

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Bid Receiving - PWGSC / Réception des
soumissions - TPSGC
Gare Maritime Champlain
Champlain Maritime Harbour
901, Cap Diamant
901, Cap Diamant
Québec
Québec
G1K 4K1

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 IUMVDS	
Solicitation No. - N° de l'invitation W7701-092553/B	Date 2010-07-16
Client Reference No. - N° de référence du client W7701-9-2553	
GETS Reference No. - N° de référence de SEAG PW-\$QCN-016-12909	
File No. - N° de dossier QCN-9-30761 (016)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2010-08-30	
Time Zone Fuseau horaire Heure Avancée de l'Est HAE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Carrier, Bertrand	Buyer Id - Id de l'acheteur qcn016
Telephone No. - N° de téléphone (418) 649-2774 ()	FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: R & D POUR LA DEFENSE CANADA-VALCARTIER BATIMENT 55 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
Gare Maritime Champlain
Champlain Maritime Harbour
901, Cap Diamant
901, Cap Diamant
Québec
Québec
G1K 4K1

Delivery Required - Livraison exigée ASAP	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

l'acheteur

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QCN-9-30761

BID SOLICITATION

FOR AN

INDOOR INTEGRATED DEVELOPMENT ENVIRONMENT FOR

AUTONOMOUS MULTI-VEHICLE RESEARCH

FOR

Defence Research and Development Canada

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- Annex A Statement of Requirements
- Annex B Basis of Payment

Forms:

- Form 1 - Substantiation of Technical Compliance Form
- Form 2 - Software Publisher Certification Form
- Form 3 - Software Publisher Authorization Form

BID SOLICITATION
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PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation and resulting contract document is divided into seven parts plus annexes and attachments 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 and states that the Bidder agrees to be bound by the clauses and conditions contained in all parts of 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, if applicable, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided; and
- Part 6 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The annexes include the Statement of Requirements, the Basis of Payment and any other annexes.

1.2 Summary

This solicitation is issued to meet the needs of Defence Research and Development Canada - Valcartier (DRDC) (the "Customer") for an Indoor Integrated Development Environment for Autonomous Multi-vehicle Research, all in accordance with Schedules A and B of the Request For Proposal.

The requirement is subject to the provisions of the *World Trade Organization Agreement on Government Procurement (WTO-AGP)*, the *North American Free Trade Agreement (NAFTA)*, the *Canada-Chile Free Trade Agreement (CCFTA)*, and the *Agreement on Internal Trade (AIT)*.

All goods must be delivered no later than 120 days after award of contract.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

- (a) 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 (<http://sacc.pwgsc.gc.ca/sacc/index-e.jsp>) issued by Public Works and Government Services Canada (PWGSC).
- (b) 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.
- (c) The 2003 (2008-12-12) Standard Instructions - Goods or Services - Competitive Requirements are incorporated by reference into and form part of the bid solicitation. If there is a conflict between the provisions of 2003 and this document, this document prevails.
- (d) Subsection 4.4 of Standard Instructions - Goods or Services - Competitive Requirements 2003 is amended as follows:
 - (i) Delete: sixty (60) days
 - (ii) Insert: one hundred-twenty (120) days

2.2 Submission of Bids

- (a) Bids must be submitted only to Public Works and Government Services Canada Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.
- (b) Due to the nature of the bid solicitation, bids transmitted by facsimile or electronic mail to Public Works and Government Services Canada will not be accepted.

2.3 Enquiries - Bid Solicitation

- (a) All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) calendar days before the bid closing date. Enquiries received after that time may not be answered.
- (b) 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.

2.4 Applicable Laws

- (a) Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in *the Province of Quebec*.

2.5 Debriefings

After issuance of a contract, offerors may request a debriefing on the results of the request for proposals. Offerors should make the request to the Contract Authority within 15 working days of receipt of notification that their offer was unsuccessful. The debriefing may be provided in writing, by telephone or in person.

2.6 Improvement of Requirement During Solicitation Period

Should bidders consider that the statement of request contained in the bid solicitation and which relates to aerial and ground vehicles, 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 reasons 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 in accordance with the article entitled "Enquiries - Bid Solicitation". Canada will have the right to accept or reject any or all suggestions.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

- (a) Canada requests that bidders provide their bid in separately bound sections as follows:
- (i) Section I: Technical Bid (2 hard copies)
 - (ii) Section II: Financial Bid (2 hard copies)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.*[delete this sentence if no soft copies requested]*

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

- (b) Canada requests that bidders follow the format instructions described below in the preparation of their bid:
- (i) use 8.5 x 11 inch (216 mm x 279 mm) paper;
 - (ii) use a numbering system that corresponds to the bid solicitation;

3.2 Section I: Technical Bid

- (a) The technical bid consists of the following:
- (i) **Substantiation of Technical Compliance Form (Form 1):** The technical bid must substantiate the compliance of the Bidder and its proposed products with the specific articles of Annex A (Statement of Requirement) identified in the Substantiation of Technical Compliance Form, which is the requested format for providing the substantiation. The Substantiation of Technical Compliance Form is not required to address any parts of this bid solicitation not referenced in the form. The substantiation must not simply be a repetition of the requirement(s), but must explain and demonstrate how the Bidder will meet the requirements and carry out the required Work. Simply stating that the Bidder or its proposed solution or product complies is not sufficient. Where Canada determines that the substantiation is not complete, the Bidder will be considered non-responsive and disqualified. The substantiation may refer to additional documentation submitted with the bid - this information can be referenced in the "Reference" column of the Substantiation of Technical Compliance Form, where bidders are requested to indicate where in the bid the reference material can be found, including the title of the document, and the page and paragraph numbers; where the reference is not sufficiently precise, Canada may request that the Bidder direct Canada to the appropriate location in the documentation.

3.3 Section II: Financial Bid

- (a) **Pricing:** Bidders must submit their financial bid in accordance with the Basis of Payment in Annex B. The total amount of Goods and Services Tax or Harmonized Sales Tax must be shown separately, if applicable. Unless otherwise indicated, all prices must be firm prices.
- (b) All prices must be expressed in Canadian dollars, FOB destination and include shipping and handling to the point of destination, customs duties and excise taxes in Canada included. The Goods and Services Tax (GST) or Harmonized Sales Tax (HST) is extra.

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- (c) **All Costs to be Included:** The financial bid must include all costs for the requirement described in the bid solicitation for the entire Contract Period. The identification of all necessary equipment, software, peripherals, cabling and components required to meet the requirements of the bid solicitation and the associated costs of these items is the sole responsibility of the Bidder.

