

RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des soumissions -
TPSGC

11 Laurier St. / 11 rue Laurier

Place du Portage, Phase III

Core 0A1/Noyau 0A1

Gatineau, Québec K1A 0S5

Bid Fax: (819) 997-9776

Revision to a Request for a Standing Offer

Révision à une demande d'offre à commandes

Departmental Individual Standing Offer (DISO)

Offre à commandes individuelle du département(OCID)

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Offer remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'offre demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Consultant Services Division/Division des services
d'experts-conseils

11 Laurier St./11 Rue Laurier

3C2, Place du Portage

Phase III

Gatineau, Québec K1A 0S5

Title - Sujet M&E Industrial Engineering	
Solicitation No. - N° de l'invitation EP168-130476/A	Date 2013-06-14
Client Reference No. - N° de référence du client EP168-130476	Amendment No. - N° modif. 001
File No. - N° de dossier fe115.EP168-130476	CCC No./N° CCC - FMS No./N° VME
GETS Reference No. - N° de référence de SEAG PW-\$\$FE-115-62909	
Date of Original Request for Standing Offer 2013-06-14	
Date de la demande de l'offre à commandes originale	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-07-30	
Time Zone Fuseau horaire Eastern Daylight Saving Time EDT	
Address Enquiries to: - Adresser toutes questions à: Bennett, Adrian	Buyer Id - Id de l'acheteur fe115
Telephone No. - N° de téléphone (819) 956-1793 ()	FAX No. - N° de FAX (819) 956-3160
Delivery Required - Livraison exigée	
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: NATIONAL CAPITAL AREA	
Security - Sécurité This revision does not change the security requirements of the Offer. Cette révision ne change pas les besoins en matière de sécurité de la présente offre.	

Instructions: See Herein

Instructions: Voir aux présentes

Acknowledgement copy required Accusé de réception requis	Yes - Oui <input type="checkbox"/>	No - Non <input type="checkbox"/>
The Offeror hereby acknowledges this revision to its Offer. Le proposant constate, par la présente, cette révision à son offre.		
Signature	Date	
Name and title of person authorized to sign on behalf of offeror. (type or print) Nom et titre de la personne autorisée à signer au nom du proposant. (taper ou écrire en caractères d'imprimerie)		
For the Minister - Pour le Ministre		

Solicitation No. - N° de l'invitation

EP168-130476/A

Amd. No. - N° de la modif.

001

Buyer ID - Id de l'acheteur

fe115

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

EP168-130476

File No. - N° du dossier

fe115EP168-130476

CCC No./N° CCC - FMS No/ N° VME

This amendment is being raised to include the entirety of Appendix C - Standing Offer Brief - Required Services (RS).

STANDING OFFER BRIEF

GENERAL OBJECTIVES	3
GO 1 Standing Offer	3
GO 1.1 Design Principles - General	4
GO 1.2 Sustainable Development	4
GO 1.3 Waste Management	6
GO 1.4 Code Compliance	7
GO 1.5 Risk Management	7
GO 1.6 Health and Safety	7
GO 1.7 PWGSC Standards and Procedure	7
GO 1.8 Quality	7
GO 2 Issues	9
GO 2.1 Major Cost Issues	9
GO 2.2 Major Time Issues	9
GO 2.3 Major Operational Issues	9
DESCRIPTION OF SERVICES	10
DS 1 Overview	10
DS 1.1 Co-ordination with PWGSC	10
DS 1.2 Co-ordination with Sub-consultants	10
DS 1.3 General Project Deliverables	10
DS 1.4 Lines of Communication	11
DS 1.5 Media	11
DS 1.6 Meetings	11
DS 1.7 Project Response Time	11
DS 1.8 Submissions, Reviews and Approvals	11
DS 1.9 Personnel and Category Levels	12
REQUIRED SERVICES	13
RS 1.0 Pre-Design Services	13
RS 1.1 Analysis of Project Scope of Work	13
RS 1.2 Investigation and Report	14
RS 1.3 Feasibility Studies / Options Analysis	16
RS 1.4 Implementation Strategy and Schedule	18
RS 1.5 Mechanical and Electrical Audits (M&E Audits)	19
RS 1.6 Sustainability Strategies and Reports	19
RS 1.7 Hazardous Waste Disposal Strategies and Reports	20
RS 1.8 Equipment Evaluation and Recommendation	21
RS 1.9 Security Requirements Reports	22
RS 1.10 Environmental Clean-up Reports	22
RS 1.11 Decommissioning Reports	23
RS 1.12 Order of Magnitude "Class D" (Indicative) Cost Reports	23
RS 2.0 Design Concept	26
RS 2.1 Overview	26
RS 2.2 Scope and Activities	26
RS 2.3 Deliverables	26

STANDING OFFER BRIEF

RS 2.4 Other Information and Requirements	27
RS 2.5 Projects Without an Investigation and Report	27
RS 3.0 Design Development	28
RS 3.1 Overview	28
RS 3.2 Scope and Activities.	28
RS 3.3 Deliverables	30
RS 4.0 Construction Documents	31
RS 4.1 Overview	31
RS 4.2 Scope and Activities	31
RS 4.3 Deliverables	32
RS 5.0 Bilingual Construction Documents	34
RS 5.1 Overview	34
RS 5.2 Scope and Activities	34
RS 5.3 Deliverables	34
RS 6.0 Tender Call, Bid Evaluation & Construction	
Contract Award	35
RS 6.1 Overview	35
RS 6.2 Scope and Activities	35
RS 6.3 Deliverables	35
RS 7.0 Construction & Contract Administration	36
RS 7.1 Overview	36
RS 7.2 Scope and Activities	36
RS 7.3 Deliverables	43
RS 8.0 Commissioning	44
RS 8.1 Overview	44
RS 8.2 Scope and Activities	44
RS 8.3 Deliverables	44
RS 9.0 Standard Operating Procedures	46
RS 9.1 Overview	46
RS 9.2 Scope and Activities	46
RS 9.3 Deliverables	46
RS 10.0 Risk Management	47
RS 10.1 Overview	47
RS 10.2 Scope and Activities	47
RS 10.3 Deliverables	47
RS 11.0 Post-Construction Warranty Review	48
RS 11.1 Overview	48
RS 11.2 Scope and Activities	48
RS 11.3 Deliverables	48

GENERAL OBJECTIVES

GO 1.0 Standing Offer

Public Works and Government Services Canada (PWGSC) is inviting consulting firms with Mechanical and Electrical Industrial Engineering expertise to submit proposals for Standing Offers.

The consultant shall provide a range of investigation and recommendation reports as well as tender and design documents for industrial projects in the National Capital Area (NCA). This can include but is not limited to:

- a) The renovation, rehabilitation and new construction of:
 - Power, steam, hot/chilled water generation plants and distribution systems;
 - High and low pressure steam systems;
 - High, medium and low temperature hot water systems;
 - Large mechanical equipment (e.g., ventilators, air handlers, chillers, cooling towers, heat exchangers, steam boilers, hot water boilers, etc.);
 - Distribution piping and mechanical and electrical service installations in trench and tunnels;
 - District heating and cooling systems;
 - Water treatment plants;
 - High and low voltage electrical distribution systems (e.g., high voltage transformers 4160/600V, switchgear, distribution panels, etc.);
 - Emergency power generation and distribution systems;
 - Fire alarm systems;
 - Industrial automation control systems;
 - Cogeneration plants;
 - Lighting systems.
- b) The creation of reports detailing:
 - Plant and equipment lifecycle and maintenance requirements evaluations;
 - Industrial plant standard operating procedures;
 - Plant mass balance modelling;
 - Electrical short circuit, device evaluation, co-ordination and arc flash studies;
 - Electrical load and capacity calculations;
 - Environmental assessments including noise abatement and emission dispersion modelling;
 - Fire protection requirements for industrial assets;
 - Standard operating procedures.

