



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

Public Works and Government Services / Travaux  
publics et services gouvernementaux  
Kingston Procurement  
Des Acquisitions Kingston  
86 Clarence Street, 2nd floor  
Kingston  
Ontario  
K7L 1X3  
Bid Fax: (613) 545-8067

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

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

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

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

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

**Comments - Commentaires**

<b>Title - Sujet</b> Hot Stage Hall Effect Mesurement Sy	
<b>Solicitation No. - N° de l'invitation</b> 23584-180629/A	<b>Date</b> 2017-11-06
<b>Client Reference No. - N° de référence du client</b> 23584-18-0629	
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$KIN-620-7334	
<b>File No. - N° de dossier</b> KIN-7-48104 (620)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2017-12-18</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Daylight Saving Time EDT
<b>F.O.B. - F.A.B.</b> Specified Herein - Précisé dans les présentes <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input checked="" type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Porter, Marta M.	<b>Buyer Id - Id de l'acheteur</b> kin620
<b>Telephone No. - N° de téléphone</b> (613) 547-7587 ( )	<b>FAX No. - N° de FAX</b> (613) 545-8067
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> DEPARTMENT OF NATURAL RESOURCES Yu-Chih Tseng 183 Longwood Rd S Hamilton ON., L8P 0A5 Yu-Chih.Tsend@canada.ca	

**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**

Public Works and Government Services / Travaux publics et  
services gouvernementaux  
Kingston Procurement  
Des Acquisitions Kingston  
86 Clarence Street, 2nd floor  
Kingston  
Ontario  
K7L 1X3

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

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## **PART 1 - GENERAL INFORMATION**

### **1.1 Requirement**

Natural Resources Canada – Minerals and Metals Sector – CANMET Materials wishes to procure a High-Temperature Hall Effect Measurement Instrument for the determination of electronic properties of materials as per Annex A – Requirement.

The objective of the equipment is to provide researchers with an essential tool to support the research and development of photovoltaic and thermoelectric materials, in determining the electronic properties of these materials from room temperature to 450°C.

The equipment consists of all the hardware, software and service required to achieve the above objective.

### **1.2 Debriefings**

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

### **1.3 Trade Agreements**

The requirement is subject to the provisions of the North American Free Trade Agreement (NAFTA), the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), and the Canadian Free Trade Agreement (CFTA).

## **PART 2 - BIDDER INSTRUCTIONS**

### **2.1 Standard Instructions, Clauses and Conditions**

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

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

The [2003](#) (2017-04-27) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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

Delete: 60 days  
Insert: 90 days

### **2.2 Submission of Bids**

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

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

All enquiries must be submitted in writing to the Contracting Authority no later than 10 calendar days before the bid closing date. Enquiries received after that time may not be answered.

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

### **2.4 Applicable Laws**

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

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.

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## **PART 3 - BID PREPARATION INSTRUCTIONS**

### **3.1 Bid Preparation Instructions**

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

Section I: Technical Bid (2 hard copies)

Section II: Financial Bid (1 hard copy)

Section III: Certifications (1 hard copy)

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

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

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

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

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

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

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

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

Bidders must submit their financial bid in accordance with the Basis of Payment.

##### **3.1.1 Electronic Payment of Invoices – Bid**

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Annex “D” Electronic Payment Instruments, to identify which ones are accepted.

If Annex “D” Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

##### **3.1.2 Exchange Rate Fluctuation**

[C3011T](#) (2013-11-06), Exchange Rate Fluctuation

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

Bidders must submit the certifications and additional information 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.

#### 4.1.1 Technical Evaluation

##### 4.1.1.1 Mandatory Technical Criteria

Bidders must provide documentation demonstrating that their proposed product meets all the technical specifications detailed below. When published documentation does not demonstrate compliance, a written narrative demonstrating compliance will be accepted.

