

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**
Réception des soumissions - TPSGC / Bid
Receiving - PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

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

Title - Sujet Géo-referenced navigation	
Solicitation No. - N° de l'invitation W7701-135598/A	Date 2013-01-07
Client Reference No. - N° de référence du client W7701-13-5598	
GETS Reference No. - N° de référence de SEAG PW-\$QCL-032-15126	
File No. - N° de dossier QCL-2-35510 (032)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-01-23	Time Zone Fuseau horaire Heure Normale du l'Est HNE
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Boudrias, Marie-M.	Buyer Id - Id de l'acheteur qcl032
Telephone No. - N° de téléphone (418) 649-2806 ()	FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: R & D POUR LA DÉFENSE CANADA VALCARTIER BATIMENT 53 2459 BLVD PIE XI NORD QUEBEC Québec G3J1X5 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

TPSGC/PWGSC
601-1550, Avenue d'Estimauville
Québec
Québec
G1J 0C7

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

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Solicitation No. - N° de l'invitation

W7701-135598/A

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

qcl032

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

W7701-13-5598

File No. - N° du dossier

QCL-2-35510

CCC No./N° CCC - FMS No/ N° VME

15. Identification Badge

List of Attachments:

- Attachment 1 Financial Bid Presentation Sheet
- Attachment 2 Point Rated Technical Criteria
- Attachment 3 Certifications Precedent to Contract Award
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- Annex A Statement of Work
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PART 1 - GENERAL INFORMATION

1. Introduction

The bid solicitation document is divided into seven parts plus attachments and annexes as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided;
- Part 6 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work (annex A), the Basis of Payment (annex B) and Contractor disclosure of foreground information (annex C).

2. Summary

(a) Title :

Geo-referenced navigation and tracking system for an airborne imaging spectrometer

(b) Objective:

The objective of this project is to provide the Airborne Infrared Imaging Spectrometer (AIRIS) with the Line of Sight (LOS) jitter stability and a Geo-steering stability suitable for the measurement of static ground targets from an airborne moving platform, and to improve the reliability of its LOS steering system.

(c) Work location :

Work requiring access to the AIRIS instrument will be conducted at DRDC Valcartier, except if the contractor and the technical authority agree that it is more practical and cost effective to set-up AIRIS at the contractor's facilities to conduct part of the work. If AIRIS has to be transported to contractor's location for part of the work, transportation and set-up of AIRIS at contractor's location will be done by DRDC personnel. Other parts of the work not requiring access to the AIRIS instrument (such as log files data analysis) will be conducted at the contractor's facilities.

(d) Ownership of Intellectual Property

Canada has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada.

(e) Canadian Content

This procurement is conditionally limited to Canadian goods and Canadian services.

(f) Security requirement

There is no security requirement associated with this procurement.

(g) Maximum funding

The maximum funding available for the contract resulting from the bid solicitation is \$75,000.00 CAD (Goods and Services Tax or the Harmonized Sales Tax extra, as appropriate. This disclosure does not commit Canada to pay the maximum funding available.

(h) Period of Contract

The period of the Contract begins on the date of Contract and ends 6 months later.

3. Debriefings

After contract award, 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.

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>) 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 (2012-11-19) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

1.1 SACC Manual Clauses

A7035T (2007-05-25), List of Proposed Subcontractors

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.

Due to the nature of the bid solicitation, bids transmitted by facsimile or e-mail to PWGSC will not be accepted.

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 questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies 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 Quebec.

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.

5. Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least five (5) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

6. Basis for Canada's Ownership of Intellectual Property

Canada has determined that any intellectual property rights arising from the performance of the Work under the resulting contract will belong to Canada on the following grounds:

The Treasury Board, granted Defence Research and Development Canada exemption from the Treasury Board Policy on "Title to Intellectual Property Arising Under Crown Procurement Contracts"

7. Maximum Funding

The maximum funding available for the contract resulting from the bid solicitation is \$75,000.00 CAD (Goods and Services Tax or the Harmonized Sales Tax extra, as appropriate). Bids valued in excess of this amount will be considered non-responsive. This disclosure does not commit Canada to pay the maximum funding available.

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 (4 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; and
- (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>). To assist Canada in reaching its objectives, bidders should:

- (1) use 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, print double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I : Technical Bid

In their technical bid, bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should clearly address and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

Section II: Financial Bid

1.1 Bidders must submit their financial bid in accordance with the following :

- (a) A Total Cost to a Limitation of Expenditure, which must not exceed the maximum funding specified in Part 2. The total amount of Goods and Services Tax or Harmonized Sales Tax is to be shown separately, if applicable. The information should be provided in accordance with the Financial Bid Presentation Sheet at Attachment 1.
- (b) Prices must be in Canadian funds, Canadian customs duties and excise taxes included, and Goods and Services Tax (GST) or Harmonized Sales Tax (HST) excluded.

1.2 Exchange Rate Fluctuation

C3011T (2010-01-11), 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 three (3) 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 three 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

Except where expressly provided otherwise, the experience described in the bid must be the experience of the Bidder itself (which includes the experience of any companies that formed the Bidder by way of a merger but does not include any experience acquired through a purchase of assets or an assignment of contract). The experience of the Bidder's affiliates (i.e. parent, subsidiary or sister corporations), subcontractors, or suppliers will not be considered.

1.1.1 Point Rated Technical Criteria

Refer to Attachment 2, Point Rated Technical Criteria.

1.2 Financial Evaluation

1.2.1 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, the Goods and Services Tax or the Harmonized Sales Tax excluded, FOB destination, Canadian customs duties and excise taxes included.

For evaluation purposes only, the price of the bid will be the Estimated Cost to a Limitation of Expenditure identified in the Financial Bid Presentation Sheet at Attachment 1.

2. Basis of Selection

2.1 Basis of Selection - Highest Rated Within Budget

To be declared responsive, a bid must:

- (a) comply with all the requirements of the bid solicitation;
- (b) obtain the required minimum points overall for the technical evaluation criteria which are subject to point rating.

Bids not meeting (a) or (b) will be declared non responsive. The responsive bid with the highest number of points will be recommended for award of a contract, provided that the total evaluated price does not exceed the budget available for this requirement. In the event that the highest number of points is obtained by more than one responsive bid, the responsive bid with the lowest evaluated price will be recommended for award of a contract.

In the event that there are more than one responsive bid with the highest number of points and the lowest evaluated price, the tie breaker will be the best score for the point rated technical criteria of section 2 "Experience of the bidder". If there is still a tie, the tie breaker will be the best score for the point rated technical criteria of section 3 "Experience of the Prime resources".

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and related documentation to be awarded a contract. Canada will declare a bid non-responsive if the required certifications and related documentation are not completed and submitted as requested.

