



National Defence

National Defence Headquarters  
Ottawa, Ontario  
K1A 0K2

Défense nationale

Quartier général de la Défense nationale  
Ottawa (Ontario)  
K1A 0K2

## REQUEST FOR PROPOSAL DEMANDE DE PROPOSITION

### Proposal To: National Defence 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 and services listed herein and on any attached sheets at the price(s) set out therefore.

### Proposition à : Défense nationale 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 et services énumérés ici et sur toute feuille ci-annexée, au(x) prix indique(s).

### Comments - Commentaires

### RETURN BIDS TO: RETOURNER LES SOUMISSIONS À :

By e-mail to: - Par courriel au :  
[DLP53BidsReceiving.DAAT53Receptiondessousmissions@forces.gc.ca](mailto:DLP53BidsReceiving.DAAT53Receptiondessousmissions@forces.gc.ca)

Attention: - Attention :  
Sandy (Alexander) Ueffing

<b>Title - Sujet</b> High-Precision Survey Unmanned Aircraft System (UAS) Système d'aéronef sans pilote (UAS) pour arpentage à haute précision	
<b>Solicitation No. N° de l'invitation</b> W8476-196008/B	<b>Date of Solicitation Date de l'invitation</b> 21 February - février 2019
<b>Address enquiries to: - Adresser toute demande de renseignements à :</b> Sandy (Alexander) Ueffing <b>Telephone No. - N° de telephone</b> 819-939-8920 <b>E-Mail Address - Courriel</b> <a href="mailto:Alexander.Ueffing@forces.gc.ca">Alexander.Ueffing@forces.gc.ca</a>	
<b>Destination</b> See herein - Voir aux présentes	

**Instructions:** Municipal taxes are not applicable. Unless otherwise specified herein all prices quoted must include all applicable Canadian customs duties, GST/HST, excise taxes and are to be delivered Delivery Duty Paid including all delivery charges to destination(s) as indicated. The amount of the Goods and Services Tax/Harmonized Sales Tax is to be shown as a separate item.

**Instructions :** Les taxes municipales ne s'appliquent pas. Sauf indication contraire, les prix indiqués doivent comprendre les droits de douane canadiens, la TPS/TVH et la taxe d'accise. Les biens doivent être livrés « rendu droits acquittés », tous frais de livraison compris, à la ou aux destinations indiquées. Le montant de la taxe sur les produits et services/taxe de vente harmonisée doit être indiqué séparément.

<b>Delivery requested Livraison demandée</b> See herein - Voir aux présentes	<b>Delivery offered Livraison proposée</b>
<b>Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Person authorized to sign on behalf of Vendor/Firm (type or print): La personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie) :</b>	
<b>Name - Nom</b>	<b>Title - Titre</b>
<b>Signature</b>	<b>Date</b>

<b>Solicitation Closes - L'invitation prend fin</b> At - à : 2:00 PM - 14:00  On - le : 8 March - mars 2019  Time Zone - Fuseau Horaire : Eastern Standard Time (EST) Heure normale de l'Est (HNE)
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**REISSUE OF BID SOLICITATION**

- A. This bid solicitation cancels and supersedes previous bid solicitation number W8476-196008/A dated 30 January 2019 with a closing of 14 February 2019 at 2:00 PM EST. A debriefing or feedback session will be provided upon request to bidders/offerors/suppliers who bid on the previous solicitation.

## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirements**

A. There is no security requirement associated with this bid solicitation.

### **1.2 Requirement**

A. The requirement is detailed under the article entitled Requirement of the resulting contract clauses in Part 6.

### **1.3 Debriefings**

A. 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 from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

### **1.4 Trade Agreements**

A. The requirement is subject to the provisions of the Canadian Free Trade Agreement (CFTA).

### **1.5 Canadian Content**

A. The requirement is subject to a preference for Canadian goods and/or services.

## **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 \(SACC\) Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.
- 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 (2018-05-22), Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation, with the following modification(s):
- (i) Section 02, Procurement Business Number, is deleted in its entirety;
  - (ii) Section 05, Submission of bids, subsection 2, paragraph d., is deleted in its entirety and replaced with the following:
    - d. send its bid only to the Department of National Defence location specified on page 1 of the bid solicitation or to the address specified in the bid solicitation.
  - (iii) Section 05, Submission of bids, subsection 4, is amended as follows:
    - Delete: 60 days
    - Insert: 120 days
  - (iv) Section 06, Late bids, is deleted in its entirety;
  - (v) Section 07, Delayed bids, is deleted in its entirety and replaced with the following:
    - 07 Delayed bids
    - 1. It is the Bidder's responsibility to ensure that the Contracting Authority has received the entire submission. Misrouting or other electronic delivery issues resulting in late submission of bids will not be accepted.
  - (vi) Section 20, Further information, subsection 2, is deleted in its entirety.

### **2.2 Submission of Bids**

- A. Bids must be submitted only to the Department of National Defence (DND) 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 will not be accepted.
- C. Due to the nature of the bid solicitation, bids transmitted by epost Connect will not be accepted.

#### **2.2.1 Electronic Submissions**

- A. Electronic Submissions: Individual e-mails that may include certain scripts, formats, embedded macros and/or links, or those that exceed five (5) megabytes may be rejected by Canada's e-mail system and/or firewall(s) without notice to the Bidder or Contracting Authority. Larger bids may be submitted through more than one e-mail. Canada will confirm receipt of documents. It is the Bidder's responsibility to ensure that their entire submission has been received. Bidders should not assume that all documents have been received unless Canada confirms receipt of each document. In order to minimize the potential for technical

issues, bidders are requested to allow sufficient time before the closing date and time to confirm receipt. Bid documents submitted after the closing time and date will not be accepted.

