

**GENERIC TERMS OF REFERENCE**  
**Mechanical Engineering Services**  
**Standing Offer Agreement**  
**W4M00-I5C587/A**

**For:**  
**Various Infrastructure Projects**  
**with the Department of National**  
**Defence**

**Department of National Defence**  
**17 Wing Construction**  
**Engineering Squadron**  
**Winnipeg, MB**

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# **1 PROJECT DESCRIPTION**

## **1.1 GENERAL**

### **1.1.1 SERVICES**

- .1 The services of a team of registered Mechanical Engineering professionals are required by the Department of National Defence (DND). A coordinating registered consulting engineering firm will be required to assemble a team of qualified professionals to respond to planning support and construction engineering services.
- .2 This document provides the Generic Terms of Reference (TOR) for the common services required for the various projects.
- .3 The Consultant will be engaged through individual project-specific “Call-Ups” which will include a Project-specific TOR.

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

- .1 The TOR documents must be used in conjunction with the General Procedures and Standards document (GP&S), as the two documents are complimentary. The GP&S document is a Public Works and Government Services Canada document (PWGSC) which has been adopted by DND. Wherever stated in the document as “PWGSC” read “DND”.
- .2 The Project-specific 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 Project-specific TOR override the GP&S Document.

### **1.1.3 PROJECT INFORMATION**

<b>Project Information</b>	
Project Title:	Standing Offer Agreement for Mechanical Engineering Services
Project Address:	Department of National Defence, 17 Wing Construction Engineering Squadron, Winnipeg, MB, as well as various armouries within Manitoba
Solicitation Number:	W4M00-15C587/A
DND Project Number:	TBD
DND Contracting Officer:	To be named at time of call-up
DND Departmental Representative:	To be named at time of call-up

## **1.2 BACKGROUND INFORMATION**

### **1.2.1 USER DEPARTMENT**

- .1 The User Department referred to throughout the TOR is the Department of National Defence (DND).

### **1.2.2 CONTEXT**

- .1 DND owns office buildings, hangars, armouries, accommodations and support buildings at various locations in Manitoba. These works were primarily built in the

1950's and 1960's. DND also maintains its own infrastructure including roads, parking lots, electrical distribution, as well as sewer, water and steam distribution systems.

- .2 The Department of National Defence is responsible for the prudent operation, maintenance and capital life-cycle rehabilitation to ensure that the infrastructure can continue to support the dependent uses and address compliance and fire, life safety issues.
- .3 Arising from 17 Wing's responsibility, it is incumbent that appropriate operation, maintenance and rehabilitation of the infrastructure be undertaken. Historically federal staff resources have been adequate to provide the required technical, engineering, and administrative capacity to support the responsibilities. Shifting mandate, attrition, and organizational change have, over the recent decades, reduced the capacity to support the infrastructure responsibilities. The mode of operation has gradually shifted to one of a knowledgeable owner, with limited internal capacity to meet all of its technical, engineering, and administrative needs. Consultants have been engaged on an increasingly frequent basis to fulfill the needed project investigation, design and construction requirements for larger and more complex projects.
- .4 The objective of this standing offer agreement is to put into place an "on-call" repertoire of mechanical engineering support to provide the capacity to respond to specific planning, operation, maintenance and rehabilitation needs.

### **1.2.3 QUALIFICATIONS**

- .1 The services of a coordinating registered professional and a team of registered professionals of record are required. The coordinating registered consulting firm shall have expertise in Mechanical Engineering, including Leed accreditation.

### **1.2.4 POTENTIAL SERVICES REQUIRED**

- .1 The needs and goals and the specific Services required will be outlined in the Project-specific TOR.
- .2 Examples of types of projects which require Mechanical Engineering Service Call-Ups are;
  - .1 HVAC systems analysis, repair and replacement and new installations including controls,
  - .2 Mechanical controls upgrade,
  - .3 Air flow analysis, balancing report and design recommendations,
  - .4 Provide options analysis, recommendations, design and project support for the above.
  - .5 Repairs and upgrades to plumbing and steam systems.
  - .6 Material testing where HAZMAT is suspected.
  - .7 Preparation of tender documents, plans and specifications of the above.