3.4 Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 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) In addition to any other time periods established in the bid solicitation:
 - (i) **Requests for Clarifications:** If Canada seeks clarification or verification from the Bidder about its bid, the Bidder will have 2 working days (or a longer period if specified in writing by the Contracting Authority) to provide the necessary information to Canada. Failure to meet this deadline will result in the bid being declared non-responsive.
 - (ii) **Extension of Time:** If additional time is required by the Bidder, the Contracting Authority may grant an extension in his or her sole discretion.

4.2 Technical Evaluation - Mandatory Technical Criteria

- (a) Each bid will be reviewed to determine whether it meets the mandatory requirements of the bid solicitation. All elements of the bid solicitation that are mandatory requirements are identified specifically with the words "must" or "mandatory". Bids that do not comply with each and every mandatory requirement will be considered non-responsive and be disqualified.
- (b) The mandatory requirements are described in "Form 1 - Substantiation of Technical Compliance Form."
- (c) **Demonstration**
 - (i) Canada may, but will have no obligation, to require that the top-ranked Bidder (identified after the financial evaluation) demonstrate any features, functionality and capabilities described in this bid solicitation or in its bid, in order to verify compliance with the requirements of this bid solicitation. If required, the demonstration must be conducted, at no cost to Canada, at a location in Canada agreed to by the Contracting Authority. Canada will provide no fewer than twenty (20) working days of notice before the scheduled date for the demonstration. Once the demonstration has begun, it must be completed within four (4) hours. Canada will pay its own travel and salary costs associated with any demonstration. Despite the written bid, if Canada determines during a demonstration that the Bidder's proposed solution does not meet the mandatory requirements of this bid solicitation, the bid will be declared non-responsive.
- (d) **Submission of a Sample**
 - (i) Canada may, but will have no obligation to, require that the top-ranked Bidder (identified after the financial evaluation) provide a sample of the goods that it has bid, to allow Canada to verify compliance of the product or solution with any of the requirements of this bid solicitation or described in the bid. If required, the sample must be delivered, at no cost to Canada, to a location specified by Canada, within 3 working days of the Contracting Authority's request. Despite the written bid, if Canada determines as a result of examining the sample that the Bidder's proposed product or solution does not meet the mandatory requirements of this bid solicitation, the bid will be declared non-responsive.

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4.3 Financial Evaluation

The financial evaluation will be conducted by calculating the Total Bid Price (TBP) using the Pricing Tables completed by the bidders. The bidder must indicate a price for each item in Annex B.

4.4 Basis of Selection

A bid must comply with the requirements of the bid solicitation and meet all mandatory technical evaluation criteria to be declared responsive. The responsive bid with the lowest TBP will be recommended for award of a contract.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications to be awarded a contract. Canada will declare a bid non-responsive if the required certifications are not completed and submitted in accordance with the articles below.

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 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 or to comply with the request of the Contracting Authority for additional information will also render the bid non-responsive.

5.1 Certifications 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 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.

5.2 Federal Contractors Program for Employment Equity - Certification

- (a) The Federal Contractors Program for Employment Equity (FCP-EE) requires that some suppliers bidding for federal government contracts, valued at \$200,000 or more (including all applicable taxes), make a formal commitment to implement employment equity. This is a condition precedent to contract award. If the Bidder is subject to the FCP-EE, evidence of its commitment must be provided before the award of the Contract.
- (b) Suppliers who have been declared ineligible contractors by Human Resources and Social Development Canada (HRSDC) are no longer eligible to receive government contracts over the threshold for solicitation of bids as set out in the *Government Contract 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-EE for a reason other than the reduction of their workforce to fewer than 100 employees. Any bids from ineligible contractors will be declared non-responsive.
- (c) If the Bidder does not fall within the exceptions enumerated in (d)(i) or (ii) below, or does not have a valid certificate number confirming its adherence to the FCP-EE, the Bidder must fax (819-953-8768) a copy of the signed form LAB 1168, Certificate of Commitment to Implement Employment Equity (<http://www1.servicecanada.gc.ca/cgi-bin/search/eforms/index.cgi?app=profile&form=lab1168&dopt=sc?=e>), to the Labour Branch of HRSDC.
- (d) Each bidder is requested to indicate in its bid whether it is:
 - (i) not subject to FCP-EE, having a workforce of fewer than 100 permanent full or part-time employees in Canada;
 - (ii) not subject to FCP-EE, being a regulated employer under the *Employment Equity Act*, S.C. 1995, c. 44;
 - (iii) subject to the requirements of FCP-EE, because it has a workforce of 100 or more permanent full or part-time employees in Canada, but it has not previously obtained a certificate number from HRSD (because it has not bid before on requirements of

\$200,000 or more), in which case a duly signed certificate of commitment is required from the Bidder; or

- (iv) subject to FCP-EE, and has a valid certification number (i.e., has not been declared an ineligible contractor by HRSDC).
- (e) Further information on the FCP-EE is available on the following HRSDC Web site: <http://www.hrsdc.gc.ca/en/gateways/topics/wzp-gxr.shtml>.

5.3 Former Public Servant Certification

- (a) 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 spending public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.
- (b) For the purposes of this clause,
 - (i) **"former public servant"** means a 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 and includes:
 - (A) an individual;
 - (B) an individual who has incorporated;
 - (C) a partnership made up of former public servants; or
 - (D) a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.
 - (ii) **"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 Public Service.
 - (iii) **"pension"** means a pension payable pursuant to the *Public Service Superannuation Act*, R.S., 1985, c. P-36, as indexed pursuant to the *Supplementary Retirement Benefits Act*, R.S., 1985, c. S-24.
- (c) If the Bidder is an FPS in receipt of a pension as defined above, the Bidder must provide the following information:
 - (i) name of former public servant;
 - (ii) date of termination of employment or retirement from the Public Service.
- (d) If the Bidder is an FPS who received a lump sum payment pursuant to the terms of a work force reduction program, the Bidder must provide the following information:
 - (i) name of former public servant;
 - (ii) conditions of the lump sum payment incentive;
 - (iii) date of termination of employment;
 - (iv) amount of lump sum payment;
 - (v) rate of pay on which lump sum payment is based;
 - (vi) period of lump sum payment including start date, end date and number of weeks; and

-
- (vii) number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.
 - (e) For all contracts awarded during the lump sum payment period, the total amount of fee 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.
 - (f) By submitting a bid, the Bidder certifies that the information submitted by the Bidder in response to the above requirements is accurate and complete.

