

# HEAVY CIVIL Engineering Services TERMS OF REFERENCE



## Standing Offer Agreement

For Various Federal Projects in Western Region

Public Works and Government Services Canada  
Real Property Services  
Western Region

June 2014





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# 1 PROJECT DESCRIPTION

## 1.1 PROJECT INFORMATION

### 1.1.1 INTRODUCTION

- 1 Public Works and Government Services Canada (PWGSC) is inviting civil engineering firms with Heavy Civil Engineering expertise to submit proposals for Standing Offers. Heavy Civil comprises establishments whose primary activity is the construction of entire engineering projects (e.g., highways and dams), and specialty trade contractors, whose primary activity is the production of a specific component for such projects. Construction projects involving water resources (e.g., dredging and land drainage), projects involving open space improvement (e.g., parks and trails), and those that may include environmental requirements are included in this subsector. Excluded from Heavy Civil are construction activities normally performed on buildings or building related projects. The selected consultants shall provide a range of services as identified in the Required Services section of this document for projects in the Western Region, excluding Comprehensive Land Claim Areas and the Northwest Territories.

### 1.1.2 OBJECTIVES

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

### 1.1.3 THE PWGSC GENERAL PROCEDURES AND STANDARDS DOCUMENT (GP&S)

- 1 The Terms of Reference (TOR) document must be used in conjunction with the GP&S, as the two documents are complimentary.
- 2 The TOR which will be issued at the time of the call-up will describe project-specific requirements, services and deliverables while the GP&S document outlines minimum standards and procedures common to all projects.
- 3 In the case of a conflict between the two documents, the requirements of the TOR override the GP&S Document.

## 1.2 GENERAL INFORMATION

### 1.2.1 PROJECT INFORMATION

Project Information	
Project Title:	Standing Offer Agreement for Heavy Civil Engineering Services
Project Address:	Various throughout Western Region
Solicitation Number	Various
PWGSC Project Number:	Various
User Department:	Various

### 1.2.2 DEPARTMENTAL REPRESENTATIVES

Department	Representative
PWGSC Departmental Representative	Project Managers - Various
PWGSC Contracting	Contracting Officers - Various



### 1.2.3 USER DEPARTMENT

- .1 The User Department will be identified in the call-up and will be a Department or Agency of the Government of Canada.

## 1.3 BACKGROUND INFORMATION

### 1.3.1 GENERAL

- .1 Background information on the need, existing conditions, constraints and challenges, possible encounter of hazardous materials, any heritage aspects or other special conditions unique to the project will be identified in the call-up.

## 2 REQUIRED SERVICES

### 2.1 CONTEXT

#### 2.1.1 GENERAL GOALS

- .1 Ensure the design is cost effective considering both initial cost and operation & maintenance costs over a life cycle of 25 years.
- .2 The services of a coordinating registered professional and a team of registered professionals of record are required. The coordinating registered professional firm shall have expertise in heavy civil engineering. The coordinating registered professional will be required to assemble a team of registered professionals of record which will additionally include structural engineering, landscape architecture, municipal engineering, geotechnical engineering and material testing, cost consulting, and topographic survey disciplines.
- .3 The following Required Services sections are intended to show the level of effort required for a “full service” package. Individual call-ups will include the actual scope of services required for that specific project, which may or may not include all of the services noted in the sections below. Services that are required for a specific call-up are to follow the guidelines as set out herein.

#### 2.1.2 DESIGN PERFORMANCE

- .1 The design is to ensure that the project:
  - .1 Responds to the operational and functional needs of the User Department, as identified in the call-up
  - .2 Incorporates sound design principles
  - .3 Incorporates suitable high quality materials into the design that are of a high quality, durable and are constructed with the best workmanship possible
  - .4 Employs advanced systems and technologies to support contemporary operating requirements with capacity for growth and change
  - .5 Embody contemporary sustainable design and application principles and is implemented in an environmentally responsible manner
  - .6 Allow capacity for growth and change

### 2.2 PRE-DESIGN SERVICES

#### 2.2.1 PURPOSE

- .1 The purpose of this stage is to identify, develop and provide the following.
  - .1 Feasibility Studies/Options Analysis
  - .2 Project Approach
  - .3 Infrastructure Condition Report
  - .4 Engineering/Geotechnical/Topographic survey or Other Investigations
  - .5 Environmental Requirements
  - .6 Regulatory Issues



