



Engineering Services

TERMS OF REFERENCE

Petroleum Storage Tank Systems Removal and Replacement Program RCMP Detachments

1. Tuktoyaktuk, NT
2. Behchoko/Rae and Edzo, NT
3. Wha' Ti, NT
4. Fort Good Hope, NT
5. Fort Liard, NT
6. Fort Providence, NT

For

**Public Works & Government Services Canada,
Western Region**

January 2013





Terms of Reference

Engineering Services

Table of Contents:

1	PROJECT DESCRIPTION	3
1.1	TERMS OF REFERENCE	3
1.2	PROJECT INFORMATION.....	3
1.3	PROJECT BACKGROUND	3
1.4	SUMMARY OF SERVICES.....	4
1.5	NORTHWEST TERRITORIES SITES.....	5
1.6	PROJECT DELIVERY.....	7
1.7	PROJECT SCHEDULE.....	7
1.8	CONSTRUCTION BUDGET	8
1.9	EXISTING DOCUMENTATION	8
1.10	CODES, STANDARDS & GUIDELINES.....	8
2	REQUIRED SERVICES	9
2.1	GENERAL REQUIREMENTS	9
2.2	ROLES AND RESPONSIBILITIES	9
2.3	PROJECT REVIEW AND APPROVAL	9
2.4	DESIGN.....	10
2.5	COMMISSIONING REQUIREMENTS	11
3	PROJECT ADMINISTRATION	12
3.1	CONSTRUCTION DOCUMENTS.....	12
3.2	SPECIFICATIONS.....	13
3.3	DRAWINGS	16
4	APPENDIX - PICTURES	19
4.1	TUKTOYAKTUK – 22,500 LITER GASOLINE TANK TO BE MOVED TO BE NFC COMPLIANT	19
4.2	FORT GOOD HOPE INSTALLED DETACHMENT TANKS	19
4.3	EXAMPLE OF INSTALLATION AND SOME ISSUES	20



1 PROJECT DESCRIPTION

1.1 TERMS OF REFERENCE

1.1.1 PURPOSE

- These Terms of Reference (TOR) have been developed to ensure that the Consultant has a clear understanding of the project scope, procedures and services required to deliver the completed project, within the agreed to budget and schedule.

1.2 PROJECT INFORMATION

Project Information		
.1	Project Title:	Petroleum Storage Tank System Removal and Replacement Program
.2	Project Locations and PWGSC Project Number:	1. Tuktoyaktuk, NT 2. Behchoko (Rae and Edzo), NT 3. Wha'Ti, NT 4. Fort Good Hope, NT 5. Fort Liard, NT 6. Fort Providence, NT
.3	PWGSC Project Number:	R.030683.025
.4	User Department:	Public Works and Government Services Canada
.5	User Department Representative:	
.6	PWGSC Departmental Representative:	
.7	PWGSC Contracting Officer	Brad Campbell

1.3 PROJECT BACKGROUND

1.3.1 SERVICES

- Public Works and Government Services Canada (PWGSC) requires the services of an environmental/mechanical engineering firm or joint partnership, acting in the capacity of the coordinating engineer of record, together with a multi-disciplinary team of sub-consultants for the provision of services required for this project.

1.3.2 CONTEXT

- As a responsible environmental steward, the Royal Canadian Mounted Police (RCMP) developed a Sustainable Development Strategy in 1997 with updates in 2000, 2003 and 2007. One of the targets of the RCMP Sustainable Development Strategy in 2003 was to achieve 100% compliance with the applicable storage tank Codes and Regulations. In response to this target, in 2006 the RCMP initiated a project to conduct a National Storage Tank Baseline Study of 65 storage tank systems (including 102 individual tanks) at RCMP facilities across Canada. The results of the Baseline Study in 2006 provided the RCMP with the information necessary to prioritize their risks associated with these tank systems.
- Building on the information provided in the Baseline Study from 2006 as well as from individual site assessment programs provided for background information review, this TOR details the work to be performed in conducting a program to remove and replace specific tanks systems in Northwest Territories.



-
- .3 Following completion of the information review, specifications and drawings will be completed for storage tank system upgrades which may include items such as construction of pads to removing old storage tank systems and replacing with new storage tank systems.

1.3.3 USER DEPARTMENT

- .1 The User Department referred to throughout the TOR is Public Works and Government Services Canada (PWGSC).

