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

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

Bid Receiving - PWGSC / Réception des soumissions - TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION

Proposal To: Public Works and Government Services Canada

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

Proposition aux: Travaux Publics et Services Gouvernementaux Canada

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Issuing Office - Bureau de distribution
Vehicles & Industrial Products Division
11 Laurier St./11, rue Laurier
7A2, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Title - Sujet
BLDG. 2E - AIR HANDLING UNIT

Solicitation No. - N° de l'invitation	Date
U6800-164722/A	2016-05-27

Client Reference No. - N° de référence du client
U6800-164722

GETS Reference No. - N° de référence de SEAG
PW-$$HP-912-71015

File No. - N° de dossier	CCC No./N° CCC - FMS No./N° VME
hp912.U6800-164722	

Solicitation Closes - L'invitation prend fin
at - à 02:00 PM
on - le 2016-07-11

Time Zone
Fuseau horaire
Eastern Daylight Saving Time EDT

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

Address Enquiries to: - Adresser toutes questions à:	Buyer Id - Id de l'acheteur
Pearson, Neil	hp912

Telephone No. - N° de téléphone	FAX No. - N° de FAX
(873) 469-3312 ( )	(819) 953-2953

Destination - of Goods, Services, and Construction:
Destination - des biens, services et construction:
DEPARTMENT OF INDUSTRY CANADA
3701 CARLING AVE
P.O.BOX 11490 STATION H
OTTAWA
Ontario
K2H8S2
Canada

Instructions: See Herein

Instructions: Voir aux présentes

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

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

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

Telephone No. - N° de téléphone
Facsimile No. - N° de télécopieur

Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)
Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)

Signature **Date**

Canada

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PART 1 - GENERAL INFORMATION

1. Requirement

1.1 Industry Canada requires Air Handling Unit as detailed herein, in accordance with Annex “A” – Pricing and Annex “B” – Air Handling Unit attached hereto.

2. Debriefings

Bidders may request a debriefing on the results of the bid solicitation. Bidders should make the request to the Contracting Authority within 15 working days of receipt of notification that their bid was unsuccessful. The debriefing may be provided in writing, by telephone or in person.

3. Trade Agreements

The requirement is subject to the provisions of the North American Free trade Agreement (NAFTA), and the Agreement on Internal Trade (AIT).

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the Standard Acquisition Clauses and Conditions *Standard Acquisition Clauses and Conditions Manual* (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) Manual issued by Public Works and Government Services Canada.

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

The 2003 (2016-04-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days
Insert: ninety (90) days

2. Submission of Bids

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

3. Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

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

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

5. Improvement of Requirement During Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least seven (7) calendar days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

6. Optional Site Visit

It is recommended that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for the site visit to be held at:

Communications Research Centre
Shirleys Bay Campus
3701 Carling Avenue
Ottawa ON
K2H 8S2

on **15 June 2016**. The site visit will begin at **10:00 EST**, in **Building 1 guard house**.

Bidders are required to bring their own hard hat and steel-toed boots/shoes. Suppliers will be denied access to the site if they do not have these. This is Mandatory.

The purpose of the visit is to conduct site survey of existing unit and existing ductwork and building openings for ductwork penetrations. New unit has to match exactly site conditions and be set in place with minor modifications to the building structure and existing mechanical infrastructure.

Bidders are requested to communicate with the Contracting Authority no later than **13 June 2016 by 14:00 EST** to confirm attendance and provide the name(s) of the person(s) who will attend. Bidders may be requested to sign an attendance sheet. Bidders who do not attend or do not send a representative will not be given an alternative appointment but they will not be precluded from submitting a bid. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

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

Section I: Technical Bid (2 hard copies)

Section II: Financial Bid (1 hard copy)

Section III: Certifications (1 hard copy)

Section IV: Additional Information (1 hard copy)

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

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

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

1) use paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and

2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

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

1) Appendix ‘‘1’’ – Evaluation Grid – Air Handling Unit;
2) Annex "B" - Air Handling Unit;

1. Equivalent Products

1.1 Products that are equivalent in form, fit, function and quality to the item(s) specified in the bid solicitation will be considered where the Bidder:

(a) designates the brand name, model and/or part number of the substitute product;

(b) states that the substitute product is fully interchangeable with the item specified;

(c) provides complete specifications and descriptive literature for each substitute product;

(d) provides compliance statements that include technical specifics showing the substitute product meets all mandatory performance criteria that are specified in the bid solicitation; and

(e) clearly identifies those areas in the specifications and descriptive literature that support the substitute product's compliance with any mandatory performance criteria.

1.2 Products offered as equivalent in form, fit, function and quality will not be considered if:

(a) the bid fails to provide all the information requested to allow the Contracting Authority to fully evaluate the equivalency of each substitute product; or

(b) the substitute product fails to meet or exceed the mandatory performance criteria specified in the bid solicitation for that item.

1.3 Suppliers are encouraged to offer or suggest green solutions whenever possible.

1.4 In conducting its evaluation of the bids, Canada may, but will have no obligation to, request bidders offering a substitute product to demonstrate, at the sole cost of bidders, that the substitute product is equivalent to the item specified in the bid solicitation.

