Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

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

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet
Fume Hoods

Solicitation No. - N° de l'invitation	Date
EV385-161710/A	2015-11-30

Client Reference No. - N° de référence du client
AAFC EV385-161710

GETS Reference No. - N° de référence de SEAG
PW-$EDM-014-10632

File No. - N° de dossier	CCC No./N° CCC - FMS No./N° VME
EDM-5-38247 (014)	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2016-01-11

Time Zone
Fuseau horaire
Mountain Standard Time MST

F.O.B. - F.A.B.
Plant-Usine: ☐ **Destination:** ☐ **Other-Autre:** ☐

Address Enquiries to: - Adresser toutes questions à:	Buyer Id - Id de l'acheteur
Lau (EDM), Chris	edm014

Telephone No. - N° de téléphone	FAX No. - N° de FAX
(780) 566-2195 ( )	(780) 497-3510

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
201-1800 11TH AVE
REGINA
Saskatchewan
S4P0H8
Canada

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
See Herein	

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**

Canada

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PART 1 - GENERAL INFORMATION

1.1 Requirement

The requirement is detailed under Annex “A” – Requirement 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 World Trade Organization Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), and the Agreement on Internal Trade (AIT).

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) 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 (2015-07-03) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

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 Saskatchewan.

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

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

Section I: Technical Bid (1 hard copy)

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). 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. The total amount of Applicable Taxes must be shown separately.

3.1.1 Exchange Rate Fluctuation

C3011T (2013-11-06), Exchange Rate Fluctuation

Section III: Certifications
Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

(a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.

(b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Technical Evaluation

4.1.1.1 Mandatory Technical Criteria

Failure to meet any of the following mandatory criteria at solicitation closing will render your submission non-compliant and given no further consideration.

1. Ability to meet the Requirement and the Specifications as described in Annex “A”.

4.1.2 Financial Evaluation

The Total Bid Price will be calculated in the following method:

The unit price quoted for each item will be multiplied by the estimated quantity to arrive at a total price per item. The total prices per item will be aggregated to determine the Total Assessed Bid Price.

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

4.2 Basis of Selection

A bid must comply with all requirements of the bid solicitation to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

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. 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 Declaration of Convicted Offences

As applicable, pursuant to subsection Declaration of Convicted Offences of section 01 of the Standard Instructions, the Bidder must provide with its bid, a completed Declaration Form (http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-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 – List of Names

Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder.

Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).

Bidders bidding as societies, firms or partnerships do not need to provide lists of names.

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 (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from Employment and Social Development Canada (ESDC) - Labour's website.

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 this 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) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

2010A (2015-07-03), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before **March 31, 2016**.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Christopher Lau
Title: Supply Specialist
Public Works and Government Services Canada
Acquisitions Branch

5th Floor, ATB Plaza North
10025 Jasper Ave.
Edmonton, AB T5J1S6

Telephone: 780-566-2195
Facsimile: 780-497-3510
E-mail address: christopher.lau@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 for the Contract is:

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

Telephone : ___ ___ _____
Facsimile: ___ ___ _____
E-mail address: _____

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: _____
Organization: _____
Address: _____

Telephone : ___ ___ _____
Facsimile: ___ ___ _____
E-mail address: _____

6.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a *Public Service Superannuation Act* (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with Contracting Policy Notice: 2012-2 of the Treasury Board Secretariat of Canada.

6.7 Payment

6.7.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm lot prices as specified in Annex “B”- Basis of Payment. 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.

SACC Manual Clause H1000C (2008-05-12), Single Payment

6.8 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:

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

6.9 Certifications

6.9.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing additional information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to provide the additional information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

6.10 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____. (*Insert the name of the province or territory as specified by the Bidder in its bid, if applicable*)

6.11 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 general conditions 2010A (2015-09-03), General Conditions - Goods (medium complexity);
(c) Annex “A”, Requirement;
(d) Annex “B”, Basis of Payment;
(e) the Contractor's bid dated _____.

6.12 *SACC Manual* Clauses

B7500C (2006-06-16), Excess Goods
G1005C (2008-05-12), Insurance
C2000C (2007-11-30), Taxes - Foreign-based Contractor (if applicable)
C2002C (2010-01-11), Duties and Taxes - Foreign-based Contractor - State of California (if applicable)

ANNEX "A" – REQUIRMENT

(Attached)

ANNEX "B" – BASIS OF PAYMENT

Prices quoted to be Lump Sum Price, FOB Destination, including all delivery and offloading charges. Customs duties are included and Applicable Taxes are extra. GST/HST, if applicable, is to be shown as a separate item on any resulting invoice.

