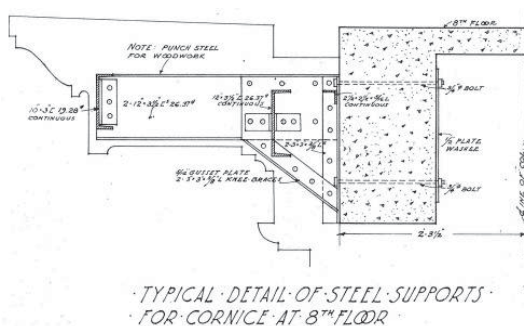
MEMBRANES

- The tin coated copper flashings and elastomeric membrane protecting the cornices are apparently in good condition, but this could not be thoroughly assessed due to the lack of access;
- In the northwestern inside corner of the northwest corner avant-corps of 105 McGill, there are moisture stains and moss on the membrane protecting the main cornice that separates the 6th from the 7th floor;
- The flashing located below the membrane which covers the cornice at the base of the engaged columns is buckled in several places.



CORNICES

- The main cast iron cornice and the one located at the base of the parapet appear to be in good condition, but were not thoroughly assessed due to lack of access;
- Attached to the 7th floor edge beam (8th floor on the drawings), the imposing main cornice, which divides the 6th from the 7th floor, shows some distortions, primarily where joints in the sheet metal are immediately above the edge of a corner avant-corps;
- Everywhere, a slot separates the stone cladding upper course from the lower quarter round of the cornice. On the northern façade of the northwest corner avant-corps of 105 McGill, the quarter round seems to disappear behind the cladding.



CORNICES (continued)

- Inside the stairwell located in the eastern portion of the central avant-corps, the interior gypsum plasterboard finish is deteriorated on several storeys, likely due to water infiltration behind the main cornice that divides the 6th from the 7th floor. An access door located on the same axis gives access to a roof drain.



STRUCTURE

- The concrete covering the steel structure of 105 McGill is cracked in several places, especially on the 5th floor (perhaps more noticeable because the structure is visible almost everywhere in this location);
- In some places, spalls are visible in the concrete beams.



- In the southeast corner of the 5th floor, a membrane apparently joins, where the walls meet the ceiling, the vapour barrier which covers the « buff pressed bricks » finish and the concrete structure above. Rust stains are visible along the entire joint between the membrane and the concrete;
- Some concrete floor slabs of the 105 McGill have significant cracks.



STRUCTURE (continued)

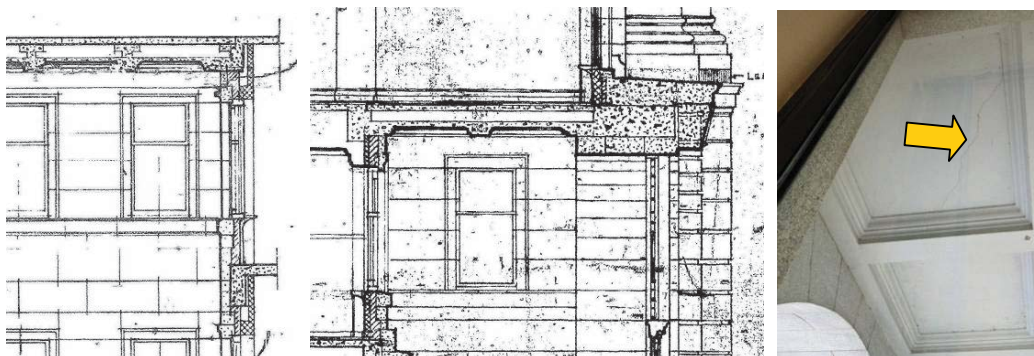
- On both north and south façades of 400 place d'Youville, the brick backing in between concrete beams of the exterior wall shows the presence of efflorescence (a condition only observed inside the two service spaces located on the 6th floor, thanks to the access doors that have been installed).



- On the 5th floor of the southeast corner of 105 McGill, there is significant air movement between the brick backing walls of the exterior wall, and this air enters the room, as the building is apparently under high negative pressure due to the Environment Canada laboratory hoods;
- On the north side of 400 place d'Youville, an opening drilled into the 6th floor concrete slab, to run drainage and heating pipes, shows that at least two floor slabs below also have openings. There is no air movement in this service space.