Section II: Financial Bid

1. Pricing

The Bidders must submit their prices in Annex "A"- Pricing and in accordance with the Basis of Payment identified in PART 6 - RESULTING CONTRACT CLAUSES.

Prices should not be indicated in any other section of the bid.

2. SACC Manual Clauses

2.1 Exchange Rate Fluctuation Risk Mitigation

1. The Bidder may request Canada to assume the risks and benefits of exchange rate fluctuations. If the Bidder claims for an exchange rate adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form PWGSC-TPSGC 450, Claim for Exchange Rate Adjustments with its bid, indicating the Foreign Currency Component (FCC) in Canadian dollars for each line item for which an exchange rate adjustment is required.

2. The FCC is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuations. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.

3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provision in the contract. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease).

4. At time of bidding, the Bidder must complete columns (1) to (4) on form PWGSC-TPSGC 450, for each line item where they want to invoke the exchange rate fluctuation provision. Where bids are evaluated in Canadian dollars, the dollar values provided in column (3) should also be in Canadian dollars, so that the adjustment amount is in the same currency as the payment.

5. Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this exchange rate fluctuation provision.

Section III: Certifications

Bidders must submit the certifications required under PART 5 - CERTIFICATIONS.

Section IV: Additional Information

Canada requests that bidders submit the following information:

1. Delivery

1.1 Firm quantity

The Air Handling Unit system delivery is requested by 30 September 2016, the best delivery that could be offered is:

Item 001 – Quantity one (1) Air Handling Unit system will be delivered within_____ ____ calendar days from the effective date of the contract.

1.2 Manufacturer and Model – (*Bidder to complete)*

Manufacturer: _____ Model: _____

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

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

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

1.1. Technical Evaluation

1.1.1 Bidders must submit, with their bid, the followings documents:

1) Appendix 1 - Evaluation Grid Air Handling Unit;
; and

2) Annex "B" – Air Handling Unit.

1.1.2 Equivalent Products

Bidders proposing substitutes and/or alternatives must provide with their bid all the information requested as detailed in Part 3, ‘’equivalent products’’ to be considered for evaluation.

1.2. Financial Evaluation

1.2.1 The purpose of the financial evaluation is to determine the aggregate price, based on the information submitted in Annex “A” - Pricing.

2. Basis of Selection

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

PART 5 - CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

1. Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the *Ineligibility and Suspension Policy* (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide with its bid the required documentation, as applicable, to be given further consideration in the procurement process.

2. Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

2.1 Integrity Provisions – Required Documentation

In accordance with the *Ineligibility and Suspension Policy, the Bidder must provide the required documentation, as applicable. Consult sections 4.21, 5.16 and 8.70.2 of the Supply Manual for additional information.*

In accordance with the *Ineligibility and Suspension Policy* (http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

2.3 Additional Certifications Precedent to Contract Award

The certifications listed below should be completed and submitted with the bid, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to comply with the request of the Contracting Authority and to provide the certifications within the time frame provided will render the bid non-responsive.

2.3.1 Product Conformance

The Bidder certifies that Air Handling Unit proposed conform, and will continue to conform throughout the duration of the contract, to all technical specifications of the purchase description(s).

This certification does not relieve the bid from meeting all mandatory technical evaluation criteria detailed in Part 4.

_____ _____

Bidder's authorized representative signature Date

2.3.2 General Environmental Criteria Certification

The Bidder must select and complete one of the following two certification statements.

A) The Bidder certifies that the Bidder is registered or meets ISO 14001.

_____ _____

Bidders' Authorized Representative Signature Date

Or

B) The Bidder certifies that the Bidder meets and will continue to meet throughout the duration of the contract, a minimum of four (4) out of six (6) criteria identified in the table below.

The Bidder must indicate which four (4) criteria, as a minimum, are met.

Green Practices within the Bidders' organization	**Insert a checkmark for each criterion that is met**
Promotes a paperless environment through directives, procedures and/or programs	
All documents are printed double sided and in black and white for day to day business activity unless otherwise specified by your client	
Paper used for day to day business activity has a minimum of 30% recycled content and has a sustainable forestry management certification	
Utilizes environmentally preferable inks and purchase remanufactured ink cartridges or ink cartridges that can be returned to the manufacturer for reuse and recycling for day to day business activity.	

Recycling bins for paper, newsprint, plastic and aluminum containers available and emptied regularly in accordance with local recycling program.	
A minimum of 50% of office equipment has an energy efficient certification.	

_____ _____

Bidders' Authorized Representative Signature Date

PART 6 - RESULTING CONTRACT CLAUSES

1. Requirement

The Contractor must deliver the Air Handling Unit system in accordance with Annex "A" – Pricing and Annex "B" – Air Handling Unit.

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual Standard Acquisition Clauses and Conditions Manual (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual)) issued by Public Works and Government Services Canada.

2.1 General Conditions

2010A (2016-04-04) General Conditions - Goods (Medium Complexity), apply to and form part of the contract

2.1.1 Subsection 09 of general conditions 2010A is amendment by replacing the period of twelve (12) months by:

1. Standard Warranty (Canada): The Air Handling Unit equipment manufacturer's warranty must be for a period of 1 year from date of equipment start up, but not more than 18 months from shipment. It must cover replacement parts having proven defective within the above period.
2. 1st Year Labor Warranty: Included

All other provisions of the warranty section remain in effect.