The majority of industrial projects will take place within seven PWGSC operated central heating and/or cooling (CHCP) plants that serve over 100 buildings through five district heating and

cooling systems in the NCA. Four of the heating systems operate on high pressure steam and one operates on high temperature hot water.

The government is constantly looking for opportunities to achieve greater efficiency and modernization, savings for taxpayers and greener more sustainable solutions to the maintenance, repair, new construction and operation of the plants. The Consultant must be familiar with and possess proven experience in best practices in district heating and cooling and potential innovations that will facilitate improved financial, energy efficiency and environmental performance.

Each call-up will elaborate on the specific objectives for individual projects; however, the following broader government objectives will apply to all call-ups:

GO 1.1 Design Principles - General

- The Consultant will maintain a high standard of design as based upon recognized contemporary design principles;
- All design elements, including planning, architectural, and engineering must be fully co-ordinated and consistent in adherence to good design principles;
- Sustainable development principles must be incorporated into all design elements, such that the associated physical works can be constructed in a sustainable, environmentally responsible manner;
- The specified quality of materials and construction methods shall be commensurate with similar Government of Canada installations and the project budget;
- Select material and equipment that minimizes operational and maintenance costs;
- Design for maximum flexibility in immediate and future use of the equipment and systems.

GO 1.2 Sustainable Development

In its Sustainable Development Strategy (SDS), PWGSC has committed to meet the requirements of LEED Gold for the construction of new office buildings, and of LEED Silver or equivalent for its major renovations or the construction of new buildings other than office buildings. The department also made commitments for key environmental aspects (e.g., energy, water, waste). In addition to the objectives vis-à-vis LEED or equivalent green building rating systems, the following sustainable design objectives should be targeted for PWGSC projects.

1.2.1 Energy Management

- Designs shall consider the inclusion of renewable energy design features (e.g., passive solar, air and water, bio-mass energy supply, etc.) as part of its energy management strategy. The RETScreen® Clean Energy Project Analysis Software

(<http://www.retscreen.net/>) of Natural Resources Canada shall be used to evaluate options and assess feasibility when requested.

1.2.2 Water Management

- Designs shall investigate and report on the feasibility of incorporating a "grey water" system as part of the plumbing facilities for the building;
- Designs shall investigate and report on the feasibility of incorporating on-site waste water treatment for sanitation and/or domestic waste water;
- Designs shall incorporate storm water management strategies, where applicable, such as roof top temporary storm water retention features, landscaped retention ponds, green roofs, and permeable (pervious) ground surface treatments (including paving).

1.2.3 Resource Use and Product Selection

- When requested, designs must undergo an assessment for embodied energy, resource consumption and environmental impacts using the AthenaTM Life-Cycle Assessment Model of the Athena Sustainable Materials Institute;
- Where available, feasible and meet the performance requirements, products will be specified that meet the requirements necessary for certification by the Environmental Choice (EcoLogo) Program or other equivalent programs;
- Products are specified that eliminate hazardous materials in their content, manufacture, application, and use;
- Where available, feasible and meet the performance requirements, products such as paints, adhesives and sealant that will be specified will have no or low levels of emissions of volatile organic compounds (VOCs);
- Where available, feasible and meet the performance requirements, products will be specified that contain a minimum 10% of post-consumer recycled product;
- Where feasible, designs will incorporate the concept of "designing for disassembly" to promote reuse and to reduce waste.

1.2.4 Indoor Environmental Quality

- Indoor air quality must meet the standards as required by the Canada Labour Code Part II as well as the latest edition of ASHRAE Standards 62 and 55 as a minimum;
- The design shall ensure that there are no instances that will promote the accumulation of moisture in the heating, ventilation, and air conditioning (HVAC) system or the collection of standing water;
- Passive ventilation systems shall be investigated to replace or supplement mechanical HVAC systems;
- All noxious or unpleasant odours arising as a result of construction activities shall be purged from the space/facility prior to occupancy and filters replaced;
- Design options such as CO₂ sensors, humidity sensors, and individual air volume controls shall be examined for their feasibility;

-
- Lighting levels shall meet the minimum requirements of the Canadian Occupational Safety and Health (COSH) Regulations, the National Building Code, the Canadian Electrical Code (CEC) and PWGSC's "Office Lighting Standard";
 - Lighting strategies shall be designed to apply the minimum for way-finding and to employ task lighting to the maximum extent feasible and consistent with functional requirements;
 - The most current industry standards for indoor environmental controls for air and light quality shall be specified;

GO 1.3 Waste Management

The Construction, Renovation, and Demolition (CRD) Non-hazardous Solid Waste Management Protocol (most recent version to be referred to) to which Real Property Branch (RPB) 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 RPB Sustainable Development Strategy (SDS) as these relate to non-hazardous solid waste generated in CRD projects.

For all Real Property Branch 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. A minimum landfill diversion rate of 75% is to be achieved where local recycling facilities exist. 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 RPB CRD 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 CRD projects can be diverted from landfill through reduction, reuse, and recycling initiatives;
- Approximately 40,000 tons 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 CRD 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.

The Departmental Representative will provide details of waste management delivery strategies. Details for specifying deliverables are provided in "Required Services" - Waste Management.

GO 1.4 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.

GO 1.5 Risk Management

Risk management strategies shall be applied to all of the services required for project delivery as outlined in the Required Services.

Within the plants, all work that includes connecting into / interacting with plant systems must be risk managed by the Consultant and co-ordinated accordingly to ensure no impact or disruption of services.

Please note that the Plant Chief is the responsible authority in ensuring the plant operates in a safe and efficient manner.

GO 1.6 Health and Safety

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. PWGSC also has a departmental policy, DP 007, Health and Safety Policy (2007-12-19), which applies to all projects.

GO 1.7 PWGSC Standards and Procedure

For standards relating to the service provisions herein please refer to "Doing Business with National Capital Area (NCA)" which is the new document which replaces "Doing Business with AES". The standards in PWGSC document "Doing Business with National Capital Area (NCA)" (Appendix C) and at project delivery stage as described in each individual Call-up must be adhered to in conjunction with this scope of services.

GO 1.8 Quality

The consultant is expected to apply sound quality management practices when providing services to PWGSC. This includes the development of a quality program that consists of both quality assurance and quality control processes and activities. These processes and activities (which can include welding tests, pressure testing, concrete tests, structural integrity testing, etc.) are to commence from the start of the project and be applied until the project is complete, and are

to apply not only to the project as a whole but to each deliverable submitted. All members of the Consultant team need to be included in the quality processes and activities. The quality program must include consideration of all project stakeholders, who are to be kept informed of the quality processes and activities and of the program's expectations.

GO 2 Issues

GO 2.1 Major Cost Issues

Issue: Budget Limitations

Effective cost estimating and cost control is of prime importance and shall be provided by Professional Quantity Surveyors when requested. The class C and class B cost estimates shall be submitted in elemental cost analysis format. The standard of acceptance for this format is the current issue of the elemental cost analysis format issued by the Canadian Institute of Quantity Surveyors.

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.

GO 2.2 Major Time Issues

Issue: "out of service time frame"

It is imperative that the out of service time frame for the various projects as a result of construction be minimized as much as possible. Program operations and time frames will govern the particular allotted time frame for construction through the identified Call-Up.

GO 2.3 Major Operational Issues

Issue: Adjacent Programs

Sustainability of adjacent programs is mandatory and therefore design decisions must be sensitive to that requirement. Additional factors recognized as affecting adjacent programs are the following: reliability of systems and equipment, redundancy to ensure continued operation, and prolonged commissioning issues.