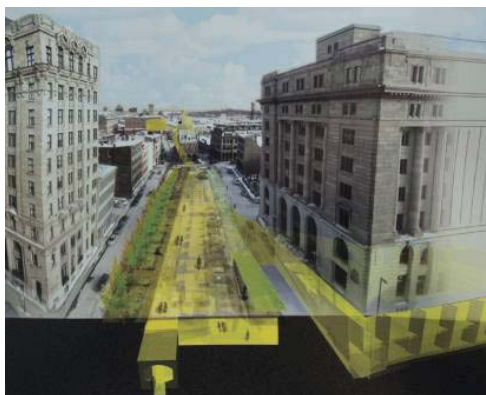


- Made of beams supporting a very thin concrete slab separated from the floor above by an air space (excerpts from the original drawings, p. 10), the portico's ceiling of 400 place d'Youville shows several cracks.



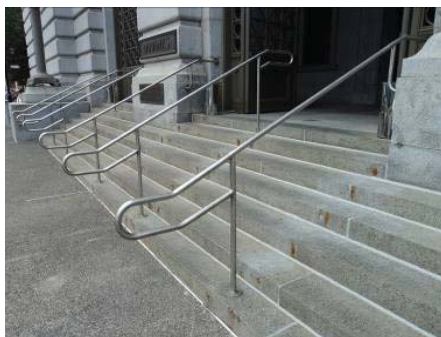
FOUNDATIONS

- Although this will have no immediate impact on future masonry repairs , it is important to keep in mind that the Pointe-à-Callière Museum is planning on presenting one day the archaeological remains located under place d'Youville (excavated during the summer of 2011), as well extending its activities in the basement ,the ground floor and the courtyard of 400 place d'Youville building³⁰;
- Otherwise, the information with regards to the basement is incomplete, considering that the interior finishes largely hide the concrete foundation walls, and that the windows, placed very high above the floor, are difficult to access.



STAIR AND RAMP / 400 PLACE D'YOUVILLE

- All risers are rust stained where the former winter carpet anchors were located;
- A large portion of the mortar joints of the access ramp located at the southwest corner of 400 place d'Youville are friable and/or opened.



³⁰ Lapointe Magne et associés, architectes et urbanistes (no date). *Pointe-à-Callière, Musée d'archéologie du 21^e siècle*, 7 pages (plans and sections). / Quartier international de Montréal et Lapointe Magne et associés, architectes et urbanistes (April 2007). *Pointe-à-Callière, Musée d'archéologie du 21^e siècle, étude de faisabilité*, 47 pages.

CAST IRON GRILLS IN THE BASEMENT WINDOWS / ENTIRE BUILDING

- Several basement windows have been replaced with ventilation louvers;
- The remaining windows, all protected with original cast iron grills, have been overlaid with an additional wire mesh grill, which hides the condition of the elements behind, and makes it difficult to assess their condition;
- It is nonetheless possible to see, in some places, that the original cast iron grills are severely rusted where they meet the stone cladding.



CAST IRON GRILLS IN GROUND FLOOR WINDOWS / 105 MCGILL

- The original cast iron grills, which protect the basement and ground floor windows of 105 McGill (and the stair window of 400 place d'Youville facing the courtyard), are undermined by rust, and are no longer firmly anchored into the stone.



CAST IRON GRILLS OF MAIN ENTRANCE PORTICO / 400 PLACE D'YOUVILLE

- Notwithstanding recent paint touch ups in the lower portion of the grill doors of the portico, these doors are rusted and stones below are stained;
- The original bronze hooks remain in good condition.



LIGHTING

- Considerable efforts were deployed to integrate and conceal electrical wiring and lamps when the building was illuminated in 2010-2011. However, this nonetheless resulted in façades along place d'Youville, as well as along McGill and Marguerite-D'Youville streets, being drilled with hundreds of holes, and clustered with all these elements, which are an obstacle to future masonry and cornice repairs.



COAT OF ARMS AND PLAQUES

- The coat of arms located southwest of the main entrance of 400 place d'Youville, as well as several bronze plaques are all in good condition, although they may have to be temporarily removed during future repointing work;
- Some plaques have rusted screws, such as here at the entrance of 105 McGill.



HEATING CABLES

- One or more heating cables run along half of the length of the cornice located at the base of the parapet of the southern façade of 400 place d'Youville, meaning from the southwest corner of the building up to the middle of the colonnade;
- On the southwest corner avant-corps, one of these cables is apparently detached.