### **1.2.5 GEOGRAPHIC AREAS OF WORK**

- .1 The geographic area of the work is confined to Manitoba, but is otherwise detailed in the Project-Specific TOR.

#### **1.2.6 SAFETY MANAGEMENT PLAN**

- .1 The Consultant will be required to have in place a safety management plan for this Standing Offer Agreement to address required Occupation Safety and Health requirements related to the provision of the contracted services, including appropriate confined space knowledge and training.

#### **1.2.7 EXISTING CONDITIONS**

- .1 Existing conditions will be described in the Project-specific TOR. See also: 1.7.1.

#### **1.2.8 CONSTRAINTS AND CHALLENGES**

- .1 The Consultant will be required to become familiar with the project site and obtain local information as required.
- .2 On occasion expert advice will be required on an emergency basis.
- .3 The Consultant will be required to obtain DOS and Reliability security clearances for all his/her firm's personnel as well as any sub-consultants to visit the project site for any reasons, such as: preliminary site inspection, attendance for site design meetings, etcetera.
- .4 All site visits must be arranged through the Departmental Representative.
- .5 Typically, the engineering services and/or subsequent construction on the project sites will be performed during normal working hours with full or partial on-going operation of the infrastructure. Project phasing must be planned to ensure that disruption to the daily operation of the facilities is kept to a minimum.
- .6 The project scope must be tailored to meet the User Department's budget. Diligent cost estimating and cost control is required.
- .7 Additional project-specific constraints and challenges will be identified in the Project-specific TOR.

#### **1.2.9 HAZARDOUS MATERIALS**

- .1 Encounter of known hazardous materials will be identified in the Project-specific TOR.
- .2 There is always the possibility of the encounter of unknown hazardous materials.

#### **1.2.10 PROJECT DELIVERY APPROACH**

- .1 The delivery approach will be identified in the Project-specific TOR.

### **1.3 SUMMARY OF DESIGN WORK**

#### **1.3.1 GENERAL**

- .1 The Consultant shall provide professional service solutions that:
  - .1 Are effective and efficient;
  - .2 Meets current Codes, Standards and guidelines;
  - .3 Optimizes performance of the system;
  - .4 Are designed for ease of operation and maintenance;
  - .5 Minimize long-term maintenance costs.
  - .6 Use industry proven materials and avoidance of experimental materials; and
  - .7 Are cost effective considering both initial cost and operation & maintenance costs over a life cycle of 50 years (varies by infrastructure component).

### **1.3.2 ENVIRONMENTAL/SUSTAINABLE DEVELOPMENT**

- .1 Environmental and sustainability targets, if any, will be described in the Project-specific TOR.

## **1.4 SUMMARY OF SERVICES**

### **1.4.1 GENERAL SERVICES**

- .1 The prime consultant will provide a team of registered, Professional Engineers with expertise and experience related to building and infrastructure design including the following consultant services and specialties:
  - .1 Mechanical Engineering Services
  - .2 HAZMAT material testing
  - .3 Structural Engineering Services

## **1.5 SCHEDULE**

### **1.5.1 GENERAL**

- .1 The project is to be delivered, ready for acceptance in accordance with the Project-specific TOR.
- .2 Prepare a Project Schedule, in accordance with the milestone list of the Project-specific TOR.

## **1.6 COST**

### **1.6.1 CONSTRUCTION BUDGET**

- .1 Where the engineering services are anticipated to lead to the construction phase the order-of-magnitude construction budget will be identified in the Project-specific TOR.

