

**RETURN BIDS TO:**  
**RETOURNER LES SOUMISSIONS À:**  
**Bid Receiving Public Works and Government  
Services Canada/Réception des soumissions  
Travaux publics et Services gouvernementaux  
Canada**  
1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
B3J 1T3  
Bid Fax: (902) 496-5016

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

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

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

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

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

**Comments - Commentaires**

<b>Title - Sujet</b> Ground Penetrating Radar System	
<b>Solicitation No. - N° de l'invitation</b> W0102-150150/A	<b>Date</b> 2014-10-09
<b>Client Reference No. - N° de référence du client</b> W0102-15-0150	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$HAL-219-9348	
<b>File No. - N° de dossier</b> HAL-4-73079 (219)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2014-10-27</b>	
<b>Time Zone</b> <b>Fuseau horaire</b> Atlantic Daylight Saving Time ADT	
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Richard, Linda K.	<b>Buyer Id - Id de l'acheteur</b> hal219
<b>Telephone No. - N° de téléphone</b> (902) 496-5261 ( )	<b>FAX No. - N° de FAX</b> (902) 496-5016
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> DEPARTMENT OF NATIONAL DEFENCE 144 PICTOU NOVA SCOTIA BOP1N0 Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**

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

**Issuing Office - Bureau de distribution**

Atlantic Region Acquisitions/Région de l'Atlantique  
Acquisitions  
1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
B3J 3C9  
Nova Scot

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

Solicitation No. - N° de l'invitation

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Amd. No. - N° de la modif.

File No. - N° du dossier

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Buyer ID - Id de l'acheteur

hal219

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## **TITLE: GROUND PENETRATING RADAR SYSTEM**

### **PART 1 - GENERAL INFORMATION**

#### **1. Requirement - Bid**

The requirement is detailed in Annex "A" – Requirement.

#### **2. Debriefings**

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

#### **3. Trade Agreements**

The requirement is subject to the provisions of the Agreement on Internal Trade (AIT).

### **PART 2 - BIDDER INSTRUCTIONS**

#### **1. Standard Instructions, Clauses and Conditions**

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *[Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual)* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2014-09-25) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of [2003](#), Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days  
Insert: ninety (90) days

#### **2. Submission of Bids**

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

### 3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than five (5) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

### 4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Nova Scotia.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

## PART 3 - BID PREPARATION INSTRUCTIONS

### 1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid ( 2 hard copies)  
Section II: Financial Bid ( 1 hard copy)  
Section III: Certifications (1 hard copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

### **Section I: Technical Bid**

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

### **Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

#### **1.1 Exchange Rate Fluctuation**

C3011T (2013-11-06), Exchange Rate Fluctuation

### **Section III: Certifications**

Bidders must submit the certifications required under Part 5.

## **PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**

### **1. Evaluation Procedures**

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.
- (c) The evaluation team will determine first if there are two (2) or more bids with a valid Canadian Content certification. In that event, the evaluation process will be limited to the bids with the certification; otherwise, all bids will be evaluated. If some of the bids with a valid certification are declared non-responsive, or are withdrawn, and less than two responsive bids with a valid certification remain, the evaluation will continue among those bids with a valid certification. If all bids with a valid certification are subsequently declared non-responsive, or are withdrawn, then all the other bids received will be evaluated.

#### **1.1 Technical Evaluation**

##### **1.1.1 Mandatory Technical Criteria**

See Annex A – Requirement.

## 1.2 Financial Evaluation

The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, FOB destination, Canadian customs duties and excise taxes included.

## 2. Basis of Selection

A bid must comply with all requirements of the bid solicitation to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

## PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and associated information to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default in carrying out any of its obligations under the Contract, if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority may render the bid non-responsive or constitute a default under the Contract.

### 1. Certifications Required Precedent to Contract Award

#### 1.1 Integrity Provisions - Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions [2003](#). The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

#### 1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](#)" list ([http://www.labour.gc.ca/eng/standards\\_equity/eq/emp/fcp/list/inelig.shtml](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)) available from [Employment and Social Development Canada \(ESDC\) - Labour's website](#).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list at the time of contract award.

## 2. Additional Certifications Required Precedent to Contract Award

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within the time frame provided will render the bid non-responsive.

