



RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave. Jasper
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

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

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 Hood	
Solicitation No. - N° de l'invitation EP922-171164/A	Date 2016-09-21
Client Reference No. - N° de référence du client AAFC EP922-171164	
GETS Reference No. - N° de référence de SEAG PW-\$EDM-014-10865	
File No. - N° de dossier EDM-6-39133 (014)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-11-01	Time Zone Fuseau horaire Mountain Daylight Saving Time MDT
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: Lau (EDM), Chris	Buyer Id - Id de l'acheteur edm014
Telephone No. - N° de téléphone (780) 566-2195 ()	FAX No. - N° de FAX (780) 497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF PUBLIC WORKS AND GOVERNMENT SERVICES CANADA HARRY HAYS BUILDING 759- 220 4 AVE SE CALGARY Alberta T2G4X3 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

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



Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire		Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
						Destination	FOB/FAM			
1	Fume Hood	EP922	EP922	1	Each	\$	\$		See Herein	

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PART 1 - GENERAL INFORMATION

1.1 Requirement

The requirement is detailed under 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 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 (2016-04-04) 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 Alberta.

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 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

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 Minimum Mandatory Performance Specifications as described in Annex "A" and Annex "B".

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 [A0222T](#) (2014-06-26), Evaluation of Price

4.2 Basis of Selection

4.2.1 Mandatory Technical Criteria

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 *Ineligibility and Suspension Policy* (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide with its bid the required documentation, as applicable, 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 *Ineligibility and Suspension Policy* (<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](http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969) website (http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

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) (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.

6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before **2017-02-08**.

6.4.2 Delivery Points

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

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Christopher Lau
Title: Procurement 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 (*To be released at contract award*)

The Project Authority for the Contract is:

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Buyer ID - Id de l'acheteur
edm014
CCC No./N° CCC - FMS No./N° VME

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 (*To be filled in by bidder*)

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" 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.

6.7.2 Single Payment

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

6.7.3 SACC Manual Clauses

C2000C (2007-11-30), Taxes - Foreign-based Contractor (if applicable)

6.7.4 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)

6.8 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 and Additional Information

6.9.1 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.

6.10 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 (2016-04-04), General Conditions - Goods (medium complexity);
- (c) Annex "A", Requirement;
- (d) Annex "B", Minimum Mandatory Performance Specifications;
- (e) Annex "C", Basis of Payment;
- (f) the Contractor's bid dated _____.

6.12 SACC Manual Clauses

B7500C (2006-06-16), Excess Goods

G1005C (2008-05-12), Insurance – No Specific Requirement

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ANNEX "A"

REQUIREMENT

(Attached)

ANNEX "B"

MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS

DELIVERY

All deliverables must be delivered to the specified location on or before **2017-02-08**.

Please indicate below:

Meet Delivery Requirement _____
or
Unable to Meet Delivery Requirement _____

COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS

A complete list of the minimum mandatory performance specifications are detailed below in the "Compliance Matrix". Bidders are to clearly demonstrate compliance with each mandatory specification.

1. Bidders **must** show compliance by addressing each performance specification in the Compliance Matrix, whether the product offered "meets" or "does not meet".
2. It is requested that supporting technical documentation, including but not limited to, specification sheets, technical brochures, photographs or illustrations be provided with the bid at solicitation close and be cross-referenced on the Compliance Matrix for each performance specification to outline where in the supporting technical documentation it demonstrates compliance. It is the Bidders responsibility to ensure that the submitted supporting technical documentation provides detail to prove that the proposed product(s) meet the requirements of the Performance Specification. If published supporting technical document is not available, the Bidder should prepare a written narrative complete with a detailed explanation of how its bid demonstrates technical compliance.
3. If the supporting documentation referenced above has not been provided at bid closing, the Contracting Authority will notify the Bidder that they must provide supporting documentation within two (2) business days following notification. Failure to comply with the request of the Contracting Authority within that time period, will deem the bid non-responsive and the bid will be given no further consideration.
4. Bidders must address any concerns with the performance specifications in written detail to the Contracting Authority before bid closing as outlined in the solicitation document.
5. Failure to meet each performance specification will result in the bid being deemed non-responsive, and be given no further consideration.