5.4 Software Publisher Certification and Software Publisher Authorization

- (a) If the Bidder is the Software Publisher for any of the proprietary software component(s) it bids, Canada requires that the Bidder confirm in writing that it is the Software Publisher. Bidders are requested to use the Software Publisher Certification Form (Form 2) included with the bid solicitation. Although all the contents of the Software Publisher Certification Form are required, using the form itself to provide this information is not mandatory. For bidders who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided.
- (b) Any Bidder that is not the Software Publisher of all the proprietary software products or components proposed as part of its bid is required to submit proof of the Software Publisher's authorization, which must be signed by the Software Publisher (not the Bidder). No Contract will be awarded to a Bidder who is not the Software Publisher of all of the proprietary software it proposes to supply to Canada, unless proof of this authorization has been provided to Canada. If the proprietary software proposed by the Bidder originates with multiple Software Publishers, authorization is required from each Software Publisher. Bidders are requested to use the Software Publisher Authorization Form (Form 3) included with the bid solicitation. Although all the contents of the Software Publisher Authorization Form are required, using the form itself to provide this information is not mandatory. For Bidders/Software Publishers who use an alternate form, it is in Canada's sole discretion to determine whether all the required information has been provided.
- (c) In this bid solicitation, "Software Publisher" means the owner of the copyright in any software included in the bid, who has the right to license (and authorize others to license/sub-license) its software products.

PART 6 - RESULTING CONTRACT CLAUSES

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

6.1 Requirement

- (a) _____ (the "**Contractor**") agrees to supply to the Client the indoor integrated development environment for autonomous multi-vehicle research, as described in Annex A, in accordance with, and at the prices set out in, the Contract.
- (b) **Client:** Under the Contract, the "**Client**" is Defence Research and Development Canada (DRDC).
- (c) **Reorganization of Client:** The Contractor's obligation to perform the Work will not be affected by (and no additional fees will be payable as a result of) the renaming, reorganization, reconfiguration, or restructuring of any Client. The reorganization, reconfiguration and restructuring of the Client includes the privatization of the Client, its merger with another entity, or its dissolution, where that dissolution is followed by the creation of another entity or entities with mandates similar to the original Client.
- (d) **Defined Terms:** Words and expressions defined in the General Conditions or Supplemental General Conditions and used in the Contract have the meanings given to them in the General Conditions or Supplemental General Conditions. Also, the following words and expressions have the following meanings:
- (i) any reference to a "**deliverable**" or "**deliverables**" includes the Hardware, the license to use the Licensed Software (the Licensed Software itself is not a deliverable, because the Licensed Software is only being licensed under the Contract, not sold or transferred), the support and maintenance of the hardware and the software, and the training.

6.2 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 (<http://sacc.pwgsc.gc.ca/sacc/index-e.jsp>) issued by Public Works and Government Services Canada.

(a) **General Conditions:**

- (i) 2030 (2008-12-12), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

(b) **Supplemental General Conditions:**

The following Supplemental General Conditions:

- (i) 4001 (2008-12-12), Supplemental General Conditions - Hardware Purchase, Lease and Maintenance; except that 4001 is modified as follows:
- (A) The definition of "Hardware" is deleted and replaced with the following: "Hardware" means all the equipment materials, matters and things to be provided, maintained, and supported (as applicable) by the Contractor under the Contract (including cables and other ancillary items). The term 'Hardware' includes Firmware, if any, but does not include software or services. Unless the context requires otherwise, the term 'Hardware' includes any Leased Hardware. Also, unless the context requires otherwise, each time the term 'Hardware' is used, it will be read as also applying to each System delivered under the Contract";
- (B) The defined term "Maintenance Service" in Section 1 is replaced with the term "Hardware Maintenance Service";

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- (C) The following sentence is added at the end of Section 2: "By supplying the Hardware, the Contractor is guaranteeing that the Hardware is not counterfeit, meaning it is not an unauthorized copy, replica, or substitute for the product manufactured by the original equipment manufacturer identified by name on the Hardware."
- (D) Subsections 14(4) and 17(4) are deleted;
- (E) Subsection 25(1)(a) is amended by adding the following words at the end of the paragraph: "or is otherwise amended to extend the Hardware Maintenance Period";
- (F) Subsection 25(1)(d) is deleted and replaced with the following: "for Hardware that is neither purchased nor leased under the Contract, but for which the Contractor is providing Hardware Maintenance Service pursuant to the Contract, the complete Contract Period, unless the Contract provides for a shorter period.";
- (G) Subsection 25(8) is renumbered to become Subsection 25(10);
- (H) A new Subsection 25(8) is added as follows: "The Contractor guarantees that the parts required to perform the Hardware Maintenance Service will be available throughout the Hardware Maintenance Period.";
- (I) A new Subsection 25(9) is added as follows: "Canada becomes the owner of any parts used to repair or maintain the Hardware (which themselves become part of the Hardware), except for Leased Hardware."
- (ii) 4003 (2008-12-12), Supplemental General Conditions - Licensed Software;
- (iii) 4004 (2008-12-12), Supplemental General Conditions - Maintenance and Support Services for Licensed Software;
- apply to and form part of the Contract.

6.3 Contract Period

The "**Contract Period**" is the entire period of time during which the Contractor is obliged to perform the Work, which begins on the date the Contract is awarded and ends 12 months after acceptance of the goods.

6.4 Delivery Date

All the deliverables must be received no later than one hundred-twenty (120) days from contract date.

6.5 Authorities

(a) Contracting Authority

The Contracting Authority for the Contract is:

Bertrand Carrier

Public Works and Government Services Canada

Champlain Harbour Station

901, Cap Diamant

Québec, Québec,

G1K 4K1

Telephone : (418) 649-2774

Facsimile: (418) 648-2209

E-mail address: bertrand.carrier@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.

(b) Technical Authority

The Technical Authority for the Contract is:

Name: _____
 Title: _____
 Organization: _____
 Address: _____
 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.

(c) Contractor's Representative

(Fill in or delete as applicable)

6.6 Payment

(a) Basis of Payment

(i) For the supply of an Indoor Integrated Development Environment for Autonomous Multi-vehicle Research, as described in Appendix A, under the agreement, Canada will pay the Contractor the firm price set out in Annex B, FOB destination, including customs duties, GST or HST extra.