3. Term of Contract

3.1 Delivery of the Air Handling Unit

3.1.1 **Firm Quantity**

Delivery of the Air Handling Unit system must be made as follows:

Item 001 – Quantity one (1) Air Handling Unit system must be delivered on or before _____. (Date to be inserted by PWGSC at time of contract award.)

Item 002 – Quantity one (1) Installation assistance and Start up service/commission and training must be carried out within 2 months after delivery of Item 001.

4. Authorities

4.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Neil Pearson
Title: Supply Specialist
Organization: Public Service and Procurement Canada - Acquisitions Branch
LEFT Directorate, HP Division,
7A2, Place du Portage, Phase 3, 11 Laurier Street, Gatineau Quebec, K1A 0S5
Telephone: 873-469-3312
Facsimile: 819 953-2953
E-mail: neil.pearson@tpsgc-pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

4.2 Procurement Authority

The Procurement Authority for the Contract is:

Name: _____ (To be inserted by PWGSC at time of contract award.)
Title: _____
Organization: _____
_____
_____
_____
Telephone: ___-___-____
Facsimile: ___-___-____
E-mail: _____

The Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The Procurement Authority is responsible for the implementation of tools and processes required for the

administration of the Contract. The Contractor may discuss administrative matters identified in the Contract with the Procurement Authority however the Procurement Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

4.3 Contractor's Representative

Name and telephone number of the person responsible for:

General enquiries:

Name: _____ (To be completed by the bidder.)
Title: _____
Telephone: ___-___-____
Facsimile: ___-___-____
E-mail: _____

Delivery follow-up:

Name: _____ (To be completed by the bidder.)
Title: _____
Telephone: ___-___-____
Facsimile: ___-___-____
E-mail: _____

5. Payment

5.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid the firm unit price(s) specified in Annex "A" - Pricing, and as follows:

Basis of Payment (BOP) Type 1:	Firm unit prices in Canadian dollars, Delivered Duty Paid at destination, Incoterms 2000, including Canadian Custom Duties and Excise Taxes included where applicable, and applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

5.2 SACC Manual Clauses

H1001C Multiple Payments 2008-05-12

5.3 Exchange Rate Fluctuation Adjustment

5.1.1 The foreign currency component (FCC) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuation. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.

5.1.2 For each line item where a FCC is identified, Canada assumes the risks and benefits for exchange rate fluctuation, as shown in the Basis of Payment. For such items, the exchange rate fluctuation amount is determined in accordance with the provision of this clause.

5.3.3 The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provisions in the contract. The exchange rate adjustment amount will be calculated in accordance with the following formula:

$$Adjustment = FCC \times Qty \times (i_1 - i_0) / i_0$$

where formula variables correspond to:

FCC

Foreign Currency Component (per unit)

i_0

Initial exchange rate (CAN$ per unit of foreign currency [e.g. US$1])

i_1

exchange rate for adjustments (CAN$ per unit of foreign currency [e.g. US$1])

Qty

quantity of units

5.3.4 The initial exchange rate is typically set as the noon rate as published by the Bank of Canada on the solicitation closing date.

5.3.5 For goods, the exchange rate for adjustment will be the noon rate as published by the Bank of Canada on the date the goods were delivered. For services, the exchange rate for adjustment will be the noon rate on the last business day of the month for which the services were performed. For advance payments, the

exchange rate for adjustment will be the noon rate on the date the payment was due. The most recent noon rate will be used for non-business days.

5.3.6 The Contractor must indicate the total exchange rate adjustment amount (either upward, downward or no change) as a separate item on each invoice or claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their invoice form PWGSC-TPSGC 450, Claim for Exchange Rate Adjustments.

5.3.7 The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease), calculated in accordance with column 8 of form PWGSC-TPSGC 450 (i.e [i_1 - i_0) / i_0]).

5.3.8 Canada reserves the right to audit any revision to costs and prices under this clause.

6. Invoicing Instructions

6.1 The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed. Suppliers are requested to provide invoices in electronic format unless otherwise specified by the Contracting Authority or Project Authority, thereby reducing printed material.

Invoices must be distributed as follows:

(a) The original and one (1) copy must be forwarded to the following address for certification and payment.

Industry Canada
Communications Research Centre
3701 Carling Ave
PO Box 11490 Station H
Ottawa, ON K2H 8S2

(b) One (1) copy must be forwarded to the Contracting Authority identified under section 4. Authorities of the Contract.

7. Certifications

7.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

8. Applicable Laws

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

9. Priority of Documents

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

(a) the Articles of Agreement;
(b) 2010A (2016-04-04) General Conditions - Goods (Medium Complexity);
(c) Annex “A” - Pricing;
(d) Annex “B” – Air Handling Unit
(e) Appendix 1 –Evaluation Grid - Air Handling Unit
(f) the Contractor's bid dated _____.

10. SACC Manual Clauses

A1009C	Work Site Access	2008-05-12
G1005C	Insurance	2016-01-28

11. Inspection and Acceptance

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

12. Preparation for Delivery

The equipment must be serviced, adjusted and delivered in condition for immediate use. The equipment must be cleaned before leaving the factory and being released to "Industry Canada " personnel at the final delivery location.

