



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

Title - Sujet Plant Growth Chamber	
Solicitation No. - N° de l'invitation 01686-190266/A	Date 2018-10-23
Client Reference No. - N° de référence du client 01686-19-0266	
GETS Reference No. - N° de référence de SEAG PW-\$KIN-900-7600	
File No. - N° de dossier KIN-8-50059 (900)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-12-03	Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Emmons, Chris	Buyer Id - Id de l'acheteur kin900
Telephone No. - N° de téléphone (613) 545-8083 ()	FAX No. - N° de FAX (613) 545-8067
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF AGRICULTURE AND AGRI-FOOD HARROW RESEARCH DEVELOPMENT CTR 2585 COUNTY RD 20 HARROW Ontario NOR1G0 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

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

Issuing Office - Bureau de distribution

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

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

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PART 1 - GENERAL INFORMATION

1.1 Requirement

The requirement is detailed under Article 6.2 of the resulting contract clauses.

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).

1.4 epost Connect service

This bid solicitation allows bidders to use the epost Connect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.

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](#) (2018-05-22) 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

2.1.1 **SACC Manual Clauses**

SACC Manual clause [B1000T](#) (2014-06-26) Condition of Material

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 in the bid solicitation.

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

Public Works and Government Services
Kingston Procurement
86 Clarence Street, 2nd Floor
Kingston, Ontario, K7L 1X3
Fax: (613) 545-8067

TPSGC.orreceptiondessoumissions-orbidreceiving.PWGSC@tpsgc-pwgsc.gc.ca (email address for epost Connect service) Offers will be not be accepted if emailed directly to this email address. This email is to initiate an ePost Connect conversation, as detailed in the Standard Instructions.

2.3 **Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than 10 (ten) 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 _____.

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

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

- If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. Bidders must provide their bid in a single transmission. The epost Connect service has the capacity to receive multiple documents, up to 1GB per individual attachment.

The bid must be gathered per section and separated as follows:

Section I: Technical Bid
Section II: Financial Bid
Section III: Certifications

- If the Bidder chooses to submit its bid in hard copies, Canada requests that the Bidder submits its bid in separately bound sections as follows:

Section I: Technical Offer (2 hard copies)

Section II: Financial Offer (1 hard copy)

Section III: Certifications (1 hard copy)

If there is a discrepancy between the wording of the soft copy on electronic media and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

- If the Bidder is simultaneously providing copies of its bid using multiple acceptable delivery methods, and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through epost Connect service, the wording of the electronic copy provided through epost Connect service will have priority over the wording of the other copies.

If there is a discrepancy between the wording of the soft copy on electronic media and the hard copy, the wording of the hard copy will have priority over the wording of the soft 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 hard copy 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 (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). 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 “C” Electronic Payment Instruments, to identify which ones are accepted.

If Annex “C” 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

3.1.3 SACC Manual Clauses

A9097T (2007-05-25) Substantial Information

Bidders must demonstrate their compliance with the following sections of the bid solicitation by providing substantial information describing completely and in detail how the requirement is met or addressed.

Bidders must provide with their technical bid, a document indicating clearly where the substantial information for each of the sections identified below can be found:

- a) 4.1.1.1 Mandatory Technical Criteria
- b) Annex “A” Requirement

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

To be considered responsive, a bid must meet all the specifications in Annex "A" and the following mandatory technical criteria. Failure to meet the specifications in Annex "A" and the following mandatory technical criteria will render your submission non-responsive and it will be given no further consideration.

1. Bidders must be ISO 9001 certified and provide their ISO 9001 Certification with their bid to be considered compliant . The certification applies to the order, design and manufacturing processes.
2. All chambers must be provided with CSA (Canadian Standards Association) product certification to UL (United Laboratories) or CSA (Canadian Standards Association) CSA (Canadian Standards Association) International, or an equivalent Nationally Recognized Testing Laboratory (NRTL), for use in both the United States and Canada. Proof of product certification must be provided.

4.1.2 Financial Evaluation

The Bidder's Firm Lot Price will be multiplied by the quantity to calculate the extended Firm Lot Price .

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

4.2 Basis of Selection

- 4.2.1** *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

The Contractor must provide the items detailed under the "Requirement" at Annex "A".

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 (2018-06-21), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

Delete: 2010A 09 (2014-09-25) Warranty

The warranty period will be 12 months after delivery and acceptance of the Work or length of the Contractor's or manufacturer's standard warranty period, whichever is longer.