Delivery, FOB Destination:

Semi-arid Prairie Agriculture Research Centre
"Construction Site Compound"
Swift Current, Saskatchewan, Canada

Project Description

Contractor to supply only fume hoods for a project at Swift Current, SK, Canada called AAFC SPARC Rehabilitation currently under construction. Fume hoods will be stored at jobsite and installed by another contractor.

All material supplied shall conform to Specification referenced: NMS Section 11 53 13

Item	Description	Quantity	Firm Price	Extended Price
1	Bench top stainless steel lined 60" (1500 mm)fume hoods, VAV configuration, c/w acid storage base cabinets	9	$_____/ each	$_____
2	Bench top stainless steel lined 60" (1500 mm) fume hoods, VAV configuration, c/w solvent storage base cabinets	7	$_____/ each	$_____
3	Floor mounted stainless steel lined 72" (1800 mm) fume hood, VAV configuration	1	$_____/ each	$_____
4	Delivery and offloading at job site	1	$_____/ lot	$_____
			Total Assesed Bid Price (GST Extra)	$_____

Bids which do not meet all of the descriptions listed above will be deemed non-compliant and given no further consideration.

If upon delivery and acceptance, the product is found not to meet the description, the product will be returned at the Suppliers expense and the Contract terminated for default.

The fume hoods must be delivered to the specified by **March 31, 2016**.

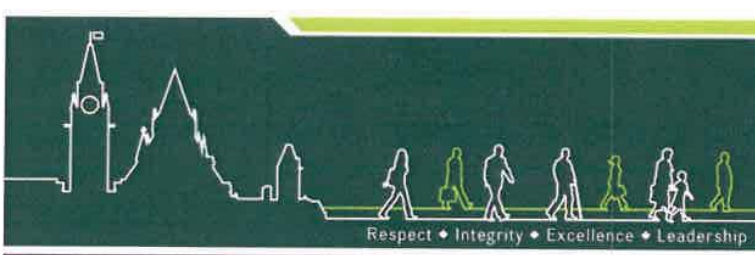
Please indicate below:

Meet Delivery Requirement _____

or

Unable to Meet Delivery Requirement _____

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada
Canada



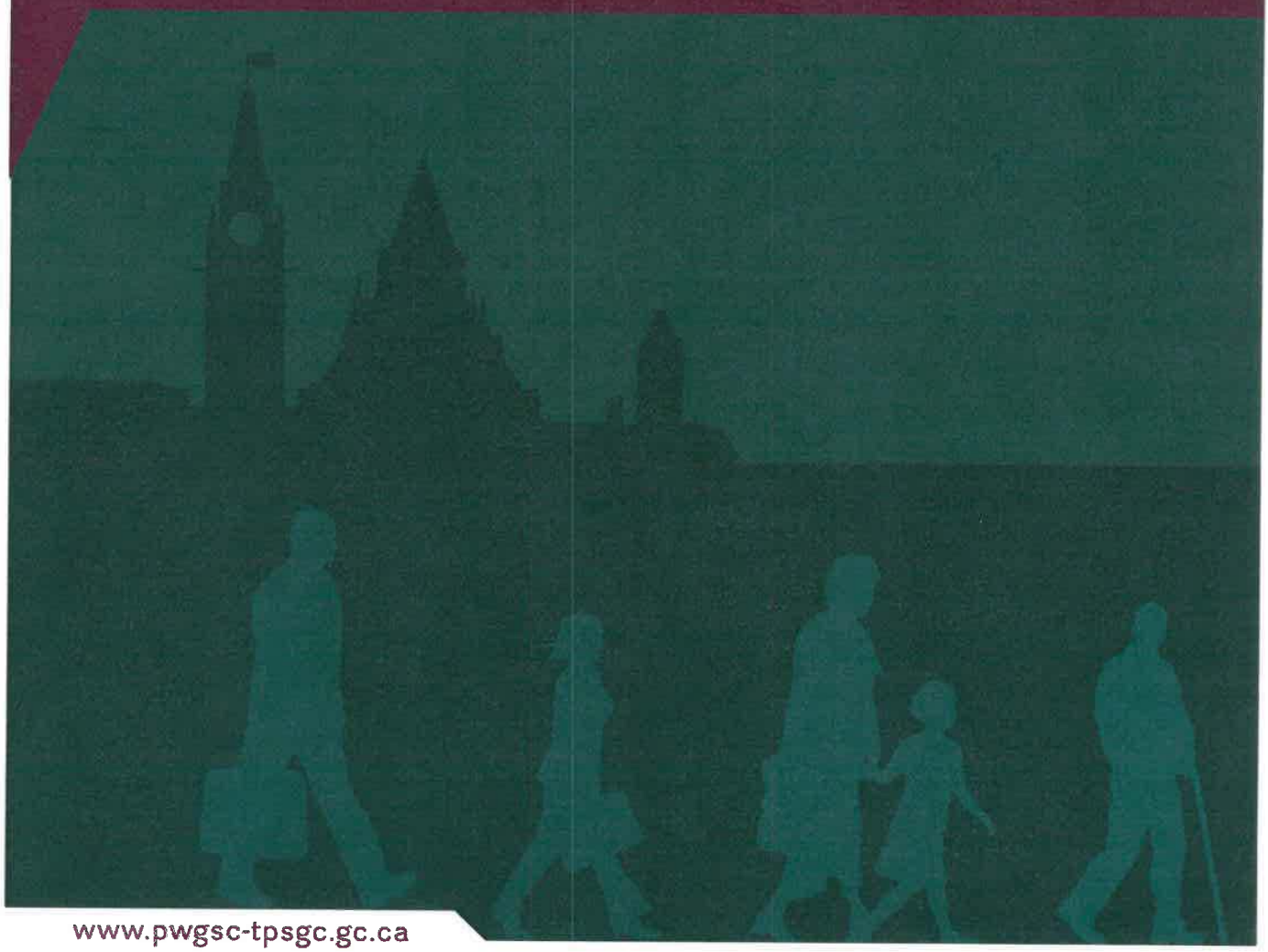
Serving GOVERNMENT. Serving CANADIANS.