### **2.3 Enquiries - Bid Solicitation**

- A. All enquiries must be submitted in writing to the Contracting Authority no later than 5 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 question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

### **2.4 Technical Data Package**

- A. A Technical Data Package (TDP) containing drawings or other technical documents associated with the Work is available upon request. All requests must be made to the Contracting Authority. Bidders are responsible for requesting the TDP early enough to ensure that the drawings are received through regular mail before bid closing.
- B. Some documents may be identified as property or intellectual property of a third-party contractor. In all cases, either:
  - (i) The documents have been mislabelled and are, in fact, property of the Crown, or
  - (ii) The Crown has a licence or other unlimited rights to use these drawings in accordance with the Contract(s) under which the drawings were developed.

### **2.5 Applicable Laws**

- A. Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.
- B. 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.

### **2.6 Improvement of Requirement During Solicitation Period**

- A. Should bidders consider that the specifications or Requirement 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 5 days before the bid closing date. 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:
- Section I: Technical Bid: 1 soft copy in PDF format by e-mail;
- Section II: Financial Bid: 1 soft copy in PDF format by e-mail;
- Section III: Certifications: 1 soft copy in PDF format by e-mail; and
- Section IV: Additional Information: 1 soft copy in PDF format by e-mail.
- B. Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.
- C. 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; and
  - (ii) Use a numbering system that corresponds to the bid solicitation.
- D. 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](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). To assist Canada in reaching its objectives, bidders should:
- (i) Use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
  - (ii) Use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

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

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

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

- A. Bidders must submit their financial bid in accordance with the attachment to Part 3 entitled Pricing Schedule.

#### **3.3.1 Electronic Payment of Invoices - Bid**

- A. If you are willing to accept payment of invoices by Electronic Payment Instruments, complete the attachment to Part 3 entitled Electronic Payment Instruments, to identify which ones are accepted.
- B. If the attachment to Part 3 entitled Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.
- C. Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

#### **3.3.2 Exchange Rate Fluctuation**

- A. The requirement does not offer exchange rate fluctuation risk mitigation. Requests for exchange rate fluctuation risk mitigation will not be considered. All bids including such provision will render the bid non-responsive.



### **3.4 Section III: Certifications**

A. Bidders must submit the certifications and additional information required under Part 5.

### **3.5 Section IV: Additional Information**

A. In Section IV of their bid, bidders should provide:

- (i) A completed, signed, and dated Page 1 of this solicitation, or final amendment, as applicable;
- (ii) The name of the contact person (provide also this person's title, mailing address, phone number, and e-mail address) authorized by the Bidder to enter into communications with Canada with regards to their bid, and any contract that may result from their bid;
- (iii) For the article in Part 2 entitled Applicable Laws of the bid solicitation: the province or territory if different than specified; and
- (iv) Any other information submitted in the bid not already detailed.

#### **3.5.1 Delivery Date(s)**

- A. Delivery of the Firm Goods and/or Services is requested on or before 29 March 2019. If a longer delivery period is required, the Bidder must submit the best delivery that could be offered, in the form of either a fixed date or a period of time from contract award. Failure to submit a date or time period will be taken as acceptance of delivery within the requested timeframe.
- B. Any delivery date(s) offered will not be included in the evaluation.

**ATTACHMENT 1 TO PART 3 - PRICING SCHEDULE**

**1. General**

- A. Bidders are requested to complete the following Pricing Schedule and include it in the bid. At a minimum, the Firm Unit Price for each Item must be submitted.
- B. All prices must be submitted in Canadian Dollars, Canadian customs duties and excise taxes included, Applicable Taxes excluded.

**2. Firm Goods and/or Services**

**2.1 High-Precision Survey Unmanned Aircraft System (UAS)**

- A. The Firm Unit Price(s) include(s) associated specifications, training, and deliverables as per Annex A, Requirement, Delivered Duty Paid (DDP) specified Delivery Point, Incoterms 2010:

Item	Delivery Point	Quantity Required	Firm Unit Price
1	7 Canadian Forces Supply Depot (CFSD) Edmonton, Alberta	1	\$

**ATTACHMENT 2 TO PART 3 - ELECTRONIC PAYMENT INSTRUMENTS**

A. The Bidder accepts to be paid by any of the following Electronic Payment Instrument(s):

- VISA Acquisition Card;
- MasterCard Acquisition Card;
- Direct Deposit (Domestic and International);
- Electronic Data Interchange (EDI);
- Wire Transfer (International Only); and
- Large Value Transfer System (LVTS) (Over \$25M).

## **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.
- B. An evaluation team composed of representatives of Canada will evaluate the bids.
- C. The evaluation team will determine first if there are 2 or more bids with a valid Canadian Content certification. In that event, the evaluation process will be limited to the bids with the certification; otherwise, all bids will be evaluated. If some of the bids with a valid certification are declared non-responsive, or are withdrawn, and less than 2 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.

#### **4.1.1 Technical Evaluation**

- A. Mandatory technical evaluation criteria are included in the attachment to Part 4 entitled Evaluation Criteria.

#### **4.1.2 Financial Evaluation - Firm Goods and/or Services**

- A. The price of the bid will be evaluated in Canadian dollars, Delivered Duty Paid (DDP) destination, Incoterms 2010, Canadian customs duties and excise taxes included, Applicable Taxes excluded.

### **4.2 Basis of Selection - Lowest Evaluated Price, Mandatory Technical Criteria**

- A. 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 evaluated price will be recommended for award of a contract.
- B. Should two or more responsive bids achieve an identical lowest evaluated price, the bid with the High-Precision Survey Unmanned Aircraft System (UAS) with the greatest endurance will be recommended for award of a contract.