## 2.2.2 FEASIBILITY STUDIES/OPTIONS ANALYSIS

- .1 Objective
  - .1 To prepare a report that outlines the research and subsequent analysis to determine the viability and practicality of a project. A feasibility study analyzes economic, financial, market, regulatory, environmental/sustainable and technical issues. The purpose at this stage is to investigate and analyze site conditions, including soil conditions, zoning, bylaws, traffic reports, service capacities, support systems, special purpose support systems, and provide recommendations
- .2 Scope and Activities
  - .1 Attend project start up meeting
  - .2 Visit the site, investigate and analyze the needs of the project
  - .3 Investigate the requirements for the particular site, including existing and new technologies
  - .4 Analyze the project requirements/program
  - .5 Review all available existing material related to the site
  - .6 Investigate and analyze all applicable codes, regulations standards
  - .7 Evaluate existing infrastructure including: municipal, civil, environmental, , functional adaptability, code compliance.
  - .8 Identify and verify all authorities having jurisdiction over the project
  - .9 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)
  - .10 Review the proposed project milestones for verification that all dates are achievable
  - .11 Review the cost plan/budget for verification that the costs are realistic and achievable and
  - .12 Prepare recommendations on the feasibility of the project
  - .13 Test the feasibility study recommendations using a minimum of three (3) options, schematic (sketch) only
  - .14 List Pro/ Cons of each option
  - .15 Execute financial analysis (Class 'D') including life cycle analysis and best value for operation and maintenance
  - .16 Indication of the preferred option
- .3 Deliverables
  - .1 Comprehensive summary of the requirements, conditions, feasibility and options analysis, demonstrating an understanding of the scope of work, including the following:
    - .1 Report on existing infrastructure including its condition, deficiencies and life expectancy
    - .2 Report on existing facilities and systems requirements
    - .3 Report on all applicable codes, regulation, standards and authorities having jurisdiction
    - .4 Report on environmental impact, sustainability and implement any environmental assessment recommendations
    - .5 Report on recommendations and options analysis
    - .6 Confirmed or adjusted project cost and time plans
    - .7 Provide written identification of the problems, conflicts or other perceived information/clarifying assumptions for the acknowledgment of the Departmental Representative
    - .8 Report on Class 'D' order of magnitude cost for each option

## 2.2.3 PROJECT APPROACH



## .1 Objective

- .1 To prepare a written statement which describes various criteria and data for a project including design objectives, site requirements and constraints, equipment and systems, and requirements. The purpose of this stage is to describe the requirements which must be met to satisfy the requirements of the project. The process seeks to answer the following questions.

- .1 What is the nature and scope of the problem?
- .2 What information is required to develop a proper engineering solution to the problem?
- .3 How much and what type of construction is needed?
- .4 What are the future requirements of this site?

## .2 Scope and Activities

- .1 In preparing a functional program, the consultant's main task is to examine the project/site in detail so as to define the clients' needs and objectives. These requirements will establish criteria for evaluating potential design solutions and other strategic alternatives.
- .2 The consultant must understand: the impacts of the project on the environment, the social impacts of its program on the community, the impacts on the existing infrastructure, and long term maintenance requirements and operational needs.
- .3 The consultant shall then develop approximate sketches and technical requirements for the proposed works including details for proposed works and environmental criteria.
- .4 The Consultant shall also advise Departmental Representative on alternatives such as the engineering and financial implications of various options. The consultant shall assist in assessing the advantages or benefits and the disadvantages or costs of each alternative.

## .3 Deliverables

- .1 The final Project Review is a report including (but not limited to) the following:
  - .1 Site requirements
  - .2 Explicit space requirements for the future of the site including: definition of the function of each type of infrastructure, the functional relationships between different types of infrastructure or areas, site and sketch of the different infrastructures, and special technical requirements of each of the items
  - .3 Financial requirements and a preliminary order of magnitude Class "D" budget
  - .4 Scheduling and time frame for the project
  - .5 Other requirements including, regulatory issues, requirements from other Authorities having Jurisdiction, community goals and concerns, and ecological and environmental concerns
  - .6 A recommended construction delivery method (traditional design-bid-build, design-build, construction management)

### 2.2.4 INFRASTRUCTURE CONDITION REPORT

## .1 Objective

- .1 The purpose of this stage is to identify and evaluate existing infrastructure including but not limited to civil, municipal, structural infrastructure, mechanical and electrical equipment and all other infrastructure which will be utilized in the current and future operation of the site.

## .2 Scope and Activities

- .1 Prepare a detailed inventory of existing infrastructure and equipment found on the site. Include drawings identifying existing location, layout.



- .2 Based on parameters developed in conjunction with the Departmental Representative and the client department, prepare an evaluation report that assesses the condition of existing infrastructure and equipment.
- .3 Assess the current inventory against the client department's functional requirements.
- .4 Include an examination of reusing/refurbishing existing infrastructure and equipment, procuring/ constructing new infrastructure and equipment, and current technologies and innovative solutions for the site.
- .5 Prepare a detailed cost analysis that compares the reuse/refurbishment of existing infrastructure and equipment, with the purchase of new. Consideration should be given to cost effectiveness and time frames required for refurbishment of existing infrastructure and equipment and/or the procurement of new.
- .3 Deliverables
  - .1 A Condition Report

## **2.2.5 ENGINEERING/GEOTECHNICAL/TOPOGRAPHIC SURVEY OR OTHER INVESTIGATIONS**

- .1 Objective
  - .1 The purpose of this stage is to research and carry out all Geotechnical, Engineering, topographic survey or other investigations required to complete the requirements of the site or project
- .2 Scope and Activities
  - .1 Conduct investigations to obtain the required information such as but not limited to Geotechnical, Engineering, Topographic Survey or other information to prepare and carry out the activities necessary to establish the required infrastructure for the site or project.
  - .2 Prepare report on each investigation clearly describing what information was required, why it was required and what the results were.
- .3 Deliverables
  - .1 An Investigation Report

## **2.2.6 ENVIRONMENTAL REQUIREMENTS**

- .1 Objective
  - .1 The purpose is respond to requirements or recommendations for a water management, waste management and environmental protection plans for regulatory, construction and post construction stages.
- .2 Scope and Activities
  - .1 Prepare any required reports or permitting requirements in support of water management, waste management and environmental protection plans for regulatory, construction and post construction stages.
  - .2 Implement recommendations of applicable environmental assessments to minimize environmental effects.
- .3 Deliverables
  - .1 Reports, permitting requirements, and recommendations as noted above.