DESCRIPTION OF SERVICES

DS 1 Overview

The following administrative requirements apply during all phases of project delivery and will be stipulated in each Call-Up.

DS 1.1 Co-ordination with PWGSC

The Project Manager assigned to the project is the Departmental Representative. The Departmental Representative is directly concerned with the project and responsible for its progress. The Departmental Representative is the liaison between the Consultant, PWGSC and the Client Departments.

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

The Consultant shall:

- Carry out services in accordance with approved documents and directions given by the Departmental Representative;
- Ensure all communications carry the PWGSC's Project Title, Project Number and File Number;
- Advise the Departmental Representative of any changes that may affect schedule or budget or are inconsistent with instructions or written approvals previously given. The Consultant shall detail the extent and reasons for the changes and obtain written approval before proceeding;

DS 1.2 Co-ordination with Sub-consultants

The Consultant shall:

- Throughout all stages of the Project, co-ordinate and assume responsibility for the work of any Sub-consultants and specialists retained by the Consultant;
- Ensure clear, accurate and ongoing communication of concept, budget, and scheduling issues (including changes) as they relate to the responsibilities of all Sub-consultants and specialists from initial base building reviews to post construction reports;
- Ensure Sub-Consultants provide adequate site inspection services and attend all required meetings.

DS 1.3 General Project Deliverables

Where deliverables and submissions include summaries, reports, drawings, plans or schedules, provide six (6) hard copies of all deliverables plus two in electronic format. All documents (drawings and specification) are to be produced in accordance with PWGSC document "Doing Business with National Capital Area (NCA)" (Appendix C) and at project delivery stage as described in each individual Call-up.

DS 1.4 Lines of Communication

Correspond only with the Departmental Representative at the times and in the manner dictated by the Departmental Representative. The Consultant shall not communicate with the client department unless so authorized in writing by the Departmental Representative. During construction tender call, PWGSC conducts all correspondence with bidders and makes the contract award.

DS 1.5 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 Departmental Representative.

DS 1.6 Meetings

The Departmental Representative may arrange regular or unique meetings throughout the duration of the project for all members of the project team, including representatives from:

- Client Department;
- PWGSC;
- Consultants.

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

DS 1.7 Project Response Time

It is a requirement of all projects covered under this Standing Offer that the prime Consultant and their proposed Sub-consultants should be personally available to attend meetings and respond to inquiries within half (½) a day of the Departmental Representative's request, in the locality of the place of the work from the date of the award of the Consultant call-up until final inspection and turnover.

DS 1.8 Submissions, Reviews and Approvals

For each call-up, any or all work in progress may be reviewed by the Departmental Representative as well as; but, not limited to the following:

PWGSC in-house services

- Submission Format: drawings and specifications;
- Submission Schedule: submissions are reviewed at a time to be arranged. Give 10 days notice when work will be completed and delivered to the Departmental Representative;
- Expected Amount of Time Required to Complete Review: 2 weeks;
- Number of Submissions: until approval has been received.

Design review committee - client

- Submission Format: reports, drawings and specifications, and oral presentations;
- Submission Schedule: submissions are reviewed at a time to be arranged. Give 10 days notice when work will be completed and delivered to the Departmental Representative;
- Expected Amount of Time Required to Complete Review: 2 weeks;
- Number of Submissions: until approval has been received.

Human Resources Social Development Canada (HRSDC), Labour Program, Fire Protection

- Submission Format: drawings and specifications;
- Submission Schedule: submissions are reviewed at a time to be arranged. Give 10 days notice when work will be completed and delivered to the Departmental Representative;
- Expected Amount of Time Required to Complete Review: 1 month;
- Number of Submissions: until approval has been received.

Where work is reviewed the consultant is to respond to and make good on any comments or feedback given by reviewers to the satisfaction of the Departmental Representative. If deemed required by the Departmental Representative the consultant will resubmit reviewed work as many times as is required to addresses any noted review deficiencies before acceptance of a reviewed work is granted and work can proceed forward.

DS 1.9 Personnel Category Levels and Experience

Please note that the category levels for this standing offer are defined as follows:

- Senior Engineer: having a minimum of twelve (12) years experience as an engineer;
- Intermediate Engineer: having a minimum of five (5) years experience as an engineer;
- Senior Technologist/Designer: having a minimum of twelve (12) years experience as an Technologist/Designer;
- Intermediate Technologist/Designer: having a minimum of five (5) years experience as an Technologist/Designer;
- Drafting Technician/Technologist/Designer: individual that drafts technical drawings.

REQUIRED SERVICES (RS)

RS 1.0 Pre-Design Services

RS 1.0.1 Principle Pre-Design Services

Principle Pre-Design Services are required to be provided by the Consultant for most Call-ups. When required these services will be noted in the Terms of Reference (ToR). These services include:

- I. Analysis of the Project Scope of Work;
- II. Investigation and Report.

RS 1.0.2 Supplementary Pre-Design Services

Supplementary Pre-Design Services may be requested occasionally by the Departmental Representative. Where needed, these supplementary services will be specifically referred to in the ToR document; the Consultant is not to perform these tasks unless specifically instructed to do. These supplementary services can include:

- I. Feasibility Studies / Options Analysis;
- II. Implementation Strategy and Schedule Report;
- III. Mechanical and Electrical Audits;
- IV. Sustainable Development Strategies and Report;
- V. Hazardous Waste Disposal Strategies and Report;
- VI. Facility Equipment Evaluation and Recommendations Report;
- VII. Security Requirements Report;
- VIII. Environmental Clean-up Report;
- IX. Decommissioning Report;
- X. Order of Magnitude Cost Report.

RS 1.1 Analysis of Project Scope of Work

Analysis of the Project Scope of Work is a Principle Pre-Design Service.

1.1.1 Overview

The Consultant is to thoroughly review the ToR document and the project requirements to ensure there are no issues that may interfere with the delivery of a cohesive quality project.

1.1.2 Scope and Activities

-
- Visit the building/site and verify the availability and capacity of services needed for the project;
 - Attend the project start up meeting;
 - Analyse 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;
 - Establish a policy for this project to minimize environmental impacts consistent with the project objectives and economic constraints;
 - Other investigative activities as required for the specific project.

1.1.3 Deliverables

- A summary report that includes:
 - A brief narrative of the project, explaining the consultant's understanding of what is required;
 - Any unrealistic schedules, budgets, etc. in the project documentation along with proposed corrective adjustments;
 - Requests for additional information, clarifications or direction;
 - Notable assumptions made by the Consultant for acknowledgement by the Departmental Representative.

1.1.4 Other Information And Requirements

Subject to applicable security restrictions, the Consultant will be given access to existing plans, survey notes, design notes, specifications or reports that will aid in the work. All such documents must be returned to the Departmental Representative on termination of the contract.

RS 1.2 Investigation and Report

Investigation and Report is a Principle Pre-Design Service.

1.2.1 Overview

The Consultant is to provide a detailed report that 1) describes the existing conditions 2) describes the required conditions that satisfy the project's objectives and 3) presents three unique options for achieving these required conditions.

1.2.2 Scope and Activities

-
- Review all available existing material related to the building/site;
 - Visit the building/site, investigate and analyse the existing equipment/systems;
 - Interview building/site operators and occupants;
 - Have any required mechanical or electrical tests conducted;
 - Determine the state of the existing equipment/systems, including the functionality, capacity, reliability, condition, safety, adherence to applicable codes, standards, etc.;
 - Identify and verify all authorities having jurisdiction over the equipment/systems;
 - Analyse the project requirements and objectives;
 - Determine the conditions that fully satisfy all of the project's requirements and objectives;
 - Create three (3) detailed options on how to move the existing equipment/systems from the existing state to the required end state;
 - For each option determine the advantages and disadvantages, implementation strategies, costs (class D estimate), schedules, energy and water consumption information, operational and maintenance cost impacts, etc.;
 - Create simple schematics for each option;
 - Identify the preferred option, along with a detailed explanation as to why it is being recommended.