## **ATTACHMENT 1 TO PART 4 - EVALUATION CRITERIA**

### **1. Mandatory Technical Criteria**

- M1 The Bidder must provide the make and model of the proposed equipment.
- M2 The Bidder must provide a list of the countries of origin for all electronic components.
- M3 The Bidder must submit documents that demonstrate current qualifications, certification, or approval for flight operations by a country, which must be a member of either NATO or Five Eyes, military airworthiness authority, a civilian agency, or regulatory body, using standards and procedures acceptable to Canada (examples include Transport Canada, Federal Aviation Administration (FAA), or equivalent organizations in other NATO and Five Eyes countries).

## **PART 5 - CERTIFICATIONS AND ADDITIONAL INFORMATION**

### **5.1 General**

- A. Bidders must provide the required certifications and additional information to be awarded a contract.
- B. The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.
- C. The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

### **5.2 Certifications Required with the Bid**

- A. Bidders must submit the following duly completed certifications as part of their bid.

#### **5.2.1 Integrity Provisions - Declaration of Convicted Offences**

- A. In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, if applicable, the Integrity declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

#### **5.2.2 Canadian Content Certification**

- A. This procurement is conditionally limited to Canadian goods.
- B. Subject to the evaluation procedures contained in the bid solicitation, bidders acknowledge that only bids with a certification that the good(s) offered are Canadian goods, as defined in clause [A3050T](#), may be considered.
- C. Failure to provide this certification completed with the bid will result in the good(s) offered being treated as non-Canadian goods.
- D. The Bidder certifies that:  
  
( ) the good(s) offered are Canadian goods as defined in paragraph 1 of clause [A3050T](#).

### **5.3 Certifications Precedent to Contract Award and Additional Information**

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

#### **5.3.1 Integrity Provisions - Required Documentation**

- A. In accordance with the section titled "Information to be provided when bidding, contracting, or entering into a real procurement agreement" of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

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

- A. By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#)" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#) website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#>).
- B. Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

## **PART 6 - RESULTING CONTRACT CLAUSES**

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

### **6.1 Security Requirements**

- A. There is no security requirement applicable to the Contract.

### **6.2 Requirement**

- A. The Contractor must provide the item(s) detailed under the Requirement at Annex A and the Basis of Payment at Annex B.

#### **6.2.1 Technical Changes, Substitutes, and Alternatives**

- A. Any technical changes, substitutes and alternatives proposed by the Contractor must be evaluated for acceptance by the Technical Authority. Any substitutes and alternatives must be equivalent in form, fit, function, quality and performance to what is being replaced and must be at no additional cost to Canada. Substitutes and alternatives that are offered as equivalent will only be acceptable once they are approved by the Technical Authority as an equivalent. A contract amendment or a completed Design Change/Deviation form will be issued.
- B. Should the Technical Authority not accept the substitute or the alternative and the Contractor is unable to meet the technical requirement, Canada may terminate the contract for default in accordance with the general conditions stated in the contract.

### **6.3 Standard Clauses and Conditions**

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

#### **6.3.1 General Conditions**

- A. 2010A (2018-06-21), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract, with the following modification:
- (i) Article 01, Interpretation, definition of "Canada", "Crown", "Her Majesty" or "the Government", is deleted in its entirety and replaced with the following:
- "Canada", "Crown", "Her Majesty" or "the Government"  
means Her Majesty the Queen in right of Canada as represented by the Minister of National Defence and any other person duly authorized to act on behalf of that minister or, if applicable, an appropriate minister to whom the Minister of National Defence has delegated his or her powers, duties or functions and any other person duly authorized to act on behalf of that minister.

### **6.4 Term of Contract**

#### **6.4.1 Delivery Dates**

- A. All the deliverables must be received on or before the date(s) specified in Annex B of the Contract.

#### **6.4.2 Delivery Points**

- A. Delivery of the requirement must be made to delivery point(s) specified at Annex B of the Contract.



- B. The Contractor must deliver the goods by appointment only. The Contractor is responsible for contacting the Contracting Authority in advance of shipping to obtain the contact information for the delivery point(s). The Contractor or its carrier must arrange delivery appointments by contacting the delivery point(s). All equipment delivered to the consignee are to be delivered between the hours of 8:00 am and 4:00 pm local time Monday through Friday, except Federal holidays. Any attempt by the carrier to deliver equipment before or after these hours may be refused unless arrangements have been made for authorized, qualified personnel to be available to perform inspections and to accept the delivery. The consignee(s) may refuse shipments when prior arrangements have not been made. When the carrier is required to return due to its failure to make an appointment for delivery, Canada will not be liable to pay for additional costs.

**6.5 Authorities**

**6.5.1 Contracting Authority**

- A. The Contracting Authority for the Contract is:

[Contact information to be detailed in the resulting contract]

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Position: \_\_\_\_\_  
Address: Department of National Defence Headquarters  
101 Colonel By Drive  
Ottawa, Ontario K1A 0K2  
Telephone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

- B. 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.

**6.5.2 Technical Authority**

- A. The Technical Authority for the Contract is:

[Contact information to be detailed in the resulting contract]

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Position: \_\_\_\_\_  
Address: Department of National Defence Headquarters  
101 Colonel By Drive  
Ottawa, Ontario K1A 0K2  
Telephone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

- B. 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.

**6.5.3 Contractor's Representative**

[Contact information to be detailed in the resulting contract]

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

## 6.6 Payment

### 6.6.1 Basis of Payment - Firm Unit Price(s)

- A. In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, as specified in Annex B for a cost of \$[amount to be detailed in the resulting contract]. Customs duties are included and Applicable Taxes are extra.

### 6.6.2 Limitation of Price

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

### 6.6.3 Method of Payment - Single Payment

- A. Canada will pay the Contractor upon completion and delivery of the Work in accordance with the payment provisions of the Contract if:
- (i) an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
  - (ii) all such documents have been verified by Canada; and
  - (iii) the Work delivered has been accepted by Canada.