## **2.3 CONCEPT DESIGN**

### **2.3.1 PURPOSE**

- .1 To translate the project requirements into preliminary design to explore design options and analyze them with respect to priorities and program objectives previously identified. Out of this process, one option will be recommended to proceed to Design Development.

### **2.3.2 SCOPE AND ACTIVITIES**

- .1 Obtain written approval from Departmental Representative for development of schematic design options based on the analysis of the Terms of Reference.





- .2 Provide alternative design options exploring possible technical and environmental strategies which are viable and have potential for development.
- .3 Analyze each solution with regard to the project goals including cost and schedule.
- .4 Write a preliminary project-description report outlining the various components and system options.
- .5 Produce Canadian Environmental Assessment Act (CEAA) Screening Report, if requested.
- .6 Recommend one option for further development with all supporting background and technical justifications.
- .7 Produce a class 'C' cost estimate for the various options; and be prepared to further develop the cost estimate to level "A" ready for tender.
- .8 Produce an implementation schedule, including alternative procurement and construction strategies.

### **2.3.3 DELIVERABLES**

- .1 Schematic Design Drawings
- .2 Site plan showing proposed works, existing infrastructure, existing and proposed services
- .3 Description of the options with recommendation of preferred solution
- .4 Waste Management plan
- .5 Recommendations of decisions for the CEAA, if requested
- .6 Cost Plan, including cost analysis, "what if" scenarios, potential risks, alternative procurement and construction strategies
- .7 Class 'C' Cost Estimate, including methodology of the estimate, assumptions made, costing alternatives and life cycle costs (document all unit pricing, analysis, and valuation)
- .8 Prepare project master schedule and identify potential risks to schedule





## **2.4 DESIGN DEVELOPMENT**

### **2.4.1 PURPOSE**

- .1 To further develop one of the options presented at the Schematic Design stage. The Design Development documents consist of drawings and other documents to describe the scope, quality, and cost of the project in sufficient detail to facilitate design approval, confirmation of code and regulation compliance, detailed planning of construction and project approval.

### **2.4.2 SCOPE AND ACTIVITIES**

- .1 Obtain written approval from Departmental representative for development of one of the proposed concept design options.
- .2 If any alterations are demanded, document all required changes, analyze the impact on all project components, and resubmit for approval if required.
- .3 Expand and clarify the Concept Design intent for each design discipline.
- .4 Present / submit design and materials for review and approval to committees, review groups and authorities having jurisdiction as identified in section Project Administration. Present the design to the government or local authorities where required.
- .5 Ensure coordination of all disciplines' design development.
- .6 Analyze the constructability of the project and advise on the construction process and duration.
- .7 Undertake a budget, schedule and risk analysis and identify any conflicts that will need to be addressed with respect to scope, quality, schedule, and cost.
- .8 Continue to review all applicable statutes, regulations, codes and by-laws in relation to the design of the project.
- .9 Define Commissioning Requirements.

### **2.4.3 DELIVERABLES**

- .1 Updated project requirements
- .2 Plans for all works, including all disciplines, showing all infrastructure, indicating all key dimensions
- .3 Preliminary works plans and plans for site preparation
- .4 Engineering, engineering details, including elevations, and site models as required
- .5 Outline specifications for all systems and principle components or equipment
- .6 Updated cost plan and cash flow
- .7 Class 'B' (substantive) cost estimate showing changes from class "C" (indicative) cost estimate
- .8 Update time plan (Schedule) with highlighted changes to the time plan
- .9 Preliminary construction schedule including long term delivery items
- .10 Project dossier detailing the basic assumptions of the project and the justifications for all major decisions
- .11 Prepare a commissioning brief describing major commissioning activities which include but are not limited to civil, municipal, structural, mechanical, electrical, and integrated system testing
- .12 Updated sustainable development strategy report



## 2.5 CONSTRUCTION DOCUMENTS

### 2.5.1 PURPOSE

- .1 Based on approved Design Development documents, the Consultant is required to prepare drawings and specifications setting forth in detail the requirements for the final cost estimate and construction of the project.
- .2 To prepare drawings and specifications setting forth in detail the requirements for the construction and final cost estimate of the project. The following requirements are minimal at these stages of the project.
  - .1 33% indicates technical completeness of all working documents
  - .2 66% indicates substantial technical development of the project - well advanced engineering and engineering plans, details, schedules and specifications
  - .3 99% is the submission of complete Construction Documents ready for tender call and submission to local authorities for pre-permit purposes
  - .4 Develop project specific Systems Operations Manual (SOM) as required
  - .5 Final Submission incorporates all revisions required in the 99% version and is intended to provide PWGSC with complete construction documents for tender call