Item No.	Mandatory Requirement	Page# (Identify page number in your proposal where the information can be found)
	<b>M1 – Corporate Experience</b>	
M-1	The Contractor must provide proof of having shipped, installed, operated and serviced a minimum of <b>two (2)</b> systems of the same capabilities within the last <b>5 years</b> from date of bid closing.	
M-2	The Contractor must provide the name of <b>two (2)</b> different clients for which they have designed and manufactured a system of the same capabilities within the last <b>5 years</b> from date of bid closing. Company name, location, contact name, current telephone number and current email address must be provided.	
	<b>M2 – General Design Requirements (age, size, weight, safety)</b>	
M2-1	The equipment must not be prototypes, demonstration models, used or refurbished.	
M2-2	The equipment, as assembled, must be sized for placement in the second floor of CanmetMATERIALS, Room 236. The equipment's footprint must be less than 3 m (width) x 1 m (depth). See Annex A: Building Constraints.	
	<b>M3 – Facility Integration (Environment, Connection to services)</b>	
M3-1	The equipment must be able to operate indoors, within a research facility, where the ambient humidity may vary from 10% to 80% (non-condensing) and where the ambient temperature may vary from 10 °C to 35 °C.	
M3-2	The equipment must be suitable for use with any one or more of the following power supplies: <ul style="list-style-type: none"> <li>60 Hz, 110 to 120VAC, 1 phase</li> </ul>	

Item No.	Mandatory Requirement	Page# (Identify page number in your proposal where the information can be found)
M3-3	The power supply for the electromagnet must be CSA certified.	
<b>M4 - Equipment Functional &amp; Technical Requirements</b>		
M4-1	The instrument must be capable of measuring samples under inert atmosphere or a vacuum of better than 0.01 kPa (0.1 Torr).	
M4-2	The instrument must be capable of operating from room temperature to 450°C.	
M4-3	The instrument must include an electromagnet that enables the Hall Effect Measurement under a variable magnetic field, with a maximum flux density of at least 1.3 Tesla.	
M4-4	The instrument must have the capability to measure the Hall voltage within the range of 0.1V to 2V.	
M4-5	The instrument must have the capability to determine the carrier mobility from 1 to 10 <sup>7</sup> cm <sup>2</sup> /Volt-sec.	
M4-6	The instrument must have the capability to measure a carrier density from 10 <sup>7</sup> to 10 <sup>19</sup> cm <sup>-3</sup> .	
M4-7	The instrument must have the capability to measure a resistivity from 0.1 to 10 <sup>7</sup> ohm-cm.	
M4-8	The system must allow measurement on rectangular samples with dimensions of at least 5mm x 5mm.	
M4-9	The system must have an over-temperature interlock that stops operation if temperature exceeds a pre-defined temperature.	
M4-10	The system must not automatically re-start the heating cycle after power failure or over-temperature failure without user intervention.	
M4-11	The system must have spring loaded sample probes.	
M4-12	The system must include a circulating water chiller for cooling the electromagnet specified in M4-3. The chiller must provide a flow rate of at least 0.5 US gallon per minute, and a pressure differential of at least 16 pounds per square inch (psi) between the water inlet and outlet.	
<b>M5 – Software and Computer Requirements</b>		
M5-1	The instrument must have a software that enables automated measurement, needing only these input parameters from the operator: <ul style="list-style-type: none"> <li>• Beginning and ending temperature</li> <li>• Number of test points within the specified temperature range.</li> </ul>	
M5-2	The software must be capable of: <ul style="list-style-type: none"> <li>• Automatically heating and stabilization (to better than 1 °C) to a pre-defined temperature.</li> <li>• Plotting, as a function of temperature, these quantities: 1) Carrier concentration 2) Mobility 3) Resistivity 4) Hall coefficient.</li> </ul>	
M5-3	The instrument and software must not require user intervention once the test is started.	
M5-4	No options or add-on packages must be required to use all possible features of the software.	
M5-5	The measurement software must operate in an IBM compatible PC operating under Windows 10.	
M5-6	The software must allow data to be exported in ASCII format and one of	

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<b>Item No.</b>	<b>Mandatory Requirement</b>	<b>Page# (Identify page number in your proposal where the information can be found)</b>
	these graphical formats: pdf, tif, jpg or bmp.	
M5-7	The software must provide the user the ability to plot, analyze and process data.	