1.3.4 PROJECT CONSTRAINTS

- .1 This project involves six different sites northern sites of which two of the sites have no road access and are considered remote. Tuktoyaktuk and Wha' Ti have no road access.
- .2 Work must be coordinated with each of the individual sites and all personnel working on this project will be subject to RCMP security checks.
- .3 The projects are being undertaken in fully functional facilities. The site reviews as well as the construction documents must consider that down times must be minimized and that facility operations cannot be compromised.
- .4 The budget for the work must also be divided by each site.

1.3.5 CONSULTANT TEAM

- .1 Expertise and relevant experience requirements for this project are as follows:
 - .1 Environmental / Regulatory analysis of the tank installations.
 - .2 Mechanical Engineering
 - .3 North of 60 tank experience
 - .4 Architectural
 - .5 Cost Estimating

1.4 SUMMARY OF SERVICES

1.4.1 GENERAL

- .1 Development of tender package (50%, 99% and tender ready specifications and drawings).
- .2 Conduct an initial site visit to gain site specific information for the production of construction specifications and drawings.
- .3 Produce construction ready specifications and drawings for each site required to upgrade, remove and/or replace (install and supply) the tank systems as well as to comply with all relevant codes and regulations.
- .4 Prepare detailed Class 'A' cost estimates to complete the improvements and/or demolition at each of the 6 sites.
- .5 Specification:
 - .1 Before and after pictures of all installations are to be provided in all the final site inspection reports.
 - .2 All new tanks are to be double walled fibreglass.
 - .3 All tank pads are to be upgraded, levelled and concrete pad installed.
 - .4 All tank pads to be supported to prevent gravel from shifting/spreading.
 - .5 All tank stands and tank piping, where required, are to be painted.
 - .6 All new piping installed from tank to furnace/boiler to be code compliant.
 - .7 A minimum 24 inch section of the fuel line must be flex hose, installed in a direct line. Pictures provided in Appendix to this TOR.
 - .8 All fuel filters to be changed.
 - .9 Snow guards to be installed over all exposed lines and/or lines to be supported against snow and ice damage.



-
- .10 All tanks to be located on exterior as close as possible to the furnace/boiler point entry.
 - .11 Shut off valves to be installed near tank and at furnace/boiler.
 - .12 Rockets where already supplied are to be installed. List of sites will be provided upon contract award.
 - .13 Rockets, where not supplied, are to be supplied and installed. List of sites will be provided upon contract award.
 - .14 Collision protection is to be installed wherever applicable. Collision protection may consist of boulders available on site or Jersey Barriers.
 - .15 Final as-built stamped and signed drawings are to be provided for each tank installation.
 - .16 Operation and Maintenance manuals are to be provided for each installation.
 - .17 No tank is to be moved to a different location unless required by Code, OH&S of tenant, or as recommended/designed by a Professional Engineer on a stamped drawing.
 - .6 Identification of Risks to the consultant and construction schedule and the proposed mitigation measures.
 - .7 Plan and attend a contractor start-up meeting and attend all required meetings with PWGSC and Contractor (weekly project management meetings during tendering and construction).
 - .8 Provide technical guidance during bidding process and site work.
 - .9 Complete reviews of all contractor deliverables.
 - .10 Provide for site supervision of the tank work at Tuktoyaktuk.
 - .11 Provide for site inspection for component and system verification and commissioning and adherence to Acts and regulations before any of the systems are filled with fuel.
 - .12 Prepare draft and final inspection reports (including compliance checklists, non-compliance/deficient items, photographs, signed and stamped as-built drawings, and accepted shop drawings at a minimum, and prepare project closeout.

1.5 NORTHWEST TERRITORIES SITES

1.5.1 TUKTOYAKTUK RCMP (NO ROAD ACCESS)

- .1 Deliverables
 - .1 Provide Plans and Specifications for construction of new concrete pad and extension of electrical in order to be compliant with the NFC and SOR/2008-197 Storage Tanks Systems for Petroleum Products and Allied Products Regulation.
 - .2 Prepare Class 'A' estimate
 - .3 Provide technical guidance and site supervision during work and final inspection including report. After system has been moved, it should be pressure tested and deficiencies addressed.
- .2 Tanks
 - .1 22,500 L Gasoline – One tank
 - .2 Note that this tank will likely be quite full and will need to be emptied and fuel saved before moving and re-filling with the saved and filtered fuel. The empty tank will require sludge removed and vapours purged at a minimum in order to move it safely as per SOR/2008-197.
 - .3 Location – see photo attached in Appendix

1.5.2 BEHCHOKO/RAE AND EDZO RCMP (ONE HOUR DRIVE FROM YELLOWKNIFE)

- .1 Deliverables
 - .1 Provide Plans and Specifications for removal, disposal and supply and install.