### 2.5.2 SCOPE AND ACTIVITIES

- .1 Obtain Departmental Representative's approval for Design Development submissions (33%, 66%, 99% and final)
- .2 Comply with requirements pertaining to such elements as format, type, content, number of copies, etc. (information regarding the preparation and submission of Construction Documents is presented in PA 1 and in Appendix D)
- .3 Confirm format of drawings and specifications
- .4 Provide full coordination of all disciplines between all tender packages
- .5 Clarify special procedures (i.e. phased construction)
- .6 Submit drawings and specifications at the required stages. (33%, 66%, 99%)
- .7 Provide written response to all review comments and incorporate them into Construction Documents where required
- .8 Advise as to the progress of cost estimates and submit updated cost estimates as the project develops
- .9 Update the project time plan (schedule)
- .10 Prepare a final Class 'A' (substantive) estimate
- .11 Review and approve materials and construction processes specifications to meet sustainable development objectives

### 2.5.3 DELIVERABLES

- .1 Deliverables shall occur in four stages, completeness of the project development shall reflect the stage of submission: 33%, 66%, 99% and 100%. Revise as required by the Departmental Representative. Resubmit for acceptance. The construction documents will update the design development report, consolidate the Scope and Activities identified above, and will continue to be utilized as the benchmark project control document to monitor progress of the project.
- .2 Deliverables are similar at 33%, 66%, 99% stages; completeness of the project development shall reflect the stage of a submission.
  - .1 Provide the following for each submission package and minimal at each stage.
    - .1 Coordinate all disciplines within and between all submission packages including any scope changes that may be required to remain within budget.
    - .2 Complete specification and working drawings for all submission packages.



- .3 Updated risk analysis, updated Class B cost estimate, and project schedule.
- .2 33% Stage
  - .1 Final geometric layout for existing and new infrastructures and facilities
  - .2 Typical cross-sections for all structures
  - .3 Preliminary design grades and slopes
  - .4 Preliminary scope of work drawing
  - .5 Structural foundation plan, floor framing plans, roof framing plans, size of main members
  - .6 Design criteria, design loads, strength and grade of structural members, soil capacity
  - .7 List of specification sections, and standard and full size drawings to be included in final contract package
  - .8 Preliminary sitting for all infrastructures and facilities
- .3 66% Stage
  - .1 Complete scope of work drawings and typical sections for all disciplines
  - .2 Complete geometric design
  - .3 Complete design grades with first draft cross-sections and profiles, including water, storm and sanitary infrastructures
  - .4 Complete structural layout with proposed materials and dimensions
  - .5 Structural strength and grades of wood, concrete, masonry, steel, reinforcement, and fasteners
  - .6 Schedule for columns, beams, footings, lintel, etc
  - .7 First draft of specifications and standard drawings
  - .8 First draft unit cost Items and quantities
  - .9 Complete layout of all infrastructures and facilities
- .4 99% Stage
  - .1 Complete contract drawings
  - .2 Complete Specifications
  - .3 Draft commissioning plan, and system operational manual
  - .4 Complete structural, geometric, and grades design
  - .5 .Complete unit cost items, and cash allowance items, and if any lump sum items.
  - .6 Contract documents
  - .7 Class A estimate
- .5 Final submission
  - .1 Submission to incorporate all revisions required by the review of the 99% submission
  - .2 Coordinate all disciplines between all submission packages including any scope changes that may be required to remain within budget
  - .3 Complete set of original specifications
  - .4 Complete contract drawings
  - .5 Complete systems operational manual as required
  - .6 Complete commissioning plan
  - .7 Class 'A' cost estimate
  - .8 Updated project schedule



## **2.6 TENDER CALL, BID EVALUATION & CONSTRUCTION CONTRACT AWARD**

### **2.6.1 PURPOSE**

- .1 Provide assistance in obtaining and evaluating bids from qualified contractors to construct the project as per the Tender Documents.

### **2.6.2 SCOPE AND ACTIVITIES**

- .1 Tender Call
  - .1 The Departmental Representative shall be responsible for the production of the required number of copies of the tender documents and for such other documents as are necessary for tender call purposes. The Consultant shall:
    - .1 Prepare, sign, seal and submit complete sets of approved tender-ready, construction drawings and specifications to the Departmental Representative.
    - .2 Provide the Departmental Representative with all information required by contractors to fully interpret the construction documents. The Contracting Authority will issue the addenda to all participants.
    - .3 Attend tender briefing meeting(s) (i.e. Bidders Conference), upon request
    - .4 Prepare addenda based on questions arising in such meetings for issue by the Contracting Authority. The Contracting Authority will issue the addenda to all participants.
  - .2 Bid evaluation and construction contract award
    - .1 The Consultant shall, upon request, assist tender evaluation by providing advice on such elements as:
      - .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 contractor's capability to undertake the full scope of work
      - .5 Examine and report on any cost and schedule impact created by the issue of tender / contract addenda

### **2.6.3 DELIVERABLES**

- .1 Originals of drawings and specifications
- .2 Electronic copies of drawings and specifications
- .3 Addenda where needed
- .4 Full notes of all inquiries, and related correspondence, during the bidding period
- .5 Changes to the documents, if re-tendering is necessary
- .6 Updated cost estimate or schedule



## **2.7 CONSTRUCTION & CONTRACT ADMINISTRATION & POST CONSTRUCTION WARRANTY REVIEW**

### **2.7.1 PURPOSE**

- .1 To ensure the implementation of 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.