1.2.3 Deliverables

- A detailed report that includes:
 - An overview of the project;
 - Information on the state of the existing equipment/systems, including locations, materials, deficiencies (as related to functionality, capacity, reliability, condition, safety, adherence to applicable codes, standards, etc.) life expectancy, life safety aspects, etc.;
 - The desired end state for the equipment/systems that satisfies all of the project requirements;
 - A minimum of 3 detailed options that describe how to bring the existing equipment/systems to the desired end state, that includes for each option advantages and disadvantages, implementation strategies, costs (class D estimate), schedules, simple schematics, energy and water consumption information, operational and maintenance cost impacts, etc.;
 - Identification of the preferred option, along with a detailed explanation as to why it is being recommended.

1.2.4 Other Information And Requirements

- As a minimum the report shall consist of the following sections:
 - Executive Summary
 - Introduction
 - Existing Conditions
 - Desired End State

-
- Analysis and Discussions
 - Options
 - Recommendations
- The Consultant is to take into consideration all applicable codes, regulations and standards, including but not limited to: National Building Code, Canada Labour Code, Model National Energy Code, National Fire Protection Association, Ontario and Québec Occupational Health and Safety, Medical Research Council;
 - In general terms the Investigation and Report is performed at very early stages of the project when there are many unknowns about the project.

RS 1.3 Feasibility Studies / Options Analysis

Feasibility Studies / Options Analysis are Supplementary Pre-Design Services.

In general, a Feasibility Studies / Options Analysis is a more in depth Investigation and Report utilized for larger and/or more complex projects. When called for, it will usually replace the need for that document.

RS 1.3.1 Overview

Feasibility Study:

The Consultant is to compose a feasibility study report which outlines the research and subsequent analysis to determine the viability and practicability of a project. The report must consider and analyse as a minimum economic, financial, market, regulatory, environmental/sustainable, code, life safety aspects and technical issues. During this stage the Consultant is to: investigate and analyse site conditions, including soil conditions, zoning, bylaws, traffic reports, service capacities, base building support systems, special purpose support systems etc. and to provide recommendations.

Options Analysis:

A design test (in schematic form) for the feasibility study recommendations to determine that the recommendations can be accommodated in a minimum of three (3) distinctly different options.

Cost Estimate:

Complete with class 'D' "Order of Magnitude" costs.

RS 1.3.2 Scope and Activities

Feasibility Study (including but not limited to):

- Visit the building/site, investigate and analyse the availability and capacity of building services needed for the project, including renewable energy;

-
- Investigate the requirements for the particular facility, including existing and new technologies;
 - Analyse the project requirements/program;
 - Review all available existing material related to the type of facility;
 - Investigate and analyse all applicable codes, regulations standards, including but not limited to: National Building Code, Canada Labour Code, Model National Energy Code, National Fire Protection Association, Ontario and Québec Occupational Health and Safety, Medical Research Council;
 - Evaluate existing facilities including: building envelop, mechanical, electrical and structural systems, functional adaptability, code compliance, hazardous and non-hazardous waste;
 - Identify and verify all authorities having jurisdiction over the project;
 - Establish a policy for this project to minimize environmental impacts consistent with the project objectives and economic constraints, and the application of the Canadian Environmental Assessment Act (CEAA);
 - Prepare recommendations on the feasibility of the project.

Options Analysis (including but not limited to):

- Test the feasibility study recommendations on a minimum of three (3) options, schematic (sketch) only;
- Bubble and flow diagrams;
- Adjacencies and functional relationships;
- Horizontal and vertical stacking relationships;
- Orientation and renewable energy;
- Indication of the preferred option.

RS 1.3.3 Deliverables

Comprehensive summary of the existing conditions, feasibility and options analysis (including but not limited to):

- Report on existing base building system elements including their condition, deficiencies and life expectancy;
- Report on existing facility systems requirements;
- Report on all applicable codes, regulation, standards and authorities having jurisdiction;
- Report on environmental impact, sustainability, preliminary environmental assessment and CEAA screening report;
- Report on recommendations and options analysis;
- Written identification of the problems, conflicts or other perceived information/clarifying assumptions for the acknowledgement of the Departmental Representative;
- Report on Class 'D' Order of Magnitude Cost for each option.

RS 1.4 Implementation Strategy and Schedule

Implementation Strategy and Schedule is a Supplementary Pre-Design Service.

RS 1.4.1 Overview

The Consultant is to create an implementation strategy that will meet the project goals and objectives.

RS 1.4.2 Scope and Activities

The Consultant shall provide a detailed implementation strategy and schedule (including but not limited to):

- Prepare a detailed implementation strategy that documents, in a report, all activities, milestones and deliverables required for the effective delivery of the project including time frames for submissions, reviews and approvals;
- Prepare a project schedule that identifies, in a graphic format such as Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT), all activities, milestones including critical deadlines, long lead delivery items and drop dead dates, required for the effective delivery of the project deliverables, including time frames for submissions, reviews and approvals;
- The Implementation Strategy and Schedule described above shall include, but not be limited to the following:
 - Decommissioning and environmental clean-up strategy;
 - Construction strategy.
- Advise the Departmental Representative of any changes to the scope that may affect schedule or are inconsistent with instructions or written approvals previously given. The consultant shall detail the extent and reasons for the changes and obtain written approval before proceeding;
- Submit the Implementation Strategy and Schedule for review. Revise as required. Resubmit for final approval. The original approved schedule will become the "Baseline" schedule to monitor project progress;
- Throughout the project, monitor critical path and deadlines for submissions, revisions and approvals. Submit weekly Progress Reports identifying completed deliverables, slippage and upcoming activities.

RS 1.4.3 Deliverables

- Implementation strategy;
- Time Plan (Schedule);
- Weekly Progress Reports.

RS 1.5 Mechanical and Electrical Audits (M&E Audits)

Mechanical and Electrical Audits are Supplementary Pre-Design Services.

RS 1.5.1 Overview

The consultant is to provide mechanical and electrical audits of building systems.

RS 1.5.2 Scope and Activities

- Mechanical and electrical analysis and testing;
- Mechanical and electrical equipment condition;
- Identification of problems;
- Remedial options;
- Recommended options;
- Air-flow and water flow testing, noise testing, pipe testing;
- Electrical testing;
- Analysis of testing results;
- Energy analysis and investigation;
- Equipment efficiency;
- Review maintenance practices and programs;

RS 1.5.3 Deliverables

- Submit the findings of the detailed investigations for review, in a report;
- Recommend replacement or repair and assign time periods: immediate, 5, 10, 15, 20 and 25 years.
- Provide cost plan;
- Revise as required.

RS 1.6 Sustainability Strategies and Reports

Sustainability Strategies and Reports are Supplementary Pre-Design Services.

RS 1.6.1 Overview

The Consultant is to research and investigate a wide range of strategies to achieve sustainability (including but not limited to):

- Recycling and reuse of materials, systems, equipment;
- Procurement of "green" materials;
- Energy reduction and management;
- Water management;
- Waste reduction and management;
- Life-cycle costing, cost benefit analysis;
- Integrated Design process.