### 6.6.4 Electronic Payment of Invoices

- A. The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

[List to be updated in the resulting contract]

- (i) Visa Acquisition Card;
- (ii) MasterCard Acquisition Card;
- (iii) Direct Deposit (Domestic and International);
- (iv) Electronic Data Interchange (EDI);
- (v) Wire Transfer (International Only); and
- (vi) Large Value Transfer System (LVTS) (Over \$25M).

## 6.7 Invoicing

### 6.7.1 Invoicing Instructions

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

National Defence Headquarters (NDHQ)  
Department of National Defence (DND)  
101 Colonel By Drive  
Ottawa, Ontario K1A 0K2  
c/o: [organization to be detailed in the resulting contract]  
attn: [name to be detailed in the resulting contract]

- (ii) For invoices not claiming any Travel and Living costs, the Contractor may provide, in lieu of a hard copy, a .pdf copy of the original invoice along with any required supporting documentation to the Contracting Authority at:

[Invoice e-mail destination address to be specified in the resulting contract]

- (iii) By submitting a .pdf copy, the Contractor certifies that the .pdf copy of each invoice will be considered as the original invoice. In addition, the Contractor must indicate the contract number and name of the Contracting Authority in its covering e-mail. Invoices claiming Travel and Living costs must be submitted in hard copy in order to provide original receipts, as per Treasury Board regulations.

## 6.8 Certifications and Additional Information

### 6.8.1 Compliance

- A. Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

### 6.8.2 Canadian Content Certification

- A. The Contractor warrants that the certification of Canadian Content submitted by the Contractor is accurate and complete, and that the goods, services or both to be provided under the Contract are in accordance with the definition contained in SACC Manual clause [A3050T \(http://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/A/A3050T/active\)](http://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/A/A3050T/active).
- B. The Contractor must keep proper records and documentation relating to the origin of the goods, services or both provided to Canada. The Contractor must not, without obtaining before the written consent of the Contracting Authority, dispose of any such records or documentation until the expiration of 6 years after final payment under the Contract, or until settlement of all outstanding claims and disputes under the Contract, whichever is later. All such records and documentation must at all times during the retention period be open to audit, inspection and examination by the representatives of Canada, who may make copies and take extracts. The Contractor must provide all facilities for such audits, inspections and examinations, and must furnish all such information as the representatives of Canada may from time to time require with respect to such records and documentation.
- C. Nothing in this clause must be interpreted as limiting the rights and remedies which Canada may otherwise have pursuant to the Contract.

## 6.9 Applicable Laws

- A. The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in **Ontario [or as specified by the bidder in its bid, if applicable]**.

## 6.10 Priority of Documents

- A. 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:
- (i) The Articles of Agreement;
  - (ii) The General Conditions 2010A (2018-06-21), General Conditions - Goods (Medium Complexity);
  - (iii) Annex A, Requirement;
  - (iv) Annex B, Basis of Payment;
  - (v) the Contractor's bid dated [date to be specified in the resulting contract], as clarified on [date to be specified in the resulting contract, if required], and as amended on [date to be specified in the resulting contract, if required].

## 6.11 Defence Contract

- A. The Contract is a defence contract within the meaning of the Defence Production Act, R.S.C. 1985, c. D-1 (<http://laws-lois.justice.gc.ca/eng/acts/d-1/>), and must be governed accordingly.
- B. Title to the Work or to any materials, parts, work-in-process or finished work must belong to Canada free and clear of all claims, liens, attachments, charges or encumbrances. Canada is entitled, at any time, to remove, sell or dispose of the Work or any part of the Work in accordance with section 20 of the Defence Production Act.

## 6.12 Insurance - No Specific Requirement

- A. The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

## 6.13 Inspection and Acceptance

- A. The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Requirement and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

## 6.14 Post-Contract Award Meeting

- A. Within 10 days of the date of Contract, the Contractor must contact the Contracting Authority to determine if a post-contract award meeting is required. A meeting will be convened at the discretion of the Contracting Authority to review technical and contractual requirements. The Contractor must prepare and distribute the minutes of the meeting within 5 calendar days after the completion of the meeting. The meeting will be held at the Contractor's facility or via teleconference at Canada's discretion at no additional cost to Canada, with representatives of the Contractor and the Department of National Defence.

### **6.15 Quality Management Systems - Requirements (Quality Assurance Code C)**

- A. The Contractor is responsible for implementing a quality system appropriate to the scope of the work to be performed. It is recommended that the quality system be based on *ISO 9001:2008 "Quality management systems - Requirements."*
- B. The Contractor is responsible for performing or having performed all inspections and tests necessary to substantiate that the material or services provided conform to the drawings, specifications and the requirements of the contract. The Contractor must keep accurate and complete inspection records which must, upon request, be made available to the authorized Department of National Defence (DND) representative, who may make copies and take extracts during the performance of the Contract and for a period of 1 year after the completion of the Contract.
- C. Despite the above, all material is subject to verification and acceptance by DND at destination. The authorized DND representative at destination may either be the consignee(s), the Technical Authority, or the Quality Assurance Authority.

### **6.16 Material**

- A. Material supplied must be new unused and of current production by manufacturer.

### **6.17 Packaging**

- A. The methods used for preservation and packaging must be in conformity with the Contractor's normal standard for domestic shipment or, if necessary, with standards for overseas shipment as below deck cargo.