SPECIFICATION

PROJECT No. R.079122.001

AIP2 AAFC SPARC Fume Hood Purchase
Swift Current, Saskatchewan, Canada

SOLICITATION No. [ ]



Part 1 General

1.1 PRODUCTS SUPPLIED BUT NOT INSTALLED UNDER THIS SECTION

.1 Variable air volume (VAV) bypass bench top fume hoods, and floor mounted fume hood.

.2 Fume hood base cabinets.

.3 Work surfaces.

.4 Laboratory service fittings, controls, fixtures, and cup sinks.

1.2 RELATED REQUIREMENTS

.1 Installation and AI testing of fume hoods; supply of face velocity monitors and alarms; installation and connection of fume hood exhaust VAV terminals; and connection of plumbing utilities are part of a separate contract.

1.3 DEFINITIONS

.1 As Manufactured (AM) Quality Control Testing: Third party testing carried out at the manufacturer's factory; performed by an independent firm, not associated with the design, manufacturing or marketing of the specified fume hood and considered an expert within the field of fume hood testing.

1.4 REFERENCES

.1 American Industrial Hygiene Association (AIHA):

.1 ANSI/AIHA Z9.5-2012, Standard for Laboratory Ventilation

.2 American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE):

.1 ANSI/ASHRAE 110-1995 Method of Testing Performance of Laboratory Fume Hoods

.3 ASTM International (ASTM):

.1 ASTM A1008/A1008M-15, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

.2 ASTM A666-15 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass

.5 Canadian Standards Association (CSA):

.1 CSA C22.2 NO. 151-M1986 (R2004), Laboratory Equipment

.2 CSA Z316.5-15, Fume Hoods and Associated Exhaust Systems

.6 Public Works and Government Services Canada (PWGSC)

.1 PWGSC MD 15128-2013, Laboratory Fume Hoods

.7 Scientific Equipment and Furniture Association (SEFA)

.1 SEFA 1-2010, Recommended Practices for Laboratory Fume Hoods

.2 SEFA 2-2010, Recommended Practices for Installation of Scientific Laboratory Furniture and Equipment

.3 SEFA 3-2010, Laboratory Work Surfaces

.4 SEFA 7-2010, Fixtures

.5 SEFA 8-M-2014, Cabinet Surface Finish Tests

.6 SEFA 11-2010, Liquid Chemical Storage

.8 Underwriters Laboratories

.1 UL 1805-2006, Laboratory Hoods and Cabinets

.9 Underwriters Laboratories of Canada

.1 ULC/ORD-C1275-84, Storage Cabinets for Flammable Liquid Containers

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate with Departmental Representative's separate contractor for supply of face velocity monitors and alarms, plumbing and electrical rough-ins for rough opening dimensions required for fume hoods.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for fume hood components and accessories. Include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit list of fume hood materials, components and accessories to be incorporated into Work.

