

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

**Bid Receiving
PWGSC
33 City Centre Drive
Suite 480
Mississauga
Ontario
L5B 2N5
Bid Fax: (905) 615-2095**

**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 SheetMetal Forming Universal Tester	
Solicitation No. - N° de l'invitation 23584-140009/B	Date 2013-11-21
Client Reference No. - N° de référence du client 23584-140009	
GETS Reference No. - N° de référence de SEAG PW-\$TOR-016-6435	
File No. - N° de dossier TOR-3-36034 (016)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2014-01-02	Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Yari, Helen	Buyer Id - Id de l'acheteur tor016
Telephone No. - N° de téléphone (905) 615-2081 ()	FAX No. - N° de FAX (905) 615-2060
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF NATURAL RESOURCES 183 LONGWOOD RD SOUTH HAMILTON Ontario L8P0A5 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 Canada
Ontario Region
33 City Centre Drive
Suite 480
Mississauga
Ontario
L5B 2N5

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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This cancels and supersedes previous RFP No. 23584-140009/A dated 14 June 2013, which closed at 2:00 P.M., on 29 July 2013.

PART 1 - GENERAL INFORMATION

1. Security Requirement

There is no security requirement associated with this bid solicitation.

2. Requirement

The requirement is detailed under Article 2 of the resulting contract clauses.

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

PART 2 - BIDDER INSTRUCTIONS

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 (2013-06-01) 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: sixty (60) days
Insert: ninety (90) days

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.

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (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 questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

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

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

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

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

Section I: Technical Bid (2 hard copies)
Section II: Financial Bid (1 hard copy)
Section III: Certifications (1 hard copy)

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

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

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

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

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

Section I: Technical Bid

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

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

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.

1.1 Technical Evaluation

1.1.1 Mandatory Technical Criteria

	Mandatory Technical Criteria	Page # of Supporting Documentation
M1.	The Bidder must have designed and manufactured a minimum of two (2) of the same or similar systems within the last 5 years of the bid closing date. To demonstrate this the Bidder must provide the name of two (2) different clients for which they have designed and manufactured the same or similar system within the last 5 years of bid closing date. Client information must include - Company name, location, contact name, current telephone number and current email address in order to validate the information.	
M2.	The Bidders must comply with Annex A, Requirement for Sheet Metal Forming Universal Tester. Bidder must submit with their bid supporting technical documents such as: literature, brochures and/or specifications for their proposed system, which clearly demonstrates that their proposed system meets 2.1 Equipment Specification of Annex A, Requirement. If any of the Equipment Specification is missing from the supporting documentation, then the Bidder must address separately, how it meets that particular Equipment Specification.	
M3.	Bidder must complete and submit with their bid Appendix 1 of Annex A, Notice of Designated and/or Hazardous Substances on Project.	

1.2 Financial Evaluation

1.2.1 Mandatory Financial Criteria

a) Bidders must submit their financial bid in **Canadian Funds** in accordance with the Basis of Payment and the Schedule of Milestones at Annex B. Bidders may propose sub-milestones within the mandatory Milestones identified at Annex B. If a Bidder is proposing sub-milestones they must include a complete description of the deliverable, completion date and cost for each sub-milestone.

b) The Bid must not contain any conditions or qualifications.

1.2.2 Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, the Goods and Services Tax or the Harmonized Sales Tax excluded, FOB destination, Canadian customs duties and excise taxes included.

2. Basis of Selection

2.1 Basis of Selection - Mandatory Technical Criteria

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

PART 5 - CERTIFICATIONS

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and documentation 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 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 with this request will also render the bid non-responsive or will constitute a default under the Contract.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Code of Conduct and Certifications - Related documentation

By submitting a bid, the Bidder certifies that the Bidder and its affiliates are in compliance with the provisions as stated in Section 01 Code of Conduct and Certifications - Bid of Standard Instructions 2003. The related documentation therein required will assist Canada in confirming that the certifications are true.

1.2 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 Human Resources and Skills Development Canada (HRSDC) - 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 " Limited Eligibility to Bid " list at the time of contract award.

PART 6 - RESULTING CONTRACT CLAUSES

1. Security Requirement

There is no security requirement applicable to this Contract.

2. Requirement

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

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.

3.1 General Conditions

2030 (2013-06-27), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

3.2 Supplemental General Conditions

4010 (2012-07-16) Services - Higher Complexity, apply to and form part of the Contract.

4. Term of Contract

4.1 Period of the Contract

The period of the Contract is from date of Contract to two years from Site Acceptance Test approval.

4.2 Delivery Date

All the deliverables must be received prior to 8 September 2014.

5. Authorities

Solicitation No. - N° de l'invitation

23584-140009/B

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

tor016

Client Ref. No. - N° de réf. du client

23584-140009

File No. - N° du dossier

TOR-3-36034

CCC No./N° CCC - FMS No/ N° VME

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Helen Yari
Public Works and Government Services Canada
Acquisitions Branch
33 City Centre Dr., Suite 480C
Mississauga, ON L5B 2N5

Telephone : 905-615-2081
Facsimile: 905-615-2060
E-mail address: helen.yari@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.

5.2 Technical Authority (to be filled in at contract award)

The Technical Authority for the Contract is:

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

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

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

5.3 Contractor's Representative

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

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

6. Payment

6.1 Basis of Payment - Firm Lot Price(s)

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid firm a unit price(s), as specified in Annex B, Basis of Payment for a cost of \$__(to be filled in 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.

