



**REQUEST FOR PROPOSALS
DEMANDE DE PROPOSITIONS**

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

National Research Council Canada (NRC)
Finance and Procurement Services
1200 Montreal Road, Building M-58
Ottawa, Ontario
K1A 0R6

Title/Sujet M10 Research Altitude Test Facility (RATFac) – Piping Modification Design	
Solicitation No./N. de l'invitation 21-58120	Date 13 May 2022
Solicitation Closes/L'invitation prend fin at/à 14 :00 on/le 14 June 2022	Time Zone/Fuseau Horaire EDT
Address Enquiries To/Adresser demandes de renseignements à : Collin Long Email : Collin.Long@nrc-cnrc.gc.ca	

Instructions: See Herein

Instructions: Voir aux présentes

Proposal To:

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:

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).



Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No./N. de telephone 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 autorisé à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

M10 Research Altitude Test Facility (RATFac) – Piping Modification Design

1.0 PRESENTATION OF PROPOSALS

- 1.1 You are invited to submit **one** electronic Technical Proposal and **one** electronic Financial Proposal in two separate attachments to fulfil the following requirement forming part of this Request for Proposal. One attachment **must** be clearly marked 'Technical Proposal' and the other attachment **must** be marked 'Financial Proposal'. All financial information **must** be fully contained in the Financial Proposal, and only in the Financial Proposal. Vendors who provide financial information in the technical proposal will be disqualified. **All proposals should include the front page of this RFP duly completed.**

2.0 SCOPE OF WORK

- 2.1 To provide services **to design new air supply piping and/or ducting (referred to as "piping" throughout document) system that will reduce minimum testing altitude** in accordance with the detailed Statement of Work attached as Appendix "A".

3.0 PERIOD OF CONTRACT

- 3.1 NRC anticipates that the work will begin in **June 2022** and will be completed 12 weeks from Contract Award

4.0 BIDDERS' CONFERENCE

- 4.1 All vendors must attend a compulsory Bidders' Conference at the designated time and place detailed below. Failure to do so will render a bid invalid. Bidders who cannot attend, for any reason, on the specified date and time will not be given an alternative appointment and their proposals will be considered non-responsive. **NO EXCEPTIONS WILL BE MADE.**

**Monday May 23, 2022 at 11:00am
1200 Montreal Road, Building M10**

As proof of attendance, the Contracting Authority will have an Attendance Form that Bidders **MUST** sign. It is the responsibility of all Bidders to ensure they have signed the mandatory Bidders Conference Attendance form prior to leaving the Bidders' Conference. Proposals submitted by Bidders who have not attended the Bidders Conference and failed to sign the Attendance Form will be deemed non-responsive.

* Due to COVID-19, we are taking additional measures to protect you and our employees at the site visits.

- To allow NRC to prepare for the site visits, all proponents are asked to pre-register preferably 48 hours ahead of the job showing and identify their preferred site visit date. Please register by emailing Collin.Long@nrc-cnrc.gc.ca. Bidders shall provide contact name, email and phone number of person attending.
- At the site visit, to limit contact and risks:
 - o The proponents will sanitize their hands at the hand sanitizing station.

- The proponents will be asked to sign the Attendance Form. It is the responsibility of all proponents to verify information on the Attendance Form.
 - The site visit will proceed with a maximum of five (5) proponents at a time. Each group will have approximately 20 minutes to review the site. The site visit will continue with the next group of five (5) proponents until each one has had a chance to review the site.
 - The site visits could take longer than usual, therefore anticipate a longer meeting duration.
 - Physical distancing: keeping a distance of at least 2 arms-length (approximately 2 metres) from others may not be possible at all times, therefore the use of NRC issued disposable face coverings to reduce the risk of transmission of COVID-19 is mandatory.
 - The proponents shall not impede safe access to and from the facility.
- Depending on the anticipated amount of pre-registration, the NRC may decide to schedule time slots for every group of five (5) proponents. The time slot for your site visit will be confirmed by the NRC Departmental Representative by email upon pre-registration. That time will supersede the site visit meeting time specified above.
 - Proposals submitted by bidders who have not attended the site visit or failed to submit their identification and contact information at the site visit will be deemed non-responsive.

5.0 **ENQUIRIES**

- 5.1 If you require clarification regarding any aspect of this RFP, address all queries to the Contracting Authority, identified below, at least 10 working days before the closing date. All queries must be in writing and queries received less than 10 working days prior to the closing date cannot be guaranteed a response. Information received verbally will not be binding upon the NRC.

Collin Long

Contracting Authority, Procurement Services
National Research Council Canada
1200 Montreal Road, Bldg. M-58
Ottawa, Ontario K1A 0R6 Email: Collin.Long@nrc-cnrc.gc.ca

- 5.2 To ensure the equality of information among Bidders, responses to general enquiries will be sent simultaneously to all bidders without identifying the source. All formal questions and answers will be distributed to all competing bidders unless such publication would reveal proprietary information. The bidder who initiates the question will not be identified. Technical questions that are considered proprietary by the bidder must be clearly identified. NRC will respond individually to the bidder if it considers the questions proprietary. If NRC does not consider the question proprietary, the bidder submitting it will be allowed to withdraw the question, or have the question and answer distributed to all bidders.
- 5.3 Vendors who attempt to obtain information regarding any aspect of this RFP during the solicitation period through any NRC contacts other than the Contracting Authority identified herein, may be disqualified (for that reason alone).

- 5.4 It is the responsibility of the Bidder to obtain clarification of the requirement contained herein, if necessary, prior to submitting its proposal. The Bidder must have written confirmation from the Contracting Authority for any changes, alterations, etc., concerning this RFP.

6.0 **PROPOSAL CLOSING DATE AND BID SUBMISSION INSTRUCTIONS**

- 6.1 Proposals must be **received electronically** no later than 14:00 EDT (according to NRC's Server Time), June 14, 2022, to the following **Contracting Authority**:

NAME - Collin.Long@nrc-cnrc.gc.ca

****The maximum file size that NRC can receive in a single email is 10MB****

****Bidders are urged to send their proposals well before the bid closing time****

Proposals <u>must not</u> be sent directly to the Project Authority
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- 6.2 All risks and consequences of incorrect delivery of electronic bids are the responsibility of the Bidder. **The National Research Council Canada will not be responsible for late bids received at destination after the closing date and time, even if it was submitted before. Electronic bids received after the indicated closing time based on NRC servers' received time will be irrevocably rejected. Bidders are urged to send their proposal in sufficient time, in advance of the closing time to reduce any technical issues. The National Research Council Canada will not be held responsible for bids sent before closing time but received by the NRC servers after the closing time.**

- 6.3 Bidders must adhere to the COVID-19 Vaccination Policy for Supplier Personnel. In accordance with the COVID-19 Vaccination Policy for Supplier Personnel, all Bidders must provide with their bid, the COVID-19 Vaccination Requirement Certification attached to this bid solicitation (refer to **Appendix "E"**), to be given further consideration in this procurement process. This Certification incorporated into the bid solicitation on its closing date is incorporated into, and forms a binding part of any resulting Contract.

- 6.4 Bid Solicitations must comply with the Standard Instructions and Conditions (applicable to Bid Solicitations) as specified in Appendix "D" of this document.

- 6.5 The sender has the sole responsibility for the timely dispatch and delivery of a proposal and cannot transfer such responsibility to the NRC. No supplementary information will be accepted after the closing deadline unless NRC requests a clarification.

- 6.6 All submitted proposals become the property NRC.

7.0 **EVALUATION CRITERIA**

- 7.1 Proposals will be assessed in accordance with the mandatory and rated evaluation attached as **Appendix "B"**. Bidders shall provide a detailed response to each criterion. NRC reserves the right to verify any and all information provided by the bidder in his/her proposal.

8.0 **COST PROPOSAL**

- 8.1 The cost proposal must be a **fixed price quotation, FOB Destination, excluding GST/HST**. The fixed price must include all the materials and services required to fulfill all

aspects of the Statement of Work. Bidders should identify the currency on which the cost proposal is based.

- 8.2 The cost proposal must have sufficient structure to show how the total proposed cost was calculated. It should contain the following elements:
- a) The number, classification and per diem and/or hourly rate for all assigned personnel. For each classification, the number of workdays should be defined.
 - b) The amount and explanation for other miscellaneous expenses that could be incurred.
- 8.3 GOODS AND SERVICES TAX (GST) and HARMONIZED SALES TAX (HST): The GST and HST, whichever is applicable, shall be considered an applicable tax for the purposes of this RFP and extra to the price herein. The amount of GST or HST shall be disclosed and shown as a separate item.
- 8.4 Bids will be evaluated in Canadian currency, therefore, for evaluation purposes, the exchange rate quoted by the Bank of Canada as being in effect on date of bid closing, shall be applied as the conversion factor for foreign currency. Prices quoted shall not be subject to, or conditional upon, fluctuations in commercial or other interest rates during either the evaluation or contract period.

9.0 **CONDITIONS OF SUBMISSION**

- 9.1 There shall be no payment by the National Research Council for costs incurred in the preparation and submission of proposals in response to this request. No payment shall be made for costs incurred for clarification(s) and/or demonstration(s) that may be required by NRC. The National Research Council reserves the right to reject any or all proposals submitted, or to accept any proposal in whole or in part without negotiation. A contract will not necessarily be issued as a result of this competition. NRC reserves the right to amend, cancel or reissue this requirement at any time.
- 9.2 Selection of the successful bidder will be on the basis of technical merit and best overall value, not on cost alone. A cost-per-point ratio will be calculated by dividing the total cost by the technical rating. The compliant bidder with the lowest cost-per-point ratio will be considered the successful bidder. NRC reserves the right to enter into negotiations with the successful bidder prior to contract award on any and all aspects of its offer. The following chart illustrates the relationship between point rating and bid price. The figures used are for illustration purposes only.

<u>Proposal</u>	<u>Rating</u>	<u>Bid Price</u>	<u>Price/Point</u>	<u>Winner</u>
A	72	\$112,000	\$ 1,555	
B	90	\$ 120,000	\$ 1,333	*****
C	78	\$ 105,000	\$ 1,346	
D	85	\$ 117,000	\$ 1,376	

The method of selection will be highest combined Technical Rating (60%) and Price (40%)

- 9.3 Proposals submitted must be valid for not less than sixty (60) calendar days from the closing date of the RFP.
- 9.4 Your proposal should contain the following statement:

"We hereby certify that the price quote is not in excess of the lowest price charged anyone else, including our most favoured customer, for like services".

- 9.5 Any contract resulting from this invitation will be subject to the General Conditions - Services 0220 (copy attached as Appendix "C") and any other special conditions that may apply.

10.0 **CONFIDENTIALITY**

- 10.1 This document is UNCLASSIFIED, however; the contractor shall treat as confidential, during as well as after the services contracted for, any information of the affairs of NRC of a confidential nature to which its servants or agents become privy.

11.0 **CRIMINAL CODE OF CANADA**

- 11.1 Canada may reject an offer where the Bidder, or any employee or subcontractor included as part of the offer, has been convicted under section 121 ("Frauds on the government" & Contractor subscribing to election fund"), 124 ("Selling or purchasing office"), or 418 ("Selling defective stores to Her Majesty") of the Criminal Code.

Bidder compliance with all of the following clauses, terms and conditions of the resulting contract is mandatory.

12.0 **T4-A SUPPLEMENTARY SLIPS**

- 12.1 Pursuant to paragraph 221(1)(d) of the Income Tax Act, payments made by departments and agencies to contractors under applicable services contracts (including contracts involving a mix of goods and services) must be reported on a T4A Supplementary slip. To enable client departments and agencies to comply with this requirement, contractors are required to provide information as to their legal name and status, business number, and/or Social Insurance Number or other identifying supplier information as applicable, along with a certification as to the completeness and accuracy of the information.

13.0 **GOVERNMENT SMOKING POLICY**

- 13.1 Where the performance of the work requires the presence of the Contractor's personnel on government premises, the Contractor shall ensure that its personnel shall comply with the policy of the Government of Canada, which prohibits smoking on any government premises.

14.0 **SECURITY LEVEL**

- 14.1 Prior to the performance of the obligations under this contract, all personnel that will be involved with the project must be cleared to the security level of **RELIABILITY** as defined in the security policy of Canada.

Any Contract resulting from this invitation will be subject to the Security Requirements Check List (SRCL), form TBS/SCT 350-103, attached at Appendix "E".

15.0 **ACCESS TO GOVERNMENT FACILITIES / EQUIPMENT**

- 15.1 Access to the facilities and equipment necessary to the performance of the work shall be provided through arrangements to be made by the Project Authority named herein. There will be however; no day-to-day supervision of the Contractor's activities nor control of the Contractor's hours of work by the Project Authority.

- 15.2 The Contractor undertakes and agrees to comply with all Standing Orders and Regulations in force on the site where the work is to be performed, relating to the safety of persons on the site or the protection of property against loss or damage from any and all causes including fires.

16.0 **GENERAL CONDITIONS**

- 16.1 The General Conditions 0220 entitled General Conditions Engineering and Architectural Services and attached as Appendix "C" form part of this Contract.

17.0 **PROGRESS REPORT**

- 17.1 As part of and together with each progress claim, the Contractor must submit a progress report consisting of a narrative of approximately one (1) page describing the technical progress achieved in terms of the "Statement of Work", explaining any variations in the work or expenditure plan, specifying any problems encountered or foreseen (relating to time, cost or technical matters) and any other matter considered reportable by the Contractor.

18.0 **ADDITIONAL WORK**

- 18.1 The successful bidder can at NRC's option, be asked to provide additional work related to this requirement. Payment will be limited to the firm per diems quoted in the Contractor's proposal.

19.0 **NON-PERMANENT RESIDENT (FOREIGN COMPANY)**

- 19.1 The Contractor shall ensure that non-permanent residents intending to work in Canada on a temporary basis in fulfillment of the Contract, who are neither Canadian citizens nor United States nationals, receive all appropriate documents and instructions relating to Canadian immigration requirements and secure all required employment authorizations prior to their arrival at the Canadian port of entry. The Contractor shall ensure that United States nationals having such intentions receive all appropriate documents and instructions in that regard prior to their arrival at the Canadian port of entry. Such documents may be obtained at the appropriate Canadian Embassy/Consulate in the Contractor's country. The Contractor shall be responsible for all costs incurred as a result of non-compliance with immigration requirements.

20.0 **NON-PERMANENT RESIDENT (CANADIAN COMPANY)**

- 20.1 The Contractor is responsible for compliance with the immigration requirements applicable to non-permanent residents entering Canada to work on a temporary basis in fulfillment of the Contract. In some instances, the employment authorization necessary to enter Canada cannot be issued without prior approval of Human Resources Centre Canada (HRCC). HRCC should always be contacted as soon as the decision to bring in a non-permanent resident is made. The Contractor will be responsible for all costs incurred as a result of non-compliance with immigration requirements.

21.0 **LUMP SUM PAYMENT - WORK FORCE REDUCTION PROGRAMS**

- 21.1 It is a term of the contract that:
- a. the Contractor has declared to the Departmental Representative whether the Contractor has received a lump sum payment made pursuant to any work force reduction program,

including but not limited to the Work Force Adjustment Directive, the Early Departure Incentive Program, the Early Retirement Incentive Program or the Executive Employment Transition Program, which has been implemented to reduce the public service;

- b. the Contractor has informed the Departmental Representative of the terms and conditions of that work force reduction program, pursuant to which the Contractor was made a lump sum payment, including the termination date, the amount of the lump sum payment and the rate of pay on which the lump sum payment was based; and
- c. the Contractor had informed the Departmental Representative of any exemption in respect of the abatement of a contract fee received by the Contractor under the Early Departure Incentive Program Order or paragraph 4 of Policy Notice 1995-8, of July 28, 1995.

22.0 **FORMER PUBLIC SERVANT**

22.1 Contracts with former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts with FPS, bidders must provide the information required below.

22.2 Definitions

For the purposes of this clause,

"former public servant" is any former member of a department as defined in the Financial Administration Act, R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a) an individual;
- b) an individual who has incorporated;
- c) a partnership made of former public servants; or
- d) a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means, a pension or annual allowance paid under the Public Service Superannuation Act (PSSA), R.S., 1985, c.P-36, and any increases paid pursuant to the Supplementary Retirement Benefits Act, R.S., 1985, c.S-24 as it affects the PSSA. It does not include pensions payable pursuant to the Canadian Forces Superannuation Act, R.S., 1985, c.C-17, the Defence Services Pension Continuation Act, 1970, c.D-3, the Royal Canadian Mounted Police Pension Continuation Act, 1970, c.R-10, and the Royal Canadian Mounted Police Superannuation Act, R.S., 1985, c.R-11, the Members of Parliament Retiring Allowances Act, R.S., 1985, c.M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c.C-8.

22.3 Former Public Servant in Receipt of a Pension

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes () No ()**

If so, the Bidder must provide the following information, for all FPS in receipt of a pension, as applicable:

- a) name of former public servant;
- b) date of termination of employment or retirement from the Public Service.

22.4 By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

22.5 Work Force Reduction Program

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of a work force reduction program? **Yes () No ()**

If so, the Bidder must provide the following information:

- a) name of former public servant;
- b) conditions of the lump sum payment incentive;
- c) date of termination of employment;
- d) amount of lump sum payment;
- e) rate of pay on which lump sum payment is based;
- f) period of lump sum payment including start date, end date and number of weeks;
- g) number and amount (professional fees) of other contracts subject to the restrictions of a work force reduction program.

22.6 For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including the Goods and Services Tax or Harmonized Sales Tax.

23.0 OFFICE OF THE PROCUREMENT OMBUDSMAN (OPO)

23.1 The Office of the Procurement Ombudsman (OPO) was established by the Government of Canada to provide an impartial, independent venue for Canadian bidders to raise complaints regarding the award of certain federal contracts under \$26,400 for goods and \$105,700 for services. If you have concerns regarding the award of a federal contract below these dollar amounts, you may contact OPO by e-mail at boa.opo@boa-opo.gc.ca, by telephone at 1-866-734-5169, or by web at www.opo-boa.gc.ca. For more information on OPO's services or to determine if your concerns are within the Ombudsman's mandate, please see the Procurement Ombudsman Regulations or visit the OPO website.

24.0 ENVIRONMENTAL CONSIDERATIONS

24.1 Canada is committed to greening its supply chain. In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to acquire products and services that have a lower impact on the environment than those traditionally acquired. Environmentally preferable goods and services are those that have a lesser or reduced impact on the environment over the life cycle of the good or service, when compared with competing goods or services serving the same purpose. Environmental performance considerations include, among other things: the reduction of greenhouse gas emissions and air contaminants; improved energy and water efficiency;

reduced waste and support reuse and recycling; the use of renewable resources; reduced hazardous waste; and reduced toxic and hazardous substances. In accordance with the Policy on Green Procurement <https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573> , for this solicitation:

- Offerors / suppliers are encouraged to offer or suggest green solutions whenever possible.
- Offerors / suppliers are requested to provide all correspondence including (but not limited to) documents, reports and invoices in electronic format unless otherwise specified by the Contracting Authority or Project Authority, thereby reducing printed material.
- The paper format of the offer / arrangement should be certified as originating from a sustainable managed forest and/or with a minimum of 30% recycled content.
- Offerors / suppliers should recycle (shred) unneeded copies of non-classified/secure documents (taking into consideration the Security Requirements).
- Product components used in performing the services should be recyclable and/or reusable, whenever possible.
- Offerors / suppliers are encouraged to offer goods and/or services certified to a reputable eco-label.
- Offerors / suppliers should use equipment that has high energy efficiency or produces low air emissions.
- Offerors / suppliers are encouraged to offer environmentally preferred products which supports a sustainable environment for nature and wildlife.
- Offerors / suppliers are encouraged to offer environmentally preferred products which ensure the comfort and air quality of building occupants.

Suppliers are encouraged to consult the following websites:

<https://www.tpsgc-pwgsc.gc.ca/app-acq/ae-gp/index-eng.html>

<https://www.tpsgc-pwgsc.gc.ca/app-acq/ae-gp/rle-qlr-eng.html>

25.0 **INTEGRITY PROVISIONS**

25.1 By responding to this RFP, the Proponent is subject to the integrity provisions contained in the following documents:

- The Government of Canada's *Integrity Provision*
- *Ineligibility and Suspension Policy* (the "Policy") in effect on the date the bid solicitation is issued
- *all related Directives related to the above policy in effect on that date*

25.2 These documents are incorporated by reference and form a binding part of the bid solicitation. The Bidder must comply with the Policy and Directives at the following link:

<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/1/2003/21>

25.3 In addition to all other information required in the procurement process, the Supplier **must** provide the following:

- Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder or, in the case of a private company, the owners of the company.

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

SURNAME	GIVEN NAME(S)	TITLE

26.0 **ATTACHMENTS**

- Appendix "A" - Detailed Statement of Work
- Appendix "B" – Evaluation Criteria
- Appendix "C" – General Conditions Engineering and Architectural Services
- Appendix "D" – Standard Instructions and Conditions
- Appendix "E" – COVID-19 Vaccination Requirement Certification
- Appendix "F" - Security Requirements Check List

Appendix "A"

NRC-CMRC

**Request for Quotation
Engineering Services
M10 Research Altitude Test Facility
(RATFac) - Piping Modification Design**

Real Property Planning and Management

March 2022
Revision C



National Research
Council Canada

Conseil national de
recherches Canada

Canada

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1 General

1.1 Background

The Aerospace Research Center's Research Altitude Test Facility (RATFac) enables NRC to play a world leading role in advancing transportation safety and it also provides the global aviation industry a key capability to develop and test the next generation gas turbine engines, airframe components and associated products at simulated altitude conditions. The facility is located at 1200 Montreal Road building M10. The facility's chamber is 35 years old (1986).

1.2 Project Description

The NRC RATFac is limited in minimal altitude resulting from the piping restrictions in the Air Supply System. The goal of this project is to design new air supply piping and/or ducting (referred to as "piping" throughout document) system that will reduce minimum testing altitude. Current minimum altitude in the facility is 1,067 m (3,500 ft) at the air flow of 4.5 kg/s (10 lb/s) due to the restrictions in the piping system (pipe sizes, elbows, valves, etc.). The Refrigeration System Upgrade Study, completed in March 2021 and attached to this request, specified increase of the existing piping diameter to 26 inches to allow for minimum altitude of 500 ft at the flow of 20 lb/s.

The project shall include engineering evaluation and design for replacement of existing system as required to reach minimum target altitudes. Consultant shall provide a full set of tender/construction drawings of the new system including valves, piping, ducting, supports, specifications and make of suggested valves, including assembly and disassembly instructions for existing equipment and appurtenances around the work area. Actual tendering and construction of the project to be completed at NRC discretion. As such, fees related to tender and construction of the project are to be identified as a spare line item.

In order to meet the objectives outlined in this Request for Proposal (RFP) for Engineering Services, Consultants are to develop and provide complete, clear, and effective project documentation in accordance with requirements outlined in this project specific RFP document, the NRC Construction Documentation & Deliverables Manual, and the NRC Engineering & Construction CAD Standards.

1.3 Confidentiality and Intellectual Property

Information exchanged as part of this project is to be treated confidential. Therefore, none of the parties shall divulge, unless in agreement and authorized by both parties any information identified as CONFIDENTIAL or PROPRIETARY. In order to proceed with design development, potential equipment suppliers may be required to sign a Non-Disclosure Agreement (NDA) with NRC.

Except for the purpose of project record documentation, information exchanged as part of this project by Consultants/Contractors, NRC and any other Parties shall be kept in confidence. All drawings, records, data, books, reports, documents, and information, whether technical, commercial, or financial in nature, supplied to, by, or on behalf of the other Party relating to this project work shall not be disclosed, unless prior written

consent to disclosure of the Party who has supplied the information is obtained or the disclosure is legally required.

Intellectual properties from new technologies resulting from this project shall be treated as per NRC Intellectual Property Policies and Procedures.

1.4 Security Requirements

All individuals entering the site must have reliability status to be verified by the NRC's security branch and must be scheduled with the NRC's Department Representative for access between 8am and 4pm. There will be no access to facility when system is in operation. All access to be strictly coordinated and approved by NRC Department Representative.

2 Statement of Work

2.1 General

Any and all required documentation and deliverables outlined as required by this project specific RFP shall be in accordance with the NRC Construction Documentation & Deliverables Manual, and the NRC Engineering & Construction CAD Standards. These documents are available upon request from the NRC Departmental Representative. Consultants shall review these documents to obtain a clear understanding of the minimum requirements for each type of deliverable (drawings and specifications), as well as supplemental details related to translations and other miscellaneous requirements.

The Consultant is to provide all Engineering/Design services which will include an Engineering team that may include Architectural, Controls, Structural and Electrical services as required. Design must meet the National Building Code and associated standards/codes.

2.2 Project Quality and Design Principles

In addition to assuring all designs are Code compliant, at a minimum the following design principles shall also be taking into consideration throughout the duration of the project by the Consultant:

- Adherence to a high standard of architectural and engineering design based on recognized, contemporary design principles. All design elements, planning, architectural and engineering design must be fully coordinated and consistent with accepted industry best practice design principles.
- Projects are to be implemented in an environmentally responsible manner and provide a healthy and safe work environment that meets all applicable Codes and supports optimum operations.
- Quality of specified materials, details and construction methods shall be commensurate with type of building, budget allocation, and life-cycle costing.
- Where possible, operation and maintenance costs are to be minimized with equipment selections.
- All construction and installation details are to be designed to facilitate ease of maintenance in a safe and effective manner.
- Adherence to local Authorities Having Jurisdiction requirements

2.3 Existing & Reference Documentation Available

- RATFac P&ID (Appendix A);
- Existing building drawings;
- Designated substance survey building M-10B;
- NRC Construction Documentation & Deliverables Manual, and the NRC Engineering & Construction CAD Standards.

2.4 Overview

2.4.1 General

The NRC Research Altitude Facility (RATFac) is limited in minimal altitude because of the restrictions in the Air Supply System. The new design shall specify the size of new piping/ducting and valves to reduce the altitude to the minimum.

RATFac Current Altitude Capabilities

Description	Value
Max. flow rate (unrefrigerated/undried air)	11.2 kg/s (24.6 lb/s)
Max. altitude	15,760 m (51,700 ft)
Min. altitude (conditioned air) at max. flow rate of 1.8 kg/s (4 lb/s)	91 m (299 ft)
Min. altitude (conditioned air) at max. flow rate of 4.5 kg/s (10 lb/s)	1,067 m (3,500 ft)

RATFac Target Altitude Capabilities

Description	Value
Maximum flow rate (unrefrigerated/undried air) – no change	11.2 kg/s (24.6 lb/s)
Maximum flow rate (refrigerated/dried air)	9.1 kg/s (20 lb/s)
Minimum flow rate (refrigerated and non-refrigerated)	0.9 kg/s (2 lb/s)
Max. altitude – no change	15,760 m (51,700 ft)
Min. altitude (conditioned air) at max. flow rate of 4.5 kg/s (10 lb/s)	91 m (299 ft)
Min. altitude (conditioned air) at max. flow rate of 9.1 kg/s (20 lb/s)	152 m (500 ft)

2.4.2 Existing Air Supply System

Air Supply System consists of roof blower, ducting, valves, etc. (Figures 1 and 2).

Current minimum altitude in the facility is 1,067 m (3,500 ft) at the air flow of 4.5 kg/s (10 lb/s) due to the restrictions in the system (pipe sizes, elbows, valves, etc.).

Preliminary evaluation showed that for the air mass flow of 9 kg/s (20 lb/s), delivery pipes connecting the air handler plenum to the valve stack at the inlet to the test chamber needs to have a nominal diameter of 26 inches in order to obtain minimum altitude of 152 m / 500 ft (see figures 1 and 2 below). The piping from the roof intake blower to the air handler plenum and the piping to the aftercooler section will also require re-design.

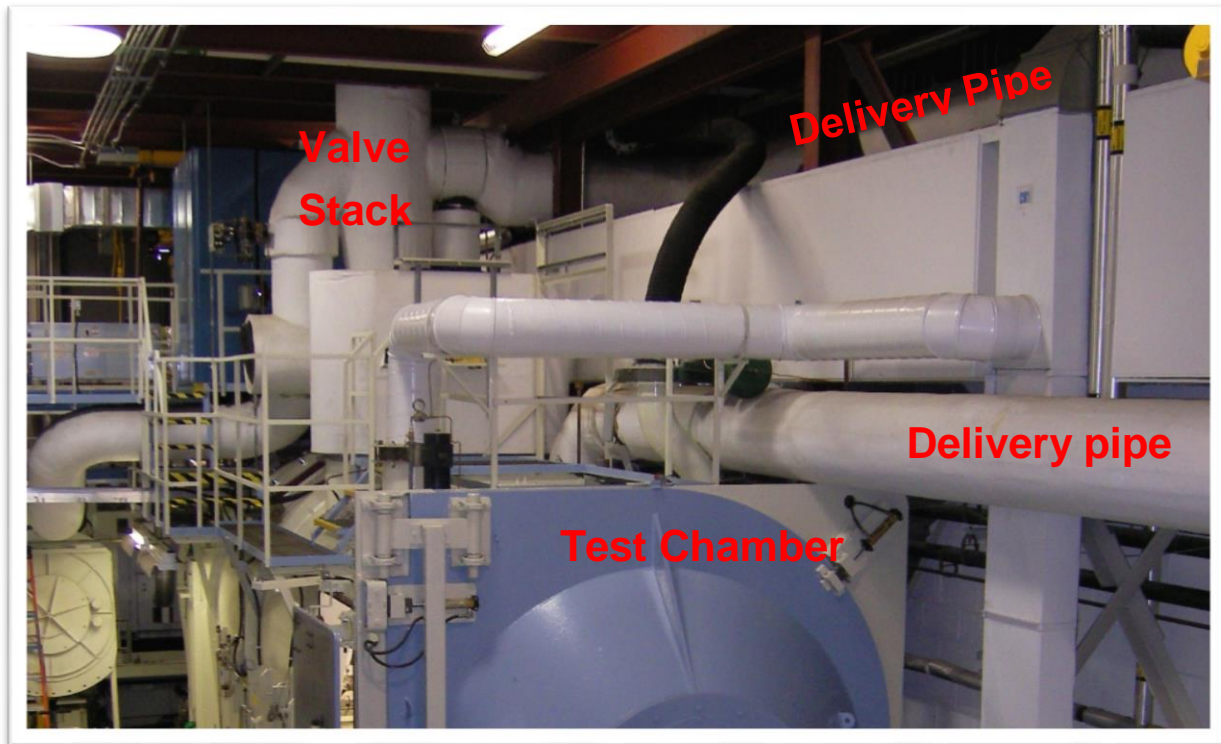


Fig. 1: Piping around Chamber

2.5 Project Requirements

The goal of this project is to design a new delivery pipe system that will reduce minimum altitude to the test chamber specified in table above and it should include, but not be limited, to the following:

1. Study assessment of the system existing conditions including as built drawings;
2. Engineering evaluation and design for replacement of existing piping as required to reach target altitudes in test chamber;
 - a. Complete an experimental pressure losses and issue a study report;
 - b. To the maximum extent possible new piping should be constrained to the existing space available in the building.
3. Full set of drawings based on the new system including valves and supports;
4. Specifications and make of suggested valves, piping or tubing;
5. Disassembly and assembly instructions of all equipment and appurtenances around the piping system that will be replaced;
6. Designated substance survey report*.

* Reports provided by third party suppliers shall be bilingual.

Measurement of air mass flow through the refrigeration system is required with an accuracy of $\pm 10\%$ of the reading.