Compliance with the certifications bidders provide to Canada is subject to verification by Canada during the bid evaluation period (before award of a contract) and after award of a contract. The Contracting Authority will have the right to ask for additional information to verify the bidders' compliance with the certifications before award of a contract. The bid will be declared non-responsive if any certification made by the Bidder is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications to provide the related documentation or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

- 1.1.1** By submitting a bid, the Bidder certifies, for himself and his affiliates, to be in compliance with the Code of Conduct and Certifications clause of the Standard instructions. The related documentation hereinafter mentioned will help Canada in confirming that the certifications are true. By submitting a bid, the Bidder certifies that it is aware, and that its affiliates are aware, that Canada may request additional information, certifications, consent forms and other evidentiary elements proving identity or eligibility. Canada may also verify the information provided by the Bidder, including the information relating to the acts or convictions specified herein, through Independent research, use of any government resources or by contacting third parties. Canada will declare non-responsive any bid in respect of which the information requested is missing or inaccurate, or in respect of which the information contained in the certifications is found to be untrue, in any respect, by Canada. The Bidder and any of the Bidder's affiliates, will also be required to remain free and clear of any acts or convictions specified herein during the period of any contract arising from this bid solicitation.

Bidders who are incorporated, including those bidding as a joint venture, must provide with their bid or promptly thereafter 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 with their bid or promptly thereafter. Bidders bidding as societies, firms, partnerships or associations of persons do not need to provide lists of names. If the required names have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply will render the bid non-responsive. Providing the required names is a mandatory requirement for contract award.

Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form- PWGSC-TPSGC 229) (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>) for any or all individuals aforementioned within the time specified. Failure to provide such Consent Forms within the time period provided will result in the bid being declared non-responsive.

2. Additional Certifications Precedent to Contract Award and Certifications Required with the Bid

Bidders must submit the certifications as provided below.

2.1 Additional Certifications Precedent to Contract Award

The certifications in **Attachment 3, Certifications Precedent to Contract Award**, 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 so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

2.2 Additional Certifications Required with the Bid

Bidders must complete and submit the certifications in **Attachment 4, Certifications Required with the Bid**, as part of their bid.

PART 6 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

1. Statement of Work

The Contractor must perform the Work in accordance with the Statement of Work at Annex A and the Contractor's technical bid entitled _____, dated _____ (to be completed by Canada at the contract award).

1.1 Work Authorization

Despite any other condition of the Contract, **the Contractor is only authorized to perform the Work required to complete tasks 1, 2 and 3 of the Contract at a cost not to exceed \$30,000.00 (GST / HST extra)**. Upon completion of tasks 1, 2 and 3, the Work will be reviewed before the Contractor is authorized to commence any Work for tasks 4 and 5. Depending on the results of the review and evaluation of the Work, Canada will decide at its discretion whether to continue with the Work.

If Canada decides to continue with tasks 4 and 5, the Contracting Authority will advise the Contractor in writing to commence work on tasks 4 and 5. The Contractor must immediately comply with the notice.

If Canada decides not to proceed with tasks 4 and 5, the Contracting Authority will advise the Contractor in writing of the decision and the Contract will be considered completed at no further costs to Canada. In no event will the Contractor be paid for any cost incurred for unauthorized work.

2. 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>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2040 (2012-11-19), General Conditions - Research & Development, apply to and form part of the Contract.

2.2 Supplemental General Conditions

The following supplemental general conditions apply to and form part of the Contract:

4002 (2010-08-16), Software Development or Modification Services

2.3 SACC Manual Clauses

K3410C (2008-12-12), Canada to Own Intellectual Property Rights in Foreground Information

3. Term of Contract

3.1 Period of Contract

The period of the Contract begins on the date of Contract and ends 6 months later.

4. Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Marie-Michèle Boudrias
Supply Agent
Public Works and Government Services Canada
1550, d'Estimauville Avenue, Quebec city, Quebec, G1J 0C7

Telephone: 418-649-2806
Facsimile: 418-648-2209
E-mail address: marie-michele.boudrias@tpsgc-pwgsc.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.

4.2 Technical Authority (to be completed by Canada at the contract award)

The Technical Authority for the Contract is:

Name : _____
Organization : _____
Telephone: _____
Facsimile: _____
E-mail address: _____

The Technical 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 Technical Authority; however, the Technical 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.

4.3 Contractor's Representative (to be completed by the bidder)

Administrative representative :

Name :
Telephone :
Facsimile :
Email :

Technical representative :

Name :
Telephone :
Facsimile :
Email :

5. Basis of payment

5.1 Basis of Payment - limitation of expenditure

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work, as determined in accordance with the Basis of Payment in Annex B, to a limitation of expenditure of \$_____ (**insert the amount at contract award**). Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

5.2 Limitation of Expenditure

1. Canada's total liability to the Contractor under the Contract must not exceed \$ _____ (**amount to be inserted at contract award**) . Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:
 - (a) when it is 75 percent committed, or
 - (b) four (4) months before the Contract expiry date, or
 - (c) as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work,

whichever comes first.
3. If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

5.3 Method of Payment

5.3.1 Progress Payments

1. Canada will make progress payments in accordance with the payment provisions of the Contract, no more than once a month, for cost incurred in the performance of the Work up to 90 percent of the amount claimed and approved by Canada if:
 - (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111(<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/1111.pdf>) and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
 - (b) the amount claimed is in accordance with the Basis of payment;
 - (c) the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
 - (d) all certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives.
2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of all work required under the Contract if the Work has been accepted by Canada and a final claim for the payment is submitted.
3. Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the right to make adjustments to the Contract from time to time during the performance of the Work. Any overpayment resulting from progress payments or otherwise must be refunded promptly to Canada.

5.4 SACC Manual Clauses

A9117C (2007-11-30), T1204 - Direct Request by Customer Department
 C2000C (2007-11-30), Taxes - Foreign-based Contractor (to be deleted if the contractor is a canadian contractor)
 C0305C (2008-05-12), Cost Submission

5.5 Discretionary Audit

SACC Manual Clause C0705C (2010-01-11), Discretionary Audit

5.6 Funding by Fiscal Year

Despite the Total Estimated Cost (Limitation of Expenditure) specified in the Contract, and unless otherwise authorized in writing by the Contracting Authority, the maximum amount which may be paid for work completed in the period ending 31 March of the year specified is as follows:

Period from the contract award to March 31, 2013:	\$20,000.00
Period from April 1st, 2013 to the end of the contract period:	\$55,000.00.

6. Invoicing Instructions - Progress Claim

1. The Contractor must submit a claim for progress payment using form PWGSC-TPSGC 1111 (<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/1111.pdf>).

Each claim must show:

- (a) all information required on form PWGSC-TPSGC 1111;
- (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- (c) a list of all expenses;

Each claim must be supported by:

- (a) a copy of time sheets to support the time claimed;
 - (b) a copy of the invoices, receipts, vouchers for all direct expenses, and all travel and living expenses;
 - (c) a copy of the monthly progress report.
2. Goods and Services Tax (GST) or Harmonized Sales Tax (HST), as applicable, must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no GST/HST payable as it was claimed and payable under the previous claims for progress payments.
 3. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the following address for certification.