-
- .2 Prepare Class 'A' estimate.
 - .3 Provide Site Supervision, technical guidance during work, and final inspection including report.
 - .2 Tanks
 - .1 1135 L – home heating fuel – 10 tanks
 - .2 Locations – Employee Housing 7 tanks; Detachment 2 tanks, Garage 1 tank

1.5.3 WHA' TI RCMP (FLY IN FROM YELLOWKNIFE; NO ROAD ACCESS)

- .1 Deliverables
 - .1 Provide Plans and Specifications for removal, disposal and supply and install.
 - .2 Prepare Class 'A' estimate.
 - .3 Provide Site Supervision, technical guidance during work, and final inspection including report.
- .2 Tanks
 - .1 1135 L – home heating fuel – 4 tanks
 - .2 Locations – Detachment 1 tank; Employee Housing 1 tank at each of 2 locations; Transient Trailer 1 tank

1.5.4 FORT GOOD HOPE RCMP (ACCESS FROM NORMAN WELLS)

- .1 Deliverables
 - .1 Provide Plans and Specifications for removal, disposal and supply and install.
 - .2 Prepare Class 'A' estimate.
 - .3 Provide Site Supervision, technical guidance during work, and final inspection including report.
- .2 Tanks
 - .1 1135 L – home heating fuel – 3 tanks
 - .2 Locations – Employee Housing 1 tank at each of 2 locations; Warehouse 1 tank
 - .3 Detachment twin tanks are NOT to be replaced but will require an inspection of all fuel supply components and replacement where required as follows (at a minimum):
 - .1 Labelling of all piping, pumps checked and installed as required.
 - .2 Replacement of fuel lines to include the 24 inch flex hose as described above.
 - .3 Fuel pumps changed if required.
 - .4 Fuel shut-off valves and all alarms tested and replaced as required.
 - .5 Tiger loops replaced as required.
 - .6 Mechanical area to be cleaned including removal of old material and organization of new equipment
 - .4 Detachment Storage Tank System shall be pressure tested upon completion of the works.

1.5.5 FORT LIARD RCMP (ACCESS BY ROAD FROM YELLOWKNIFE)

- .1 Deliverables
 - .1 Provide Plans and Specifications for removal, disposal and supply and install.
 - .2 Prepare Class 'A' estimate.
 - .3 Provide Site Supervision, technical guidance during work, and final site inspection including report.



- .2 Tanks
 - .1 1135 L – home heating fuel – 3 tanks as follows: Employee Housing 1 tank at one location; Garage 1 tank; Warehouse 1 tank
 - .2 The Detachment has at present a 900 liter day tank that is NOT a part of the scope of this work.

1.5.6 FORT PROVIDENCE RCMP (3 HOUR ROAD ACCESS FROM YELLOWKNIFE)

- .1 Deliverables
 - .1 Provide Plans and Specifications for removal, disposal and supply and install.
 - .2 Prepare Class ‘A’ estimate.
 - .3 Provide Site Supervision, technical guidance during work, and final site inspection including report.
- .2 Tanks
 - .1 1135 L – home heating fuel – 6 tanks
 - .2 Locations – Employee Housing 1 tank at each of four locations; Warehouse/Workshop 1 tank; Garage/Workshop 1 tank

1.6 PROJECT DELIVERY

1.6.1 GENERAL

- .1 This project will use a design-bid-build approach. The construction portion of the project will be publicly tendered on MERX or using SELECT if smaller portions of work are sectioned off.

1.7 PROJECT SCHEDULE

1.7.1 GENERAL

- .1 The project is to be delivered, ready for occupancy in accordance with the project milestone listing identified below.
- .2 Completion dates shown are relative to an assumed start date of April 4 to 18, 2013.
- .3 Prepare a Project Planning and Control Schedule, in accordance with the milestone list.