### 2.1 Canadian Content Certification

#### 2.1.1 SACC Manual clause [A3050T](#) (2010-01-11) Canadian Content Definition

This procurement is conditionally limited to Canadian goods.

Subject to the evaluation procedures contained in the bid solicitation, bidders acknowledge that only bids with a certification that the good(s) offered are Canadian goods, as defined in clause [A3050T](#), may be considered.

Failure to provide this certification completed with the bid will result in the good(s) offered being treated as non-Canadian goods.

The Bidder certifies that:

(  ) the good(s) offered are Canadian goods as defined in paragraph 1 of clause [A3050T](#).

## PART 6 - RESULTING CONTRACT CLAUSES

### 1. Security Requirement

There is no security requirement applicable to this Contract.

### 2. Requirement

The Contractor must provide a Ground Penetrating Radar System in accordance with the Requirement at Annex "A".

### 3. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

#### 3.1 General Conditions

2010A (2014-09-25), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

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#### 4. Term of Contract

##### 4.1 Delivery Date

All the deliverables must be received on or before January 31, 2015.

#### 5. Authorities

##### 5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Linda Richard  
Title: Supply Officer  
Public Works and Government Services Canada  
Acquisitions Branch  
Address: 1713 Bedford Row  
Halifax, NS B3J 3M9  
Telephone: (902) 496-5261  
Facsimile: (902) 496-5016  
E-mail address: linda.k.richard@pwgsc-tpsgc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

##### 5.2 Project Authority

The Project Authority for the Contract is: **(To be named upon award of contract)**

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority, however the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

##### 5.3 Contractor's Representative

**(Please complete)**

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Procurement Business Number: \_\_\_\_\_  
Address: \_\_\_\_\_

Telephone : \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

## 6. Payment

### 6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm unit prices in Annex B for a cost of \$ \_\_\_\_\_ insert the amount at contract award). Customs duties are included and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

### 6.2 Limitation of Price

SACC Manual clause [C6000C](#) (2011-05-16) Limitation of Price

### 6.3 Single Payment

SACC Manual clause [H1000C](#) (2008-05-12) Single Payment

## 7. Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.
2. Invoices must be distributed as follows:
  - a. The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.

## 8. Certifications

### 8.1

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing associated information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to provide the associated information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

### 8.3 SACC Manual Clauses

SACC Manual Clause A3060C (2008-05-12) Canadian Content Certification

## 9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Nova Scotia.

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## 10. Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) 2010A (2014-09-25), General Conditions - Goods (Medium Complexity);
- (c) Annex A Requirement;
- (d) Annex B, Basis of Payment;
- (e) the Contractor's bid dated \_\_\_\_\_ (*insert date of bid*) .

## 11. Defence Contract

SACC Manual clause [A9006C](#) (2012-07-16) Defence Contract

## 12. SACC Manual Clauses

SACC Manual clause [A9062C](#) (2012-07-16) Canadian Forces Site Regulations  
SACC Manual clause [B1501C](#) (2006-06-16) Electrical Equipment

## **ANNEX "A"**

### **REQUIREMENT**

#### **1. GENERAL REQUIREMENTS**

##### **a. General Scope**

The work under this requirement comprises the purchase of one complete Ground Penetrating Radar (GPR) system and associated operator training for 14 Construction Engineering Squadron (14 CES);

##### **b. Documents Required**: Supplier is to supply the following documents for review prior to acceptance:

1. Complete specifications on the GPR system being supplied;
2. Complete specifications on all accessories, equipment and software being supplied; and
3. Complete quote on all equipment and training to be provided broken down by line items.

##### **c. Equipment Handling**

1. The supplier is responsible to ensure that the equipment is well packed in protective packaging and arrives at the destination in good working order. Should any of the equipment arrive damaged the manufacturer will replace equipment at no cost to the Department of National Defence (DND); and
2. The manufacturer will be responsible for all shipping, customs and any other associated shipping costs for the supplied equipment.