Any attempt by the carrier to deliver the equipment will be refused unless arrangements have been made for authorized, qualified personnel to be available to perform inspections and to accept the delivery. When the carrier is required to return due to its failure to make an appointment for delivery, Canada will not be liable to pay for additional costs.

13. Delivery and Handling

Air Handling Unit must arrive as single, fully assembled and wired components, on a flatbed trailer. The Sub-Structure support and hardware must be shipped on a separate pallet on the same trailer.

Upon arrival of Air Handling Unit (prior to any lifting operation), the unit must be inspected on the truck by the Department Representative for general acceptance. Any items of concern related to damage or lifting operations shall be documented and reported (in writing) to the manufacturer's representative.

Air Handling Unit will be temporarily placed and stored on the ground prior to its final installation. Upon delivery to the designated site, provide suitable pressure treated wood sleepers for equipment placing and storage on the flat surface. Provide heavy duty cover. Cover shall not trap any moisture and be adequately secured to stay in place in any weather/wind conditions. Prior to preparing material for storage prepare inventory list and digital record of off-loaded equipment.

Prior to lifting and off loading Air Handling Unit all possible excess water should be removed from the unit.

14. Shipping Instructions

The Contractor must ship the goods prepaid DDP - Delivered Duty Paid (as detailed in Annex ‘’A’’- Pricing). Unless otherwise directed, delivery must be made by the most economical means. The Contractor is responsible for all delivery charges, administration, costs and risks of transport and customs clearance, including the payment of customs duties and taxes.

Item 001 - the contact person for delivery is: _____ **(to be inserted by PWGSC at time of contract award)**.

15. Packaging

The methods used for preservation and packaging must be in conformity with the contractor's normal standard for domestic shipment or, if necessary, with standards for overseas shipment as below deck cargo.

16. Material

Material supplied must be new, unused by manufacturer.

ANNEX "A" – PRICING

Item 001 Air Handling Unit System

The Contractor must deliver the equipment including all deliverables in accordance with the attached Annex ''B'' – Air Handling Unit.

The Air Handling Unit system and related items must be delivered to:

Industry Canada
Communications Research Centre
3701 Carling Ave
PO Box 11490 Station H
Ottawa, Ontario

Delivery contact: _____ (Name to be inserted by PWGSC at time of contract award.)

Date of delivery: _____ (Date to be inserted by PWGSC at time of contract award.)

Firm Lot price of $ _____ for Air Handling Unit system including all related Items, in accordance with Basis of Payment Type 1 (as detailed at Clause 5.1 Basis of Payment).

Manufacturer and Model – (to be inserted by PWGSC at time of contract award.)

Manufacturer: _____ Model: _____

Quantity: One (1)

Item 002 Installation Assistance and Start up Service/ Commission and Training

The Contractor must carry out Installation assistance and Start up service/commission and training in accordance with the attached Annex "B" - Air Handling Unit

Firm unit price of $_____ per Installation assistance and Start up Service/Commission and training in accordance with Basis of Payment Type 1 (as detailed at Clause 5.1 Basis of Payment).

Quantity: One (1)

1.1 **Administrative**

.1 Submit to Departmental Representative submittals listed for review. Submit COMPLETE set of shop drawings and data with bid submission. To assure objectivity and impartiality in reviewing the technical aspects of the submission all submission will be reviewed without knowledge of the price submitted.

.2 Verify product dimmensions vs. field measurements and affected adjacent Work area.

.3 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.Failure to submitt complete set of documents will cause of the bid submission to be disqualify.

.4 Do not proceed with fabrication affected by submittal until review is complete.

.5 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.6 Where items or information is not produced in SI Metric units converted values are acceptable.

1.2 Shop Drawings and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price.

.4 Make changes in shop drawings as Departmental Representative may require. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.5 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of each shop drawing, product data and sample.
.5 Other pertinent data.

.6 Submissions include:

.1 Date and revision dates.
.2 Project title and number.
.3 Name and address of:.
.1 Supplier.
.2 Manufacturer.
.4 Identification of submission by Section and specific element of Work.
.5 Stamp, signed by authorized representative certifying approval of submissions, verification of field measurements and compliance with Documents.
.6 Details of appropriate portions of Work as applicable:
.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

.7 All Data to be job specific.

.8 Delete information not applicable to project.

.9 Maintain blank area 75 mm x 75 mm for Departmental Representative's review stamp and comments.

.10 Ensure submissions are capable of being copied or faxed without loss of legibility or detail.

1.3 References

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.4 Quality

.4 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 Submittals

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Departmental Representative's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Within two weeks after unit delivery submit to the Departmental Representative, six final copies of operating and maintenance manuals in English and French.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 Furnish evidence, if requested, for type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

1.6 Maintenance Manual

.8 Organize data as instructional manual.

.9 Provide drawing information on CD in dxf, dwg and pdf file formats.

1.7 Contents Each Volume

.1 Table of Contents: provide title of project;

.2 Date of submission; names.

.3 Addresses, and telephone numbers of Departmental Representative and Contractor with name of responsible parties.

.4 Schedule of products and systems, indexed to content of volume.