RS 1.6.2 Scope and Activities

The Consultant shall research and investigate sustainable development strategies in the context of the project and make recommendations:

- Prepare a detailed inventory of existing non-contaminated materials, systems, equipment identified for reuse or recycling. Include target markets for recycled material and make recommendations. Verify with client department. Revise as required. Obtain approval;
- Investigate and identify potential "green" building materials and products for the project include sourcing (i.e. In order to meet government objectives sole source is necessary). Verify with client department. Revise as required. Obtain approval;
- Investigate and analyse potential to exceeding the Model National Energy Code by 30% to 50%. Make recommendations for an Energy Reduction and Management plan;
- Investigate and analyse potential to increasing energy efficiency, and strategies to decrease water run-offs. Make recommendations, verify with client department. Revise as required. Obtain approval;
- Develop a non-hazardous and hazardous waste reduction and management plan. Make recommendations, verify with client department. Revise as required. Obtain approval;
- Based on the recommendations included in the above five bullets, perform a cost / benefit and life-cycle costing analysis for the Sustainability Strategy for the project.

RS 1.6.3 Deliverables

- Submit the Sustainability Strategy for review, in a report;
- Revise as required;
- Resubmit for final approval.

RS 1.7 Hazardous Waste Disposal Strategies and Reports

Hazardous Waste Disposal Strategies are Supplementary Pre-Design Services.

RS 1.7.1 Overview

The Consultant is to identify hazardous waste disposal issues and recommend strategies for mitigation.

RS 1.7.2 Scope and Activities

The Consultant shall research and investigate hazardous waste disposal strategies in the context of the project and make recommendations:

-
- Prepare a detailed inventory of existing contaminated materials, systems, equipment identified for disposal. Verify with client department. Revise as required. Obtain approval;
 - Develop a hazardous waste reduction and management plan. Make recommendations, verify with client department. Revise as required. Obtain approval;
 - Based on the recommendations included in the above two bullets, perform a cost / benefit and life-cycle costing analysis for the Hazardous Waste Disposal Strategy for the project.

RS 1.7.3 Deliverables

- Submit the Hazardous Waste Disposal Strategy for review, in a report;
- Revise as required;
- Resubmit for final approval.

RS 1.8 Equipment Evaluation and Recommendation

Equipment Evaluation and Recommendation is a Supplementary Pre-Design Services.

In general, Equipment Evaluation and Recommendation reports provide more specific and in depth information on existing equipment as compared to what is typically called for in the Investigation and Report. It can be used for larger and/or more complex projects involving significant amounts of equipment.

RS 1.8.1 Overview

The Consultant is to identify and evaluate existing facility equipment and make recommendations for their reuse, recycling, refurbishment and/or replacement.

RS 1.8.2 Scope and Activities

- At such time as the Departmental Representative determines, prepare a detailed inventory of existing equipment. Include drawings identifying existing location and layout. Verify with client department. Revise as required. Obtain approval. Note that the Consultant shall refer to the PWGSC National Project Management System;
- Based on parameters developed in conjunction with the Departmental Representative and the client department, prepare an equipment evaluation report that assesses the condition of existing equipment. Assess the current inventory against the client department's functional requirements;
- Prepare a detailed cost analysis (Class B) that compares the reuse/refurbishment of existing equipment, with the purchase of new equipment. Consideration should be given to cost effectiveness and time frames required for refurbishment of existing equipment and/or the procurement of new equipment.

RS 1.8.3 Deliverables

- Submit inventory, evaluation report, & cost analysis in a report for review;
- Revise as required;
- Resubmit for final approval.

RS 1.9 Security Requirements Reports

Security Requirements Reports are Supplementary Pre-Design Services.

RS 1.9.1 Overview

The Consultant is to research and investigate the security requirements of the client for the project.

RS 1.9.2 Scope and Activities

- Prepare a report that documents the effects the Investigation and Report options will have to the current and future security requirements of the identified client departments.
- Recommend any necessary modifications to the project to address security issues. Assess the impact of these modifications on space, time and budget.

RS 1.9.2 Deliverables

- Submit recommendations in a report for review;
- Revise as required;
- Resubmit for final approval.

RS 1.10 Environmental Clean-up Reports

Environmental Clean-up Reports are Supplementary Pre-Design Services.

RS 1.10.1 Overview

The Consultant is to research and investigate the environmental requirements of the client for the project.

RS 1.10.2 Scope and Activities

-
- Prepare a Waste Management Plan including all non-contaminated material that is to be reused or recycled whenever possible according to the PWGSC, Construction and Demolition Waste Management Protocol.

RS 1.10.3 Deliverables

- Submit a report for review;
- Revise as required;
- Resubmit for final approval.

RS 1.11 Decommissioning Reports

Decommissioning Reports are Supplementary Pre-Design Services.

RS 1.11.1 Overview

The Consultant is to research and investigate the decommissioning requirements of the client's specialized equipment and systems.

RS 1.11.2 Scope and Activities

- Prepare a Decommissioning Plan including all stand-alone facility equipment and systems that are to be reused or recycled whenever possible according to the PWGSC and Treasury Board Standards.

RS 1.11.3 Deliverables

- Submit a report for review;
- Revise as required;
- Resubmit for final approval.

RS 1.12 Order of Magnitude "Class D" (Indicative) Cost Reports

Order of Magnitude "Class D" (Indicative) Cost Reports are Supplementary Pre-Design Services.

In general, Order of Magnitude "Class D" (Indicative) Cost Reports provide more specific and in depth cost information than what is typically called for in the Investigation and Report. It can be used for larger and/or more complex projects involving significant costs and/or cost risks.

RS 1.12.1 Overview

The Consultant is to provide an indication of the total cost of the project, based on the user's functional requirements to the degree known at the time. The Consultant is to base the estimate on historical cost data for similar work, suitably adjusted for such factors as: effect of inflation, location, risk, quality, size and time. All related factors affecting cost are to be considered to the extent possible. Such an estimate is strictly an indication (rough order of magnitude) of the project total cost and completion date. This estimate is used to establish the indicative estimate required by Treasury Board for Preliminary Project Approval. The expected degree of accuracy will be noted in the ToR document.

RS 1.12.2 Scope and Activities

Specific tasks include, but are not limited to:

- Prepare (life-cycle) cost plans from project briefs, preliminary concepts or other preliminary information;
- Prepare cost analysis;
- Prepare option analysis and "what if" scenarios;
- Provide advice and recommendations on project planning in order to achieve the most cost effective project sequence;
- Identify and quantify potential risks and make contingency recommendations in order to minimize negative cost impacts;
- Advise on alternative procurement and construction strategies to create efficiencies wherever possible; and/or
- Identify, forecast and analyse project-related issues including possible market shortages and potential price fluctuations.

Cost Estimating

Develop cost estimates of projects:

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

RS 1.12.3 Deliverables

Cost Planning

- Cost plans;
- Cost analyses and "what if" scenarios;
- Cash flows and / or;
- Reports on alternative procurement and construction strategies or other project-related issues.

Cost Estimating

-
- Fully detailed cost estimate. Order of magnitude "Class D" accuracy;
 - Documentation of the methodology of the estimate and any assumptions made;
 - Documentation of all pricing and valuation calculations;
 - Reports on investigation of costing alternatives; and / or
 - Reports on life-cycle costs.

RS 2.0 Design Concept

RS 2.1 Overview

The Consultant is to develop an option selected from the Investigation and Report by the Departmental Representative into a fully formed concept. The fully formed concept will form the bases of the detailed designs and specifications to follow.

For projects where an Investigation and Report has not been previously been done, refer to section RS 2.5.