Insert: 2010A 09 (2014-09-25) Warranty

The warranty period will be 24 months after delivery and acceptance of the Work or length of the Contractor's or manufacturer's standard warranty period, whichever is longer.

6.4 Term of Contract

6.4.1 Period of the Contract

The period of the Contract is from date of Contract award to 30 June 2019 inclusive.

6.4.2 Delivery Date

All the deliverables must be received on or before 31 March 2019.

6.4.3 Shipping Instructions – FOB Destination and Delivery Duty Paid

Delivered Duty Paid (DDP) AAFC Harrow Research and Development Center, County Road 20, Harrow, ON, N0R 1G0

6.4.4 Delivery Points

Delivery of the requirement will be made to delivery point(s) specified at Annex "A" of the Contract.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Chris Emmons
Title: Supply Specialist

Public Services and Procurement Canada
Acquisitions Branch
Directorate: Acquisitions Kingston
86 Clarence Street, 2nd Floor
Kingston, Ontario K7L 1X3

Telephone: 613-545-8083
Facsimile: 613-545-8067
E-mail address: chris.emmons@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

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 Contractor's Representative

Name: _____

Title: _____

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 firm lot prices, as specified in Annex B for a cost of \$_____. 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 (2008-05-12) Single Payment

6.6.4 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

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.
2. Invoices must be distributed as follows:

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

(b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

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 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 _____.

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.

Solicitation No. - N° de l'invitation
W0113-18CS14/A
Client Ref. No. - N° de réf. du client
W0113-18CS14

Amd. No. - N° de la modif.
File No. - N° du dossier
KIN-8-50060

Buyer ID - Id de l'acheteur
KIN900
CCC No./N° CCC - FMS No./N° VME

- (a) the Articles of Agreement;
- (b) the general conditions 2010A (2018-06-21), Goods (Medium Complexity);
- (c) Annex A, Requirement;
- (d) Annex B, Basis of Payment;
- (e) the Contractor's bid dated _____

6.11 SACC Manual Clauses

SACC Manual clause G1005C (2016-01-28) Insurance – No Specific Requirement

ANNEX "A" REQUIREMENT

Agriculture and Agri-Food Canada requires the supply and delivery of one (1) standard production model Controlled Environment Plant Growth Chambers (14 to 16 square foot internal growth area) for optimum conditions suitable for plant growth, carbon dioxide enrichment studies and other related similar research projects to Agriculture and Agri-Food Canada, Greenhouse and Processing Crops Research Centre, 2585 County Road 20, Harrow, ON, CANADA, NOR 1 GO in accordance with the specifications detailed herein.

Standard production model Controlled Environment Chambers will mean a chamber manufactured as a model line, sold and supported by the manufacturer with original equipment manufacturers parts, skilled repair technicians, covered by a full two year warranty coverage and sold worldwide. Prototype or one of a kind controlled environment growth chambers are not acceptable.

Technical Requirements:

Bidder must guarantee the availability of parts and components for a minimum of 10 years from date of contract award.

1.1 1 Wall panel construction must be woodless with CFC-free insulation. Exterior panels must be aluminum, finished with baked on enamel paint having either a smooth or pebbled finish or high polished stainless steel. Interior panels and doors must be finished with high reflective white enamel baked on smooth aluminum sheets or high polished stainless steel. End walls must have a reflective specular aluminum finish or polished stainless steel. The chamber must be equipped with mechanical fastening devices which will allow the chamber to be secured to the floor with concrete anchors.

1.2 The growth chamber must be equipped with two front mounted access doors complete with thermal gasket, keyed magnetic locks and stainless steel hinges. Each door must be supplied with one (1) dual pane observation window with a minimum glass size of 10"x 14" (254mm x 355mm) complete with a light tight cover, pull handle and latching hardware.

1.3 The growth chamber must be equipped with two (2), internally mounted 120 Volt AC duplex receptacles, rated for damp locations and wired with overload protection.

1.4 Outside dimensions must be 104"W x 35"D x 78"H (2640mmW x 901mmD x 1980mmH) ± 2" (50mm)

1.5 Inside dimensions must be 73" W x 31"D (1854mmW x 800mmD) ± 2" (50mm)

1.6 Interior growth area must be no less than 15 to 16 ft² (1.4m² to (1.5m².)

1.7 Growth height must be no less than 57" (1448mm) from growth floor to light canopy in the UP position.

1.8 The growth chamber must be equipped with one hose bib and connected to the local control system for timed control of automatic watering.