##### **d. Training**

1. The manufacturer will provide operator training at 144 Construction Engineering Flight (144 CEF), a sub-unit of 14 CES located in Pictou, Nova Scotia, Canada, for all equipment purchased;

##### **e. Standards**

1. Throughout this statement reference is made to certain national standards. These standards are to be considered an integral part of the requirement for this equipment;
2. Where reference is made to standards, the latest edition shall always govern unless a specifically dated edition is mentioned; and
3. All units of measure used within this statement are SI units (metric). Units are stated, but in the event of no units being stated the following will apply.
  - a) Length is stated in millimeters unless indicated otherwise;
  - b) Weight is stated in kilograms unless indicated otherwise; and
  - c) Temperature is stated in degrees Celsius unless indicated otherwise.

**f. Warranty**

1. The manufacturer shall warranty all new equipment and parts under this statement for a period of one year. All warranties are to be in effect as of the date that all equipment is delivered and all training is complete.

**g. Service and Support**

1. The manufacturer shall ensure that parts for the complete system are kept in North American inventory and available to the user with shipment occurring no more than two business days after notification of a requirement for parts; and
2. The manufacturer will remain available following the initial training for follow on training to the users of the equipment on an as-needed basis.

**2. GROUND PENETRAING RADAR**

**a. Performance**

1. Equipment will be used for expedient surveys of ice and terrestrial runways and associated aircraft operating surfaces. Equipment must be capable of detecting the following under ice and ground runway, taxiway and apron surfaces.
  - a. Equipment must have a simple calibration procedure for layer depth measurement purposes. This must be accomplished in the field by a trained technician using a core sample.
  - b. After calibration the measurement of ice layer thickness must be to an accuracy of +/- 10% of the ice layer thickness compared to a physical measurement, with clear displayed delineation between the ice and water interface.
  - c. After calibration the measurement of top layer asphalt or concrete thickness must be to an accuracy of +/- of the layer thickness compared to a physical measurement, with clear displayed delineation between layers.
  - d. Capable of detecting air or liquid water voids in ice layer to a minimum size with normal dimensions of 150mm x 150mm x 150mm.
  - e. Capable of detecting air, ice or liquid water voids on terrestrial surfaces to a minimum size with nominal dimensions of 150mm x 150mm x 150mm.
  - f. Linear rate of advance of scanner must be no less than 5 m/s, while supplying sufficient accuracy to indicated areas for further study. This will allow unit to be dragged behind a vehicle.

**b. Equipment**

1. All electrical components including the data acquisition and display unit, antennas and GPS receivers must be self-contained units with the following characteristics.
  - a. Shielded from external or unwanted electromagnetic interference;
  - b. Compliant with CE and FCC regulations
  - c. Completely sealed against water and dust intrusion while in operation. Any electrical connection ports must include rubber sealing covers to prevent water intrusion when not in use. Sealed packing cases are not a suitable replacement since equipment will be operated in adverse weather.

- d. Capable of operating within a temperature range of -10°C to 40°C for no less than 4 hours;
  - e. Capable of operating at temperatures within -10°C to -30°C and 40°C to 50°C for no less than 1 hour
  - f. No single component is to weight more than 15kg or be more than 0.5m<sup>2</sup> in volume.
2. The GPR data acquisition and display unit must meet the following characteristics:
- a. Composed of one self-contained unit;
  - b. Powered by an internal, removal, rechargeable battery. In total two batteries will be supplied.
  - c. Allow for instantaneous display of subsurface conditions currently beneath the antenna. The display will have the following characteristics:
    - i. 800 x 600 pixel resolution or higher;
    - ii. 64K colour or better; and
    - iii. No smaller than 127mm measured diagonally.
  - d. Following external ports as a minimum:
    - i. One GPR antenna input, compatible with all antennas supplied;
    - ii. One DC power unit;
    - iii. One Serial RS232 GPS input, compatible with GPS unit supplied; and
    - iv. USB or similar data transfer port or Compact Flash card port;
  - e. The unit must allow for calibration in the field without the use of any additional equipment such as a computer. This will be accomplished by a menu system accessed through the screen on the unit.
  - f. Include or incorporate a screen glare/sun shade for use in bright sunlight;
  - g. Support GPS data integration with GPR scan data log. Must interlace data to allow drafting of survey data on a computer.
  - h. Allow GPR survey data transfer between unit and a computer. To be accomplished by common non-proprietary interface such as the Universal Serial Bus (USB) and/or removable media such as a Compact Flash card; and
  - i. Associated cables and adapters, including but not limited to:
    - i. AC to DC Converter capable of accepting 110VAC to 240VAC at 50Hz and 60Hz with North American standard plug;
    - ii. 12V DC vehicle accessory (cigarette lighter) adapter; and
    - iii. Data transfer cable.
3. GPR antennas to be supplied must conform to the following characteristics:
- a. One 900 MHz antenna capable of high detail detection of the ice/water interface; pavement depth and small air or water voids to a depth of 1000mm;
  - b. One 400 MHz antenna suitable for the locating of the ice/water interface, utility lines and medium sized air or water voids to a depth of 4000mm;
  - c. Each antenna will be supplied with two cables compatible with the data acquisition and display unit. One short cable when the antenna and data acquisition and display unit are in close proximity such as in a cart and one long cable when the antenna is dragged behind a vehicle;
  - d. Antennas must be shielded to eliminate above ground interference. Also antennas must not interfere with the accurate operation of the GPS receiver; and
  - e. Replaceable long lasting wear strips where antennas drag along the surface.
4. Global Positioning System (GPS) receiver to be supplied must conform to the following characteristics:

- a. May also be referred to as a Global Navigation Satellite System (GNSS) receiver;
  - b. One GPS receiver capable of supplying position data to the data acquisition and display unit
  - c. Typical position accuracy required of 1000mm or less
  - d. Composed of self-contained unit excluding external antennas or cables required. Handheld portable type unit
  - e. Self-powered by commercially available disposable batteries, such as AA or an internal rechargeable battery with charging cabling and adapters included.
  - f. Include associated adapter and cables required to allow for continuous data out to the data acquisition and display unit; and
  - g. Operate in the same temperature range described for the data acquisition and display unit.
5. Other supporting equipment including:
- a. Wheeled cart to mount antenna, data acquisition and display unit and GPS to allow operator to push and watch display simultaneously. The display should be at a comfortable viewing angle while the survey is being conducted. Cart must be compatible with both antennas supplied, only one will be mounted at a time, and
  - b. Wheeled cart to mount an antenna when the survey is being conducted by dragging the antenna behind a vehicle with the data acquisition and display unit located inside the vehicle. May be the same cart as mentioned above as long as it is suitable for this application.
6. All physical components supplied by the manufacturer including, but not limited to electrical components, major components, travel cases, spare parts, cables, batteries and manuals must conform to the following characteristics:
- a. Not suffer any permanent damage from storage temperature in the range of -30°C to 50°C; and
  - b. The manufacturer shall warranty all new equipment and parts under this statement for a period of one year. All warranties are to be in effect as of the date that all equipment is delivered and all training is complete.
7. All equipment supplied must be provided with travel cases meeting the following characteristics:
- a. Contain all equipment supplied by the manufacturer including, but not limited to major components, spare parts, cables and manuals;
  - b. Cases are to be constructed from a non-brittle plastic material capable of continued operation from -30°C to 40°C. All case materials must be resistant to oils;
  - c. Cases will be matte black in colour with the following markings:
    - i. Marked on two lines, line 1: "Ground Penetrating Radar" and line 2: "Property of DND."
    - ii. Text will be no smaller than 40mm in height and white in colour
  - d. Completely sealed for water submersion to 1m for 30 min with a replaceable rubber gasket around the lid circumference;
  - e. No less than two latches per case that positively close to prevent accident opening during rough handling.
  - f. Integrated locks in the latches or reinforced padlock locking locations molded into the cases.