Estimated Cost: \$ [to be completed at contract award]

(ii) **GST/HST:** Estimated Cost: \$ [to be completed at contract award]

(iii) **Competitive Award:** The Contractor acknowledges that the Contract has been awarded as a result of a competitive process. No additional charges will be allowed to compensate for errors, oversights, misconceptions or underestimates made by the Contractor when bidding for the Contract.

(iv) **Purpose of Estimates:** All estimated costs contained in the Contract are included solely for the administrative purposes of Canada and do not represent a commitment on the part of Canada to purchase goods or services in these amounts. Any commitment to purchase specific amounts or values of goods or services are described elsewhere in the Contract.

(b) Limitation of Expenditure

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.

(c) Method of Payment - Single Payment

- (i) H1000C (2008-05-12), Single Payment

6.7 Invoicing Instructions

- (a) The Contractor must submit invoices in accordance with the information required in the General Conditions.
- (b) The Contractor's invoice must include a separate line item for each subparagraph in the Basis of Payment provision.
- (c) By submitting invoices, the Contractor is certifying that the goods and services have been delivered and that all charges are in accordance with the Basis of Payment provision of the Contract, including any charges for work performed by subcontractors.
- (d) The Contractor must provide the original of each invoice to the Technical Authority. On request, the Contractor must provide a copy of any invoices requested by the Contracting Authority.

6.8 Certifications

Compliance with the certifications 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 or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, under the default provision of the Contract, to terminate the Contract for default.

6.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in the Province of Quebec.

6.10 Priority of Documents

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

- (a) these Articles of Agreement, including any individual SACC clauses incorporated by reference in these Articles of Agreement;
- (b) supplemental general conditions, in the following order:
 - (i) 4001;
 - (ii) 4003;
 - (iii) 4004;
- (c) general conditions (2008-12-12) General Conditions - Higher Complexity - Goods;
- (d) Annex A, Statement of Requirement;
- (e) Annex B, Basis of Payment ;
- (f) the Contractor's bid dated _____ (*insert date of bid*), not including any software publisher license terms and conditions that may be included in the bid, not including any provisions in the bid with respect to limitations on liability, and not including any terms and conditions incorporated by reference (including by way of a web link) in the bid.

6.11 Defence Contract

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

6.12 Foreign Nationals (Canadian Contractor)

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

6.13 Foreign Nationals (Foreign Contractor)

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

6.14 Insurance Requirements

- (a) SACC Manual clause G1005C (2008-05-12) Insurance Requirements

6.15 Limitation of Liability - Information Management/Information Technology

- (a) This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees. This section applies regardless of whether the claim is based in contract, tort, or another cause of action. The Contractor is not liable to Canada with respect to the performance of or failure to perform the Contract, except as described in this section and in any section of the Contract pre-establishing any liquidated damages. The Contractor is only liable for indirect, special or consequential damages to the extent described in this Article, even if it has been made aware of the potential for those damages.

(b) First Party Liability:

- (i) The Contractor is fully liable for all damages to Canada, including indirect, special or consequential damages, caused by the Contractor's performance or failure to perform the Contract that relate to:
- (A) any infringement of intellectual property rights to the extent the Contractor breaches the section of the General Conditions entitled "Intellectual Property Infringement and Royalties";
 - (B) physical injury, including death.
- (ii) The Contractor is liable for all direct damages caused by the Contractor's performance or failure to perform the Contract affecting real or tangible personal property owned, possessed, or occupied by Canada.
- (iii) Each of the Parties is liable for all direct damages resulting from its breach of confidentiality under the Contract. Each of the Parties is also liable for all indirect, special or consequential damages in respect of its unauthorized disclosure of the other Party's trade secrets (or trade secrets of a third party provided by one Party to another under the Contract) relating to information technology.
- (iv) The Contractor is liable for all direct damages relating to any encumbrance or claim relating to any portion of the Work for which Canada has made any payment. This does not apply to encumbrances or claims relating to intellectual property rights, which are addressed under (i) (A) above.

- (v) The Contractor is also liable for any other direct damages to Canada caused by the Contractor's performance or failure to perform the Contract that relate to:
- (A) any breach of the warranty obligations under the Contract, up to the total amount paid by Canada (including any applicable taxes) for the goods and services affected by the breach of warranty; and
- (B) any other direct damages, including all identifiable direct costs to Canada associated with re-procuring the Work from another party if the Contract is terminated by Canada either in whole or in part for default, up to an aggregate maximum for this subparagraph (B) of the greater of 0.50 times the total estimated cost (meaning the dollar amount shown on the first page of the Contract in the cell titled "Total Estimated Cost" or shown on each call-up, purchase order or other document used to order goods or services under this instrument), or \$1,000,000.

In any case, the total liability of the Contractor under subparagraph (v) will not exceed the total estimated cost (as defined above) for the Contract or \$1,000,000. whichever is more.

- (vi) If Canada's records or data are harmed as a result of the Contractor's negligence or wilful act, the Contractor's only liability is, at the Contractor's own expense, to restore Canada's records and data using the most recent back-up kept by Canada. Canada is responsible for maintaining an adequate back-up of its records and data.

(c) Third Party Claims:

- (i) Regardless of whether a third party makes its claim against Canada or the Contractor, each Party agrees that it is liable for any damages that it causes to any third party in connection with the Contract as set out in a settlement agreement or as finally determined by a court of competent jurisdiction, where the court determines that the Parties are jointly and severally liable or that one Party is solely and directly liable to the third party. The amount of the liability will be the amount set out in the settlement agreement or determined by the court to have been the Party's portion of the damages to the third party. No settlement agreement is binding on a Party unless its authorized representative has approved the agreement in writing.
- (ii) If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada by the amount finally determined by a court of competent jurisdiction to be the Contractor's portion of the damages to the third party. However, despite Sub-article (i), with respect to special, indirect, and consequential damages of third parties covered by this Section, the Contractor is only liable for reimbursing Canada for the Contractor's portion of those damages that Canada is required by a court to pay to a third party as a result of joint and several liability that relate to the infringement of a third party's intellectual property rights; physical injury of a third party, including death; damages affecting a third party's real or tangible personal property; liens or encumbrances on any portion of the Work; or breach of confidentiality.
- (iii) The Parties are only liable to one another for damages to third parties to the extent described in this Sub-article (c).