6.2 Milestone Payments

1. Canada will make milestone payments in accordance with the Schedule of Milestones detailed in in Appendix 1 of Annex B and the payment provisions of the Contract, up to 90 percent of the amount claimed and approved by Canada if:
 - (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
 - (b) the total amount for all milestone payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
 - (c) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives;
 - (d) all work associated with the milestone and as applicable any deliverable required have been completed and accepted by Canada.
2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of all Work required under the Contract if the Work has been accepted by Canada and a final claim for the payment is submitted.

7. Invoicing Instructions

7.1 Invoicing Instructions - Progress Payment Claim

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment.

Each claim must show:

- (a) all information required on form PWGSC-TPSGC 1111;
 - (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
 - (c) the description and value of the milestone claimed as detailed in the Contract;
 - (d) holdback of 10%.
2. Applicable Taxes must be calculated on the total amount of the claim before the holdback is applied. At the time the holdback is claimed, there will be no Applicable Taxes payable as it was claimed and payable under the previous claims for progress payments.
3. The Contractor must prepare and certify one original and two (2) copies of the claim on form PWGSC-TPSGC 1111, and forward it to the Contracting Authority identified under the section entitled "Authorities" of the Contract for appropriate certification.

The Contracting Authority will then forward the original and one (1) copy of the claim to the Technical Authority for certification after inspection and acceptance of the Work takes place and onward submission to the Payment Office for the remaining certification and payment action.

4. The Contractor must not submit claims until all work identified in the claim is completed.

8. Certifications

8.1 Compliance

Compliance with the certifications and related documentation provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification, provide the related documentation 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.

9. Applicable Laws

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

10. Priority of Documents

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

- (a) the Articles of Agreement;
- (b) the supplemental general conditions 4010 (2012-07-16) Services - Higher Complexity;
- (c) the general conditions 2030 (2013-06-27) Higher Complexity Goods;
- (d) Annex A, Requirement;
- (e) Annex B, Basis of Payment;
- (f) Annex C, Insurance Requirement
- (f) the Contractor's bid dated _____.

11. Insurance - Specific Requirements

The Contractor must comply with the insurance requirements specified in Annex C. The Contractor must maintain the required insurance coverage for the duration of the Contract. Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract.

The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

The Contractor must forward to the Contracting Authority within ten (10) days after the date of award of the Contract, a Certificate of Insurance evidencing the insurance coverage and confirming that the insurance policy complying with the requirements is in force. Coverage must be placed with an Insurer licensed to carry out business in Canada. The Contractor must, if requested by the Contracting Authority, forward to Canada a certified true copy of all applicable insurance policies.

12. Electrical Equipment

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SACC Manual Clause B1501C (2006-06-16) Electrical Equipment

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ANNEX A

REQUIREMENT

(Document is attached herein)

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ANNEX B

BASIS OF PAYMENT

The firm LOT prices herein are an all inclusive prices, in accordance with Annex A, Requirement, in Canadian funds. Delivery is FOB destination, transportation cost included to NRC, CANMET-MTL, 183 Longwood Road, South, Room G043, Hamilton, Ontario L8P 0A5. The Contractor is responsible for all delivery charges, administration, costs, risks of transport, customs clearance, including the payment of customs duties and taxes, off-loading equipment from truck to NRC dock and moving it to the room where it will be installed and tested.

The total amount of Goods and Services Tax or Harmonized Sales Tax is to be shown separately, if applicable.

1. Firm Requirement

Item No.	Description	Quantity	Firm Lot Price
1.1	Sheet Metal Forming Universal Tester Equipment in accordance with Annex A – Requirement. The equipment must consist of all the hardware and software and the following main components: ·Hydraulic Press ·Hydraulic Power Pack ·Control System ·Data Acquisition System	1 LOT	\$ _____
	Breakdown of the firm lot price is as follows:		
	i) Equipment \$ _____		
	ii) Transportation Cost \$ _____		
	iii) Installation, commissioning, acceptance testing (SAT), and on-site training at NRC \$ _____		
	GST / HST Extra (if applicable)		\$ _____
	TOTAL		\$ _____

2. Delivery:

Firm Requirement: All the deliverables must be received prior to 8 September 2014.

APPENDIX 1 OF ANNEX B**Schedule of Milestones and Payments**

The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

Milestone No.	Description or "Deliverable"	Firm Amount	Delivery Date
1	Completion and approval of certified engineering design and delivery of the drawings	20% of Contract Value Less 10% holdback	7 February 2014 or _____
2	Completion of Factory Acceptance Testing (FAT)	30% of Contract Value Less 10% holdback	10 July 2014 or _____
3	Equipment delivery, installation, Site Acceptance Testing (SAT) commissioning, handover and on-site training	50% of Contract Value Less 10% holdback	8 September 2014 or _____
4	Acceptance of all deliverables	Release of Holdback	

ANNEX C

INSURANCE REQUIREMENT

1. Commercial General Liability Insurance

1. The Contractor must obtain Commercial General Liability Insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$2,000,000 per accident or occurrence and in the annual aggregate.
2. The Commercial General Liability policy must include the following:
 - a. Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada should read as follows: Canada, as represented by Public Works and Government Services Canada.
 - b. Bodily Injury and Property Damage to third parties arising out of the operations of the Contractor.
 - c. Products and Completed Operations: Coverage for bodily injury or property damage arising out of goods or products manufactured, sold, handled, or distributed by the Contractor and/or arising out of operations that have been completed by the Contractor.
 - d. Personal Injury: While not limited to, the coverage must include Violation of Privacy, Libel and Slander, False Arrest, Detention or Imprisonment and Defamation of Character.
 - e. Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.
 - f. Blanket Contractual Liability: The policy must, on a blanket basis or by specific reference to the Contract, extend to assumed liabilities with respect to contractual provisions.
 - g. Employees and, if applicable, Volunteers must be included as Additional Insured.
 - h. Employers' Liability (or confirmation that all employees are covered by Worker's compensation (WSIB) or similar program)
 - i. Broad Form Property Damage including Completed Operations: Expands the Property Damage coverage to include certain losses that would otherwise be excluded by the standard care, custody or control exclusion found in a standard policy.
 - j. Notice of Cancellation: The Insurer will endeavour to provide the Contracting Authority thirty (30) days written notice of policy cancellation.