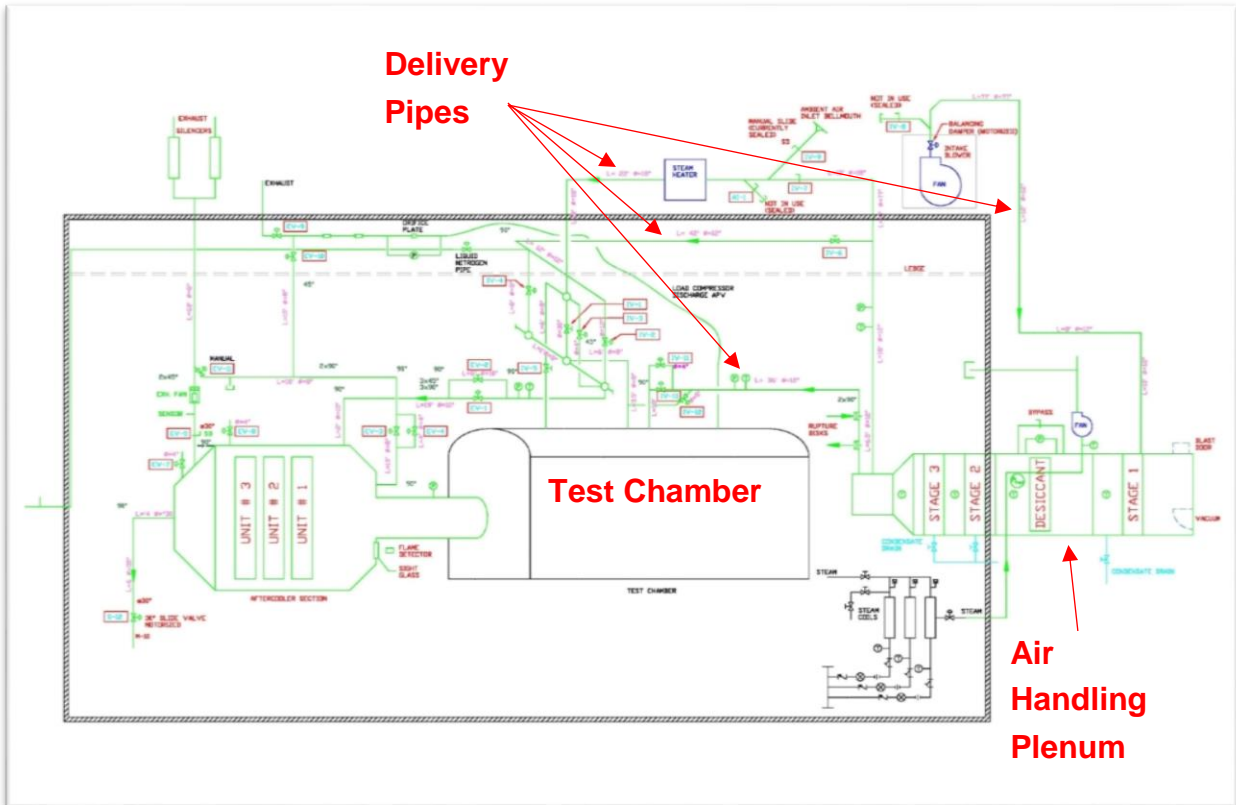


Fig. 2: Air Supply and Exhaust Systems

2.5.1 Proposed Project Timeline

Tender ready documents shall be provided no later than 12 weeks from contract award or prior to March 31, whichever date is earlier.

2.5.2 Additional Information

Stainless piping and/or duct is preferred, provide a cost percentage delta from other options.

Tender documentation shall clearly demonstrate the three different work packages as shown on P&ID (Appendix A) in order to allow potential bidders to offer a separate financial bid to each package

2.5.3 Construction Documentation (Detailed Design Development)

Complete the development of the drawings and specifications into a complete, coherent, and coordinated package that is suitable for Tender for each of 3 work packages as shown in Appendix A. Specifications, drawings, and addenda shall be complete and clear in order to enable Contractors to prepare bids.

2.5.3.1 Tasks

In order to meet the objectives outlined as part of construction documentation preparation, the Consultant shall, at a minimum, conduct the following:

- Conduct two (2) pre-design meeting with NRC stakeholders, prepare meeting minutes for distribution as per direction of NRC Departmental Representative;
 - One pre-design meeting shall discuss engineering recommendations with the NRC Technical Team (the NRC technical team is not responsible for approving the recommended options);
- Conduct a 50% design completion meeting and a 99% design completion meeting and prepare meeting minutes for distribution as per direction of NRC Departmental Representative;
- Develop as built drawings of the existing piping system of the RAT facility, indoors and outdoors;
- Conduct an experimental program, on site, to quantify the performance of the existing system in order to evaluate immediate needs and make specific requirements towards an optimized new piping configuration.
 - Proposal shall clearly specify assumptions and constrains of the study.
- Develop a report on Engineering evaluation of the system;
- Review and update the System P&ID and process diagram based on the engineering report;
- Develop an disassembly and assembly plan with clear instructions on how to efficiently handle the different equipment and appurtenances around the area of work, designated substance report shall be reviewed and incorporate as needed in instructions;
- Develop a substance of interest survey report to validate the findings and recommendation of the NRC provided reported;
- Develop a technical Commissioning Plan, incorporating feedback from NRC, identifying the roles and responsibilities of the Consultant, the designated General Contractor, sub-consultants, Contract Administrator, and the NRC stakeholders.
- Develop a documented, systematic approach to verify the performance of individual systems and the dynamic testing and adjustment of all systems operating together, including the building envelope, mechanical, electrical, fire alarm, communications, and others as may be appropriate;
- Prepare the drawings and specifications for a tender package including supports and full list of materials and equipment including insulation and mass flow meter for submission to NRC Departmental Representative, in AutoCAD format, for review and comment at the following stages: 50% and 99% progress;
- Review and respond to all NRC Departmental Representative provided comments and questions identified in each documentation progress stage; and
- Revise and update the cost estimates, including details on methodology used, as indicated:
 - Estimate preliminary information at 50% progress stage, for each of 3 work packages;
 - Provide a quantity surveyor Class B estimate at 99% progress stage, for each of 3 work packages.
 - Class B estimate shall be presented in a report format including methodology, assumptions, cost escalation, budget risks, etc.
 - NRC shall considered options due to budget restrictions, i.e. type of piping use. Class estimate shall be delivered with the options as required by NRC at the Project kick off meeting (no more than 3 options shall be required).

2.5.3.2 Deliverables

In accordance with the NRC Construction Documentation & Deliverables Manual, and the NRC Engineering & Construction CAD Standards the Consultant shall provide the following:

- Pressure losses test report: including testing plan, raw measured data and analysed results;
- As built drawings and process schematics;
- Final construction documentation consisting of signed and sealed final drawings and specifications ready for Tender/Construction;
- Class B cost Estimate Report;
- Proposed and/or updated Engineering Design Work plan & Schedule;
- Proposed Construction Schedule; and
- Project design and implementation Risk Assessment Plan/Risk Register as well as a HAZOP.
- Designated substance survey report (bilingual).

2.6 Financial Proposal

NRC is soliciting proposals in response to this RFP from several engineering firms (Proponents). A contract for engineering services described in this RFP is anticipated to be awarded to the Proponent with the lowest submitted fee proposal in accordance with contracting documents. NRC reserves the right to review the submitted offer to validate the scope provided, if NRC finds the scope to be non-compliant the proponent bid shall be disqualified. NRC reserves the right to cancel this RFP in its entirety at any time.

Proponents shall present their financial proposal as follow, each deliverable shall have its own individual price*:

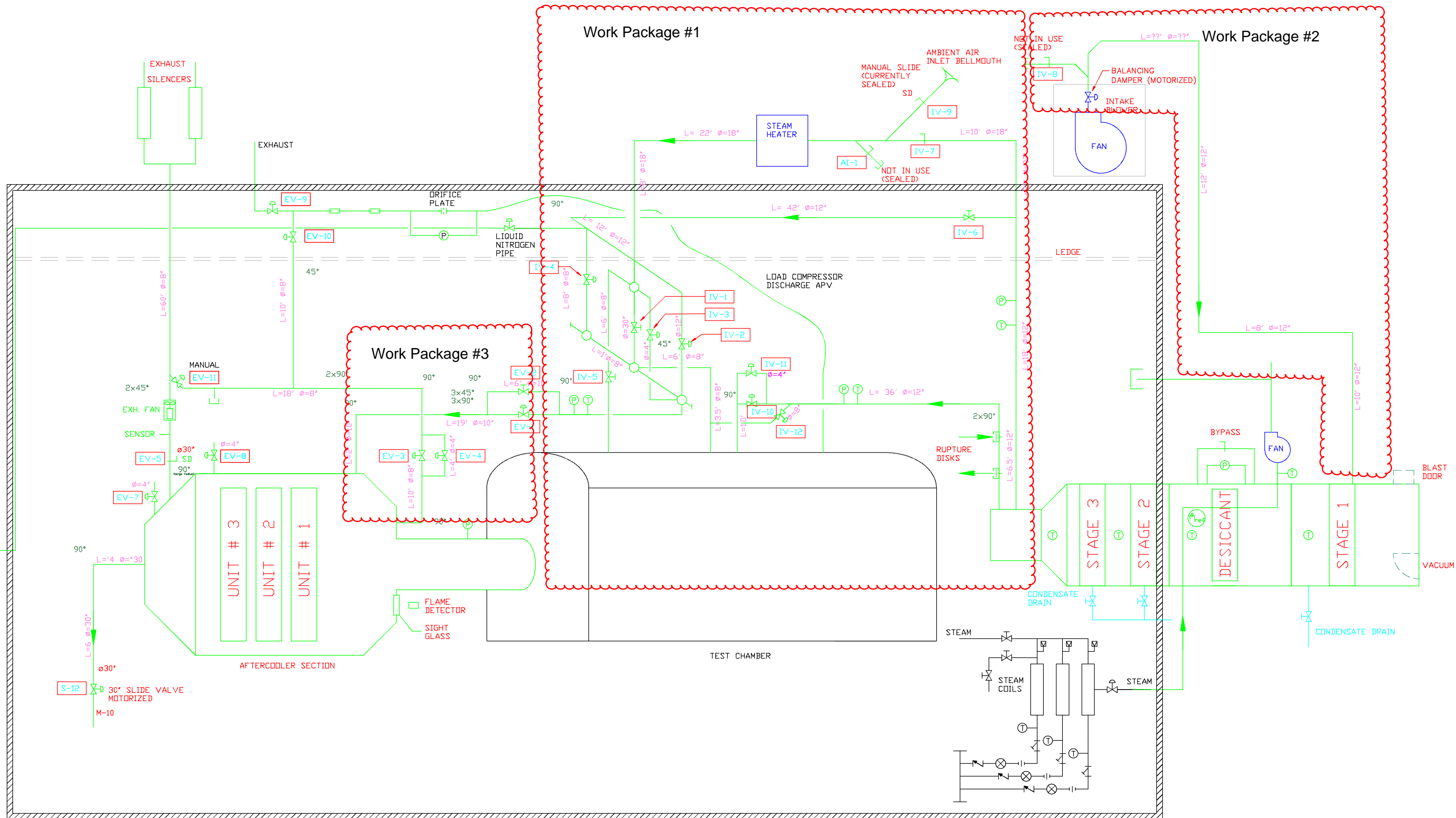
- Deliverable A: RATFAC piping modification study report (as-built drawings, experimental pressure losses program and recommendation report);
- Deliverable B: Tender ready drawings and specifications and Class estimate report, updated engineering design work plan, proposed construction schedule and risk assessment plan/risk register;
- Deliverable C: Assembly and disassembly documentation manuals;
- Deliverable D: Tender and construction management estimated support fees;
- Deliverable D1: \$/hr of the different disciplines involved during the full project lifecycle (from design to project close-out);
- Deliverable E: Designated substance survey report;
- Deliverable F: English to French Translation. (For information only) Supplier shall only indicate if translation will be done internally or externally, no costs are to be provided at this point.

*** Financial tender evaluation will be completed based on the total package value, not individual deliverables values**

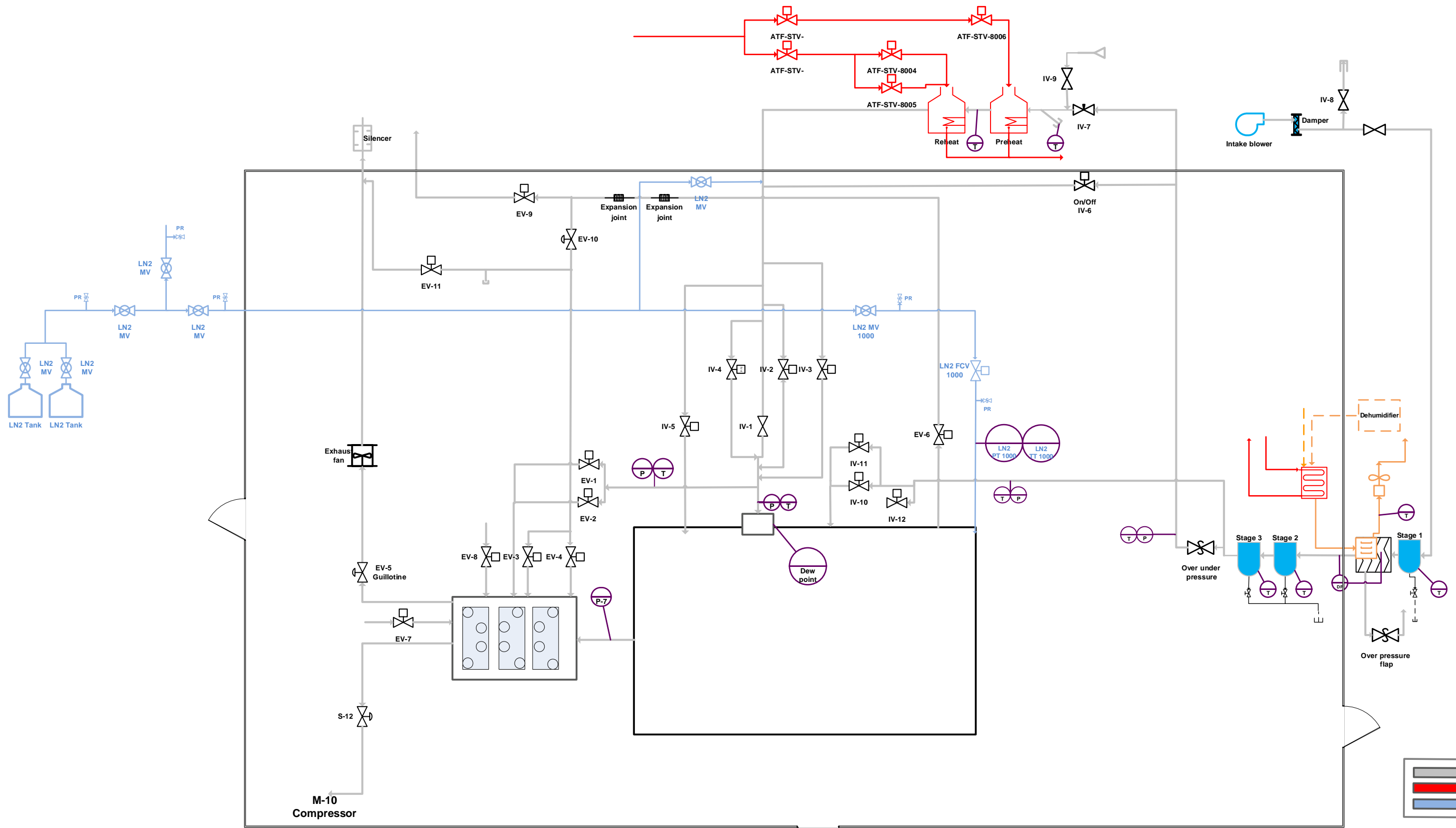
APPENDIX A – RATFac P&IDs and chamber layout

Reference Documentation

1. RATFAC altitude facility P&ID
2. RATFAC option breakdown P&ID
3. Mechanical drawing M10 ALT CELL dwg No 1001



RATFAC ALTITUDE FACILITY P&ID



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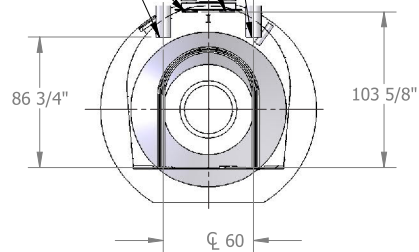
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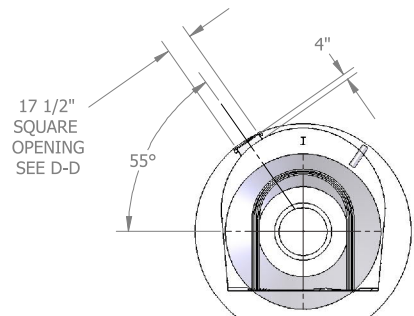
Gas Turbine Laboratory

- Test Cell: M10B Ratfac
- Altitude Chamber
- Compressor: 2-5 Megawatt
- Draft on October 07, 2020 by M. Talbot
- Revised on
- Rev
- Version #: 1

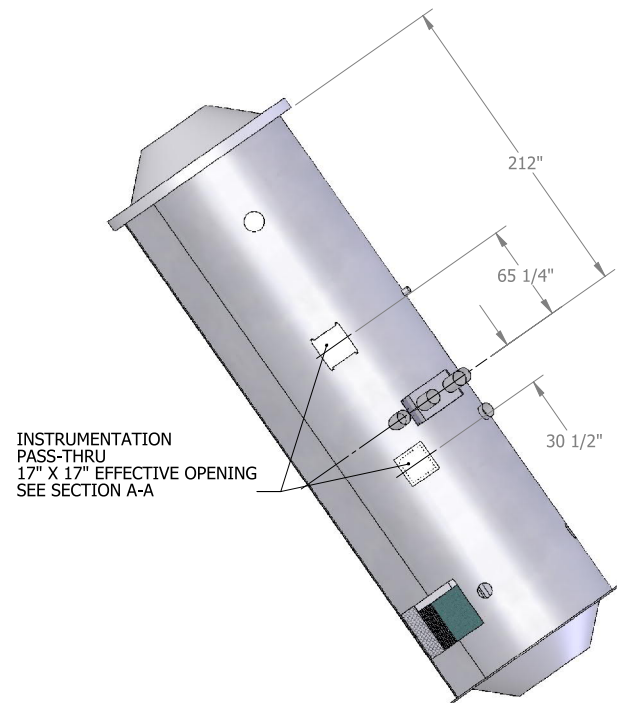
McMASTER CARR P/N 176K178 ADAPTER
(USES CLAMP P/N 176K138)
PLEASE REFER TO McMASTER, CARR CATALOGUE
PAGE 045 (DUCT/FITTINGS)



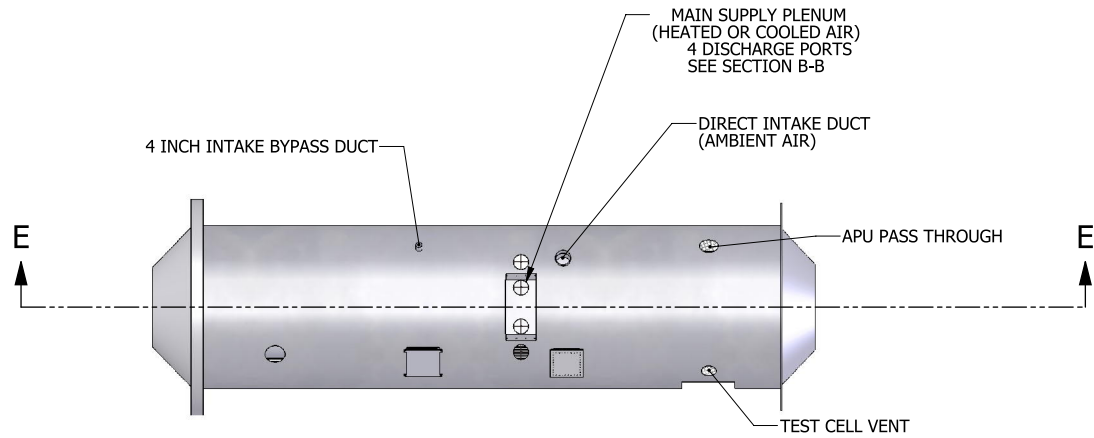
SECTION B-B



SECTION A-A



VIEW D-D



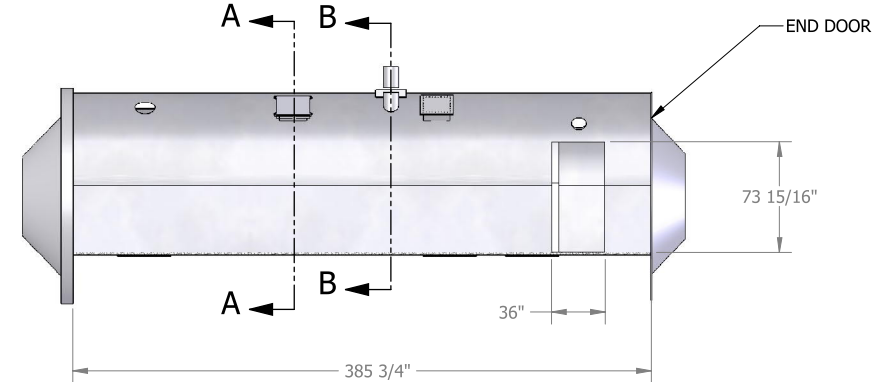
4 INCH INTAKE BYPASS DUCT

MAIN SUPPLY PLENUM
(HEATED OR COOLED AIR)
4 DISCHARGE PORTS
SEE SECTION B-B

DIRECT INTAKE DUCT
(AMBIENT AIR)

APU PASS THROUGH

TEST CELL VENT

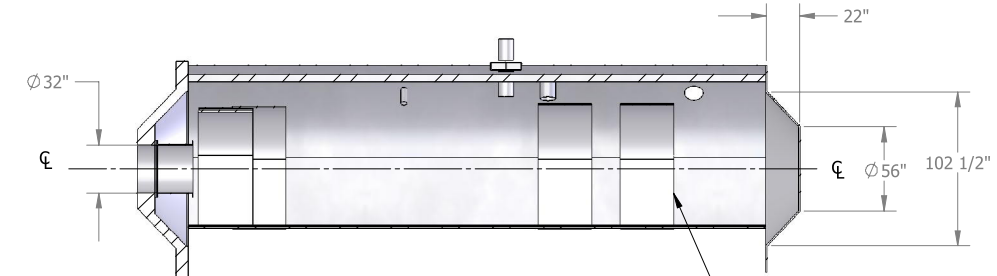


END DOOR

73 15/16"

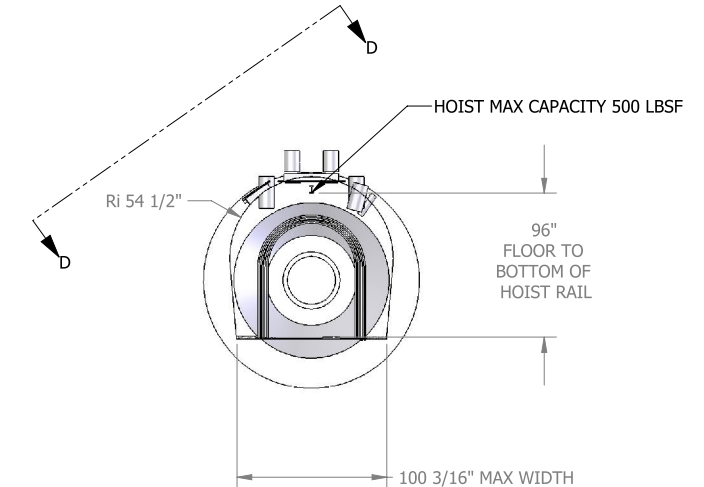
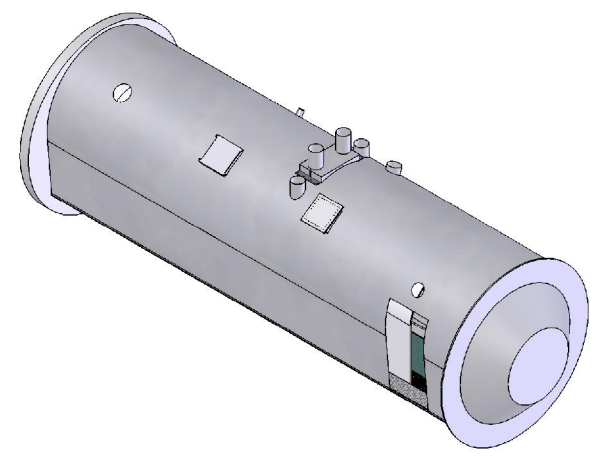
385 3/4"

36"



SECTION E-E

SHIELDS ARE REMOVABLE
(RIDE ON V RAILS)

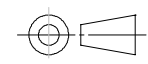


HOIST MAX CAPACITY 500 LBSF

Ri 54 1/2"

96"
FLOOR TO
BOTTOM OF
HOIST RAIL

100 3/16" MAX WIDTH



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INTERPRET GEOMETRIC TOLERANCING PER: ANSI Y14.5 M-1994		CHECKED		4/7/2009
MATERIAL		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON			
APPLICATION				

GTL Gas Turbine Laboratory		M7 Aeropropulsion Facility 1200 Montreal Road Ottawa, Ontario Canada	
TITLE: M10 ALT CELL			
SIZE	DWG. NO.	REV	
D	1001	A	
SCALE: 1:64	WEIGHT:	SHEET 1 OF 2	

APPENDIX B – Refrigeration System Study

Reference Documentation




NRC

Aerospace Research Centre

RATFac Upgrade Study

Final Report

Report Number: 4277/R/570
Revision: 0
29 March 2021

<i>Prepared:</i>	David Van Every Process Engineer	 Signature	29 March 2021 date
<i>Prepared:</i>	Philippe Kouame Thermal Systems Engineer	 Signature	29 March 2021 date
<i>Approved:</i>	John Shen Project Manager	 John Shen Project Manager	29 March 2021 date
<i>Accepted:</i>	NRC	Signature	date

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RECORD OF REVISIONS

REV	DESCRIPTION	DATE	APPROVAL
A	Initial release for Phase One	10 Feb 2021	JS
B	Corrections from review meeting	12 Feb 2021	JS
C	Phase 2 information added	10 Mar 2021	JS
0	Final Release	29 Mar 2021	JS

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List of Abbreviations

COP:	Coefficient of Performance
CV:	Control Valve
DB:	Dry Bulb
DEH:	Dehumidification unit
GWP:	Global Warming Potential
HX:	Heat Exchanger
IGV:	Inlet Guide Vane
MIMO:	Multiple Input Multiple Output
PI:	Proportional Integral
PLC:	Programable Logic Controller
RATFac:	Research Altitude Test Facility
RH:	Relative Humidity
SV:	Solenoid Valve
VFD:	Variable Frequency Drive

1. INTRODUCTION

Aiolos has been commissioned by the NRC to investigate upgrade options for NRC's existing Research Altitude Test Facility (RATFac). This facility is used for performance tests of live aircraft engines at temperatures and pressures typical of flight at altitude. Inlet air is drawn from ambient, then dried and conditioned to the desired test temperature, by a desiccant dryer system and a refrigeration system which supplies refrigerant to several direct expansion fin tube heat exchangers in the inlet air handler enclosure. The capabilities of the existing facility are summarized in Table 1-1.

Table 1-1: RATFac Current Overall Capabilities

Description	Value
Max. flow rate (unrefrigerated/undried air)	11.2 kg/s (24.6 lb/s)
Max. altitude	15,760 m (51,700 ft)
Min. altitude (conditioned air) at max. flow rate of 1.8 kg/s (4 lb/s)	91 m (299 ft)
Min. temperature at max. flow rate of 1.8 kg/s (4 lb/s)	-50 °C (-58 °F)
Dew point temperature at max. flow rate of 1.8 kg/s (4 lb/s)	-50 °C (-58 °F)
Heated inlet air at a flow rate of up to 1.8 kg/s (4 lb/s)	+48 °C (+118 °F)

The target performance requirements, which are the subject of this study, are summarized in Table 1-2.

Table 1-2: RATFac Upgrade Performance Requirements

Description	Value
Maximum flow rate (unrefrigerated/undried air) – no change	11.2 kg/s (24.6 lb/s)
Maximum flow rate (refrigerated/dried air) – Option 1	4.5 kg/s (10 lb/s)
Maximum flow rate (refrigerated/dried air) – Option 2	9.1 kg/s (20 lb/s)
Minimum flow rate (refrigerated and non-refrigerated)	0.9 kg/s (2 lb/s)
Max. altitude – no change	15,760 m (51,700 ft)
Min. altitude (conditioned air) at max. flow rate of 4.5 kg/s (10 lb/s)	91 m (299 ft)
Min. altitude (conditioned air) at max. flow rate of 9.1 kg/s (20 lb/s)	91 m (299 ft)
Min. temperature at max. flow rate	-57 °C (-70 °F)
Dew point temperature at max. flow rate (two options)	-60 °C and -80°C (-76 °F and -112°F)
Heated inlet air at flow rate of up to 1.8 kg/s (4 lb/s) – no change	+48 °C (+118 °F)

This study is conducted in two phases. The first phase developed two inlet air system low temperature refrigeration concepts to achieve Option 1 (10 lb/sec) performance. The two concepts considered are,

- a) Conventional vapour compressor refrigeration
- b) Turbo-expander refrigeration

The second phase will use either a) or b) refrigeration concepts for Option 2 (20 lb/sec) performance.

2. EXISTING RATFac INLET AIR FLOW PATH LOSSES

The primary inlet air flow path for the existing system consists of approximately 72 feet of 12 inch diameter pipe that connects the air handler plenum to the valve stack at the inlet to the test chamber. When flowing air at 10 lbs/sec the flow velocity in this pipe will be about 51 m/sec resulting in high pressure losses; estimated to be about 1.4 psi. The new inlet air system, whether with conventional refrigeration, or with the turbo-expander option must overcome these losses to be able to operate near site altitude in the test chamber.

Overcoming these losses would require a high pressure fan, for the conventional refrigeration system option, with a drive power of about 50 kW. It is recommended to replace the inlet pipe with a larger 18 inch diameter pipe, reducing pipe velocity to about 23 m/sec. This change will reduce energy consumption and allow a standard design for the conventional refrigeration system air handler and supply fan.

To maintain losses and pipe velocities at similar values as for the 10 lb/sec option, the 20 lb/sec option will require a supply pipe nominal diameter of 26 inches.

3. VAPOUR COMPRESSION REFRIGERATION SYSTEM – 10 LB/SEC OPTION

3.1 System Description

The concept for this option is mainly based on the set of multi condensing units.

The process and instrumentation diagram for the system is given in drawing 4277-102-1-2. This system consists of the following four principal subsystems:

- 1) Inlet filtration and dehumidification subsystem (DEH)
- 2) Medium temperature condensing unit for the pre-cooling coil
- 3) Medium temperature condensing unit for the first post-cooling coil
- 4) Low temperature condensing unit for the last post-cooling coil

The dehumidification and condensing units have been sized with the design ambient air condition provided by NRC (26°C, 60% RH) which is different from ASHRAE climatic design conditions. For temperatures or relative humidity above the provided design condition, the system will not provide with full dehumidification capacity.

The system is capable of operating at process air flow rates ranging from 2 to 10 lb/s by loading and unloading to accommodate different conditions within this envelope. On the dehumidification unit, process and regeneration fans as well as desiccant wheel operate with a VFD. On the condensing units, the screw compressors can unload as follows:

- 25% of total capacity for Cooling Stage 1
- 17% of total capacity for Cooling Stage 2
- 5% of total capacity for Cooling Stage 3

3.1.1 Air Pre-cooling

Air pre-cooling is a first step in removing water content from the ambient humid air.

After the air is filtered at the dehumidification unit intake, it passes through a direct expansion refrigerant to air heat exchanger to be cooled down. This direct expansion coil acts as the evaporator of the refrigeration unit. At this stage of the compression refrigeration cycle, R-449A which is the refrigerant used, is at a lower temperature than the process air and absorbs latent heat of vaporization by evaporating. Heat extraction from the air occurs because the refrigerant is low temperature and low pressure. The low pressure is maintained by the suction of the compressor.

Leaving the evaporator, refrigerant gets superheated hence preventing any liquid to reach the compressor. Refrigerant enters the compressor in a gas state at low temperature and pressure. At this point, a single compression takes place and refrigerant temperature and pressure increase.

At the outlet of the compressor, the refrigerant is a superheated gas and separation with oil is done at the oil separator before entering the condenser. In the condenser, which is essentially a heat exchanger, the refrigerant de-superheats and condenses by transferring heat to the cooling tower water which must not exceed 85°F [29.4°C]. These two processes happen at constant refrigerant pressure.

When leaving the condenser, the refrigerant is a mixture of liquid and gas. Separation is done in the receiver and only the liquid refrigerant leaves the vessel before reaching the economizer.

An economizer is a type of sub-cooler that uses part of the total refrigerant flow from the receiver to cool the rest of the refrigerant flow. Cooling at the economizer is achieved using a thermal expansion valve.

After this first cooling stage in the economizer, one refrigerant stream leaves the economizer to undergo a second expansion through a second thermal expansion valve before entering the evaporator. The other refrigerant stream which is evaporated leaves the economizer to enter the compressor at an intermediate pressure level.

The sub-cooling of the main refrigerant flow increases the overall cooling capacity and offers a COP of 4.26 for this condensing unit.

3.1.2 Desiccant dehumidification

After pre-cooling, process air enters the desiccant wheel for another stage of moisture removal. Air passes through the flutes of the material, contacting the desiccant and releases its moisture content to the desiccant. Process air is dry as it leaves the wheel for first post-cooling. The wheel rotates slowly in a controlled manner into a second airstream which is heated in the regeneration coil using steam. This second airstream called reactivation air, warms the desiccant and takes away its moisture content which is exhausted to ambient.

3.1.3 First air Post-cooling

This second cooling stage takes place after process air passes through the desiccant wheel. Cooling for this stage is achieved with an identical refrigeration cycle as for pre-cooling using the same R-449A refrigerant. Condensing unit for this cooling stage offers a COP of 1.07.

3.1.4 Second air Post cooling

After this last cooling stage, air is supplied to the Test Cell at desired setpoint values for a minimum of -57°C DB and -80°C Dewpoint (0.0032g/kg).