ATTN: Olfa Ben Mahmoud

Supply Support Clerk
Public Works and Government Services Canada
601-1550 Avenue D'Estimauville
Québec, Québec
G1J 0C7

E-mail address : olfa.benmahmoud@tpsgc-pwgsc.gc.ca

The Contracting Authority will then forward the original and two (2) copies of the claim to the Technical Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

4. The Contractor must not submit claims until all work identified in the claim is completed.

7. Certifications

7.1 Compliance

Compliance with the certifications and related documentation provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the entire contract period. If the Contractor does not comply with any certification, provide the related documentation 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.

7.2 SACC Manual Clauses

A3060C (2008-05-12), Canadian Content Certification (to be deleted if the successful bidder has not completed and submitted a Canadian content certification with his bid)

8. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____ (to be inserted at contract award).

9. 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) the supplemental general conditions 4002 (2010-08-016), Software Development or Modification Services;
- (c) the general conditions 2040 (2012-11-19), General Conditions - Research and Development;
- (d) Annex A, Statement of Work;
- (e) Annex B, Basis of Payment;
- (f) Annex C, Contractor disclosure of foreground information;
- (g) the Contractor's bid dated _____ (insert date of bid).

10. Defence Contract

SACC Manual clause A9006C (2008-05-12), Defence Contract

11. Foreign Nationals (Canadian Contractor) (to be deleted if the contractor is a Foreign Contractor)

SACC Manual clause A2000C (2006-06-16), Foreign Nationals (Canadian Contractor)

OR

11. Foreign Nationals (Foreign Contractor) (to be deleted if the contractor is a Canadian Contractor)

SACC Manual clause A2001C (2006-06-16), Foreign Nationals (Foreign Contractor)

12. Insurance

SACC Manual clause G1005C (2008-05-12), Insurance

13. Progress Reports

1. The Contractor must submit monthly reports, in electronic format, on the progress of the Work, to both the Technical Authority and the Contracting Authority.
2. The progress report must contain two parts:
 - (a) PART 1: The Contractor must answer the following three questions:
 - (i) Is the project on schedule?
 - (ii) Is the project within budget?
 - (iii) Is the project free of any areas of concern in which the assistance or guidance of Canada may be required?

Each negative response must be supported with an explanation.

- (b) PART 2: A narrative report, brief, yet sufficiently detailed to enable the Technical Authority to evaluate the progress of the Work, containing as a minimum:
 - (i) A description of the progress of each task and of the Work as a whole during the period of the report. Sufficient sketches, diagrams, photographs, etc., must be included, if necessary, to describe the progress accomplished.
 - (ii) An explanation of any variation from the work plan.
 - (iii) A description of trips or conferences connected with the Contract during the period of the report.
 - (iv) A description of any major equipment purchased or constructed during the period of the report.

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14. Site Regulations

The Contractor must comply with all standing orders or other regulations, instructions and directives in force on the site where the Work is performed.

15. Identification badge

SACC Manual clause A9065C (2006-06-16), Identification badge

ATTACHMENT 1**FINANCIAL BID PRESENTATION SHEET**

1. LABOUR: firm all-inclusive rates, GST/HST extra, F.O.B. Destination (for goods), in accordance with the following:

INSTRUCTIONS:

- A- Bidders are requested to quote one rate per proposed labour category, for the contract period.
 B- Bidders are requested to identify the name of each prime resource proposed to comply with the point rated technical criteria of section 3. Experience of the Prime resources (see attachment 2 - Point rated technical criteria).
 C- If the resource works for a subcontractor, the Bidders are requested to identify the name of the subcontractor.
 D- If necessary, the Bidders may insert more or less lines in the table bellow.

A Labour Categories	B Firm Hourly Rate for the entire contract period	C Total estimated number of hours	D Extended Total per Labour Category (BXC)
Labour Category : _____ Name of the proposed resource (if applicable - please refers to instruction B): _____	\$_____ / hour	_____ hours	\$_____
Labour Category : _____ Name of the proposed resource (if applicable - please refers to instruction B): _____	\$_____ / hour	_____ hours	\$_____

A Labour Categories	B Firm Hourly Rate for the entire contract period	C Total estimated number of hours	D Extended Total per Labour Category (BXC)
Labour Category : _____ Name of the proposed resource (if applicable only - please refers to instruction B): _____	\$_____ / hour	_____ hours	\$_____
Labour Category : _____ Name of the proposed resource (if applicable - please refers to instruction B): _____	\$_____ / hour	_____ hours	\$_____
Labour Category : _____ Name of the proposed resource (if applicable - please refers to instruction B): _____	\$_____ / hour	_____ hours	\$_____

TOTAL ESTIMATED LABOUR: \$ _____

Items 2 through 7 shall be completed if the Bidder's rates in 1. above do not include the following:

2. EQUIPMENT: at laid down cost without markup

Description

Price

(a)

\$ _____

(b)

\$ _____

TOTAL ESTIMATED EQUIPMENT: \$ _____

3. RENTALS: at actual cost without markup

Description	Price
(a)	\$ _____
(b)	\$ _____
TOTAL ESTIMATED RENTALS: \$ _____	

4. MATERIALS AND SUPPLIES: at laid down cost without markup

Description	Price
(a)	\$ _____
(b)	\$ _____
TOTAL ESTIMATED MATERIALS AND SUPPLIES: \$ _____	

5. SUBCONTRACTS: at actual cost without markup

Support for the proposed subcontractor's price is required in the same details as that required for the Bidder's price. The estimated price for subcontracts should include all direct charges and travel & living expenses which would be to the account of the subcontractor.

The subcontractor's resources that are proposed by the bidder must be included in the table of section 1 and are subject to the provision of section 1, Labour.

TOTAL ESTIMATED SUBCONTRACTS: \$ _____

6. TRAVEL & LIVING: at actual cost without markup but not to exceed the limits of the Treasury Board Travel Directive. With respect to the TB Travel Directive, only the meal, private vehicle and incidental allowances specified in Appendices B, C and D of the TB Travel Directive <http://www.tbs-sct.gc.ca/hr-rh/gtla-vgcl/> and the other provisions of the directive referring to "travellers" rather than those referring to "employees", are applicable.

Details are to be provided on a separate sheet.

TOTAL ESTIMATED TRAVEL & LIVING: \$ _____

7. OTHER DIRECT CHARGES: at actual cost without markup

Details are to be provided on a separate sheet.

TOTAL ESTIMATED OTHER DIRECT CHARGES: \$ _____

**TOTAL ESTIMATED COST TO A LIMITATION OF EXPENDITURE: \$ _____
(GST/HST extra)**

ATTACHMENT 2

POINT RATED TECHNICAL CRITERIA

A. Point Rated Technical Criteria

Group of point rated technical criteria	Scores	
	Max	Min
1. Technical proposal	35	NA
2. Experience of the bidder	40	NA
3. Experience of the Prime resources	20	NA
Total:	95	50

1. TECHNICAL PROPOSAL

1.1 Understanding of background, scope and objectives (max: 10 pts / min: NA).

The bidder should demonstrate its understanding of the background, the objectives and the scope of the project in a clear and concise manner.