- g. Cases are to include submersion proof automatic air pressure release valves to allow for air transportation.
  - h. Include foam or other reusable padding to protect equipment during rough handling;
  - i. Cases must be able to withstand typical stacking without crushing that occurs on board commercial aircraft. Cases must not deform significantly under 50kg of load; and
  - j. Total gross weight of individual cases, including padding and equipment contained within must not exceed 30kg or exceed 1m<sup>3</sup> in volume. Large or heavy cases will be equipped with handles to allow for two-man carrying or equipped with wheels.
8. Software. Software to be supplied with equipment is to conform to the following requirements and characteristics.
- 1. Compatible with Microsoft Windows 7.
  - 2. Interpret downloaded GPR data and GPS data simultaneously in order to:
    - a. Display three dimensional track of GPS data vs. Subsurface scan data
    - b. Allow the electronic export of GPS and GPR data in a common format for plotting in order drafting or display programs
    - c. Allow the printing and export of individual depth slices in common non-proprietary picture formats such as JPG or BMP.
  - 3. To be supplied with equipment with full instruction on its use included in training provided by manufacturer; and
  - 4. Include all operations manuals.
9. Training:
- a) Training is to be provided by the manufacturer at 144 CEF, Pictou, Nova Scotia, Canada following the delivery of all equipment and software for up to 10 persons from 14 CES.
  - b) Training facilities will be provided by 144 CEF and include a classroom, computer and projector. Outdoor training will be conducted on terrestrial surfaces including grass, asphalt and concrete. Depending on season, training may also be conducted on ice surfaces. Any training requirements beyond this will be the responsibility of the manufacturer; and
  - c) All training costs will be paid for by the manufacturer including:
  - d) All transportation, housing and meals for all manufacturer instructions or staff; and
  - e) All teaching materials such as training books, manuals or other handouts.
  - f) All trainees will be provided with:
    - I. A step-by-step manual on the basic setup and operation of the GPR and GPS, and
    - II. Physical hands-on demonstration and trainee practice in the following areas:
      - i. Equipment setup, start-up and initialization;
      - ii. Conducting a scan while collecting subsurface data and GPS data;
      - iii. Interpreting GPR data to spot pavement layer thickness, air/liquid filled voids and buried objects; and
      - iv. Basic equipment maintenance, disassembly and packing in travel cases.
5. Instruction will be provided in a classroom on the use of the software provided in the following areas:
- a. Uploading GPR and GPS data from the field into a computer, and

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- b. The use of the software for interpreting, plotting data, generating three dimensional tracks of GPR data vs. GPS position data and exporting depth slices of interest.
6. Five extra step-by-step manuals as extra copies.

**ANNEX 'B'**  
**BASIS OF PAYMENT**

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in the contract. Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable. Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

Price is to include all delivery charges, administration, costs and risks of transport and customs clearance, including the payment of customs duties and taxes to the destination.

<b>Item #</b>	<b>Description</b>	<b>Unit of Issue</b>	<b>Quantity (a)</b>	<b>Unit Price (b)</b>	<b>Extended Price (a x b) = c</b>
1	Ground Penetrating Radar System As described in Annex "A" Requirement	Each	1	\$	\$
2	Training As described in Annex "A" Requirement	Each	1	\$	\$
3	Delivery	Each	1	\$	\$
<b>TOTAL</b>					<b>\$</b>

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**ANNEX 'C'**  
**LIST OF DIRECTORS**

Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder. Bidders bidding as sole proprietorship, including those bidding as a joint venture, must provide the name of the owner. Bidders bidding as societies, firms, or partnerships do not need to provide lists of names.

Legal Name of Company:	
Corporate Address:	
Procurement Business Number:	
<b>DIRECTORS - NAMES</b>	<b>DIRECTORS - TITLES</b>

## ANNEX D

### MANDATORY TECHNICAL CROSS- REFERENCE

Bidders are requested to provide cross-reference below to identify the page(s) where each mandatory specification can be demonstrated in their technical document provided with their bid. Canada reserves the right to verify any and all information relating to mandatory requirements. For the few criteria which are not identified in specification sheets/literature/brochures, your firm's indication of "Compliance – Yes" will be consideration that the requirement is met or exceeded.