### **6.18 Wood packaging materials**

- A. All wood packaging materials used in shipping must conform to the [International Standards for Phytosanitary Measures No. 15: Regulation of Wood Packaging Material in International Trade \(ISPM 15\)](https://www.ippc.int/en/core-activities/standards-setting/ispms/) (<https://www.ippc.int/en/core-activities/standards-setting/ispms/>).
- B. Pertinent additional information on Canada's import and export programs is provided in the following Canadian Food Inspection Agency policy directives:
  - (i) D-98-08 - [Entry Requirements for Wood Packaging Materials Produced in All Areas Other Than the Continental United States](http://www.inspection.gc.ca/plants/plant-protection/directives/forestry/d-98-08/eng/1323963831423/1323964135993) (<http://www.inspection.gc.ca/plants/plant-protection/directives/forestry/d-98-08/eng/1323963831423/1323964135993>); and
  - (ii) D-13-01 - [Canadian Heat Treated Wood Products Certification Program \(HT Program\)](http://www.inspection.gc.ca/plants/forestry/exports/ht-program/eng/1319462565070/1319462677967) (<http://www.inspection.gc.ca/plants/forestry/exports/ht-program/eng/1319462565070/1319462677967>).

### **6.19 Delivery and Unloading**

- A. Delivery trucks must be equipped with an unloading device which will permit unloading at sites with no hydraulic, stationary or other type of unloading facility.
- B. When making deliveries, sufficient personnel must be provided to permit unloading of any type of vehicle without the assistance of federal government personnel.
- C. At some sites, the delivery truck must be unloaded while parked at the curb. When material is placed on the sidewalk, it must be placed in proximity to the designated entrance so as to be readily accessible to transport by mechanical handling equipment utilized by site personnel.

**6.20 Canadian Forces Site Regulations**

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

**6.21 Labelling**

- A. The Contractor must ensure that the manufacturer's and specification numbers appear on each item, either printed on the container or on an adhesive label of highest commercial standard affixed to the container.

## **ANNEX A - REQUIREMENT**

See attached document(s) entitled:

“HIGH-PRECISION SURVEY UAS  
DEPARTMENT OF NATIONAL DEFENCE  
STATEMENT OF WORK (SOW)”; and

“HIGH PRECISION SURVEY UAS  
DEPARTMENT OF NATIONAL DEFENCE  
SYSTEM PERFORMANCE SPECIFICATION (SPS)”.

HIGH-PRECISION SURVEY UAS  
DEPARTMENT OF NATIONAL DEFENCE  
STATEMENT OF WORK (SOW)



## Statement Of Work

### **1. INTRODUCTION**

1.1 Purpose. This Statement of Work (SOW) describes the products and services required for a Commercial-Off-the-Shelf (COTS) Real-Time Kinetic (RTK) Global Positioning System (GPS)-guided Unmanned Aircraft System (UAS); referred to henceforth as the “System”.

#### 1.2 Scope

1.2.1 The Work includes the delivery of equipment and training required to establish and sustain capabilities by Canada that meets or exceeds the requirements listed in the associated document entitled “System Performance Specification (SPS)”.

#### 1.3 Electronic Document Format.

1.3.1 All digital copies must be supplied in searchable PDF format unless stated otherwise.

1.3.2 All digital copies requiring modifications from Department of National Defence (DND) must be delivered in Microsoft Office format.

1.3.3 All Digital copies must be functional without the requirement for a password, an auto-run installation procedure or an Internet connection.

### **2. APPLICABLE DOCUMENTS**

2.1 Applicability. The following documents form part of this SOW to the extent specified herein, and are supportive of this SOW when referenced. All other document references are to be considered supplemental information only. Unless otherwise specified, the issue or amendment of documents effective for this contract must be those in effect on the date of contract award.

#### 2.2 Referenced Documents

2.2.1 In the event of conflict between the documents referenced herein and the contents of the SOW, the contents of the SOW must apply.

#### 2.2.2 Government Publications

D-01-100-214/SF-000 Specification for Preparation of Provisioning Documentation for Canadian Forces Equipment

B-GT-D35-001/AG-000 Canadian Forces Publication on Management of The Radio Spectrum

B-GT-D35-001/AG-000 Application for Spectrum Supportability  
Annex B Appendix 1

### **3. SYSTEM CHARACTERISTICS**

#### 3.1 General.

3.1.1 The Contractor must deliver the System which performs at or above the criteria identified in the SPS and includes all major components necessary to prepare for and conduct autonomous operational flights and operator level field maintenance.

## Statement Of Work

- 3.1.2 If requested by DND, the Contractor must provide details on the supply chain of the components composing the system, including the name of the supplier and the country of origin.
- 3.1.3 The Contractor must originate from a North Atlantic Treaty Organization (NATO) or a Five Eyes (Australia, Canada, New Zealand, the United Kingdom and the United States) country for electronic components.

### **4. SYSTEMS ENGINEERING**

#### **4.1 Airworthiness**

- 4.1.1 The Contractor must submit electronically documentation to Canada that demonstrates current qualifications, certification or approval for flight operations by an allied (NATO or Five Eyes) military airworthiness authority, a civilian agency or regulatory body, using standards and procedures acceptable to Canada. (i.e. Transport Canada, Federal Aviation Administration (FAA), and equivalent organizations in other NATO and Five Eyes countries).

- 4.1.2 Summary of Operational History. The Contractor must provide a Summary of Operational History and any other documentation facilitating its airworthiness accreditation. This documentation may be used by Canada for the applications for Technical Airworthiness Clearance.

- 4.1.2.1 The Summary of Operational history must detail, as a minimum, the following:

- 4.1.2.1.1 Brief system development history;

- 4.1.2.1.2 Operational history summary – hours flown/operated, losses including causes, fault arising rates, brief details of significant airworthiness issues and resolution;

- 4.1.2.1.3 Any Special Conditions including Support Documentation; and

- 4.1.2.1.4 Any exemptions including Support Documentation.