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COMPLIANCE MATRIX – MINIMUM MANDATORY PERFORMANCE SPECIFICATIONS

Requirement	Manufacturer Offered:	Model number Offered#
New twenty (20) constant volume bypass fume hoods		

Item No.	Description	Meets	Does Not Meet	Reference page from Proposal
M1	Supply and deliver new twenty (20) constant volume bypass fume), in compliance with the Minimum Performance Specifications and the requirement outlined in Annex "A" – Requirement			

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ANNEX "C"

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.

- Firm unit costs are **FOB Destination** to:

Lethbridge Research and Development Centre
5403 1 Avenue South
Lethbridge, AB T1J 4P4

- Firm Unit Prices do not include GST/HST. GST/HST will be added as a separate line item to any invoice issued as a result of the contract.

Item	Description	Qty.	Firm Unit Price	Extended Price
1	Supply and deliver new twenty (20) constant volume bypass fume hoods, in compliance with the Minimum Performance Specifications and the requirement outlined in Annex "A" – Requirement.	1 lot	\$ _____/lot	\$ _____
Total Assessed Bid Price:				\$ _____

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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)

PART 1 - GENERAL

1.1 Scope

- .1 Supply and deliver new twenty (20) constant volume bypass fume hoods to Lethbridge Research and Development Centre., (5403 1 Ave S, Lethbridge, AB T1J 4P4) in accordance with the specification herein.
- .2 New fume hoods shall be completed with listed attached mechanical and electrical fixtures.
- .3 Where the term "hoods" is used it shall refer to fume hoods.

1.2 Quality

- .1 Where governed by code requirements in their final installed locations, items of this Section shall conform to the ULC Standards, CSA Z316.5-04 Fume hood and associated exhaust systems, and all other standards as noted.
- .2 All electrical and operating items shall be CSA or ULC approved and carry the appropriate CSA or ULC label.
- .3 Hoods shall be manufactured by a fabricator having a minimum of 10 years experience in the design, fabrication and installation of highest quality research scientific laboratory hoods, manufactured to highest laboratory standards and accuracy.

1.3 AS MANUFACTURED (AM)
FUME HOOD PERFORMANCE

- .1 One of the 20 fume hoods must be tested by the manufacturer (or an independent testing agent), and witnessed by a qualified third party as directed by the Engineer. The test will be conducted at the manufacturer site; and the tested fume hood must pass all of the As Manufactured (AM) tests as outlined in MD15128

Laboratory Fume Hoods dated April 2013. This compliance is the condition and prerequisite of the contract of purchasing of fume hoods.

- .2 The qualified thirty party is responsible for ensuring the test procedures and the test results to meet the MD15128 requirements; the acceptance of test instruments, accuracy of the instruments, instrument calibration and set-up to fully meet the MD15128. Manufacturer must include \$2,500 as cash allowance in the tender base price for the thirty party services. Provide a test report to outline the test results.

- .3 The AM fume hood test shall be performed at a sash height of 450 mm. Fume hood tests are to be done for the two loading conditions.

Condition 1: Fume hood is non-loaded with simulated experimental apparatus placed within fume hood.

Condition 2: Fume hood is loaded with simulated experimental apparatus placed within fume hood. For each loading condition, the tests shall be done with a challenge 0.25 m/s cross draft of air at the sash plane and the draft shall be directed downward toward the sash at 45 degree.

Tests shall include:

- Face velocity
- Visualization- small and large
- By-pass effectiveness
- Tracer gas
- Cross drafts
- Sash movement effects
- Minimum airflow requirements as per NFPA 45

- .4 The passing criteria of the performance tests for both loading conditions shall be as per the MD 15128.
For this specific size of fume hood, Condition 2 shall be conducted as per the Figure 6-5 on page 44 of MD15128.
All boxes shall be elevated by 50 mm from work surface with blocks.