## **1.7 EXISTING DOCUMENTATION**

### **1.7.1 AVAILABLE FOR THE CONSULTANT**

- .1 Copies of all pertinent documentation will be made available to the Consultant.
- .2 Available as-built drawings and Operation & Maintenance Manuals may be available on the project sites and the Consultant will be responsible for verifying the accuracy of the information incorporated into the design.

### **1.7.2 DISCLAIMER**

- .1 Reference information will be available in the language in which it is written.
- .2 The documentation may be unreliable and is offered, "as is" for the information of the Consultant.

## **1.8 CODES, ACTS, STANDARDS, REGULATIONS**

- .1 A listing of Codes, Acts, Standards and Guidelines potentially applicable to this project are contained in the GP&S Document.
- .2 The Authorities Having Jurisdiction (AHJ) are:
  - .1 The local AHJs, to be identified by the Departmental Representative;
  - .2 Provincial Agencies having legislation impacted by the work undertaken through the Call-up and ensuing construction projects;
  - .3 Federal agencies having legislation impacted by the work undertaken through the Call-up and ensuing construction projects;
  - .4 Treasury Board of Canada.

- .3 The Consultant must identify, analyze and design the project in accordance with the requirements of all AHJs and all applicable Codes, Acts, Standards and Guidelines and Legislation.
  - .1 The applicability of various Codes, Acts, Standards and Guidelines listed in the GP&S document arise out of direct and indirect references in documents which apply to Federal Real Property.
  - .2 The work of the consultant team must comply with the legislation and requirements that are unique to Federal Government Real Property in Canada.
  - .3 The consultant team must be fully versed and comply with the requirements of the Construction Engineering Technical Orders (CETO's) and the Fire Marshal Directives (FMD's).
  - .4 The work of the consultant team must comply with the legislation and requirements that are unique to Federal Government projects tendered through DND.
- .4 The Departmental Representative, with input from the Consultant, will identify any AHJ's that will require on-going consultation and communication, including the sharing of any reports, designs, tender documents or construction contract documents.

## **2 REQUIRED SERVICES**

### **2.1 GENERAL REQUIREMENTS**

- .1 Following is a list of Services potentially required for an Investigation, Report, Design or Construction Project.
- .2 The Project-specific TOR will identify the project-specific requirements including;
  - .1 Services Required,
  - .2 Project Stages and Deliverables,

#### **2.1.2 SERVICES WHICH MAY BE REQUIRED**

- .1 The prime consultant will provide a team of registered, Professional Engineers and Technologists with expertise and experience related to building and infrastructure assessments, repair, rehabilitation and new construction.
  - .1 Building condition and energy assessments and reports,
  - .2 Code analyses,
  - .3 Options analysis report with recommendations,
  - .4 Preparation of preliminary and final designs, tender documents, plans and specifications for construction contracting purposes,
  - .5 Construction Engineering and Site Support Services
  - .6 Other Engineering Services may also be required from time to time for planning or project purposes, which can be engaged as required through Sub-Agreements as described in the General Instructions to Proponents in the Request for Standing Offer Agreement.

## **2.2 PROJECT REVIEW AND APPROVAL**

### **2.2.1 GENERAL**

- .1 Comply with all applicable laws and regulatory requirements as required by the General Conditions of the Contract and AHJs

### **2.2.2 REVIEWS, APPROVALS AND PRESENTATIONS**

- .1 Each submission at each stage of the project is subject to reviews by, the Departmental Representative, the User Department site personnel, and DND technical experts.
  - .1 Expected turn-around time for reviews is two (2) weeks;
  - .2 For the review at each stage, the consultant shall provide a single coordinated written response to the comments.