-
- k. If the policy is written on a claims-made basis, coverage must be in place for a period of at least 12 months after the completion or termination of the Contract.
- l. Owners' or Contractors' Protective Liability: Covers the damages that the Contractor becomes legally obligated to pay arising out of the operations of a subcontractor.
- m. Non-Owned Automobile Liability - Coverage for suits against the Contractor resulting from the use of hired or non-owned vehicles.
- a. Litigation Rights: Pursuant to subsection 5(d) of the Department of Justice Act, S.C. 1993, c. J-2, s.1, if a suit is instituted for or against Canada which the Insurer would, but for this clause, have the right to pursue or defend on behalf of Canada as an Additional Named Insured under the insurance policy, the Insurer must promptly contact the Attorney General of Canada to agree on the legal strategies by sending a letter, by registered mail or by courier, with an acknowledgement of receipt.

For the province of Quebec, send to:

Director Business Law Directorate,
Quebec Regional Office (Ottawa),
Department of Justice,
284 Wellington Street, Room SAT-6042,
Ottawa, Ontario, K1A 0H8

For other provinces and territories, send to:

Senior General Counsel,
Civil Litigation Section,
Department of Justice
234 Wellington Street, East Tower
Ottawa, Ontario K1A 0H8

A copy of the letter must be sent to the Contracting Authority. Canada reserves the right to co-defend any action brought against Canada. All expenses incurred by Canada to co-defend such actions will be at Canada's expense. If Canada decides to co-defend any action brought against it, and Canada does not agree to a proposed settlement agreed to by the Contractor's insurer and the plaintiff(s) that would result in the settlement or dismissal of the action against Canada, then Canada will be responsible to the Contractor's insurer for any difference between the proposed settlement amount and the amount finally awarded or paid to the plaintiffs (inclusive of costs and interest) on behalf of Canada.

2. Errors and Omissions Liability Insurance

1. The Contractor must obtain Errors and Omissions Liability (a.k.a. Professional Liability) insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature but for not less than \$1,000,000 per loss and in the annual aggregate, inclusive of defence costs.

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tor016

Client Ref. No. - N° de réf. du client

23584-140009

CCC No./N° CCC - FMS No/ N° VME

-
2. If the policy is written on a claims-made basis, coverage must be in place for a period of at least 12 months after the completion or termination of the Contract.
 3. The following endorsement must be included:

Notice of Cancellation: The Insurer will endeavour to provide the



ANNEX A

REQUIREMENT

FOR

Sheet Metal Forming Universal Tester

Version: 5.0
Last Revised: October 2013

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1.0 Requirements

Natural Resources Canada – CanmetMATERIALS (www.canmetmaterials.nrcan.gc.ca) has a requirement for the design **and manufacturing, installation, commissioning, training, manuals & drawings, and service** for Sheet Metal Forming Universal Tester equipment.

The objective of the equipment is to provide researchers with an essential tool to assist in the research and development of formability properties of metals and rank lubricants.

The system shall be capable of performing Limited Dome Height, Marciniak Cup, Limited Draw Ratio, Draw Bead Simulation, Olsen & Erickson Cup, and hole expansion tests with optional tooling.

The system shall also be capable of performing burst tests on tubes and hydro forming small parts with the addition of optional tooling.

The equipment must consist of all the hardware and software and the following main components:

- Hydraulic Press
- Hydraulic Power Pack
- Access deck
- Control System
- Data Acquisition System

The equipment must be custom built using standard designs.

The delivery and installation of the equipment is in Room G043, at 183 Longwood Rd. South, Hamilton, ON, L8P 0A5, Canada. See Appendix 2 of Annex A, Building Constraints.