-
- .5 A failure of any one of these tests shall constitute a failure of the fume hood and shall relieve the Engineer from any responsibility of purchasing the fume hoods from the manufacturer.
- .6 Manufacturer shall allow one week in advance notice to the Engineer prior the test and one day to finish the test. Engineer shall be present to witness the tests.
- 1.4 Qualifications of Manufacturer
- .1 Manufacturers shall have an established organization, experienced engineering department and production facilities specializing in fume hood fabrication. Manufacturers shall have demonstrated ability to produce equipment of the required quality, and the proven capacity to complete an installation of this size and type within the required time limits.
- .2 Hood evaluation of the manufacturer's product shall take place in the manufacturer's test facility with samples, apparatus, instruments, and test materials to be supplied by the manufacturer at no cost to the Engineer. At his option, the Engineer may verify data with his own instruments, providing instrument suitability and calibration are mutually acceptable.
- .3 Testing shall be performed to CSA C22.2 No. 151 and newest ASHRAE/SAMA/ANSI Standards as well as meeting all requirements specified herein such as MD1528.
- 1.5 References
- .1 ASTM A 167-94a, "Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip".
- .2 ASTM A 366/A 366M-91 (1993), "Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality".
- .3 ASTM B 456-94, "Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium".

- .4 ASTM A 240/A240M-94a, "Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Fusion Welded Unfired Pressure Vessels".
- .5 CAN/CGSB-12.1-M90, "Glass, Safety, Tempered or Laminated".
- .6 CSA C22.2 No. 151-1979, "Laboratory Equipment".
- .7 CSA Z316.5-94, "Fume Hoods and Associated Exhaust Systems".
- .8 NSF, "National Sanitary Foundation Testing Laboratory".
- .9 CAN3-0188.1-M78, "Interior Mat-Formed Wood Particleboard".

1.6 Shop Drawings

- .1 Submit Shop Drawings to the Engineer for review prior to order equipment.
- .2 Provide detail drawings of each article under this Section showing size, installation, preparation, services required and rough-in requirements, operation, materials, finishes, field joints, wiring and piping diagrams, controls, etc.
- .3 Manufacturer's publications are acceptable for standard non-custom specialties if the specific model or type fully shown along with all available accessories, features.
- .4 Provide factory test reports on hood performance including exhaust air volumes, face velocities of various sash positions (300mm open, 450mm open and fully open) and static pressure loss.
- .5 Provide Fume hood Test Report as required in clauses 1.3 and 1.4.

1.7 SAMPLES

- .1 Where called for in this Section under the specific item, provides 2 samples minimum size 50 x 100mm, of material or finish.

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| <u>1.8 Maintenance Data</u> | .1 | Submit Maintenance Data to the Engineer for review. |
| | .2 | Provide 2 copies of complete operating and maintenance data for each specific item in this Section together with name, address and telephone number of nearest representative for parts supply. |
| <u>1.9 Product Delivery Storage and Handling</u> | .1 | Coordinate with the Engineer for the fume hood delivery schedule. |
| | .2 | Finished items, components, assemblies shall be wrapped and crated in a manner to protect materials and finishes from damage during shipping and handling. |
| | .3 | Store items carefully protected from moisture and damage, in original wrappings with manufacturer's labels, seals intact. |
| | .4 | Tie or secure all moving parts so that no damage will occur during shipping, handling. |
| | .5 | Benchtop hoods to be delivered to site fully assembled. |
| <u>1.10 Job Conditions</u> | .1 | Protect surfaces, materials, finishes of other Work from damage when fume hoods delivered to the site. |
| | .2 | Where connections to mechanical, electrical or other trades required, provide all data, dimensions, drawings in time for proper rough-in and preparation required to receive the Work. |

PART 2 - PRODUCTS

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| <u>2.1 Manufacturers</u> | .1 | Equipment listed by catalogue number and manufacturer shall be the specified standard required. Alternative manufacturers may be proposed for approval in accordance with Contract Documents. |
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- .2 All fume hoods shall be 1498-1500mm wide.
- .3 The fume hoods specified herein may need to be custom designed and manufactured to meet the requirements.
- .4 Sash shall be vertical sliding design.