.3 Include product names, types and series numbers for fume hood components and accessories.

.4 Include contact information for manufacturer for fume hood components and accessories used on this Project.

.3 Shop Drawings:

.1 Indicate locations and types of service fittings, together with associated service connections required.

.2 Indicate plumbing connections, duct connections, electrical connections, and locations of access panels.

.3 Include roughing-in information for mechanical, plumbing, and electrical connections.

.4 Show adjacent walls, doors, windows, other building components, laboratory casework, and other laboratory equipment. Indicate clearances from above items.

.4 Samples: Manufacturer's colour charts consisting of actual units or sections of units showing the full range of colours available for fume hood exterior, and each type of work surface material indicated.

.5 Test and Evaluation Reports

.6 Certification.

.7 Sample warranty.

1.7 CLOSEOUT SUBMITTALS

.1 Submit operations and maintenance data to Departmental Representative. Include following operation and maintenance data:

.1 Description of equipment operation, adjustment, and maintenance.

.2 Operator's manual.

.3 Written instructions booklet showing additional information on safe, proper operation and maintenance, components parts list, and nearest local manufacturer's representative for components and emergency repairs.

.2 Warranty.

1.8 MAINTENANCE MATERIAL SUBMITTALS

.1 Supply special tools for opening sash beyond normal opening position.

1.9 QUALITY ASSURANCE

.1 Test and Evaluation Reports: Submit detailed performance reports in accordance with PWGSC MD 15128, fume hood design criteria and materials thickness. Include hood superstructure details.

.1 Indicate exhaust air flow rate.

.2 Indicate pressure drop through fume hood.

.2 Certification: submit catalogued or published certified ratings obtained from tests carried out by manufacturer or those ordered by manufacturer from independent testing agency signifying performance capabilities, including "As Manufactured (AM)" tests in accordance with PWGSC MD 15128.

.3 Manufacturer's Qualifications: ISO 9001 certified.

1.10 DELIVERY, STORAGE, AND HANDLING

.1 Deliver laboratory equipment only after wet operations in building are completed.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.1 Upon arrival and before installation, demonstrate that fume hood is consistent with prototype and product data, and has not been damaged in transit.

.2 Ensure fume hood bears CSA label.

.3 Inspect fume hood and record condition using approved check sheet.

.4 Departmental Representative will supply check sheet.

.5 After check of fume hood inspection has been carried out have Departmental Representative sign sheet and submit sheet as part of record documentation.

.3 Store laboratory equipment in ventilated place, protected from weather, with relative humidity therein of 50% or less at 20 degrees C.

.4 Protect finished surfaces from soiling and damage during handling. Keep covered with polyethylene film or other protective covering.

1.11 WARRANTY

.1 Provide written warranty signed by manufacturer against failures in products which occur within warranty period indicated below, without reducing or otherwise limiting any other rights to correction which Departmental Representative may have under the Contract Documents. Correction may include repair or replacement. Correct failures which occur within one year following the anticipated in-service date of December 2016.

Part 2 Products

2.1 DESCRIPTION

.1 Laboratory fume hood: ventilated, enclosed work space, designed for continuous use to capture, confine and exhaust fumes, vapours and particulates generated within fume hood cavity.

.2 Factory fabricated package, piped and wired for single connections to exhaust system, electrical power, laboratory services, water supply, and laboratory drainage system.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

.1 Fume hood, controls and alarms: ULC labelled.

.2 Fume hood face velocity: average 0.508 m/s.

.1 Design sash position (normal operating sash height) at 450 mm.

.2 Noise level (with sash in normal operating position) at 500 mm from sash: 70 dBA maximum.

.3 Meet performance criteria in PWGSC MD 15128.

.4 Construct to most stringent requirements of CSA Z316.5, SEFA 1, and classified to UL 1805.

.5 Acid Storage, and Solvent Storage Cabinets: Designed, constructed and tested to SEFA 11, and as specified.

.6 Chemical and Physical Resistance of Metal Finishes: Submit independent testing laboratory report certifying that exterior finish of laboratory fume hoods and cabinets are capable of withstanding cabinet surface finish test procedures in accordance with SEFA 8M.

2.3 GENERAL

.1 Equipment: complete in every respect ready for operation. Provide power, lighting, motors, starters, terminal boxes and other devices specified to be mounted on equipment. Provide components as required by code, complete with numbered terminals, on equipment, for services ready for field connection.