7. CONCLUSION

7.1 Summary

Analysing the available information on the building, reviewing the previous restoration project file and previous expert reports, as well as performing a preliminary condition assessment of the masonry together lead to the following conclusions:

1. The Montreal Customs Building is a well-documented and highly valuable heritage building which largely maintains its integrity, notwithstanding several insensitive alterations over the years. This integrity would nonetheless benefit from heightened awareness and care when future interventions will be carried out;
2. Some repairs made in 1997-1999 do not meet trade practise, and the beneficial effects of this campaign have been much shorter than what is usually offered by interventions of this scope (premature deterioration of the mortar joints, repeated fracture of the lower corners of the pilasters, and displacement of several stones at the corner and central avant-corps, stabilized, but resolved, among others). These repairs must therefore be entirely replaced;
3. Notwithstanding the displacement of several stones of the corner avant-corps of 105 McGill, and the de-bonding of the majority of the mortar joints, stones located above are apparently heavy enough to refrain, for now, stones from protruding farther out of the wall plane. Urgent stabilization work has thus not been required in the fall of 2011. However, humidity and water will continue to accumulate inside the cavities between the cladding and the brick backing, in locations where stones are displaced, accelerating the deterioration of the wall.

As for the stone fragments that have detached from the façades over the years, they mostly originate from the ground floor of the building (lower corners of the granite pilasters), and this situation represents a relatively low risk for public safety. However, the numerous displaced stones at the three corners of 105 McGill and at the two corners of the central avant-corps are mainly located at the 4th, 5th and 6th floor, not to mention the severely deteriorated stones of the parapets. This situation definitely represents a higher risk.

In addition, the exfoliation of the stones and the de-bonding of the mortar joints, especially at parapet level, will continue. Although these processes are accentuated here, among others, due to the superficial repointing made in 1997-1999, they are standard aging processes. Also, most debris should be slowed down or stopped in their fall by one cornice or another, as it is currently the case, but a risk remains that they reach the sidewalk. This said, the existing condition of the Montreal Customs Building envelope, even if assessed in a preliminary manner for now, requires major repair work, including the replacement of numerous stones, and this, only a dozen years following the previous campaign;

4. Apart from the context of their respective mandates, previous expert reports present relevant findings and assumptions with regards to the condition of the masonry, but none of them offers a comprehensive and totally accurate understanding of the building's behaviour or a complete portrait of the situation. They thus systematically underestimate the scope of the deteriorations and of the repairs to be performed (the deteriorations observed on site during the fall of 2011 by PWGSC are considerably more significant than what was compiled in any previous description);

5. Based on the above, it is no longer possible to only secure the cladding, and this evolution of the situation renders obsolete all previous justifications, mandates, statements, plans and reports. Consequently, the interventions proposed in previous expert reports, as well as the approach put forward in the 2008 IAR could only partially slow down the current deteriorations, and thus fail to ensure the long term conservation of this heritage building, one of the most visible and prestigious federal government property in the Quebec Region. Moreover, confining the repairs to stabilization work of some portions of the building would result in repeating what was done during the previous campaign of 1997-1999, and to face again a difficult situation in just a few years. Finally, returning to a limited scope of work, defined several years ago based on incomplete data and a poor understanding of the characteristics and deterioration of the building, is therefore absolutely not recommended;
6. The present document paves the way for a future detailed condition assessment of the masonry, which an inspection from a basket, the sounding of the stones and exploratory borings can only permit. Considering the complexity of the issues, it would be wise that this assessment be conducted by a team composed of an architect, a structural engineer and a mason, all specialized in traditional masonry, starting with the locations where stones are displaced and where mortar joints are opened, situations that represent a relative risk for public safety. Hiring such a multidisciplinary team, and a especially a structural engineer, is not to conduct a complete structural analysis of the building, but to get a balanced and comprehensive condition assessment of the masonry, combining the global perspective of the architect, the more specific view point of the engineer, and the practical knowhow of the mason.

The objective of future repair work would not only be limited to public safety measures, but would be to ensure the weatherproofing of the exterior walls and the integrity of the building's structure, while respecting trade practice, as well as the applicable policies with regards to construction work planned and performed on and inside a federal heritage building;

7. In order to show due diligence while taking into consideration the delays to get the required approvals and financing, hire consultants and launch a call for tenders for a project of this scope, this detailed assessment will likely be conducted in 2013, in order to prepare final plans and specifications in 2014, and to start construction in the spring of 2015, stretched on a period of at least two to three years.