## **2.3 PRE-DESIGN ENGINEERING**

### **2.3.1 SCOPE AND ACTIVITIES**

- .1 The Pre-design Engineering will deliver all of the Required Services outlined in the Project-Specific TOR to help consolidate the Scope of the subsequent design phase, and will be utilized as the benchmark project control document to monitor progress of the project.
- .2 Through the provision of the Required Services, the Pre-Design shall respond to the operational and functional needs of the user, and may, subject to complexity, require the Consultant to submit a brief work plan, schedule and cost proposal to complete the work. Services potentially required are;
  - .1 Visit the site(s),
  - .2 Analyse the project requirements including any amendments,
  - .3 Investigate and review all other available existing material related to the project including requirements identified in the Project-specific TOR,
  - .4 Identify and analyze all Codes, Acts, Standards and Guidelines that apply to this project,
  - .5 Identify and verify all Authorities Having Jurisdiction (AHJ) over the codes, regulations and standards that apply to the projects,
  - .6 Identify all additional information that will be needed to deliver the project,
  - .7 Provide the range of Required Engineering Services identified in the Project Specific TOR,
  - .8 Establish the sustainability targets,
  - .9 Provide updated cost estimates,
  - .10 Identify and assess the recommended options, and
  - .11 Complete a report documenting the above, complete with an engineering opinion of the recommended option.

### **2.3.2 DELIVERABLES**

- .1 A Draft Predesign Report that will contain at a minimum:
  - .1 An Executive Summary;
  - .2 Options analysis if requested;
  - .3 Necessary sections to document and present the items listed in the Scope and Activities section;
  - .4 Class C cost estimate; and updated schedule



- .2 Final Pre-design Report with a written response to comments.

## **2.4 ENGINEERING SERVICES**

### **2.4.1 SCOPE AND ACTIVITIES**

- .1 The services required shall respond to the operational and functional needs of the user, and may, subject to complexity, require the Consultant to submit a brief work plan, schedule and cost proposal to complete the work. Services potentially required are:
  - .1 Visit the site(s) and meet with the departmental representative as required;
  - .2 Provide a wide range of professional technical engineering services identified in the Project-Specific Terms of Reference.
  - .3 Review all other available existing material related to the project including requirements identified in the Project-specific TOR

### **2.4.2 DELIVERABLES**

- .1 Provide draft reports for review by the Departmental Representative.
  - .1 Report to include all site assessments, analyses, modelling, opinions conclusions and recommendations
  - .2 Required report outline will be determined in the Project-specific TOR
- .2 Provide final reports incorporating all comments provided by the Departmental Representative,
  - .1 Final report to be stamped and sealed by a professional engineer registered in the Province the work is intended to be implemented, and
  - .2 Required report outline will be determined in the Project-specific TOR.
  - .3 Provide one hard copy and electronic copy in MS Word.

## **2.5 DESIGN AND CONSTRUCTION ENGINEERING SUPPORT SERVICES**

### **2.5.1 GENERAL**

- .1 The Consultant Team will provide phased planning and design engineering services, as described in the Project-specific TOR and consistent with phasing in the GP&S, and deliver comprehensive Engineering Reports and/or Designs as required.
- .2 The work will generally: progress from pre-design to preliminary design and then final design; and include contract tendering, construction and post construction (close-out) support.
- .3 The work assigned may require the consultant to provide services of one, some, or all of the components and will be applicable to projects of moderate complexity.

### **2.5.2 DESIGN SERVICES**

- .1 General
  - .1 The objective of this stage is to further develop the Pre-design Engineering Phase findings into drawings and specifications for the purpose of proceeding to tendering and construction.
  - .2 The Consultant must obtain written authorization from the Departmental Representative before proceeding with Construction Documents.

.2 Scope and Activities

.1 The Consultant shall:

- .1 Create construction documents in accordance with the GP&S Document;
- .2 Design according to the budget and schedule;
  - .1 The inability to design a solution that is attainable in accordance with the Construction Budget and Schedule will require the Call-up Contract to be revised.
- .3 Update the cost estimates;
  - .1 Provide a cost breakdown by unit rate and/or trade for review of bids and comparison with the successful Contractor's cost breakdown.
- .4 Update the project schedule; and
- .5 Establish a quality control process including necessary environmental compliance monitoring procedures for the construction and contract administration stage.