6.16 Hardware

- (a) With respect to the provisions of Supplemental General Conditions 4001:

Part III of 4001 applies to the Contract (Additional Conditions: Purchase)	Yes
Part V of 4001 applies to the Contract (Additional Conditions: Maintenance)	Yes

Delivery Location	See on page 1
Installation Site	DRDC - Valcartier
Delivery Date	<i>Delivery Date will be no later than 120 days from the date of the contract</i>
Contractor must deliver Hardware Documentation	Yes
Format and Medium on which Hardware Documentation must be Delivered	<i>Paper and CD - Rom</i>
Contractor must Install Hardware at time of Delivery	Yes
Contractor must Integrate and Configure Hardware at time of Installation	Yes
Hardware is part of a System	No
Hardware Warranty Period	12 months from goods acceptance
Hardware Maintenance Period	12 months from goods acceptance
Class of Maintenance Service	<i>- Return-to-Depot Maintenance Service</i>
Toll-free Telephone Number for Maintenance Service	[to be completed with information from the Contractor at the time of award]
Website for Maintenance Service	[to be completed with information from the Contractor at the time of award]

6.17 Licensed Software

(a) With respect to the provisions of Supplemental General Conditions 4003:

Licensed Software	The Licensed Software, which is defined in 4003, includes all the products offered by the Contractor in its bid, and any other software code required for those products to function in accordance with the Software Documentation and the Specifications, including without limitation all of the following products: _____ [this information will be completed at contract award using information in the Contractor's bid]
Type of License being Granted	<i>Device License Entity License</i>
Number of Devices Licensed	5
Entity Licensed	The Entity Licensed is the Client.
Language of Licensed Software	The Licensed Software must be delivered in both French and English.
Delivery Location	see on page 1
Installation Site	See on page 1
Software Warranty Period	12 months from goods acceptance
Media on which Licensed Software must be Delivered	<i>CD-ROM</i>

(b) **On-going Maintenance of Software Code:** The Contractor must continue to maintain the version of the Licensed Software (i.e., the version or "build" originally licensed under the Contract) as a commercial product (i.e., the Contractor or the software publisher must be continuing to develop new code in respect of the Licensed Software to maintain its functionality, enhance it, and deal with Software Errors) for at least 2 years from the date the Contract is awarded. After that time, if the Contractor or the software publisher decides to discontinue or no longer maintain the then-current version or "build" of the Licensed Software and, instead, decides to provide upgrades to the Licensed Software as part of the Software Support, the Contractor must provide written notice to Canada at least 12 months in advance of the discontinuation.

6.18 Licensed Software Maintenance and Support

(a) With respect to the provisions of Supplemental General Conditions 4004:

Licensed Programs	The Licensed Programs to be supported and maintained are: _____.
Software Support Period	12 months from goods acceptance
Contractor must provide On-site Support Services	No
Contact Information for Accessing the Contractor's Support Services	In accordance with Section 5 of 4004, the Contractor will make its Support Services available through the following: Toll-free Telephone Access: _____ Toll-free Fax Access: _____ Email Access: _____ The Contractor must respond to all telephone, fax or email communications (with a live service agent) within 60 minutes of the initial time of the Client or User's initial communication.
Website	In accordance with Section 5 of 4004, the Contractor must make Support Services available over the Internet. To do so, the Contractor must include, as a minimum, frequently asked questions and on-line software diagnostic routines and support tools. Despite the Hours for Providing Support Services, the Contractor's website must be available to Canada's users 24 hours a day, 365 days a year, and must be available 99% of the time. The Contractor's website address for web support is _____.
Language of Support Services	The Support Services must be provided in both French and English, based on the choice of the User requesting support.

6.19 Training

- (i) The Contractor shall provide training on the products included in the integrated environment, at the time of installation.
- (ii) The training must be provided at the installation site under the contract.
- (iii) The training, including both the instruction and the course materials, must be provided in French or English.

6.20 Safeguarding Electronic Media

- (a) Before using them on Canada's equipment or sending them to Canada, the Contractor must use a regularly updated product to scan electronically all electronic media used to perform the Work for computer viruses and other coding intended to cause malfunctions. The Contractor must notify Canada if any electronic media used for the Work are found to contain computer viruses or other coding intended to cause malfunctions.
- (b) If magnetically recorded information or documentation is damaged or lost while in the Contractor's care or at any time before it is delivered to Canada in accordance with the Contract, including accidental erasure, the Contractor must immediately replace it at its own expense.

6.21 Access to Canada's Property and Facilities

Canada's property, facilities, equipment, documentation, and personnel are not automatically available to the Contractor. If the Contractor would like access to any of these, it is responsible for making a request

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File No. - N° du dossier

QCN-9-30761

Buyer ID - Id de l'acheteur

qcn016

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to the Technical Authority. Unless expressly stated in the Contract, Canada has no obligation to provide any of these to the Contractor. If Canada chooses, in its discretion, to make its property, facilities, equipment, documentation or personnel available to the Contractor to perform the Work, Canada may require an adjustment to the Basis of Payment and additional security requirements may apply.

ANNEX A

STATEMENT OF REQUIREMENT

INDOOR INTEGRATED DEVELOPMENT ENVIRONMENT FOR AUTONOMOUS MULTI-VEHICLE RESEARCH

The indoor integrated development environment for autonomous multi-vehicle research is defined as an integrated system that consists of a Mathworks MATLAB Simulink-based mission development toolbox and a group of integrated electrically powered aerial and ground test vehicles. The purpose of the integrated development environment is to facilitate the understanding and creation of single- and multi-vehicle guidance, navigation and control algorithms that will allow vehicles to operate autonomously.

General Requirements

The integrated development environment shall be comprised of a mission development toolbox that will be used to develop innovative guidance, navigation and control algorithms for autonomous vehicle studies. The mission development toolbox shall use the MATLAB Simulink method of code generation to allow algorithms to be evaluated using mathematical representations of aerial and/or ground test vehicles in test scenarios. The mission development toolbox shall use the MATLAB Simulink method of code generation to allow the algorithms to be compiled and uploaded to the embedded computer onboard on the physical representations of the aerial and/or ground platforms and tested. The mission development toolbox, using MATLAB Simulink blocks, shall permit online control and real-time monitoring of a non-homogeneous fleet of mathematical and/or physical air and/or ground test vehicles as they undergo system performance evaluations. The mathematical and physical representations of the aerial and ground vehicles shall be integrated seamlessly with the mission development toolbox to permit rapid algorithm evaluation using the MATLAB Simulink method of executable code generation for the vehicle's embedded processor.