2.0 Equipment Specification and Service Requirement

2.1 Equipment Specification

A1	Equipment Certifications
A1-1	The equipment must be CSA, ESA, or ULC approved with visible markings.
A1-2	The design of equipment must comply with the guidelines for Control of Hazardous Energy – Lockout and Other Methods CSA Z460.
A1-3	The design of equipment must comply with the guidelines for “Safeguarding of Machinery”, CSA Z432.
A1-4	The design of equipment must comply with the “Code for Power Press Operation: Health, Safety, and Guarding Requirements, CSA-Z142.
A1-5	The contractor must obtain all necessary permits and reviews including the ESA inspection and certification. In addition, the equipment must meet the requirements of the Province of Ontario Occupational Health and Safety Regulations for Industrial Establishments, section 7: Pre-Start Health and Safety Review. It will be the responsibility of the contractor to make any modifications necessary to meet the section 7 requirements.
A2	General Design Requirements (age, size, weight)
A2-1	The equipment must not be demonstration models, used or refurbished
A2-2	The Contractor must complete and submit Appendix 1 of Annex A: “Table and Notice of designated and/or hazardous substances on project” with their proposals.
A2-3	As part of the submission the Contractor must submit a Project Schedule demonstrating how project requirements and deadlines will be met.
A2-4	The equipment, as assembled, must be sized for placement in Room G043, CanmetMATERIALS Building, Ground floor, within a 3.5 m by 4.5 m area, 7.8 m height. See Appendix 2 of Annex A, Building Constraints.
A2-5	The Sheet Metal Forming Universal Tester must be composed at least of the following components: <ul style="list-style-type: none"> ▪ Hydraulic Press ▪ Hydraulic Power Supply ▪ Access deck ▪ Control system and data acquisition hardware ▪ Control system and data acquisition Software
A2-6	The Hydraulic Press must have the following characteristics: <ul style="list-style-type: none"> • Double acting press with fully independent punch and clamp stroke. • The upper crosshead (Bolster) and the lower, moveable bed (clamp) of the press must have T slots for mounting test fixtures and tooling. Punch and clamp orientation can be reversed. The punch travels through a hole in the bolster (See A4-8) • The system will be used for warm and hot forming with tool temperatures up to 750 °C. Although these tools will be insulated from the press significant heat transfer will occur through conduction to the press slides, convection off of the tooling to the upper slide, and radiation. The press must be designed to accommodate at least 75 degree Celsius temperature gradient between the punch, clamp, and bolster. This suitability of the design for high temperature tests must be demonstrated through detailed explanations of specific design features or examples of similar presses which the contractor has built and are currently in operation. • Aramis Compatible: part face must be visible to both stereo cameras during forming.



	Cameras are mounted 30° apart at approximately 1 m from blank surface.
A2-7	<p>The Hydraulic Power Supply must have the following features:</p> <ul style="list-style-type: none"> • Water cooled with a separate hydraulic loop to circulate oil through a filter and the heat exchanger to prevent overheating. • Sensors to monitor the reservoir oil level and temperature. These sensors must cause the pump controls to shut down the hydraulic power supply if the oil level is too low or the oil temperature too high. • The system must have a minimum of 112 liters (30 gallons) of pressure accumulation for improved system performance. • Any hydraulic system with design pressure over 15 psig <u>and</u> design temperature more than 65 Deg. C, must be registered and approved by the Technical Standards and Safety Authority (TSSA) as per CSA B51-09.
A2-8	<p>Control system:</p> <ul style="list-style-type: none"> • Feedback (closed) loop control of location, velocity, and force for punch and clamp. • The controller must have proportional, integral, derivative, and feed forward compensation capabilities. • Force control must use pressure transducers and/or load cells • Ability to build and save test programs • The controller must have a minimum loop closure rate of 2 kHz for control accuracy. • The control system must be capable of switching feedbacks or control modes on the control channels in real time while the system is executing a test program. The switching must be done in a manner that does not generate a significant bump in the control signal that will affect a test. • The controller must include signal conditioning for the position and force transducers required for the clamp and punch actuators. • The controller must be capable of acquiring up to 16 channels of data with a minimum of 16 bit resolution. Eight of these channels must be available for monitoring inputs from customer supplied sensors. A minimum of four digital and four analog (+/- 10 Volt) are required. • Real time outputs of position and force for the punch and clamp for connection to an external system such as a DIC strain mapping.
A2-9	<ul style="list-style-type: none"> • The Data Acquisition system must record: <ul style="list-style-type: none"> ○ Force ○ Location ○ Data from customer supplied sensors attached to the 16 channels mentioned in A2-8 • The acquisition rate must be at least 2 kHz per channel to adequately capture short duration events that occur during the tests.
A2-10	<p><u>Software and Press Operation.</u></p> <p>The press must operate in three modes;</p> <ol style="list-style-type: none"> 1) Setup 2) Manual or Step Through 3) Automatic <p>Mode Descriptions:</p>



In setup mode the operator may jog the actuators up and down and apply load in real time using the HMI.

In both Manual and Automatic Modes the press will run through a program or recipe created by the user. The program will consist of a series of pre-defined steps. Manual mode will allow the user to proceed through the steps one at a time. The press will stop after each step and await user input before proceeding to the next step.

Program/Recipe Creation

There must be two methods of creating programs. Both methods must use a graphical computer interface. Programs can be saved and recalled later. The methods are:

- 1) Simple Test
- 2) Test Builder

Simple Test

The Simple Test Method must allow the operator to define the following:

- 1) Punch and Clamp Start Positions
- 2) Fast advance speed to start position
- 3) Clamping Force
- 4) Choose load or displacement control for punch
 - a. Load Control: Define peak load, ramp rate, end of stroke position
 - b. Displacement Control: define speed, maximum load, and end of stroke condition.
- 5) End condition. The condition that ends a test can be position, load drop, achieving a target load, user input, external input. Multiple conditions can be specified for each test such as load drop or position.

Test Builder

Test builder method allows the operator to build a program by specifying a sequence of steps. Each step will begin once the "trigger" from the previous step is complete. During each step actions are defined for The Punch, Clamp, DAQ, and digital outputs. As many steps as required can be added to the program.