.10 For each product or system:
List names, addresses and telephone numbers of

.2 For each product or system:
List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturers.

1.8 Equipment and Systems

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.3 Include manufacturer's printed operation and maintenance instructions.

.4 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.5 Include test reports in Maintenance Manual folder.

.6 Additional requirements: as specified in individual specification sections.

1.9 Materials and Finishes

.1 Building Products and Applied Materials: include product data, with catalogue number, size, composition, and color designations. Provide information for re-ordering custom manufactured products.

.2 Additional Requirements: as specified in individual specifications sections.

1.10 References

.1 American Gas Association (AGA)

.2 American National Standards Institute/Air-Conditioning, Heating and Refrigeration Institute (ANSI/AHRI)

.1 ANSI/AHRI 210/240-08, Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment.

.2 ANSI/AHRI 270-08, Sound Rating of Outdoor Unitary Equipment.

.3 CSA Group

.1 CSA B52-13, Mechanical Refrigeration Code.

.2 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.

.4 National Fire Protection Association (NFPA)

.1 NFPA (Fire) 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, 2015 Edition.

.5 Underwriters Laboratories (UL)

.1 UL 1995-2015, Standard for Heating and Cooling Equipment.

1.11 Submittals

Shop Drawings:

.2 Submit shop drawings to indicate materials, finishes, method of anchorage, number of anchors, dimensions construction and assembly details, manufacturer's installation instructions and associate accessories.

.3 Drawings to indicate project specific layout:

.1 Equipment, ductwork and piping connections location and sizes.

.2 Equipment shipped loose showing final location in assembly.

.3 Control equipment shipped loose, showing final location in assembly.

.4 Dimensions, internal and external construction details, recommended method

of installation with proposed structural steel support, mounting curb details, sizes and location of mounting bolt holes; include mass distribution drawings showing point loads.

.5 Detailed composite wiring diagrams for control systems showing factory installed wiring and equipment on packaged equipment or required for controlling devices of ancillaries, accessories, controllers.

.6 Fan performance curves.

.7 Details of vibration isolation.

.8 Estimate of sound levels to be expected across individual octave bands in dB referred to A rating.

.9 Type of refrigerant used.

.10 Drawing of unit "Lift Rigging" recommendations showing proper sizing of spreader bar, locations of pre-installed lifting brackets, and final leveling instructions.

1.12 PRODUCTS

.1 Roof mounted, self-contained single zone unit with gas burner and DX refrigeration and bear label of CSA,CGA,FM,UL and ULC.

.2 The air handling units and major components shall be products of manufacturers regularly engaged in the production of such equipment and with a minimum of five (5) continuous years of proven production.

.3 Substitution of any product other than that specified must ensure no deviation below the stated capacities, air flow rate, heat transfer rate, filtration efficiency and air mixing quality. Power requirements must not be exceeded, and where specifically defined, sound power levels must not be exceeded. Applications for "equal" or "alternate" must address these factors.

.4 Unless stated otherwise, air-handling units are to be shipped to the job in one piece, factory assembled. Modular units assembled achieve a close approximation to the intent of this specification will not be considered equal. All equipment shall where specified and applicable, be pre-wired, and factory certified by an approved testing agency such as CETL, ETLUS, UL, CSA prior to shipment.

.5 Pre-wired air handling units shall bear an approved label with all the necessary identification marks, electrical data.

.a Unit must conform to regulations set out in the Canadian Energy Efficiency conditioners (condensing units). Packaged units shall be tested to CSA Standard C746-98 and must bear an EEV (energy efficiency verification) label provided by CSA. "Where specified as factory packaged air conditioning unit, factory assembled split systems do not conform to the Canadian Energy Efficiency Act and will not be considered."

.6 All electrical circuits shall undergo a dielectric strength test, and shall be factory tested and checked as to proper function.

.7 Units to consist of cabinet and frame, supply fan, return fan heat exchanger, burner with integral induced draft fan, heater control, air filter, refrigerant cooling coil, compressor, condenser coil and fans, motorized outside air damper, return damper, motorized gravity exhaust damper.

.8 Prefabricated roof curb to conform to requirements of National Roofing Contractors Association (NRCA), minimum height 450 mm.

.9 Conform to ANSI/AHRI 210/240, rating for unit larger than 40 kW nominal.

1.13 Cabinet

.1 Cabinets: weatherproofing tested and certified to AGA rain test standards and soundproofing tested to AHRI 270.

.2 Unit casing shall be of minimum 18 gauge (1.3mm) satin coat galvanized sheet metal. Surfaces shall be cleaned with a degreasing solvent to remove oil and metal oxides and primed with a two-part acid based etching primer. Finish coat shall be electro-statically applied enamel, to all exposed surfaces. All unprotected metal and welds shall be factory coated. 16ga floor checker plate.

.3 Provide a 22 gauge (.85mm) solid galvanized metal liner over the entire interior of the unit.

.4 Units shall be provided with access doors to the following components: fans and motors, filters, dampers and operators, access plenums and humidifiers/wet cells, electrical control panels, burner compressor compartments. Access doors shall be large enough for easy access. Removal of screwed panels will not be acceptable.

.5 Units shall be provided with hinged access doors, with e-profile gasket, fully lined, and a minimum of two lever handles, operable from both sides for all units.