The required elements for this criterion are:

- a. There is a brief introduction.
- b. There is a concise evaluation of:
 - i. the project needs,
 - ii. the objectives of the proposed work,
 - iii. the reasons that justify the conduct of the work as proposed.
- c. The text is concise,
- d. The text is clear and easy to understand.

The evaluation scale is available at the end of this attachment.

1.2 Recognition of direct as well as peripheral problems, and ability to solve them (max: 5 pts / min: NA)

The Bidder should state any major difficulties that are anticipated for this project and explain how it would address these difficulties.

Evaluation scale :

(5 pts) The bidder has recognized and provided a list of the major direct and peripheral problems and demonstrated his ability to solve them.

(4 pts) The bidder is aware of the major direct and peripheral problems, provided a list of those problems, but forgot 1 or 2 important problems. However, he showed his ability to solve the problems he identified.

(3 pts) The bidder is aware of the major direct and peripheral problems, provided a list of those problems, but showed a limited ability to solve some of them.

(1 to 2 pts) The bidder is aware of the nature and existence of direct and peripheral problems, but no description of those problems is provided or the description is limited. Moreover, his ability to solve them is not well demonstrated.

(0 pt) Any other situation

1.3 Proposed methodology and scientific approach to perform the work (max: 10 pts / min: NA)

The bidder should clearly describe the strategy and methodology it intends to adopt to meet the requirements and should provide an assessment of the level of success anticipated. The technical strategy proposed should be consistent with the requirements of the statement of work (annex A). Sufficient detail should be provided to demonstrate that the methodology proposed will ensure that the objectives are achieved.

The evaluation scale is available at the end of this attachment.

1.4 Work schedule (max: 10 pts / min: NA)

The bidder should clearly describe its work schedule to perform each tasks and subtasks of the project. The methodology should be described in terms of activities, timelines, deliverables, effort and the relative involvement of each labour category in the performance of the different tasks of this project (work schedule).

The evaluation scale is available at the end of this attachment.

2. Experience of the bidder

For each point rated technical criteria of this section, the bidder should demonstrate its experience by describing previous projects in which it was involved. For each project proposed by the bidder, the bidder should provide enough information to enable the evaluation team to assess whether it meets the criterion. It is possible to use the same projects to demonstrate the bidder experience in more than one criterion. A short text containing at least the following elements should support the bidder demonstration for each proposed project:

- Title;
- Project duration;
- Project value (\$);
- Brief description;
- Involvement, percentage of effort and responsibility of the bidder (i.e. Was main developer, was sub-contractor ...);
- Labour category from the bidder's company involved in the project.

2.1 Ground testing and evaluation of Geo-referenced navigation and tracking systems for airborne sensors (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) **Within the last 5 years**, the bidder has performed the quantitative evaluation of LOS jitter stability and LOS pointing precision of **two or more** Geo-referenced navigation and tracking systems for airborne sensors.

(5 pts) **Within the last 5 years**, the bidder has performed the quantitative evaluation of LOS jitter stability and LOS pointing precision of **one** Geo-referenced navigation and tracking system for airborne sensors.

(0 pt) Any other situation.

2.2 Repair and upgrade of Geo-referenced navigation and tracking systems for airborne sensors (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) **Within the last 5 years**, the bidder has repaired and/or upgraded the electronic drives and software for the control loop of **two or more** Geo-referenced navigation and tracking systems for airborne sensors.

(5 pts) **Within the last 5 years**, the bidder has repaired and/or upgraded the electronic drives and software for the control loop of **one** Geo-referenced navigation and tracking systems for airborne sensors.

(0 pt) Any other situation.

2.3 Development of Geo-referenced navigation and tracking systems for airborne sensors (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) **Within the last 5 years**, the bidder has developed **two (or more)** different Geo-referenced navigation and tracking systems for airborne sensors.

(5 pts) **Within the last 5 years**, the bidder has developed **one** Geo-referenced navigation and tracking system for airborne sensors.

(0 pt) Any other situation.

2.4 Integration of Commercial Off The Shelf (COTS) Geo-referenced navigation and tracking systems for airborne sensors to an existing sensor (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) **Within the last 5 years**, the bidder has integrated to an existing airborne sensor system **two (or more) of its own** COTS Geo-referenced navigation and tracking systems for airborne sensors.

(8 pts) **Within the last 5 years**, the bidder has integrated to an existing sensor system **one of its own** COTS Geo-referenced navigation and tracking systems for airborne sensors.

(6 pts) **Within the last 5 years**, the bidder has integrated to an existing airborne sensor system **two (or more)** COTS Geo-referenced navigation and tracking systems for airborne sensors (these COTS systems are products from another company).

(4 pts) **Within the last 5 years**, the bidder has integrated to an existing sensor system **one** COTS Geo-referenced navigation and tracking system for airborne sensors (this COTS system is a product from another company).

(0 pt) Any other situation.

3. Experience of the Prime resources

The experience of the proposed resources will be evaluated against their resumes. Each resume should contain sufficient data elements to allow the evaluation team to understand the experience of the proposed resources. Each resume should describe the work experience of the proposed resources related to each criterion.

The following information should be provided for each project used to demonstrate the experience of the proposed resources: name of the project and/or contract number, project description, description of tasks performed by the proposed resource (and exact duration of each task), total duration of the involvement of the proposed resource in the project, software solutions used in the project (if applicable), as well as any other relevant information that would demonstrate the compliance with the criteria.

The bidder can propose sub-contractor's resources. Sub-contractor's resources will be evaluated on the same level as the bidder's resources.

For each technical criterion listed in this section, **the evaluation team will only consider the resources involved in at least 10% of the total hours of the project** (e.g. if the total number of hours of effort for the project is 2000 hours, to be considered for the sub criteria of section 2., the resource must work at least 200 hours on the project). **These resources would be the “Prime resources”**. To determine the total number of hour and the number of hour per resource, Canada will use the bidder's work schedule provided to comply with the point rated technical criterion 1.4 “Work schedule”.

3.1 At least one of the “prime resources” has experience with performing the Ground testing and evaluation of Geo-referenced navigation and tracking systems for airborne sensors (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) The prime resource has 24 months or more of experience in this area, and experience includes the quantitative evaluation of LOS jitter stability and LOS pointing precision, and the qualitative assessment of the hardware implementation, of Geo-referenced navigation and tracking systems for airborne sensors.

(8 pts) The prime resource has between 12 and 23 months of experience in this area, and experience includes the quantitative evaluation of LOS jitter stability and LOS pointing precision, and the qualitative assessment of the hardware implementation, of Geo-referenced navigation and tracking systems for airborne sensors.