Triggers:

- Force level reached by chosen actuator
- Specified location reached
- Previous command given (example: intensify load to 50 tons sent to actuator)
- Previous command fulfilled (example: intensify load to 50 tons command sent to actuator and command completed)
- User input (i.e. click)
- Digital input (door close, palm buttons, etc)
- External Input: Digital or condition on voltage signal



	<ul style="list-style-type: none"> • Load drop <ul style="list-style-type: none"> ○ Specified in % or threshold <p>Actions:</p> <p>Clamp and Punch Actions:</p> <ul style="list-style-type: none"> • Force or Displacement ramp (linear increase from level 1 to 2) • Function ramp (sine, etc) • Dwell (hold force or position) • Gear – gear action of one actuator to action of other actuator • File – load or displacement profile input from file (such as a CVS file or excel file) • Feedback – control output is function of sensor feedback (i.e. set clamp load equal to 2 x punch load while punch is operating in displacement mode)
A2-11	The contractor must supply and install all equipment required by this specification.
A2-12	The contractor must commission the system and demonstrate to the contract authority that it meets the design requirements.
A3	Facility Integration (Environment, Connection to services)
A3-1	The equipment must be able to operate indoors, within a research facility, where humidity may vary from 0% to 100%; NEMA 12 enclosures.
A3-2	Connection to services requirements: The Sheet Metal Forming Universal Tester and all of its components will require connection to building services such as electrical services, cooling circuit services, . It will be the responsibility of the Contractor to connect the press to these services which will be in the vicinity (within 3 meters) of the equipment. The Contractor must specify to CanmetMATERIALS what services are required. The Contractor must determine loads to the foundation and advice CanmetMATERIALS.
A3-3	Flooring and Trenches requirements: The Sheet Metal Forming Universal Tester and each of its components must be reviewed for drainage requirements, water, oils or condensation. A solution must be incorporated into the layout of equipment or into the surrounding floor area to contain and collect any discharge. Provision must be made to allow the containment containers to be monitored and emptied as required. Hydraulic systems will require drip trays and containment pans.
A3-4	Electrical requirements: 600 V, 3 phases, 60 Hz; 208 V; 110V or combinations of these voltages.
A3-5	Compressed Air service available: CanmetMATERIALS will provide compressed air up to 0.011 m³/s (25 SCFM) at up to 0.76 MPa (110 psi). Requirements above this will have to be met using an auxiliary compressor.
A3-6	Cooling water service available: the building is supplied with a cooling system that operates at 20 °C. Should any components require cooling the Contractor must provide an adequately sized heat exchanger to ensure that the equipment cannot contaminate the building cooling system. See Appendix 3 of Annex A for Mandatory Heat Exchanger and/or Chillers requirements.
A3-7	Plumbing requirements: Plumbing accessories to be provided by the Contractor. CanmetMATERIALS to provide piping and water drops. Compressed air piping: must be compatible with ASTM B-88, type “K”, hard drawn, seamless copper tubing and locally mounted flexible tubing.



	Cooling piping: must be compatible with ASTM B-88 type “L” hard copper and locally mounted flexible tubing.
A3-8	CanmetMATERIALS to provide floor and foundations if required for the machinery suitably levelled and reinforced to ensure satisfactory operation in accordance with the features requested by the Contractor. The Contractor must supply and install any supporting structural steel, steel cover plates, and steel platform if required. Any structural design required must be certified by a Professional Engineer.
A3-9	Acoustic Noise Level requirements: the acceptable noise level must be not more than 87dBA @ 1 m from any of the system components or engineering control must be supplied.
A3-10	Ethernet & Network Connection: The data collection system must allow collected data to be transferred into commercial data processing software such as Excel through standard data transfer protocols such as Ethernet or a USB connection.
A4	Equipment Functional & Technical Requirements
A4-1	The pressing (Punch) force must be at least 1078 kN (110 Metric Ton force)
A4-2	The clamping force must be at least 1078 kN (110 Metric Ton force). Punch and clamp must act in the same direction, against the bolster, such than a full 110 metric Tons of clamping force and 110 metric Tons of punch force can be applied concurrently. If the Clamp opposes the Punch then a clamp force of 220 metric Tons is required. 110 metric Tons to overcome the punch force and 110 metric Tons of pressing force
A4-3	Punch Stroke: 355 mm to 457 mm (14” to 18”).
A4-4	Clamp Stroke: 304 mm to 406 mm (12” to 16”).
A4-5	Punch holder (slide) Shut Height: 304 mm to 355 mm (12” to 14”).
A4-6	Clamp Shut Height: 304 mm to 355 mm (12” to 14”).
A4-7	Bed dimensions (open, unobstructed area) for bolster and clamp: <ul style="list-style-type: none"> • minimum of 787 mm x 533 mm (31” x 21”) • maximum of 1143 mm x 889 mm (45” x 35”)
A4-8	Clamp platen hole for punch: 228 mm (9”) in diameter.
A4-9	In order for the operator to place a sample into the press without straining, the work area must be within 762 mm to 1220 mm (30” to 48”) from the floor or operator platform. If a platform is required it must be supplied with the press.
A4-10	Maximum punch speed of at least 75mm/s at full load (175 in/min)
A4-11	Maximum pressing speed: Must be capable of at least 200 mm/s with a load at 60 tons
A4-12	Minimum controlled pressing speed: 0.08 mm/sec (0.2 in/min) or slower
A4-13	Displacement transducer accuracy: the transducer must have a maximum non-linearity of ±0.02% of full-scale and a minimum resolution of 0.013mm (0.0005 in.).
A4-14	Displacement control accuracy: 0.05 mm
A4-15	Calibration requirements: <ul style="list-style-type: none"> • The procurement must include a calibration plan identifying and listing each measuring device that must be calibrated, calibration range, recommended points and frequency of calibration. • The system design must include calibration ports, and arrangements to facilitate the calibration operation. • All components identified in the calibration plan must be calibrated prior to commissioning starting.



2.2. Occupational Health & Safety and Environment

2.2.1. Contractor Health & Safety Compliance Requirements

- The contractor must comply with the Province of Ontario's requirements and CanmetMATERIALS Federal Occupational Health, Safety and Environment (OHS & E) policy and procedures.
- CanmetMATERIALS will orient the contractor for CanmetMATERIALS Federal OHS&E policy and procedures, prior to the start of the work.
- The contractor must put in place its own qualified compliance monitoring process and team.