.6 Unit shall be internally insulated with 51mm thick 24 kg./cu.m. density insulation.

.7 Provide a 600mm access plenum prior to filters to allow for face loading filters.

.8 Provide a discharge a plenum at a minimum of 1000mm long.

.9 Cooling coil drain pans shall be fabricated of stainless steel and are an integral part of the floor paneling, a minimum of 51mm deep, with welded corners. Drain pans shall extend a minimum of 152mm downstream of coil face and be provided with a 38mm S.S. M.P.T. drain connection. Drain pans must have a fast pan and be sloped and pitched such that there is no standing water. Intermediate fast pans shall be provided between cooling coils where required for effective moisture removal.

.10 Air handling units shall be weatherproofed and equipped for installation outdoors. This shall include generally for the prevention of infiltration of rain and snow into the unit, louvers or hoods on air intakes and exhaust openings with 25mm galvanized inlet screens; rain gutters or diverters over all access doors; all joints caulked with a water resistant sealant; roof joints turned up 51mm with three break interlocking design; outer wall panels extend a minimum of 6mm below the floor panel; drain trap(s) connections for field supply and installation of drain traps.

.11 The unit base frame shall match the existing curb without the use of curb adapters. The base frame shall be constructed in order to sit on existing curb. Where the unit does not cover provide 16ga checker plate.

.12 The supply air plenum shall match the existing opening and be provided with walk over grating.

.13 Supplier to conduct site survey of existing unit and existing ductwork and building openings for ductwork penetrations. New unit has to match exactly site conditions and be set in place with minor modifications to the building structure and existing mechanical infrastructure.

1.14 Fans

.1 Centrifugal fans shall be rated in accordance with AMCA Standard Test Code, Bulletin 210. Fan manufacturer shall be a member of AMCA. All fans and fan assemblies shall be dynamically balanced during factory test run. Fan shafts shall be selected for stable operation at least 20% below the first critical RPM. Fan shafts shall be provided with a rust inhibiting coating.

.2 All other forward curved fan assemblies shall be equipped with greaseable pillow block bearings, supported on a rigid structural steel frame. Return fan shall be a forward curved assembly.

.3 Supply fan shall be an airfoil and/or BI fans shall be equipped with greaseable, self-aligning ball or roller type pillow block bearings.

.4 Provide full section return air fans as scheduled. The use of power exhaust propeller or centrifugal fan arrangements will not be considered.

.a Provide variable air volume fan control for units adjustable frequency drive shall be mounted in a NEMA 1 enclosure and shall be labelled by an approved testing agency such as UL.

.a1 Sine wave carrier input, PWM output. IGBT transistors. Adjustable acceleration and deceleration timing.

a2 Keypad to be removable, with alphanumeric display able to provide output status monitoring, output frequency, output voltage, output RPM, and output current. Include fault log display with capacity for the recent 30 faults with a time stamp. Diagnostic display menus to include reference speed command, heat sink

temp, bus voltage, active I/O command status, time from power up, and current setting.

.a3 Unit mounted manual VFD bypass switch locks out VFD, fan runs on maximum set volume. Bypass switch and all interlock contacts are factory mounted and pre-wired.

.a4 Line and load reactors required for all 460 and 575 volt applications.

.a5 Drive shall be factory supplied and installed.

.a6 Minimum CFM of 35% on DX, gas fired heat exchangers, and electric heat systems.

.5 Provide OSHA compliant belt guards on all units with walk in sections over 1524 mm high.

.6 Fan-motor assemblies shall be provided with vibration isolators. Isolators shall be bolted to steel channel welded to unit floor, which is welded to the structural frame of the unit. Provide seismic restraint type isolators containing compressed spring. Use of separate bumper or snubber is not acceptable. Fans shall be attached to the discharge panel by a polyvinyl chloride coated polyester woven fabric, with a sealed double locking fabric to metal connection.

.7 Provide single extended grease line from far side to access side bearing.

1.15 Air Filters

.1 Filter sections shall be provided with adequately sized access doors to allow easy removal of filters. Filter removal shall be from one side.

.2 50mm Pleated Panel Disposable Filters: An optimum blend of natural and synthetic fibre media with a rust resistant support grid and high-wet strength beverage board enclosing frame with diagonal support members bonded the air entering and air exiting side of each pleat. The filter media shall have a minimum efficiency of 30-35% on ASHRAE Standard 52.1-92, and a minimum of MERV 8 per ASHRAE 52.2. Rated U.L. Class 2.

.3 For units with filter banks up 1825m high, the filter modules shall be designed to slide out of the unit. Side removal 25mm or 50mm filters shall slide into a formed metal track, sealing against metal spacers at each end of the track.

.4 Final filters shall be 150mm filter media shall have an average efficiency of 90 95% on ASHRAE 52.1-92 and a MERV 14 when tested under ASHRAE 52.2

.5 Provide filter bank with "Dwyer 2000 magnehelic" air filter gauge complete with static pressure tips and aluminum tubing all factory installed. Filter gauge to have a range of 0-500 Pa.

.6 Where the filter gauges are provided on outdoor units they shall be mounted inside of a weatherproof enclosure with viewing window.