RS 2.2 Scope and Activities

- Investigate different technical approaches (minimum three) to implement the option selected from the Investigation and Report by the Departmental Representative;
- For each of the different technical approaches:
 - Identify the required equipment/systems, with special consideration given to unique or highly specialized items;
 - Identify the approximate size of the required equipment/systems;
 - Analyse how any new equipment/systems will impact existing installations;
 - Identify and analyse the risks, particularly as they pertain to cost and schedule;
 - Determine the associated energy, operational and maintenance costs;
 - Identify whether full time operating staff will be needed for operating any of the equipment/systems. Differentiate between staff that are needed by code requirements versus staff which are needed because of the nature and size of the equipment/systems;
 - Verify that the project's objectives, requirements and constraints are satisfied;
 - Develop a Class 'C' cost estimate and implementation schedule;
 - Develop schematics to fully characterize the nature of the equipment/system;
 - Identify other discipline services that will be required during the project delivery stages such as architectural, civil and structural;
 - Consult authorities of jurisdiction as needed to ensure compliance to codes, standards, etc.;
- Identify one preferred technical approach, with all supporting background and technical justifications;

RS 2.3 Deliverables

Provide the following:

- A detailed report that thoroughly describes and characterizes the different viable technical approaches that can be taken. This is to include for each technical approach:
 - A detailed description;

-
- What new or existing equipment/systems will be installed or modified, along with there approximate size and location;
 - Schematics, calculations and tables outlining the equipment/system;
 - A class “C” estimate;
 - A detailed characteristics discussion (e.g., advantages and disadvantages as compared to other approaches, risks, costs, implementation schedule, etc.)
 - In the report recommend a preferred technical approach, along with a detailed explanation as to why it is being recommended.

RS 2.4 Other Information and Requirements

- As a minimum the report shall consists of the following sections:
 - Executive Summary
 - Description of the option from the Investigation and Report being developed;
 - Technical Approaches (c/w sketches, calculations, tables, etc.)
 - Recommendations
- The Consultant is to take into consideration all applicable codes, regulations and standards, including but not limited to: National Building Code, Canada Labour Code, Model National Energy Code, National Fire Protection Association, Ontario and Québec Occupational Health and Safety, Medical Research Council;

RS 2.5 Projects Without an Investigation and Report

On occasion, a projects will not require and Investigation and Report. This can occur when:

- The options typically developed in the Investigation and Report are already known;
- The project is relatively straightforward, such that there is only one obvious option to proceed.

For projects of this type, the Consultant will develop three (3) technical approaches as described in the prior sections for an option that will be provided by the Departmental Representative.

RS 3.0 Design Development

RS 3.1 Overview

The Consultant is to develop the technical approach selected by the Departmental Representative from the Design Concept report into preliminary construction documents (i.e., design drawings and specifications), complete with a class “B” estimate and a construction schedule.

RS 3.2 Scope and Activities.

- Obtain written approval from the Departmental Representative for development of one of the proposed technical approaches from the Design Concept submission;
- If any alterations to the selected technical approach are required, document all required changes, analyse the impact on all project components, and resubmit for approval ;
- Confirm the required format of the drawings and specifications;
- Clarify if any special procedures are required (e.g., phased construction);
- Ensure that all of the members of the Consultant team are co-ordinated during Construction Document development;
- Submit 33% complete Construction Documents to the Departmental Representative and any other individuals, groups, review committees, etc. as required;
- Provide written responses to all review comments and incorporate them into the Construction Documents where required;
- Present the design to the government or local authorities where required;
- Provide a class “B” (substantive) cost estimate;
- Analyse the constructability of the project and advise on the construction process and duration;
- Create a construction schedule noting all major milestones and equipment delivery dates;
- Continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project;

RS 3.2.1 Mechanical Drawing Requirements

Provide drawings showing advanced development of the following:

- Site Plan showing service entrances for steam, chilled water, water supply, sanitary and storm drains and connections to public utility services, including all key invert elevations;
- Drawings showing the preliminary sizing and physical dimensions of all industrial equipment, ventilation, cooling and heating systems complete with their locations, proximities to other equipment/structures, layouts and hook-ups;
- Drawings of piping, showing routing and sizing of major lines and location of pumping and other equipment where required;
- Drawings of the fire protection systems showing major components;

-
- Riser diagrams for HVAC, plumbing, fire protection and fuel or gas storage and fuel or gas distribution systems;
 - Provide information of all internal and external energy loads in sufficient detail to determine the compatibility of the proposal with existing services;
 - Analysis of selected equipment and plant with schematics and calculations sufficient to justify the economy of the selected systems;
 - Describe the mechanical systems to be provided and the components of each system. Describe the perceived operation of the mechanical systems;
 - Explain what operating staff will be needed to operate the systems and the expected functions of the operation staff;
 - Describe the control architecture. Provide preliminary Digital Control System (DCS) network architecture, mechanical control schematics, and sequence of operation;
 - Explain what acoustical and sound control measures are to be included in the design.

RS 3.2.2 Electrical drawing Requirements

Provide drawings showing advanced development of the following:

- Single line diagram of the electrical power distribution circuits with their metering and protection, including:
 - Complete rating of equipment;
 - Ratios and connections of Current Transformer (CT's) and Power Transformer (PT's);
 - Description of relays when used;
 - Maximum short circuit levels on which design is based;
 - Identification and size of services;
 - Connected load and estimated maximum demand on each load centre.
- Electrical plans with:
 - Room identification;
 - Legend of all symbols used;
 - Circuit numbers at outlets and control switching identified;
 - All conduit and wire sizes except for minimum sizes which should be given in the specification;
 - A panel schedule with loadings for each panel;
 - Telephone conduits system layout for ceiling/floor distribution.
- Riser diagrams for lighting, power and telecommunication cable systems, fire alarm and other systems;
- Elementary control diagrams for each system;
- Schedule for motor and controls;
- Complete lighting layout and fixture schedule clearly indicating methods of circuiting, switching and fixture mounting;
- Electric heating layout and schedule;

-
- Provide the following data:
 - Total connected normal load;
 - Maximum demand and diversity factors for normal load;
 - Total connected emergency load;
 - Maximum demand and diversity factors for emergency load;
 - Capacity of base building emergency generator;
 - Sizing of standby load;
 - Short-circuit requirements and calculations showing the ratings of equipment used.

RS 3.2.3 Specification Requirements

- Provide draft specifications of all National Master Specification (latest edition) sections to be used;
- Include principal equipment, components and systems.

RS 3.2.4 Cost Estimate Requirements

- Provide class "B" (substantive) cost estimate;
- Highlight changes from class "C" (indicative) cost estimate.

RS 3.2.5 Construction Schedule Requirements

- Create a construction schedule, complete with work breakdown structure, milestones, equipment delivery dates, etc.;
- Highlight any changes from schedules or timelines provided in the Investigation and Report and/or Design Concept;

RS 3.3 Deliverables

- 33% complete construction documents;
- Class "B" estimate;
- Construction Schedule.

RS 4.0 Construction Documents

RS 4.1 Overview

The Consultant is to continue preparing co-ordinated Construction Drawings and Specifications setting forth in detail the requirements for the construction and final cost estimate of the project.

- 66% 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;
- Final Submission incorporates all revisions required in the 99% version and is intended to provide PWGSC with complete construction documents for tender call.

RS 4.2 Scope and Activities

- Obtain the Departmental Representative's approval to continue developing the Construction Documents created in Design Development (66%, 99% and final);
- Confirm the required format of the drawings and specifications;
- Clarify if any special procedures are required (e.g., phased construction);
- Ensure that all of the engineering disciplines are co-ordinated during Construction Document development;
- Submit complete Construction Documents at the required stage (66%, 99% and final) to the Departmental Representative and any other individuals, groups, review committees, etc. as required;
- Provide written response to all review comments and incorporate them into Construction Documents where required;
- Present the design to the government or local authorities where required;
- Provide a class "A" cost estimate;
- Analyse the constructability of the project and advise on the construction process and duration;
- Update the construction schedule noting any and all changes from the Construction Schedule created in Design Development;
- Continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project.