Article	Mandatory Requirement	Cross-Reference from Literature (i.e. Brochure title, page #)
<b>2.a Performance</b>		
a	Equipment must have a simple calibration procedure for layer depth measurement purposes. This must be accomplished in the field by a trained technician using a core sample.	
b	After calibration the measurement of ice layer thickness must be to an accuracy of +/- 10% of the ice layer thickness compared to a physical measurement, with clear displayed delineation between the ice and water interface.	
c	After calibration the measurement of top layer asphalt or concrete thickness must be to an accuracy of +/- of the layer thickness compared to a physical measurement, with clear displayed delineation between layers.	
d	Capable of detecting air or liquid water voids in ice layer to a minimum size with normal dimensions of 150mm x 150mm x 150mm.	
e	Capable of detecting air, ice or liquid water voids on terrestrial surfaces to a minimum size with nominal dimensions of 150mm x 150mm x 150mm.	
f	Linear rate of advance of scanner must be no less than 5 m/s, while supplying sufficient accuracy to indicated areas for further study. This will allow unit to be dragged behind a vehicle.	
<b>2 b. Equipment</b>		
1.	All electrical components including the data acquisition and display unit, antennas and GPS receivers must be self-contained units with the following characteristics:	
a.	Shielded from external or unwanted electromagnetic interference;	
b.	Compliant with CE and FCC regulations.	
c.	Completely sealed against water and dust intrusion while in operation. Any electrical connection ports must include rubber sealing covers to prevent water intrusion when not in use. Sealed package cases are not a suitable replacement since equipment will be operated in adverse weather.	
d.	Capable of operating within a temperature range of -10°C to 40°C for no less than 4 hours.	
e.	Capable of operating at temperatures within -10°C to -30°C and 40°C to 50°C in volume.	

2.	The GPR data acquisition and display unit must meet the following characteristics:	
a.	Composed of one self-contained unit.	
b.	Powered by an internal removal, rechargeable battery. In total two batteries will be supplied.	
c.	Allow for instantaneous display of subsurface conditions currently beneath the antenna. The display will have the following characteristics.	
	<ul style="list-style-type: none"> <li>i. 800 x 600 pixel resolution or higher</li> <li>ii. 64K colour or better; and</li> <li>iii. No smaller than 127mm measured diagonally.</li> </ul>	
d.	Following external ports as a minimum: <ul style="list-style-type: none"> <li>i. One GPR antenna input, compatible with all antennas supplied;</li> <li>ii. One DC power unit;</li> <li>iii. One Serial RS232 GPS input, compatible with GPS unit supplied; and</li> <li>iv. USB or similar data transfer port or Compact Flash card port.</li> </ul>	
e.	The unit must allow for calibration in the field without the use of any additional equipment such as a computer. This will be accomplished by a menu system accessed through the screen on the unit.	
f.	Include or incorporate a screen glare/sun shade for use in bright sunlight;	
g.	Support GPS data integration with GPR scan data log. Must interlace data to allow drafting of survey data on a computer.	
h.	Allow GPR survey data transfer between unit and a computer. To be accomplished by common non-proprietary interface such as the Universal Serial Bus (USB) and/or removable media such as a Compact Flash card; and	
i.	Associated cables and adapters, including but not limited to: <ul style="list-style-type: none"> <li>i. AC to DC Converter capable of accepting 110VAC to 240VAC at 50Hz\ and 60Hz with North American standard plug;</li> <li>ii. 12V DC vehicle accessory (cigarette lighter) adapter; and</li> <li>iii. Data transfer cable.</li> </ul>	
3.	GPS antennas to be supplied must conform with the following characteristics:	
a.	One 900 MHz antenna capable of high detail detection of the ice/water interface, pavement depth and small air or water voids to a depth of 1000mm;	
b.	One 400MHz antenna suitable for the locating of the ice/water interface, utility lines and medium sized air or water voids to a depth of 4000mm;	
c.	Each antenna will be supplied with two cables compatible with the data acquisition and display unit. One short cable when the antenna and data acquisition and display unit are in close proximity such as in a cart and one long cable when the antenna is dragged behind a vehicle.	
d.	Antennas must be shielded to eliminate above ground interference. Also antennas must not interfere with the accurate operation of the GPS receiver; and	
e.	Replaceable long lasting wear strips where antennas	