#### 4.1.1 Financial Evaluation

To be responsive the Bidder must:

- 1) Provide Firm Unit prices for **all** items listed in Annex B – Basis of Payment.
- 2) Not alter the format of the Basis of Payment in Annex B.

The Bidder's Firm Unit Prices will be multiplied by the quantity to calculate the extended firm Unit Pricing.

SACC Manual Clause [A0220T](#) (2014-06-26), Evaluation of Price

#### 4.2 Basis of Selection

##### 4.2.1 Basis of Selection

SACC Manual Clause A0031T (2010-08-16), Basis of Selection – Mandatory Technical Criteria

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

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

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.

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.

### **5.1 Certifications Required with the Bid**

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

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

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the 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 Certifications Precedent to Contract Award and Additional Information**

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 provided will render the bid non-responsive.

#### **5.2.1 Integrity Provisions – Required Documentation**

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.

#### **5.2.2 Federal Contractors Program for Employment Equity - Bid Certification**

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list 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#>).

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**

**6.1.1** There is no security requirement applicable to the Contract.

### **6.2 Requirement**

Natural Resources Canada – Minerals and Metals Sector – CANMET Materials wishes to procure a High-Temperature Hall Effect Measurement Instrument for the determination of electronic properties of materials as per Annex A – Requirement.

The objective of the equipment is to provide researchers with an essential tool to support the research and development of photovoltaic and thermoelectric materials, in determining the electronic properties of these materials from room temperature to 450°C.

The equipment consists of all the hardware, software and service required to achieve the above objective.

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

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

#### **6.3.1 General Conditions**

[2010A](#) (2016-04-04), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

#### **6.3.2 Supplemental General Conditions**

[4001](#) (2015-04-01), Supplemental General Conditions – Hardware Purchase, Lease and Maintenance, apply to and form part of the Contract.

[4003](#) (2010-08-16), Supplemental General Conditions – Licensed Software, apply to and form part of the Contract.

[4004](#) (2013-04-25), Supplemental General Conditions – Maintenance and Support Services for Licensed Software, apply to and form part of the Contract.

### **6.4 Term of Contract**

#### **6.4.1 Period of the Contract**

The period of the Contract is from date of Contract to June 30, 2018 inclusive

#### **6.4.2 Delivery Date**

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While delivery is requested by March 2, 2018, the best delivery that could be offered is \_\_\_\_\_ **(To be filled out by Bidder)**

#### **6.4.3 Shipping Instructions – Free on Board Destination and Delivered Duty Paid**

Incoterms 2000 "DDP Delivered Duty Paid" NRCan, CANMATERIALS, Hamilton, Ontario.

#### **6.5 Authorities**

##### **6.5.1 Contracting Authority**

The Contracting Authority for the Contract is:

Name: Marta Porter  
Title: A/Team Leader  
Public Works and Government Services Canada  
Acquisitions Branch  
Address: 86 Clarence Street, 2<sup>nd</sup> Floor  
Kingston ON., K7L 1X3  
Telephone: 613-547-7587 Cell: 613-483-6084  
Facsimile: 613-545-8067  
E-mail address: marta.porter@pwgsc.gc.ca

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

##### **6.5.2 Project Authority *(To be entered at time of Contract Award)***

The Project Authority for the Contract is:

Name:  
Title:  
Organization:  
Address:

Telephone:  
Facsimile:  
E-mail:

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

##### **6.5.3 Inspection Authority *(To be entered at time of Contract Award)***

The Inspection Authority for the Contract is:

Name:  
Title:  
Department or Agency:  
Address:

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---

Telephone:  
Facsimile:  
E-mail address:

The Inspection Authority is the representative of the department or agency for whom the Work is being performed under the Contract and is responsible for inspection of the Work and acceptance of the finished work. The Inspection Authority may be represented on-site by a designated inspector and any other Government of Canada inspector who may from time to time be assigned in support of the designated Inspector. Contracting officers must identify any designated inspector in the contract.

#### **6.5.4 Technical Authority *(To be entered at time of Contract Award)***

The Technical Authority for the Contract is:

Name:  
Title:  
Department or Agency:  
Address:

Telephone:  
Facsimile:  
E-mail address:

The Technical Authority named above 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.