RS 4.2.1 Technical and Production Meeting Requirements

- The Departmental Representative may request a review meeting for each submission;
- Representatives from Client Department(s) and PWGSC support staff may be present as arranged by the Departmental Representative;
- Consultant shall ensure that his staff and the sub-consultant representatives attend the technical and production meetings as required;

-
- Consultant shall ensure all documents are co-ordinated with all sub-consultants and disciplines;
 - Consultant shall arrange for all necessary data, progress prints, etc.;
 - Consultant shall prepare minutes of the meetings and distribute copies to all participants.

RS 4.2.2 Progress Review

- As work progresses on construction drawings, submit drawings, schedules, details, pertinent design data and updated Cost and Schedule information as required.

RS 4.3 Deliverables

- Deliverables are similar at all three stages;
- Completeness of the project development should reflect the stage of a submission;
- All deliverables are subject to approval of the Departmental Representative.

RS 4.3.1 66% Submission

- 66% complete specifications and working drawings;
- 66% Commissioning plan;
- One copy of support data, studies, calculations, etc., as required by PWGSC Engineering disciplines for review;
- One copy of updated Cost Plan and Construction Schedule.

RS 4.3.2 99% Submission

- Complete specification and working drawings;
- 99% Commissioning plan;
- One copy of site information, soil investigating report, borehole logs, etc.;
- 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 Construction Schedule.

RS 4.3.3 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 Commissioning Plan;
 - One set of designated substance survey report (provided by PWGSC).

-
- As a safeguard against loss or damage to the originals, retain a complete set of drawings in reproducible form and one copy of specification;
 - Inspection Authorities Submission (i.e. Municipal Building Departments);
 - Submit and obtain approval on plans and specifications required by Inspection Authorities before tender call (i.e. Consultant is to apply for and obtain Building Permit(s))

RS 5.0 Bilingual Construction Documents

RS 5.1 Overview

The Consultant is to have Construction Documents provided in Canada's two Official Languages.

RS 5.2 Scope and Activities

- provide construction documents in Canada's two Official Languages;
- affix a professional seal to both language versions of the Construction Documents.

The total amount payable for the production of bilingual construction documents shall not exceed the amount specified in the Call-up for Services without the prior authorization of the Departmental Representative

RS 5.3 Deliverables

- English Construction Documents;
- French Construction Documents.

RS 6.0 Tender Call, Bid Evaluation & Construction Contract Award

RS 6.1 Overview

The Consultant is to support the Departmental Representative throughout the tender period of the project.

RS 6.2 Scope and Activities

- Attend tenderers briefing meeting(s) (i.e. Job Showing);
- Prepare addenda based on questions arising in such meetings for issue by the Contracting Authority;
- Provide the Departmental Representative with all information required by tenderers to fully interpret the Construction Documents. PWGSC will issue the addenda to all participants;
- Keep full notes of all inquiries during the bidding period and submit same to Departmental Representative at the end, for PWGSC records;
- Assist in tender evaluation by providing advice on the following:
 - The completeness of tender documents in all respects;
 - The technical aspects of the tenders;
 - The effect of alternatives and qualifications which may have been included in the tender;
 - The tenderers capability to undertake the full scope of work;
 - The availability of adequate equipment to carry out the work.
- If PWGSC decides to re-tender the project, provide advice and assistance to the Departmental Representative;
- Revise and amend 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.

RS 6.3 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 7.0 Construction & Contract Administration

RS 7.1 Overview

The consultant is to ensure the implementation of the project is in compliance to the Contract Documents, and to direct and monitor all necessary or requested changes to the scope of work during construction.

RS 7.2 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 the Departmental Representative 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;
- Ensure compliance with Commissioning Plan, update plan as necessary;
- 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 Departmental Representative 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 Departmental Representative;
- Indicate any changes or material/equipment substitutions on Record Documents;
- Conduct a final warranty review.

RS 7.2.1 Construction Meetings

- Immediately after construction 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 Departmental Representative;
- Call job meetings every 2 weeks, commencing with the construction briefing meeting. The meetings should include the job superintendent, Inspector of Construction, main sub-contractors, affected sub-consultants and Government of Canada representatives as necessary. Prepare minutes of the meeting and distribute copies to all participants within 48 hours. The Departmental Representative may invite client Departments to attend any of these meetings.

RS 7.2.2 Project Schedule

-
- Obtain Construction Schedule with detailed commissioning component shown separately, as soon as possible after contract award and ensure proper distribution;
 - 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.

RS 7.2.3 Time Extensions

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

RS 7.2.4 Cost Breakdown

- Obtain from the Contractor a detailed cost breakdown on the standard PWGSC form and submit to the Department with the first Progress Claim.

RS 7.2.5 Labour Requirements

- The Contractor is bound by the Contract to maintain competent and suitable workmen on the project and to comply with the Canada Department of Labour - Labour Conditions. Inform the Department 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 construction contract is posted in a conspicuous place on site.

RS 7.2.6 Bylaw Compliance

- Ensure that construction complies with applicable bylaws and regulations;
- Obtain approvals/certifications from the Technical Standards and Safety Authority (TSSA) where required;
- Matters pertaining to the Department of Labour shall be referred to the Departmental Representative.

RS 7.2.7 Construction Safety

- All construction projects that are occupied by federal employees during construction are subject to the Canada Occupational Safety and Health Act and Regulations as administered by Health and Welfare Canada and/or Provincial Regulations - whichever is more restrictive;
- Fire safety provisions during construction must comply with Fire Commissioner of Canada (FCC) Standards 301 and 302, administered by Fire Protection Engineering

Services, Labour Program, Human Resources and Skills Development Canada, formerly known as 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;
- Ensure the Contractor is mandated to provide all required co-ordination, 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 mandated to provide Watchman Service as defined in FCC 301 and by the Fire Commissioner.

RS 7.2.8 Site Visits

- Provide non-resident construction inspection services. 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 Contractor 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 Department 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.

RS 7.2.9 Clarifications

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

RS 7.2.10 Progress Reports

- Report to the Departmental Representative regularly on the progress of the work;
- Submit weekly reports.

RS 7.2.11 Work Measurement

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

RS 7.3.12 Detail Drawings

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

RS 7.2.12 Shop Drawings

- On completion of project forward three copies of reviewed shop drawings to the Department. Ensure that shop drawings include the project number and are recorded in sequence;
- Verify the number of copies of shop drawings required. Consider additional copies for Client's departmental review;
- Shop drawings shall be stamped: "Checked and Certified Correct for Construction" by the Contractor and stamped: "Reviewed" by the Consultant before return to the Contractor;
- Expedite the processing of Shop Drawings.

RS 7.2.13 Inspection and Testing

- Prior to tender, provide Department with recommended list of tests to be undertaken, including on site and factory testing;
- Ensure all testing is detailed within Commissioning Plan;
- When the construction 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 the construction contract;
- Immediately notify Departmental Representative when tests fail to meet project requirements and when corrective work will affect schedule;
- Assist Departmental Representative in evaluating testing firm's invoices for services performed.

RS 7.2.14 Construction Changes

- The Consultant does not have authority to change the work or the price of the Contract. However, the Consultant will prepare Contemplated Changes Notices (CCNs) and Change Orders (COs);
- Changes which affect cost or design concept must be approved by the Department;
- Upon Departmental approval obtain quotations from the Contractor in detail. Review prices and forward promptly recommendations to the Department;
- The Department will issue Consultant-prepared CCNs and COs to the Contractor, with copy to 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.

RS 7.2.15 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 Progress Payment;
 - Cost Breakdown;
 - Statutory Declaration Progress Claim.
- Review and sign designated forms and promptly forward claims to the Departmental Representative for processing;
- Submit with each progress claim:
 - Updated schedule of the progress of the work;
 - Photographs of the progress of the work.

RS 7.2.16 Materials on Site

- The Contractor may claim for payment of material on site but not incorporated in the work;
- Materials must be stored in a secure place designated by the Department;
- A detailed list of materials with supplier's invoices showing the price of each item must accompany a claim; the Consultant shall check and verify this list (Detail Sheet);
- 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.