1.7.2 ANTICIPATED MILESTONE DATES

- .1 **Note: Accelerated dates or opportunities to condense schedule will be considered favourably by PWGSC**

Project Phase		Anticipated Milestones
.2	Consultant Contract award	April 4 to 18, 2013
.3	Submission of 50% Construction Documents	June 4 to 11, 2013
.4	Submission of 99% Construction Documents	July 4 to 11, 2013
.5	Submission of 100% Tender Ready Construction Documents	July 15 to 19, 2013
.6	PWGSC tender period 40 days	July 20-September 15, 2013
.7	Construction	September to October, 2013



.8	Final Inspection Report	October, 2013
----	-------------------------	---------------

1.8 CONSTRUCTION BUDGET

1.8.1 GENERAL

- .1 The construction budget has not yet been accurately determined.

1.9 EXISTING DOCUMENTATION

1.9.1 DOCUMENTS AVAILABLE FOR THE CONSULTANT

- .1 Copies of all pertinent documentation will be made available to the *Consultant*.
- .2 There are likely no existing AutoCAD drawings available. The Consultant will be required to produce scaled AutoCAD drawings of the installations from scratch if these are not available.

1.9.2 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*.

1.10 CODES, STANDARDS & GUIDELINES

1.10.1 GENERAL

- .1 The Work shall, unless otherwise specified, be designed, constructed, and commissioned in a manner which is:
 - .1 Compliant with all applicable federal, provincial, municipal, and regional laws, acts, regulations, and codes.
 - .2 Minimizes disruption and interference with occupants including the prevention of transmission of noise when demolition or construction work occurs in the building or on the property.
- .2 Adherence to all applicable codes and standards and without limiting the generality of the foregoing shall include the following:
 - .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 Canada Occupational Health and Safety Regulations,
 - .5 Canada Labour Code (including latest revisions of all regulations),
 - .6 National Fire Protection Association (NFPA) standards,
 - .7 American Society for Testing and Materials (ASTM),
 - .8 American National Standards Institute (ANSI),
 - .9 The Canadian Council of Ministers of the Environment (CCME) *Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products* (CCME, 2003),
 - .10 The Canadian Environmental Protection Act (CEPA, 1999),
 - .11 The Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, published in Canada Gazette Part II on June 12, 2008 (Registration SOR/2008-197),



- .12 The Canadian Standards Association CSA-B139-09.
- .13 Local and/or municipal codes and bylaws
 - .1 In the event of a conflict between codes, the more stringent shall take precedence.

2 REQUIRED SERVICES

2.1 GENERAL REQUIREMENTS

2.1.1 MEETINGS

- .1 The *Departmental Representative* will arrange meetings, bi-weekly, throughout the project either in person or by teleconference.
- .2 Meetings will normally be held by teleconference.
- .3 The key personnel of the prime *Consultant* and sub-consultants or specialist firms must be available to attend meetings or respond to inquiries.

2.1.2 PHASES

- .1 Design: to provide construction documents for review at 50%, 99%, 100% completion stages
- .2 Tender services, construction support services, commissioning support services and post construction services will be provided following design approval.

2.2 ROLES AND RESPONSIBILITIES

2.2.1 CONSULTANT

- .1 The “*Consultant Team*”:
 - .1 All team members must be registered to work in the Northwest Territories as applicable to the site.
- .2 The *Consultant* shall:
 - .1 Attend meetings,
 - .2 Record the issues and decisions,
 - .3 Prepare and distribute minutes within two working days of the meeting,
 - .4 Ensure all meetings are green i.e. using electronic documents or double-sided hard copies and
 - .5 Ensure sub-consultants provide site inspection services and attend required meetings.

2.2.2 USER DEPARTMENT

- .1 The User Department’s Representative is responsible for the interests of the User Department, in collaboration with the PWGSC *Departmental Representative*.
- .2 Unless directed otherwise, all communications with the User Department is through the PWGSC *Departmental Representative*.

2.3 PROJECT REVIEW AND APPROVAL

2.3.1 GENERAL

- .1 The *Consultant* shall ensure that design submissions are provided as required below.

2.3.2 FEDERAL GOVERNMENT

- .1 The federal authorities having jurisdiction over this project are:
 - .1 HRSDC for fire prevention engineering services and life safety; and,



- .2 The User Department for technical criteria.

2.3.3 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, the User Department technical experts and PWGSC.
- .2 For the PWGSC review at each stage;
 - .1 Review submissions to be distributed in PDF format.
 - .2 Expected turn around time for reviews is two (2) weeks.
 - .3 The consultant team will receive review comments in the form of an editable MS Word document or MS Excel document.
 - .4 The consultant shall provide a coordinated written response to the comments.