1.9 The growth chamber must be equipped with a central control panel located at the left or right

end of the growth chamber depending on the machine area location.

1.10 Must provide each chamber with two (2) instrumentation ports with a minimum diameter of 1 inch (25.4mm).

1.11 Each chamber must be supplied with a factory installed removable aluminum or stainless steel perforated growth floor which allows conditioned air movement in a vertical direction through the crop and then through the light canopy.

1.12 Subfloor and drain must be corrosion resistant and must be waterproofed in order to avoid water leakage through the side panels. Agriculture and Agri-Food Canada will connect all chamber drains to existing floor drain systems in the complex. All drain openings and drain lines installed as part of the chamber by the manufacturer must be capable of evacuating evaporator defrost cycle condensation and excess plant watering.

1.13 Each chamber must be set up for single tier operation with vertical air flow.

Relative Humidity Requirements:

1.14 Must provide additive humidity to achieve a minimum of 90% RH lights OFF and 80% RH lights ON, limited by a +25°C maximum dew point through the incorporation of spray nozzles, requiring 60 psi (4.2 bar) pressure, that are programmed with the control system.

1.15 Must ensure humidity control is within $\pm 3\%$ RH and system must incorporate a dry humidity sensor located in a device for sensing, measuring and controlling. Must provide misting programming through the microprocessor controller.

1.16 Must provide a separate coil dehumidification to allow reduction in humidity to at least 40% RH at +25°C.

Refrigeration System and Components:

1.17 Must provide a water-cooled, hermetically sealed condensing unit for the growth chamber. Must ensure valves provide continuous flow and variable temperature returns to cooling water.

1.18 Must provide a hot-gas refrigeration system incorporating a 3-way proportional valve to ensure a steady-state system without the use of individual solenoids on separate heating and cooling circuits. Must ensure unit is capable of switching from cooling tower operations to domestic city water, includes a thermostatic 3-way water valve, and is equipped with a hand operated bypass shut off valve and a water condenser sized for maximum inlet water temperature of +29°C. Maximum pressure drop across condenser and water valve shall not exceed 10 psi (0.7 bar).

1.19 Must ensure evaporator coil be copper-tube construction.

1.20 Must ensure condensing unit is charged with CFC-free refrigerant.

1.21 In the single tier configuration mode, must ensure air in the chamber is directed uniformly upward (vertical) through the floor at less than 50 fUmin (15.2 m/min).

1.22 Must ensure the refrigeration system is capable of removing radiant lamp heat.

1.23 Must ensure conditioning unit has sufficient fans, heaters and valves necessary to meet the specified parameters

1.24 Fresh air control must have individual manual adjustment of positively sealed inlet and outlet from open 20 ff/min(0.57 m'/min)to close.

1.25 Monitoring must include the following: a) Refrigeration system operation is monitored by the control system, including visual and audible alarm. b) Pressure transducers allow for real-time diagnostics for preventative maintenance and repair. c) Proportional refrigeration control valve to have feedback for monitoring valves position by Building Management System.

1.26 Each unit must be assembled and tested at the manufacturing facility prior to shipment and delivery to ensure chamber performance meets all factory performance objectives.

Lighting Requirements - High Light Intensity

Bidders must provide growth chamber light scans to confirm light intensity is as specified and stated in micromoles/m²/sec measured at 6" from the lamps, verified at 25°C with 100 hour old lamps.

1.27 In the single tier vertical air flow configuration mode, manufacturer must ensure light intensity at a minimum of 875 to 925 micromoles/m²/s measured at 6" (150mm) from lamps, verified at 25°C with 100 hour old lamps.

1.28 Chamber must be equipped with an adjustable light canopy that will ensure a balance spectrum for research plant materials using TS fluorescent and Halogen incandescent lamps.

1.29 Must ensure that the lamp bank is counterbalanced and adjustable to a minimum of 57" (1448mm) from the floor.

1.30 Must ensure fluorescent and incandescent lamps are controlled independently with a minimum of 4 or 5 programming levels for each lamp type.

1.31 Must ensure energy efficient electronic ballasts are easily accessible for servicing and that cooling will be provided by adequate air circulating fan motors.