### **2.7.2 SCOPE AND ACTIVITIES**

- .1 During the implementation of the project, act on PWGSC's behalf to the extent and scope noted in the call up.
- .2 Carry out the review of the work at intervals appropriate to determine if the work is in conformity with the contract documents.
- .3 Attend site and or job meetings as required.
- .4 Keep 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.
- .5 Ensure compliance with commissioning plan, update plan as necessary.
- .6 Determine the amounts owing to the Contractor based on the progress of the work and certify payments to the contractor for approval.
- .7 Act as interpreter of the requirements of the contract documents.
- .8 Provide cost advice during construction.
- .9 Advise the Departmental Representative of all potential changes to scope, schedule and cost, for the duration of the implementation.
- .10 Review the Contractor's submittals.
- .11 Prepare and justify change orders for issue by the Departmental Representative.
- .12 Indicate any changes or material/equipment substitutions on record documents.
- .13 During the twelve (12) month warranty period investigate all defects and alleged defects and issue instructions to the Contractor.
- .14 Prepare and post systems operating instructions as required
- .15 Assist in commissioning activities as requested.
- .16 Finalize systems operations manual.
- .17 Conduct a final warranty review and coordinate as built of the final work.

### **2.7.3 DELIVERABLES**

- .1 Written reports from site visits including persons involved
- .2 Written reports on the progress of the work and the cost of the project at the end of each month
- .3 Additional detail drawings when required to clarify, interpret or supplement the construction documents
- .4 Post contract drawings (As-Built Drawing)
- .5 Interim or final certificates
- .6 Debrief of commissioning activities
- .7 As built records
- .8 Warranty deficiency list
- .9 Report on final warranty review

### **2.7.4 DETAILS**

- .1 Construction Meetings



- .1 Immediately after contract award, attend a briefing meeting with the Contractor, PWGSC Departmental Representative. Prepare minutes of the meeting and distribute copies to all participants and to other persons agreed upon with the Departmental Representative.
- .2 In coordination with the PWGSC Departmental Representative, attend other construction meetings.
- .2 Project schedule
  - .1 Coordinate all tender packages and incorporate in project schedule.
  - .2 Monitor the approved construction schedule, take necessary steps to ensure that the schedule is maintained and submit a detailed report to the PWGSC Departmental Representative, concerning any delays.
  - .3 Keep accurate records of causes of delays.
  - .4 Make every effort to assist the Contractor(s) to avoid delays.
- .3 Site Visits
  - .1 Provide construction inspection services. Ensure compliance with contract documents.
  - .2 Provide services of qualified personnel who are fully knowledgeable with technical and administrative requirements of project.
  - .3 Assess quality of work and identify in writing to the Contractor(s) the PWGSC Departmental Representative, all defects and deficiencies observed at time of such inspections.
  - .4 Inspect materials and prefabricated assemblies and components at their source or assembly plant, as necessary for the progress of the project.
  - .5 Any directions, clarifications or deficiency list shall be issued in writing to the PWGSC Departmental Representative.
- .4 Shop Drawings
  - .1 Forward two (2) copies of reviewed shop drawings to PWGSC.
  - .2 Verify the number of copies of shop drawings required. Consider additional copies for Client / Users review.
  - .3 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.
  - .4 Expedite the processing of shop drawings.
  - .5 All equipment must be CSA approved, or CSA equivalent. In the case of equivalency, provide letters of approval for use in Canada.
- .5 Inspection and Testing and reviewing for Quality Assurance
  - .1 Provide Material Testing sub consultant and contractor with number and type of test and samples for each type of material to be undertaken to confirm that materials meet specification requirements. This includes on-site and offsite testing. Review testing methods, data of inspection testing agencies, and provide recommendations for acceptance or rejection.
  - .2 Provide the Departmental Representative and construction survey sub consultant a list of number and types of surveys to be carried out to check construction geometrics, slopes, and grades against the design. Review topographic survey methods and data and provide recommendations for acceptance or rejection of work.
  - .3 Brief the testing firm on required services, distribution of reports, communication lines once the contract is awarded.
  - .4 Witness sufficient number of on-site testing, including testing during off-hours.
  - .5 Review all material test and survey reports and take necessary action with the Contractor(s) when work fails to comply with contract.