This includes:

- (i) supplying the purchased Hardware;
- (ii) providing the Hardware Documentation, including the user manual and the technical description of the hardware;
- (iii) providing maintenance and support services for the Hardware during the Hardware Maintenance Period;
- (iv) granting the license to use the Licensed Software described in this Annex;
- (v) providing the Software Documentation, including the user manual and the technical description of the software;
- (vi) providing maintenance and support for the Licensed Software during the Software Support Period;
- (vii) providing training as detailed in article 6.19;
- (viii) all necessary equipment, software, peripherals, cabling and components required to meet the requirements;
- (ix) delivery, installation, integration and configuration of the Hardware and the Licensed Software.

1. Mission Development Toolbox (Qty 1)

The rapid development, prototyping and deployment environment for multi-vehicle guidance, navigation and control algorithms shall have the following features:

1. a) Architecture

- Based on the MathWorks MATLAB programming language and Simulink graphical programming blocks.
- Seamless integration with MATLAB RealTime Workshop to generate code for the integrated aerial and ground vehicle embedded processors running a real-time operating code.
- Built on the concept of a host and target component to permit seamless algorithm development using either mathematical representations or physical representations of the integrated aerial or ground test vehicles.
- Built on the concept of an extensible Simulink vehicle application interface comprised of high-level primitive commands that communicate with low level hardware drivers used in the integrated aerial and ground test vehicles.

1. b) Functionality

- Multi-host/multi-target, single-host/multi-target, single-host/single-target configurations.
- Real-time performance diagnostics, code optimization, parameter tuning, and dynamic reconfiguration.
- Concurrent execution, control and monitoring of multiple vehicle controllers.
- High-level Simulink mission blocks for the integrated aerial vehicle that is comprised as a minimum of the Set Functions: initialize, takeoff, way point, land, loiter, track heading, throttle, GPS home, roll-pitch-yaw, and Read Functions: sensors, vehicle state.
- High-level Simulink mission blocks for the integrated ground vehicle that is comprised as a minimum of the Set Functions: initialize, drive velocity, direction, way point, vehicle modes, wait event, wait angle, wait time, wait distance, way point navigation, sensor query list, sensor data streaming, and Read Function: sensors.
- Low-level Simulink mission blocks enabling multi-vehicle deployment that is comprised as a minimum of the functions: asynchronous threading; circular buffer initialize, read, write and clear; FIFO read and write
- Simulink communication blocks for the basic/ advanced protocols TCPIP, UDP, serial and shared memory that run on wireless network adapters on the host computer and the integrated aerial and ground vehicles.
- Data logging blocks to save data to MATLAB workspace or to a file.
- Simulink visualization blocks that seamlessly integrates 3D graphics into the data visualization environment that is comprised as a minimum of the functions: thresholding, image capture and save, landmark detection, edge detection, centroid pose.

1.c) Simulink aerial and ground test vehicle blocks

- 6DOF model of the integrated aerial test vehicle flight characteristics that is validated through testing for the following flight modes:
 - ✓ Forward translation at slow and medium speed
 - ✓ Backward translation at slow and medium speed

-
- ✓ Sideways translation at slow and medium speed
 - ✓ Yawing in clockwise and counter-clockwise directions at slow and medium rates
 - ✓ Hovering
 - ✓ Vertical take off
 - ✓ Vertical descent
 - 2DOF model of the integrated ground test vehicle traversing characteristics that is validated through testing for the following modes:
 - ✓ Forward translation at slow and medium speed
 - ✓ Backward translation at slow and medium speed
 - ✓ Turning in clockwise and counter-clockwise directions at slow and medium rates

1.d) Physical aerial and ground test vehicle Simulink blocks

- Simulink block of 6DOF autopilot and sensor hardware drivers to seamlessly program the real-time operating code to the integrated aerial test vehicle embedded processor module and sensor interface.
- Simulink block of 2DOF control and sensor hardware drivers to seamlessly program the real-time operating code to the integrated ground vehicle embedded processor and sensor interface.

1.e) Auxiliary device support

- Simulink virtual reality block to develop interactive 3D environment with haptic devices.
- Support for a camera-based localization & motion tracking system including Simulink block.
- Support streaming of video from onboard camera including Simulink block.
- Support of third-party devices like USB/IEEE 1394 cameras, force-feedback joystick game controllers and motion sensing controllers including respective Simulink blocks.

1.f) Software support

- Library of sample MATLAB code and Simulink Models that demonstrate the functionality of the Mission Development Toolbox features listed in 1.b).
- Customer care program providing version upgrade and bug fix software patches for the Mission Development Toolbox.
- Perpetual licenses for one host environment and five target processors minimum.

2. Integrated Aerial Test Vehicle (Qty 4)

The aerial test vehicle shall be a high-performance electrically powered miniature rotorcraft that is equipped with :

- 1) an on-board autopilot, IMU, closed-loop flight controller,
 - 2) an embedded controller for executing vehicle guidance, navigation and control algorithms,
- and
- 3) wireless network communications with a base station or other vehicles

The aerial test vehicle shall be seamlessly integrated with the MATLAB Simulink development environment and the mission development toolbox.

The integrated aerial test vehicle shall have the following features:

2.a) Integration with mission development toolbox

- Seamless integration with Mission Development Toolbox and MATLAB RealTime Workshop to generate code for the integrated aerial test vehicle sensors and embedded processor running the real-time operating system at a minimum 500 Hz.
- Real-time performance diagnostics, parameter tuning, and dynamic reconfiguration of integrated aerial test vehicle.
- Vehicle state and sensor data communication based on basic/ advanced protocols TCPIP, UDP, serial and shared memory.
- Data logging of attitude, altitude, speed, direction and vehicle state to onboard memory or to MATLAB workspace or file in the integrated development environment.

2.b) Flight performance

- Electric propulsion system required
- Vertical takeoff and landing, 6 m/s min. up, 3 m/s min. Down
- 80 deg/s min. turn rate
- hovering, 12 m/s min. forward speed
- 400g minimum lift-off sensor payload capacity
- 15 min. flight time minimum for aerial test vehicle equipped with embedded controller, attitude heading reference sensors, sensors and interface, communications radio, batteries, aerodynamic shell and landing gear.