#### **4.2 Frequency Management and Supportability**

- 4.2.1 If the Radio Equipment for the System is not already certified for use in Canada, the Contractor must complete and submit the form DND 552, “Application for Frequency Supportability” accompanied by supporting documentation to enable Canada to assess and initiate the appropriate frequency allocation coordination for the conduct of UAS operations.

- 4.2.2 The Contractor must then provide updates to the documents if any changes that affect the frequency spectrum requirements are made to the System during the period of this Contract or any options called up from this Contract.

### **5. INTEGRATED LOGISTICS SUPPORT (ILS)**

#### **5.1 Cataloguing**

- 5.1.1 The Contractor must provide all necessary documentation mandated by Canada to catalogue and inventory the complete system including all consumable and repairable spare parts, reusable containers, and all Special Tools and Test Equipment (STTE).

- 5.2 Spare Parts. The Contractor must provide enough spare parts (including propellers) and consumables to maintain the equipment operational for a minimum of 200 flights per aircraft in accordance with user manual.

## Statement Of Work

### 5.3 Storage, Transportation and Handling

5.3.1 The Contractor must provide all technical data, publications and material required for the safe storage, transportation, handling, and disposal procedures of any items to be handled by personnel during the conduct of the system operation and related maintenance work.

5.4 Labelling and Packaging. The Contractor must follow in accordance with Contract standard packaging procedures best commercial procedures for the labelling and packaging of equipment, assemblies and spare parts.

5.5 UAS Operator Manual. The Contractor must provide an operator manual required by operator personnel to enable safe and effective performance of the applicable maintenance tasks and proper system training and operation. The following data must be included in the operator manual:

5.5.1 Aircraft and Ground Control System (GCS) performance characteristics and system description. This must describe the performance expected from the aircraft (operating ranges, service ceiling, airspeeds, endurance, etc.) and descriptions of the components associated with the aircraft and ground support equipment. Some examples of these components are the airframe, propulsion system, electrical system, flight control system, avionics, data links and communications, navigation systems, payload, autopilot, mission planning tools, imagery processing system, landing system, etc.

5.5.2 Critical and non-critical emergency procedures should be clearly detailed so as to be readily accessible for immediate use. These should describe the immediate actions to be taken and remedial procedures to be followed in the event of failures in various aircraft systems. In addition to detailing regular aircraft systems emergency procedures (electrical problems etc.) a detailed description of loss of command and control link procedures and rules of safety must be provided. This must describe what actions the operator must take to regain/improve connectivity and what procedures the aircraft will follow on the determination of a link loss with GCS.

5.5.3 Operating procedures for the entire system. This must include all normal procedures for the entire range of aircraft operations to include any initial setup/checkout of the system components, and all pre-flight/post-flight operating procedures and checks. Additionally, any warnings and cautions regarding the systems operation should be provided and clearly depicted.

5.5.4 The condition and minimum equipment for the system to maintain conformity to meet specification and flight authorization must be included.

### 5.6 Training

5.6.1 The Contractor must provide comprehensive training

5.6.2 The Contractor must provide a training support package to the operation and maintenance of the UAS in DRDC-METC installations.

5.6.3 The Contractor must use the same equipment and software versions for training as will be used on deployed tasks.

5.6.4 The Contractor provided training session must address, as a minimum, the following topics in the content of the course and training materials:

## Statement Of Work

- 5.6.4.1 Formal flying demonstration of system capabilities (including Stabilized Gimbal functionality)
- 5.6.4.2 Overview of System theory
- 5.6.4.3 Equipment overview
- 5.6.4.4 Equipment set-up
- 5.6.4.5 Pre-use testing/inspection
- 5.6.4.6 Weight and balance procedure for payload installation
- 5.6.4.7 Flight planning/programming
- 5.6.4.8 Use and operation
- 5.6.4.9 Flight data extraction
- 5.6.4.10 User maintenance and care
- 5.6.4.11 Scheduled Maintenance tasks
- 5.6.4.12 Consumable replacement
- 5.6.4.13 Basic diagnosis and/or fault finding
- 5.6.4.14 Storage
- 5.6.4.15 Safety, including personnel and equipment
- 5.6.4.16 Hazardous material issues
- 5.6.5 Conduct of Training
  - 5.6.5.1 The Contractor must provide one (1) training session in English required to qualify a group of no more than five (5) personnel per session. This training will take place in Canadian DND classroom facilities with appropriate range space for flying located in Valcartier, Quebec.
  - 5.6.5.2 The Contractor must provide training Documentation (schedule, manuals, presentations, checklists, cheat sheets, support documentation and material required) for each of the students that must remain in their possession for future reference.

**HIGH PRECISION SURVEY UAS**  
**DEPARTMENT OF NATIONAL DEFENCE**  
**SYSTEM PERFORMANCE SPECIFICATION (SPS)**

## 1. INTRODUCTION

- 1.1 Purpose. This System Performance Specification (SPS) describes the key performance requirements for a Commercial-Off-the-Shelf (COTS) Real-Time Kinetic (RTK)-Global Positioning System (GPS)-guided Unmanned Aircraft System (UAS); referred to henceforth as the “System”.
- 1.2 Overview. The Canadian Department of National Defence (DND) has a requirement for a survey-grade RTK-GPS guided UAS with large payload capacity and endurance. The DND-supplied payloads are to be a Radio Frequency (RF) Transponder and Infrared (IR) Target, both of which are to be fixed to the underside of the aircraft. The systems will be operated by trained personnel for the purposes of Tracking Radar (TC) and Missile Telemetry System (TS) calibration and training. These ammunition tracking radar systems are highly complex pieces of equipment, and hence require regular calibration and training to ensure their tracking accuracy and mission readiness. A RTK-GPS guided UAS is an ideal tool for such activities, as it offers an aerial target with precise real-time locating and offers simulated deployment scenarios for operator training exercises.