1.32 Supplier must provide factory installed quantum light meter for display purposes and recording of light output supplied in each new chamber.

Temperature Requirements for Standard Temperature Operation

1.33 Standard temperature operation range: Must ensure full operation with a minimum temperature range of +4°C to +45°C lights OFF; +10°C to +45°C lights ON (full fresh air) is provided.

1.34 Must ensure a temperature control within ±0.5°C, at control point.

1.35 Must ensure primary temperature safety limits are provided for programmable high and low temperature alarm limit that automatically follows the programmed set point.

1.36 Must provide secondary temperature safety limits to provide independent high and low temperature limit.

1.37 Must ensure an audible alarm is provided for both limits and that activation of safety limit set points turns off power to the chamber.

1.38 Must provide a vertically adjustable sensing device located in the growth area to ensure a

continuous sample of growth room air is drawn over the sensors for accurate controlling, measuring and recording at plant location and ensuring to mitigate lamp radiation.

Utility Requirements:

- 1.39 Electrical Service: Bidder will connect unit to existing electrical service on site with an external disconnect switch. Growth chamber must be configured for 120/208 volt, three phase, 60 cycle, four wire plus ground electrical service.
- 1.40 Drain: Bidder will connect drain lines from growth chamber to facility drains.
- 1.41 Bidder will connect the supply and return condenser cooling water lines from central cooling tower system and connect humidity system existing reverse osmosis water supply.
- 1.42 Bidder will supply Reverse Osmosis supply to chamber additive humidification system.

Installation Specifications:

- 1.44 AAFC will off-load the equipment at the delivery site with appropriate unloading devices
- 1.45 AAFC will transport the equipment from the off-loading or storage area to the assembly area.
- 1.46 AAFC will un-crate equipment and dispose of crating material in customer supplied disposal bins.
- 1.47 AAFC will assemble and make work the supplied equipment using qualified personnel.
- 1.48 Supplier will start-up and check equipment performance and operation to factory specifications.
- 1.49 Supplier will provide two hours of instruction on use and maintenance of the equipment.
- 1.50 Supplier will provide for each unit one complete set of user documentation technical specifications, maintenance manuals, drawings and list of spare parts in English.
- 1.51 AAFC will ensure fully functional services are provided in accordance with local codes and legislation

Control System:

- 1.52 Bidder must provide a touch screen controller with a back lit high resolution display monitor at each unit. Must ensure daily programs can be linked to simulate multi day or seasonal programs. Must ensure up to eight programs may be sequenced together. Must provide an on screen help manual for programming. Must provide a status screen to display set point conditions, unit ID number and operating indicators of various components.
- 1.53 Must ensure all controlled parameters at each unit can be recorded to provide a log of actual experimental results. Must ensure that stored data can be transferred to a desktop via a portable storage device and local area network. Must ensure graphing of both set points and actual performance values is provided. Pan and zoom functions to increase resolution must be incorporated. Must provide graphing program to view historical data in graph form to compare with actual performance. Must ensure a continuous on-screen graphical display of the last 24 hours of room performance and next 8 hours of unit set point program. Inputs and controlled parameters must be automatically logged to provide a historical record of performance.

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- 1.54 Must provide a minimum of three multi-level security password protection to each unit.
- 1.55 The unit must be equipped with an on screen diagnostic display of optional inputs and outputs such as refrigeration valves, damper motors, etc., that allows service personnel access to the service life of the components including lamp burning hours, valve cycles etc.
- 1.56 Must ensure each unit is equipped with a start-up delay to stagger activation of units.
- 1.57 Must ensure each unit controller is shipped communications-ready for connection to a Central Management System and the local area network.
- 1.58 The growth chamber must be equipped with dry contact relays to allow operator to track and receive high and low temperature alarms, humidity, lighting and other controlled parameters from the unit. The unit must allow the integration with existing Building Alarm System, Central Management and local network. Must ensure that alarms can be logged to a portable storage device and the network.

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ANNEX "B" BASIS OF PAYMENT

Pricing Instructions (To be removed at time of Contract Award):

Bidders will provide a firm, all-inclusive lot price 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" AAFC Harrow Research and Development Center, County Road 20, Harrow, ON, N0R 1G0

1. Lot Price for the supply, delivery and installation of One (1) Growth Chamber in accordance with the specifications detailed in A.

\$ _____ / lot

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ANNEX "C" 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)