2.3. Training

2.3.1. On-Site Training

On-site (CanmetMATERIALS Facility, Hamilton, Ontario) commissioning and training is to include system operation, hardware maintenance procedures, software usage, safety training, procedure for maintenance, system calibration and trouble shooting of the system for up to a maximum of five (5) users in English for one week.

The exact date, time and location of the training will be mutually agreed between the Contractor and the Technical Authority.

12.4. Documentation (Manuals & Equipment Drawings)

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

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

Manuals must be provided to CanmetMATERIALS in English.

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

2.5. Warranty, Service, Support & Updates

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

The Contractor must provide technical support as either; regional (local) technical support; technical phone support; or support via the Internet. Communication must begin within **2 business days** of the initial request for support.



The Contractor must have available spare parts and provide service support for a minimum of **five (5) years** after acceptance.

The Contractor must provide all software updates and new releases for a period of **two (2) years** following acceptance.

Note: The word "updates" means all enhancements, extensions or other modifications to the software. The word "releases" means enhancements or modifications to the software or new modules or supplementary modules that function in conjunction with the software that represent the next generation of software.

2.6. Project Management

2.6.1. Schedule

The contractor must provide a project schedule, which represents the project's key milestones, deliverables and activities. The contractor must demonstrate and track progress against this schedule.

The Contractor's project plan must be provided to CanmetMATERIALS within two weeks of contract date.

The project plan must be setup and maintained in Microsoft Project 2010 professional.

The project plans must show:

- Baseline agreement
- Current forecast
- Changes since last report

2.6.2. Meetings

All coordination of meetings must be managed through CanmetMATERIALS's Project Authority. These meetings will be held with all parties:

- Kick-off meeting: this meeting may be held at CanmetMATERIALS facility in Hamilton, Ontario, the Contractor's site, or by a video conference (as agreed) within 4 weeks from contract award.

This meeting will outline the following for each party as it relates to this project:

- All the project parties
- Roles and responsibilities
- Deadlines
- Project Plans
- Risks and issues
- Meeting and communication plans
- Issue resolution procedure
- OHS & E requirements.

- Monthly meetings: these meetings may be held at CanmetMATERIALS facility in Hamilton, Ontario, the Contractor's site, or by a video conference (as agreed) every month until completion of the project.

This meeting will review:

- Project work accomplished to date
- Forecasted project work for the next month
- Updated forecast to completion



- New risks and updated risk status complete with risk mitigation and contingency plans
 - Issues to be resolved
 - Requests for assistance from the management teams
- Building integration design review meeting: Building integration design review meetings will be held at CanmetMATERIALS facility in Hamilton, Ontario to discuss in details the equipment demands on the facility with the Building Owner's Engineers. The Contractor must provide a complete set of specifications and drawings detailing the equipment building requirements (example: electrical, HVAC, mechanical, structural, etc.) within two months of the project kick-off meeting. The building integration design review meeting will be held within one month after receipt of these specifications and drawings.

2.7 Design and Manufacturing Certifications

The Contractor must demonstrate that the equipment or product meets the standards listed in 2.13.1 Regulations, Guidelines and Standards and any other appropriate standards and regulations, for the intended use.

2.8 Installation

The Contractor must provide on-site installation of the system upon arrival at the CanmetMATERIALS Facility in Hamilton, Ontario. Installation must be carried out by a qualified service technician.

CanmetMATERIALS will provide:

- the required service drops (electrical, compressed air, industrial gases like argon, oxygen, hydrogen, nitrogen, helium, RO water, tap water, and water cooling circuit); and lockable disconnects to support the final hook-up of the system.
- Floor and foundations if required for the machinery suitably levelled and reinforced to ensure satisfactory operation in accordance with the features requested by the Contractor.

2.8.1 Installation Certification

The Contractor is required to arrange and provide installation certification by the Ontario Electrical Safety Authority (ESA) for any electrical installation work.

The Contractor is required to ensure that any hydraulic system meets the requirements of the Province of Ontario, including TSSA certifications if required.

Plumbing must adhere to the National Plumbing Code.

Team members working on this project must have the following Ontario certifications, licenses or proof of training, as applicable and required:

- Certified pressure welders
- Certified Steam Fitters
- Certified Plumbers



- Certified Industrial Millwrights, Riggers, Ironworkers and welders
- Certified electricians
- Confined space training and certifications
- WHMIS training and certification
- Crane and Forklift certifications

All the necessary local permits must be obtained by the Contractor.

2.9 Acceptance Test Requirements

The acceptance tests must be in accordance with the Acceptance Test Plan specified in Appendix 4 of Annex A.

2.10 Calibration Certification

The Contractor must provide calibration and certification of calibration of the equipment as installed at the Hamilton Facility. Wherever possible, all calibrations are to be provided by an accredited calibration service provider, who is accredited to ISO/IEC 17025-2005.

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

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

The calibration service provider must include with the calibration report, the evidence of Accreditation, by a recognized Accrediting Body, and the Scope of Accreditation, for all artefacts and standards used in the calibration.

2.11 Commissioning

The Contractor must provide on-site commissioning at the CanmetMATERIALS facility in Hamilton, Ontario. The on-site commissioning of the system must be carried out by qualified personnel.

The exact date and time of the commissioning will be mutually agreed between the Contractor and the Technical Authority.