To achieve this low-end Design Point, a double compression refrigeration process with R-507A as refrigerant was selected instead of a cascade configuration with R-449A and R-508B for the following reasons:

- From an economic standpoint, the price of R-508B is up to seven times more expensive than R-507A.
- From an environmental standpoint, R-508B GWP is three times higher than R-507A.
- Cascade refrigeration systems require complex controls and circuitry and are maintenance heavy compared to double compression refrigeration systems.

The rest of the refrigeration cycle is identical to the above condensing units with a COP of 0.59.

3.2 Controls

Replacement of the existing system with the new refrigeration system option will be very simple.

The existing system uses supervisory setpoints from the Main PLC to existing refrigeration system which does the closed loop control. The existing control system will need some minor modifications to adapt to the upgraded refrigeration system, but no major hardware additions are envisioned. The scope of the controls effort for the new refrigeration system is envisioned as :

- Modification of PLC I/O to accommodate new instrumentation
- Modification of existing PLC program to accommodate new I/O
- Modification of existing HMIs to accommodate new I/O and functionality (i.e. setpoint ranges etc.)
- Startup at site (supervisory only)

The figure below illustrates the Architecture including removal and addition of equipment:

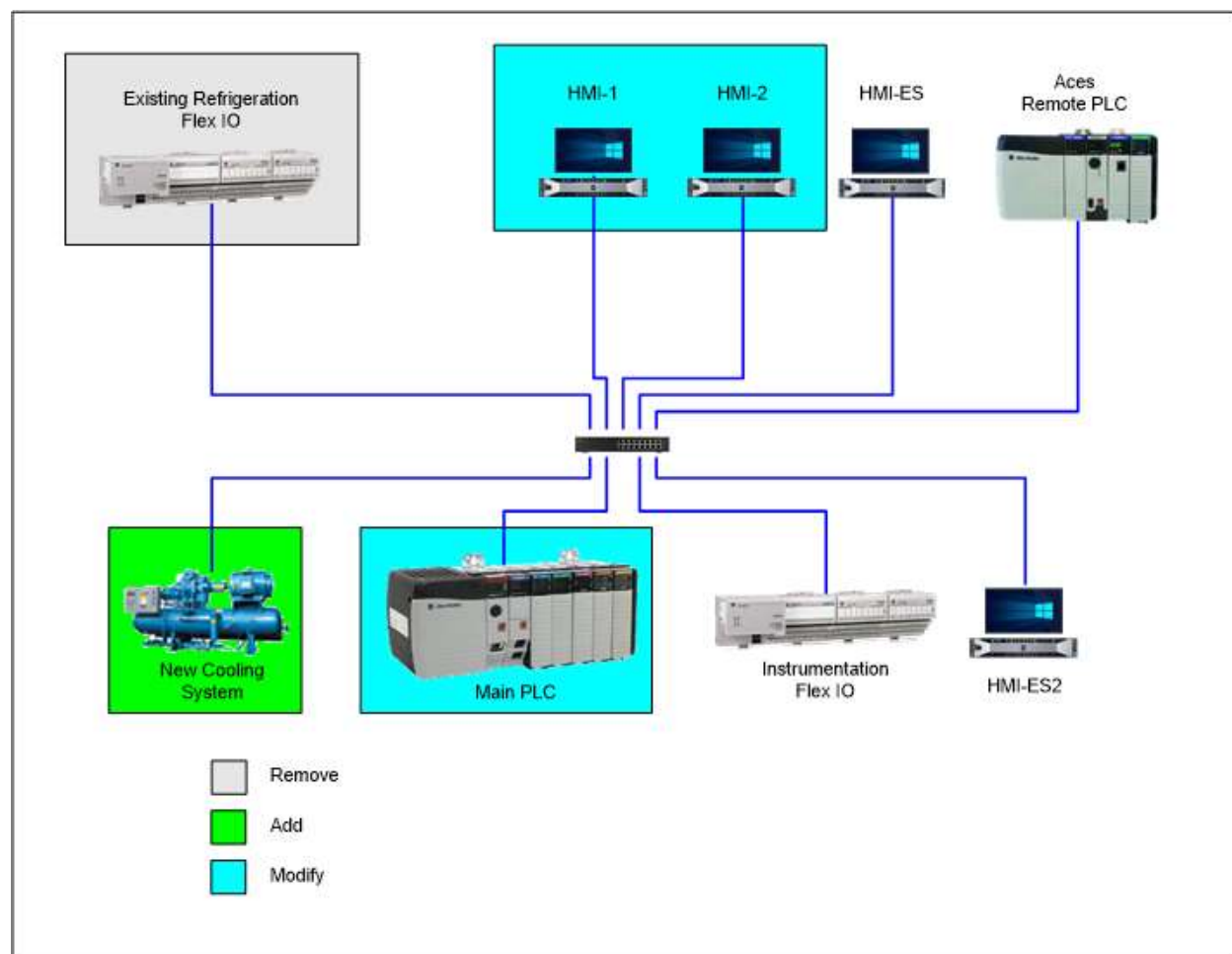


Figure 3-1: Control System Architecture – Conventional Refrigeration Option

The new system is depicted as a single unit for the purposes of this diagram. Internal architecture of the Cooling System such as compressors and air handling unit is not shown.

This diagram was reproduced from the existing network diagram supplied by NRC. It is assumed that the “Aces Remote PLC”, Instrumentation I/O rack and “ES” HMIs will not need to be touched.

The Flex I/O rack for the existing refrigeration is shown as being removed. The new I/O could potentially use this rack, or could be sent to the Main PLC via Ethernet or perhaps wired directly to the Main PLC rack. None of these options require the addition of hardware and would not impact the cost significantly.

3.3 Utility Requirements

Electrical Power, water and steam requirements are summarized in the tables below.

Table 3-1: Electrical Power Requirements

Equipment	Power Requirements (V/Ph/Hz)	Power consumption (kW)
Condensing unit 1 Water Pump	575/3/60	7.5
Condensing unit 2 Water Pump	575/3/60	5.5
Condensing unit 3 Water Pump	575/3/60	3
Dehumidification Unit	575/3/60	60
Refrigeration Compressor 1	575/3/60	100
Refrigeration Compressor 2	575/3/60	230
Refrigeration Compressors 3 & 4	575/3/60	130
Total	-	536

Table 3-2: Water Requirements for Condensing Units' Condensers

Pump	Volume Flow Rate (GPM)
Condensing Unit 1 Pump	190
Condensing Unit 2 Pump	140
Condensing Unit 3 Pump	80
Total	410

A steam supply of a of 72.5 psig minimum pressure is required for regeneration heater coils. Required mass flow rate is indicated in the table below.

Table 3-3: Steam Requirements for Regeneration Heater Coils

Coil	Mass Flow Rate (lb/h)
Regeneration coil	1000

3.4 Building Layout

The building layout for this Conventional Refrigeration option is depicted in drawing 4277-100-2-2.

The dehumidification unit will be installed alongside the West wall on the new building. The air intake from the ambient is done from the South side of the building with the dehumidification unit recessed in the wall.

Processed air delivered to the Test Cell is discharged from the other end of the dehumidification unit recessed in the shared wall between the new building and the existing building.

Condensing units will be piped to their corresponding sections of the dehumidification unit.

Water pumps bringing water from the existing cooling tower will be piped to each condensing units' condensers.

A double door on the East side and a sliding door on the South side of the building are meant to be used for getting equipment indoor or move it out if necessary.

A single service door is located on the South-East of the building to provide access to personnel.

3.5 Maintenance

- Filter replacement every 2 years
- Face and peripheral seal every 2 years
- All of the cooling coils will need inspection once a year for debris build up, the same for the regeneration heater coil.

3.6 Cost Estimate and Schedule

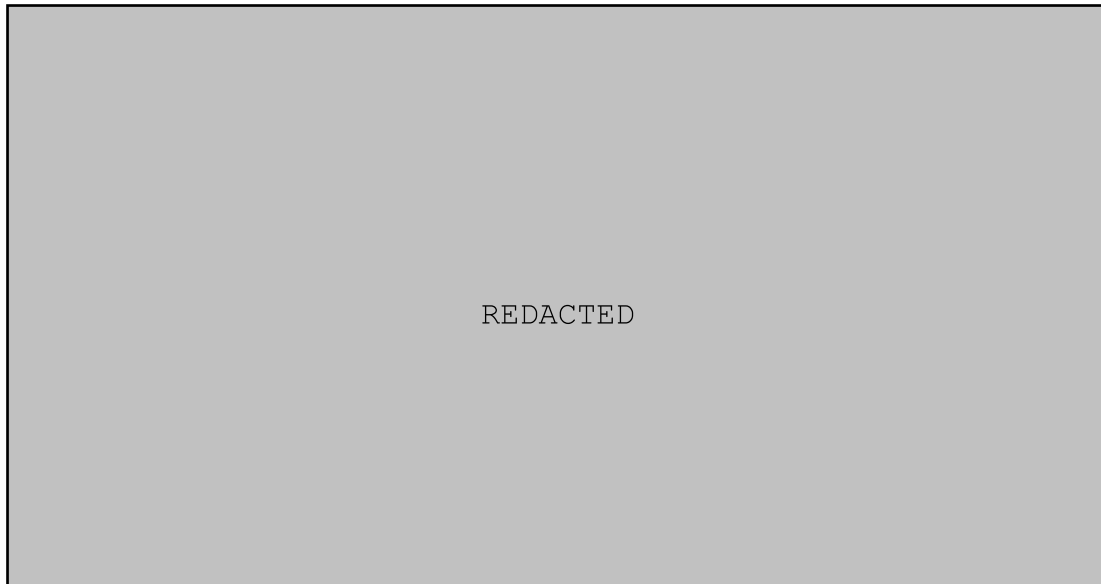
The cost estimate for this turnkey option is based on inputs from multiple suppliers and encompasses:

- Removal of the existing System and shack
- A building addition to shelter the new equipment
- A brand-new Dehumidifier that meets performance requirements
- Condensing units for each cooling stage
- Piping and its installation within the building addition
- The replacement of the existing 12-inch supply pipe
- Electrical and Controls
- Site supervision and Commissioning

Major equipment which are condensing units and the dehumidification unit have a sixteen-week lead time. An additional 4 weeks of freight time is estimated at this point and is included with insurance in the budget.

The costs are presented in the table below, broken down by major cost element. Note that these estimates are valid today and do not consider escalation to some future date.

Table 3-4: Cost Summary – Conventional Refrigeration Option



REDACTED

The schedule timescale is formatted in months, so the duration of the overall project appears to be straightforward. For the conventional refrigeration option, 10 months is projected from kick-off till the final acceptance. Since the project start date is not yet decided, assumption is made from the first week of May 2021. One important task item, Facility Shutdown, is red highlighted in order to emphasize the duration (approx. 250 days) that the facility cannot be operational.

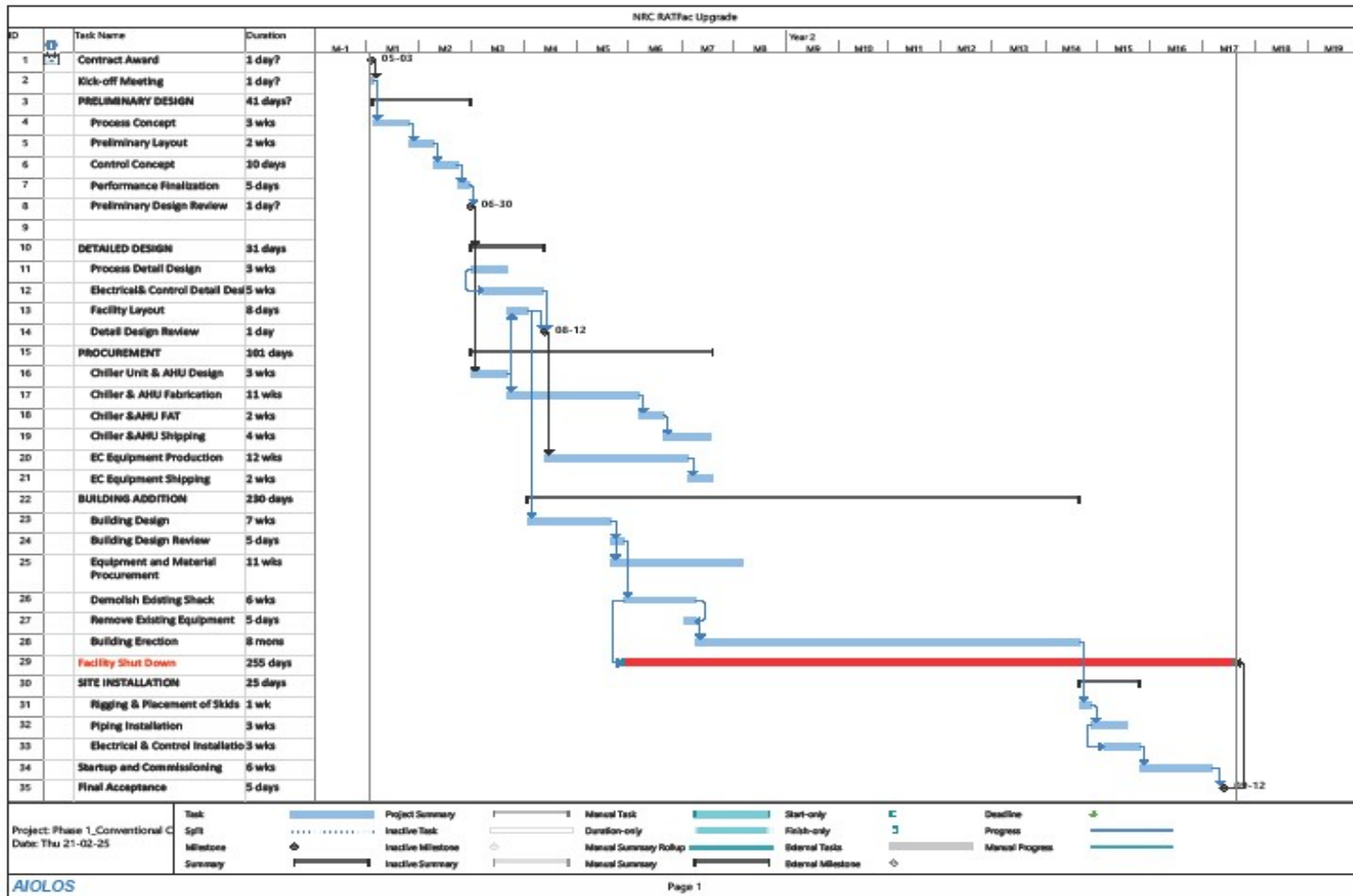


Figure 3-2: Overall Schedule – Conventional Refrigeration Option

4. TURBO EXPANDER REFRIGERATION SYSTEM – 10 LB/SEC OPTION

4.1 System Description

The process and instrumentation diagram for the system is given in Drawing 4277-102-1. This system consists of the following major components:

- 1) Inlet filtration and dehumidification subsystem (DEH)
- 2) Air compressor C1 driven by a constant speed electric motor.
- 3) Heat exchangers HX1 and HX2.
- 4) Turboexpander E which drives compressor C2.

The primary component on which the entire system concept is based is the turboexpander. The turboexpander is an air driven turbine through which the flow is expanded to achieve low temperatures. The expander and the expander driven compressor are purpose designed, highly engineered machines.

Inlet air from ambient is filtered and dehumidified and then compressed by compressor C1. The first stage of dehumidification will be achieved with a water-glycol heat exchanger located in the dehumidifier enclosure. Chilled water-glycol will be supplied by a dedicated standard chiller package.

The discharge air from C1 is then cooled in heat exchanger HX1 utilizing cooling tower water. The cooling water temperature at inlet to HX1 can be controlled by mixing with water that is recirculated from the discharge side of HX1. The air is then further compressed in compressor C2, which is driven by the expander. Aftercooling is by HX2 using cooling tower water. This heat exchanger is not controlled (unlike HX1) and always provides maximum cooling. Air at a temperature something higher than cooling water temperature is then expanded nearly isentropically in expander E when the test point requires low temperature air. During this mode of operation, the flow through the expander is controlled by integral expander inlet guide vanes in response to signals from the control algorithm residing in the PLC.

For those test points that do not require refrigeration, valve 900-SV-01 is closed and no flow passes through C2 or E. In this case regulating the net cooling provided by HX1 controls the process air temperature. The air bypasses the turboexpander flowing through valves 900-CV-03a and 03b for supply to the test cell. Valves 900-CV-03a and 03b are regulated in combination with compressor C1's discharge pressure (controlled by C1's variable inlet guide vanes) such that the mass flow setpoint is achieved. Final fine control of air temperature is achieved by HX1. Alternatively, final air temperature control in high temperature mode can be done with the existing steam heater located in the test cell inlet piping.

Air is automatically recycled back to the inlet of C1 through valve 900-CV-01 to prevent C1 compressor surge when low flow rates are required at the discharge from C1. In a similar way flow is recycled through valve 900-CV-02 when low flow rates are required at the discharge from C2.

Stable output of mass flow rate and temperature from the system during expander operation is based on the concept of controlling the C1 air compressor outlet pressure. With this pressure constant the amount of refrigeration is controlled by the flow through the expander, which is regulated by the integral expander inlet guide vanes (IGVs). Flow through valves 900-CV-03a and 03b is then mixed with the expander flow to produce the desired combination of flow and temperature. In this scheme, if more refrigeration is required then more of the total flow will pass through the expander and less through valves 900-CV-03a and 03b. If less refrigeration is required, then the flow split will shift more of the flow to valves 900-CV-03a and 03b.

As is apparent, changing the expander IGVs will affect both the system discharge temperature and mass flow. In a similar way, changing the position of the bypass valves (900-CV-03a and 03b) will also change both the discharge temperature and mass flow simultaneously. The controller design will incorporate a Multiple Input Multiple Output (MIMO) control algorithm with a decoupler block, such that conventional proportional integral (PI) feedback control can be used.

4.2 Operating Envelope

The sizing of all equipment was determined for the high mass flow, low temperature operating point. This is,

Discharge mass flow: 10 lb/sec

Discharge temperature: -70°F

Discharge pressure: 15 psia

This is the most demanding operating point for the equipment and will require the highest electrical power consumption. However, NRC will require the system to operate over a wide range of mass flows and temperatures. A minimum mass flow of 2 lb/sec has been requested. The minimum mass flow possible will be determined by the expander performance needed to provide the refrigeration and this is a function of gas velocity through the machine. The maximum mass flow will be limited because the turbomachinery (C1, C2 and E) is limited by gas velocities at the discharge of each machine. The absolute limit will occur when the machine chokes (flow passage Mach number near 1). The maximum mass flow is also limited by C1 power and this limit will be reached before the choking limit. Thus, the system has a limited turndown in mass flow. As both minimum and maximum are related to gas velocities, the limits will be a function of the pressure at the expander exit. As the exit pressure is decreased both the minimum and maximum mass flow will decrease. These operating limits can be visualized with aid of a plot of mass flow as a function of the discharge temperature and pressure. The

boundaries will be seen mass flow surfaces on this type of plot. The expected minimum and maximum mass flow surfaces for the 10 lb/sec system are given in Figure 4-1 and Figure 4-2.

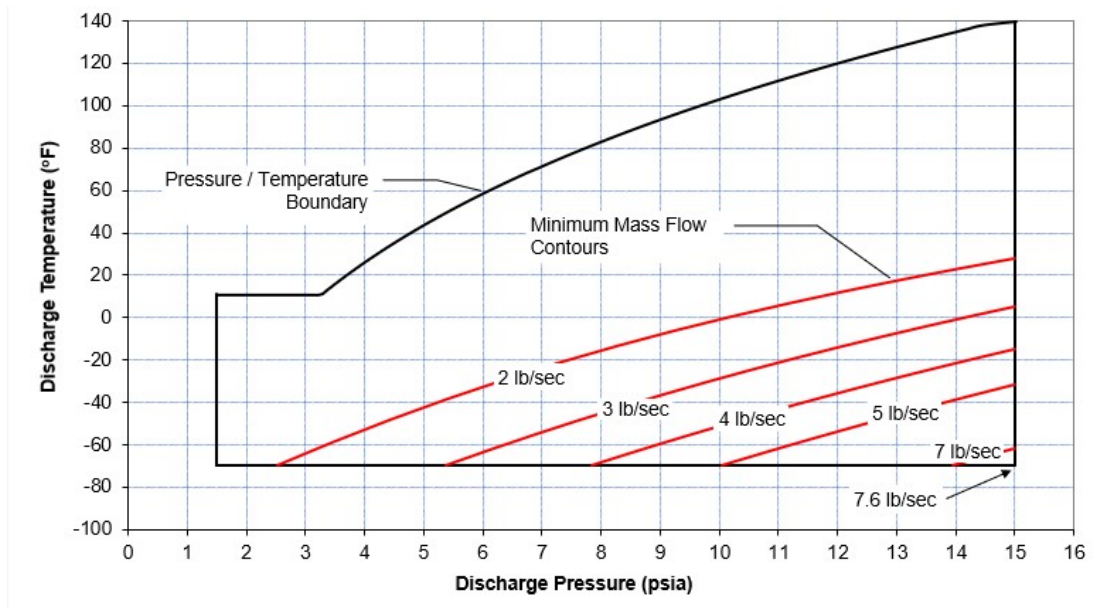


Figure 4-1: Turbo Expander System Minimum Mass Flow Contours.

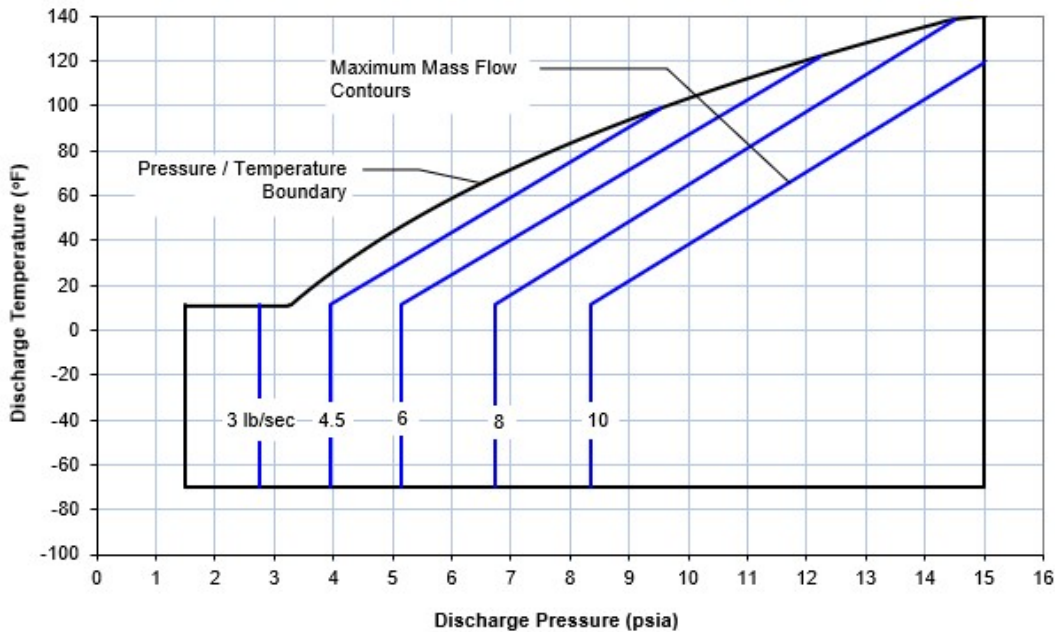


Figure 4-2: Turbo Expander System Maximum Mass Flow Contours.

The design point inlet and outlet flow conditions for each component of the system are given in Table 4-1 below.

Table 4-1 Turboexpander Operating Parameters at the Design Point

Parameter	Units	Location						
		Supply Fan Inlet	C1 Inlet	C1 Outlet	C2 Inlet	C2 Outlet	E Inlet	E Outlet
Mass Flow	lb/sec	14.9	10	10	10	10	10	10
Pressure	psia	14.5	14.5	40	37.2	71	68	15
Temperature	deg F	78.8	66.3	290.3	95	242.1	95	-71.4
Humidity	grains/lb	88.4	0.035	0.035	0.035	0.035	0.035	0.035
	deg F DP	63.8	-88					

4.3 Controls

Replacement of the existing system with the Turbo Expander option will not be as straightforward as the Vapour Compression option.

The existing system uses supervisory setpoints from the Main PLC to existing refrigeration system which does the closed loop control. The Main PLC can continue to exercise this supervisory role, sending setpoints to the Turbo Expander system for closed loop control of the temperature and mass flow. In this respect, the Turbo Expander will be similar to the Vapour Compression option in that the Main PLC and existing HMIs can have minor modifications to update the changed I/O and functionality.

As mentioned in section 4.1, however, the controls of the temperature and mass flow affect one another significantly require a decoupling of the controls which must be applied externally:

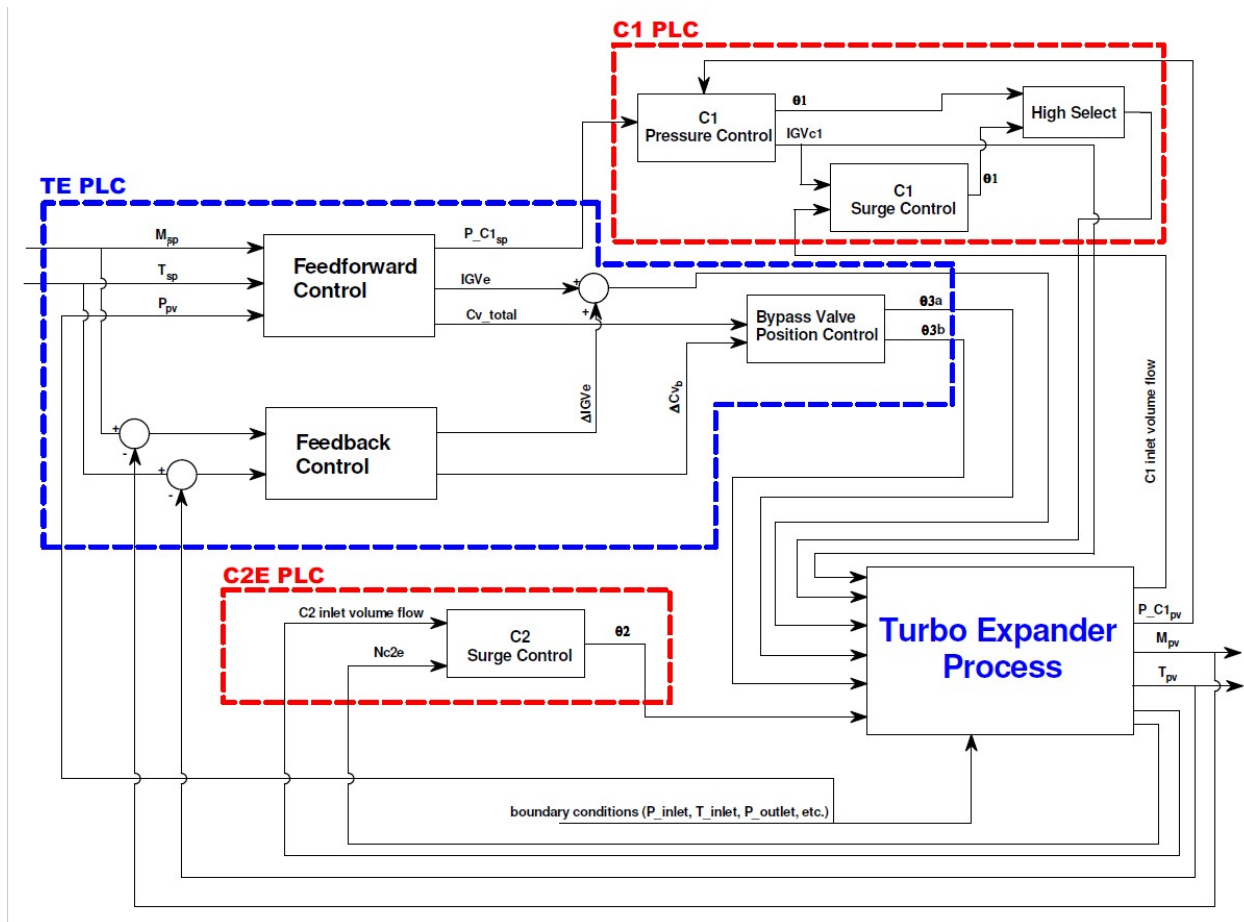


Figure 4-3: Control Block Diagram – Turbo Expander Option

In order to decouple the control loops an external PLC (TE PLC) is required. The TE PLC will perform the overall control, directly sensing the mass flow and temperature and closing the loop as shown in the Figure above. To do this the TE PLC sends a feedforward discharge pressure setpoint to C1 and directly controls the expander inlet guide vanes and the bypass valves through feedforward and feedback techniques. The decoupling is applied in the feedback control block.

The scope of the controls effort for the Turbo Expander system is envisioned as:

- Modification of existing Main PLC program to accommodate new I/O
- Modification of existing HMIs to accommodate new I/O and functionality (i.e. setpoint ranges etc.)
- Addition of TE PLC including I/O to accommodate new instrumentation
- Addition of a TE HMI for control and tuning of TE system

- Programming of TE PLC
- Programming of TE HMI
- Startup at site

The figure below illustrates the Architecture including removal and addition of equipment:

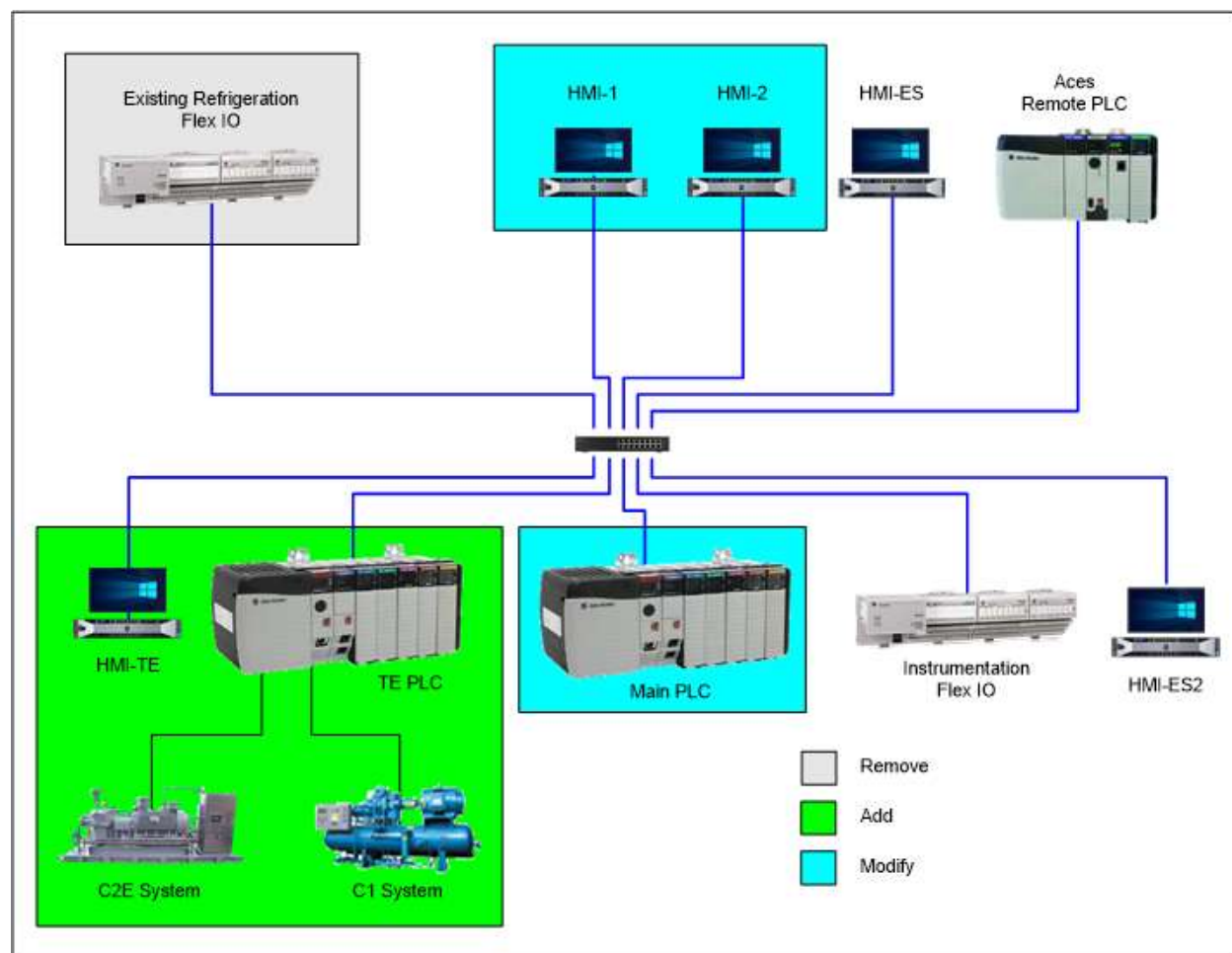


Figure 4-4: Control System Architecture - Turbo Expander Option

The Turbo Expander system is shown as the new TE PLC and HMI connected to the existing system via Ethernet, and the two compressor systems directly wired to the TE PLC. Additional direct wiring is not shown.