- .6 Immediately notify PWGSC Departmental Representative if material tests or geometrics, grades and slopes fail to meet project requirements and when corrective work will affect schedule.
- .7 Review and evaluate testing firm's invoices for services performed.
- .8 Assist the PWGSC Departmental Representative in approving all Contractor's sample mock-ups or model areas that will be used to establish benchmarks for acceptable construction standards.
- .6 Construction Changes
  - .1 The Consultant does not have authority to change the work or the price of any contract(s).
  - .2 Changes, which affect cost or design concept, must be approved by the Departmental Representative.
  - .3 Upon PWGSC approval, obtain quotations from the Contractor(s) in detail. Review prices and forward recommendations to the PWGSC Departmental Representative promptly.
  - .4 PWGSC will issue change orders to the Contractor(s), with copy to Consultant.
  - .5 All changes, including those not affecting the cost of the project, must be covered by change orders.
  - .6 Each month, review Contractor's construction documents to ensure Contractor(s) has recorded all changes.
- .7 Contractor(s) Progress Claims
  - .1 Review and approve validity of monthly progress claim.
- .8 Interim Inspection
  - .1 Inform PWGSC when satisfied that the construction work is substantially complete ready to be inspected for issuing an Interim Certificate of Completion to the Contractor.
- .9 Final Certificate
  - .1 Inform PWGSC when satisfied that all work under the contract has been completed, including the deficiency items as a result of the interim inspection. PWGSC convenes an 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.
- .10 Take Over
  - .1 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 / Users. The date of Interim 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.
  - .2 Provide the PWGSC Departmental Representative and the PWGSC Contracting Officer 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 for completeness and extent of coverage
- .11 As-Built and Record Drawings and As-Built Specifications
  - .1 Following the take-over, obtain as-built marked-up hard copy from the Contractor(s).
  - .2 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.
  - .3 Verify at each progress payment that the Contractor(s) has/have accurately recorded information on the site as-built set of construction documents.
  - .4 Check and verify all as-built records for completeness and accuracy and submit to the PWGSC Departmental Representative.





- .5 Produce record drawings by incorporating final as-built-information into project drawings.
- .6 Submit a comprehensive consolidated final package of record drawings in number and format required by the contract within four (4) weeks of receiving marked up as-built drawings from the contractor

## **2.8 ESTIMATING AND COST PLANNING**

### **2.8.1 PURPOSE**

- .1 The purpose of cost planning and cost control is to assist in the accomplishment of project cost objectives. It is a continuous and interactive process involving planning, action, measurement, evaluation and revision.

### **2.8.2 SCOPE AND ACTIVITIES**

- .1 The Cost Specialist shall provide an interactive and continuous cost consulting service from the commencement of project design through to construction completion and subsequent evaluation, including the preparation of complete estimates for all construction trades, escalation, inflation and contingency costs
- .2 The Cost Specialist shall attend all relevant project and production meetings throughout the design phases and be prepared to present and defend the estimates directly to the Departmental Representative.
- .3 The Cost Specialist is 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.
- .4 If the estimate falls short of or exceeds the construction cost limit due to such changes, the Cost Specialist with the Consultant team shall fully advise the Departmental Representative. The Cost Specialist with the Consultant team shall propose alternative design solutions.

### **2.8.3 DELIVERABLES**

- .1 Class A, Class B, Class C, and Class D estimates and Cost Planning Report.
- .2 Cost Planning Report will include sufficient description and cost detail to clearly identify:
  - .1 Scope change: identifying the nature, reason and total cost impact of all identified and potential project scope changes affecting construction cost estimate.
  - .2 Cost overruns and under runs: identifying the nature, the reason and the total cost impact of all identified and potential cost variations.
  - .3 Options enabling a return to the construction cost estimate: identifying the nature and potential cost effects of all identified options proposed in order to return the project within the construction cost estimate.

## **2.9 RESIDENT CONSTRUCTION SERVICES**

### **2.9.1 PURPOSE**

1. The Resident *Construction* Services representative is responsible to ensure the presence of the Consultant on site for the project. The representative is to review coordinate and monitor all aspects of the work during key periods of the construction of the facility, and liaise with the contractor, PWGSC and other agencies as appropriate to the work.
2. The Resident *Consultant* Site Representatives are responsible for providing full time resident inspection for all aspects of the project, maintaining daily records of all construction work placed.

### **2.9.2 SCOPE AND ACTIVITIES**

- .1 General duties and Responsibilities



- .1 Provide full time resident inspection, coordination and monitoring during the construction work and be responsible to the Consultant. In addition, the Departmental Representative may delegate additional responsibilities.
- .2 Maintain daily records of all construction work placed and ensure constant communication among, the PWGSC Departmental Representative, the Consultant and the Contractor.
- .3 In case of emergencies, the Resident Consultant Site representatives are empowered to stop the work, or give orders to protect the safety of the workers or Crown property.
- .2 Inspection and Reporting
  - .1 Inspect all phases of the work in progress, for the purpose of bringing to the attention of the Contractor(s), after checking with the Consultant and Departmental Representative any discrepancies between the work, the contract documents and accepted construction procedures.
  - .2 Maintain a daily log of such inspections and shall issue a weekly written report to the Consultant, for distribution, in the form to be directed.
  - .3 Prepare any other reports or surveys as may be requested by the Departmental Representative through the Consultant.
  - .4 Verify quantities of materials received and record work progress through photographs (negatives to be held by PWGSC).
- .3 Interpretation of the contract documents
  - .1 Interpretation of the contract documents shall be the responsibility of the Consultant. The Consultant may, however, have the Resident Site representatives provide the Consultant with information regarding job conditions and may require the Resident Site representatives to relay day-to-day instructions to the Contractor.
  - .2 It shall be the duty of the Resident Site representatives 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.
- .4 Changes in the Work
  - .1 The Resident Site representatives 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.
  - .2 The Consultant may call upon the Resident Site representatives to assist in the evaluation of changes in the work, where knowledge of job conditions is required.
- .5 Communication and Liaison
  - .1 Convey the Consultant's instructions regarding the required standards of workmanship to the Contractor(s).
  - .2 Refer to 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. Informal discussions with sub-trade Superintendents are usually permissible (but only with the agreement of the Contractor); however the Resident Site representatives 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 representatives 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, and drawings.