2.11.1 Definitions:

"Cold Commissioning" means that the contractor must demonstrate that the equipment is acceptable by providing required certifications and other documentations prior to energizing equipment.

"Warm Commissioning" means the contractor must demonstrate that the equipment is functioning correctly by conducting equipment operations which demonstrate that all the functions of the equipment are operating within specification, in the absence of any materials or products.

"Hot commissioning" means that CanmetMATERIALS must demonstrate that the equipment is fully functional within specifications and applicable standards by conducting equipment operations with materials or products. At the end of hot commissioning, the equipment must be "Turned over to Operations".



2.11.2 Cold Commissioning Acceptance:

This mode of commissioning is to be carried out prior to Energizing Equipment. The Contractor must develop a detailed test plan for completing cold commissioning. The items to be completed include the following:

Contractor:

- Obtain Electrical Certification (Ontario Electrical Safety Authority -- ESA)
- Provide Safety Engineering Compliance/ Deficiency Report
- Write Standard Operating Procedures for Updates or Creation
- Develop Lock-Out Tag-Out (LOTO) Procedure
- Provide Equipment Documentation Updates (as a result of equipment modification & installation)
- Rework to Obtain Compliance

CanmetMATERIALS Staff:

- Equipment Energizing Procedure Commences
- Staged Removal of Lock-Out Tag-Out (LOTO) of Equipment

2.11.3 Warm Commissioning:

The Contractor must develop detailed test plan for completing warm commissioning acceptance.

Warm commissioning must involve the following:

- Conduct Calibration and Alignment
- Verify Motor Rotations
- Verify all Machine Motions
- Correct any Interference
- Ensure Limit Switches are Properly Set
- Verify Speed and Speed Controls
- Verify Automation
- Have Machine Run up to Speed to Perform all Motions with no Product

Warm Commissioning is assumed to be completed at this stage, afterwards,

- Contractor Signs off on Commissioning of New Equipment

2.11.4 Hot Commissioning:

Hot commissioning is conducted in order to achieve the following:

- Run Machine with Product and Assistance of Operator to Verify that Quality Requirements are Met
- Rework from Verification Testing
- Hot Commissioning Complete

At the completion of hot commissioning, the equipment must be "Turned-Over to Operations".

2.12 Legal Requirements

The services and procurement activity must meet the regulations, guidelines, and standards as outlined in "2.13 Associated Documents". Where there is a conflict between the various regulations, guidelines, and standards, the contractor must comply with the machine specific requirements for that type of machine.



Standards in order of precedence are:

- Canadian-Federal
- Canadian-Provincial
- US/NA
- ISO/EN
- Other

Where they exist, the harmonized corresponding ISO/EN numbered standards are equivalent and may be substituted.

2.13 Associated Documents

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

2.13.1. Regulations, Guidelines, and Standards

Government of Canada

- Canada Labour Code Part II: Occupational Health and Safety
- Canada Occupational Health and Safety Regulations
- National Building Code
- National Fire Code
- National Plumbing Code
- Treasury Board of Canada Directives, Guidelines, Policies and Procedures
- Canadian Environmental Protection Act
- Controlled Goods Act (may be applicable)

Province of Ontario

- Occupational Health and Safety Act
- Ontario's 2012 OH&S Act and Regulations
- Guidelines for Pre-start Health and Safety Reviews, Annex II (Recognized Standards) (Ontario Ministry of Labour, April 2001)
- Ontario Building Code (current edition)
- Technical Standards and Safety Act (including applicable standards referenced within).
- Ontario Fire Code (current edition)
- Ontario Plumbing Code
- Environmental Protection Act
- Ontario Electrical Safety Code 25th edition

Industry Canada

- ICES-001:** Industrial, Scientific and Medical (ISM) Radio Frequency Generators

2.13.2. Safety Standards

ANSI

- ANSI/AIHA Z9.10:** Fundamentals Governing the Design and Operation of Dilution Ventilation Systems in Industrial Occupancies

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CSA

Z142: Code for Power Press Operation: Health, Safety, and Guarding Requirements

Z432: Safeguarding of Machinery

Z107.58: Noise Emission Declarations for Machinery

CAN/CSA-Z431: Basic and Safety Principles for Man-Machine Interface, Marking, and Identification

Z460-05: Control of Hazardous Energy – Lockout and Other Methods

2012 Canadian Electrical Code

NFPA

79: Electrical Standard for Industrial Equipment



**Appendix 1 of Annex A
Notice of designated and/or hazardous substances on project**

Instructions to Contractors/Bidders: Please complete the following sections of this form, and return a signed and dated copy with your bid. Failure to do so may result in your bid being deemed non-responsive.

Notice of Designated and/or Hazardous Substances on Project	
Project	
Project Address	
Project No.	
Contract Authority	
Project Manager	

Notice to Contractors / Bidders: In accordance with applicable occupational health and safety, and/or environmental protection statutes, be advised that **no designated substances are present in the work area.**

We, _____ (name of Contractor/Bidder) hereby acknowledge having received this "Notice of Designated or Hazardous Substances on Project."

Signed for the Contractor / Bid Date:

Name (Please Print):

Title:

Contractors/Bidders Certification: In accordance with applicable occupational health and safety, and/or environmental protection statutes, the bidder below certifies that no designated substances will be brought onto the CanmetMATERIALS facility.

We, _____ (name of Contractor/Bidder) hereby acknowledge having received this "Notice of Designated or Hazardous Substances on Project."