This diagram was reproduced from the existing network diagram supplied by NRC. It is assumed that the “Aces Remote PLC”, Instrumentation I/O rack and “ES” HMIs will not need to be touched.

It is conceivable that the TE functionality could be absorbed by the existing Main PLC and HMIs if the same contractor is used for all controls aspects of this upgrade. For pricing purposes however, it is assumed that the TE PLC and TE HMI will be a separate system.

4.4 Utility Requirements

The electrical loads, cooling water, nitrogen, instrument air and steam requirements for the design point are given in Table 4-2 and Table 4-3 below.

Table 4-2: Electrical Power Requirements

Item Description	AC Power Consumption		
	4160 VAC 60 Hz, 3 PH	575 VAC 60 Hz, 3 PH	120 VAC 60 Hz, 1 PH
<i>Dehumidifier</i>			
Process Fan		15 kW	
Reactivation Fan		7.5 kW	
Desiccant Wheel Motor		2 kW	
Control Panel			2 kW
<i>Standard Chiller</i>		100 kW	
<i>Cooling Water Pumps</i>		15 kW	
<i>Turboexpander</i>			
Lube Oil Pump Motor		7.5 kW	
Reservoir Heater		7.5 kW	
Unit Control Panels			4 kW
C1 Main Motor	640 kW		

Table 4-3: Summary of other utility requirements.

Service	Maximum Consumption
<i>Nitrogen</i>	
Expander/Compressor (C2/E)	200 to 300 SCFM
Compressor (C1)	200 to 300 SCFM
<i>Instrument Air (control valves)</i>	7 SCFM
<i>Cooling Water</i>	
HX1	400 GPM
HX2	400 GPM
<i>Steam</i>	1000 lb/hr

4.5 Building Layout

The building layout for this option is shown on Drawing 4277-100-1. The layout drawing shows the space requirements for the major pieces of equipment. Piping, cooling water pumps and

standalone electrical cabinets are not shown. The equipment skids (dehumidifier, driving compressor and compressor/expander) will be largely self-contained with the electrical panels and control panels associated with each skid mounted on the skid.

The skid dimensions were based on information given in budgetary estimates from suppliers with some adjustment based on experience with the previous NRC IATS project. Budgetary information for the compressors and expander was received from Atlas Copco Mafi-Trench. The drawings provided by Atlas Copco showed a very large C2E skid with a separate area for the lube oil system. For the NRC IATS project a compact lube system was mounted on the C1 skid (serving both C1 and C2E) so this has been assumed to be feasible for the system presented here. Also, dimensional information was not obtained for the heat exchangers (HX1 and HX2). The space allocation shown on the drawing is for the heat exchangers used for the IATS project.

LCI has been engaged by Aiolos to contribute to this study with cost estimates for the building. LCI's review of the layout revealed that the East wall of the addition is too close to the adjacent existing building's large roll-up doors. The East wall needs to be moved to the West about 5 feet to provide the needed clearance. This will be challenging to achieve as the layout is already tight. Moving the East wall will be explored in the second phase of the study if the Turbo Expander Option is chosen as the preferred option.

4.6 Cost Estimate and Schedule

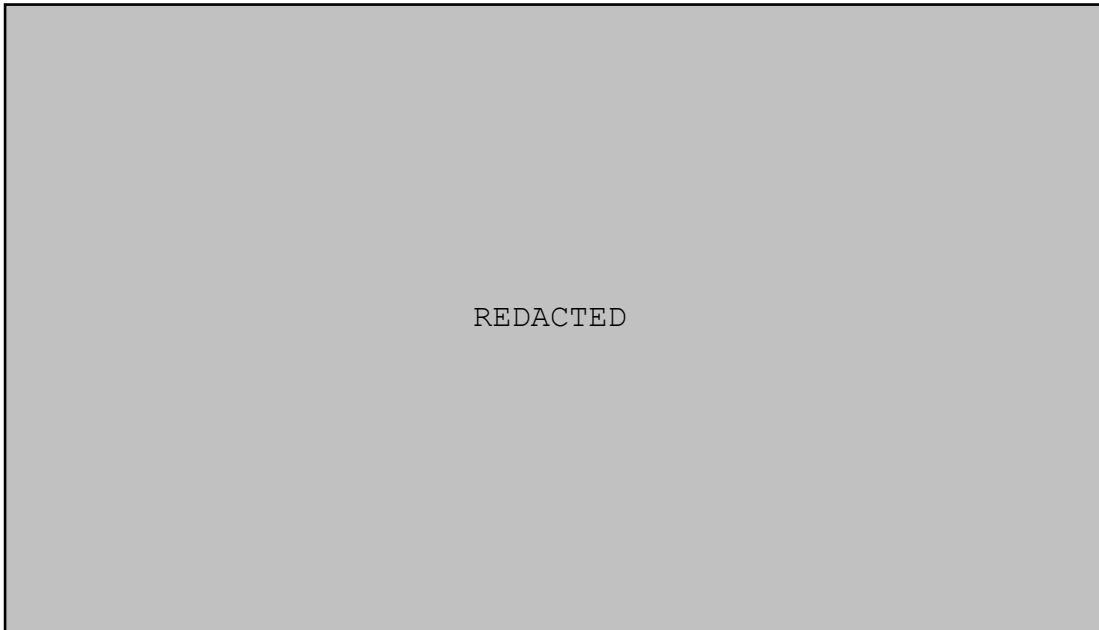
The cost estimate presented in this section assumes the project is executed as a turnkey project which includes the building addition and the replacement of the existing 12 inch supply pipe which supplies inlet air to the chamber.

Budgetary costs for the dehumidifier were obtained from several suppliers. Atlas Copco Mafi-Trench provided the budgetary cost for the turboexpander. This system is essentially a scaled down version of the turboexpander system provided for the IATS project with a maximum mass flow about 1/3 of the maximum mass flow for the IATS. The cost of interconnecting piping and installation of equipment were taken from actual costs for the IATS plus escalation. Although the piping is slightly smaller, the complexity is the same and the skid sizes are about the same. This should give a slightly conservative estimate of costs that is within the budget accuracy requirement for the study.

Estimates for removing the existing refrigeration shack and the existing refrigeration equipment were provided by LCI. LCI also estimated the costs for the new building addition.

The costs are presented in the table below, broken down by major cost element. Note that these estimates are valid today and do not consider escalation to some future date.

Table 4-4: Cost Summary – Turbo Expander Option



REDACTED

Same as the other option, the schedule timescale is formatted in months, so the duration of the overall project is clear to view. For the turbo expander option, 22 months is projected from kick-off until the final acceptance. This mainly came from the long delivery time of the turbo expander itself. The assumption is also made for the project start date from the first week of May 2021. One important task item, Facility Shutdown, is red highlighted in order to emphasize the duration (approx. 250 days) that the facility cannot be operational.

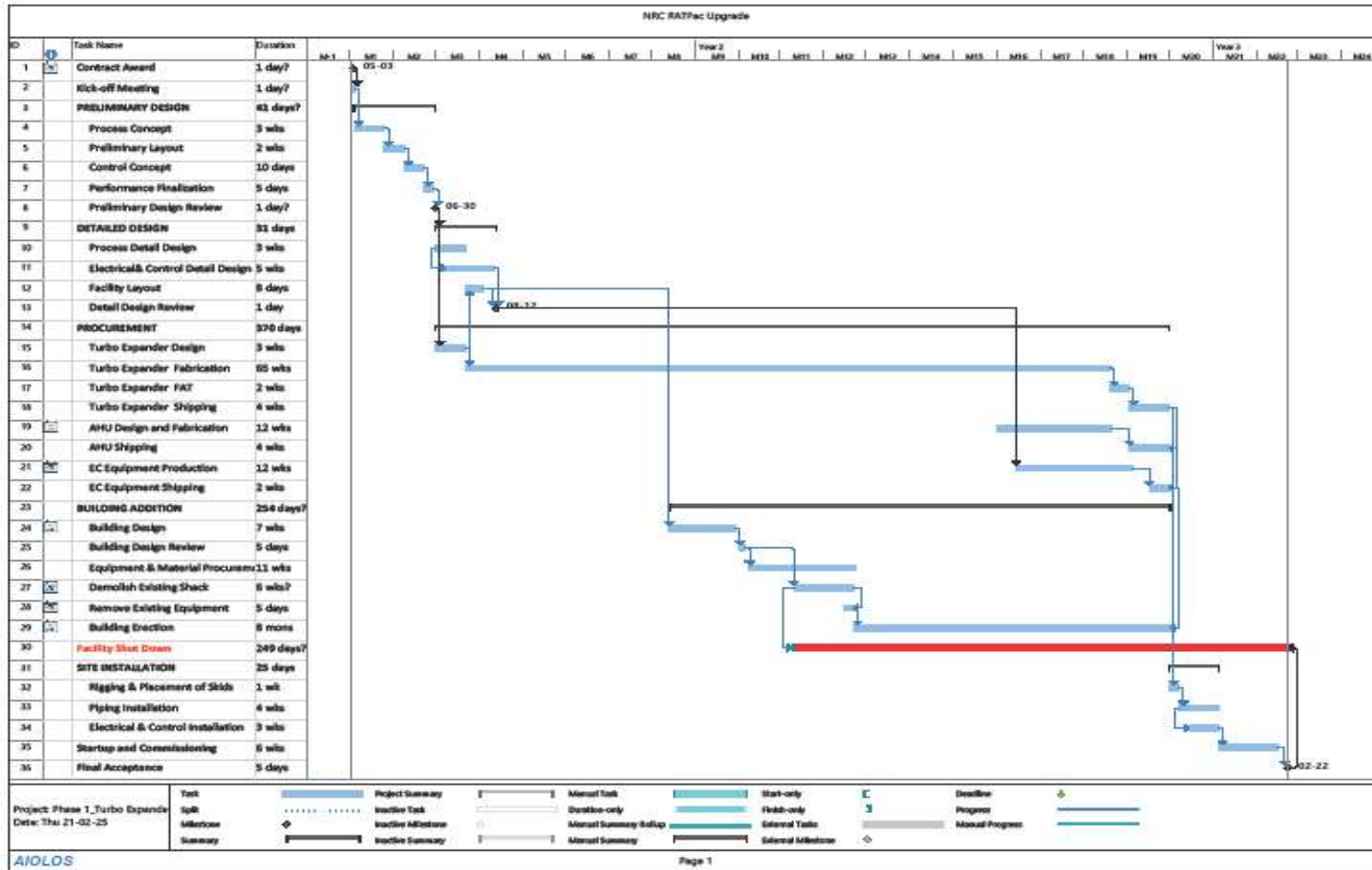


Figure 4-5: Overall Schedule – Turbo Expander Option

5. VAPOUR COMPRESSION REFRIGERATION SYSTEM – 20 LB/SEC OPTION

5.1 System Description

For this option, the maximum mass flow rate of conditioned air to the test cell is increased from 10 lb./s to 20 lb./s.

The System configuration remains unchanged and sized as per same design ambient air conditions provided by NRC.

The system is capable of operating at process air flow rates ranging from 2 to 20 lb/s by loading and unloading to accommodate different conditions within this envelope. On the dehumidification unit, process and regeneration fans as well as desiccant wheel still operate with a VFD. On the condensing units, the screw compressors can unload as follows:

- 12% of total capacity for Cooling Stage 1
- 12.5% of total capacity for Cooling Stage 2
- 1.5% of total capacity for Cooling Stage 3

5.1.1 Air Pre-cooling

The process is identical as described in section 3.1.1 and offers a COP of 3.38 for this condensing unit.

5.1.2 Desiccant dehumidification

The principal remains the same as described in section 3.1.2. However, the diameter of the wheel as well as the number of revolutions per minute are increased to meet new air flow capacity of 20 lb./s.

5.1.3 First air Post-cooling

The process is identical as described in section 3.1.3 and offers a COP of 0.97 for this condensing unit.

5.1.4 Second air Post cooling

The process is identical as described in section 3.1.4 and offers a COP of 0.56 for this condensing unit. Supplied air to the Test Cell meets minimum condition of -57°C DB and -80°C Dewpoint (0.0032g/kg).

5.2 Controls

The Controls strategy and architecture presented in section 3.2 is not impacted by the increased capacity of the equipment to 20 lb./s.

5.3 Utility Requirements

Electrical Power, water and steam requirements are summarized in the tables below.

Table 5-1: Electrical Power Requirements

Equipment	Power Requirements (V/Ph/Hz)	Power consumption (kW)
Condensing unit 1 Water Pump	575/3/60	15
Condensing unit 2 Water Pump	575/3/60	10
Condensing unit 3 Water Pump	575/3/60	7.5
Dehumidification Unit	575/3/60	145
Refrigeration Compressor Stage 1	575/3/60	213.6
Refrigeration Compressor Stage 2	575/3/60	484
Refrigeration Compressors Stage 3	575/3/60	225.6
Total	-	1100.7

Table 5-2: Water Requirements for Condensing Units' Condensers

Pump	Volume Flow Rate (GPM)
Condensing Unit 1 Pump	342.5
Condensing Unit 2 Pump	268
Condensing Unit 3 Pump	160
Total	770.5

A steam supply of a of 72.5 psig minimum pressure is required for regeneration heater coils. Required mass flow rate is indicated in the table below.

Electric regeneration heater can be offered as an option for an additional \$ 55000.

Table 5-3: Steam Requirements for Regeneration Heater Coils

Coil	Mass Flow Rate (lb/h)
Regeneration coil	2016

5.4 Scheduled Maintenance

Assuming the unit will run 24h/day, the AHU would require a service every 3 months and this would take approximately 1 day including performance monitoring.

Filters will need to be checked and once every two years, the face and peripheral seals will require replacement.

All cooling coils and steam regeneration heater will need to be inspected once a year for debris build up.

Condensing units will require standard monitoring and usual checks like any refrigeration unit, and it will mainly consist of:

- Monitoring of refrigerant levels to spot an eventual loss of charge
- Sight glass visual check to ensure they remain dry
- Oil levels monitoring on compressors. Each compressor will have oil sensors linked back to the condensing unit PLC for safety.

5.5 Building Layout

As the increase in air flow capacity to 20 lb./s has impacted footprint of the AHU and condensing units, building dimensions have been slightly increased to accommodate the equipment size. See drawing 4277-100-3-3 for details.

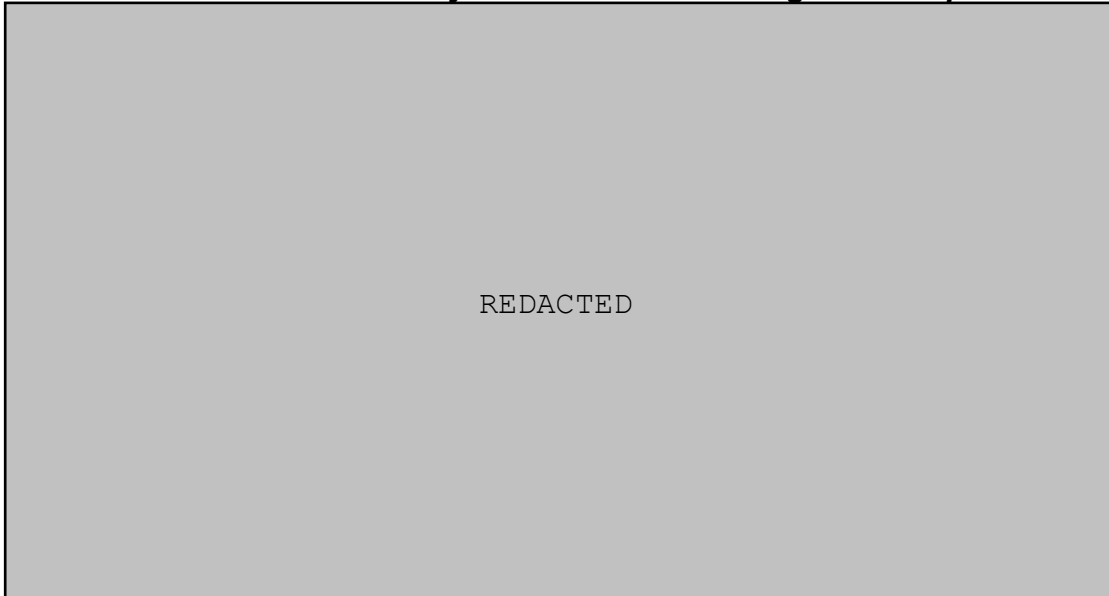
5.6 Cost Estimate and Schedule

The increase in flow capacity has no impact on the delivery; lead time and freight time for major equipment remain respectively sixteen weeks and for four weeks. As such, the schedule stays the same as Figure 3-2 in Section 3-2, and the facility shut down time is estimated to be 250 days as

well mainly due to the 8 months building addition erection time. In summary, the overall project span is approximately 17 months from kick-off until the final acceptance.

The costs are presented in the table below, broken down by major cost element. Note that these estimates are valid today, excludes HST and do not consider escalation to some future date.

Table 5-4: Cost Summary – Conventional Refrigeration Option



REDACTED

APPENDIX C – NRC Construction Documentation and Deliverables Manuals & NRC Engineering and Construction CAD standards

Reference Documentation

NRC-CMRC

Construction Documentation and Deliverables Manual

Real Property Planning and Management

June 2020

Revision 2



National Research
Council Canada

Conseil national de
recherches Canada

Canada 

REVISIONS

VERSION	DATE	DESCRIPTION
0.1	11 18 2019	Draft Version for Consultation
0.2	11 28 2019	Draft Version for Review
1.0	12 05 2019	Original Issue – Revision 1
1.1	06 12 2020	Revision 2

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1 General

1.1 Purpose

This document is intended to provide architectural and engineering consultants (Consultants) with the requirements for producing deliverables for National Research Council Canada (NRC) projects in order to ensure a well-documented design process, and facilitate engagement and review by NRC employees. This document has been assembled based upon documentation prepared by PSCP, “Doing Business with PWGSC Documentation and Deliverables Manual”.

1.2 Scope

This document shall apply to design-bid-build projects undertaken by NRC.

1.3 Harmonization with Project Specific Terms of Reference

This document shall be used in conjunction with project specific Request for Proposal (RFP) requirements. In case of a conflict between documents, the requirements of the RFP shall prevail over those of this document.

1.4 Terminology

This document utilizes the following terminology:

- **shall:** used to express a requirement, a provision the Consultant is obligated to meet;
- **should:** used to express a recommendation; and
- **may:** used to express an option or that which is permissible within the limits of this document.

1.5 Definitions

Addenda: changes to the construction documents or tendering procedures, issued during the tendering process.

Construction Documents: drawings and specifications (including addenda).

Drawings: graphic means of showing work to be done, as they depict shape, dimension, location, quantity of materials and relationship between building components.

Reports: written account given of a particular matter after thorough investigation or consideration prepared by the Consultant.

Specifications: written descriptions of materials and construction processes in relation to quality, colour, pattern, performance and characteristics of materials, installation and quality of work requirements.

Indicative Estimate: estimate that is not sufficiently accurate to warrant Treasury Board approval as a cost objective and provides a rough cost projection used for budgetary planning purposes in the early stages of concept design development. Based on an operational Statement of Requirements (SOR), market assessment of products and technologies available to meet requirements and considerations such as implementation, life cycle costs and operational savings.

Substantive Estimate: high quality and reliable estimate based on the following elements:

- Detailed system and component design, design adaptation, work plans and drawing for components, construction or assembly, and installation. Includes site acquisition, preparation and special requirement estimates. Contingency funding requirements must be justified based on line-by-line risk assessments including market factors, industrial capability and considerations.
- Significant and identifiable deliverables as well as the costs of the government contribution to employee benefit plans (20% of all salaries charged to the project).
- Agreed upon objectives, including those resulting from procurement review.
- Market assessment, where acquisition is through lease, lease purchase or capital lease. The provision allowance for fit-up or special tailoring requirements will be subject to review and possible revision at the contract approval stage.

2 Construction Documents

2.1 General

This section provides direction to Consultants on the preparation of construction documents (namely specifications and drawings) to be submitted to NRC for real property projects across Canada.

Specifications, drawings, and addenda shall be complete and clear in order to enable Contractors to prepare bids without guesswork.

2.1.1 Principles of NRC Contract Documents

Contact documents shall be prepared based on common public procurement principles.

NRC is responsible for preparing and issuing the construction contract and the terms and conditions as well as all other related bidding and contractual documents. For detailed information, the standard acquisition clauses and conditions commonly used by NRC in the contracting process are available on the buyandsell.gc.ca website.

2.1.2 Translations

When bilingual documents are required, as outlined by project specific RFPs, all documentation including drawings, specifications, reports as well as all bidder questions shall be prepared in both official languages.

Ensure English and French documentation is of equal quality in all respects.

2.1.3 Meeting Minutes

Meeting minutes shall be prepared for all design meetings and distributed to all required within 1-week of meeting date. Unless otherwise indicated in the project specific RFP, it shall be the sole responsibility of the Consultant to prepare and distribute meeting minutes. Refer to meeting minutes sample template in Appendix F.

2.1.4 Construction Document Definitions

Unless otherwise indicated in a project specific RFP, construction document submissions (33%, 66%, 99%, and Tender / 100%) shall meet the definitions outlined below. Further discipline based requirements may be included in the project specific RFP.

- **33%:** shall demonstrate general intent of design and compliance and alignment with relevant standards. Summary specification (table of contents) required, but not a full specification.
- **66%:** shall show full system, all components, requirements, and lack only minor details on drawings. Specifications shall be well advanced and contain major work and material requirements and lack only minor details.
- **99%:** shall be for final review by NRC, lacking no detail and complete with a project specific specification.

- **Tender** (100%): shall address comments by NRC as required, signed and sealed by the responsible design professional in compliance with various provincial jurisdiction requirements, ready for tender.

2.1.5 Quality Assurance

It is the sole responsibility of the Consultants to undertake their own quality control process and to review, correct, and coordinate their documents between disciplines. The Consultant shall also ensure constructability of their design.

2.1.6 Quality Assurance of Deliverables

For every construction document submission (33%, 66%, 99% and Tender), the Consultant shall provide:

- completed and signed Submission of Construction Documents Checklist (Appendix A); and
- index as per Appendix B.

2.1.7 Design Reviews

2.1.7.1 General

Unless otherwise indicated in the project specific RFP, Consultants shall allow for a 2-week review period at each construction document submission (33%, 66%, 99%, and Tender) by NRC. NRC shall conduct architectural and engineering review at each specified construction document submission and provide comment utilising the Technical Services Review (Appendix C).

2.1.7.2 Consultant Response

Consultants shall review the NRC prepared Technical Service Review at each construction document submission (33%, 66%, 99%, and Tender). In addition to any subsequent modifications required as a result of NRC review comments, Consultant shall provide a response to each item indicated in the Technical Service Review such as changes noted, clarifications made, or propose alternative solutions for further review with NRC.

2.1.8 Terminology & Quantities

The Consultant shall use the term **Departmental Representative** instead of Engineer, NRC, Owner, Consultant or Architect. Departmental Representative means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor.

Notations such as “verify on site,” “as instructed,” “to match existing,” “example,” “equal to,” “equivalent to,” and “to be determined on site by Departmental Representative” shall not be indicated in specifications nor in drawings, as such wording promotes inaccurate and inflated bids.

Construction documents shall permit bidders to bid accurately. If a precise quantity is impossible to identify (e.g. cracks to be repaired), then provide an estimated quantity for bidding purposes (to be used in conjunction with unit prices). Ensure that the terminology used throughout construction documents is consistent and does not contradict applicable codes and standards.

2.1.9 Units of Measure

All units of measure indicated within drawings and specifications shall be based on the International System of Units (SI).

2.2 Drawings

2.2.1 General

Drawings shall be prepared in accordance with the NRC Engineering & Construction CADD Standard and the Canadian Standards Association CSA B78.5-93 (R2002): Computer-Aided Design Drafting (Buildings). Drawing shall also meet the following criteria:

- dimensions shall be in metric only (no dual dimensioning); and
- no trade names present on any drawings.

2.2.2 Information to be Included

Drawings should show the quantities of the elements, the configuration of the project, the dimensions, and details of how the work is constructed. There should be no references to future work or information that will be changed by future addenda. The scope of work should be clearly detailed, and elements not in the Contract should be eliminated or kept to an absolute minimum.

2.2.3 Titleblocks and Revision Notes

NRC titleblocks shall be used for drawings and sketches, including addenda.

The percent of drawing completion should be included in the revision notes. Revision notes shall be input during design development, but cleared for Tender drawing (100% complete).

2.2.4 Drawing Numbers

Drawings shall be numbered in sets according to the type of drawing and discipline involved as indicated in the following table.

DISCIPLINE	DRAWING
Architectural	XXXX-A01, XXXX-A01F, XXXX-A02, XXXX-A02, etc.
Civil	XXXX-C01, XXXX-C01F, XXXX-C02, XXXX-C02, etc.
Mechanical	XXXX-M01, XXXX-M01F, XXXX-M02, XXXX-M02, etc.
Electrical	XXXX-E01, XXXX-E01F, XXXX-E02, XXXX-E02, etc.
Structural	XXXX-S01, XXXX-S01F, XXXX-S02, XXXX-S02, etc.

Note: XXXX denotes NRC project number and XXX-A01F denotes French drawing

2.2.5 Presentation Requirements

Present the drawings in sets, providing the applicable site plan, civil, architectural, structural, mechanical, and electrical drawings in that order. All drawings should be of uniform standard size.

2.2.6 Legends

Provide a legend of symbols, abbreviations, references, etc., on the front sheet of each set of drawings (discipline specific), or in the case of large sets of drawings, provided the legend immediately after the title sheet and index sheets.

2.2.7 Schedules and Tables

Where schedules or tables occupy entire sheets, locate them at the back of each set of drawings for convenient reference.

2.2.8 North Arrow

Include a north arrow on all plans. Orient all plans in the same direction for easy cross-referencing. Wherever possible, lay out plans so that the north point is at the top of the sheet.

2.2.9 Drawing Symbols

Follow generally accepted drawing conventions, understandable by the construction trades.

2.2.10 As-Built Drawings

As-built drawings are official record drawings and shall represent as constructed conditions including location and size of equipment, devices, plumbing lines, mechanical and electrical equipment, structural elements etc. As-built drawings shall be updated in CADD and provided to NRC upon project completion. Handwritten notes are not acceptable.

2.2.11 Drawing Submission Format

Unless otherwise stated in the project specific RFP, drawing submissions shall be in electronic format.

2.2.11.1 Drawing Electronic Copy Deliverable Format

Drawing submitted electronically shall be provided:

- without password protection or printing restrictions;
- in two formats:
 - PDF/E-1 (in compliance with ISO 24517-1);
 - .dwg format; and
- in accordance with supplemental specific provisions indicated in project specific RFP.

2.3 Specifications

2.3.1 National Master Specifications

Specifications prepared for NRC shall follow the most current version of the **National Master Specification** (NMS) format offered by the National Research Council. In addition, Consultant shall incorporate NRC supplied General Specification sections, provided in NMS format, into specification package.

The Consultant has overriding responsibility for the content of construction project specifications. For each specification, the Consultant shall edit, amend, and supplement the NMS template as deemed necessary to produce an appropriate project specification free of conflict and ambiguity. The Consultant should refer

to the latest *NMS User's Guide* and *NMS Development Guide* issued by the National Research Council for further guidance on using the NMS.

2.3.2 Index

Specifications shall include an index which list all specification sections, including numbers of pages, as well as the division and section names in the format shown in Appendix B.

2.3.3 Specification Organization

Narrow scope sections describing single units of work should be used for complex work. Broad scope sections may be used for less complex work. The Consultant shall use consistently for the entire specification the NMS full-page format.

Start each section on a new right hand page and show the NRC project number, NMS section title, NMS section number, page number, and specification date on each page. The project title, and Consultant name are not to be indicated.

2.3.4 Standards

Code and standard references in the NMS may not be up to date, the Consultant shall ensure that the project specification use the current applicable edition of all references quoted.

2.3.5 Specifying Materials

Specifications should make use of generic names in referencing construction materials. The Consultant should refer to the latest version of the *NMS Development Guide* issued by the National Research Council for further details.

2.3.5.1 Alternate Products and Materials

Alternative materials to those specified may be considered during the solicitation period; however, the onus will be on the Consultant to review and evaluate all requests for approval of alternative materials.

2.3.5.2 Sole Sourcing

Sole sourcing of materials and/or work is only allowed in exceptional and justifiable circumstances. Prior to including sole source materials and/or work, the Consultant shall contact the Departmental Representative to obtain approval for the sole sourcing. Consultants shall provide proper justification for all individual sole source requirements.

Sole sourcing for materials and work may be required when performing work on existing proprietary systems, such as fire alarm systems, building automation systems (BAS) etc.

Wording for the sole source of work should be in Part 1 as follows:

Designated Contractor

.1 Retain the services of [_____] to do the work of this section.

Wording for the sole source of building automation system should be in Part 1 as follows:

Designated Contractor

.1 Retain the services of [] or its authorized representative to complete the work of all building automation system sections.

Wording for the sole source of building automation system should be in Part 2 as follows:

Materials

.1 There is an existing [] system presently installed in the building. All materials must be selected to ensure compatibility with the existing [] system.

Wording for the sole source of materials (i.e. fire alarm systems) should be in Part 2 as follows:

Acceptable Materials

.1 The only acceptable materials are [].

2.3.6 Measurements for Payment

The measurement for payment shall be provided in lump sum or unit prices.

2.3.6.1 Unit Prices

Unit prices should only be used in instances where the quantity can only be roughly estimated (e.g. earth work). The approval of the Departmental Representative shall be sought in advance of their use. In each applicable NMS section where unit prices are used, add new or replace paragraph title “Measurement for Payment” with “Unit Prices.” and use the following wording:

[The work for this section] or [define the specific work if required, e.g. rock excavation] will be paid based on the actual quantities measured on site and the unit prices stated in the Bid and Acceptance Form.

Provide a unit price table, sample shown below, to designate the work to which a unit price arrangement applies. The table shall include:

- the price per unit and the estimated total price for each item listed;
- a complete description of each type of work covered; and
- items as described in the referenced specification section.

Item	Specification Reference	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity	Price per Unit GST/HST extra	Estimated Total Price GST / HST extra
TOTAL ESTIMATED AMOUNT						

2.3.7 Cash Allowances

Construction documents shall be complete and contain all of the requirements for the contractual work. Cash allowances are to be used only under exceptional circumstances (i.e. utility companies, municipalities), where no other method of specifying pricing is appropriate.

To include cash allowances, obtain approval from the Departmental Representative in advance, and use Section 01 21 00 – Allowances of the NMS to specify the criteria.

2.3.8 Warranties

The 12-month warranty period specified in NRC’s standard acquisition clauses and conditions with regard to the contract should typically be retained as is. Extended warranties should only be used where experience has shown that serious defects are likely to appear after expiry of the standard one-year warranty period. When necessary to extend beyond the 12-month warranty period, use the following wording in Part 1 of the applicable technical sections, under the heading “Extended Warranty”:

For the work of this Section [____], the 12-month warranty period is extended to [____] months.

Where the extended warranty is intended to apply to a particular part of a specification section, modify the previous text as follows:

For [____], the 12-month warranty period is extended to [____] months.

2.3.9 Miscellaneous Requirements

Paragraphs noted as “Scope of Work” shall not be included. Within Part 1 – General of specifications, the paragraphs “Summary” and “Section Includes” shall not be utilized.

2.3.10 Specification Coordination

All sections of the specifications shall be coordinated, including the “Related Sections” portion of specifications and appendices. References to non-existent sections shall not be present within the specifications.

2.3.11 Regional Guide

The Consultant should contact the Departmental Representative to obtain the region’s requirements for Division 01 (General Requirements) or other short-form specifications as appropriate.

2.3.12 Health and Safety

All project specifications are required to include Section 01 35 29 – Health and Safety Requirements. Confirm with the Departmental Representative to determine if there are any supplemental instructions to meet regional requirements.

2.3.13 Subsurface Investigation Reports

If required, subsurface investigation report(s) shall be included after Section 31, and the following paragraph added to Section 31:

Subsurface Investigation Report(s)

.1 Subsurface investigation report(s) are included in the specification following this section.

If the Departmental Representative determines that it is not practical to include the subsurface investigation report(s), alternate instructions will be provided.

Where tender documents are to be issued in both official languages, the subsurface investigation report(s) shall be issued in both languages.

In addition to providing the subsurface investigation report(s), the foundation information required by the current *National Building Code of Canada* (Division C, Part 2, 2.2.4.6) shall be included on foundation drawings.

2.3.14 Prequalifications and Pre-Award Submissions

Do not include in the specifications any mandatory contractor and/or subcontractor prequalification or pre-award submission requirements that could become a contract award condition. If a prequalification process or a pre-award submission is required, contact the Departmental Representative.

There should be no references to certificates, transcripts, samples, the license numbers of a trade, or any other documentation or items being included with the bid.