.3 Deliverables

- .1 50% complete Construction Documents. (50% completion at stages as defined in the Project-specific TOR)
  - .1 A Class "B" Estimate.
  - .2 An updated project schedule.
  - .3 Construction Drawings.
    - .1 Drawings should reflect 50% completeness with all Plan, Elevation, Details, and Sections shown.
  - .4 Specifications (NMS format)
    - .1 Index to specifications
    - .2 Draft Division 1.
- .2 99% complete Construction Documents, fully coordinated as if ready for tender.
  - .1 This submission incorporates all revisions required by the review of the previous submission.
  - .2 The Consultant shall submit documents to the DND Departmental Representative.
  - .3 The submittal shall include:
    - .1 A Class "A" Estimate;
    - .2 An updated project schedule;
    - .3 Construction Drawings;
      - .1 Drawings should reflect ready for tender completeness with a complete design without any unfinished details for DND final review and comment prior to final revisions for submitting 100% Construction Documents.
    - .4 Complete Specifications;
      - .1 Specifications should be complete with all sections (including Division 1) and thoroughly coordinated with the Drawings.
    - .5 Response to DND written comments of previous submittal.
- .3 Final (100%) Construction Documents ready for tendering.
  - .1 This submission incorporates all revisions required by the review of the previous submission.

- .2 The Consultant shall submit documents to the Departmental Representative and any Authority Having Jurisdiction that was previously identified as requiring on-going consultation and communication including the sharing of any tender documents.
- .3 The submittal shall include:
  - .1 An updated Class 'A' cost estimate;
  - .2 An updated project schedule;
  - .3 Tender Drawings & Specifications;
    - .1 As per the GP&S Document.
  - .4 Response to DND written comments of previous submittal;
  - .5 Advise the Departmental Representative of all issues raised by other AHJs and officials, and all Consultants' responses.
- .4 The Consultant must confirm in writing that:
  - .1 The documents are ready to be issued for tender;
  - .2 The checklist in the GP&S Document has been reviewed in concert with the requirements of the Consultant Agreement; and
  - .3 A full review and coordination of the Contract Documents are complete and in accordance with professional standard of care.

### **2.5.3 CONTRACT TENDER SERVICES**

- .1 General
  - .1 The object of this phase is to support the Departmental Representative with the tender. Tender issuance will be done by DND.
  - .2 The Contract Authority for this project is DND.
- .2 Scope and Activities
  - .1 When requested, the Consultant will be required to;
    - .1 Provide the Departmental Representative with information required by bidders to interpret tender documents;
    - .2 Prepare addenda, in response to all questions within two (2) business days during the bidding period and submit to Departmental Representative;
    - .3 Attend pre-tender site visits;
    - .4 During Bid Review and Analysis, assist the Departmental Representative, as required, by analyzing and reviewing the submitted bid.

### **2.5.4 CONSTRUCTION SUPPORT SERVICES**

- .1 General
  - .1 The object of this phase is to support the Departmental Representative with the construction phase and ensure the quality, budget and schedule of the project.
- .2 Scope and Activities
  - .1 The Consultant shall:
    - .1 Designate Tender drawing as Construction Drawings including any modifications occurring during the Tender phase;
    - .2 Provide regular field reviews and as required to fulfil the Consultant's professional obligations to monitor the construction activities throughout the construction period and keep Departmental Representative informed of work progress;
      - .1 Reject unsatisfactory work and materials,