2.4 DESIGN

2.4.1 GENERAL

- .1 The objective of this stage is to translate the findings of previous investigations into construction drawings and specifications for the purpose of tendering.
- .2 The Consultant must obtain written authorization from the Departmental Representative before proceeding with Construction Documents.

2.4.2 SCOPE AND ACTIVITIES

- .1 The Consultant shall:
 - .1 Create construction documents,
 - .2 Design according to the budget and schedule,
 - .1 Non-compliances will require revisions to the contract documents.
 - .3 Update the cost estimates
 - .4 Update the project schedule
 - .5 Establish a quality control process for the construction and contract administration stage

2.4.3 DELIVERABLES

- .1 For the 50% complete Construction Documents.
 - .1 A Class “C” 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
 - .1 Index to specifications
- .2 For the 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 PWGSC Departmental Representative, HRSDC, local municipality, or any other Authority Having Jurisdiction.
 - .3 The submittal shall include:
 - .1 A Class “A” Estimate
 - .2 An updated project schedule
 - .3 Construction Drawings



-
- .1 Drawings shall reflect 99% completeness with a complete design without any unfinished details.
 - .4 Complete Specifications.
 - .1 Specifications shall be complete with all Sections and thoroughly coordinated with the Drawings.
 - .5 There shall be a written response to the PWGSC 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 PWGSC Departmental Representative, HRSDC, local municipality, or any other Authority having jurisdiction:
 - .3 The submittal shall include:
 - .1 An updated Class 'A' cost estimate.
 - .2 An updated project schedule
 - .3 Construction Drawings & Specifications
 - .4 Response to PWGSC written comments of previous submittal
 - .5 Advise the PWGSC Project Departmental Representative of all issues raised by other officials and all Consultants' responses.

2.5 COMMISSIONING REQUIREMENTS

2.5.1 COMMISSIONING PROCESS

- .1 "Commissioning" is a quality assurance process, in which the functional requirements of the Owner/occupant and the operational requirements of facility management are tested, verified and proven to function as intended.
- .2 Commissioning deliverables occur at various phases throughout the project.
- .3 Commissioning shall be in accordance with the PWGSC Commissioning Manual CP.1 (2003).
- .4 Commissioning is provided by the Construction Contractor and is monitored by the Commissioning Agent.
- .5 Ensure the Specifications provide requirements for Component Check Sheets, System Check Sheets and Integrated System Check Sheets all as per the CP.1 Manual.

2.5.2 COMPONENT VERIFICATION

- .1 Component verification sheets (CV) sheets are developed by the *Consultant* and incorporated in the contract documents to ensure the facility is an operating entity and meets the requirements as described in the Agreement.
- .2 The CV sheets are intended to monitor and track the supply and shop drawing requirements associated with each component. The *Consultant* must verify that the components being installed in the built works are acceptable to their design and the approved shop drawings.
- .3 The commissioning process requires the documentation of all the components installed as part of a system that will have performance verification testing conducted.

2.5.3 SYSTEM & INTEGRATED SYSTEM TESTING

- .1 The systems and integrated systems tests are known as "performance verification tests (PVTs)". These are intended to demonstrate the functional performance of the systems & integrated system during the various modes of operation, against the design intent. Each test shall be uniquely identified and reflected in the contractor's commissioning schedule.



- .2 Once the contract has been awarded the *Consultant* shall monitor the contractor's process to help ensure the timely completion of these tests. The *Consultant* shall witness each test. The *Consultant* shall provide final certification of the test results. After an acceptable review of the test document, the PWGSC Commissioning Specialist will recommend to the *Departmental Representative* the acceptance or rejection of the test results.

2.5.4 TEST REQUIREMENTS

- .1 Each CV or PVT shall be uniquely named, numbered and categorized by discipline.
- .2 Tests shall define:
 - .1 Test Purpose
 - .2 System Design Narrative
 - .3 Test Prerequisites
 - .4 Testing Procedures
 - .5 Test Comments
 - .6 Test Sign-off Block

3 PROJECT ADMINISTRATION

3.1 CONSTRUCTION DOCUMENTS

3.1.1 PURPOSE

- .1 This section provides direction in the preparation of construction contract documents (namely specifications, drawings and addenda) for PWGSC.
- .2 Drawings, specifications and addenda must be complete and clear, in order that a contractor can prepare a bid without guesswork. Standard practice for the preparation of construction contract documents requires that:
 - .1 Drawings are the graphic means of showing work to be done, as they depict shape, dimension, location, quantity of materials and relationship between building components.
 - .2 Specifications are written descriptions of materials and construction processes in relation to quality, colour, pattern, performance and characteristics of materials, installation and quality of work requirements.
 - .3 Addenda are changes to the construction contract documents or tendering procedures, issued during the tendering process.