2.3.15 Contracting Issues

Specifications describe the workmanship and quality of the work and shall not contain any NRC Procurement Front End Contracting details. Division 00 of the NMS is not used by NRC, except for the Seals page 00 01 07, the Table of Contents 00 01 10, and the List of Drawing Sheets 00 01 15. In specifications, remove all references to the following:

- general instructions to bidders;
- general conditions;
- Canadian Construction Documents Committee (CCDC) documents;
- priority of documents;
- security clauses and clearances;
- terms of payment or holdback;
- the tendering process;
- bonding requirements;
- insurance requirements;
- alternative and separate pricing;
- site visits (mandatory or optional); and
- release of lien and deficiency holdbacks.

2.3.16 Specification Submission Format

Unless otherwise stated in the project specific RFP, specification submissions shall be in electronic format.

2.3.16.1 Specification Electronic Copy Deliverable Format

Specifications submitted electronically shall be provided:

- without password protection or printing restrictions;
- in PDF/A (in compliance with ISO 19005) and .doc format; and
- in accordance with supplemental specific provisions indicated in project specific RFP.

2.4 Addenda

2.4.1 Format

Prepare addenda using the format shown in Appendix D. No signature-type information is to appear.

Every page of the addendum, including attachments, shall be numbered consecutively. All pages shall have the NRC project number and the appropriate addendum number. Sketches shall appear in the NRC format, signed and sealed.

No Consultant information (name, address, phone #, Consultant project #, etc.) should appear in addenda or their attachments, except on sketches.

2.4.2 Content

Each item should refer to an existing paragraph of the specification or note/detail on the drawings. The clarification style is not acceptable.

Where there are many or major changes to a section or drawing, consider deleting the entire section or drawing and replacing it with a new version.

3 Cost Estimates

3.1 Cost Estimate Submission Formats

3.1.1 Format

Construction cost estimates for projects shall be prepared in the elemental analysis format, which is in accordance with the latest edition issued by the Canadian Institute of Quantity Surveyors (CIQS). Refer to Appendix E for Construction Estimate Preparation - Minimum Requirement Checklist.

3.1.2 Contents

All cost estimates shall contain the following:

- introduction narrative complete with an outline description of the cost estimate basis;
- description of information obtained and used in the cost estimate including the date received;
- listing of notable inclusions;
- listing of notable exclusions;
- listing of items/issues carrying significant risk;
- summary of the itemized cost estimate;
- itemized breakdown of cost estimate by elemental analysis for Class B, C, and D; and
- itemized breakdown of costs estimate in both elemental analysis and National Master Specification division format for Class A, including measured quantities, unit rate pricings and amounts for each item of work.

Allowances, if deemed necessary by Consultant, shall contain the following:

- design allowance to cover unforeseen items during design phase;
- escalation allowance for changes in market conditions between the date of the cost estimate and the date tender is called;
- construction allowance to cover unforeseen items during construction; and
- the basis of calculations of the above allowances.

3.2 Classes of Cost Estimates for Construction Projects

NRC applies a detailed, four-level classification using the terms Class A, B, C and D. Apply these estimate classifications at the project stages as defined in the project specific RFP. For projects required to be submitted to Treasury Board (TB) for approval: an indicative estimate shall be at least a Class D and a Substantive Estimate shall be at least a Class B.

3.2.1 Class D (Indicative) Estimate

Based upon a comprehensive statement of requirements, an outline of potential solutions and/or functional program, this estimate is to provide an indication of the final project cost that will enable ranking to be made for all the options being considered. This cost estimate shall be prepared in elemental analysis format, such as cost per square metre. The level of accuracy of a Class D cost estimate shall be such that no more than a 30% design allowance is required.

3.2.2 Class C Estimate

Based on schematic/conceptual design and/or comprehensive list of project requirements, this estimate shall be adequately detailed and shall be sufficient for making the correct investment decision. This cost estimate shall be based on measured quantities of all items of work and prepared in elemental analysis format. The level of accuracy of a Class C cost estimate shall be such that no more than a 20% design allowance is required.

3.2.3 Class B (Substantive) Estimate

Based on design development drawings and outline specifications, which include the preliminary design of all major systems and subsystems, as well as the results of all site/installation investigations, this estimate shall provide for the establishment of realistic cost objectives and be sufficient to obtain effective project approval.

This cost estimate shall be based on measured quantities of all items of work and prepared in elemental analysis format. The level of accuracy of a Class B cost estimate shall be such that no more than a 15% design allowance is required.

3.2.4 Class A (Pre-Tender) Estimate

Based on completed construction drawings and specifications prepared prior to calling competitive tenders, this estimate shall be sufficient to allow a detailed reconciliation and/or negotiation with any contractor's tender submission. This cost estimate shall be based on fully measured quantities of all items of work and prepared in both elemental analysis and Trade division format as per MasterFormat™. The level of accuracy of a Class A cost estimate shall be such that no more than a 10% design allowance is required.

4 Project Schedules

4.1 Schedule Format

Project schedules shall be submitted in the .mpp file extension (compatible with MS Project). The schedule shall include:

- major and minor milestones;
- activities representing discrete elements of work assigned to one person which:
 - are named using verb-noun combination (i.e. Review Design Development Report);
 - contain realistic durations in days;
- project logic linking activities with appropriate relationships finish-start (FS), finish-finish (FF), start-start (SS); and
- identification of the critical path activities.

4.2 Progress Reporting

The progress report shall detail the progress of each activity up to the date of the report. It shall also include any logic changes made, both historic and planned; projections of progress and completion; as well as the actual start and finish dates of all activities being monitored.

The contents of each progress report will vary depending on the requirements at each project phase. A progress report should include:

- an executive summary;
- a narrative report;
- a variance report;
- a criticality report;
- an exception report (as required); and
- the detailed project schedule (network diagram or bar charts).

4.2.1 Executive Summary

The executive summary should provide a synopsis of narrative, variance, and exception report and shall not exceed one page.

4.2.2 Narrative Report

The narrative shall detail the work performed to date, comparing work progress to planned, and presenting current forecasts. This report should summarize the progress to date, explaining current and possible deviations and delays and the required actions to resolve delays and problems with respect to the Detailed Schedule, and Critical Paths.

4.2.3 Variance Report

The variance report, with supporting schedule documentation, should detail the work performed to date and compare work progress to work planned. It should summarize the progress to date and explain all causes of deviations and delays and the required actions to resolve delays and problems with respect to the detailed schedule and critical paths.

4.2.4 Exception Report

The exception report shall be provided when unforeseen or critical issues arise. The Consultant shall advise the Departmental Representative and submit the details and proposed solutions in the form of an exception report. The report shall include sufficient description and detail to clearly identify:

- scope changes, including identifying the nature, reason, and total impact of all identified and potential project scope changes affecting the project;
- delays and accelerations, including identifying the nature, reason, and total impact of all identified and potential duration variations; and
- options enabling a return to the project baseline, including Identifying the nature and potential effects of all proposed options for returning the project within the baselined duration.

4.2.5 Detailed Project Schedule

A detailed project schedule shall be provided along with a network diagram or bar charts in the following format:

- Paper size: 11X17
- Orientation: Landscape
- Columns: Activity ID, Activity Name, Duration, Activity % Complete, Start, Finish, Total Float
- Footer format: Project Title, Report Type, Print Date, Data Date, Revision Block
- Sorting: Early Start, then Early Finish, then Activity ID based on the WBS.

APPENDIX A

Submission of Contract Documents Checklist

APPENDIX B

Drawings and Specifications Table of Contents Sample

APPENDIX C

Technical Services Review

APPENDIX D

Addenda Template

APPENDIX E

Construction Estimate Preparation – Minimum Requirement Checklist

APPENDIX F

Meeting Minutes Sample Template

NRC·CMRC

Engineering & Construction CADD Standards

Real Property Planning and Management

June 2020

Fifth Edition - Revision 2



National Research
Council Canada

Conseil national de
recherches Canada

Canada

REVISIONS

This document has been prepared for the sole use of the Engineering & Construction Group within Real Property Planning and Management (RPPM) and Architectural and Engineering Consultants (Consultants) retained to prepare construction documentation. No part of the contents of this manual may be reproduced or transmitted in any form or by any means without permission of the Engineering & Construction Director.

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VERSION	DATE	DESCRIPTION
1.0	20 03 1994	Original Issue – First Edition
1.1	20 03 1995	Revised Layering Chapter – Revision 1
1.2	29 03 1995	Revised Plotting Chapter – Revision 2
1.3	05 04 1995	Revised Listing of Printers – Revision 3
1.4	18 04 1995	Revision to Graphics – Revision 4
1.5	17 05 1995	Revision to Typesetting – Revision 5
1.6	09 06 1995	Revised Plotter Pen Settings – Revision 6
1.7	08 08 1995	Revised Plotting Chapter – Revision 7
1.8	01 11 1997	Second Edition Preliminary Draft
1.9	01 03 1998	Second Edition Final Draft
2.0	01 06 1998	Second Edition Issue
3.0	30 09 1999	Third Edition Final Draft
3.1	01 01 2013	Fourth Edition Final Draft
4.0	30 01 2013	Fourth Edition Issue
4.1	15 11 2019	Fifth Edition, Preliminary Draft for Review – CAD Manual and Procedures Converted to Separate Documents
5.0	05 12 2019	Fifth Edition Issue
5.1	02 07 2020	Fifth Edition – Revision 1
5.2	06 12 2020	Fifth Edition – Revision 2

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1 General Information

1.1 Purpose

This document is intended to provide guidelines for the preparation of construction documentation in a consistent, prescribed manner for all National Research Council Canada (NRC) construction projects.

1.2 Computer and IT Support

1.2.1 General IT Support

General computer, software and IT support can be obtained by contacting the NRC IT Service Center at (613) 990-0333 or by email at clientservicecentre@nrc-cnrc.gc.ca.

1.2.2 Software Specific Support

For software specific Engineering & Construction questions related to AutoCAD, CostWorks and alike software, please speak with the Engineering Manager.

1.3 Project Organization

A consistent system followed by everyone makes file management easier and improves efficiency. The project organization standards outline an organized and safe approach for our multi-disciplinary Engineering & Construction Team to store, save, update and retrieve drawing files. Please refer to (document currently under development) for details related to file management, naming convention and document organizational filing structure.

1.3.1 CADD Workstations

The hard-drive contained within the CADD workstations is primarily intended to be used as the device that stores and utilizes locally installed software programs. It should not be used to store data pertaining to work related projects or tasks, as the network back-up software cannot automatically back-up the local hard-drive. Temporary or personal files may be stored on the local hard-drive if the user wishes, an alternate location for these files is the user network home directory.

AutoCAD resides in the directory C:\Program Files\Autodesk\AutoCAD and users shall not copy project data files or other files to this directory.

1.3.2 Files Server Storage

The IMSB network consists of many file servers each containing many network volumes (drives). FEU on "imsbm60san1.imsb.nrc.ca\ibp\ASPM\Common\PM is the primary file server used for the storage of files by the Engineering & Construction Group and is usually mapped to the drive letter I:\. To a user, being connected to the file service is like an extension of the PC hard-drive.

Note: Throughout this document reference is made to I:\ drive and other network drives. Network drives letters are assigned or mapped for each user depending upon the particular user needs. Network drive letter can be thought of as aliases for the full network location on the Black (NRC Legacy) Network.

1.3.3 Templates

AutoCAD templates which include Engineering & Construction standardized layers for architectural, mechanical and electrical disciplines have been created. Each template contains various titleblock layouts which upon selection of a suitable layout for specific projects, all other layouts shall be deleted. These templates are stored in the following network directory:

I:\ASPM\Common\PM\FEU\Engineering Files\ASPM_AUTOCAD\TEMPLATES

In addition, Engineering & Construction has created discipline specific libraries which include standardized blocks and details relevant to each architectural, mechanical and electrical disciplines respectively. These libraries are located in the following directory:

I:\ASPM\Common\PM\FEU\Engineering Files\ASPM_AUTOCAD\ASPM-CAD Database

Engineering & Construction titleblocks and discipline specific libraries shall not be modified without approval of Engineering Manager, and associated discipline specific designated CADD representative.

1.3.4 Designated CADD Representatives

DISCIPLINE	NAME	CONTACT INFO
Architectural	Justin De Gagné Stephen Hebb	Justin.DeGagne@nrc-cnrc.gc.ca Stephen.Hebb@nrc-cnrc.gc.ca
Mechanical	John Goodwin	John.Goodwin@nrc-cnrc.gc.ca
Electrical	Frédéric Giroux	Frederic.Giroux@nrc-cnrc.gc.ca

1.3.5 Consultant Support

As required, and when requested, all NRC standard Titleblocks and CTB files will be provided to Consultants to ensure all drawings are prepared in accordance with the Engineering & Construction CADD Standards.

Questions or inquiries related to the Engineering & Construction CADD Standards should be directed to the Engineering Manager.

2 Typical Drawing Specifications

2.1 General

Drawings shall be prepared in accordance with this Engineering & Construction CADD Standard and the Canadian Standards Association CSA B78.5-93 (R2002): Computer-Aided Design Drafting (Buildings). Drawing shall also meet the following criteria:

- dimensions shall be in metric only (no dual dimensioning); and
- no trade names present on any drawings.

2.1.1 Information to be Included

Drawings should show the quantities of the elements, the configuration of the project, the dimensions, and details of how the work is constructed. There should be no references to future work or information that will be changed by future addenda. The scope of work should be clearly detailed, and elements not in the Contract should be eliminated or kept to an absolute minimum.

2.1.2 Titleblocks and Revision Notes

In order to maintain continuity in our drawings, standardized discipline specific titleblocks have been created, and are stored in the following directory for reference and use:

I:\ASPM\Common\PM\FEU\Engineering Files\ASPM_AUTOCAD\TEMPLATES

Engineering & Construction titleblocks shall be used for all drawings and sketches, including addenda.

The percent of drawing completion should be included in the revision notes. Revision notes shall be input during design development, but cleared for TENDER drawing (100% complete).

2.1.3 Drawing Numbers

Drawings shall be numbered in sets according to the type of drawing and discipline involved as indicated in the following table.

DISCIPLINE	DRAWING
General (Site Plan)	XXXX-G01, XXXX-G01F, XXXX-G02, XXXX-G02F, etc.
Civil	XXXX-C01, XXXX-C01F, XXXX-C02, XXXX-C02F, etc.
Architectural	XXXX-A01, XXXX-A01F, XXXX-A02, XXXX-A02F, etc.
Structural	XXXX-S01, XXXX-S01F, XXXX-S02, XXXX-S02F, etc.
Mechanical	XXXX-M01, XXXX-M01F, XXXX-M02, XXXX-M02F, etc.
Electrical	XXXX-E01, XXXX-E01F, XXXX-E02, XXXX-E02F, etc.

Note: XXXX denotes NRC project number, and XXXX-G01F denotes French drawing

2.1.4 Presentation Requirements

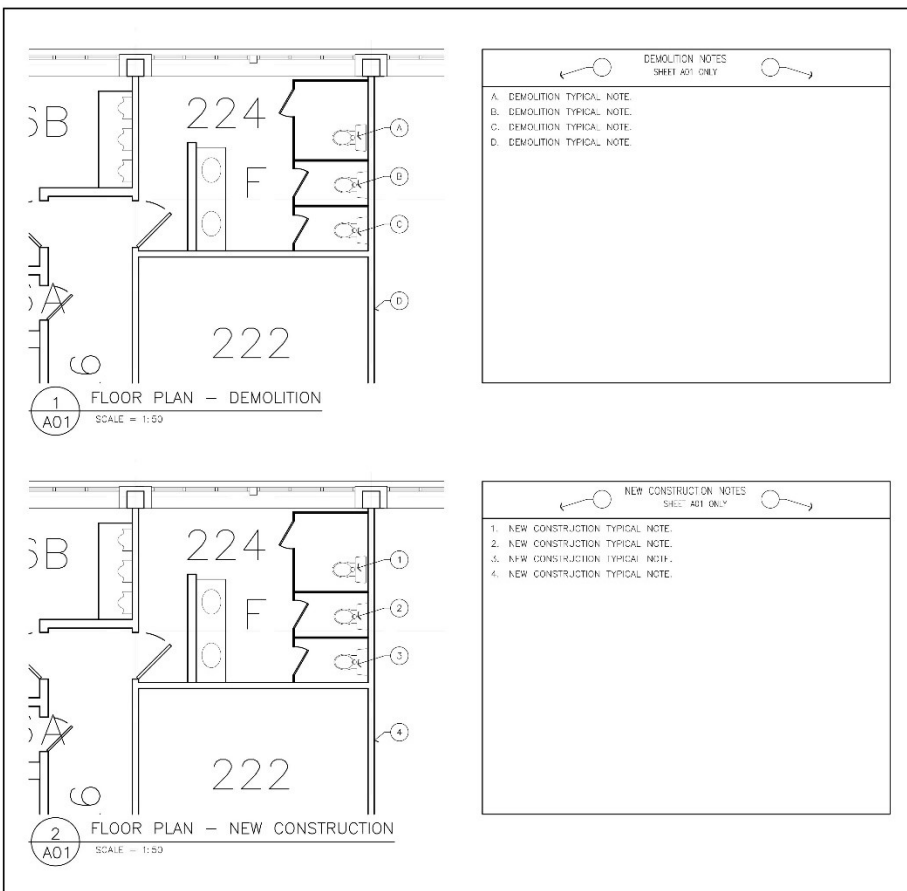
Present the drawings in sets, providing the applicable site plan, civil, architectural, structural, mechanical, and electrical drawings in that order. All drawings should be of uniform standard size.

Translation of drawings will be required for all public tenders, as such, for consistency the following general format guidelines shall be adhered to:

- Refrain from incorporating written notes in model space, unless absolutely necessary. Use note bubbles on paper space to accommodate this practice.
- Translation of English notes to French requires in general 30 – 40% more space, therefore leave adequate room on drawings to ensure English and French drawing layouts remain identical.
- Drawing notes shall be numbered and/or lettered in paper space and consolidated in one general area of the drawing.

Refer to Fig. 1 below for visual representation of drawing presentation requirements.

Fig. 1 – General Layout Requirements



2.1.5 Legends

Provide a legend of symbols, abbreviations, references, etc., on the front sheet of each set of drawings (discipline specific), or in the case of large sets of drawings, provided the legend immediately after the title sheet and index sheets.

2.1.6 Schedules and Tables

Where schedules or tables occupy entire sheets, locate them at the back of each set of drawings for convenient reference.

2.1.7 North Arrow

Include a north arrow on all plans. Orient all plans in the same direction for easy cross-referencing. Wherever possible, lay out plans so that the north point is at the top of the sheet.

2.1.8 Drawing Symbols & Details Libraries

In order to maintain continuity in our drawings, standardized discipline specific libraries for both symbols and standard details have been created to represent common drawing elements, and are stored in the following directory for reference and use:

I:\ASPM\Common\PM\FEU\Engineering Files\ASPM_AUTOCAD\ASPM-CAD Database

When symbols are not provided in the Engineering & Construction standardized discipline specific libraries, follow generally accepted drawing conventions, understandable by the construction trades for creation of appropriate drawing symbols. Seek approval of Engineering Manager and designated discipline CADD representative for inclusion and addition of new symbols to the libraries.

2.1.9 As-Built Drawings

As-built drawings are official record drawings and shall represent as constructed conditions including location and size of equipment, devices, plumbing lines, mechanical and electrical equipment, structural elements etc. As-built drawings shall be updated in CADD and provided to NRC upon project completion. Handwritten notes are not acceptable.

3 Drawing Layer Conventions

3.1 General

Layer conventions are an important aspect of CADD standardization and critical to the sharing of electronic data. Typically, layers are used to group information by function, and to enforce linetype, colour and other standards.

Three (3) specific elements define a layer: name, colour, and linetype. When a CADD user draws an element on a particular layer, the element is shown in the specific colour and linetype defined for the current layer, provided that the colour and linetype settings are set to BYLAYER.

Engineering & Construction has adopted a modified version of the PSPC National Computer Aided Design and Drafting Standard 5.0 developed by the Architectural & Engineering Services Group. For more information on this system please refer to the PSPC National Computer Aided Design and Drafting Standard 5.0.

In general, all layer names for specific disciplines shall already be loaded in the drawing template files used to start a new drawing. Refer to section 1.3.3 of this document for additional details. However, should the need arise to create a new layer, please refer to the Annex A-CADD Layers in the PSPC National Computer Aided Design and Drafting Standard 5.0 for details on how to name the new layer(s).

3.2 General Discipline

The following table is for general use on drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Color	Linetype	Description
GENERAL			
G-GL-CAL	red	Continuous	Callout blocks
G-GL-SYM	red	Continuous	Symbols, key plan, north arrow, bar scale
G-GL-TXT	red	Continuous	Text
G-GL-TXT-E	red	Continuous	English text
G-GL-TXT-F	red	Continuous	French text
G-GL-XRE	red	Continuous	External reference
LEGEND INFORMATION			
G-LG-LIN	green	Continuous	Symbol legend line work
G-LG-TXT	red	Continuous	Symbol legend text
TITLE BLOCK			
G-TL-ATT	red	Continuous	Attributes for title block
G-TL-LAY	white	Continuous	Paper space metaview boundaries
G-TL-LIN	yellow	Continuous	Line work for title block
G-TL-LOG	green	Continuous	Logos
G-TL-RME	white	Continuous	Title block Read Me layer
G-TL-TIL	white	Continuous	Title Block Insertion Layer
G-TL-TXT	white	Continuous	Text for title block

3.3 Civil Discipline

The following table is for use on civil drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Colour	Linetype	Description
BOREHOLE			
C-BH-IDN	190	Continuous	Boreholes identification number
C-BH-LOG	8	Continuous	Borehole logs and data
C-BH-MON	190	Continuous	Geotechnical monitoring well
C-BH-SMP	190	Continuous	Soil sample location
C-BH-STP	8	Continuous	Stratigraphic profile
C-EN-PLM	yellow	Continuous	Plume outline
C-EN-SIT	yellow	Continuous	Boundary limits of contaminated site
C-EN-TNK	yellow	Continuous	Holding tanks for environmental issues
C-EN-WEL	yellow	Continuous	Environmental monitoring wells
GASES AND FUELS			
C-GF-DPI	161	Continuous	Diesel fuel pipelines
C-GF-DSE	161	Continuous	Diesel fuel valves, manholes, meters, storage
C-GF-NPI	161	Continuous	Natural gas pipelines
C-GF-NSE	161	Continuous	Natural gas valves, manholes, meters, storage
C-GF-OPI	161	Continuous	Oil pipelines
C-GF-OSE	161	Continuous	Oil valves, manholes, meters, storage
C-GF-PPI	161	Continuous	Propane pipelines
C-GF-PSE	161	Continuous	Propane valves, manholes, meters, storage
C-GF-TXT	161	Continuous	Gas and fuels text/description
GENERAL			
C-GL-PIC	magenta	Continuous	Inserted pictures
HYDROLOGY			
C-HY-CAT	8	Continuous	Catchment area
C-HY-DRA	8	Continuous	Drainage area
C-HY-FLO	8	Continuous	Flow/discharge
C-HY-ICE	8	Continuous	Ice thickness
LANDSCAPE			
C-LD-ART	8	Continuous	Artwork, Special Features
C-LD-FLG	8	Continuous	Flagpoles
C-LD-FTN	8	Continuous	Fountains, pools

C-LD-FUR	8	Continuous	Site furnishings, benches, garbage cans
C-LD-IRP	8	Continuous	Irrigation System Piping
C-LD-IRR	8	Continuous	Irrigation Heads, Controls
C-LD-LWN	8	Continuous	Lawn area
C-LD-PLT	8	Continuous	Plant materials
C-LD-SPO	8	Continuous	Sport facilities, goal nets, shooting targets
C-LD-TER	8	Continuous	Terraces, courtyards, patios
C-LD-TXT	white	Continuous	Descriptive information text
PROFILE DATA			
C-PR-HOR	white	Continuous	Horizontal profiles
C-PR-VER	white	Continuous	Vertical profiles
ROADS			
C-RO-ACR	white	Continuous	Fire department access routes
C-RO-ALI	white	Continuous	Alignment
C-RO-BRG	white	Continuous	Bridges, overpasses
C-RO-CLI	white	CENTER	Road centreline
C-RO-CON	8	Continuous	Construction Staging
C-RO-CRB	15	Continuous	Curbs
C-RO-GRL	green	Continuous	Guide/guard rails, median dividers, bollards
C-RO-GUT	15	Continuous	Gutter line
C-RO-HWY	cyan	Continuous	Highway plan
C-RO-MRK	8	Continuous	Markings and road striping
C-RO-MSH	red	Continuous	Mass Haul Diagram
C-RO-RMP	white	Continuous	Ramps, on-ramps, loading docks
C-RO-ROD	white	Continuous	Drivable road limits (asphalt) road, lots
C-RO-ROD-APP	8	Continuous	Drivable road limits approximate location
C-RO-ROD-CON	white	Continuous	Drivable road limits (concrete) road, lots
C-RO-ROD-GRV	white	Continuous	Drivable road limits (gravel), shoulder of road
C-RO-SHO	yellow	Continuous	Edge of Shoulder
C-RO-STG	8	Continuous	Staging Layout Plans
C-RO-STR	white	Continuous	Bridge abutments, piers, supports
C-RO-TUN	white	Continuous	Road tunnels, underpasses
C-RO-TXT	white	Continuous	Road description/information text
RAILWAY			
C-RW-ALI	white	Continuous	Alignment
C-RW-BRG	white	Continuous	Bridges
C-RW-CLI	white	Continuous	Rail centerline
C-RW-RAI	white	Continuous	Railway lines, switches
C-RW-RMP	white	Continuous	Ramps
C-RW-STR	white	Continuous	Bridge abutments, piers, trestles, supports

C-RW-TUN	white	Continuous	Tunnels
SANITARY SEWERS			
C-SA-ABN	white	Continuous	Abandoned sanitary sewer line
C-SA-CMB-MLI	white	Continuous	Combined main sewer line
C-SA-CMB-SLI	white	Continuous	Combined service sewer line
C-SA-DRA	white	Continuous	Drainage catch areas
C-SA-IOT	white	Continuous	Sanitary inlet outlet structure
C-SA-JUN	white	Continuous	Junction symbols
C-SA-JUN-IDN	8	Continuous	Text description type of junction
C-SA-MAN	white	Continuous	Sewer manholes, pumping stations
C-SA-MAN-IDN	8	Continuous	Text regarding t/g elevation, inverts elevation
C-SA-MLI	white	Continuous	Sanitary main sewer line
C-SA-SEW	white	Continuous	Sanitary sewer
C-SA-SLI	white	Continuous	Sanitary service sewer line
C-SA-TMT	white	Continuous	Sewage treatment areas
C-SA-TXT	white	Continuous	General text; length of sewer, slope, material
SITE FEATURES			
C-SF-ARM	8	Continuous	Erosion control, armourstone, riprap
C-SF-BRG	8	Continuous	Foot bridges
C-SF-CON	8	Continuous	Concrete features, slabs
C-SF-DBR	8	Continuous	Debris, rubble, loose rock and soil
C-SF-FEN	8	Continuous	Fencing
C-SF-GRA	8	Continuous	Grading, ditches, berms, dykes
C-SF-MAR	131	Continuous	Marshes, wetlands
C-SF-PIT	8	Continuous	Borrow Pit
C-SF-RWL	8	Continuous	Retaining walls
C-SF-STR	white	Continuous	Stairs not attached to buildings
C-SF-SWK	8	Continuous	Sidewalks
C-SF-TOS	8	Continuous	Top of Slope
C-SF-TRE	green	Continuous	Trees, tree lines
C-SF-TRL	8	HIDDEN	Trails, footpaths
C-SF-TUN	8	Continuous	Utility /Pedestrian service tunnels
C-SF-TXT	8	Continuous	Site feature description text
C-SF-WTR	131	Continuous	Watercourses, shorelines
SIGNS AND GUIDE POSTS			
C-SI-GDP	red	Continuous	Guideposts
C-SI-SGL	white	Continuous	Sign layouts and details
C-SI-SGN	8	Continuous	Signs
C-SI-TXT	8	Continuous	Signage text

STORM DRAINAGE AND SYSTEMS			
C-SM-ABN	green	Continuous	Abandoned storm sewer line
C-SM-CUL	green	HIDDEN	Culverts
C-SM-DCL	green	CENTER	Ditch centre line
C-SM-DRA	green	Continuous	Drainage catchment area, storm water ponds
C-SM-IOT	green	Continuous	Storm inlet outlet structure
C-SM-JUN	green	Continuous	Junction symbols
C-SM-JUN-IDN	8	Continuous	Junction description text
C-SM-MAN	green	Continuous	Catch basins, manholes, pumping stations
C-SM-MAN-IDN	white	Continuous	Manhole description text; elevation, direction
C-SM-MLI	green	Continuous	Storm main sewer line
C-SM-MNG	white	Continuous	Storm water management pond
C-SM-SEW	green	Continuous	Storm sewer
C-SM-SLI	green	Continuous	Storm service sewer line
C-SM-SUB	green	Continuous	Sub drains
C-SM-TXT	green	Continuous	Text describing length of sewer, slopes, material
SURVEY CONTROL, NON LEGAL			
C-SV-BEN	white	Continuous	Local bench mark
C-SV-BND	white	Continuous	Non-legal boundaries
C-SV-CHN	white	Continuous	Chainage
C-SV-CTL	white	Continuous	Control point
C-SV-GRD	white	Continuous	Survey grid
C-SV-HOR	white	Continuous	Horizontal alignment
C-SV-HPT	white	Continuous	Horizontal control point
C-SV-LIM	white	Continuous	Limits of contract, non-legal
C-SV-LIN	white	Continuous	Survey feature connectivity line work
C-SV-MON	white	Continuous	Found legal monument
C-SV-PAR	white	Continuous	Parcel line work
C-SV-PAR-TXT	white	Continuous	Parcel text
C-SV-PNT	white	Continuous	Survey point
C-SV-SEL	white	Continuous	Super elevation
C-SV-SET	white	Continuous	Setback
C-SV-STA-EQU	white	Continuous	Station equation labels
C-SV-STA-LBL	white	Continuous	Station labels
C-SV-STA-PTS	white	Continuous	Station points
C-SV-TRA	white	Continuous	Traverse line work
C-SV-VER	white	Continuous	Vertical alignment
C-SV-VPT	white	Continuous	Vertical control point

TOPOGRAPHICAL INFORMATION			
C-TP-BNK	8	Continuous	Embankments, cliffs
C-TP-MAJ	251	Continuous	Major contours
C-TP-MIN	254	Continuous	Minor contours
C-TP-SPT	8	Continuous	Spot elevation
C-TP-SRF	37	Continuous	Surface model line work
C-TP-SRF-BRK	8	Continuous	Surface model break lines
C-TP-SRF-TXT	white	Continuous	Surface calculation text
WATER AND FIRE			
C-WM-FHY	cyan	Continuous	Fire hydrants
C-WM-FRL	cyan	Continuous	Fire lines
C-WM-IRP	cyan	Continuous	Irrigation system piping
C-WM-IRR	cyan	Continuous	Irrigation heads, controls, valves
C-WM-JUN	cyan	Continuous	Junction symbols
C-WM-JUN-IDN	8	Continuous	Text describing type of junction
C-WM-MAN	cyan	Continuous	Manholes, pumping stations, storage, valves
C-WM-MAN-IDN	8	Continuous	Text describing t/g elevation, t/pipe elevation
C-WM-MLI	cyan	Continuous	Water main
C-WM-RAW	cyan	Continuous	Raw water lines
C-WM-SLI	cyan	Continuous	Water service line
C-WM-TXT	cyan	Continuous	Water main descriptive text
C-WM-WTR	cyan	Continuous	Water wells

3.4 Architectural Discipline

The following table is for use on architectural drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Color	Linetype	Description
0 NON PLOT	white	Continuous	Non Plot Information
0 VIEWPORT	white	Continuous	Viewports
CIRCULATION			
A-CI-CVY	yellow	Continuous	Horizontal conveyors, moving sidewalks
A-CI-ELE	yellow	Continuous	Elevators
A-CI-ELE-BRF	yellow	Continuous	Lift platforms for barrier-free access
A-CI-RMP	yellow	Continuous	Ramps
A-CI-RMP-BRF	yellow	Continuous	Barrier-free ramps
A-CI-STR	yellow	Continuous	Stairs, stair wells and ladders
A-CI-STR-ESC	yellow	Continuous	Escalators
CEILINGS			
A-CL-BKH	red	Continuous	Bulkheads
A-CL-FIN	green	Continuous	Finishes
A-CL-GRD	11	Continuous	Physical ceiling grid
A-CL-GRD-SCD	11	Continuous	Planning grid lines
A-CL-OPN	blue	Continuous	Openings, penetrations, skylights
DOORS			
A-DR-EXT	red	Continuous	Exterior doors, jambs, casework, swing
A-DR-EXT-IDN	green	Continuous	Exterior doors identification number
A-DR-INT	red	Continuous	Interior doors, jambs, casework, swing
A-DR-INT-IDN	green	Continuous	Interior doors identification number
A-DR-INT-PAR	11	Continuous	Interior doors in a demountable wall
A-DT-DIM	yellow	Continuous	Detail Dimensions - Dimensions
A-DT-HAT	yellow	Continuous	Detail Hatching
A-DT-TXT	yellow	Continuous	Text - Annotations,