RS 7.2.17 Acceptance Board

- Inform the Department when satisfied that the project is substantially completed. The Consultant shall ensure that his/her representative, his/her sub-consultant representative, Resident On-Site Reviewer, Contractor and major sub-trades representatives shall form part of the Project Acceptance Board and attend all meetings as organized by the Department.

RS 7.2.18 Interim Inspection

- 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.

RS 7.2.19 Interim Certificates

-
- Payment of the contractor requires completion and signing, by the parties concerned, of the following documents:
 - Certificate of Substantial Performance (Interim);
 - Statutory Declaration;
 - Worker's Compensation Board Certificate.
 - Verify that all items are correctly stated and ensure that completed documents and any supporting documents are supplied to the Departmental Representative for processing.

RS 7.2.20 Operation and Maintenance Data Manual

- Operation and Maintenance Data Manual: 4 hard copy sets and 1 electronic set of each volume produced by Contractor in accordance with project specification and verified for completeness, relevance and format by the Mechanical and Electrical Consultants and submitted to PWGSC Departmental Representative prior to interim acceptance or actual start of operation and instruction period, whichever occurs sooner. The Contractor shall retain one copy of each volume for his record and use during the instruction period.

RS 7.2.21 Instruction of Operating Personnel

- Make arrangements and ensure that Department's operating personnel is properly instructed on the operation of all services and systems using the final manuals as reference;
- Consultant to provide training sessions, as required, on the subject of design intent and systems operations. Utilize Systems operations manual and standard operating procedures for training sessions.

RS 7.2.22 Keys

- Ensure that all keys and safe combinations are delivered to the Departmental Representative .

RS 7.2.23 Final Inspection

- Inform the Departmental Representative when satisfied that all work under the construction contract has been completed, including the deficiency items, inspection and Acceptance as a result of the Interim Inspection. The Department 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.

RS 7.2.24 Final Certificate

-
- The final payment requires completion and signing, by the parties concerned, of the following documents:
 - Certificate of Completion (Final);
 - Statutory Declaration;
 - Workmen's Compensation Clearance Certificate;
 - Hydro Certificate;
 - All TSSA certifications.
 - Verify that all items are correctly stated and ensure that completed documents and any supporting documents are furnished to the Department for processing.

RS 7.2.25 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 Interim Certificate of Completion and the Final Certificate of Completion signifies commencement of the 12 month warranty period for work completed on the date of each certificate in accordance with the General Conditions of the Contract;
- Provide Department 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.
- As of the Take-over Date, the Contractor may cancel the Contract Insurance, and the Department or Client Department (as the case may be) assumes responsibility for:
 - Security of the work(s);
 - Fuel and utility charges;
 - Proper operation and use of equipment installed in the project;
 - General maintenance and cleaning of the work(s);
 - Maintenance of the site (except any landscaping maintenance covered by the contract).

RS 7.2.26 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 6 weeks of final acceptance;
- Provide a complete set of final shop drawings.

RS 7.3 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;
- Interim or Final certificates;
- Debrief of Commissioning Activities;
- As built records;
- Warranty deficiency list;
- Report on Final Warranty Review.

RS 8.0 Commissioning

RS 8.1 Overview

The consultant shall provide commissioning services to verify:

- That the Construction Documents were correctly interpreted by the Contractors;
- That the installed equipment/systems satisfy the project's requirements;
- That the installed equipment/systems operate correctly and consistently under all normal loading conditions;
- That the project has received all performance verification tests/procedures from the Contractor and that the results meet the design intent.

RS 8.2 Scope and Activities

- Prepare a preliminary commissioning plan (to be submitted with the 33% design documents) where the size and complexity of the project warrant its inclusion;
- Prepare a commissioning plan;
- Provide complete documentation on the operations and maintenance requirements of the installed equipment/systems;
- Provide complete documentation on the project design, including design intent documents;
- Identify contractor and subcontractor commissioning, Performance Verification (PV) and testing responsibilities;
- Plan the PV activities, develop the installation checklists and PV report forms, and prepare a detailed verification schedule. PV tests will be performed by the contractor and witnessed by the Consultant. Maintain detailed development reports and review with the contractor for special systems such as EMCS, telecom, security;
- PV inspection forms will be completed for all components, subsystems, systems, and integrated systems, and a final performance verification report will be submitted to the Commissioning Manager;
- Prepare a training plan for the O&M staff to be trained on the operations of the new equipment / systems. Anticipate and plan for up to four (4) repeat training sessions to meet operational requirements. Training materials should include the O&M manuals, as-built documentation, site specific operating instructions and SOP documentation. Training should be both on site and classroom, as required to meet the operational complexity of the project;
- Ensure the Contractor provides all operation and maintenance information and spare parts for the installed equipment / systems.

8.3 Deliverables

- Preliminary Commissioning Plan

-
- Commissioning Plan;
 - Operation and Maintenance Manuals;
 - Installation Checklists;
 - Performance Verification Forms;
 - Performance Verification Report;
 - O&M Staff Training Plan, Training Records and signed Attendance Forms.

RS 9.0 Standard Operating Procedures

RS 9.1 Overview

The Consultant is to provide or update Standard Operating Procedures (SoP) for equipment, systems, processes, etc.

RS 9.2 Scope and Activities

Specific tasks include, but are not limited to:

- Review the facilities policy on the use of SoPs;
- Review existing SoPs where they exist;
- Review equipment and/or system specifications, “as built” drawings, manufacturer operation and maintenance manuals, operator logs, the facilities life safety and emergency procedures, and any other pertinent documents, policies or procedures to ensure a full understanding of the circumstances related to the SoP;
- Where one does not already exist, prepare a template for use in providing SoPs for review and approval by the Departmental Representative;
- Compose the required SoPs in sufficient detail such that someone having limited experience with or knowledge of the procedure can successfully reproduce the procedure unsupervised;
- Provide flow charts, diagrams, definitions, checklists, step by step instructions, procedure limitations, applicability and other explanatory material as required within the SoP;
- Where requested in the ToR documents conduct tests with users of the SoP to verify its correct use;
- Where requested in the ToR provide training in the use of the SoP;
- Verify that the provided SoP follows the facilities document control policy (e.g., that the SoP is numbered, has the correct version, is dated where required, etc.);

9.3 Deliverables

- Submit draft SoPs and/or SoP templates for review;
- Revise and resubmit as required until approved;
- Submit final approved SoPs in the quantity and format noted in the ToR;
- Training for users of the SoPs.

RS 10.0 Risk Management

RS 10.1 Overview

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

RS 10.2 Scope and Activities

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);
- Implement risk mitigation.

10.3 Deliverables

- Prepare Risk Management Reports at Design Development, 66% Design Documents, and 100% Design Documents stages;
- Include input from all sub-consultants and from Client;
- Take steps to implement risk mitigation as required. This may include (but is not limited to) further recommendations, analysis, investigations, site meetings, site supervision, etc.

RS 11.0 Post-Construction Warranty Review

RS 11.1 Overview

The Consultant is to ensure that the equipment/systems constructed throughout the course of the project are fully operational and functional prior to the warranty expiration dates.

RS 11.2 Scope and Activities

- Review if requested, during the Contractor's warranty period, any defects reported by the Departmental Representative;
- 30 days prior to the expiry of any warranty period, visit the site and record any defects observed or reported;
- At the end of any warranty period, carry out a final review of the equipment/systems and report the existence of any defects to the Departmental Representative. If the Departmental Representative accepts the rectification of the defects, a notice of "Final Warranty Inspection" shall be issued to the Contractor.

RS 11.3 Deliverables

- Equipment/Systems Defect Reports;
- Notice of Final Warranty Inspection;