#### **6.5.5 Procurement Authority *(To be entered at time of Contract Award)***

The Procurement Authority for the Contract is:

Name:  
Title:  
Organization:  
Address:

Telephone:  
Facsimile:  
E-mail:

The Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The Procurement Authority is responsible for the implementation of tools and processes required for the administration of the Contract. The Contractor may discuss administrative matters identified in the Contract with the Procurement Authority however the Procurement Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

#### **6.5.6 Contractor's Representative *(To be filled in by Bidder)***

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

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---

Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

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

## 6.6 Payment

### 6.6.1 Basis of Payment

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

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

### 6.6.2 Limitation of Price

SACC Manual clause [C6000C](#) (2017-08-17) Limitation of Price

### 6.6.3 Single Payment

SACC Manual clause [H1000C](#) (2017-08-17) Single Payment

### 6.6.5 Electronic Payment of Invoices – Contract

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

- a. Visa Acquisition Card;
- b. MasterCard Acquisition Card;
- c. Direct Deposit (Domestic and International);
- d. Electronic Data Interchange (EDI);
- e. Wire Transfer (International Only);
- f. Large Value Transfer System (LVTS) (Over \$25M)

## 6.7 Invoicing Instructions

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.

Invoices must be distributed as follows:

- a. The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment.

## 6.8 Certifications and Additional Information

### 6.8.1 Compliance

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

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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.

## 6.9 Applicable Laws

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

## 6.10 Priority of Documents

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

- (a) the Articles of Agreement;
- (b) the supplemental general conditions [4001](#) (2015-04-01), Supplemental General Conditions – Hardware Purchase, Lease and Maintenance;
- (c) the supplemental general conditions [4003](#) (2010-08-16), Supplemental General Conditions – Licensed Software;
- (d) the supplemental general conditions [4004](#) (2013-04-25), Supplemental General Conditions – Maintenance and Support Services for Licensed Software;
- (e) the general conditions 2010A (2016-04-04) General Conditions – Goods (Medium Complexity);
- (f) Annex A, Requirement;
- (g) Annex B, Basis of Payment;
- (h) Annex C, Site Acceptance Testing;
- (i) the Contractor's bid dated \_\_\_\_\_ .

## 6.11 Insurance

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.

## 6.12 Inspection and Acceptance

The Project 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 Statement of Work 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.

## **ANNEX "A"**

### **REQUIREMENT**

CanmetMATERIALS requires a High-Temperature Hall Effect Measurement Instrument to support the research and development in thermoelectric materials. This instrument determines the electronic properties of a semiconductor material by making the Hall Effect measurement on a sample at various temperatures. The projects supported by this instrument thermoelectric materials. Currently, these measurements cannot be done at CanmetMATERIALS or collaborating universities. They are available at external contractors, at an elevated cost. It is determined that the capital cost of this instrument can be recovered very quickly considering the number of projects and the revenue deriving from them.

#### **1.1 Description of Equipment/Services being procured**

The system must have the following main components:

1. One or more sample chamber with at least one access;
2. Heating elements;
3. Heating and cooling system to provide accurate temperature control of the sample;
4. Computerized data recording system with supervisory visualization system and control system;
5. A magnet to apply the magnetic field to the sample under test;
6. Electronic instruments capable of determining with great accuracy the resistivity of the sample under test;

The equipment must be installed in Room 236, at 183 Longwood Rd. South, Hamilton, ON, L8P 0A5, Canada.

#### **2.1 Installation**

##### **2.1.1 Calibration Certification**

The contractor must provide calibration and certification of calibration of the equipment as installed at the Hamilton Facility.

The procurement must include a calibration plan identifying and listing each measuring device that must be calibrated, calibration range, recommended points and frequency of calibration.

The system design must include calibration ports, and arrangements to facilitate the calibration operation.