2.c) Physical size

- 100 cm diameter maximum surface area footprint
- 18 cm minimum clearance between airframe to ground
- 1100 g without payload, 1500 g max. with sensor payload

2.d) Attitude heading reference sensors

- On-board flight controller consisting of:
 - ✓ 3-axis gyroscope, range configurable for $\pm 75^\circ/\text{s}$, $\pm 150^\circ/\text{s}$, $\pm 300^\circ/\text{s}$, resolution $0.02^\circ/\text{s}/\text{LSB}$ minimum at a range setting of $\pm 75^\circ/\text{s}$
 - ✓ 3-axis accelerometer, resolution 3.0 mg/LSB minimum
 - ✓ 3-axis magnetometer, resolution 0.80 mGa/LSB minimum
 - ✓ Roll, pitch, yaw angle determination
 - ✓ Barometric pressure sensor
 - ✓ GPS receiver with 4 Hz update rate

2.e) Sensor and auxiliary input/output

- 4 sonar inputs minimum, 3.0 cm resolution minimum
- 4 general purpose analog inputs minimum, 12-bit, +3.3V
- 1 absolute and relative pressure sensor
- 1 serial GPS input
- 1 USB camera input with 8 fps minimum
- 4 PWM outputs minimum

- 2 generic I²C I/O channels minimum, reconfigurable for 2 I²C, 2 DIO or 2 RS232
- Battery voltage measurement
- Flight data recorder for attitude, altitude, speed, direction

2.f) Communications

- 250 kbps minimum for datalink
- wireless network adapter with configurable IP parameters
- Tele-operation from handheld RF controller on 2.4000 - 2.4835 GHz band

2.g) Power

- Sufficient number of LiPo batteries for 1 hr semi-continuous operation before requiring charge of all batteries

2.h) Maintenance

- Sufficient number of propellers, gears, airframe components to restore aerial test vehicle to flying condition after two crashes.

3. Integrated Ground Test Vehicle (Qty 3)

The ground vehicle shall be a flexible, expandable and electrically powered wheeled vehicle that is equipped with:

- 1) onboard navigation sensors,
 - 2) an embedded controller for executing vehicle guidance, navigation and control algorithms,
- and
- 3) wireless network communications with a base station or other vehicles.

The ground test vehicle shall be seamlessly integrated with the MATLAB Simulink development environment and the mission development toolbox.

The integrated ground test vehicle shall have the following features:

3.a) Integration with mission development toolbox

- Seamless integration with Mission Development Toolbox and MATLAB RealTime Workshop to generate code for the integrated ground test vehicle sensors and embedded processor running the real-time operating system at a minimum 500 Hz.
- Real-time performance diagnostics, parameter tuning, and dynamic reconfiguration of integrated ground test vehicle.
- Vehicle state and sensor data communication based on basic/ advanced protocols TCP/IP, UDP, serial and shared memory.
- Data logging of speed, direction and vehicle state to onboard memory or to MATLAB workspace or file in the integrated development environment.

3.b) Mobile performance

- Electric propulsion system required
- Directional control by differential drive or steerable wheel
- 0.1 m/s traversing speed minimum
- 10 deg/s turn rate minimum
- 1.5 kg minimum payload

3.c) Physical size

- 50 cm x 50 cm footprint max.
- 3 kg without payload, 4.5 kg max. with payload

3.d) Sensor and auxiliary input/output

- 3-axis magnetometer, resolution 0.80 mGa/LSB minimum
 - 3 sonar inputs minimum, 3.0 cm resolution minimum
 - 3 point bump sensors
 - 3 infrared range sensors minimum
 - 1 USB camera input with 8 fps minimum
 - 3 general purpose analog inputs minimum, 12-bit, +3.3V
 - 2 generic I²C I/O channels minimum, reconfigurable for 2 I²C, 2 DIO or 2 RS232
 - 4 PWM outputs minimum
 - Battery capacity measurement

3.e) Communications

- 250 kbps minimum for datalink
- wireless network adapter with configurable IP parameters

3.f) Power

- Sufficient number of NiMH or LiPo batteries for 1 hr semi-continuous operation before requiring charge of all batteries

3.g) Maintenance

- Sufficient number of gears and body components to restore ground test vehicle to operating condition after two crashes.

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File No. - N° du dossier

QCN-9-30761

Buyer ID - Id de l'acheteur

qcn016

CCC No./N° CCC - FMS No./N° VME

ANNEX B

BASIS OF PAYMENT

Item No.	Description	FIRM PRICE
For the supply of an Indoor Integrated Development Environment for Autonomous Multi-vehicle Research, as described in Appendix A, under the agreement, Canada will pay the Contractor the firm price.		
TOTAL BID PRICE (TBP) :		\$

FORM 1

SUBSTANTIATION OF TECHNICAL COMPLIANCE FORM

No.	Article of Statement of Work that requires substantiation by the Bidder Mandatory Criteria	Bidder Substantiation	Preferably, the documentation should include the following information:	Reference to additional Substantiating Materials included in Bid
A	Mission Development Toolbox			
I	Architecture			
1	Based on the MathWorks MATLAB programming language and Simulink graphical programming blocks.		Basic Procedures: Instructions for configuring building, running and managing models. Provide general information on data collection, parameter tuning, managing models and control of block execution order.	
2	Seamless integration with MATLAB RealTime Workshop to generate code for the integrated aerial and ground vehicle embedded processors running a real-time operating code		Command line tool instructions for downloading, running and stopping model on target including syntax, options and description of options.	
3	Built on the concept of a host and target component to permit seamless algorithm development using either mathematical representations or physical representations of the integrated aerial or ground test vehicles		Console tool instructions to monitor input/output between development environment and test vehicles	
4	Built on the concept of an extensible Simulink vehicle application interface comprised of high-level primitive commands that communicate with low level hardware drivers used in the integrated aerial and ground test vehicles.		Data acquisition hardware tool instructions for card initialization and immediate, buffered, and time based input/output access	
II	Functionality			
5	Multi-host/multi-target,single-host/multi-target,single-host/single-target configurations.		Communication procedures: Instructions for high-level client block connecting a remote host and manages input/output. Instructions for high-level server block that accepts connection from remote host and manages input/output	