3.1.2 PRINCIPLES FOR PWGSC CONTRACT DOCUMENTS

- .1 PWGSC contract documents are based on common public procurement principles.
- .2 PWGSC does not use Canadian Construction Document Committee (CCDC) documents.
- .3 The construction contract and the terms and conditions are prepared and issued by PWGSC, along with all other related bidding and contractual documents.
 - .1 For more detailed information, the clauses are available on the following web site:
 - .1 <http://sacc.pwgsc.gc.ca/sacc/query-e.jsp>.
 - .2 Any questions should be directed through the PWGSC Project Manager.

3.1.3 QUALITY ASSURANCE

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

3.1.4 SPECIFICATIONS

- .1 In preparing project specifications, the Consultant must use the current edition of the National Master Specification (NMS) in accordance with the "NMS User's Guide".

3.1.5 DRAWINGS

- .1 Computer Aided Design & Drafting (CADD)



- .1 Drawings shall be in accordance with PWGSC Western CADD Standards and CSA B78.3.
- .2 Refer to:
 - .1 <http://www.tpsgc-pwgsc.gc.ca/cdao-cadd/ouest-western/tm-toe-eng.html>
 - .2 The above link is subject to change
 - .3 The Consultant shall check with the Project Manager to ensure that the link is current.
- .3 Download and use the Toolkit which includes drawing border templates, layer utility and drawing standards checker.

3.1.6 ADDENDA

- .1 Format
 - .1 Prepare addenda using PWGSC format.
 - .2 No signature type information is to appear.
 - .3 Every page of the addendum (including attachments) must be numbered consecutively.
 - .4 All pages must have the PWGSC project number and the appropriate addendum number.
 - .5 Sketches shall appear in the PWGSC format, stamped and signed.
 - .6 No Consultant information (name, address, phone #, consultant project # etc.) may appear in the addendum or its attachments (except on sketches).
- .2 Content
 - .1 Each item should refer to an existing paragraph of the specification or note/detail on the drawings. The clarification style is not acceptable.

3.1.7 SUBMISSIONS

- .1 For each construction document submission, the Consultant shall provide:
 - .1 Original specification printed one side on 216 mm x 280 mm white bond paper.
 - .2 Table of Contents: listing all Sections, number of pages in each Section and including a list of drawings.
 - .3 Reproducible original drawings sealed and signed by the design authority.
- .2 Tender information:
 - .1 Include a description of all units and estimated quantities to be included in unit price table.
 - .2 Include a list of significant trades including costs.
 - .1 PWGSC will then determine which trades, if any, will be tendered through the Bid Depository.
- .3 Government Electronic Tendering System (MERX):
 - .1 Consultants shall provide an electronic true copy of the final documents (specifications and drawings) on one or multiple CD-ROM in Portable Document Format (PDF) without password protection and printing restrictions.
 - .2 The electronic copy of drawings and specifications is for bidding purposes and shall be signed and sealed compliant by a Professional Engineer.

3.1.8 PWGSC ROLE

- .1 PWGSC shall provide:
 - .1 General and Special Instructions to Bidders
 - .2 Bid and Acceptance Form
 - .3 Standard Construction Contract Documents

3.2 SPECIFICATIONS

3.2.1 NATIONAL MASTER SPECIFICATION (NMS)

- .1 In preparing project specifications, the Consultant must use the current edition of the National Master Specification (NMS) in accordance with the "NMS User's Guide".



- .2 The NMS is a master construction specification available in both official languages, which is divided into 48 Divisions (Master format 2004) and is used for a wide range of construction and/or renovation projects.
- .3 The Consultant retains overriding responsibility for content and shall edit, amend and supplement the NMS as deemed necessary to produce an appropriate project specification, free of conflict and ambiguity.