- .5 Accompany PWGSC representatives on inspections and report to the Consultant requirements, comments or instructions of the PWGSC forces. Note that the Resident Site representatives 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, the Consultant and the Contractor 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.
- .6 Daily Log
  - .1 The Resident Site representatives 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
    - .6 Unusual site conditions experienced
    - .7 Significant developments, remarks
    - .8 Special visitors on-site
    - .9 Authorities given Contractor or the CM Contractor(s) to undertake certain or hazardous works
    - .10 Environmental incidents
    - .11 Reports, instructions from Appropriate Authorities Response Actions
    - .12 Stop work requests by PWGSC
  - .2 The log is the personal property of the Resident Site representatives. Copies of the logbook, certified as copies, are to be provided to PWGSC and Consultant at the end of the project.
- .7 Weekly records
  - .1 The Resident Site representatives shall prepare weekly reports for the Consultant in the form directed including:
    - .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 the CM Contractor(s) or his agents
- .8 Site Records



- .1 The Resident Site representatives shall maintain orderly and updated files at the site including the following:
  - .1 Contract and Tender Documents
  - .2 Approved Shop Drawings
  - .3 Approved Samples
  - .4 Site Instructions
  - .5 Contemplated Change Orders
  - .6 Change Orders
  - .7 Memoranda
  - .8 Test and Deficiency Reports
  - .9 Updated Progress schedule
  - .10 Correspondence and Minutes of Meeting
  - .11 Names, addresses, telephone numbers of PWGSC representatives, Consultant, Contractors, and sub-trades key personnel associated with the contract, including home telephone numbers in case of emergencies
- .2 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, issued subsequent to the award of the contract.
- .3 The Resident Site representatives shall follow approved protocol for the security and protection of documents and information held on-site.
- .4 The Resident Site representatives shall review monthly the accuracy of as-built marked up drawings kept by the Contractor and report any discrepancies or deficiencies to the Consultant.
- .9 Work Inspection
  - .1 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 documentation. 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 Construction Representative any of these on which the Contractor is tardy or refuses to correct.
  - .2 Arrange for 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.
  - .3 Report if materials and equipment are being incorporated into the project prior to approval of relative shop drawings or samples.
  - .4 Assist in the preparation of all deficiency, interim, preliminary, and final reports in collaboration with PWGSC and Consultant representatives.
  - .5 The Resident Site representatives shall be responsible for the measurement of all work to be done on a unit-cost basis.
- .10 Site Meetings
  - .1 The Resident Site representatives shall attend all job-site meetings.
- .11 Quality Assurance Inspection and Testing
  - .1 Ensure 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.
  - .2 Provide full quality assurance testing.
  - .3 Notify the Consultant if the test results do not meet the specified requirements, or if the Contractor does not have tests undertaken as required.
- .12 Emergencies



- .1 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 representatives shall give immediate written notice to the Contractor of the possible hazard. He shall further, if necessary, stop the work or give orders for remedial work, and contact the Consultant immediately for further instruction.
- .13 Limitations
  - .1 The Resident Site representatives shall not:
    - .1 Authorize deviations from the contract documents
    - .2 Approve shop drawings or samples
    - .3 Advise the Client / Users in any matter without obtaining guidance from Consultant
    - .4 Accept any work or portions of
    - .5 Enter into the area of responsibility of the Contractor's Field Superintendent
    - .6 Stop the work unless convinced that an emergency exists as noted above
- .14 Hazardous Construction Operations
  - .1 Examine all site conditions and methods to be used by the Contractor undertaking hazardous operations.
  - .2 Inspect the areas where hazardous work is under way to ensure that the Contractor is maintaining the agreed safety standards.
  - .3 Any infractions may result in the Resident Site representatives stopping the work. All infractions or work stoppages ordered shall be reported in writing and verbally to the Consultant and PWGSC Representative

### 3 PROJECT ADMINISTRATION

#### 3.1 GENERAL REQUIREMENTS

##### 3.1.1 PWGSC PROCEDURES AND STANDARDS

- .1 Adhere to the general project administration requirements contained in section 2.1 of the GP&S document.
- .2 Adhere to additional general project administration requirements detailed in the call-up.

##### 3.1.2 PROJECT DELIVERY

- .1 Deliver the project within the construction budget established during preliminary project approval.
- .2 Deliver the project within the key milestones and according to the detailed project schedule listed in the call-up.
- .3 Ensure that each Consultant team member understands the project requirements, for seamless delivery of the required services.
- .4 Ensure co-ordination of services with other consultants hired by PWGSC.
- .5 Provide a quality management plan that includes rigorous quality reviews.
- .6 Provide a continuous risk management program; address the risks associated specifically with this project including potential for soil contamination and presence of hazardous materials.

##### 3.1.3 ENVIRONMENTAL/SUSTAINABLE DEVELOPMENT

- .1 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. Sustainable development goals will be outlined in each call-up.



## **3.2 SCHEDULE**

### **3.2.1 GENERAL**

- .1 Deliver the project in accordance with the project milestone listing identified in the call-up.