2.2 Materials

- .1 All materials, products shall be the best of their respective kind and suitable in all respects for the specified end use for which each item or assembly is intended in this project.
- .2 Exterior Liners: Sheet steel: Stretcher leveled furniture grade to ASTM A 366/A 366M-91 (1993).
- .3 Interior Liners: Stainless steel: To ASTM A167 and ASTM A240, type 316.
- .4 Glass: Safety glass to CAN/CGSB-12.1, clear float, tempered laminated minimum 6mm thickness.
- .5 Particleboard: To CAN3-0188.1, Type II Industrial grade, sanded, density.

2.3 Fabrication

- .1 All equipment of this Section to be completed in all respects, fully shop assembled and finished with fastenings concealed or countersunk flush, all joints in exposed surfaces to be welded joints, all internal piping, wiring ducting, shop installed and tested, mechanical and electrical fittings and fixtures installed.
- .2 Workmanship shall be the best grade of modern shop and field practice know to recognized manufactures specializing in the Work of products listed and design and fabrication of scientific research hoods.
- .3 Works and equipment shall be accurately assembled free from distortion or defects detrimental to appearance and/or operation and fully capable of performing the job for which it is specified over the intended life of the building in which it is installed.

- .4 All equipment under this Section shall be fully finished in the shop with all metal parts receiving a thorough cleaning and be given one coat of primer followed by two coats of baked-on enamel or a powder coating finish. Stainless steel shall be given a #4 finish. Extruded aluminum shall be given a clear, anodized finish. Colors shall be as later selected by Engineer.
- .5 All operating equipment, both power and manual, shall be fully tested in the shop as an assembled entity before shipping to site.
- .6 Equipment shall be provided complete with all fittings, fixtures, accessories requiring only site hook-up to building services to be fully operational.
- .7 All hoods shall be fully tested in the factory as an assembled entity before shipping to site.

2.4 Mechanical Service Fittings

- .1 Acceptable Manufactures: (service outlets) Watersaver or Chicago Faucet.
- .2 Metals: Use minimum 80% red brass alloy for valve bodies. Make handles and turrets from brass forgings. Use solid brass bar stock or specially selected alloys for assembly components and operating parts such as valve stems, renewable seats and needle cones.
- .3 Completely enclose spring mechanisms. Design compression and needle valve stems to operate inside and make them replaceable. Provide needle valves with stainless steel floating needles and removable seats.
- .4 Provide fittings with wall flanges, shanks, lock nuts, couplings, nuts and tailpieces.
- .5 Finish exposed parts of service fittings inside hoods with corrosion-resistant finish.
- .6 Provide isolation valves to all service connections on the building side of the services. Isolation valves compatible with media. Valve colored coding as per universal.

- .7 For natural gas, nitrogen, compressed air and vacuum: angle hose cock outlets, complete with remote control handle on front face of hood, colour-coded corrosion resistant finish to match remote control handle colour. Use front loading valves and no remote control rods.
- .8 For cold water: side wall mounted gooseneck with vacuum breaker and serrated nozzle complete with remote control handle on front of hood; size to ensure nozzle is centered over integral cup sink; colour-coded corrosion resistant finish to match remote control valve handle colour. Use front loading valves and no remote control rods
- .9 Drill 8-25mm diameter holes for each side. Remote controls on face of hood. Provide SS buttons for unused holes.
- .10 Drill holes on interior lining for only those fixtures called for with each fume hood on equipment list/layouts in 3.5.
- .11 Pre-pipe fittings as called for with each respective hood per individual lab layouts and schedules, including piping, remote control valves, turrets, buttons, controls, and escutcheons. Piping to end with isolation valves.

2.5 Hardware

- .1 All rough hardware (screws, nuts, bolts, washers, etc.) Type 316 stainless steel with #4 finishes.
- .2 Finish hardware shall be of a type consistent with highest quality items for long hard usage and shall be the best of their respective kinds.