.2 Provide reinforcing and anchorage for built-in products.

.3 Insulate between dissimilar metals, and metal and concrete or masonry to prevent electrolysis.

.4 Coordinate position of disconnects with walls, equipment and modular panels to allow full and free access.

.5 Factory prepare fume hoods with proper cutouts and brackets to accept field mounted devices.

2.4 MATERIALS

.1 Steel Sheet: Commercial-quality, cold-rolled, carbon-steel sheet, to ASTM A1008.

.2 Stainless-Steel Sheet: Type 304, stretcher leveled.

.3 Safety Glass: Clear tempered safety glass to CAN/CGSB-12.1, Type 2.

2.5 FLOOR-MOUNTED FUME HOOD

.1 Fabricate VAV bypass floor-mounted fume hood as specified for bench top fume hoods, with the following exceptions:

.1 Quantity: one.

.2 Size:

.1 Width: ~~1500~~ 1800 mm nominal.

.2 Height: maximum 2300 mm. Ceiling height: 2440 mm. Ceiling tile may be omitted above fume hoods for access to light.

.3 Depth: minimum 600 mm clear.

.3 No bottom airfoil.

.4 Sash: horizontal sliding.

.5 No gas, vacuum or water services are required.

.6 Floor: Stainless steel, dished, no drain.

2.6 VARIABLE AIR VOLUME (VAV) BYPASS BENCH TOP FUME HOODS

.1 Quantity: 16.

.2 Size:

- .1 Width: 1500 mm nominal.
- .2 Height: 1400 mm nominal. Overall height of unit including specialty cabinets below fume hoods must fit within available ceiling height of 2440 mm. Ceiling tile and suspension grid may be omitted above fume hoods for access to light, and for full sash extension.
- .3 Depth: 830 mm nominal.

.3 Sash: Minimum 6 mm thick minimum tempered safety glass to CAN/CGSB-12.1 in corrosion resistant PVC track with provisions for raising and lowering sash.

- .1 Sash handle: type 304 stainless steel with #4 satin finish, designed to eliminate eddies in plane of sash opening and thin enough in profile to minimize interference with line-of-sight of fume hood user.
- .2 Clear openable height to 700 mm. If required due to ceiling height, provide sash limiter.

.4 Sash opening: normal operating position to:

- .1 Form part of fume hood design criteria.
- .2 Ensure normal operating position is labelled on front.
- .3 Ensure opening is restricted by sash stop.
- .4 Normal operating position of sash: 450 mm opening above airfoil.

.5 Counterbalance mechanism: sprocket and chain assembly.

- .1 Sash to move easily and quietly with one finger operation, and remain in place where it is stopped.
- .2 Spring counterbalance mechanisms are not acceptable.
- .3 Sash to open and close against rubber bumper stops, installed to ensure user can readily adjust sash opening when moving sash from either end.
- .4 In event of failure of counterbalance mechanism, sash must remain 50 mm minimum above lowest part of airfoil.
- .5 Sash guides: stainless steel in full length corrosion-resistant extruded PVC tracks.

.6 Sash stop: include physical stop to prevent sash from opening beyond normal operating position under regular working conditions.

- .1 Allow sash to open beyond normal operating position when placing apparatus in hood.
- .2 Ensure sash automatically resets to normal operating limit.

.7 Horizontal air-foil:

.1 Type 304 stainless steel with #4 satin finish, installed 25 mm above raised portion of work surface and designed for eddy-free air entry.

.2 Project 150 mm into fume hood beyond edge of sash.

.3 Design airfoil to eliminate reverse flow within 75 mm of plane of sash.

.8 Work surface: Type 304 stainless steel, cove corners, dished to contain spills, with 150 mm safety rim at front edge, and clear demarcation of work area. Construct to SEFA 3.

.1 Ensure joints with interior panels are sealed.

.2 Provide cut out for cup sink flush with recessed work surface. Provide cut out for acid storage vent pipe where acid storage is schedule.

.3 Reinforce work surface with stainless steel hat channels.

.9 Interior panels:

.1 Stainless steel: to ASTM A666, 1.2 mm thick, Type 304 with #4 satin finish with square corners, welds ground smooth.

.2 Interior access panels: gasketed, removable and replaceable without use of special tools.

.10 Fastenings: ensure fastenings inside fume hood are corrosion resistant and remain unaffected by repeated manipulations.

.11 Baffles: construct baffles from same material as interior panels.