(6 pts) The prime resource 24 months or more of experience in this area, and experience **does not** include the quantitative evaluation of LOS jitter stability and LOS pointing precision, and the qualitative assessment of the hardware implementation, of Geo-referenced navigation and tracking systems for airborne sensors.

(4 pts) The prime resource has between 12 and 23 months of experience in this area, and experience **does not** include the quantitative evaluation of LOS jitter stability and LOS pointing precision, and the qualitative assessment of the hardware implementation, of Geo-referenced navigation and tracking systems for airborne sensors.

(0 pt) Any other situation

3.2 At least one of the “prime resources” has experience with performing the Integration of Commercial Off The Shelf (COTS) Geo-referenced navigation and tracking systems for airborne sensors to an existing sensor (max: 10 pts / min: NA)

Evaluation scale :

(10 pts) The prime resource has 24 months or more of experience in this area.

(6 pts) The prime resource has between 12 and 23 months of experience in this area.

(0 pt) Any other situation.

EVALUATION SCALE FOR CRITERIA 1.1, 1.3 AND 1.4

INADEQUATE	WEAK	ACCEPTABLE	GOOD	VERY GOOD	EXCELLENT
0 point	2 points	4 points	6 points	8 points	10 points
<ul style="list-style-type: none"> Did not submit information which could be evaluated 	<ul style="list-style-type: none"> Lacks complete or almost complete understanding of the requirements 	<ul style="list-style-type: none"> Has some understanding of the requirements but lacks adequate understanding in some areas of the requirements 	<ul style="list-style-type: none"> Demonstrates a very good understanding of the requirements 	<ul style="list-style-type: none"> Demonstrates a very good understanding of the requirements 	<ul style="list-style-type: none"> Demonstrates expert understanding of the requirements
	<ul style="list-style-type: none"> Weaknesses cannot be corrected 	<ul style="list-style-type: none"> Generally doubtful that weaknesses can be corrected 	<ul style="list-style-type: none"> Weaknesses can be easily corrected 	<ul style="list-style-type: none"> No significant weaknesses 	<ul style="list-style-type: none"> No apparent weaknesses
	<ul style="list-style-type: none"> Extremely poor, insufficient to meet performance requirements 	<ul style="list-style-type: none"> Little capability to meet performance requirements 	<ul style="list-style-type: none"> Minimum acceptable capability, should meet minimum performance 	<ul style="list-style-type: none"> Satisfactory capability, should ensure effective results 	<ul style="list-style-type: none"> Superior capability, should ensure very effective results

ATTACHMENT 3

CERTIFICATIONS PRECEDENT TO CONTRACT AWARD

1. Federal Contractors Program for Employment Equity - Certification

1.1 Federal Contractors Program - over \$25,000 and below \$200,000

Suppliers who are subject to the Federal Contractors Program (FCP) and have been declared ineligible contractors by Human Resources and Skills Development Canada (HRSDC) are no longer eligible to receive federal government contracts over the threshold for solicitation of bids as set out in the *Government Contracts Regulations*. Suppliers may be declared ineligible contractors either as a result of a finding of non-compliance by HRSDC, or following their voluntary withdrawal from the FCP for a reason other than the reduction of their workforce to less than 100 employees. Any bids from ineligible contractors, including a bid from a joint venture that has a member who is an ineligible contractor, will be declared non-responsive.

The Bidder, or, if the Bidder is a joint venture the member of the joint venture, certifies its status with the FCP, as follows:

The Bidder or the member of the joint venture

- (a) () is not subject to the FCP, having a workforce of less than 100 full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada;
- (b) () is not subject to the FCP, being a regulated employer under the *Employment Equity Act*, S.C. 1995, c. 44;
- (c) () is subject to the requirements of the FCP, having a workforce of 100 or more full-time or part-time permanent employees, and/or temporary employees having worked 12 weeks or more in Canada, but has not previously obtained a certificate number from HRSDC, having not bid on requirements of \$200,000 or more;
- (d) () has not been declared an ineligible contractor by HRSDC, and has a valid certificate number as follows: _____.

Further information on the FCP is available on the HRSDC Web site (<http://www.hrsdc.gc.ca/eng/labour/equality/fcp/index.shtml>).

2. Former Public Servant Certification

Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

Definitions

For the purposes of this clause, "former public servant" is any former member of a department as defined in the Financial Administration Act, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a. an individual;
- b. an individual who has incorporated;
- c. a partnership made of former public servants; or
- d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, a pension or annual allowance paid under the Public Service Superannuation Act (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the Supplementary Retirement Benefits Act, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the Canadian Forces Superannuation Act, R.S., 1985, c.C-17, the Defence Services Pension Continuation Act, 1970, c.D-3, the Royal Canadian Mounted Police Pension Continuation Act, 1970, c.R-10, and the Royal Canadian Mounted Police Superannuation Act, R.S., 1985, c.R-11, the Members of Parliament Retiring Allowances Act, R.S., 1985, c.M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c.C-8.

Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes () No ()**

If so, the Bidder must provide the following information, for all FPS in receipt of a pension, as applicable:

- a. name of former public servant;
- b. date of termination of employment or retirement from the Public Service.

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

Work Force Reduction Program

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? **Yes () No ()**

If so, the Bidder must provide the following information:

- a. name of former public servant;
- b. conditions of the lump sum payment incentive;
- c. date of termination of employment;
- d. amount of lump sum payment;
- e. rate of pay on which lump sum payment is based;
- f. period of lump sum payment including start date, end date and number of weeks;
- g. number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

3. Status and Availability of Resources

The Bidder certifies that, should it be awarded a contract as a result of the bid solicitation, every individual proposed in its bid will be available to perform the Work as required by Canada's representatives and at the time specified in the bid solicitation or agreed to with Canada's representatives. If for reasons beyond its control, the Bidder is unable to provide the services of an individual named in its bid, the Bidder may propose a substitute with similar qualifications and experience. The Bidder must advise the Contracting Authority of the reason for the substitution and provide the name, qualifications and experience of the proposed replacement. For the purposes of this clause, only the following reasons will be considered as beyond the control of the Bidder: death, sickness, maternity and parental leave, retirement, resignation, dismissal for cause or termination of an agreement for default.

If the Bidder has proposed any individual who is not an employee of the Bidder, the Bidder certifies that it has the permission from that individual to propose his/her services in relation to the Work to be performed and to submit his/her résumé to Canada. The Bidder must, upon request from the Contracting Authority, provide a written confirmation, signed by the individual, of the permission given to the Bidder and of his/her availability. Failure to comply with the request may result in the bid being declared non-responsive.

4. Education and Experience

The Bidder certifies that all the information provided in the résumés and supporting material submitted with its bid, particularly the information pertaining to education, achievements, experience and work history, has been verified by the Bidder to be true and accurate. Furthermore, the Bidder warrants that every individual proposed by the Bidder for the requirement is capable of performing the Work described in the resulting contract.

5. Language Capability

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qc1032

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

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The Bidder certifies that it has the language capability required to perform the Work, as stipulated in the Statement of Work.