3.2.2 SPECIFICATION ORGANIZATION

- .1 Narrow scope sections describing single units of work are preferred for more complex work; however, broad scope sections may be more suitable for less complex work.
- .2 Use either the NMS 1/3 - 2/3 page format or the Construction Specifications Canada full-page format.
- .3 For specifications not included in the NMS, but required for the project, follow the number and title recommendations of Master Format 2004.
- .4 Number each page and start each Section on a new page
- .5 Bind specifications.
- .6 Include Division 1, edited to PWGSC requirements.
- .7 Note: Consultant's name is not to be indicated in the specifications.

3.2.3 TERMINOLOGY

- .1 Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect.
- .2 "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor.
- .3 Notations such as: "verify on site", "as instructed", "to match existing", "example", "equal to" or "equivalent to", "to be determined on site by "Departmental Representative", should not be indicated in the specifications as this promotes inaccurate and inflated bids.
- .4 Specifications must permit bidders to calculate all quantities and bid accurately.
 - .1 If quantities are impossible to identify (i.e. cracks to be repaired) give an estimated quantity for bid purposes (unit prices).
- .5 Ensure that the terminology used throughout the specifications is consistent and does not contradict the applicable standard construction contract documents.

3.2.4 DIMENSIONS

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

3.2.5 STANDARDS

- .1 As references in the NMS may not be up to date, it is the responsibility of the consultant to ensure that the project specification uses the latest applicable edition of all references quoted.
- .2 Canadian standards should be used wherever possible.

3.2.6 SPECIFYING MATERIALS

- .1 The practice of specifying actual brand names, model numbers, etc., is against departmental policy except for special circumstances.
- .2 The method of specifying materials shall be by using industry recognized standards.
- .3 If the above method cannot be used and where no standards exist, specify by a non-restrictive, non-trade name "prescription" or "performance" specifications.
- .4 In exceptional or justifiable circumstances, or if no standards exist and when a suitable non-restrictive, non-trade name "prescription" or "performance" specification cannot be developed only then specify by trade name.
- .5 Include all known materials acceptable for the purpose intended, and in the case of equipment, identify by type and model number.



3.2.7 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 The term “Acceptable Manufacturers” must not be used, as this restricts competition and does not ensure the actual material or product will be acceptable.
 - .1 A list of words and phrases that should be avoided is included in the NMS User's Guide.
- .2 Listing of acceptable products or materials is to be an exception, due to a unique specification or for the purpose of assisting bidders in identifying lesser known potential products or materials.
- .3 For exceptions, provide justifiable reasons for listing products and materials and submit to the *Departmental Representative* for acceptance.
- .4 When authorized to list acceptable products or materials, list all, with a minimum of three (3), trade names of products and materials acceptable for the intended purpose.

3.2.8 ALTERNATE PRODUCTS AND MATERIALS

- .1 Alternates must be approved by addendum issued by the *Departmental Representative* in accordance with Instructions to bidders.
- .2 Review applications for approval of alternate products and materials and provide recommendations to the *Departmental Representative*.
- .3 Compare products/materials to specifications. Do not compare product-to-product or material-to-material.

3.2.9 SEPARATE AND ALTERNATE PRICES

- .1 Do not include Separate or Alternate Pricing unless authorized to do so by the *Departmental Representative*.
- .2 Conditions regarding Separate and Alternate Pricing require that evaluation criteria be published and at the time of tender closing, all bidders be evaluated with a full matrix of values, based on the evaluation criteria.

3.2.10 SOLE SOURCING

- .1 Sole sourcing for materials and work may be used for proprietary systems (i.e. fire alarm systems, EMCS systems).
- .2 Substantiation and/or justification will be required.
- .3 Prior to including sole source materials and/or work, the Consultant must contact the *Departmental Representative* to obtain the approval for the sole sourcing.

3.2.11 UNIT PRICES

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

3.2.12 CASH ALLOWANCES

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

3.2.13 WARRANTIES

- .1 It is the practice of PWGSC to have a 12-month warranty and to avoid extending warranties for more than 24 months.
- .2 When it is deemed necessary to extend a warranty beyond the 12 month period provided for in the General Conditions of the contract, obtain approval from the Project Manager.
- .3 Delete all references to manufacturers’ guarantees.

3.2.14 SCOPE OF WORK

- .1 No paragraphs noted as “Scope of Work” are to be included.



3.2.15 SUMMARY AND SECTION INCLUDES

- .1 In Part -1 All Sections; do not use (delete):
 - .1 “Summary” and
 - .2 “Section Includes.”