### **3.2.2 RESPONSE TIME**

- .1 It is a requirement of this Request for Standing Offer that the prime consultant and their proposed sub-consultants be personally available to attend meetings within 48 hours, in the locality of the place of the work and to respond to inquiries within 24 hours of the Departmental Representative's request, from the date of the award of the consultant call-up until final inspection and turnover.

## **3.3 COST**

### **3.3.1 ESTIMATED CONSTRUCTION BUDGET**

- .1 Typically the construction estimate does not include project management fees, administration costs, consultant fees, risk allowance, escalation or GST and is in constant dollars.
- .2 The estimated construction cost will be established at the outset of the project.
- .3 The consultant will be required to verify the cost estimate at each stage of the project as outlined in the GP&S.

## **3.4 EXISTING DOCUMENTATION**

- .1 Existing documentation will be detailed in the call-up.

## **3.5 CODES, ACTS, STANDARDS, REGULATIONS**

### **3.5.1 GENERAL**

- .1 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. In addition to applicable legislated codes and standards, the following documents listed below apply;
  - .1 The NRC National Building Code of Canada 2010;
  - .2 The NRC National Fire Code of Canada, 2010;
  - .3 The NRC National Plumbing Code of Canada 2010;
  - .4 CSA Canadian Standards Association
  - .5 ULC-Underwriters' Laboratories of Canada
  - .6 National Fire Protection Association (NFPA) standards
  - .7 American Society for Testing and Materials (ASTM)
  - .8 ACI-American Concrete Institute
  - .9 AASHTO-American Association of State of Highway and Transportation Officials
  - .10 American National Standards Institute (ANSI)
  - .11 Asphalt Institute Manuals
  - .12 AWWA –American Water Works Association
  - .13 Canadian water Quality Guidelines
  - .14 CGSB –Canadian General Standard Board
  - .15 The Canada Labour Code,
  - .16 Canada Occupational Health and Safety Regulations,
  - .17 Canadian Drinking Water Standards,
  - .18 Storage of Dangerous Substances Design Guidelines
  - .19 Canadian Highway Bridge Design Code
  - .20 Transportation Association of Canada - Manuals, Guides and Handbooks





- .2 The call-up TOR will outline additional Acts, standards and regulations that are project specific requirements.

### **3.6 COMMUNICATIONS AND MEETINGS**

#### **3.6.1 COMMUNICATION**

- .1 If any communication with the User Departments results in the need for any change to the Project scope of work, quality, cost or schedule, the Consultant shall inform the Departmental Representative, and seek direction, before taking any action.
- .2 The Departmental Representative may arrange for the Consultant to obtain access to the PWGSC secure shared document management site (Buzzsaw).
- .3 Correspondence
  - .1 All correspondence from the Consultant shall be distributed as directed by the Departmental Representative.
  - .2 There shall be no correspondence between occupants or users of the facility and the Consultant unless directed by the Departmental Representative.
  - .3 All correspondence must carry the contract name/number, PWGSC Project title, PWGSC Project number and file number and a date (i.e. Month/Day/Year).
  - .4 Automatic date fields shall not be used except when preceded by the text "Printed on:"
- .4 The Consultant shall:
  - .1 Develop a communication and correspondence protocol, submit to the Departmental Representative for review and acceptance prior to implementation and incorporate it into the Project Procedures Manual.
    - .1 Account for the involvement of all Stakeholders in this protocol.
  - .2 Direct communication and correspondence between members of the PWGSC Project Team, the Contractor and the user departments on routine matters as may be required to enable the project to proceed in a timely and efficient manner.
    - .1 However, no communication shall alter the terms of the project scope, quality, budget or schedules unless directed in writing by the Departmental Representative.
- .5 Other meeting requirements will be delineated in the call-up.

#### **3.6.2 SUBMISSIONS TO PWGSC**

- .1 Where submissions to PWGSC include summaries, reports, network diagrams, drawings, plans or specifications, submit one (1) original to the Departmental Representative in electronic format, unless otherwise directed in writing.
- .2 Electronic format:
  - .1 The electronic deliverables shall be provided using Microsoft applications.
  - .2 Alternatively, the Consultant may submit all work in Adobe Acrobat \*.pdf format except for network diagrams which must be submitted in their original electronic format.

### **3.7 PROJECT REVIEW AND APPROVAL**

#### **3.7.1 FEDERAL GOVERNMENT**

- .1 At a minimum, the federal authorities having jurisdiction are:
  - .1 User department for functional design, multimedia, IT and security systems
  - .2 Environment Canada for environmental regulations
  - .3 National Building Code for building code compliance





### **3.7.2 PROVINCIAL AND MUNICIPAL AUTHORITIES**

- .1 The federal government generally defers to provincial and municipal authorities for specific regulations, standards and inspections but in areas of conflict, the more stringent authority prevails.

## **3.8 HEALTH AND SAFETY**

### **3.8.1 GENERAL REQUIREMENTS**

- .1 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.
- .2 In keeping with the responsibility and in order to enhance health and safety protection for all individuals on federal construction sites, PWGSC voluntarily complies with the applicable provincial/territorial construction health and safety acts and regulations, in addition to the related Canada Occupational Safety and Health Regulations.