.1 Design baffles to provide multiple exhaust slots to minimize variations in face velocity across sash opening when sash is in normal operating position.

.2 Set baffles at manufacturer's plant on basis of prototype testing, and permanently mark setting.

.12 Exhaust duct collar: 300 mm diameter, integral with top panel and constructed from stainless steel, with bell-mouthed entry, and flanged to accept exhaust duct.

.13 Exterior panels:

.1 Cold rolled steel to ASTM A1008/A1008M finished with powder coating procedure, fastened using concealed stainless steel screws and devices.

.1 Do not use external screws.

.2 Ensure panels are easily removable to allow access to services.

.2 Back closure panels: of same material and finish as exterior panels; include finished back panel for fume hoods in Rooms 147 and 149.

.3 Finish: electrostatically applied urethane powder coat of selected colour and baked in controlled high temperature oven to assure a smooth, hard satin finish.

.1 Provide chemical resistant, high-grade laboratory furniture quality finish in accordance with SEFA 8M.

.2 Colour selected from manufacturer's standard range by Departmental Representative.

.14 Superstructure: rigid self-supporting unit consisting of double wall construction with outer metal shell and inner lining of corrosion-resistant material.

.1 Panels must be attached to full frame construction, minimum 1.9 mm galvanized members.

.1 Attach panels and brackets to eliminate screw heads and metallic brackets from hood interior.

.2 Double wall to house and conceal steel framing members, attaching brackets and remote operating service fixture mechanisms, and complete with:

.1 Include levelling screws.

.15 Vertical side posts of fume hood face: radiused airfoil shape to reduce eddies and promote smooth entry of air into hood.

.1 Ensure service fixtures do not disturb air flow pattern.

.2 Incorporate removable panels to provide access to service valves as indicated.

.3 Ensure unit is capable of accepting five maximum plumbing and laboratory services and one duplex electrical receptacle on each side of opening.

.4 Include light switch, monitor and alarm.

.16 Monitors and alarms:

.1 Supply of exhaust air terminal, face velocity monitor and alarm, and fume hood velocity control system are specified in a separate contract.

.2 Coordinate and provide cut-outs for field mounted devices.

.3 Mount face velocity control devices on fume hood in accordance with manufacturer's recommendations.

.17 Light fixture: CSA approved, LED or T8 two-tube fluorescent, rapid start, with electronic sound-rated ballasts. Mount fixture in roof liner using vapourproof sealed laminated glass panel to manufacturer's standard system.

.1 Include lamps with fixtures.

.2 Interior illumination at work surface: 860 lux minimum.

.3 Accessible for maintenance from fume hood exterior.

.4 Include flush-mounted switch on side post of fume hood.

.18 Factory wire electrical outlets and switches and terminate in box on roof of fume hood to CAN/CSA-C22.2 No.61010-1.

.1 Only ULC listed or CSA approved electrical devices are acceptable.

.2 Provide separate switch for light, and separate switch for blower start.

2.7 LABORATORY SERVICES

.1 To SEFA 7.

.2 Mechanical Service Fixtures: pre-plumbed with forged brass valves with brass tubing for gas. Provide handles with colour-coded index buttons and colour-coded service outlet.

.1 Valves: extruded brass valve and rotating seat, TFE-coated silicone bronze stem and TFE packing. Include needle valves on all services except gas service.

.2 Provide front-loaded remote control fittings mounted on vertical side posts of fume hood face, located to avoid interference with smooth entry of air into hood.

.3 Factory-install and pipe plumbing fittings between valve and outlet. Carry inlet piping to a point 150 mm below work top rear corner depending on the rough-in locations.

.4 Equip remote controls with universal joints, wall flanges, couplings and tailpieces for connection to services.

.5 Use quick-connect compression fittings on inlet and outlet of valve body. Soldered and brazed connections not easily disassembled are not acceptable.

.3 Outlets:

.1 Forged or cast brass body complete with tailpiece for connection to service piping.

.2 Turrets and handles to be of forged brass.

.3 Finish: inside fume hood chemical- and corrosion-resistant.

.4 Mount service outlets on hood interior sidewall in a staggered arrangement, with lowest outlets closest to front, and highest outlet closest to rear.

.4 Electrical: two duplex receptacles 120 V, 20 amp, CSA approved or ULC listed and labelled, GFI, hospital grade, mounted in side posts, stainless steel cover plate.

.1 Connect electrical service to each fume hood to dedicated electrical circuit.

.2 Factory wire electrical outlets, and terminate in box on top of fume hood.