2.6 Finishes

- .1 All sheet steel pretreated and cleaned after fabrication, primed and finished with highest grade chemical resistant laboratory furniture quality baked enamel or modified epoxy powder coating providing a smooth hard satin finish. Surface not exposed to view shall have one coat primer followed by one coat enamel. Colour as later selected by Engineer and shall

be a custom colour and not any manufacturer's standard colour. The colour shall be off white to match the new 5 fume hoods recently purchased.

- .2 All stainless steel shall be given a #4 satin finish.

2.7 Superstructure

- .1 Double wall constructions consisting of an outer shell and an inner liner. Double wall to house and conceal auxiliary framing members, attaching brackets and service fixture mechanisms. Outer shell, inner shell and frames (where necessary) to be assembled, fastened, and connected into a rigid, self-supporting entity. Wall thickness at sides to be 100mm maximum; front to be 150mm maximum; and rear 12mm maximum.
- .2 Outer Shell: 1.588mm cold rolled sheet steel. Continuous welded fabrication. Front of head and sides surrounding sash, to be a 45° airfoil brake-shape or a curved surface of 50mm radius. Baked enamel finish applied to all surfaces (see finishes). All airfoils shall be 316L stainless steel.
- .3 Inner Liner & Countertop/Work surface: 1.5mm stainless steel, Type 316. All interior corners to be radiused and welds ground smooth with seamless corners, #4 satin finish, sides integral with countertop/work surface, with slightly raised edges to contain spills. Provide side safety ledge across the front edge. Underside of work surface/base to be 19mm particleboard bonded to it for rigidity and sound deadening.
- .4 Exhaust Collar: 1.5mm stainless steel, Type 316L, sizes 300mm diameter.
- .5 Lighting Panel: 6mm safety glass sealed into SS trim with neoprene in a manner which totally insulates light fixture from fumes and vapors.
- .6 Access panels for service valves: 1.5mm SS, type 316L, 200 x 750mm on both sides of inner liner.

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- .7 Data Card Holder: 0.912mm SS frame secured
- .8 Cup Sink: 150mm diameter 316 stainless steel raised cup sink and tail piece, integral/seamless with base/countertop.
- .9 Equipment Struts: Provide stainless steel channel to each side of inner liner at location and to the dimensions shown. Stiffen liner panel as required from behind to permit positive attachment. Acceptable material: Unistrut P-4000X.
- .10 Access Opening: (Benchtop hoods) Provide access opening at the rear of the fume hoods, concealed between the walls on both sides, to facilitate connection of fume hood service fittings to piping located behind laboratory casework.
- .11 Vents: Provide 38 mm diameter polypropylene venting up side walls, through hood liner at each end side wall, vented in behind upper baffle with sealed removable plug.
- .12 Baffles: Fabricated from same material as liner, bolted in place to allow removal. Top baffle to be in two segments with slider and thumb-screw adjustment.
- .13 By-Pass grilles: Integral with exterior front panel; louvers shall be inward punched and upward facing; louver location to be high enough to conform to design and operation set out in clause 2.12.
- .14 Hood construction shall be for seismic rated anchor installation. Manufacturer shall retain a professional seismic engineer, who is registered in the province of BC, to certify the fume hood design suitable for seismic anchor installation to existing storage cabinets and wall structure.

2.8 Sash

- .1 Vertical rising sash shall consist of the following:
 - .1 Opening size: Maximize full view to suit width specified.
 - .2 6 mm laminated safety glass set into stainless steel glazing channel, maximum

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- 25 mm wide.
- .3 Bottom rail to have integral, formed full width flush stainless steel pull.
 - .4 Top rails to be formed to accept lead weights for fine tuning of sash for exact and positive operation.
 - .5 Use single weight, pulley and cable counterbalance system, including guides (stainless steel) to prevent sash tilting, permit one finger operation at any point along width, and to hold sash at any position without creep.
 - .6 Pulleys to be nylon tired, ball-bearing type, 38 mm in diameter.
 - .7 Cables to be stranded stainless steel, minimum 4mm.
 - .8 Provide SS spring loaded slide bolt to prevent sash from dropping in the event of failure of cables if required.
 - .9 Sash to open and close against rubber bumpers, top and bottom.
 - .10 Glass must be resistant to discoloration and crazing by age or exposure to chemicals.