	drag along the surface.	
4.	Global Positioning System (GPS) receiver must conform to the following characteristics:	
a.	May also be referred to as a Global Navigation Satellite System (GNSS) receiver;	
b.	One GPS receiver capable of supplying position data to the data acquisition and display unit;	
c.	Typical position accuracy required of 1000mm or less	
d.	Composed of self-contained unit excluding external antennas or cables required. Handheld portable type unit.	
e.	Self-powered by commercially available disposable batteries, such as AA or an internal rechargeable battery with charging cabling and adapters included.	
f.	Include associated adapter and cables required to allow for continuous data out of to the data acquisition and display unit; and	
g.	Operate in the same temperature range described for the data acquisition and display unit.	
5.	Other supporting equipment including:	
a.	Wheeled cart to mount antenna, data acquisition and display unit and GPS to allow operator to push and watch display simultaneously. The display should be at a comfortable viewing angle while the survey is being conducted. Cart must be compatible with both antennas supplied, only one will be mounted at a time; and	
b.	Wheeled cart to mount an antenna when the survey is being conducted by dragging the antenna behind a vehicle with the data acquisition and display unit located inside the vehicle. May be the same cart as mentioned above as long as it is suitable for this application.	
6.	All physical components supplied by the manufacturer including, but not limited to, electrical components, major components, travel cases, spare parts, cables, batteries and manuals must conform to the following characteristics:	
a.	Not suffer any permanent damage from storage temperature in the range of -30°C to 50°C; and	
b.	The manufacturer shall warranty all new equipment and parts under this statement for a period of one year. All warranties are to be in effect as of the date that all equipment is delivered and all training is complete.	
7.	All equipment supplied must be provided with travel cases meeting the following characteristics:	
a.	Contain all equipment supplied by the manufacturer including, but not limited to, major components, spare parts, cables and manuals.	
b.	Cases are to be constructed from a non-brittle plastic material capable of continued operation from -30°C to 40°C. All case materials must be resistant to oils;	
c.	Cases will be matte black in colour with the following markings: i. Marked on two lines, line 1: "Ground Penetrating Radar" and line 2: "Property of DND" ii. Text will be no smaller than 40mm in height and white in colour.	
d.	Completely sealed for water submersion to 1m for 30 min with a replaceable rubber gasket around the lid circumference;	

e.	No less than two latches per case that positively close to prevent accidental opening during rough handling.	
f.	Integrated locks in the latches or reinforced padlock locking locations molded into the cases.	
g.	Cases are to include submersion proof automatic air pressure release valves to allow for air transportation.	
h.	Include foam or other reusable padding to protect equipment during rough handling.	
i.	Cases must be able to withstand typical stacking without crushing that occurs on board commercial aircraft. Cases must not deform significantly under 50kg of load; and	
j.	Total gross weight of individual cases, including padding and equipment contained within, must not exceed 30kg or exceed 1m <sup>3</sup> in volume.	
8.	Software: Software to be supplied with equipment is to conform to the following requirements and characteristics:	
a.	Compatible with Microsoft Windows 7.	
b.	Interpret downloadable GPR data and GPS data simultaneously in order to: <ul style="list-style-type: none"> <li>i. Display three dimensional track of GPS data vs Subsurface scan data</li> <li>ii. Allow the electronic export of GPS and GPR data in a common format for plotting in order drafting or display programs</li> </ul>	
c.	To be supplied with equipment with full instruction on its use including in training provided by manufacturer	
d.	Include all operations manuals.	
9.	Training	
a.	Training is to be provided by the manufacturer at 144 CEF, Pictou, Nova Scotia, Canada following the delivery of all equipment and software for up to 10 persons from 14 CES.	
b.	Training facilities will be provided by 144 CEF and include a classroom, computer	
c.	All training costs will be paid for by the manufacturer including: <ul style="list-style-type: none"> <li>i. All transportation, housing, and meals for all manufacturer instructions or staff; and</li> <li>ii. All teaching materials such as training books, manuals or other handouts.</li> </ul>	
d.	All trainees will be provided with: <ul style="list-style-type: none"> <li>i. A step-by-step manual on the basic setup and operation of the GPR and GPS, and</li> <li>ii. Physical hands-on demonstration and trainee practice in the following areas:           <ul style="list-style-type: none"> <li>i. Equipment setup, start-up and initialization</li> <li>ii Conducting a scan while collecting subsurface data and GPS data;</li> <li>iii Interpreting GPR data to spot pavement layer thickness, air/liquid filled voids and buried objects; and</li> <li>iv. Basic equipment maintenance, disassembly and packing in travel cases.</li> </ul> </li> </ul>	
e.	Instruction will be provided in a classroom on the use of the software provided in the following areas: <ul style="list-style-type: none"> <li>i. Uploading GPR and GPS data from the field into a computer, and</li> <li>ii. The use of the software for interpreting, plotting data, generating three dimensional tracks of GPR data vs GPS</li> </ul>	

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	position data and exporting depth slices of interest.	
f	Five extra step-by-step manuals as extra copies.	