.5 Plumbing: include laboratory cold water service as indicated.

.1 Isolating valves: include remote controlled valves located within end panels, controlled by handles projecting through side posts of fume hood.

.2 Locate to avoid interference with smooth entry of air into fume hood.

.6 Fixtures: exposed within fume hood to have chemical-resistant metallic bronze finish.

.1 Ensure portions exposed to fume hood exterior are chrome plated.

.7 Cup sinks: 75 by 150 mm oval (or nearest standard), mounted flush with recessed top, and welded into work surface, with approved acid-resisting seal, 38 mm drain with cross strainer debris catcher. Location: rear, left hand side.

.1 Cold water faucets: panel-mounted on side panel inside fume hood with rigid gooseneck of heavy duty 10 mm brass pipe with vacuum breaker, and integral backflow preventer upstream from serrated nozzle and remote control on exterior panel.

.8 Vacuum outlet:

.1 Aspirating type, with single straight serrated nozzle outlet with flange, mounted on side panel inside fume hood, separate water service, outlet discharging into cup sink.

.1 Remote control on exterior panel.

.9 Identify service fixtures using colour coding as follows:

Service	Letter Coding	Colour Coding
Cold water	CW	Green
Vacuum	VAC	Yellow

.10 Access to services:

.1 Provide five cut-outs per side post.

.2 Cap unused openings with cap plugs of same material as exterior panels.

.3 Ensure service connections are accessible from fume hood exterior through removable access panels.

.4 Include isolating valves on building side of services.

.11 Corrosion-resistant label: Provide corrosion-resistant label permanently attached to fume hood exterior with abbreviated information relating to sash position and recommended location of apparatus and accessories when placed within the fume hood.

2.8 LIQUID CHEMICAL STORAGE CABINETS

.1 Acid Storage: to SEFA 11, and as follows:

.1 Painted steel exterior finish, with moulded corrosion-resistant polyethylene lining, with coved corners, and lip at front of cabinet opening to contain spills.

.2 Provide flush front top panel above and between two doors; removable back panel with one vent hole; one full width and depth shelf.

.3 Provide polyolefin vent pipe to vent storage cabinets to fume hood.

.4 Doors: complete with louvre vents.

.5 Colour: selected by Departmental Representative. Printed message or decal, in English and French, on each door "ACID".

.6 Size: 560 deep by ~~1524~~ 762 wide by 908 mm high.

.7 Quantity: nine sets of two cabinets.

.2 Flammable/Solvent Storage: to SEFA 11, and as follows:

.1 Manufactured in accordance with NFPA 1 and NFPA 30, tested to ULC.

.2 To ULC/ORD C1275, rear access panel, three-point latch on doors, four adjustable leveling devices, and means for attaching grounding wire on exterior at base of cabinet.

.3 Double wall construction, with mineral fibre insulation, non-vented.

.4 Doors: self-closing.

.5 Adjustable shelving.

.6 Liquid-tight steel drip pan on bottom.

.7 Colour: selected by Departmental Representative. Printed message on doors, in English and French "FLAMMABLES – KEEP FIRE AWAY".

.8 Size: 560 deep by 762 wide by 908 mm high. Provide two cabinets under each fume hood scheduled for solvent storage.

.9 Quantity: seven sets of two cabinets.

.3 Provide manufacturer's standard hardware.

2.9 ACCESSORIES

.1 Linear Trim Exhaust Valves for balancing each fume hood.

.2 Paper tissue screen located behind baffle to prevent paper towels and other debris from blocking exhaust system.

2.10 SOURCE QUALITY CONTROL - AM TESTING

.1 "As Manufactured" Testing Equipment: to PWGSC MD 15128.

- .1 Data logger:
  - .1 Speed: Minimum 0.5 seconds.
  - .2 Memory: minimum 900 data points, and sufficient to allow data collection for duration of test.
- .2 In-duct flow sensor to measure flow response:
  - .1 Range: 95 L/s to 950 L/s.
  - .2 Accuracy: ±5%.
- .3 Thermal anemometer:
  - .1 Range: 0.25 to 2.0 m/s.
  - .2 Mounting: on stand with probe fixed at each traverse grid location.
  - .3 Include: output recorded for 20 seconds minimum at a rate of 1 reading/second on data logger.
  - .4 Accuracy:
    - .1 Below 0.50 m/s: ±0.025 m/s.
    - .2 0.50 m/s and over: ±5 %.
  - .5 Time constant:
    - .1 For face velocity: 20 seconds.
    - .2 For VAV tests: maximum 1 second.
- .4 Detector for tracer gas containment:
  - .1 Type: continuous reading.
  - .2 Minimum Range: 0.01 to 100 ppm.
  - .3 Accuracy:
    - .1 Concentrations 0.05 to 0.1 ppm: ±25%.
    - .2 Concentrations above 0.1 ppm: ±10%.
- .5 Smoke generator:
  - .1 Use smoke generator and diffuser complying with PWGSC MD 15128.