3.2.16 RELATED SECTIONS

- .1 In Part 1 All Sections; do not use (delete).

3.2.17 INDEX

- .1 List all the plans and specification sections with correct number of pages, section names and correct drawing titles in the format shown on the website.

3.2.18 HEALTH AND SAFETY

- .1 Confirm with the Project Manager to determine if there are any instructions to meet regional requirements.

3.2.19 EXPERIENCE AND QUALIFICATIONS

- .1 Remove experience and qualification requirements from specification sections.

3.2.20 PREQUALIFICATION

- .1 Do not include in the specification any mandatory contractor and/or subcontractor prequalification requirements that could become a contract award condition.
- .2 If a prequalification process is required, contact the Project Manager.
- .3 There should be no references to certificates, transcripts or license numbers of a trade or subcontractor being included with the bid.

3.2.21 CONTRACTING ISSUES

- .1 Specifications describe the workmanship and quality of the work.
 - .1 Contracting issues should not appear in the specifications.
- .2 Division 00 of the NMS is not used for PWGSC projects.
- .3 Remove all references within the specifications, to the following:
 - .1 General Instructions to Bidders
 - .2 General Conditions
 - .3 CCDC documents
 - .4 Priority of documents
 - .5 Security clauses
 - .6 Terms of payment or holdback
 - .7 Tendering process
 - .8 Bonding requirements
 - .9 Insurance requirements
 - .10 Alternative and separate pricing
 - .11 Site visit (Mandatory or Optional)
 - .12 Release of Lien and deficiency holdbacks

3.3 DRAWINGS

3.3.1 TITLE BLOCKS

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

3.3.2 DIMENSIONS

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

3.3.3 TRADE NAMES

- .1 Trade names on drawings are not acceptable.
- .2 Refer to SECTON 2.3, SPECIFICATIONS; 2.3.6 Specifying Materials for specifying materials by trade name.



3.3.4 SPECIFICATION NOTES

- .1 No specification type notes are to appear on any drawing.

3.3.5 TERMINOLOGY

- .1 Use the term "Departmental Representative" instead of Engineer, PWGSC, Owner, Consultant or Architect.
- .2 "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor.
- .3 Notations such as: "verify on site", "as instructed", "to match existing", "example", "equal to" or "equivalent to", "to be determined on site by "Departmental Representative", may not be indicated on the drawings or in the specifications as this promotes inaccurate and inflated bids.
- .4 Specifications & drawings must permit bidders to calculate all quantities and bid accurately.
- .5 If quantities are impossible to identify (i.e. cracks to be repaired) give an estimated quantity for bid purposes (unit prices).
- .6 Ensure that the terminology used throughout the drawings & specifications is consistent and does not contradict the applicable standard construction contract documents.

3.3.6 INFORMATION TO BE INCLUDED

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

3.3.7 DRAWING NUMBERS

- .1 Number drawings in sets according to the type of drawing and the discipline involved as follows:
 - .1 The requirements of SECTION 2 PWGSC NATIONAL CADD STANDARD will supersede these requirements, where warranted.
- .2 During the Design Phase of the project each submission and review must be noted on the Notes block of the drawing title, but at the time of construction document preparation, all revision notes should be removed.

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

3.3.8 PRINTS

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

3.3.9 BINDING

- .1 Staple or otherwise bind prints into sets.



-
-
- .2 Where presentations exceed 20 sheets, the drawings for each discipline may be bound separately for convenience and ease of handling.

3.3.10 LEGENDS

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

3.3.11 SCHEDULES

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

3.3.12 NORTH POINTS

- .1 On all plans include a north point.
- .2 Orient all plans in the same direction for easy cross-referencing.
- .3 Wherever possible, lay out plans so that the north point is at the top of the sheet.

3.3.13 DRAWING SYMBOLS

- .1 Follow generally accepted drawing conventions, understandable by the construction trades, and in accordance with PWGSC publications.



4 APPENDIX - PICTURES

4.1 TUKTOYAKTUK – 22,500 LITER GASOLINE TANK TO BE MOVED TO BE NFC COMPLIANT



4.2 FORT GOOD HOPE INSTALLED DETACHMENT TANKS



4.3 EXAMPLE OF INSTALLATION AND SOME ISSUES



Collision protection (boulders from site).



Example of 24" flex hose design.



Example of concrete pad.



Snow loads to be considered so that system is not compromised (as in fuel lines, shut-off valves, etc).