EMERGENCY			
A-EM-COR-HAT	11	Continuous	Corridor hatching
A-EM-COR-OLN	yellow	Continuous	Corridor outline
A-EM-OLN	red	Continuous	General outline
A-EM-OLN-HAT	11	Continuous	General hatching
A-EM-STR-HAT	11	Continuous	Staircase hatching
A-EM-STR-OLN	red	Continuous	Staircase outline
A-EM-TXT	red	Continuous	Text
A-EM-WAL-HAT	11	Continuous	Wall hatching
A-EM-WAL-OLN	red	Continuous	Wall outline
ELEVATIONS			
A-EV-DIM	yellow	Continuous	Elevation dimensions
A-EV-HAT	8	Continuous	Elevation hatch
A-EV-LIN			Elevation line work
A-EV-OLN			Elevation outline
A-EV-TXT	yellow	Continuous	Elevations text, annotations
EQUIPMENT			
A-EQ-EXT	yellow	Continuous	Equipment exterior
A-EQ-DIM	yellow	Continuous	Equipment dimension
A-EQ-HAT		Continuous	Equipment hatching
A-EQ-INT	red	Continuous	Equipment Interior
A-EQ-TXT	green	Continuous	Equipment text
FLOORS			
A-FL-CTP	red	Continuous	Counter tops
A-FL-CTP-PAR	red	Continuous	Counter tops on partitions
A-FL-DIM	green	Continuous	Floor dimensions
A-FL-FIN	red	Continuous	Floor finishes
A-FL-FIN-IDN	red	Continuous	Floor finishes description
A-FL-FUR	yellow	Continuous	Furniture
A-FL-LEV	red	Continuous	Floor level changes, ramps, truck well
A-FL-MIL	yellow	Continuous	Architectural specialties, casework and millwork
A-FL-OPN	8	Continuous	Openings, floor hatches
A-FL-OVH	8	HIDDEN	Overhead items, skylights, overhangs, soffits
A-FL-RAS	8	Continuous	Raised floors
A-FL-TXT	green		Floor text

GENERAL			
A-GL-ATT	white	Continuous	Attributes
A-GL-CLN	white	Continuous	Under construction lines, temporary aids
A-GL-DIM	white	Continuous	General architectural dimensions
A-GL-IDN	white	Continuous	Identification, elevation point
A-GL-RME	white	Continuous	Read-me general drawing info.
A-GL-TXT	white	Continuous	General text (street names)
GRIDS			
A-GR-EXT	252	DASHDOT	Grid lines exterior
A-GR-INT	252	DASHDOT	Grid lines interior
PLAN INFORMATION			
A-PL-OLN	8	Continuous	Open to below plan information outline
ROOFS			
A-RF-OLN	magenta	Continuous	Roofs edge and features
A-RF-OPN	8	Continuous	Roof openings for fans, stacks and ducts
A-RF-OVH	8	HIDDEN	Overhead items, roof above, canopies, soffits
A-RF-WLK	8	Continuous	Roof board walks, cat walks
ROOMS			
A-RM-IDN1	white	CONTINUOUS	Room names - existing
A-RM-IDN2	white	CONTINUOUS	Room names - existing
A-RM-IDN-N	yellow	CONTINUOUS	Room names - new
A-RM-NUM	white	CONTINUOUS	Room numbers - existing
A-RM-NUM-N	yellow	CONTINUOUS	Room numbers
SCREENS			
A-SY-SCR	yellow	CONTINUOUS	Screens
A-SY-SCR-N	yellow	CONTINUOUS	Screens - new
A-SY-SUR	yellow	CONTINUOUS	Work surfaces
A-SY-SUR-N	yellow	CONTINUOUS	Work surfaces - new
SECTIONS			
A-ST-DIM	yellow	Continuous	Section dimensions
A-ST-HAT	8	Continuous	Section hatch
A-ST-TXT	yellow	Continuous	Section text, annotations

WINDOWS			
A-WD-EXT	green	Continuous	Exterior window panes and frames
A-WD-INT	green	Continuous	Interior window panes and frames
A-WD-INT-PAR	green	Continuous	Window headers in a demountable wall
A-WD-OVH	8	HIDDEN	Overhead window/skylight
A-WD-SIL	8	Continuous	Window sill
WALLS			
A-WL-ACC	red	Continuous	Architectural or protection elements, guards
A-WL-ACC-BRF	yellow	Continuous	Barrier - free accessories (grab bars, etc.)
A-WL-COL	red	Continuous	Columns
A-WL-EXT	cyan	Continuous	Exterior walls
A-WL-EXT-HAT	8	Continuous	Exterior walls hatch
A-WL-FIN	8	Continuous	Wall finishes
A-WL-HED	8	Continuous	Door and window headers
A-WL-HED-PAR	8	Continuous	Door and window headers on partition
A-WL-INT	green	Continuous	Interior walls
A-WL-INT-LOW	green	Continuous	Interior walls - low walls
A-WL-INT-LOW-PAR	green	Continuous	Interior partition - low walls
A-WL-INT-PAR	green	Continuous	Interior demountable walls
A-WL-OLN	8	Continuous	Wall outlines, building footprints
A-WL-WRM	8	Continuous	Washroom partitions
A-WL-INT-X	yellow	HIDDEN2	Interior walls - Demolition
A-WL-EXT-X	yellow	HIDDEN2	Exterior walls - Demolition

3.5 Structural Discipline

The following table is for use on structural drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Color	Linetype	Description
CEILINGS			
S-CL-BEM	8	Continuous	Ceiling beams
FLOORS			
S-FL-BEM	8	Continuous	Floor beams
S-FL-BRC	white	Continuous	Bracing
S-FL-DEK	white	Continuous	Decking, waffle
S-FL-FRM	white	Continuous	Framing
S-FL-JNT	8	Continuous	Joints, expansion, construction
S-FL-JST	white	Continuous	Joists
S-FL-OLN	white	Continuous	Floor outline
S-FL-OPN	8	Continuous	Floor openings
S-FL-SLB	8	Continuous	Floor slab
S-FL-STR	white	Continuous	Stairs
FOUNDATION			
S-FN-FIL	white	Continuous	Backfill, soil-line
S-FN-FTG	white	Continuous	Footings
S-FN-OLN	white	Continuous	Foundation outline
S-FN-PIL	white	Continuous	Piles, caissons, piers
STRUCTURAL GRIDS			
S-GR-EXT	8	CENTER	Structural grid lines outside building
S-GR-INT	8	CENTER	Structural grid lines inside building
ROOFS			
S-RF-BEM	8	HIDDEN	Beams
S-RF-BRC	white	Continuous	Bracing
S-RF-DEK	white	Continuous	Decking, waffle
S-RF-FRM	white	Continuous	Framing
S-RF-JNT	white	Continuous	Joints, expansion, construction
S-RF-JST	white	Continuous	Joists
S-RF-OLN	white	Continuous	Roof outline
S-RF-OPN	white	Continuous	Roof openings
S-RF-SLB	8	Continuous	Roof slab

WALLS AND COLUMNS			
S-WL-BRC	8	Continuous	Cross bracing
S-WL-BRG	yellow	Continuous	Bearing walls
S-WL-COL	yellow	Continuous	Columns
S-WL-JNT	8	Continuous	Joints, expansion, construction
S-WL-OPN	white	Continuous	Wall openings
S-WL-RWL	yellow	Continuous	Retaining walls

3.6 Mechanical Discipline

The following table is for use on mechanical drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Colour	Linetype	Description
H-CS-AIR	136	Continuous	Control air piping
H-CS-DAM	136	Continuous	Damper actuators, controllers
H-CS-EQP	136	Continuous	Energy management systems and other control equipment
H-CS-THR	136	Continuous	Thermostats, humidistat, sensors
H-CS-VAV	136	Continuous	Valve actuators, controllers
H-DD-COA	46	Continuous	Combustion air ductwork
H-DD-EXH	46	Continuous	Exhaust air ductwork
H-DD-FLU	16	Continuous	Flue, vent, breaching
H-DD-INS	251	Continuous	Duct insulation, acoustical lining
H-DD-OUT	116	Continuous	Outside air ductwork
H-DD-REL	16	Continuous	Relief air ductwork
H-DD-RET	146	Continuous	Return ductwork
H-DD-SUP	216	Continuous	Supply ductwork
H-DE-BYP	216	Continuous	By-pass box
H-DE-EXH	46	Continuous	Exhaust grilles
H-DE-FAN	136	Continuous	Fans, dampers, coils, filters and other equipment
H-DE-OUT	116	Continuous	Outside air grilles
H-DE-RET	146	Continuous	Return grilles
H-DE-SUP	216	Continuous	Supply diffusers, grills, vents
H-DE-VAV	136	Continuous	Variable air volume boxes
H-DT-DIM	yellow	Continuous	Detail Dimensions - Dimensions
H-DT-HAT	251	Continuous	Detail Hatching - Hatching - Insulation, Wood Grain, etc.
H-DT-TXT	yellow	Continuous	Text - Annotations, Title, Graphic Scale, etc.
H-EQ-ACE	136	Continuous	Air conditioning equipment
H-EQ-CMA	96	Continuous	Compressed air equipment
H-EQ-CNV	176	Continuous	Convectors
H-EQ-FEQ	176	Continuous	Fuel equipment
H-EQ-HYD	46	Continuous	Hydronic equipment

H-EQ-REF	106	Continuous	Refrigerant equipment
H-EQ-STM	66	Continuous	Steam equipment
H-EQ-WPM	86	Continuous	Domestic water tanks, pumps, water softeners
H-FD-CEX	16	Continuous	Chemical extinguishing piping
H-FD-FEX	16	Continuous	Foamed extinguishing piping
H-FD-SPP	16	Continuous	Sprinkler piping
H-FD-STP	16	Continuous	Standpipe piping
H-FE-CAB	16	Continuous	Fire hose cabinet
H-FE-CEX	16	Continuous	Chemical extinguishing equipment
H-FE-EPE	16	Continuous	Explosion-proof equipment
H-FE-EXG	16	Continuous	Fire extinguisher
H-FE-FDP	16	Continuous	Fire dampers
H-FE-FEX	16	Continuous	Foamed extinguishing equipment
H-FE-FHY	16	Continuous	Building fire hydrants
H-FE-FIT	16	Continuous	Sprinklers
H-FE-SMC	16	Continuous	Smoke control equipment
H-FE-SPE	16	Continuous	Sprinkler equipment
H-FE-SPH	254	Continuous	Sprinkler heads
H-FE-SSZ	176	Continuous	Sprinkler system zones
H-FE-STE	16	Continuous	Standpipe equipment
H-FP-MAN	16	Continuous	Manholes, valves, meters and fueling stations
H-FP-SER	16	Continuous	Fuel and process piping
H-FP-TNK	16	Continuous	Fuel tanks
H-PD-CHR	136	DASHED	Chilled water return
H-PD-CHS	136	Continuous	Chilled water supply
H-PD-CMA	96	Continuous	Compressed air
H-PD-CTR	156	DASHED	Cooling tower return
H-PD-CTS	156	Continuous	Cooling tower supply
H-PD-CWR	156	DASHED	Condenser Water Return
H-PD-CWS	156	Continuous	Condenser Water Supply
H-PD-DCW	86	DASHDOT	Domestic cold water
H-PD-DHR	246	DIVIDE	Domestic hot water recirculation
H-PD-DHW	246	DIVIDE	Domestic hot water
H-PD-DRA	246	Continuous	Drainage waste and vents
H-PD-FIT	yellow	Continuous	Fittings
H-PD-FOR	226	DASHED	Fuel oil return
H-PD-FOS	226	Continuous	Fuel oil supply
H-PD-GLR	106	DASHED	Glycol return
H-PD-GLS	106	Continuous	Glycol supply
H-PD-HWR	196	DASHED	Heating water return
H-PD-HWS	196	Continuous	Heating water supply

H-PD-MAN	251	Continuous	Access holes
H-PD-NGA	56	Continuous	Natural gas
H-PD-PGA	56	Continuous	Propane gas
H-PD-RAD	196	Continuous	Radiant heat tubing
H-PD-RCK	196	Continuous	Pipe Rack
H-PD-RFG	106	Continuous	Refrigerant gas
H-PD-RFL	146	Continuous	Refrigerant liquid
H-PD-RHR	196	DASHED	Reheat Return
H-PD-RHS	196	Continuous	Reheat Supply
H-PD-SAN	36	Continuous	Sanitary
H-PD-STC	66	DASHED	Steam condensate
H-PD-STM	66	Continuous	Steam
H-PD-VNT	16	Continuous	Vent Pipe
H-PF-BIB	8	Continuous	Hose bib connectors
H-PF-FDR	8	Continuous	Floor drains
H-PF-FIX	8	Continuous	Fixtures
H-PF-RDR	8	Continuous	Roof drains
H-SM-CSY	144	Continuous	Control system schematics
H-SM-DRS	94	Continuous	Duct riser diagrams
H-SM-DUC	104	Continuous	Duct schematic diagrams
H-SM-PIP	164	Continuous	Piping schematic diagrams
H-SM-PRS	164	Continuous	Piping riser diagrams
H-SM-WST	34	Continuous	Waste schematics

3.6.1 Supplemental Mechanical Specific Drawing Notes

Show valves, fittings, meters, regulators and all other piping distribution related items on the layer of the system to which these items are associated.

Show pumps, expansion tanks, storage tanks and other major pieces of equipment on the appropriate piping equipment layer.

Piping distribution layers starting with an “H” (mechanical) are normally meant to show piping distribution inside of buildings. However, it is asked that all services other than those specifically named in the civil layers (i.e. sewers (sanitary, storm or combined), natural gas, and water mains (fire protection and potable water)) be shown as mechanical piping distribution on layers starting with “H”. The mechanical / civil transition point should be as follows:

- Sewers: 3'-0" (1m) outside of building foundation or wall;
- Natural gas: at the outlet of the utility meter; and
- Watermains: at the building isolation or post indicator valve.

Show balancing dampers, fire dampers, extractors, turning vanes and other similar duct mounted equipment on the layer of the ductwork system to which these items are related. On the same basis, duct insulation and acoustical lining shall be shown on the layer of the related ductwork system; however, duct insulation and acoustical lining shall be drawn with a fixed colour of 8 and hidden line type to ensure good plot visibility.

Labels for equipment shall be inserted on the same layer as the equipment.

Show related technical information on the same layer as the item it relates to (i.e. Rating of a portable fire extinguisher (10BC), setting of a thermostat or pressure switch etc.).

When equipment is connected to two (2) or more different services, this item shall be drawn on each respective piping equipment layer. Both entities shall be superimposed so that the plotted result will only show one item (i.e. a steam to hot water heat exchanger shall be drawn both on H-EQ-STM and on H-EQ-HYD).

3.7 Electrical Discipline

The following table is for use on electrical drawing(s). The colours and linetypes have been set-up to facilitate easy viewing and plotting of the information.

Note: add extensions below as required

- N New Work
- X Demolition

Layer Name	Colour	Linetype	Description
E-DA-EQP	green	Continuous	Data/voice Equipment
E-DA-TXT	yellow	Continuous	Data/voice Text
E-DA-WRG	green	Continuous	Data/voice Wiring
E-FA-EQP	green	Continuous	Fire Alarm Equipment
E-FA-TXT	yellow	Continuous	Fire Alarm Text
E-FA-WRG	green	Continuous	Fire Alarm Wiring
E-L-EQP	green	Continuous	Lighting Equipment
E-L-TXT	yellow	Continuous	Lighting Text
E-L-WRG	green	Continuous	Lighting Wiring
E-P-EQP	green	Continuous	Power Equipment
E-P-TXT	yellow	Continuous	Power Text
E-P-WRG	green	Continuous	Power Wiring
E-P-PAN	green	Continuous	Distribution equipment such as panels, transformers etc.
E-P-PAN-TXT	yellow	Continuous	Distribution text
E-TB-DET	green	Continuous	Details, single lines, etc. that are located in paper space on a drawing
E-TB-TXT	green	Continuous	Paper space detail text
NOTES_NO_PRINT	red	Continuous	For adding notes to record drawings such as project/drawing names etc.

4 Pen & Colour Assignments

The following colour and pen width assignments for Engineering & Construction are predefined and contained within Plotting Control Parameter (PCP) files stored as CTB files on the network in the following directory:

I:\ASPM\Common\PM\FEU\Engineering Files\ASPM_AUTOCAD\Plot Styles

CTB files will be provided to Consultants to ensure all drawings are prepared in accordance with the Engineering & Construction CADD Standards. For reference, PCP details provided below and ASPMFULL corresponds to CTB 1050C Greyscale and ASPMHALF to CTB 8000 Greyscale.

Pen No. 1			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.006" (0.15mm)	100%	8, 17, 27, 37, 47, 57, 67, 77, 87, 97, 107, 117, 127, 137, 147, 157, 167, 177, 187, 197, 207, 217, 227, 237, 247
ASPMHALF.PCP	0.003" (0.08mm)	100%	

Pen No. 2			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	100%	2, 3, 16, 26, 36, 46, 56, 66, 76, 86, 96, 106, 116, 126, 136, 146, 156, 166, 176, 186, 196, 206, 216, 226, 236, 246
ASPMHALF.PCP	0.006" (0.15mm)	100%	

Pen No. 3			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.018" (0.45mm)	100%	4, 7, 11, 21, 31, 41, 51, 61, 71, 81, 91, 101, 111, 121, 131, 141, 151, 161, 171, 181, 191, 201, 211, 221, 231, 241
ASPMHALF.PCP	0.009" (0.23mm)	100%	

Pen No. 4			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.024" (0.60mm)	100%	1, 6, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100,
ASPMHALF.PCP	0.012" (0.30mm)	100%	110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240

Pen No. 5			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.030" (0.75mm)	100%	5
ASPMHALF.PCP	0.015" (0.38mm)	100%	

Pen No. 100			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	0% (Invisible)	250
ASPMHALF.PCP	0.006" (0.15mm)	0% (Invisible)	

Pen No. 120			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	20% (Very light grey)	251
ASPMHALF.PCP	0.006" (0.15mm)	20% (Very light grey)	

Pen No. 140			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	40% (Light grey)	252
ASPMHALF.PCP	0.006" (0.15mm)	40% (Light grey)	

Pen No. 160			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	60% (Medium grey)	253
ASPMHALF.PCP	0.006" (0.15mm)	60% (Medium grey)	

Pen No. 180			
PCP File	Width	Density	AutoCAD Colour
ASPMFULL.PCP	0.012" (0.30mm)	80% (Very dark grey)	9, 254
ASPMHALF.PCP	0.006" (0.15mm)	80% (Very dark grey)	



1. EVALUATED CRITERIA

Potential bidders will be rated based on a combination of technical and financial proposals. For this project the total score will be established as follows:

Technical rating 60%	=	Technical Score (Points)
Price rating 40%	=	Price Score (Points)
Total Score	=	Max. 100 points

1.1 Specific requirement for the proposal

The maximum number of pages (including text and graphics) to be submitted as part of the rated criteria is 25 pages.

If applicable, the following are not part of the page limitation mentioned above:

- Covering letter;
- Cover Page;
- Tab/Dividers, provided they are free of text and/or graphics;
- Front page of the RFP;
- Front page of revision(s) to the RFP; and
- Price Proposal Form.

Consequence of non-compliance: any pages which extend beyond the above page limitation and any other attachments will be extracted from the proposal and will not be forwarded to the NRC Evaluation Board for evaluation.

1.2 Mandatory requirements

Failure to meet the mandatory requirements will render the proposal as non-responsive and no further evaluation will be carried out.

- Bidders shall demonstrate 10+ years' experience in applied engineering capability. Applied engineering shall be demonstrated by listing at least five (5) projects where the Bidder have worked as the prime consultant and lead the development of the solution/application. Bidders are to provide a table with the following information: Project name, Challenge description, Solution developed, disciplines involved (mechanical, electrical, controls, etc.) date completed, client contact name and email/phone number. Examples shall be provided of similar complexity level projects to the one proposed in this tender.
- Bidders shall demonstrate project management capabilities. This shall be demonstrated by providing examples of two projects, one page per project, completed in the last 10 years. Bidders shall provide a description of the project/engineering challenge and how it applied project

management techniques to ensure the project was completed as expected. Bidders shall provide the project name and description of the solution developed, the date completed, and describe their roles in developing and maintaining the following Project Management disciplines: Schedule, Budget, Scope definition, Risk analysis and Quality Control.

- Bidders shall demonstrate complex engineering design capabilities. This shall be demonstrated by providing examples of two complex projects, one page per project, completed in the last 10 years. Complex projects are engineering projects that required in depth review of the solutions and evaluation of multiple potential solutions. Bidders shall provide a detail description of the engineering challenge, the solution development methodology and the final solution implementation, commissioning and testing.

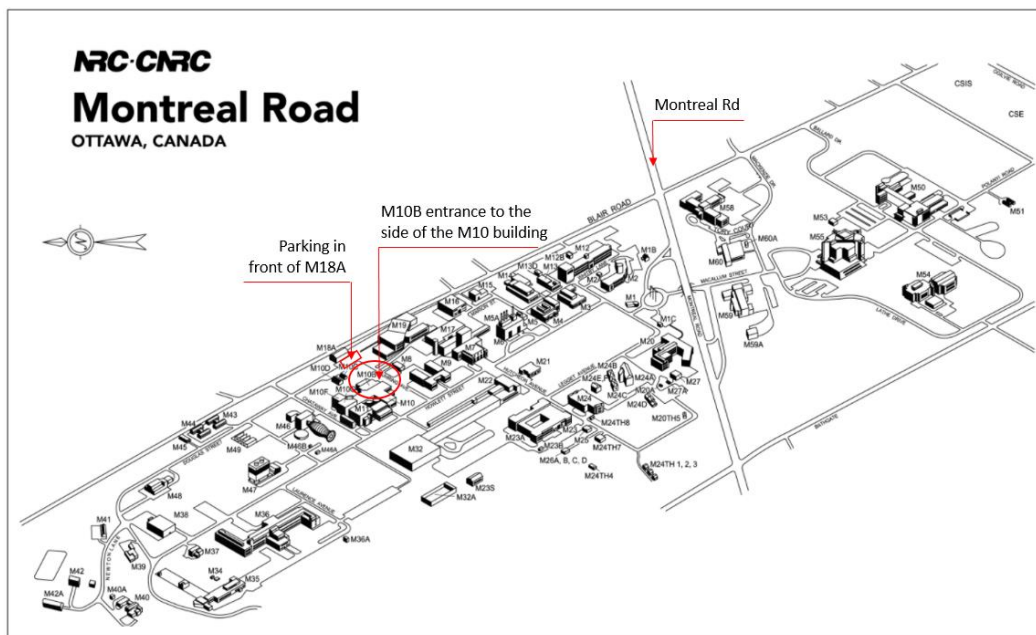
When submitting the technical proposal start by demonstrating the mandatory criteria before presenting the rated requirement information.

2. SITE VISIT

Potential bidders will have the opportunity to visit the Aerospace Research Center's Research Altitude Test Facility (RATFac) to have a better understand of the scope of work. Visit is mandatory and will take place at:

National Research Council building M-10
1200 Montreal Road Campus
Ottawa, ON

Visitation will be conducted on **May 11th at 10AM**



3. RATED REQUIREMENTS

Technical proposals shall start with the Mandatory and rated requirement reference sheet. After the reference sheet, Bidders may choose to include 2 to 5 pages with introductory information about their companies and their project and engineering team before the pages related to the requirements responses.

3.1 Engineering and integration services of existing facilities (20 Points)

Bidders shall present previous experience with engineering and integration services completed on existing facilities. Information that should be supplied:

Two (2) examples of projects completed in the last 10 years, one per page, where the solutions developed was applied to an existing facility (i.e. facility expansion, or facility upgrade). Bidders shall demonstrate their role in supporting the client to identify the necessary upgrades including the evaluation methodology used, how the solutions were presented to the client, how the decision process was made and how the implementation plan was developed, presented and integrated to the existing facility.

A minimum score of 60% shall be achieved in this criteria, if not, the NRC will not consider the submission any further.

3.2 Turnkey project delivery (20 Points)

Bidders must describe their experience leading turnkey delivery projects. Information that should be supplied:

Bidder shall present three (3) projects, completed in the last 10 years, where they worked as the prime consultant from the initial design to the final commissioning, managing the delivery contractors or directly supporting the client to manage them. Each project shall be presented in one page with the following information: Project name, date completed and description of the project solution(s), as well as the Bidder responsibility related to the engineering design, tender process support and, implementation and commissioning phase management as well as their role in the management of the contractors work.

A minimum score of 60% shall be achieved in this criteria, if not, the NRC will not consider the submission any further.

3.3 Knowledge of aerodynamics system (30 Points + 2 for high altitude tunnels)

Bidders shall provide one project, completed in the last 10 years, where they worked with aerodynamics systems. Bidder shall provide a one page description with the project name, project description, and the Bidder responsibility in developing the application(s). Each description should be presented in one or more paragraphs that clearly identifies the bidder roles and achievements in the project. Experience with high altitude aerodynamic applications will receive an extra 2 marks.

This criteria has no minimum score restrictions

3.4 Experience with wind tunnel Design or engineering solutions development (30 Points)

Bidders shall provide at least one example where they were responsible to develop a wind tunnel design or where it was responsible to develop solutions to an existing wind tunnel. Examples shall be provided in one page and shall have the description of the wind tunnel technology or solution developed, the Bidder role in its development along with the disciplines applied (mechanical, electrical, etc). Each description should present details, in one or more paragraphs that clearly define and identifies the bidder roles and achievements in the project.

This criteria has no minimum score restrictions

4. EVALUATION AND RATING

Financial proposal envelopes will remain sealed and only the technical components of the proposals considered responsive will be reviewed, evaluated and rated by a NRC Evaluation Board in accordance with the following criteria.

Technical Ratings:

IT	Criterion	Rating
3.1	Engineering and integration services of existing facilities	0 - 20
3.2	Turn Key project delivery	0 - 20
3.3	Knowledge of aerodynamics system	0 – 30 (+2)
3.4	Experience with wind tunnel Design or engineering solutions development	0 - 30
	Total Technical Rating	0 -100 (+2)

The successful Bidder shall be the one who accumulates the highest combined score of the technical assessment (60%) and financial proposal (40%), as indicated in the **sample** tables below:

TABLE A	Bidder #1	Bidder #2	Bidder #3
Technical score	85 points out of 100	80 out of 100	75 out of 100
Financial proposal	\$320,000	\$310,000	\$300,000

For information only:

	Technical score	Tendered amount score	Final score
Bidder #1	$\frac{85}{100} \times 60(\%) = 51$	$\frac{300}{320 \text{ k}} \times 40(\%) = 37.5$	= 88.5 (successful bid)
Bidder #2	$\frac{80}{100} \times 60(\%) = 48$	$\frac{300}{310 \text{ k}} \times 40(\%) = 38.7$	= 86.7
Bidder #3	$\frac{75}{100} \times 60(\%) = 45$	$\frac{300}{300 \text{ k}} \times 40(\%) = 40.0$	= 85.0

5. Mandatory and rated requirement reference sheet

Bidders must complete the reference table below to demonstrate where, in which page, in their proposal is the information related to each requirement located.

This page is to be printed, completed and added as the first page of the technical submission proposal.

MANDATORY REQUIREMENTS	PAGE	NRC USE
Bidders shall demonstrate 10+ years' experience in applied engineering capability. Applied engineering shall be demonstrated by listing at least five (5) projects where the Bidder have worked as the prime consultant and lead the development of the solution/application. Bidders are to provide a table with the following information: Project name, Challenge description, Solution developed, disciplines involved (mechanical, electrical, controls, etc.) date completed, client contact name and email/phone number. Examples shall be provided of similar complexity level projects to the one proposed in this tender.		
Bidders shall demonstrate project management capabilities. This shall be demonstrated by providing examples of two projects, one page per project, completed in the last 10 years. Bidders shall provide a description of the project/engineering challenge and how it applied project management to ensure the project was completed as expected. Bidders shall provide the project name and description of the solution developed, the date completed, and describe their roles in at least the following Project Management disciplines: Schedule, Budget, Scope definition, Risk analysis and Quality Control.		
Bidders shall demonstrate complex engineering design capabilities. This shall be demonstrated by providing examples of two complex projects, one page per project, completed in the last 10 years. Complex project are engineering project that required in depth review of the solutions and evaluation of multiple potential solutions. Bidders shall provide a detail description of the engineering challenge, the solution development methodology and the final solution implementation, commissioning and testing.		

RATED REQUIREMENTS	PAGE	NRC USE
Engineering and integration services of existing facilities		
Turn Key project delivery		
Knowledge of aerodynamics system (+2 for high altitude tunnels)		
Experience with wind tunnel Design or engineering solutions development		

Project Reference number:	6066_0274
Bidder/proponent:	
Reference Number (if applicable):	
Date:	
Signature	



0220 General Conditions

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GC 3	Successors and Assigns
GC 4	Assignment
GC 5	Administration
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GC 26	Lobbyist Certification - Contingency Fees
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GC 29	Ad Valorem Sales Tax
GC 30	Tax Withholding of 15 Percent
GC 31	Composition of Consultant Team



GC 1 Definitions

Average Bank Rate means the simple arithmetic mean of the *Bank Rate* in effect at 4:00 p.m. Eastern Standard Time each day during the calendar month which immediately precedes the calendar month in which payment is made.

Bank Rate means the rate of interest established from time to time by the Bank of Canada as the minimum rate at which it makes short term advances to members of the Canadian Payments Association.

NRC, Canada, Crown, Her Majesty or the Government means Her Majesty the Queen in right of *Canada*;

Construction Contract means a contract entered into between *NRC* and a *Contractor* for the construction of the Project;

Construction Contract Award Price means the price at which a *Construction Contract* is awarded to a *Contractor*;

Construction Cost Estimate means an anticipated amount for which a *Contractor* will execute the construction of the Project;

Construction Cost Limit means that portion of the total amount of Project funds which shall not be exceeded on construction of the Project;

Consultant means the party which submitted a responsive proposal which was accepted by *NRC* to perform the *Consultant Services* under the Agreement, and includes the officer or employee of the *Consultant* identified in writing by the *Consultant*;

Contracting Authority means the party identified on the front cover page to whom inquiries are to be addressed;

Contractor means a person, firm or corporation with whom *NRC* enters, or intends to enter, into a *Construction Contract*;

Cost Plan means the allocation of proposed costs among the various elements of the Project, as described in the *Project Brief or Terms of Reference*;

Days means continuous calendar days, including weekends and statutory public holidays;

NRC Representative means the officer or employee of *NRC* identified in writing by a duly authorised *NRC* officer to perform the *NRC Representative's* duties under the Agreement;

Mediation is a process of dispute resolution in which a neutral third party assists the parties involved in a dispute to negotiate their own settlement;



Payroll Cost means the actual cost of any person employed by the *Consultant* or the *Consultant's Sub-Consultants* as a staff member, including principals employed as staff members, and includes an amount for salary, statutory holidays, vacations with pay, unemployment insurance premiums and worker's compensation contributions where applicable, pension plan contributions, sick time allowance, medical/dental insurance premiums, and such other employee benefits as may be approved by the *NRC Representative*;

Project Brief or Terms of Reference means a document describing in sufficient detail the *Services* to be provided by the *Consultant* to permit the *Consultant* to proceed with the *Services* and may include general project information, scope of the work, site and design data, and time plan, specifically related to the Project;

Project Schedule means a time plan, including the sequence of tasks, milestone dates and critical dates which must be met for the implementation of the planning, design and construction phases of the Project;

Service(s) means the *Consultant Services* and *Project Services* as set forth in the Agreement;

Specialist Consultant means any Architect, Professional Engineer, or other specialist, other than the *Consultant*, engaged by *NRC* directly or, at the specific request of *NRC*, engaged by the *Consultant* for "Additional Services";

Sub-Consultant means any Architect, Professional Engineer, or other specialist engaged by the *Consultant* for the *Services* included in the Agreement;

Technical Documentation includes designs, reports, photographs, physical models, surveys, drawings, specifications, computer software developed for the purpose of the Project, computer printouts, design notes, calculations, CADD (Computer-aided Design and Drafting) files, and other data, information and material, prepared, computed, drawn, or produced and operating and maintenance manuals either prepared or collected for the Project.

GC 2 Interpretations

1. Words importing the singular only also include the plural, and vice versa, where the context requires;
2. Headings or notes in the Agreement shall not be deemed to be part thereof, or be taken into consideration in its interpretation;
3. "Herein", "hereby", "hereof", "hereunder" and similar expressions refer to the Agreement as a whole and not to any particular subdivision or part thereof.