ATTACHMENT 4

CERTIFICATIONS REQUIRED WITH THE BID

1. Canadian Content Certification

This procurement is conditionally limited to Canadian goods and Canadian services.

Subject to the evaluation procedures contained in the bid solicitation, bidders acknowledge that only bids with a certification that the goods and services offered are Canadian goods and Canadian services, as defined in clause A3050T, may be considered.

Failure to provide this certification completed with the bid will result in the goods and services offered being treated as non-Canadian goods and non-Canadian services.

The Bidder certifies that:

- () a minimum of 80 percent of the total bid price consist of Canadian goods and Canadian services as defined in paragraph 5 of clause A3050T.

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the Supply Manual.
(<https://buyandsell.gc.ca/policy-and-guidelines/supply-manual/annex/3/6>).

1.1 SACC Manual clause A3050T (2010-01-11), Canadian Content Definition

ANNEX A

STATEMENT OF WORK

1. GENERAL

1.1 Title

Geo-referenced navigation and tracking system for an airborne imaging spectrometer

1.2 Objective

The objective of this project is to provide the Airborne Infrared Imaging Spectrometer (AIRIS) with the Line of Sight (LOS) jitter stability and a Geo-steering stability suitable for the measurement of static ground targets from an airborne moving platform, and to improve the reliability of its LOS steering system.

1.3 Background

AIRIS is an airborne imaging spectrometer designed, built and operated by DRDC Valcartier with support from local industry. It uses a Fourier transform spectrometer to measure infrared energy as a function of wavelength at various spectral resolutions (1 to 16 cm^{-1} , resulting in integration times of 227 to 18 ms, respectively; see Table 1 for the relationship between spectral resolution and integration time) at modest spatial resolution (8x8 pixels detector array). The low spatial resolution imaging spectrometer is supplemented with co-aligned visible and IR cameras that provide broadband contextual imagery at higher spatial resolution (typically 320 x 240 pixels). The AIRIS spectrometer is implemented as nadir viewing interrogator for fixed ground targets; this function is supported by its navigation and tracking system called NavTrack.

Table 1: Relationship between spectral resolution and integration times;
note that these are fixed values for AIRIS.

Spectral resolution (cm^{-1})	1	2	4	8	16
Integration time (ms)	227	125	60	33	18

Target interrogation with AIRIS is performed as follows. A list of fixed ground targets is stored in NavTrack with their GPS coordinates. Using GPS and IMU inputs measured on the AIRIS mount, NavTrack calculates the position and orientation of the sensor platform relative to the fixed ground target (at an update rate of 10 Hz) and sends commands to the tracking mirror in AIRIS' input telescope to put and maintain the target within the Field of View (FOV) of AIRIS, as long as the target is in the Field of Regard (FOR). Table 2 shows the size of the FOR and FOV for each AIRIS input telescope, as well as the pixel footprint and time in FOR at a 1 km altitude and aircraft speed of 100 m/s. NavTrack also sends inputs to a visual aid for the pilot to navigate accurately to the target and keep it within the FOR. The small size of the footprints and short time in the FOR, especially with the 9X telescope, require a very high skill level from the pilot. Consider for instance that for AIRIS configured with the 9X telescope, the pilot has to position and maintain the aircraft on a straight line within 60 m of the target from an altitude of 1 km.

Table 2: AIRIS basic optical characteristics; footprints and times are for a 1 km altitude and aircraft speed of 100 m/s; FOV and FOR are fixed for a given telescope; footprints and time in FOR depend on aircraft speed and altitude, for a given telescope.

Telescope	FOV (mrad)	FOR (mrad)	Footprint (m ²)	Time in FOR (s)
3X	pixel: 3.6	150	pixel: 3.6 x 3.6	1.5
	array: 28.8		array: 9.6 x 9.6	
			FOR: 150 x 150	
9X	pixel: 1.2	60	pixel: 1.2 x 1.2	0.6
	array: 9.6		array: 9.6 x 9.6	
			FOR: 60 x 60	

AIRIS was used in two field experiments during which spectral measurements of a variety of targets were made. Both input telescopes were used during these experiments. This practical experience with AIRIS revealed a number of weaknesses in the tracking telescope control loop that need to be corrected before AIRIS can support the development of operational spectral imaging sensors through phenomenology studies, data collection of reference signatures for a database, etc. The observed weaknesses are:

- a) Unreliability of LOS steering hardware implementation: electronic components that control mirror actuators have regularly burnt. Improvements have been made but uncertainty remains about reliability of hardware.
- b) Physical integration of scanning mirror: the diodes that measure the position of the steerable mirror in the 9X configuration are on a separate mount from the steerable mirror, which requires a labour intensive re-alignment of these components when they have to be replaced. It would be preferable that these diodes be mounted on the same frame as the steerable mirror.
- c) Calibration to nadir: AIRIS' pointing system and contextual visible and IR cameras are calibrated to nadir before flight. Once in flight, it was observed that a pointing error remains because of an offset of unknown origin that may come from the optical system or the navigation software. This error must be corrected in-flight before data collection begins.

- d) Line of sight (LOS) jitter induces noise in the spectral data collected with AIRIS, which degrades the signal-to-noise ratio (SNR) of the measurements. Amplitude and frequency of LOS jitter have never been quantified. The sources of LOS jitter are:
- i. Abrupt motions of the aircraft caused by atmospheric turbulences;
 - ii. Abrupt motions of the tracking mirror to compensate for aircraft motions and keep the target within the FOV;
 - iii. The vibration level in the aircraft.

Based on the FOV and FOR parameters in Table 2 and a spectral resolution of 8 cm^{-1} , which results in an interferometer scan rate of 30 Hz (i.e. integration time of 33 ms), the most demanding conditions for LOS stability during spectral measurements is a maximum LOS jitter amplitude of 0.6 mrad (i.e. $\frac{1}{2}$ a pixel with the 9X telescope) during a minimum of 33 ms to maintain the target image within one pixel during integration time.

1.4 Acronymes

AIRIS: Airborne Infrared Imaging Spectrometer
 COTS: Commercial Off The Shelf
 DRDC: Defence Research and Development Canada
 FOR: Field of Regard
 FOV: Field of View
 GPS: Global Positioning System
 Hz: Hertz
 IFOV: Instantaneous field of view (i.e. the FOV of one pixel)
 IMU: Inertial Measurement Unit
 km: kilometre
 LOS: Line of sight
 m: metre
 ms: millisecond
 mrad: milliradian
 s: second
 SNR: Signal-to-noise ratio

2. APPLICABLE DOCUMENTS (references)

Fournier, P., Smithson, T., St-Germain, D.; Development and evolution of the DRDC airborne infrared imaging spectrometer; DRDC Valcartier Technical Report DRAFT.