#### **2.2 Manuals & Equipment Drawings**

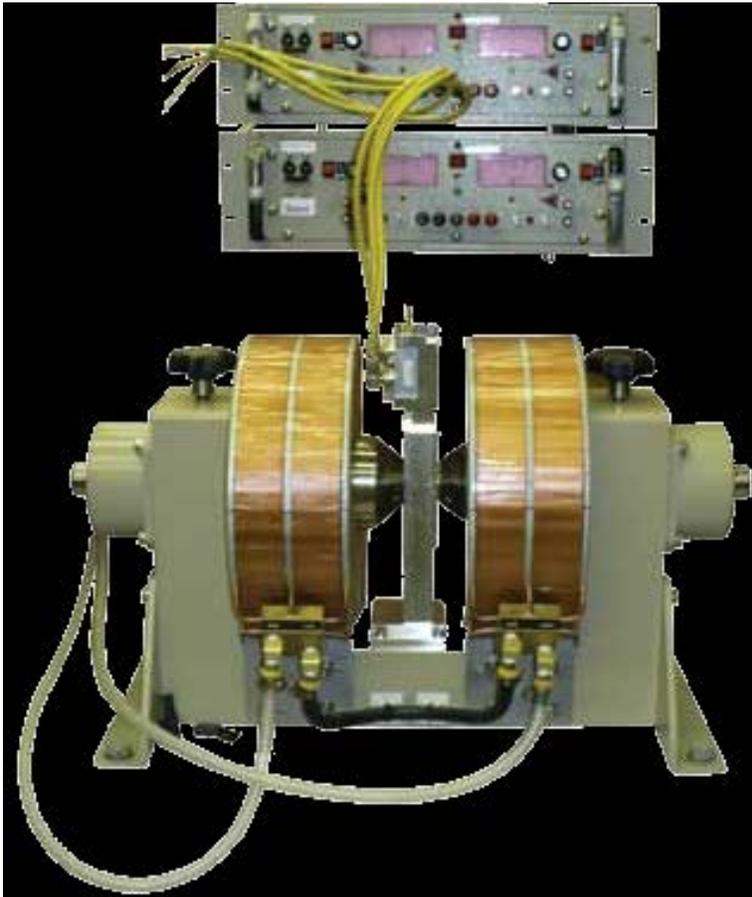
The Contractor is to provide to NRCAN, two (2) hard copies and one (1) electronic copy, in MS Word or PDF format, of the manuals which must include, but not limited to:

- Installation and startup manuals
- Calibration Procedure and certifications
- User Manuals including electrical, hydraulic and pneumatic schematics
- OEM certifications
- Maintenance, Troubleshooting & Parts manual
- Procedure to place the system into a safe and reliable shutdown state
- Emergency procedures

Manuals must be provided to NRCAN in English language.

The Contractor is to provide to NRCan, electronic copies, in PDF format, of the system schematics, layouts, and equipment detail drawings.

### Proposed System - Picture



### 2.3 Service, Support & Updates

The Contractor must provide for **1-year parts and labour warranty** on the entire equipment. Warranty will begin on the day that the equipment is accepted as fully tested and operational to the satisfaction of NRCan at CanmetMATERIALS.

Purchase of the equipment must include technical support as either; regional technical support; technical phone support; or support via the Internet. Communication must begin within **72 hours** of the initial request for support.

The system provided must have spare parts and service support available for a minimum of **three (3) years** after purchase.

The Contractor must provide all software updates and new releases to the purchaser for a period of at least **one (1) year** following acceptance, at no additional cost.

Note: The word "updates" means all enhancements, extensions or other modifications to the software. The word "releases" means enhancements or modifications to the software or new modules or supplementary modules that function in conjunction with the software, that represent the next generation of software, and which the Contractor has decided to make available to its customers usually for an additional charge.

### **Acceptance Test Requirements**

The equipment as supplied and installed must pass all tests and checks as specified in Annex C - Site Acceptance Testing. Testing to occur after Contract Award and as per General Condition 2010A 08 (2008-05-12) Inspection and Acceptance of the Work.

### **3.0 Building Constraints**

All building constraints must be verified against the latest version of the buildings as built drawings and specifications.