GC 3 Successors and Assigns

1. The Agreement shall inure to the benefit of, and be binding upon, the parties hereto and their lawful heirs, executors, administrators, successors and assigns.



GC 4 Assignment

1. The Agreement shall not be assigned, in whole or in part, by the *Consultant* without the prior consent of *NRC*. After a request for assignment has been received from the *Consultant*, a decision shall be given by *NRC* to the *Consultant* in a timely manner.
2. An assignment of the Agreement without such consent shall not relieve the *Consultant* from any obligation under the Agreement, or impose any liability upon *NRC*.

GC 5 Administration

1. *NRC* shall not transfer the administration of the Agreement to another federal department or agency without giving prior notice to the *Consultant*.

GC 6 Indemnification

1. The *Consultant* shall indemnify and save harmless *NRC*, its employees and agents, from losses arising out of the errors, omissions or negligent acts of the *Consultant*, its employees and agents, in the performance of the *Services* under the Agreement.
2. The *Consultant's* liability to indemnify or reimburse *NRC* under the Agreement shall not affect or prejudice *NRC* from exercising any other rights under law.

GC 7 Notices

1. Any notice, request, direction, consent, decision, or other communication that is required to be given or made by either party pursuant to the Agreement, shall be in writing, and shall be deemed to have been effectively given when:
 - (a) served personally, on the day it is delivered;
 - (b) forwarded by registered mail, on the day the postal receipt is acknowledged by the other party; or
 - (c) forwarded by facsimile or other electronic means of transmission, one working day after it was transmitted.
2. The address of either party, or the person authorised to receive notices, may be changed by notice in the manner set out in this provision.

GC 8 Suspension

1. The *NRC Representative* may require the *Consultant* to suspend the *Services* being provided, or any part thereof, for a specified or unspecified period.



2. If a period of suspension does not exceed sixty (60) *days* and when taken together with other periods of suspension does not exceed ninety (90) *days*, the *Consultant* shall, upon the expiration of that period, resume the performance of the *Services* in accordance with the terms of the Agreement, subject to any agreed adjustment of the time schedule.
3. If a period of suspension exceeds sixty (60) *days* or when taken together with other periods of suspension, the total exceeds ninety (90) *days*, and:
 - (a) the *NRC Representative* and the *Consultant* agree that the performance of the *Services* shall be continued, then the *Consultant* shall resume performance of the *Services*, subject to any terms and conditions agreed upon by the *NRC Representative* and the *Consultant*, or
 - (b) the *NRC Representative* and the *Consultant* do not agree that the performance of the *Services* shall be continued, then the Agreement shall be terminated by notice given by *NRC* to the *Consultant*, in accordance with the terms of GC 10.
4. Suspension costs related to this clause are as outlined in GC9.

GC 9 Suspension Costs

1. During a period of suspension of the *Services* pursuant to GC 8 the *Consultant* shall minimize all costs and expenses relating to the *Services* that may occur during the suspension period.
2. Within fourteen (14) days of notice of such suspension, the *Consultant* shall submit to the *NRC Representative* a schedule of costs and expenses, if any, that the *Consultant* expects to incur during the period of suspension, and for which the *Consultant* will request reimbursement.
3. Payment shall be made to the *Consultant* for those costs and expenses that are substantiated as having been reasonably incurred during the suspension period.

GC 10 Termination

1. *NRC* may terminate the Agreement at any time, and the fees paid to the *Consultant* shall be in accordance with the relevant provisions in GC 11.

GC 11 Termination Costs

1. In the event of termination of the Agreement pursuant to GC 10, *NRC* shall pay, and the *Consultant* shall accept in full settlement, an amount based on these Terms of Payment, for *Services* satisfactorily performed, plus an amount to compensate the *Consultant* for reasonable costs and expenses, if any, that are related to the *Services* not performed and incurred after the date of termination.
2. Within fourteen (14) days of notice of such termination, the *Consultant* shall submit to the *NRC Representative* a schedule of costs and expenses incurred plus any additional costs that the *Consultant* expects to incur after the date of termination, and for which the *Consultant* will request reimbursement.
3. Payment shall be made to the *Consultant* for those costs and expenses that are substantiated as having been reasonably incurred after the date of termination.



GC 12 Taking the Services Out of the Consultant's Hands

1. *NRC* may take all or any part of the *Services* out of the *Consultant's* hands and may employ reasonable means necessary to complete such *Services* in the event that:
 - (a) the *Consultant* has become insolvent or has committed an act of bankruptcy, and has neither made a proposal to the *Consultant's* creditors nor filed a notice of intention to make such a proposal, pursuant to the *Bankruptcy and Insolvency Act*, or
 - (b) the *Consultant* fails to perform any of the *Consultant's* obligations under the Agreement or, in the *NRC's* opinion, so fails to make progress as to endanger performance of the Agreement, in accordance with its terms.
2. If the *Consultant* has become insolvent or has committed an act of bankruptcy, and has either made a proposal to the *Consultant's* creditors or filed a notice of intention to make such a proposal, pursuant to the *Bankruptcy and Insolvency Act*, the *Consultant* shall immediately forward a copy of the proposal or the notice of intention to *NRC*.
3. Before the *Services* or any part thereof are taken out of the *Consultant's* hands under GC 12.1(b), the *NRC Representative* shall provide notice to the *Consultant*, and may require such failure of performance or progress to be corrected. If within fourteen (14) *days* after receipt of such notice such default shall not have been corrected or corrective action initiated to correct such fault, *NRC* may, by notice, without limiting any other right or remedy, take all or any part of the *Services* out of the *Consultant's* hands.
4. If the *Services* or any part thereof have been taken out of the *Consultant's* hands, the *Consultant* shall be liable for, and upon demand pay to *NRC*, an amount equal to all loss and damage suffered by *NRC* by reason of the non-completion of the *Services* by the *Consultant*.
5. If the *Consultant* fails to pay on demand for the loss or damage as a result of GC 12.4, *NRC* shall be entitled to deduct and withhold the same from any payments due and payable to the *Consultant*.
6. If the *Services* or any part thereof are taken out of the *Consultant's* hands as a result of GC 12.1(b) and GC 12.3, the amount referred to in GC 12.5 shall remain in the Consolidated Revenue Fund until an Agreement is reached or a decision of a court or tribunal is rendered. At that time the amount, or any part of it, which may become payable to the *Consultant* shall be paid together with interest from the due date referred to in GC 9 and in accordance with the terms of the Agreement.
7. The taking of the *Services*, or any part thereof, out of the *Consultant's* hands does not relieve or discharge the *Consultant* from any obligation under the Agreement, or imposed upon the *Consultant* by law, in respect to the *Services* or any part thereof that the *Consultant* has performed.



GC 13 Payments to the Consultant

1. The *Consultant* shall be entitled to receive progress payments at monthly or other agreed intervals, subject to the limitations of the Calculation of Fees clause herein, if applicable. Such payments shall be made not later than the due date. The due date shall be the 30th day following receipt of a properly submitted invoice.
2. The properly submitted invoice shall be an invoice delivered to the *NRC Representative* in the agreed format with sufficient detail and information to permit verification. The invoice shall also identify, as separate items:
 - (a) the amount of the progress payment being claimed for *Services* satisfactorily performed,
 - (b) the amount for any tax calculated in accordance with the applicable federal legislation, and
 - (c) the total amount which shall be the sum of the amounts referred to in GC 13.2(a) and GC 13.2(b).
3. The amount of the tax shown on the invoice shall be paid by *NRC* to the *Consultant* in addition to the amount of the progress payment for *Services* satisfactorily performed.
4. The *NRC Representative* shall notify the *Consultant* within fifteen (15) *days* after the receipt of an invoice of any error or missing information therein. Payment shall be made not later than thirty (30) *days* after receipt of the corrected invoice or the required information.
5. Upon completion of each *Service* as described elsewhere in the Agreement, provided at least one progress payment has been made, the *Consultant* shall provide a Statutory Declaration evidencing that all the *Consultant's* financial obligations for *Services* rendered to the *Consultant* or on the *Consultant's* account, in connection with the Agreement, have been satisfied, before any further payment is made.
6. Upon written notice by a *Sub-Consultant*, with whom the *Consultant* has a direct contract, of an alleged non payment to the *Sub-Consultant*, the *NRC Representative* may provide the *Sub-Consultant* with a copy of the latest approved progress payment made to the *Consultant* for the *Services*.
7. Upon the satisfactory completion of all *Services*, the amount due, less any payments already made, shall be paid to the *Consultant* not later than thirty (30) *days* after receipt of a properly submitted invoice, together with the Final Statutory Declaration in accordance with GC 13.5.

GC 14 Delayed Payment

1. Subject to GC 14.4 below, if *NRC* delays in making a payment that is due in accordance with GC 13, the *Consultant* will be entitled to receive interest on the amount that is overdue for the period of time as defined in GC 14.2 including the day previous to the date of payment. Such date of payment shall be deemed to be the date on the cheque



given for payment of the overdue amount. An amount is overdue when it is unpaid on the first day following the due date described in GC 13.1.

2. Except as provided for in GC 14.4, interest shall be paid automatically on all amounts that are not paid by the due date or fifteen (15) *days* after the *Consultant* has delivered a Statutory Declaration in accordance with GC 13.5 or GC 13.7.7, whichever is the later.
3. The rate of interest shall be the *Average Bank Rate* plus 3 percent per year on any amount which is overdue pursuant to GC 14.1.
4. With respect to amounts which are less than fifteen (15) *days* overdue, no interest shall be payable or paid if a payment is made within the said fifteen (15) *days* unless the *Consultant* so demands after such amounts have become due.

GC 15 Records to be Kept by the Consultant

1. The *Consultant* shall keep accurate time sheets and cost records and, if required for the purposes of the Agreement, shall make these documents available at reasonable times to the *NRC Representative* who may make copies and take extracts therefrom.
2. The *Consultant* shall afford facilities for audit and inspection at mutually agreeable times and at places where the relevant documents are located, and shall provide the *NRC Representative* with such information as *NRC* may from time to time require with reference to the documents referred to in GC 15.1.
3. The *Consultant* shall, unless otherwise specified, keep the time sheets and cost records available for audit and inspection for a period of at least two (2) years following completion of the *Services*.

GC 16 National or Departmental Security

1. If the *NRC Representative* is of the opinion that the Project is of a class or kind that involves national or departmental security, the *Consultant* may be required:
 - (a) to provide any information concerning persons employed for purposes of the Agreement unless prohibited by law;
 - (b) to remove any person from the Project and its site if that person cannot meet the prescribed security requirements; and
 - (c) to retain the Project *Technical Documentation* while in the *Consultant's* possession in a manner specified by *NRC*.
2. If the Project is of a class or kind that involves national or departmental security, the *Consultant* shall not issue, disclose, discard or use the Project *Technical Documentation* on another project without the written consent of *NRC*.



GC 17 Copyright and Reuse of Documents

1. Except as otherwise specified in the Supplementary Conditions any copyright in any and all documents which are instruments of the *Services* for this Project, and are prepared by or under the direction of the *Consultant*, shall belong to the *Consultant*.
2. *NRC* may, after consultation with the *Consultant*, reuse for another Project the documents referred to in GC 17.1, and shall pay to the *Consultant* for such reuse an appropriate fee based on current practice.

GC 18 Conflict of Interest

1. The *Consultant* declares that the *Consultant* has no pecuniary interest in the business of any third party that would cause, or seem to cause, a conflict of interest in carrying out the *Services*, and should such an interest be acquired during the life of the Agreement, the *Consultant* shall declare it immediately to *NRC Representative*.
2. The *Consultant* shall not have any tests or investigations carried out by any persons, firms, or corporations, that may have a direct or indirect financial interest in the results of those tests or investigations.
3. The *Consultant* shall not submit, either directly or indirectly, a bid for any Construction Contract related to the Project.
4. No former public office holder who is not in compliance with the post-employment provisions of the Conflict of Interest and Post-Employment Code for Public Office Holders shall derive a direct benefit from the Agreement.

GC 19 Status of Consultant

1. The *Consultant* is engaged under the Agreement as an independent *Consultant* for the sole purpose of providing *Services*.
2. Neither the *Consultant* nor any of the *Consultant's* employees shall be regarded as employees or agents of *NRC*.
3. The *Consultant*, as employer, agrees to be solely responsible for any and all payments and deductions required to be made by law, including those required for *Canada* or Quebec Pension Plans, Unemployment Insurance, Worker's Compensation, and Income Tax.

GC 20 Declaration by Consultant

1. The *Consultant* declares that:
 - (a) based on the information provided pertaining to the *Services* required under the Agreement, the *Consultant* has been provided sufficient information by the *NRC Representative* to enable the *Services* required under the Agreement to proceed



and is competent to perform the *Services* and has the necessary licenses and qualifications including the knowledge, skill and ability to perform the *Services*;

- (b) the quality of *Services* to be provided by the *Consultant* shall be consistent with generally accepted professional standards and principles.

GC 21 Insurance

21.1 General

1. The Consultant, at the Consultant's expense, shall obtain and maintain, or shall cause to be obtained and maintained, insurance contracts in respect of the *Services*, and in accordance with the requirements of this General Condition.
2. Within thirty (30) days after acceptance of the Consultant's proposal by *NRC*, the Consultant shall, unless otherwise directed in writing by the Contracting Authority, deposit with the Contracting Authority an **Insurer's Certificate of Insurance** in the form displayed in this document and, if requested by the Contracting Authority, the originals or certified true copies of all contracts of insurance maintained by or on behalf of the Consultant and the Consultant's Sub-Consultants as might be applicable pursuant to the insurance coverage requirements contained in the proposal documents. Thereafter, during and after the performance of the *Services*, the Consultant shall provide the Contracting Authority, on request, with verification satisfactory to the Contracting Authority that the required insurance coverage is in place.
3. The Consultant shall provide **annually** to the Contracting Officer an Insurer's Certificate of Insurance until the services provided by the Consultant under the contract are completed.
4. Upon **completion** of the services the Consultant shall produce certification that the insurance coverage for Professional Liability/Errors and Omissions Liability will be maintained for the period of five (5) years after the completion of services, which shall be the date of either:
 - substantial performance of the work for each construction phase; or
 - suspension or abandonment of the project
5. The provisions of these insurance coverage requirements are not intended to cover all of the Consultant's indemnification obligations. Any additional insurance coverage the Consultant may deem necessary to fulfil the Consultant's obligations shall be at the Consultant's discretion and expense.
6. The payment of monies up to the deductible amount made in satisfaction of any claim shall be at the cost of the Consultant.

21.2 Comprehensive General Liability

1. Comprehensive General Liability insurance shall be effected by the Consultant at the Consultant's expense, and maintained in force throughout the performance of the *Services*. The policy shall be in an amount usual for the nature and scope of the *Services* but, unless specified elsewhere in the proposal documents, shall have a limit of liability of not less than \$1,000,000 for any one occurrence or series of occurrences



arising out of one cause, and shall have a property damage deductible of not more than \$5,000 per occurrence. Legal or defence costs incurred in respect of a claim or claims shall not operate to decrease the limit of liability.

2. The policy shall insure *NRC*, the Consultant, and the Consultant's Sub-Consultants for the performance of the Services, and shall include but not be limited to the following coverage/provisions:
- (A) "Additional Named Insured: Canada as represented by *NRC* is named as an Additional Named Insured under any liability insurance policies for Canada's respective rights and interests under the contract for the performance of the Services."
 - (B) "Cross Liability: Any act or omission by one or another of the Insured hereunder shall not prejudice the rights or interests of any other Insured. This policy, subject to its limits of liability, shall apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each. The inclusion herein of more than one Insured shall not operate to increase the limits of the Insurers' liability."
 - (C) "Litigation Rights: It is understood and agreed that where any suit is instituted for or against *NRC* which the Insurer or Insurers would, but for this clause, have the right to pursue or defend on behalf of *NRC* as an Additional Named Insured under this insurance policy, the Insurer shall promptly contact the Attorney General of Canada to agree on the legal strategies by sending a registered letter to:

Senior General Counsel,
Civil Litigation Section,
Department of Justice Canada,
Kent and Wellington Streets,
Ottawa, Ontario K1A 0H8

The notification must be followed, within a reasonable period, by an information copy to the Contracting Authority.

The Insurer also agrees that *NRC* reserves the right to co-defend any action brought against *NRC*. However, all expenses incurred by *NRC* to co-defend such actions would be at *NRC*'s expense."

- (D) "Notice of Cancellation or Amendments of Insurance Coverage: The Insurer agrees to give the Contracting Authority at least thirty (30) days' prior written notice of any policy cancellation or any changes in the policy coverage.

21.3 Professional Liability

1. The Consultant, at the Consultant's expense, shall effect and continuously maintain Professional Liability insurance from the commencement of performance of the Services until five (5) years after their completion. The policy shall be in an amount usual for the nature and scope of the Services but, unless specified elsewhere in the proposal documents, shall have a limit of liability of not less than \$1,000,000 per claim,



and a deductible amount of not more than \$5,000 per claim. Legal or defence costs incurred in respect of a claim or claims shall not operate to decrease the limit of liability.

2. The following clauses must be incorporated into the conditions of the Consultant's Professional Liability insurance coverage:
 - (A) "Litigation Rights: It is understood and agreed that where any suit is instituted for or against *NRC* which the Insurer, or Insurers would, but for this clause, have the right to pursue or defend on behalf of *NRC* under this insurance policy, the Insurer shall promptly contact the Attorney General of Canada to agree on the legal strategies by sending a registered letter to:

Senior General Counsel
Civil Litigation Section
Department of Justice
Kent and Wellington Streets
Ottawa, Ontario K1A 0H8

The notification must be followed, within a reasonable period, by an information copy to the Contracting Authority.

The Insurer also agrees that *NRC* reserves the right to co-defend any action brought against *NRC*. However, all expenses incurred by *NRC* to co-defend such actions would be at *NRC*'s expense."
 - (B) "Notice of Cancellation or Amendments of Insurance Coverage: The Insurer agrees to give the Contracting Authority at least thirty (30) days' prior written notice of any policy cancellation or any changes in the policy coverage."
 - (C) "The Insurer shall continue to provide the required insured coverage for Professional Liability for a period of five (5) years following completion of the Services and shall, upon the completion of the Services by the Consultant, provide the Consultant with certification of that undertaking in a form satisfactory to *NRC*."
3. Forthwith upon receipt of the Insurer's certification referred to in clause 17.1 paragraph 4, the Consultant shall deposit it with the Contracting Authority.

GC 22 Resolution of Disagreements

1. In the event of a disagreement regarding any aspect of the *Services* or any instructions given under the Agreement:
 - (a) the *Consultant* may give a notice of disagreement to the *NRC Representative*. Such notice shall be promptly given and contain the particulars of the disagreement, any changes in time or amounts claimed, and reference to the relevant clauses of the Agreement;



- (b) the *Consultant* shall continue to perform the *Services* in accordance with the instructions of the *NRC Representative*; and
 - (c) the *Consultant* and the *NRC Representative* shall attempt to resolve the disagreement by negotiations conducted in good faith. The negotiations shall be conducted, first, at the level of the *Consultant's* project representative and the *NRC Representative* and, secondly and if necessary, at the level of a principal of the *Consultant* firm and a senior *NRC* manager.
2. The *Consultant's* continued performance of the *Services* in accordance with the instructions of the *NRC Representative* shall not jeopardize the legal position of the *Consultant* in any disagreement.
3. If it was subsequently agreed or determined that the instructions given were in error or contrary to the Agreement, *NRC* shall pay the *Consultant* those fees the *Consultant* shall have earned as a result of the change(s) in the *Services* provided, together with those reasonable disbursements arising from the change(s) and which have been authorised by the *NRC Representative*.
4. The fees mentioned in GC 22.3 shall be calculated in accordance with the Terms of Payment set out in the Agreement.
5. If the disagreement is not settled, the *Consultant* may make a request to the *NRC Representative* for a written *NRC* decision and the *NRC Representative* shall give notice of the *NRC* decision within fourteen (14) *days* of receiving the request, setting out the particulars of the response and any relevant clauses of the Agreement.
6. Within fourteen (14) *days* of receipt of the written *NRC* decision, the *Consultant* shall notify the *NRC Representative* if the *Consultant* accepts or rejects the decision.
7. If the *Consultant* rejects the *NRC* decision, the *Consultant*, by notice may refer the disagreement to *Mediation*.
8. If the disagreement is referred to *Mediation*, the *Mediation* shall be conducted with the assistance of a skilled and experienced mediator chosen by the *Consultant* from a list of mediators proposed by *NRC*, and *NRC Mediation* procedures shall be used unless the parties agree otherwise.
9. Negotiations conducted under the Agreement, including those conducted during *Mediation*, shall be without prejudice.

GC 23 Members of House of Commons

1. No member of the House of Commons shall be admitted to any share or part of the Agreement, or to any benefit that may arise therefrom.



GC 24 Amendments

1. The Agreement may not be amended, or modified, nor shall any of its terms and conditions be waived, except by Agreement in writing executed by both parties.

GC 25 Entire Agreement

1. The Agreement constitutes the entire arrangement between the parties with respect to the subject matter of the Agreement, and supersedes all previous negotiations, communications and other arrangements relating to it, unless incorporated by reference herein.

GC 26 Lobbyist Certification - Contingency Fees

1. The *Consultant* certifies that it has not directly or indirectly paid or agreed to pay and covenants that it will not directly or indirectly pay a contingency fee for the solicitation, negotiation or obtaining of the Agreement to any person other than an employee acting in the normal course of the employee's duties.
2. All accounts and records pertaining to payments of fees or other compensation for the solicitation, obtaining or negotiation of the Agreement shall be subject to the accounts and audit provisions of the Agreement.
3. If the *Consultant* certifies falsely under this section or is in default of the obligations contained therein, *NRC* may either take the work out of the *Consultant's* hands in accordance with the conditions of the Agreement or recover from the *Consultant* by way of reduction to the Basic Fee or otherwise the full amount of the contingency fee.

4. In this clause,

"**Contingency fee**" means any payment or other compensation that is contingent upon or is calculated upon the basis of a degree of success in soliciting or obtaining a Government Agreement or negotiating the whole or any part of its term.

"**Employee**" means a person with whom the *Consultant* has an employer/employee relationship.

"**Person**" includes an individual or group of individuals, a corporation, a partnership, an organization and an association and, without restricting the generality of the foregoing, includes any individual who is required to file a return with the registrar pursuant to section 5 of the *Lobbyist Registration Act*, R.S. 1985 c.44 (4th Supplement) as the same may be amended from time to time.

GC 27 Non-discrimination in Hiring and Employment Practices

1. For the purpose of this General Condition, "person" includes the *Consultant*, the *Consultant's Sub-Consultants* and other firms forming the *Consultant* team, and their



- respective employees, agents, licensees or invitees, and any other individual involved in the performance of the work.
2. The *Consultant* shall not refuse to employ and will not discriminate in any manner against any person because
 - (a) of that person's race, national origin, colour, religion, age, sex or marital status,
 - (b) of the race, national origin, colour, religion, age, sex, or marital status of any person having any relationship or association with that person, or
 - (c) a complaint has been made or information has been given by or in respect of that person relating to an alleged failure by the *Consultant* to comply with GC 27.2(a) and GC 27.2(b) above.
 3. Within two (2) working days immediately following receipt of a written complaint pursuant to GC 27.2 above, the *Consultant* shall
 - (a) cause to have issued a written direction to the person or persons named by the complainant to cease all actions that form the basis of the complaint; and
 - (b) forward a copy of the complaint to the *NRC Representative* by registered mail.
 4. Within twenty four (24) hours immediately following receipt of a direction from the *NRC Representative* to do so, the *Consultant* shall cause to have removed from the *Consultant* team any person or persons whom the *NRC Representative* believes to be in breach of the provisions of GC 27.2 above.
 5. No later than thirty (30) days after receipt of the direction referred to in GC 27.4 above, the *Consultant* shall cause the necessary action to be commenced to remedy the breach described in the direction.
 6. If a direction is issued pursuant to GC 27.4 above, *NRC* may withhold from monies that are due and payable to the *Consultant* an amount representing the sum of the costs and payment referred to in GC 27.8 and GC 27.9 below.
 7. If the *Consultant* fails to proceed in accordance with GC 27.6 above, the *NRC Representative* shall take the necessary action to have the breach remedied, and shall determine all supplementary costs incurred as a result by *NRC*.
 8. *NRC* may make a payment directly to the complainant from monies that are due and payable to the *Consultant* upon receipt from the complainant of:
 - (a) a written award issued pursuant to the federal *Commercial Arbitration Act*, R.S., 1985, c. C-34.6; or
 - (b) a written award issued pursuant to the *Canadian Human Rights Act*, R.S., 1985, c.H-6; or
 - (c) a written award issued pursuant to provincial or territorial human rights legislation; or



- (d) a judgement issued by a court of competent jurisdiction.
9. The *Consultant* shall be liable for and upon demand shall pay to *NRC* the supplementary costs referred to in GC 27.8. If the *Consultant* fails to make payment on demand, *NRC* may deduct the same from any amount due and payable to the *Consultant*.
 10. A payment made pursuant to GC 27.8 is, to the extent of the payment, a discharge of *NRC*'s liability to the *Consultant* under the terms of the Agreement and may be deducted from any amount due and payable to the *Consultant*.
 11. If the *NRC Representative* is of the opinion that the *Consultant* has breached any of the provisions of this General Condition, *NRC* may take the work out of the *Consultant*'s hands pursuant to GC 10.
 12. The *Consultant* shall ensure that the provisions of this General Condition are included in all agreements and contractual arrangements entered into as a consequence of this work.

GC 28 Changes in Taxes and Duties

1. In the event of any change (including a new imposition or repeal), on or after the date of submission of the proposal, of any tax, customs or other duty, charge, or any similar imposition that is imposed under sales or excise tax legislation of the Government of Canada and which affects the cost to the *Consultant* of the Services, the amount payable to the *Consultant* shall be adjusted to reflect the increase or decrease in the cost to the *Consultant*.
2. There shall be no adjustment under paragraph 1 in respect of any change that would increase the cost to the *Consultant* of the Services if public notice of the change was given before the proposal submission date in sufficient detail to permit the *Consultant* to have calculated the effect on the *Consultant*'s cost before that date.
3. The *Consultant* shall forward to *NRC* a certified statement showing the increase or decrease in cost to the *Consultant* that is directly attributable to the change in the imposition. *NRC* or the *NRC Representative* may verify the increase or decrease in cost by audit.

GC 29 Ad Valorem Sales Tax

1. Federal government departments and agencies are not required to pay any ad valorem sales tax levied by the province in which the taxable goods or services are delivered. This exemption is provided to federal government departments and agencies under the authority of the following:
 - (a) Provincial Sales Tax Exemption Licence Numbers, for the provinces of:

Prince Edward Island	OP-10000-250
Ontario	11708174G
Manitoba	390-516-0
British Columbia	005521



- (b) An Exemption Certification, for Quebec, Saskatchewan, the Yukon Territory, and the Northwest Territories, which certifies that the property and/or services ordered/purchased hereby are for the use of, and are being purchased by the federal government with Canada funds, and are therefore not subject to provincial/territorial sales and consumption taxes.
2. Currently, in Alberta, Saskatchewan, the Yukon Territory, and the Northwest Territories, provincial sales taxes do not apply to goods or services delivered to the federal government.
3. The Consultant is not exempt from paying provincial sales tax under the above Exemption Licence Numbers or Exemption Certification. The Consultant is required to pay Provincial Sales Tax on taxable goods or services used or consumed in the performance of the Contract (as per appropriate provincial legislation), including material incorporated into real property.

GC 30 Tax Withholding of 15 Percent

1. If the Consultant is a non-resident contractor as defined in the *Income Tax Act*, the Consultant acknowledges and agrees that, pursuant to the provisions of that Act, *NRC* is empowered to withhold an amount of 15 percent of the price to be paid to the Consultant for services performed in Canada. This amount will be held on account with respect to any liability for taxes which may be owed to Canada.

GC 31 Changes in the Consultant Team

1. Should an entity or person named in the Consultant's proposal as an entity or person who is to perform the Services or part of the Services be unable to perform or complete Services as described in the proposal, the Consultant shall obtain the concurrence of the *NRC Representative* prior to performing or completing the Services, or entering into an agreement with another entity or person to perform or complete the Services, such concurrence not to be unreasonably withheld.
2. In seeking to obtain the concurrence of the *NRC Representative* referred to in paragraph 1, the Consultant shall provide notice in writing to the *NRC Representative* containing:
 - (a) the reason for the inability of the entity or person to perform the Services;
 - (b) the name, qualifications and experience of the proposed replacement entity or person, and
 - (c) if applicable, proof that the entity or person has the required security clearance granted by *NRC*.
3. The Consultant shall not, in any event, allow performance of any part of the Services by unauthorized replacement entities or persons, and acceptance of a replacement entity or person by the *NRC Representative* shall not relieve the Consultant from responsibility to perform the Services.



4. *NRC* may order the removal from the Consultant Team of any unauthorised replacement entity or person and the Consultant shall immediately remove the entity or person from the performance of the Services and shall, in accordance with paragraphs 1) and 2), secure a further replacement.

5. The fact that *NRC* does not order the removal of a replacement entity or person from the performance of the Services shall not relieve the Consultant from the Consultant's responsibility to meet all the Consultant's obligations in the performance of the Services.

**STANDARD INSTRUCTIONS AND CONDITIONS:
(APPLICABLE TO BID SOLICITATION)**

1. Submission of Bids

1.1 It is the Bidder's responsibility to:

- (a) send a signed original of the bid solicitation, duly completed, IN THE FORMAT REQUESTED;
- (b) direct its bid ONLY to the email address specified;
- (c) ensure that the Bidder's name, the bid solicitation reference number, and bid solicitation closing date and time are clearly visible;
- (d) provide a comprehensive and sufficiently detailed bid, including all requested pricing details, that will permit a complete evaluation in accordance with the criteria set out in the bid solicitation.

Timely and correct delivery of bids to the specified email address is the sole responsibility of the Bidder. The National Research Council Canada (NRC) will not assume or have transferred to it those responsibilities. All risks and consequences of incorrect delivery of bids are the responsibility of the Bidder.

1.2 Bids may be accepted in whole or in part. The lowest or any bid will not necessarily be accepted. In the case of error in the extension of prices, the unit price will govern. NRC may enter into contract without negotiation.

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

1.4 Bids will remain open for acceptance for a period of not less than sixty (60) days from the closing date of the bid solicitation, unless otherwise indicated by NRC in such bid solicitation.

1.5 While NRC may enter into contract without negotiation, Canada reserves the right to negotiate with bidders on any procurement.

1.6 Notwithstanding the bid validity period stipulated in this solicitation, Canada reserves the right to seek an extension from all responsive bidders, within a minimum of three (3) days prior to the end of such period. Bidders shall have the option to either accept or reject the extension.

1.7 If the extension referred to above is accepted, in writing, by all those who submitted responsive bids, then Canada shall continue immediately with the evaluation of the bids and its approval processes.

1.8 If the extension referred to above is not accepted, in writing, by all those who submitted responsive bids then Canada shall, at its sole discretion: either continue to evaluate the responsive bids of those who have accepted the extension and seek the necessary approvals; or cancel the solicitation; or cancel and reissue the solicitation.

2. Late Bids

2.1 It is NRC policy to return, unopened, bids delivered after the stipulated bid solicitation closing date and time.

2.2 All risks and consequences of incorrect delivery of bids are the responsibility of the Bidder. The NRC will not be held responsible for electronic bids that arrive after the due date and time due to power failure or any other electronic failure issues.

For further information, please contact the Contracting Authority identified in the bid solicitation.

COVID-19 vaccination requirement certification

In accordance with the COVID-19 Vaccination Policy for Supplier Personnel [COVID-19 vaccination requirement for supplier personnel - Buyandsell.gc.ca](https://buyandsell.gc.ca), all Bidders must provide with their bid, the COVID-19 Vaccination Requirement Certification attached to this bid solicitation, to be given further consideration in this procurement process. This Certification incorporated into the bid solicitation on its closing date is incorporated into, and forms a binding part of any resulting Contract.

COVID-19 Vaccination Requirement Certification

I, _____ (*first and last name*), as the representative of
 _____ (*name of business*) pursuant to
 _____ (*insert solicitation number*), warrant and certify that all
 personnel that _____ (*name of business*) will provide on the
 resulting Contract who access federal government workplaces where they may come into contact with
 public servants will be:

- (a) fully vaccinated against COVID-19 with Health Canada-approved COVID-19 vaccine(s); or
- (b) for personnel that are unable to be vaccinated due to a certified medical contraindication, religion or other prohibited grounds of discrimination under the Canadian Human Rights Act, subject to accommodation and mitigation measures that have been presented to and approved by Canada; until such time that Canada indicates that the vaccination requirements of the COVID-19 Vaccination Policy for Supplier Personnel are no longer in effect.

I certify that all personnel provided by _____ (*name of business*) have been notified of the vaccination requirements of the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel, and that the _____ (*name of business*) has certified to their compliance with this requirement.