2.9 Air Deflector/Foil

- .1 Type 316L, 1.5mm metal core thickness stainless steel aerodynamically shaped deflector attached at the sill location for all fume hoods. Deflectors shall be supported with stainless steel Z-clips, to permit the passage of required volumes of air when sash is in the closed position. Clearances to accommodate passage of standard 20-amp NEMA male plug.

2.10 Lighting and Receptacles

- .1 Light Fixtures: 3-lamp, T8, 40 watt (80 lux) , vapour tight heavy duty fluorescent fixtures, c/w ballasts bearing CSA certification, automatic resetting type, thermally protected, energy-saving, high power factor type with an "A" sound rating. Lamps to be new, warm white, from the same manufacturer, switch on hood face c/w SS plate.
- .2 Service access must be possible from outside of fume hood.

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- .3 GFCI receptacles shall be specification grade, duplex receptacle, CSA type 5-15R, 125V, 15A, U ground, white, ground fault LED indicator, stainless steel cover plate.
Hubbell GRF5252-WHI

2.11 Wiring

- .1 Provide light switch, exhaust switch, relay, pilot lights and grounding-type receptacles. The relay shall control the fume hood exhaust valve (FHEV) "on" to operate the fume hood at maximum design air flow, and "off" to operate the fume hood at a minimum design air flow.
- .2 Pre-wire to a standard consistent with applicable codes, utilizing liquid tight flexible electrical conduit.
- .3 Wiring for lighting shall be pre-wired ready to receive connection with supply at the fixture location.
- .4 Wiring for the exhaust switch, pilot lights and relay, to be pre-wired, ready to receive connection with supply at the relay junction box. Pilot lights to register red for exhaust off, and green for exhaust on.
- .5 Wiring for receptacles shall be pre-wired ready for connection at the perimeter laboratory cable tray.
- .6 All escutcheon plates to be stainless steel.

2.12 Design and Operation

- .1 Fume hoods shall be custom designed for uniform air flow through the hood face of 0.508 m/s. at a sash height of 300mm. Variations of required face velocity shall not exceed 20% of the average face velocity as measured with the maximum sash opening at left, right and center of the hood face.
- .2 Fume hoods shall be "balanced type" which maintains a constant exhaust volume regardless of sash position.
- .3 Maximum air volumes for each hood shall conform with the following:

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Size (mm)	Max. l/s	Duct Collar
(dia.)		
1500	255	300 mm

- .4 Measured average static pressure loss readings taken 3 diameters above the hood outlet from four points 90° apart, shall not exceed the following for all maximum air volumes as dictated above:

Face Velocity	Measured S.P.L.
(W.C.)	
0.508 m/s	124 Pa

- .5 Baffles shall be provided to control air vectors into and through the fume hood. With the sash positioned 150 mm above the airfoil, the average in flow velocity shall not be less than twice the selected full open face velocity nor greater than three times of that amount. Changes in average face velocity and exhaust volume as a result of baffle adjustment shall not exceed 5% for any baffle position at the specified face velocity. Back baffle shall be fabricated with twenty 25 mm diameter holes in a single horizontal row. Top baffle shall be adjustable to provide a 12.7 mm gap in the closed position through to a 51 mm gap when fully opened.
- .6 .1 1498-1500mm wide, bench-mounted
.2 Integral 316 stainless steel base/work surface with all welded construction.
.3 Integral SS raised cup sink and RH side wall mounted cold water gooseneck.
.4 Natural gas on RH mounted with remote control handle.
.5 Compressed air on RH mounted with remote control handle.
.6 Vacuum on RH mounted with remote control handle.

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- .7 Cold water on RH mounted with remote control handle.
- .8 2-115V 15 amp duplex GFI receptacle (one LH and one RH), see section 2.10.3.
- .9 3 tubes T8 fluorescent light and switch (80 lux at work surface).
- .10 Vent kit for chemical storage cabinets.
- .11 Motor switch and pilot light (RH mounted).
- .12 Mount airflow monitors. Airflow monitors shall be Siemens Model number Part# 546-0030 to comply to requirements.