#### **Loading Dock Limits:**

The pinch point for truck unloading directly from their box or flatbed is the inner door and dock leveller:

Overhead door 2.3m wide x 3.0m high

- Dock floor is 1.2m below finish floor of the ground floor level.
- Dock leveller 20 Ton capacity with platform 2.1m wide x 2.1m long + drop down lip 2.14m wide x 2.22m Deep. Hydraulic leveller range is +/- 0.3m

The door at the top of the ramp is 2.3m wide x 3m high.

#### **Elevator Limits:**

##### **Passenger Elevator:**

- Load Limit: 1590 kg (3500 lb).
- Door Opening: width of 1070 mm (42") and a height of 2134 mm (84")
- Interior Dimensions: 2030 mm (6'8") wide by 1650 mm (5'5") deep by height to suspended ceiling of 2290 mm (7'6").

##### **Freight Elevator:**

- Load Limit: 4545 kg (10000 lb).
- Door Opening: width of 2440 mm (8'0") and a height of 2440 mm (8'0")
- Interior Dimensions: 2440 mm (8'0") wide X 4290 mm (14'1") deep X height of 3050 mm (10'0").

**Pallet truck Limit:** 2492 kg (5500 lb)

#### **Associated Documents**

Note: the content of this section is not all inclusive. It is the responsibility of the supplier to ensure that all relevant regulations, guidelines and standards are met as it applies to this scope of work.

#### **Regulations, Guidelines, and Standards**

##### **Government of Canada**

Canada Labour Code Part II: Occupational Health and Safety  
Canada Occupational Health and Safety Regulations

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Canadian Electrical Code  
National Fire Code

**Province of Ontario**

Occupational Health and Safety Act  
Ontario's 2012 OH&S Act and Regulations  
Ontario Building Code (current edition)  
Ontario Fire Code (current edition)  
Environmental Protection Act  
Ontario Electrical Safety Code 25<sup>th</sup> edition

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**ANNEX "B"**

**BASIS OF PAYMENT**

Firm, all-inclusive unit prices in Canadian dollars (exclusive of HST). H.S.T., if applicable, is extra to the price herein and shall be shown on any invoice as a separate item. Customs duties are included.

**Incoterms 2000 "DDP Delivered Duty Paid":**

**NRCan, CANMATERIALS, Hamilton, Ontario.**

<u>Item</u>	<u>Qty</u>	<u>Firm Unit Price (CAD)</u>
Supply, delivery and installation/calibration of one (1) Hot Stage Hall Effect Measurement System as per Annex A – Requirement.	1	\$ _____
On-site training session (in English) to include all travel costs.	1	\$ _____
Manufacturer: _____		
Model Number: _____		
	Total Firm Unit Price	\$ _____

## ANNEX "C"

### Site Acceptance Testing

**(Testing to occur after Contract Award and as per General Condition 2010A 08 (2008-05-12)  
Inspection and Acceptance of the Work)**

#### Introduction

This document outlines the methods and testing procedures for all acceptance testing for the High-Temperature Hall Effect Measurement Instrument. In order for acceptance testing to be completed successfully, the "Vendor" must perform all tests to successful completion in the presence of a CANMET MATERIALS Technical representative. Each test has two possible outcomes: pass or fail. Any failed test is reason for the entire test sequence to be failed.

#### Project Description

The equipment is being purchased to perform measurements of electronic properties of a semiconductor sample between room temperature and 450 °C.

#### Test Team Personnel

The test team consists of one "Vendor" tester and one primary CANMET MATERIALS 's witness who have the authority to sign off tests and two CANMET MATERIALS's Secondary Witness who can observe the tests and input their observations to the primary witness.

Name	Role	Company
Yu-Chih Tseng	Primary Operator	
	Secondary Operator	
Yu-Chih Tseng	Primary Witness	CANMET MATERIALS
Roger McCallum	Secondary Witness	CANMET MATERIALS

#### Stakeholders

##### CANMET MATERIALS

Name	Department	Role
Yu-Chih Tseng	NRCAN	Research Scientist
Roger McCallum	HEALTH & SAFETY	Occupational Health & Safety Officer

#### Vendor

Name	Department	Role

**Sign-off**

By signing this document, each party agrees to the terms and protocols in the Acceptance Test Plan.