1.16 Heat Exchangers and Burners

.1 Heating unit shall be indirect natural gas fired approved for both sea level and high altitude areas. The entire package, including damper controls, fan controls, and all other miscellaneous controls and accessories shall be approved by an independent testing authority and carry the approval label of that authority as a complete operating package.

.a All units must exceed the ASHRAE 90.1 requirement of steady state efficiency at low fire operation.

.b Operating natural gas pressure at units manifold shall be 1750 Pa.

.c Optional gas manifolds shall be provided to FM standards.

.d Gas fired units shall be approved for operation in -40°C locations.

.2 Heat Exchanger/Burner Assembly:

.a Heat exchanger shall be a primary drum and multi-tube secondary constructed of titanium stainless steel with multi-plane metal turbulators and shall be of a floating stress relieved design. Heat exchanger shall be provided with condensate drain connection. The heat exchanger casing shall have 25mm of insulation between the outer cabinet and inner heat reflective galvanized steel liner. Blower location shall be engineered to improve the required air flow pattern around the heat exchanger. Using duct type furnaces and closed coupled blowers are not acceptable.

.b The heat exchanger/burner assembly shall be a blow through positive pressure type. Units incorporating the DJM module shall have an interrupted pilot ignition system to provide increased safety. Units using continuous or intermittent pilots are not acceptable.

.c Multiple heat exchangers or tube style heat exchangers with in-shot burners are not acceptable.

.d Flame surveillance shall be from the main flame after ignition not the pilot flame. The burner and gas train shall be in a cabinet enclosure. Atmospheric burners or burners requiring power assisted venting are not acceptable.

.e The heat exchanger/burner assembly shall include 15:1 turn down for all input ranges from 29.3 kW to 410 kW. The high turn down heat exchanger/burner assembly minimum input shall be capable of controlling 6.7% of its rated input, excluding the pilot assembly, without on/off cycling and include built in electronic linearization of fuel and combustion air. Efficiency shall increase from high to low fire.

1.17 Dampers

.1 Damper frames shall be U-shaped galvanized metal sections securely screwed or welded to the air handling unit chassis. Pivot rods of 13mm aluminum shall turn in nylon or bronze bushings. Rods shall be secured to the blade by means of straps and set screws.

.2 Blades shall be 18 gauge (1.3mm) galvanized metal with two breaks on each edge and three breaks on centerline for rigidity. The pivot rod shall "nest" in the centerline break. Damper edges shall interlock. Maximum length of damper between supports shall be 1219 mm. Damper linkage brackets shall be constructed of galvanized metal.

.3 Dampers shall be extruded aluminum low leak air foil Tamco Series 1000.

.4 Mixing dampers shall be parallel blade type.

.5 Gravity relief dampers shall be single blade gasketed design.

1.18 Refrigeration

.1 Conform to CSA B52 and UL 1995 requirements.

.2 Compressor/Condenser Section:

.a Packaged units shall be CETL, ETLUS approved and operate down to 50°F(10°C) as standard. Where applicable, multiple refrigeration circuits shall be separate from each other. Refrigeration circuits shall be complete with liquid line filter-driers, and service ports fitted with Schraeder fittings. Units with over 6 Ton hermetic compressors and all units with semi-hermetic compressors shall also incorporate load compensated thermal expansion valves with external equalizers and combination sight glass moisture indicators. The complete piping system shall be purged and pressure tested with dry nitrogen, then tested again under vacuum. Each system shall be factory run and adjusted prior to shipment.

.b Controls for hermetic compressor units shall include compressor and condenser fan motor contactors, supply fan contactors and overload protection, control circuit transformer, cooling relays, ambient compressor lockout, automatic reset low pressure controls, and manual reset high pressure controls on compressors over 6 tons. Head pressure actuated fan cycling control shall be provided on all multiple condenser fan units.

.c Fans: propeller type with single piece spun venturi outlets and zinc plated guards. Motors: sequenced for head pressure control.

.d Electrical system: complete with operating controls, oil and refrigerant pressure protection, motor overload protection, weatherproof electrical wiring with weatherproof, rain tight disconnect.

.e Include refrigerant piping with automatic hot gas bypass, sight glass, filter and valves.

.f Condenser: staggered copper tube aluminum fin coil assembly.

.g Capacity reduction: Provide hot gas bypass on the lead compressor to maintain adequate suction pressure in the event of low loads.
.h Refrigerant: 410-A.
.i Provide a minimum of 4 compressors, individually circuited.
.j Compressors shall be located on the side of the unit in a service enclosure complete with hinged access doors c/w leverlok handles for ease of service. Enclosure shall include 50mm acoustical insulation.

.3 Evaporator:
.a Rated to ANSI/AHRI 210/240.
.b Thermostatic expansion valve, with adjustable super heat and external equalizer
.c Coil: NPS 1/2 o.d. staggered seamless copper tubes expanded into aluminum fins and insulated condensation pan.

.d Cooling coil condensate drain pans: designed to avoid standing water, easily cleaned or removable for cleaning. Drain connection: deep seal trap complete with trap seal primer.