7.2 Recommendations

Based on the analysis and findings presented in this report, several questions remain unanswered. In order to fill in the gaps, it is recommended, during the detailed assessment that will be carried out over the next few months, to:

a. Outside:

1. Assess the condition of mortar joints and of every stone unit to verify the presence of any defect or deterioration (exfoliation, erosion, cracks, fracture, etc.);
2. Probe every stone unit using a mason's hammer to detect cavities and/or delamination, especially in the case of stones placed bed out;

3. Carry out exploratory borings from outside, at a minimum into the southeast and northwest corner avant-corps of 105 McGill, in order to better understand the causes of the stone cladding displacements, and to assess the condition of the brick backing behind. Also assess the type of anchors installed behind the plugs, as well as the colour of the original mortar joints;
4. Study the role of thermal expansion on the steel structure, especially on the façades exposed to sunlight on the corner avant-corps of 105 McGill, in relation to the fact that cladding stones are piled on a height of seven storeys, without intermediate supports (in order to clarify the displacements observed). Similarly, explore the possibility that stones push onto one another, especially on the west façade of the northwest corner avant-corps of 105 McGill;
5. Perform a detailed analysis of the displacements observed along the pillars, and semicircular arches;
6. Explore the possibility that the load of the pillars located between the ground floor and first floor openings is such that it contributes to the fracturing of the lower corners of the pilasters;
7. Take advantage of the means to access the façades to assess the condition of doors and windows;
8. Assess the condition of the roofing, of all parapets, cornices, as well as of their membranes and flashings;
9. Confirm the presence of a coating on the façades, especially inside the courtyard, or that an irregular cleaning of the stones was carried out;
10. Carry out a detailed condition assessment of all exterior cast iron elements, such as the grill doors of the portico, the grills protecting the transom above the two entrance doors, the display case between the two entrance doors, the decorative grills on the walls of the portico, the two lampposts framing the entrance of 400 place d'Youville, the grills that protect the basement (the original ones in cast iron and the ones installed more recently in wire mesh) and ground floor windows (except for the grills of the carriage entrance, restored only a few months ago);
11. Assess the condition of any other element in contact with the exterior masonry (curtain wall behind the carriage entrance grills, marquees, signage, ashtrays, lamps, wiring, piping, handrails) and for which the removal and reinstallation could be required during future masonry repair work.

b. Inside:

1. Assess the severity of the cracks observed in the concrete covering of some of the steel beams and in some floor slabs of 105 McGill, in the portico ceiling of 400 place d'Youville, as well as inside the lean-to that gives access to the underground parking. These verifications should ideally be conducted before the warehouse spaces conversion project, for which construction should take place between April 2012 and December 2013;

2. Trace back the borings made in 2005, reopen them and assess the evolution. Assess the presence of air movements inside the cavities located between the exterior wall and the terracotta blocks partition (400 place d'Youville). Check the presence of a water infiltration on the 3rd floor on the façade along Marguerite d'Youville Street, as well as the possibility that a brick course on the interior side of the exterior wall would not be properly supported (105 McGill). Take time to spot check ceiling spaces, and to drill additional exploratory borings if required. These tests should ideally be coordinated with the warehouse spaces conversion project, for which construction should take place between April 2012 and December 2013;
3. Explore the role of ventilation and air conditioning on the pressure maintained inside the building, and check the presence of condensation, infiltrations and specific deteriorations around the windows (without necessarily conducting a new thermographic study);
4. Check how windows are installed, considering that they are apparently stuck between the stone cladding and the interior finish sheathing (insulation and gypsum plasterboards) - not mentioning the dropped ceilings, and could only be removed from outside in the event of their future replacement;
5. Assess the condition of the foundations (visible portions in the basement), as well as the presence of infiltrations in the basement.

c. Others:

1. Confirm with relevant quarries the availability and dimensions of stones that can be cut in Standstead grey granite and Wallace buff standstone, obtain samples, and confirm prices and delivery times. Explore the possibility of buying stone prior to tenders;
2. Check with specialized providers the possibility of installing and using an elevating work platform on masts, with adjustable outriggers to reach every section of the walls, considering the presence of the cornices and colonnades;
3. Try to find out the report titled *État de la maçonnerie*, written by Roger Leblanc architect in August 1995;
4. Try to find out the original wall sections and details at a scale of ½ inch = 1 foot (pages 15 and 18 mentioned in annex 1 of the Cardin + Ramirez report);
5. Explore the possibility of installing on the cornice that separates the 7th floor from the parapet (and perhaps along the deep cornice located at the base of the engaged columns, to be confirmed) aluminum “butterfly” snow stoppers, likely placed in line (rather than in a staggered pattern), at least every 16 inches centre to centre, and attached with stainless steel screws embedded in sealant for waterproofing and to separate aluminum from the other flashing metals. This intervention has already been the subject of several discussions and has been delayed specifically in order to be integrated into the major masonry repair project.

7.3 Preliminary List of Interventions

Although the exact scope of the repair work required will be confirmed during the upcoming detailed condition assessment of the masonry, it is already possible to establish that, at a minimum, the following interventions will have to be contemplated:

1. Plan that construction work will be spread on at least two or three years. Plan all scaffolding and/or elevating work platform on masts, and required cranes. Although some site installations can be located in the courtyard and/or in the setback along Marguerite-D'Youville Street, plan for occupying and closing portions of streets, and get all the authorizations required from the city. These arrangements or, at least, a first coordination with the City of Montreal, should be made during the preparation of drawings and specifications, in order to avoid delaying the beginning of the construction once the project will be awarded to a contractor;
2. Remove carefully every lamp and electrical wire to allow for repointing work (such a scenario will likely be less expensive and cause less damage than to protect everything in place during construction). Question the relevance of reinstalling them. In the case where they would not be reinstalled, repair all damaged stones, as well as every ground floor lower window mullion to which lamps were attached;
3. Remove carefully and safely store all other elements attached to the masonry and which could interfere with repointing work and masonry repairs, and reinstall them at the end of the job;
4. Remove a fair portion if not all displaced stones, whether anchored or not, repair the brick backing and/or the structure behind, and put existing stones back in place, planning that a fair number of them will likely have to be replaced. This includes stones located in the corner avant-corps, as much as those found in the parapets, architraves, and semicircular arches;
5. Replace stones that are fractured, too eroded or disaggregated, especially in the case of lintels, as well as at the level of the parapet and the cornice immediately below;
6. Replace most of the repairs made using restoration mortar with stone inserts and/or replace stones that are too deteriorated;
7. Repair in a long-lasting manner every lower corner of the pilasters;
8. Replace all sealant joints installed in the inside corners of the building, or replace them with mortar joints;
9. Remove all sealant joints around the openings to allow for repointing, and install new ones afterwards;
10. Remove down to sound mortar every mortar joint, those of the granite cladding as much as those of the sandstone cladding, and repoint with a mortar having higher compressive strength in locations under more compression loading;
11. Scrape paint, remove rust and repaint all steel lintels above the openings;
12. At a minimum, replace every sealant joint where flashings meet the stone cladding. Plan for the replacement of a portion of the flashings, cornice drains and membranes;

13. Plan for scraping and repainting the main cast iron cornice;
14. Confirm the usefulness of the enclosed storage area for fuel located on the western side of the carriage entrance. Ideally, remove the mesh and beam and not reinstall them, and repair every damaged stone;
15. Explore the possibility of removing the curtain wall and to reinstall the carriage entrance back into its original location;
16. Faced with the difficult if not impossible task of removing the remainings of the east façade marquee of 105 McGill, soften the sharp edges, scrape paint, remove rust and repaint everything;
17. Remove all wire mesh grills placed in front of the original cast iron basement grills in order to repoint stones, restore and reinstall the cast iron grills (see item 18 hereafter). Ideally, the wire mesh grills should not be reinstalled. Otherwise, their anchors should be modified in order to avoid any future damage to the stone;
18. Remove, restore in shop and reinstall every exterior original cast iron elements, such as the grill doors of the portico, the grills protecting the transom above the two entrance doors of the portico, the display case between the two entrance doors of the portico, the decorative grills on the walls of the portico, the original grills that protect the basement and ground floor windows, as well as the two lampposts framing the entrance of 400 place d'Youville (replace the five globes added after 1970 with a single one, as originally);
19. Find an efficient and harmless method to clean, among others, the bird droppings, paint drops and rust stains from the stone;
20. Install on one or more cornices aluminum “butterfly” snow stoppers, or another more compatible and efficient type of snow guards.