3. SCOPE OF THE WORK

3.1 Task 1 - Hardware implementations

- a) The contractor must review current hardware implementations for the tracking mirror in the 3X and the 9X telescopes, identify weaknesses, and make recommendation on future course of action to augment reliability of the system in order to prevent hardware breakdowns and unusual wear and tear of the system.

3.2 Task 2 - LOS jitter stability and LOS pointing precision and accuracy (GEO steering error)

- a) The contractor must perform a quantitative assessment on the current LOS jitter amplitude and frequency from NavTrack logs, AIRIS broadband imagery and AIRIS spectral data collected during the two data collection campaigns (2005 and 2009) and determine whether it meets at least the "maximum LOS jitter amplitude of 0.6 mrad during a minimum of 33 ms" requirement. If not, the contractor must propose technical solutions to meet this requirement. If it meets the the the "maximum LOS jitter amplitude of 0.6 mrad during a minimum of 33 ms" requirement, Task 2-a) is complete the contractor will proceed to Task 2-b).
- b) The contractor must assess the technical feasibility of augmenting LOS jitter stability to allow measurements at 4 cm-1 spectral resolution (60 ms integration time) with the 3X telescope (3.6 mrad IFOV hence a maximum LOS jitter amplitude of 1.8 mrad) and 9X telescope (1.2 mrad IFOV hence a maximum LOS jitter amplitude of 0.6 mrad). If the assessment is positive, the contractor must propose a technical solution to achieve the higher LOS jitter stability in AIRIS specified in this paragraph. If not, Task 2-b) is complete and and the contractor will proceed to Task 2-c).
- c) The contractor must perform a quantitative assessment the current LOS pointing precision (also referred to as "geo-steering stability") using data from NavTrack logs, GPS and IMU technical specifications, GPS coordinates of targets during the 2005 and 2009 data collection campaigns. The contractor must assess whether current pointing precision is within the footprint of a spectrometer pixel (refer to Table 2 for pixel footprints). If not, the contractor must provide recommendations to increase pointing precision to within the footprint of a spectrometer pixel. If the assessment is positive, Task 2-c) is complete and the contractor will proceed to Task 2-d).
- d) Proposed solutions :

With respect to Tasks 1 and 2 a), b) and c), the contractor must consider either improvements of current system or replacement with COTS system. For each option (i.e. improvement or replacement), contractor will provide estimate of costs and schedule for the two AIRIS optical configurations (including hardware, software and labour). Integration of COTS system means opto-mechanical integration to AIRIS for each optical configuration, and integration of COTS control loop system (i.e. control loop hardware and algorithms) to NavTrack's target tracking algorithms and Graphical User Interface.

The contractor will issue a technical report presenting both options and explaining the merits, costs and constraints of each, and make recommendations. The technical authority will review the report and select one of the options proposed by the contractor. The technical report may be discussed at a meeting. The implementation of the selected solution will be subject to the work authorization process (see section 1.1 of the contract clauses).

3.3 Task 3 - Control loop algorithms for the pointing mirrors

- a) Review mirror control loop and target tracking algorithms in NavTrack, identify weaknesses. Assess whether it is more cost effective to implement corrections as required or to integrate COTS algorithms.
- b) The contractor must review the algorithms for visual feedback in broadband camera image and implement corrections as required to reduce CPU usage if possible while maintaining precision and update rate of the visual feedback.
- c) Proposed solutions:

With respect to Task 3 a), the contractor must consider either improvements of current algorithms or replacement with COTS algorithms. For each option (i.e. improvement or replacement), the contractor will provide estimate of costs and schedule for the two AIRIS optical configurations (including hardware, software and labour). Integration of COTS algorithms means integration to NavTrack's target tracking algorithms and Graphical User Interface.

The contractor will issue a technical report presenting both options and explaining the merits, costs and constraints of each, and make recommendations. The technical authority will review the report and select one of the options proposed by the contractor. The technical report may be discussed at a meeting. The implementation of the selected solution will be subject to the work authorization process (see section 1.1 of the contract clauses).

3.4 Task 4 - Implementation of selected solutions for Tasks 1, 2 and 3 (subject to work authorisation)

The contractor will proceed with implementation of the technical solutions selected by the technical authority for Tasks 1, 2 and 3.

3.5 Task 5 - Procedure for calibration of spectrometer to nadir (subject to work authorisation)

- a) The contractor must review the methodology for calibration to nadir (on the ground) and implement corrections as required to ensure that system is pointing within the footprint of one spectrometer pixel when in flight.

4. REPORTS AND OTHER DELIVERABLES

All reports must be written in English and delivered in one (1) electronic copy in PDF format on a DVD.

Associated tasks	Description of the deliverables	Deadline
Tasks #1 and #2	<p><u>Deliverable #1 :</u> A technical report on the assessment of current target tracking system (including qualitative assessment of the hardware implementation and the quantitative assessment of LOS jitter and LOS pointing precision from available AIRIS data). The technical report must contain at least the following sections:</p> <ol style="list-style-type: none"> 1) The objectives of the task; 2) Methodology used in order to address the objectives (explicit list of the activities conducted). 3) Issues and problems (if applicable) 4) A quantitative assessment of LOS jitter amplitude and frequency, and of LOS pointing precision; 5) The proposed solutions to improve the hardware reliability, LOS jitter stability and LOS pointing precision of target tracking system; 6) A cost analysis of each proposed solution, and a discussion of the merits and constraints of each proposed solution; 7) A schedule of work to implement each proposed solution. 	No later than on May 31, 2013
Task 3	<p><u>Deliverable #2:</u> Technical report on the review of mirror control loop and target tracking algorithms in NavTrack. The technical report must contain at least the following sections:</p> <ol style="list-style-type: none"> 1) The objectives of the task; 2) Methodology used in order to address the objectives (explicit list of the activities conducted); 3) Issues and problems (if applicable); 4) A complete list of the system weaknesses; 5) The proposed solutions to correct weaknesses; 6) A cost analysis of each proposed solution, and a discussion of the merits and constraints of each proposed solution; 7) A schedule of work to implement each proposed solution. 	No later than on May 31, 2013

Associated tasks	Description of the deliverables	Deadline
Tasks 4	Deliverable #3: Technical report on implementation of selected solutions. The report must include at least the following information: 1) The objectives of the task 2) The description of the selected solution that has been implemented 3) The description of the methodology used in order to address the objectives including a description of the testing procedures employed and the analysis performed 4) Issues and problems (if applicable) 5) A new quantitative assessment of LOS jitter and pointing precision, and a procedure for calibration to nadir. The report must clearly state whether the requirement for "maximum LOS jitter amplitude of 0.6 mrad during a minimum of 33 ms" is met and whether the LOS pointing precision is within the footprint of one spectrometer pixel. 6) Source code and technical documentation of modified target tracking algorithms (if this solution is selected).	No later than on August 31, 2013
Task 4	Deliverable #4: AIRIS instrument with improved navigation and target tracking system.	No later than on August 31, 2013
Task 5	Deliverable #5: A copy of the revised methodology for calibration to nadir (on the ground)	No later than on August 31, 2013

For each report described in the above table the contractor will send by e-mail, no later than 10 working days before the deadline, a draft version of the report that must include all the requested information. The draft version will be reviewed by the technical authority.