Signed for the Contractor / Bid Date:

Name (Please Print):

Title:



Appendix 2 of Annex A: Building Constraints

Driveway Paving Limits:

46,000 Kg

Loading Dock Limits:

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

- Overhead door 2.3m wide x 3.0m high
- Dock floor is 1.2m below finish floor of the ground floor level.
- Dock leveller 20 Ton capacity with platform 2.1m wide x 2.1m long + drop down lip 2.14m wide x 2.22m Deep. Hydraulic leveller range is +/- 0.3m
- The door at the top of the ramp is 2.3m wide x 3m high.
- Room G043 sliding door dimensions: 5800 mm (w) x 5690 mm (h)

Floor Loading Limits and Material Handling practices:

During building integration meeting the successful contractor will discuss the equipment delivery with the owner's building engineers.

In-House Crane Limit:

G043/HighBay-10To



**Appendix 3 of Annex A:
Mandatory Heat Exchanger and Chillers Requirements**

Req. No.	Requirement
A1 – Equipment Certifications	
A1-1	The equipment must be CSA or ULC approved with visible markings.
A1-2	The design of equipment must follow the guidelines listed below: <ul style="list-style-type: none"> • Control of Hazardous Energy – Lockout and Other Methods CSA Z460; • Safeguarding of Machinery-CSA Z432; • Performance standards for rating packaged water chillers- CSA C743; • Heating and Cooling Equipment-CSA-C22.2 #236-05
A1-3	All plumbing works must follow National Plumbing Code
A2 – General Design Requirements (age, size, weight)	
A2-1	The equipment must not be prototypes, demonstration models, used or refurbished.
A2-2	The equipment, as assembled, must be sized for placement in room G043 laboratory.
A2-3	Contractor to provide 40 mesh screen size strainer, on return water line.
A2-4	The coolant and construction materials must be compatible with sodium nitrite and sodium Metaborate inhibitors containing process water loop.
A2-5	Details of all yellow metals used in the heat exchanger and chillers must be given
A2-6	Use of Aluminum coils or other Aluminum alloys' parts in the heat exchanger and chiller is prohibited for this procurement
A3 – Facility Integration (Environment, Connection to services)	
A3-1	The equipment must be able to operate indoors, within a research facility, where humidity may vary from 0 to 100%.
A3-2	Electrical requirements: 600 VAC, 3 phases, 60 Hz; 208 VAC, 110 VAC, 60 Hz or combinations of these voltages. The electrical power demand must be balanced to maintain a power factor of 95% or better.
A3-3	Plumbing requirements: Plumbing accessories to be provided by the Contractor. CanmetMATERIALS to provide piping and water drops.
A3-4	Acoustic Noise Level requirements: Not more than 87dbA @ 1 m from any of the system components or engineering control must be supplied.



Natural Resources
Canada

Ressources naturelles
Canada

**Appendix 4 of Annex A:
Acceptance Test Plan**

ACCEPTANCE TEST PLAN

SHEET METAL FORMING UNIVERSAL TESTER

Natural Resources Canada
CanmetMATERIALS

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Canada



Introduction

This document outlines the methods and testing procedures for acceptance testing for the SHEET METAL FORMING UNIVERSAL TESTER. In order for acceptance testing to be completed successfully, *the Contractor* must perform all tests to successful completion in the presence of a CanmetMATERIALS Technical representative. Each test has two possible outcomes: pass or fail. Any failed test is reason for the entire test sequence to be failed.

Sign-off

The Contractor and CanmetMATERIALS must both sign off on each requirement that has been met.

The Contractor and CanmetMATERIALS must develop an agreed upon list of deficiencies and the Contractor must provide an acceptable corresponding corrective action plan.

Factory Acceptance Test (FAT) Plan

Prior to shipment of the System to CanmetMATERIALS, the Contractor must demonstrate the ability of the system to meet the acceptance criteria and must be co-witnessed by both the Contractor and the Technical Authority.

The Factory Acceptance Test must be conducted at the Contractor's facility to confirm compliance of the system with 2.1 Equipment Specification as set out in Annex A and Appendix 3 of Annex A, Mandatory Heat Exchanger and Chillers Requirements.

The equipment as supplied and installed must pass all tests and checks.

Failure of any aspect of testing can result in termination of the contract at Government of Canada's discretion.

FAT plan will be conducted without test specimen.

Site Acceptance Test (SAT) Plan

SAT Plan must be conducted at the CanmetMATERIALS site in Hamilton. Depending on tooling availability, SAT will be conducted with test specimen. Otherwise SAT will be performed on a sample following a mutually agreed testing protocol between CanmetMATERIALS and the Contractor.



<p>1. Press</p> <p>Demonstrate the press and hydraulic system can able to meet the Annex A, 2.1.Equipment Specification, A4 - Equipment Functional & Technical Requirements.</p>	<p>Check Item <input type="checkbox"/></p>
<p>2. Interlocks and Safeties</p> <p>Demonstration of equipment safety, alarms, and interlocks such as:</p> <ul style="list-style-type: none"> • Low water flow, high temperature water • Pressing force overload limit • Visual and audible alarms 	<p>Check Item <input type="checkbox"/></p>
<p>3. Instrumentation</p> <p>Demonstrate operability and function of all instruments supplied.</p>	<p>Check Item <input type="checkbox"/></p>
<p>4. Spares</p> <p>Review spare parts list and recommendations.</p>	<p>Check Item <input type="checkbox"/></p>
<p>5. Manuals and Documentation</p> <p>Explain the contents and use of the manuals being sure to include vendor manuals and Factory performance test data.</p>	<p>Check Item <input type="checkbox"/></p>

Final Sign-off

	Date:		Date:
CONTRACTOR NAME		CanmetMATERIALS Inspection Authority	