- .2 Provide written reports.
- .3 Authorize special tests, inspections and minor works that do not impact project cost and schedule;
  - .1 Provide the Departmental Representative with all material specifications, mixes and tests outside the scope of the Contractor.
- .4 Review shop drawings and provide copies to the Departmental Representative
- .5 Review and comment on the Contractor's schedule;
- .6 Interpret contract documents as required and provide any additional drawings or specifications required to clarify, interpret or supplement Construction Documents;
- .7 Review, comment and make recommendations on various documents such as Contractor's Progress Claims and updated schedules;
- .8 Provide timely technical advice;
- .9 Recommend the amounts owing to the Contractor based on work progress;
- .10 Assist the Departmental Representative to prepare Certificate of Substantial Completion and recommend sign-off;
- .11 For Changes to the work;
  - .1 Assist the Departmental Representative to prepare Change Orders, to be issued by the Departmental Representative.
- .12 For Cost Estimating Services;
  - .1 Evaluate change orders; claims, work completed and cash flow.
  - .2 After issue of contract provide details for evaluating the project's cost performance.
- .13 For Scheduling Services;
  - .1 Review contractor's monthly schedule report and report findings and recommendations to DND for further discussion with the Contractor.
- .14 For Permits;
  - .1 Assist the Contractor and provide required documentation in order to obtain all necessary permits.

#### **2.5.5 POST CONSTRUCTION SERVICES**

- .1 General
  - .1 The purpose of this phase is to support the Departmental Representative in obtaining all final documents required for project close out.
- .2 Scope and Activities
  - .1 Project Close-out Services:
    - .1 Revise documentation to reflect all changes, revisions and adjustments at completion;
    - .2 Prepare record drawings and specifications based on Contractor's as-builts;
    - .3 Assist the Departmental Representative to prepare the Final Certificate of Completion and recommend sign-off;
    - .4 Prepare a summary of the post construction compliance monitoring results;
    - .5 Obtain and review the the O&M Manual prepared by the contractor for accuracy and completeness prior to forwarding to DND; and

- .6 Participate in Lessons Learned workshops if requested.
- .2 Warranty Services:
  - .1 Monitor and certify rectification of deficiencies before completion of contract and issuance of final certificate of completion;
  - .2 Sign off on the Final Completion of the construction contract;
  - .3 Participate in post-construction warranty inspections with Departmental Representative and Contractor;
  - .4 Provide warranty deficiency list; and
  - .5 Provide Final Warranty Review report.
- .3 Deliverables
  - .1 Construction Contract Deficiency List;
  - .2 Final Certificate;
  - .3 Provide two (2) copies of As-Built and Record Drawings and As-Built Specifications in MS Word, PDF and ACAD formats;
  - .4 Post construction compliance monitoring report;
  - .5 Comments to O&M Manual;
  - .6 Warranty inspection reports and deficiencies list; and
  - .7 Sign-off on Warranty.

### **3 PROJECT ADMINISTRATION**

#### **3.1 GENERAL**

- .1 In addition to adhering to the general project administration requirements contained in Section 2 of the General Procedures & Standards document, the Consultant shall comply with the project-specific requirements in this section.;

#### **3.1.2 LANGUAGE**

- .1 No variation.

#### **3.1.3 MEDIA**

- .1 No variation.

#### **3.1.4 PROJECT MANAGEMENT**

- .1 No variation.

#### **3.1.5 LINES OF COMMUNICATION**

- .1 No variation.

#### **3.1.6 MEETINGS**

- .1 Meeting locations and frequency will be described in the Project-specific TOR.

#### **3.1.7 CONSULTANT RESPONSIBILITIES**

- .1 No variation.

#### **3.1.8 DND RESPONSIBILITIES**

- .1 No variation.

#### **3.1.9 USER DEPARTMENT RESPONSIBILITIES**

- .1 No variation.

#### **3.1.10 REVIEW AND APPROVAL BY PROVINCIAL AND MUNICIPAL AUTHORITIES**

- .1 No variation.

#### **3.1.11 BUILDING PERMITS AND OCCUPANCY PERMITS**

- .1 No variation.

#### **3.1.12 TECHNICAL AND FUNCTIONAL REVIEWS**

- .1 No variation.