## 2. REQUIREMENTS

- 2.1 System Maturity. The current version of the Ground Control System (GCS) and the current version of the aircraft (i.e. propulsion system, avionics and structural components) of the System must be a COTS product with demonstrated flight history. A newer revision of the System based on an operational system configuration will be considered acceptable.
- 2.2 System Composition. The System must, as a minimum, be comprised of all major components necessary to prepare for, and conduct, autonomous flights and operator-level field maintenance. The System must include, but not necessarily be restricted to, the following items:
- 2.2.1 Aircraft. The aircraft must include a forward-facing First Person View (FPV) camera, and 2 complete sets of Aircraft batteries. The system must also include all necessary electrical interfaces, cables, hardware, and software necessary for launch, operation, control, and recovery.
- 2.2.2 Ground Control Station (GCS). The GCS must include all necessary electrical interfaces, cables, hardware, and software necessary for aircraft launch, operation, control, recovery and extraction of acquired data.
- 2.2.3 RTK-GPS. The RTK-GPS must include all necessary electrical interfaces, cables, hardware, and software for control and monitoring of the aircraft via the GCS. The ground-side of the RTK-GPS must include a survey-grade tripod with optical plummet.
- 2.2.4 Battery Charging System. The Battery Charging System must include all necessary battery charging components and accessories for the aircraft, RTK-GPS, and GCS.
- 2.2.5 Stabilized Gimbal. The stabilized gimbal must be detachable and support a payload up to 5 kg through the following range:
- 2.2.5.1 Rotation: 360° (continuous, multiple turns)
- 2.2.5.2 Tilt/Pitch:  $\pm 90^\circ$

## System Performance Specification

- 2.2.5.3 Roll:  $\pm 45^\circ$
- 2.3 Operational Environment. The System must operate in the following environment:
  - 2.3.1 Air Temperature:  $-10^\circ\text{C}$  to  $+40^\circ\text{C}$  (all mechanical/electrical systems)
  - 2.3.2 Humidity: 10% Relative Humidity (RH) to 95% RH
  - 2.3.3 Wind Limit: Winds gusts up to 30 km/hr (in all flight modes)
  - 2.3.4 Altitude: 0 to 300m Main Sea Level (MSL)
  - 2.3.5 Flight Radius from GCS:  $\geq 5$  km unobstructed line of sight (telemetry and control)
- 2.4 Aircraft Flight Performance. The Aircraft must meet or exceed the following performance requirements in standard atmosphere, as defined by International Civil Aviation Organization (ICAO) (Temperature:  $15.0^\circ\text{C}$ , Pressure: 1013.25 hPa, Air density:  $1.225\text{ kg/m}^3$ ):
  - 2.4.1 Hovering Time (including vertical take-off and landing) with gimbal and 5 kg Payload:  $\geq 15$  minutes at 20 m MSL.
  - 2.4.2 Cruising Flight Time with Gimbal and 0 kg Payload:  $\geq 30$  minutes at 20 m MSL.
  - 2.4.3 Cruising Flight Speed with Gimbal and 5 kg Payload:  $\geq 17$  m/s (no winds).
- 2.5 Aircraft Payload Capacity. The Aircraft must carry a payload of a maximum of 7 kg underneath the aircraft.

### NOTE

The anticipated payload consists of 2 independent systems which may be optionally attached (either one or the other, even both).

The 5 kg **RF transponder** responds to a 0.1W signal 10.515 GHz signal with a signal shifted up or down by 32 768 Hz.

The 2 kg omni-directional **IR source** must have a completely clear field of view (in azimuth) below the aircraft.

- 2.5.1 The Aircraft must have a clear volume to attach payload(s) underneath the aircraft, at the minimum dimensions of:
  - 2.5.1.1 Length (front to back of aircraft): 250 mm
  - 2.5.1.2 Width (side to side of aircraft): 155 mm
  - 2.5.1.3 Height (vertical distance under aircraft): 125 mm
- 2.6 Aircraft Flight Controller. The System must be equipped with a flight controller that can conduct automated flight and includes, at a minimum, the following features:
  - 2.6.1 Position reporting accuracy (2D):  $\pm 20$  mm (static mode).
  - 2.6.2 Position reporting accuracy (3D):  $\pm 30$  mm (static mode).
  - 2.6.3 Auto-takeoff, landing, and flight via programmed waypoints.
  - 2.6.4 Auto-return home (including when RF signal is lost).
  - 2.6.5 Auto-safe altitude Return Home.