FORM 1

SUBSTANTIATION OF TECHNICAL COMPLIANCE FORM

No.	Article of Statement of Work that requires substantiation by the Bidder Mandatory Criteria	Bidder Substantiation	Preferably, the documentation should include the following information:	Reference to additional Substantiating Materials included in Bid
6	Real-time performance diagnostics, code optimization, parameter tuning, and dynamic reconfiguration		Instructions for mid-level communication blocks that allow data call, answer, read, write and formatted write. Instructions for low-level communication blocks that allow data stream connect, listen, accept, close, poll, send, flush, receive and print with immediate and delayed scheduling.	
7	Concurrent execution, control and monitoring of multiple vehicle controllers		Instructions for commands that permit multi-rate models and block that allows asynchronous threads	
8	High-level Simulink mission blocks for the integrated aerial vehicle that is comprised as a minimum of the Set Functions: initialize, takeoff, way point, land, loiter, track heading, throttle, GPS home, roll-pitch-yaw, and Read Functions: sensors, vehicle state.		Instructions for dynamic reconfiguration commands and blocks that allow switching in/out, grouping, state input/output, target connect, model loading	
9	High-level Simulink mission blocks for the integrated ground vehicle that is comprised as a minimum of the Set Functions: initialize, drive velocity, direction, way point, vehicle modes, wait event, wait angle, wait time, wait distance, way point navigation, sensor query list, sensor data streaming, and Read Function: sensors		Instructions for interfacing with external functions and application programming interfaces	
10	Low-level Simulink mission blocks enabling multi-vehicle deployment that is comprised as a minimum of the functions: asynchronous threading; circular buffer initialize, read, write and clear; FIFO read and write		Instructions for optimizing system performance through priority assignment, disabling modes and code generation options	
11	Simulink communication blocks for the basic/ advanced protocols TCP/IP, UDP, serial and shared memory that run on wireless network adapters on the host computer and the integrated aerial and ground vehicles		Instructions for configuring system parameters related to Real-Time Workshop, external file mode, and the mission development environment.	
12	Data logging blocks to save data to MATLAB workspace or to a file		Instructions and full description of mission development functions that can be called within Matlab scripts	

FORM 1

SUBSTANTIATION OF TECHNICAL COMPLIANCE FORM

No.	Article of Statement of Work that requires substantiation by the Bidder Mandatory Criteria	Bidder Substantiation	Preferably, the documentation should include the following information:	Reference to additional Substantiating Materials included in Bid
13	Simulink visualization blocks that seamlessly integrates 3D graphics into the data visualization environment that is comprised as a minimum of the functions: thresholding, image capture and save, landmark detection, edge detection, centroid pose.		The functions cover configuration and verification of target models, target interaction and simulation, error handling, input devices, hardware access, and data streaming over communication channels	
III	Simulink aerial and ground test vehicle blocks			
14	6DOF model of the integrated aerial test vehicle flight characteristics that is validated through testing for the following flight modes: <ul style="list-style-type: none"> • Forward translation at slow and medium speed • Backward translation at slow and medium speed • Sideways translation at slow and medium speed • Yawing in CW and CCW directions at slow and medium rates • Hovering • Vertical take off • Vertical descent 		* Description of mission development menu and related actions, preference list, default resources, and build options. * Description of mission development error codes, symbolic names and narrative of problem. * Complete description of each function block. Each description shall include: block name and icon, purpose of block, block library that contains the block, description of block's use, block input/output, data types supported by block, block dialogue and parameters	
15	2DOF model of the integrated ground test vehicle traversing characteristics that is validated through testing for the following modes: <ul style="list-style-type: none"> • Forward translation at slow and medium speed • Backward translation at slow and medium speed • Turning in CW and CCW directions at slow and medium rates 		Block categories shall cover: 1) Advanced asynchronous subsystems dynamic reconfiguration, timing functions, communications, 2) High-level, mid-level and low-level communications, 3) Data acquisition equipment initialization, immediate input/output, buffered input/output, timebase input/output, watchdog timer, 4) Data handling for data logging, error handling, waveform generation, time, status, 5) Test vehicle initialization and state.	

FORM 1

SUBSTANTIATION OF TECHNICAL COMPLIANCE FORM

No.	Article of Statement of Work that requires substantiation by the Bidder Mandatory Criteria	Bidder Substantiation	Preferably, the documentation should include the following information:	Reference to additional Substantiating Materials included in Bid
IV	<p>■ Physical aerial and ground test vehicle Simulink blocks</p>			
16	<p>Simulink block of 6DOF autopilot and sensor hardware drivers to seamlessly program the real-time operating code to the integrated aerial test vehicle embedded processor module and sensor interface</p>		<p>Aerial vehicle block categories for Set Functions: initialize, takeoff, way point, land, loiter, track heading, throttle, GPS home, roll-pitch-yaw, and Read Functions: sensors, vehicle state</p>	
17	<p>Simulink block of 2DOF control and sensor hardware drivers to seamlessly program the real-time operating code to the integrated ground vehicle embedded processor and sensor interface</p>		<p>Ground vehicle block categories for Set Functions: initialize, drive velocity, direction, way point, vehicle modes, wait event, wait angle, wait time, wait distance, way point navigation, sensor query list, sensor data streaming, and Read Function: sensors</p>	
B	<p>Integrated Aerial and Ground Test Vehicle</p>			
18	<p>Seamless integration with Mission Development Toolbox and MATLAB RealTime Workshop to generate code for the integrated aerial and ground test vehicle sensors and embedded processor running the real-time operating system at a minimum 500 Hz.</p>		<p>Instructions for establishing wireless connection between mission development environment and target vehicles</p>	
19	<p>Real-time performance diagnostics, parameter tuning, and dynamic reconfiguration of integrated aerial and ground test vehicle</p>		<p>Instructions for establishing communication and data input/output with test vehicle sensors.</p>	
20	<p>Vehicle state and sensor data communication based on basic/advanced protocols TCPIP, UDP, serial and shared memory.</p>			
21	<p>Data logging of attitude, altitude, speed, direction and vehicle state to onboard memory or to MATLAB workspace or file in the integrated development environment</p>			

Form 2

Software Publisher Certification Form

(to be used where the Bidder itself is the Software Publisher)

The Bidder certifies that is the software publisher of all the following software products and components and that it has all the rights necessary to license them (and any non-proprietary sub-components incorporated into the software) on a royalty-free basis to Canada:

[bidders should add or remove lines as needed]

Form 3

Software Publisher Authorization Form

(to be used where the Bidder is not the Software Publisher)

This confirms that the software publisher identified below has authorized the Bidder named below to license its proprietary software products under any contract resulting from the bid solicitation identified below.

This authorization applies to the following software products:

[bidders should add or remove lines as needed]

Name of Software Publisher (SP) _____

Signature of authorized signatory of SP _____

Print Name of authorized signatory of SP _____

Print Title of authorized signatory of SP _____

Address for authorized signatory of SP _____

Telephone no. for authorized signatory of SP _____

Fax no. for authorized signatory of SP _____

Date signed _____

Solicitation Number _____

Name of Bidder _____