	VENDOR	COMPANY
Signature		
Name		CANMET MATERIALS
Title		Technical Authority
Date		

**Deliverables**

**Hardware**

The following hardware items must be delivered to CANMET MATERIALS fully inspected and functional.

Quantity	Deliverable	Pass / Fail	Model/Part #
1			

**Software**

The following software items must be delivered to CANMET MATERIALS fully inspected and functional.

Quantity	Deliverable	Pass / Fail	Product/Part #
1			

**Site acceptance Test Plan**

**Site Acceptance Test (SAT)**

SAT will be conducted at the CANMET MATERIALS site in Hamilton, ON after installation and commissioning has been completed.

**1. Equipment Certifications**

# Table A – Mandatory Equipment Requirements	Test Description	Details	SAT
1.1	CSA/electrical approval of electromagnet power supply		

**2. Facilities integration**

Table A Mandatory Specifications	Test Description	Details	SAT
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3.1	Equipment must be able to operate within these electrical requirements: 1 phase, 50-60Hz, 110-120V		
3.2	If there are utility failures, the product must shutdown without any hazard to the operators, facilities, or itself.		
3.3	There must not be any leaks in the plumbings and fittings supplied by the vendor.		

#### 4. Functional Testing

Table A Mandatory Specifications	Test Description	Details	SAT
4.1	Equipment must be able to achieve a base pressure of 0.1 mBar or better within 30 minutes, OR Achieve an inert sample atmosphere without leaks.		
4.2	Equipment must be able to achieve sample temperature anywhere between room temperature and 450 °C.	Each sample temperature must be stabilized to within $\pm 1.0K$ , within 15 minutes.	
4.3	Instrument must be able to measure samples under inert gas or vacuum	Must demonstrate temperature stabilization ( $\pm 1$ degree Celcius) under both environments.	
4.4	Hall Effect measurement of one phosphorus-doped silicon sample.	The properties deduced by the instrument must match the sample specifications to within 5%.	
4.5	Hall Effect measurement of one boron-doped silicon sample.	The properties deduced by the instrument must match the sample specifications to within 5%.	
4.6	Demonstrate capability to export data into ASCII format.	Software export option and working USB port.	

### Calibration

The supplier must provide calibration and certification of calibration of the equipment as installed at CANMET MATERIALS's lab. The measurements must be traceable to the International System of Units (SI).

#	Test Description	Details	SAT
1	Calibration plan		
2	Calibration report		

### Manuals and Equipment drawings

The Vendor must provide two (2) hard copies and one (1) electronic copy, in MS Word or PDF format of the manuals which must include, but not limited to:

- Installation and start up manuals
- User manuals
- Maintenance, troubleshooting and parts manual
- Software back-up

#	Test Description	Details	SAT
1	Installation and start up manuals		
2	User manuals		
3	Maintenance		
4	Software back up		

### Safety Testing

CANMET MATERIALS expects that all instrumentation installed in the lab will conform to the Health and Safety standards outlined within the User Requirements Specification. The HEALTH & SAFETY department also expects all automation, and instrumentation to be certified with the CSA standard. This section will ensure that the system conforms to these standards. All safety tests must be passed without exception. No deficiencies will be accepted for this section.

#	Test Description	Details	SAT
1	CSA/electrical approval of the electromagnet power supply		
2	Demonstrate functioning interlocks: <ul style="list-style-type: none"> <li>• Over temperature interlock</li> </ul>		
3	Demonstrate that equipment stops operation and safely shuts off in the event of cooling failure or over temperature.		

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### **Deficiencies**

#### **Issues**

#	Test # / Sequence	Description	Comments

#### **Action Plan**

Deficiency	Action Plan

#### **Final sign-off**

##### **SAT**

The SAT for CANMET MATERIALS system Hall Effect was

##### **OUTCOME**

Tested by:	Date:	Witnessed by:	Date:
Vendor Representative		Staff	
Vendor		CANMET MATERIALS	

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## **ANNEX “D” to PART 3 OF THE BID SOLICITATION**

### **ELECTRONIC PAYMENT INSTRUMENTS**

The Bidder accepts 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);
- Large Value Transfer System (LVTS) (Over \$25M)