## System Performance Specification

- 2.6.6 Out-of-bounds warning.
- 2.6.7 Programmable user altitude and speed restrictions.
- 2.7 GCS. The System must include a GCS with rechargeable battery set and all necessary equipment for the operation of the aircraft. The GCS must, at a minimum, include the following features:
  - 2.7.1 Allow the recording and retrieval of the following flight data: GPS time, altitude, speed, heading, RTK-GPS coordinates, and aircraft status.
  - 2.7.2 Allow input/output and real-time display of navigational and positional information to be in WGS84 Latitude/Longitude (or UTM) format.
  - 2.7.3 Record and display video feeds gathered by the forward-facing FPV camera.
  - 2.7.4 Export recorded media via industry-standard interfaces (i.e. USB or Ethernet) with time-stamp.
  - 2.7.5 Provide the operator with real-time aircraft status, navigation information and First Person View by means of High Definition (HD) displays with Windows-type interface and touch-screen functionality.
  - 2.7.6 Include HDMI output for displaying information on an external monitor.
  - 2.7.7 Include IP connectivity to external network through Wi-Fi and wired cable.
  - 2.7.8 Include joysticks and switches for manual flight and control modes.
  - 2.7.9 Be provided with an installed and configured software suite for mission planning, importation of maps, flight control, and monitoring.
- 2.8 RTK GPS. The System must include a RTK-GPS that is fully integrated with the System and includes a survey-grade tripod with optical plummet and rechargeable battery set. The RTK GPS must report position of the Aircraft in real-time with the following requirements:
  - 2.8.1 Range of airside RTK-GPS to GCS:  $\geq 5$  km;
  - 2.8.2 Range of RTK-GPS tripod to GCS:  $\geq 20$  m; and
  - 2.8.3 Minimum refresh rate: 10 Hz.
- 2.9 Battery Charger System. The System must include all necessary battery charging components and accessories for the Aircraft, RTK-GPS, and GCS that meet the following requirements:
  - 2.9.1 Nominal Input Voltage: 120 VAC, 60 Hz
  - 2.9.2 AC Power Cord Type: NEMA 5-15P plug
  - 2.9.3 Charging a complete set of all System batteries from fully depleted within 3 hrs.
  - 2.9.4 Reversed Polarity Protection or keyed connector cables for critical polarity protection.
- 2.10 Software Suite. The System software must include all software necessary to meet the following requirements:
  - 2.10.1 The System must allow the user to program and edit waypoints (coordinates in deg. /min. /sec. with altitude or UTM) for up to 99 waypoints.
  - 2.10.2 The System must display waypoints and position of Aircraft in real-time on georeferenced map.



## System Performance Specification

- 2.10.3 The System must allow user waypoint (geo-referenced) programming and edition using "Point-and-click" and/or numerical values (GPS coordinates including elevation and speed between waypoints).
  - 2.10.4 Waypoint coordinate units and resolution must meet the following requirements:
    - 2.10.4.1 Latitude and Longitude: degree/minute/second with a resolution of 0.001 sec. or better
    - 2.10.4.2 Altitude: meter (m) with a resolution of 0.01 m or better
    - 2.10.4.3 Ground Speed: meter per second (m/s) with a resolution of 0.1 m/s or better
  - 2.10.5 The System must allow flight plans to be uploaded to the flight controller.
  - 2.10.6 The System must use, as a primary positioning means, the RTK-GPS coordinate positions for navigation and position.
  - 2.10.7 The System must perform in-flight Position hold (i.e. hover).
  - 2.10.8 The System must allow user programmable boundaries using polygonal shapes (including altitude) for No-Fly/Fly Zones.
  - 2.10.9 The System must allow flight path simulations prior to real flight.
  - 2.10.10 The System must have on-board Telemetry to report the Aircraft status that includes, as a minimum: battery status, ground speed, GPS position (lat., long, alt. and/or UTM position) and heading to GCS.
  - 2.10.11 The System must allow the user the option to select between Manual Flight Control and Automatic Flight Control. Manual Flight Control means the UAV is controlled and flight stabilized by the on-board flight controller and responds to manual user control inputs via the GCS.
  - 2.10.12 The System must record flight data at a minimum of 10 Hz for a period of at least 30 minutes, which includes: time, altitude, speed, heading, geo-referenced RTK-GPS coordinates, and Aircraft status.
  - 2.10.13 The System must automatically return to user-programmed waypoint at user-programmed safe altitude, in the event of lost RF communication.
  - 2.10.14 The System must provide adequate warning, in the event of low voltage.
  - 2.10.15 The System must provide the operator with "return-to-launch" at user-programmed altitude option during flight.
  - 2.10.16 The System must allow the user to set flight altitude and Aircraft speed limits within user-programmed flight area.
- 2.11 Data Links and Frequencies. The System must include all necessary equipment for the remote wireless operation of the aircraft that meets the following requirements:
- 2.11.1 The data link must be able to send data to control the aircraft and receive imagery and telemetry information.
  - 2.11.2 The data link must employ a noise and interference tolerant and interception resistant digital waveform technique for the command and control up-link.
  - 2.11.3 All Radio Frequency (RF) equipment must comply with the Canadian Radio Communications Act and with Canadian Radio-communication Regulations.

## System Performance Specification

- 2.11.4 The Data link must operate and be compliant to licence exempt band specifications under federal regulations as per Canadian Industrial, Scientific, and Medical (ISM) or licence exempt bands. The following bands are provided as examples:
  - 2.11.4.1 902-928 Mhz
  - 2.11.4.2 2.4-2.5 GHz
  - 2.11.4.3 5.275-5.875 GHz
  
- 2.12 Network Connectivity Requirements. The System must be of closed nature, fully operable without connectivity to any outside network infrastructure. The following requirement are mandatory to both the overall System as well as its individual subcomponents:
  - 2.12.1 The System must not require Internet connections for it to function;
  - 2.12.2 The System must not require operators to create accounts on any site or service; and
  - 2.12.3 The System must support offline updates if the subcomponent has the ability of being updated or upgraded.
  - 2.12.4 The RTK (GNSS) functionality is naturally not subject to this requirement and must rely on satellite constellations to function.

**ANNEX B - BASIS OF PAYMENT**

**1. General**

A. All prices, rates, and costs are in Canadian Dollars, Canadian customs duties and excise taxes included, Applicable Taxes excluded.

**2. Firm Goods and/or Services**

**2.1 High-Precision Survey Unmanned Aircraft System (UAS)**

A. The Firm Unit Price(s) include(s) associated specifications, training, and deliverables as per Annex A, Requirement, Delivered Duty Paid (DDP) specified Delivery Point, Incoterms 2010:

Item	Delivery Point	Delivery Date	Quantity Required	Firm Unit Price
1	7 Canadian Forces Supply Depot (CFSD) Edmonton, Alberta	[Date to be detailed in the resulting contract]	1	[\$[Cost to be detailed in the resulting contract]