I certify that the information provided is true as of the date indicated below and will continue to be true for the duration of the Contract. I understand that the certifications provided to Canada are subject to verification at all times. I also understand that Canada will declare a contractor in default, if a certification is found to be untrue, whether made knowingly or unknowingly, during the bid or contract period. Canada reserves the right to ask for additional information to verify the certifications. Failure to comply with any request or requirement imposed by Canada will constitute a default under the Contract.

Signature: _____

Date: _____

Optional

For data purposes only, initial below if your business already has its own mandatory vaccination policy or requirements for employees in place. Initialing below **is not** a substitute for completing the mandatory certification above.

Initials: _____

Information you provide on this Certification Form and in accordance with the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel will be protected, used, stored and disclosed in accordance with the Privacy Act. Please note that you have a right to access and correct any information on your file, and you have a right to file a complaint with the Office of the Privacy Commissioner regarding the handling of your personal information. These rights also apply to all individuals who are deemed to be personnel for the purpose for the Contract and who require access to federal government workplaces where they may come into contact with public servants.



Contract Number / Numéro du contrat
Security Classification / Classification de sécurité

**SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)**

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine	2. Branch or Directorate / Direction générale ou Direction
3. a) Subcontract Number / Numéro du contrat de sous-traitance	3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant

4. Brief Description of Work / Brève description du travail

5. a) Will the supplier require access to Controlled Goods?
Le fournisseur aura-t-il accès à des marchandises contrôlées? No / Non Yes / Oui

5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations?
Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques? No / Non Yes / Oui

6. Indicate the type of access required / Indiquer le type d'accès requis

6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets?
Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS?
(Specify the level of access using the chart in Question 7. c)
(Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c) No / Non Yes / Oui

6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted.
Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé. No / Non Yes / Oui

6. c) Is this a commercial courier or delivery requirement with **no** overnight storage?
S'agit-il d'un contrat de messagerie ou de livraison commerciale **sans** entreposage de nuit? No / Non Yes / Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada <input type="checkbox"/>	NATO / OTAN <input type="checkbox"/>	Foreign / Étranger <input type="checkbox"/>
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7. b) Release restrictions / Restrictions relatives à la diffusion

No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/> Not releasable À ne pas diffuser <input type="checkbox"/> Restricted to: / Limité à : <input type="checkbox"/> Specify country(ies): / Préciser le(s) pays :	All NATO countries Tous les pays de l'OTAN <input type="checkbox"/> Restricted to: / Limité à : <input type="checkbox"/> Specify country(ies): / Préciser le(s) pays :	No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/> Restricted to: / Limité à : <input type="checkbox"/> Specify country(ies): / Préciser le(s) pays :
---	---	---

7. c) Level of information / Niveau d'information

PROTECTED A / PROTÉGÉ A <input type="checkbox"/>	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ <input type="checkbox"/>	PROTECTED A / PROTÉGÉ A <input type="checkbox"/>
PROTECTED B / PROTÉGÉ B <input type="checkbox"/>	NATO RESTRICTED / NATO DIFFUSION RESTREINTE <input type="checkbox"/>	PROTECTED B / PROTÉGÉ B <input type="checkbox"/>
PROTECTED C / PROTÉGÉ C <input type="checkbox"/>	NATO CONFIDENTIAL / NATO CONFIDENTIEL <input type="checkbox"/>	PROTECTED C / PROTÉGÉ C <input type="checkbox"/>
CONFIDENTIAL / CONFIDENTIEL <input type="checkbox"/>	NATO SECRET / NATO SECRET <input type="checkbox"/>	CONFIDENTIAL / CONFIDENTIEL <input type="checkbox"/>
SECRET / SECRET <input type="checkbox"/>	COSMIC TOP SECRET / COSMIC TRÈS SECRET <input type="checkbox"/>	SECRET / SECRET <input type="checkbox"/>
TOP SECRET / TRÈS SECRET <input type="checkbox"/>		TOP SECRET / TRÈS SECRET <input type="checkbox"/>
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) <input type="checkbox"/>		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) <input type="checkbox"/>

Security Classification / Classification de sécurité
--



Contract Number / Numéro du contrat
Security Classification / Classification de sécurité

PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? No Yes
 Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS? Non Oui
 If Yes, indicate the level of sensitivity:
 Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? No Yes
 Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate? Non Oui

 Short Title(s) of material / Titre(s) abrégé(s) du matériel :
 Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

<input type="checkbox"/> RELIABILITY STATUS COTE DE FIABILITÉ	<input type="checkbox"/> CONFIDENTIAL CONFIDENTIEL	<input type="checkbox"/> SECRET SECRET	<input type="checkbox"/> TOP SECRET TRÈS SECRET
<input type="checkbox"/> TOP SECRET-SIGINT TRÈS SECRET - SIGINT	<input type="checkbox"/> NATO CONFIDENTIAL NATO CONFIDENTIEL	<input type="checkbox"/> NATO SECRET NATO SECRET	<input type="checkbox"/> COSMIC TOP SECRET COSMIC TRÈS SECRET
<input type="checkbox"/> SITE ACCESS ACCÈS AUX EMBLEMES			

Special comments:
 Commentaires spéciaux : _____

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
 REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? No Yes
 Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail? Non Oui
 If Yes, will unscreened personnel be escorted?
 Dans l'affirmative, le personnel en question sera-t-il escorté? No Yes
 Non Oui

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? No Yes
 Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS? Non Oui

11. b) Will the supplier be required to safeguard COMSEC information or assets? No Yes
 Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC? Non Oui

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? No Yes
 Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ? Non Oui

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? No Yes
 Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS? Non Oui

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? No Yes
 Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale? Non Oui



PART C - (continued) / PARTIE C - (suite)

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.

Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.

Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ			CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET
											A	B	C			
Information / Assets / Renseignements / Biens / Production																
IT Media / Support TI																
IT Link / Lien électronique																

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED? No Yes
 La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE? Non Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED? No Yes
 La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE? Non Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquez qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).



Contract Number / Numéro du contrat
Security Classification / Classification de sécurité

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme			
Name (print) - Nom (en lettres moulées)		Title - Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
14. Organization Security Authority / Responsable de la sécurité de l'organisme			
Name (print) - Nom (en lettres moulées)		Title - Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached? Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?			<input type="checkbox"/> No / Non <input type="checkbox"/> Yes / Oui
16. Procurement Officer / Agent d'approvisionnement			
Name (print) - Nom (en lettres moulées) Collin Long		Title - Titre Senior Contracting Officer	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel Collin.Long@nrc-cnrc.gc.ca	Date
17. Contracting Security Authority / Autorité contractante en matière de sécurité			
Name (print) - Nom (en lettres moulées)		Title - Titre	Signature
Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date

Security Classification / Classification de sécurité
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Instructions for completion of a Security Requirements Check List (SRCL)

The instruction sheet should remain attached until Block #17 has been completed.

GENERAL - PROCESSING THIS FORM

The project authority shall arrange to complete this form.

The organization security officer shall review and approve the security requirements identified in the form, in cooperation with the project authority.

The contracting security authority is the organization responsible for ensuring that the suppliers are compliant with the security requirements identified in the SRCL.

All requisitions and subsequent tender / contractual documents including subcontracts that contain PROTECTED and/or CLASSIFIED requirements must be accompanied by a completed SRCL.

It is important to identify the level of PROTECTED information or assets as Level "A," "B" or "C," when applicable; however, certain types of information may only be identified as "PROTECTED". No information pertaining to a PROTECTED and/or CLASSIFIED government contract may be released by suppliers, without prior written approval of the individual identified in Block 17 of this form.

The classification assigned to a particular stage in the contractual process does not mean that everything applicable to that stage is to be given the same classification. Every item shall be PROTECTED and/or CLASSIFIED according to its own content. If a supplier is in doubt as to the actual level to be assigned, they should consult with the individual identified in Block 17 of this form.

PART A - CONTRACT INFORMATION

Contract Number (top of the form)

This number must be the same as that found on the requisition and should be the one used when issuing an RFP or contract. This is a unique number (i.e. no two requirements will have the same number). A new SRCL must be used for each new requirement or requisition (e.g. new contract number, new SRCL, new signatures).

1. Originating Government Department or Organization

Enter the department or client organization name or the prime contractor name for which the work is being performed.

2. Directorate / Branch

This block is used to further identify the area within the department or organization for which the work will be conducted.

3. a) Subcontract Number

If applicable, this number corresponds to the number generated by the Prime Contractor to manage the work with its subcontractor.

b) Name and Address of Subcontractor

Indicate the full name and address of the Subcontractor if applicable.

4. Brief Description of Work

Provide a brief explanation of the nature of the requirement or work to be performed.

5. a) Will the supplier require access to Controlled Goods?

*The Defence Production Act (DPA) defines "Controlled Goods" as certain goods listed in the Export Control List, a regulation made pursuant to the *Export and Import Permits Act* (EIPA). Suppliers who examine, possess, or transfer Controlled Goods within Canada must register in the Controlled Goods Directorate or be exempt from registration. More information may be found at www.cgd.gc.ca.*

b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations?

The prime contractor and any subcontractors must be certified under the U.S./Canada Joint Certification Program if the work involves access to unclassified military data subject to the provisions of the Technical Data Control Regulations. More information may be found at www.dlis.dla.mil/jcp.

6. Indicate the type of access required

Identify the nature of the work to be performed for this requirement. The user is to select one of the following types:

a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets?

The supplier would select this option if they require access to PROTECTED and/or CLASSIFIED information or assets to perform the duties of the requirement.

b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted.

The supplier would select this option if they require regular access to government premises or a secure work site only. The supplier will not have access to PROTECTED and/or CLASSIFIED information or assets under this option.

c) Is this a commercial courier or delivery requirement with no overnight storage?

The supplier would select this option if there is a commercial courier or delivery requirement. The supplier will not be allowed to keep a package overnight. The package must be returned if it cannot be delivered.

7. Type of information / Release restrictions / Level of information

Identify the type(s) of information that the supplier may require access to, list any possible release restrictions, and if applicable, provide the level(s) of the information. The user can make multiple selections based on the nature of the work to be performed.

Departments must process SRCLs through PWGSC where:

- contracts that afford access to PROTECTED and/or CLASSIFIED foreign government information and assets;
- contracts that afford foreign contractors access to PROTECTED and/or CLASSIFIED Canadian government information and assets; or
- contracts that afford foreign or Canadian contractors access to PROTECTED and/or CLASSIFIED information and assets as defined in the documents entitled Identifying INFOSEC and INFOSEC Release.

a) Indicate the type of information that the supplier will be required to access

Canadian government information and/or assets

If Canadian information and/or assets are identified, the supplier will have access to PROTECTED and/or CLASSIFIED information and/or assets that are owned by the Canadian government.

NATO information and/or assets

If NATO information and/or assets are identified, this indicates that as part of this requirement, the supplier will have access to PROTECTED and/or CLASSIFIED information and/or assets that are owned by NATO governments. NATO information and/or assets are developed and/or owned by NATO countries and are not to be divulged to any country that is not a NATO member nation. Persons dealing with NATO information and/or assets must hold a NATO security clearance and have the required need-to-know.

Requirements involving CLASSIFIED NATO information must be awarded by PWGSC. PWGSC / CIISD is the Designated Security Authority for industrial security matters in Canada.

Foreign government information and/or assets

If foreign information and/or assets are identified, this requirement will allow access to information and/or assets owned by a country other than Canada.

b) Release restrictions

If **Not Releasable** is selected, this indicates that the information and/or assets are for **Canadian Eyes Only (CEO)**. Only Canadian suppliers based in Canada can bid on this type of requirement. NOTE: If Canadian information and/or assets coexists with CEO information and/or assets, the CEO information and/or assets must be stamped **Canadian Eyes Only (CEO)**.

If **No Release Restrictions** is selected, this indicates that access to the information and/or assets are not subject to any restrictions.

If **ALL NATO countries** is selected, bidders for this requirement must be from NATO member countries only.

NOTE: There may be multiple release restrictions associated with a requirement depending on the nature of the work to be performed. In these instances, a security guide should be added to the SRCL clarifying these restrictions. The security guide is normally generated by the organization's project authority and/or security authority.

c) Level of information

Using the following chart, indicate the appropriate level of access to information/assets the supplier must have to perform the duties of the requirement.

PROTECTED	CLASSIFIED	NATO
PROTECTED A	CONFIDENTIAL	NATO UNCLASSIFIED
PROTECTED B	SECRET	NATO RESTRICTED
PROTECTED C	TOP SECRET	NATO CONFIDENTIAL
	TOP SECRET (SIGINT)	NATO SECRET
		COSMIC TOP SECRET

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?

If Yes, the supplier personnel requiring access to COMSEC information or assets must receive a COMSEC briefing. The briefing will be given to the "holder" of the COMSEC information or assets. In the case of a "personnel assigned" type of contract, the customer department will give the briefing. When the supplier is required to receive and store COMSEC information or assets on the supplier's premises, the supplier's COMSEC Custodian will give the COMSEC briefings to the employees requiring access to COMSEC information or assets. If Yes, the Level of sensitivity must be indicated.

9. Will the supplier require access to extremely sensitive INFOSEC information or assets?

If Yes, the supplier must provide the Short Title of the material and the Document Number. Access to extremely sensitive INFOSEC information or assets will require that the supplier undergo a Foreign Ownership Control or Influence (FOCI) evaluation by CIISD.

PART B - PERSONNEL (SUPPLIER)

10. a) Personnel security screening level required

Identify the screening level required for access to the information/assets or client facility. More than one level may be identified depending on the nature of the work. Please note that Site Access screenings are granted for access to specific sites under prior arrangement with the Treasury Board of Canada Secretariat. A Site Access screening only applies to individuals, and it is not linked to any other screening level that may be granted to individuals or organizations.

RELIABILITY STATUS	CONFIDENTIAL	SECRET
TOP SECRET	TOP SECRET (SIGINT)	NATO CONFIDENTIAL
NATO SECRET	COSMIC TOP SECRET	SITE ACCESS

If multiple levels of screening are identified, a Security Classification Guide must be provided.

b) May unscreened personnel be used for portions of the work?

Indicating Yes means that portions of the work are not PROTECTED and/or CLASSIFIED and may be performed outside a secure environment by unscreened personnel. The following question must be answered if unscreened personnel will be used:

Will unscreened personnel be escorted?

If No, unscreened personnel may not be allowed access to sensitive work sites and must not have access to PROTECTED and/or CLASSIFIED information and/or assets.

If Yes, unscreened personnel must be escorted by an individual who is cleared to the required level of security in order to ensure there will be no access to PROTECTED and/or CLASSIFIED information and/or assets at the work site.

PART C - SAFEGUARDS (SUPPLIER)

11. INFORMATION / ASSETS

a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information and/or assets on its site or premises?

If Yes, specify the security level of the documents and/or equipment that the supplier will be required to safeguard at their own site or premises using the summary chart.

b) Will the supplier be required to safeguard COMSEC information or assets?

If Yes, specify the security level of COMSEC information or assets that the supplier will be required to safeguard at their own site or premises using the summary chart.

PRODUCTION

c) Will the production (manufacture, repair and/or modification) of PROTECTED and/or CLASSIFIED material and/or equipment occur at the supplier's site or premises?

Using the summary chart, specify the security level of material and/or equipment that the supplier manufactured, repaired and/or modified and will be required to safeguard at their own site or premises.

INFORMATION TECHNOLOGY (IT)

d) Will the supplier be required to use its IT systems to electronically process and/or produce or store PROTECTED and/or CLASSIFIED information and/or data?

If Yes, specify the security level in the summary chart. This block details the information and/or data that will be electronically processed or produced and stored on a computer system. The client department and/or organization will be required to specify the IT security requirements for this procurement in a separate technical document. The supplier must also direct their attention to the following document: Treasury Board of Canada Secretariat - Operational Security Standard: Management of Information Technology Security (MITS).

e) Will there be an electronic link between the supplier’s IT systems and the government department or agency?

If Yes, the supplier must have their IT system(s) approved. The Client Department must also provide the Connectivity Criteria detailing the conditions and the level of access for the electronic link (usually not higher than PROTECTED B level).

SUMMARY CHART

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier’s site(s) or premises.

For users completing the form **online** (via the Internet), the Summary Chart is automatically populated by your responses to previous questions.

PROTECTED	CLASSIFIED	NATO	COMSEC
PROTECTED A	CONFIDENTIAL	NATO RESTRICTED	PROTECTED A
PROTECTED B	SECRET	NATO CONFIDENTIAL	PROTECTED B
PROTECTED C	TOP SECRET	NATO SECRET	PROTECTED C
	TOP SECRET (SIGINT)	COSMIC TOP SECRET	CONFIDENTIAL
			SECRET
			TOP SECRET

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?

If Yes, classify this form by annotating the top and bottom in the area entitled “Security Classification”.

b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?

If Yes, classify this form by annotating the top and bottom in the area entitled “Security Classification” and indicate with attachments (e.g. SECRET with Attachments).

PART D - AUTHORIZATION

13. Organization Project Authority

This block is to be completed and signed by the appropriate project authority within the client department or organization (e.g. the person responsible for this project or the person who has knowledge of the requirement at the client department or organization). This person may on occasion be contacted to clarify information on the form.

14. Organization Security Authority

This block is to be signed by the Departmental Security Officer (DSO) (or delegate) of the department identified in Block 1, or the security official of the prime contractor.

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?

A Security Guide or Security Classification Guide is used in conjunction with the SRCL to identify additional security requirements which do not appear in the SRCL, and/or to offer clarification to specific areas of the SRCL.

16. Procurement Officer

This block is to be signed by the procurement officer acting as the contract or subcontract manager.

17. Contracting Security Authority

This block is to be signed by the Contract Security Official. Where PWGSC is the Contract Security Authority, Canadian and International Industrial Security Directorate (CIISD) will complete this block.

Instructions pour établir la Liste de vérification des exigences relatives à la sécurité (LVERS)

La feuille d'instructions devrait rester jointe au formulaire jusqu'à ce que la case 17 ait été remplie.

GÉNÉRALITÉS - TRAITEMENT DU PRÉSENT FORMULAIRE

Le responsable du projet doit faire remplir ce formulaire.

L'agent de sécurité de l'organisation doit revoir et approuver les exigences de sécurité qui figurent dans le formulaire, en collaboration avec le responsable du projet.

Le responsable de la sécurité des marchés est le responsable chargé de voir à ce que les fournisseurs se conforment aux exigences de sécurité mentionnées dans la LVERS.

Toutes les demandes d'achat ainsi que tous les appels d'offres et les documents contractuels subséquents, y compris les contrats de sous-traitance, qui comprennent des exigences relatives à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS doivent être accompagnés d'une LVERS dûment remplie.

Il importe d'indiquer si les renseignements ou les biens PROTÉGÉS sont de niveau A, B ou C, le cas échéant; cependant, certains types de renseignements peuvent être indiqués par la mention « PROTÉGÉ » seulement. Aucun renseignement relatif à un contrat gouvernemental PROTÉGÉ ou CLASSIFIÉ ne peut être divulgué par les fournisseurs sans l'approbation écrite préalable de la personne dont le nom figure à la case 17 de ce formulaire.

La classification assignée à un stade particulier du processus contractuel ne signifie pas que tout ce qui se rapporte à ce stade doit recevoir la même classification. Chaque article doit être PROTÉGÉ et/ou CLASSIFIÉ selon sa propre nature. Si un fournisseur ne sait pas quel niveau de classification assigner, il doit consulter la personne dont le nom figure à la case 17 de ce formulaire.

PARTIE A - INFORMATION CONTRACTUELLE

Numéro du contrat (au haut du formulaire)

Ce numéro doit être le même que celui utilisé sur la demande d'achat et services et devrait être celui utilisé dans la DDP ou dans le contrat. Il s'agit d'un numéro unique (c.-à-d. que le même numéro ne sera pas attribué à deux besoins distincts). Une nouvelle LVERS doit être utilisée pour chaque nouveau besoin ou demande (p. ex. un nouveau numéro de contrat, une nouvelle LVERS, de nouvelles signatures).

1. Ministère ou organisme gouvernemental d'origine

Inscrire le nom du ministère ou de l'organisme client ou le nom de l'entrepreneur principal pour qui les travaux sont effectués.

2. Direction générale ou Direction

Cette case peut servir à fournir plus de détails quant à la section du ministère ou de l'organisme pour qui les travaux sont effectués.

3. a) Numéro du contrat de sous-traitance

S'il y a lieu, ce numéro correspond au numéro généré par l'entrepreneur principal pour gérer le travail avec son sous-traitant.

b) Nom et adresse du sous-traitant

Indiquer le nom et l'adresse au complet du sous-traitant, s'il y a lieu.

4. Brève description du travail

Donner un bref aperçu du besoin ou du travail à exécuter.

5. a) Le fournisseur aura-t-il accès à des marchandises contrôlées?

La *Loi sur la production de défense* (LPD) définit « marchandises contrôlées » comme désignant certains biens énumérés dans la Liste des marchandises d'exportation contrôlée, un règlement établi en vertu de la *Loi sur les licences d'exportation et d'importation* (LLEI). Les fournisseurs qui examinent, possèdent ou transfèrent des marchandises contrôlées à l'intérieur du Canada doivent s'inscrire à la Direction des marchandises contrôlées ou être exemptés de l'inscription. On trouvera plus d'information à l'adresse www.cgp.gc.ca.

b) Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?

L'entrepreneur et tout sous-traitant doivent être accrédités en vertu du Programme mixte d'agrément Etats-Unis / Canada si le travail comporte l'accès à des données militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques. On trouvera plus d'information à l'adresse www.dlis.dla.mil/jcp/.

6. Indiquer le type d'accès requis

Indiquer la nature du travail à exécuter pour répondre à ce besoin. L'utilisateur doit choisir un des types suivants :

a) Le fournisseur et ses employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS?

Le fournisseur choisit cette option s'il doit avoir accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS pour accomplir le travail requis.

b) Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.

Le fournisseur choisit cette option seulement s'il doit avoir accès régulièrement aux locaux du gouvernement ou à un lieu de travail protégé. Le fournisseur n'aura pas accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS en vertu de cette option.

c) S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit?

Le fournisseur choisit cette option s'il y a nécessité de recourir à un service de messagerie ou de livraison commerciale. Le fournisseur ne sera pas autorisé à garder un colis pendant la nuit. Le colis doit être retourné s'il ne peut pas être livré.

7. Type d'information / Restrictions relatives à la diffusion / Niveau d'information

Indiquer le ou les types d'information auxquels le fournisseur peut devoir avoir accès, énumérer toutes les restrictions possibles relatives à la diffusion, et, s'il y a lieu, indiquer le ou les niveaux d'information. L'utilisateur peut faire plusieurs choix selon la nature du travail à exécuter.

Les ministères doivent soumettre la LVERS à TPSGC lorsque:

- les marchés prévoient l'accès aux renseignements et aux biens de nature PROTÉGÉS et/ou CLASSIFIÉS étrangers ;
- les marchés prévoient aux entrepreneurs étrangers l'accès aux renseignements et aux biens de nature PROTÉGÉS et/ou CLASSIFIÉS canadiens; ou
- les marchés prévoient aux entrepreneurs étrangers ou canadiens l'accès aux renseignements et aux biens de nature PROTÉGÉS et/ou CLASSIFIÉS tels que définis dans les documents intitulés Moyens INFOSEC détermination et Divulgateion de INFOSEC.

a) Indiquer le type d'information auquel le fournisseur devra avoir accès

Renseignements et/ou biens du gouvernement canadien

Si des renseignements et/ou des biens canadiens sont indiqués, le fournisseur aura accès à des renseignements et/ou à des biens PROTÉGÉS et/ou CLASSIFIÉS appartenant au gouvernement canadien.

Renseignements et/ou biens de l'OTAN

Si des renseignements et/ou des biens de l'OTAN sont indiqués, cela signifie que, dans le cadre de ce besoin, le fournisseur aura accès à des renseignements et/ou à des biens PROTÉGÉS et/ou CLASSIFIÉS appartenant à des gouvernements membres de l'OTAN. Les renseignements et/ou les biens de l'OTAN sont élaborés par des pays de l'OTAN ou leur appartiennent et ne doivent être divulgués à aucun pays qui n'est pas un pays membre de l'OTAN. Les personnes qui manient des renseignements et/ou des biens de l'OTAN doivent détenir une autorisation de sécurité de l'OTAN et avoir besoin de savoir.

Les contrats comportant des renseignements CLASSIFIÉS de l'OTAN doivent être attribués par TPSGC. La DSICI de TPSGC est le responsable de la sécurité désigné relativement aux questions de sécurité industrielle au Canada.

Renseignements et/ou biens de gouvernements étrangers

Si des renseignements et/ou des biens de gouvernements étrangers sont indiqués, ce besoin permettra l'accès à des renseignements et/ou à des biens appartenant à un pays autre que le Canada.

b) Restrictions relatives à la diffusion

Si **À ne pas diffuser** est choisi, cela indique que les renseignements et/ou les biens sont **réservés aux Canadiens**. Seuls des fournisseurs canadiens installés au Canada peuvent soumissionner ce genre de besoin. NOTA : Si des renseignements et/ou des biens du gouvernement canadien coexistent avec des renseignements et/ou des biens réservés aux Canadiens, ceux-ci doivent porter la mention **Réservé aux Canadiens**.

Si **Aucune restriction relative à la diffusion** est choisi, cela indique que l'accès aux renseignements et/ou aux biens n'est assujéti à aucune restriction.

Si **Tous les pays de l'OTAN** est choisi, les soumissionnaires doivent appartenir à un pays membre de l'OTAN.

NOTA : Il peut y avoir plus d'une restriction s'appliquant à une demande, selon la nature des travaux à exécuter. Pour ce genre de contrat, un guide de sécurité doit être joint à la LVERS afin de clarifier les restrictions. Ce guide est généralement préparé par le chargé de projet et/ou le responsable de la sécurité de l'organisme.

c) Niveau d'information

À l'aide du tableau ci-dessous, indiquer le niveau approprié d'accès aux renseignements et/ou aux biens que le fournisseur doit avoir pour accomplir les travaux requis.

PROTÉGÉ	CLASSIFIÉ	NATO
PROTÉGÉ A	CONFIDENTIEL	NATO NON CLASSIFIÉ
PROTÉGÉ B	SECRET	NATO DIFFUSION RESTREINTE
PROTÉGÉ C	TRÈS SECRET	NATO CONFIDENTIEL
	TRÈS SECRET (SIGINT)	NATO SECRET
		COSMIC TRÈS SECRET

8. Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?

Si la réponse est Oui, les membres du personnel du fournisseur qui doivent avoir accès à des renseignements ou à des biens COMSEC doivent participer à une séance d'information COMSEC. Cette séance sera donnée au « détenteur autorisé » des renseignements ou des biens COMSEC. Dans le cas des contrats du type « personnel affecté », cette séance sera donnée par le ministère client. Lorsque le fournisseur doit recevoir et conserver, dans ses locaux, des renseignements ou des biens COMSEC, le responsable de la garde des renseignements ou des biens COMSEC de l'entreprise donnera la séance d'information COMSEC aux membres du personnel qui doivent avoir accès à des renseignements ou à des biens COMSEC.

9. Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Si la réponse est Oui, le fournisseur doit indiquer le titre abrégé du document, le numéro du document et le niveau de sensibilité. L'accès à des renseignements ou à des biens extrêmement délicats INFOSEC exigera que le fournisseur fasse l'objet d'une vérification Participation, contrôle et influence étrangers (PCIE) effectuée par la DSICI.

PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Niveau de contrôle de la sécurité du personnel requis

Indiquer le niveau d'autorisation de sécurité que le personnel doit détenir pour avoir accès aux renseignements, aux biens ou au site du client. Selon la nature du travail, il peut y avoir plus d'un niveau de sécurité. Veuillez noter que des cotes de sécurité sont accordées pour l'accès à des sites particuliers, selon des dispositions antérieures prises auprès du Secrétariat du Conseil du Trésor du Canada. La cote de sécurité donnant accès à un site s'applique uniquement aux personnes et n'est liée à aucune autre autorisation de sécurité accordée à des personnes ou à des organismes.

COTE DE FIABILITÉ	CONFIDENTIEL	SECRET
TRÈS SECRET	TRÈS SECRET (SIGINT)	NATO CONFIDENTIEL
NATO SECRET	COSMIC TRÈS SECRET	ACCÈS AUX EMBLEMES

Si plusieurs niveaux d'autorisation de sécurité sont indiqués, un guide de classification de sécurité doit être fourni.

b) Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?

Si la réponse est Oui, cela veut dire que certaines tâches ne sont pas PROTÉGÉES et/ou CLASSIFIÉES et peuvent être exécutées à l'extérieur d'un environnement sécurisé par du personnel n'ayant pas d'autorisation de sécurité. Il faut répondre à la question suivante si l'on a recours à du personnel n'ayant pas d'autorisation de sécurité :

Le personnel n'ayant pas d'autorisation de sécurité sera-t-il escorté?

Si la réponse est Non, le personnel n'ayant pas d'autorisation de sécurité ne pourra pas avoir accès à des lieux de travail dont l'accès est réglementé ni à des renseignements et/ou à des biens PROTÉGÉS et/ou CLASSIFIÉS.

Si la réponse est Oui, le personnel n'ayant pas d'autorisation de sécurité devra être escorté par une personne détenant la cote de sécurité requise, pour faire en sorte que le personnel en question n'ait pas accès à des renseignements et/ou à des biens PROTÉGÉS et/ou CLASSIFIÉS sur les lieux de travail.

PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

11. RENSEIGNEMENTS / BIENS :

a) Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

Si la réponse est Oui, préciser, à l'aide du tableau récapitulatif, le niveau de sécurité des documents ou de l'équipement que le fournisseur devra protéger dans ses installations.

b) Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

Si la réponse est Oui, préciser, à l'aide du tableau récapitulatif, le niveau de sécurité des renseignements ou des biens COMSEC que le fournisseur devra protéger dans ses installations.

PRODUCTION

c) Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

Préciser, à l'aide du tableau récapitulatif, le niveau de sécurité du matériel que le fournisseur fabriquera, réparera et/ou modifiera et devra protéger dans ses installations.

TECHNOLOGIE DE L'INFORMATION (TI)

d) Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

Si la réponse est Oui, préciser le niveau de sécurité à l'aide du tableau récapitulatif. Cette case porte sur les renseignements qui seront traités ou produits électroniquement et stockés dans un système informatique. Le ministère/organisme client devra préciser les exigences en matière de sécurité de la TI relativement à cet achat dans un document technique distinct. Le fournisseur devra également consulter le document suivant : Secrétariat du Conseil du Trésor du Canada – Norme opérationnelle de sécurité : Gestion de la sécurité des technologies de l'information (GSTI).

e) Y aura-t-il un lien électronique entre les systèmes informatiques du fournisseur et celui du ministère ou de l'agence gouvernementale?

Si la réponse est Oui, le fournisseur doit faire approuver ses systèmes informatiques. Le ministère client doit aussi fournir les critères de connectivité qui décrivent en détail les conditions et le niveau de sécurité relativement au lien électronique (habituellement pas plus haut que le niveau PROTÉGÉ B).

TABLEAU RÉCAPITULATIF

Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

PROTÉGÉ	CLASSIFIÉ	NATO	COMSEC
PROTÉGÉ A	CONFIDENTIEL	NATO DIFFUSION RESTREINTE	PROTÉGÉ A
PROTÉGÉ B	SECRET	NATO CONFIDENTIEL	PROTÉGÉ B
PROTÉGÉ C	TRÈS SECRET	NATO SECRET	PROTÉGÉ C
	TRÈS SECRET (SIGINT)	COSMIC TRÈS SECRET	CONFIDENTIEL
			SECRET
			TRÈS SECRET

12. a) La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

Si la réponse est Oui, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de

sécurité » au haut et au bas du formulaire.

b) La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

Si la réponse est Oui, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquez qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

PARTIE D - AUTORISATION

13. Chargé de projet de l'organisme

Cette case doit être remplie et signée par le chargé de projet pertinent (c.-à-d. la personne qui est responsable de ce projet ou qui connaît le besoin au ministère ou à l'organisme client. On peut, à l'occasion, communiquer avec cette personne pour clarifier des renseignements figurant sur le formulaire.

14. Responsable de la sécurité de l'organisme

Cette case doit être signée par l'agent de la sécurité du ministère (ASM) du ministère indiqué à la case 1 ou par son remplaçant ou par le responsable de la sécurité du fournisseur.

15. Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?

Un Guide de sécurité ou un Guide de classification de sécurité sont utilisés de concert avec la LVERS pour faire part d'exigences supplémentaires en matière de sécurité qui n'apparaissent pas dans la LVERS et/ou pour éclaircir certaines parties de la LVERS.

16. Agent d'approvisionnement

Cette case doit être signée par l'agent des achats qui fait fonction de gestionnaire du contrat ou du contrat de sous-traitance.

17. Autorité contractante en matière de sécurité

Cette case doit être signée par l'agent de la sécurité du marché. Lorsque TPSGC est le responsable de la sécurité du marché, la Direction de la sécurité industrielle canadienne et internationale (DSICI) doit remplir cette case.