.2 Conduct "as manufactured" (AM) tests in manufacturer's testing facility to CSA Z316.5, ANSI/ASHRAE 110, and PWGSC MD 15128 procedures before transportation to site.

.3 Performance acceptance criteria: in accordance with PWGSC MD 15128.

.4 Co-ordinate with Departmental Representative for transportation of all relevant controls to fume hood manufacturer for installation and calibration to function as specified. Controls include, but may not be limited to:

.1 Fume hood monitor/alarm.

.2 Laboratory controller, with software and hardware.

.3 Exhaust valve and flow station.

.5 Conduct "AM" tests with fume hood empty, and with simulated experimental apparatus placed inside.

.1 Locate simulated apparatus 150 to 250 mm behind plane of sash in manner approved by Departmental Representative as follows:

.1 Two 3.8 litre paint cans.

.2 One 300 by 300 by 450 mm cardboard box.

.3 Four 150 by 150 by 300 mm cardboard boxes.

.2 With simulated cross-drafts:

.1 Challenge with single 0.25 m/s cross draft with the air directed horizontally, 45 degrees incident to plane of sash.

.6 Witnessing "AM" Tests:

.1 Departmental Representative reserves the right to witness testing.

.2 Notify Departmental Representative minimum two weeks before start of testing.

.7 Conduct "As Manufactured" (AM) Fume Hood Performance Tests as follows:

.1 Visualization (smoke) tests: meet or exceed performance criteria of PWGSC MD 15128.

.2 Face velocity and flow tests for VAV fume hoods: to PWGSC MD 15128.

.1 Average face velocity at design sash position: 0.5 m/s ±0.01 m/s

.1 Variation allowed for individual readings: ±20% of average.

.2 Average face velocity with sash at 66% of design sash position: 0.5 m/s ±0.05 m/s.

.1 Variation allowed for individual readings: ±20% of average.

.3 Average face velocity with sash at 33% of design sash position: 0.5 m/s ±0.05 m/s.

.1 Variation allowed for individual readings: ±20% of average.

.4 VAV speed of response: time to reach 90% of the steady state value: within 3 seconds of initial sash movement.

.5 VAV time to steady state: time to return to ±10% of average face velocity or flow: within 5 seconds of initial sash movement.

.6 Minimum flow with sash closed: capable of maintaining 150 to 375 air changes per hour to ANSI/AIHA Z9.5.

.3 Tracer gas tests: to PWGSC MD 15128.

.1 Conduct tests at target average face velocity, and at ±20% of target velocity.

.2 Use approved tracer gas.

.3 Leakage with sash at design position:

.1 Average leakage: <0.025 ppm.

.2 Peak reading: <0.100 ppm.

.4 Leakage with sash in fully open position:

.1 Average leakage: <0.05 ppm.

.2 Peak reading: <0.25 ppm.

.5 Peripheral scan:

.1 Record significant peak readings and their locations.

.2 Record 30 second rolling averages.

.3 Include readings in test report.

.6 Sash movement effect (SME), to determine potential for escape after movement of sash to ANSI/ASHRAE 110 procedures.

.1 Maximum 45 second rolling average: <0.05 ppm.

.4 Fume hood monitor and alarm.

.1 Monitor accuracy (3-point calibration required): accurate within 5% of average face velocity or flow.

.2 Alarm enunciation (both audible and visual): If flow is high or low by 10% as compared to design setpoint.

.3 Alarm response: maximum 10 seconds enunciation delay.

.5 Hood static pressure at design sash position, and 0.5 m/s face velocity: <62 Pa.

.6 Noise level: <70 dBA at working position in front of fume hood.

.8 Conduct VAV response tests, stability tests and SME simultaneously for VAV fume hoods.

Part 3 Execution

3.1 INSTALLATION

.1 Installation will be part of a separate contract.

3.2 FIELD (AI) TESTING

.1 As-installed field testing will be part of a separate contract. In the event fume hoods do not pass AI testing, provide troubleshooting assistance.

END OF SECTION