The technical authority will send, by e-mail, to the contractor, his comments (if required) on the draft versions of the technical report, no later than 10 working days after its reception. The contractor must amend the reports in accordance with the technical authority' comments. The final version of the report must be received by the technical authority no later than on the deadline specified in the above table.

4.1 Publications:

Any manuscript for publication in magazines, newspapers or other, including presentation summaries or other types of publication, must be submitted to the TA for revision and approval at least ninety (90) days before the date of the presentation or publication. An explicit reference regarding Canada funding must be included, and it must be clearly mentioned that the content is the authors' responsibility. The TA will provide a written objection if there are specific elements (e.g. audience) that are not in the Canada's best interests. If the TA objects in writing, he/she must send the written objection to the organization responsible for publication (the newspaper or conference).

4.2 Foreground Information

In addition to the disclosure obligation under Section 28 of the general conditions 2040, any Foreground Information must be fully disclosed and documented by the Contractor in the technical reports delivered by the Contractor to the Technical Authority under this Contract.

5. MEETINGS

5.1 General instruction for meetings:

5.1.1 Meetings location:

As often as possible, the meetings will be held face-to-face at DRDC Valcartier located at 2459, boul. PIE-XI Nord, Quebec, Quebec, G3J 1X5. If geographic dispersion of the team members is encountered, video-teleconference or teleconferencing capacity should be used as a complementary communications channel, except for the kick-off meeting and the close-out meeting that must be held on-site at DRDC Valcartier.

5.1.2 Agenda and minutes:

For each formal meeting, the Contractor must prepare and distribute the agenda at least 24 hours before the date of the meeting. The contractor is also responsible for the preparation of the minutes. The contractor must provide the minutes to the technical authority no later than five working days after the date of the meeting for approval.

5.1.3 Languages:

The meetings must be held in French or English (as selected by the contractor).

5.2 The following meetings will be required:

Meeting	When
Kick-off meeting The following topics will be discussed during this meeting (but not limited to): <ul style="list-style-type: none"> - Review of the contract or task objectives - Presentation of the project plan - Methodology used to execute the work - Procedures, formats and standards to be used to produce documentation 	In the first month of the contract period
Task Final Review Meetings A task final meeting will be required at the end of Tasks 1, 2 and 3. During those meeting, the following topics will be discussed (but not limited to): <ul style="list-style-type: none"> - Summarize the work performed; - Show the results, and - Discuss the proposed solutions. 	At the end of each task

Meeting	When
Informal meetings	As needed. The party calling the meeting (the contractor or the technical authority) must advise the other party at least 24 hours in advance.
Close-out meeting The following topics will be discussed during this meeting (but not limited to): <ul style="list-style-type: none"> - Summarize the work performed; - Review the list of deliverables; - Acceptance of deliverables (if possible). 	At the end of the contract period

6. GOVERNMENT SUPPLIED MATERIAL (GSM)

DRDC Valcartier will provide the contractor with the following items:

- (a) Access to the AIRIS instrument and its operating system.
- (b) Data files of NavTrack logs, data files of spectrometer and broadband cameras necessary to assess LOS jitter stability and LOS pointing precision. Software applications to read the data files will be supplied as required. This data will be provided on DVD, external hard drive or USB key, as required by the size of the files and of the applications to read them.

7. GOVERNMENT FURNISHED EQUIPMENT (GFE)

Miscellaneous laboratory equipment such as black body references, folding mirrors, voltmeters, basic tools (such as screwdrivers, pliers, allen keys, etc.), liquid nitrogen, etc. necessary to conduct experiments and measurements in the laboratory with AIRIS. In the case where AIRIS has to be set-up at the contractor's facilities (see paragraph 9- Work location), specific equipment not available at contractor's facility maybe loaned to the contractor.

8. SPECIAL CONSIDERATIONS

Contractor's resources must be escorted at all times by DRDC personnel when they are at DRDC Valcartier.

9. WORK LOCATION

Work requiring access to the AIRIS instrument will be conducted at DRDC Valcartier, except if the contractor and the technical authority agree that it is more practical and cost effective to set-up AIRIS at the contractor's facilities to conduct part of the work. If AIRIS has to be transported to contractor's location for part of the work, transportation and set-up of AIRIS at contractor's location will be done by DRDC personnel. Other parts of the work not requiring access to the AIRIS instrument (such as log files data analysis) will be conducted at the contractor's facilities.

Solicitation No. - N° de l'invitation

W7701-135598/A

Amd. No. - N° de la modif.

File No. - N° du dossier

QCL-2-35510

Buyer ID - Id de l'acheteur

qcl032

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

W7701-13-5598

CCC No./N° CCC - FMS No/ N° VME

ANNEX B

BASIS OF PAYMENT

(To be compiled by Canada at the contract award.)

N.B.: The Basis of Payment will be in accordance with the financial bid presentation sheet completed by the Bidder and the following paragraph will be inserted at the end of the Basis of Payment :

"With the exception of the firm rate(s) and price(s), the amounts shown in the various items specified above are estimates only. Minor changes to these estimates will be accepted for billing purposes as the Work proceeds, provided that these changes have the prior approval of the Technical Authority, and provided that the estimated cost does not exceed the aforementioned Limitation of Expenditure."

ANNEX C

CONTRACTOR DISCLOSURE OF FOREGROUND INFORMATION

Please see reference applicable in your contract to look into **Article 1 - Interpretation of 2040 General Conditions** to obtain the complete definition of the term Foreground Information and thus to help you to determine the information which must be revealed. <http://sacc.pwgsc.gc.ca/sacc/query-e.jsp>.

The Contractor shall respond to the following questions:

1. Contract No.:
2. What is the descriptive title of the FIP (Foreground Intellectual Property)?
3. Abbreviated description of the FIP and, if applicable, of the different systems and sub-systems.
4. What is or was the objective of the project?
5. Explain how the FIP meets the objective of the project (for example: the advantage of the new solution, what problem did the FIP resolve or what benefits did the FIP deliver).
6. Under which category (ies) would you best describe the FIP and why: Patents, Inventions, Trade Secrets, Copyright, Industrial Designs, Rights in Integrated Circuit Topography, Know-how, Other?
7. Describe the features or aspects of the FIP that are novel, useful and not obvious.
8. Has the FIP been tested or demonstrated? If yes, please summarise the results.
9. Has any publication or disclosure to others been made? If so, to whom, when, where and how?
10. Provide names and addresses of the inventors.
11. Provide an explicit and detailed description of the FIP developed during the contract (Refer to pertinent section of the technical report, if necessary).

Please specify name and position of person approving / authorizing this disclosure. This person is to sign and date the disclosure.

Signature

Date

Name

Title

(Internal DRDC Valcartier)

Signature

Date

Name

Title (Technical authority)