1.19 Controls

.1 General:
.a All control for Air handling Unit shall be design for standalone operation and third party BAS interface utilizing BACnet - (Data Communication Protocol for Building Automation and Control Networks).
.b The controller shall automatically start in heating, economizer or cooling mode based on continuously monitored ambient temperature and load requirements.
.c The controller shall include an adjustable low limit set point for freeze protection to cease equipment operation in the event of low discharge temperature. If the discharge air temperature falls below the adjusted set point, the blowers will shut down and the outside air dampers shall close. The low limit bypass timer shall vary automatically depending on the thermal coefficient of the style of heat exchanger.

.d If the discharge air temperature approaches the low limit set point, the controller shall automatically reduce the economizer minimum fresh air down to half of its original setting to compensate.

.e As the ambient temperature falls, the controller shall automatically compensate for outside air thermal expansion by proportionally reducing the amount of outside air.

.f The electronic temperature control system shall provide up to 5 stages of mechanical cooling control (4 compressors and economizer) to maintain discharge temperature. The minimum run and off time for the compressors shall be variable based on load requirements.

.g When in heating mode, the controller shall provide a signal to the programmed logic heating controller.

.h Heating controller general:

.a1 Electronic control heating 'M' module (Modulating Fuel with Modulating Combustion Air) complete with proportional and integral control with discharge air sensor to maintain set point temperature and provide rapid response to incremental changes in discharge air temperature. Combustion air motor speed varies proportionally in response to the modulation of gas flow to provide optimum fuel/air mixture and efficiency at all conditions. Combustion blower RPM shall be proved using a hall effect speed sensor. Two speed or step speed combustion blowers are not acceptable.

.a2 Combustion efficiency of high efficiency heat exchangers shall increase by 1% to 3% from high fire to low fire while turning down on units incorporating 15:1 turn down (HT Burner). Heat exchangers shall provide a minimum of 80% efficiency throughout the entire operating range.

.a3 Alternate manufacturers units that do not incorporate a variable speed combustion air blower shall have a modulating gas valve and a combustion air damper with a linear linkage connected to an actuator which has a minimum of 100 steps of control.

.4 Controllers for heating units shall include the following standard features:

.a Service analyzer with diagnostic lights for ease of set-up and service.

.b Linear gas and combustion air flow obtained via a built in solid-state linear algorithm.

.c 40°C minimum operating ambient temperature.
.d Four air change pre-purges on units with over 117kW input.
.e Maintained purge to decrease temperature cycles.
.f Post purge.
.g Interrupted pilot.
.h Self check procedure on start-up to make sure air proving and discharge air sensors are operating within design tolerances.
.i Low fire start.
.j Controlled burner start-up and shut down.
.k Blower contactor that starts fan after burner pre-purge.
.l Economizer enable control.
.m Damper contact that allows fan to start after damper opens, damper to close after fan stops, and damper to close on flame failure.
.n Non-recycling auto by-pass low limit with alarm contacts and built-in sensor checking.
.o Built-in alternate blower and damper functions and set back temperatures for unoccupied mode operation using a single room thermostat.
.p Separate gas and air actuators independently controlled to give the correct air to fuel ratio though out the entire firing range.

.5 Heating control function shall be modulating discharge air with 0-10VDC, BMS reset. Minimum discharge air set point is 10°C if BMS control signal fails.

.6 Discharge air sensor shall be field mounted in supply ductwork by installing contractor.

.7 Volume compensation (VAV only):

.a The controller shall automatically increase the minimum position of the outside air dampers to compensate for the required minimum volume of fresh air as the VAV (Variable Air Volume) system reduces the total volume of air. The economizer function shall be disabled to minimum position if the ambient temperature rises above a predetermined set point.

.b Variable air volume (load shedding) the controller shall automatically compensate the internal control algorithms when a change in air volume from the supply blower variable air volume dampers occurs for improved temperature control.

1.20 Factory Supplied Controls and Wiring

.1 Provide a system of motor control, including all necessary terminal blocks, motor overload protection, grounding lugs, control transformers, auxiliary contactors and terminals for the connection of external control devices or relays.

.2 Gas fired units shall also include high limit and combustion airflow switch.

.3 Fire alarm circuits shall be powered from a relay in unit circuitry.

.4 Factory installed and wired non-fused disconnect switch in CEMA/NEMA configuration, or disconnect with integral door closure mounted on face of control panel.

.5 Automatic controls shall be housed in a panel mounted in or on the air handling unit, which will meet that standard of the specific installations.

.6 Service receptacles powered from unit power supply. Unit to be single point power connection wired in such a way that the main unit disconnect can be off and the receptacle will still be energized. Provide transformers as required.

1.21 Capacity

HVAC (rooftop) Unit Schedule

Tag	Unit	Duty	Supply Fan Air flow L/s *	Return Fan Air flow L/s **	ESP	Htg Capacity ***	Clg Capacity ****	SA Fan Motor	RA Fan Motor	EI Service	Amps MCC	Max Breaker	Notes
RTU-1	Rooftop A/C	Main	7580	7580	498 Pa	190 kW input 152 kW out	137 kW	20HP	10 Hp	600V 3ph	95.6 A	110 A	Refrigerant R-410A VAV system

* BAE-DW fan VFD motor
** FC DIDW fan VFD motor
*** Temperature rise 30 deg 15:1 turndown
**** Based on EAT 80/67 (DB/WB) LAT 57.9/57.3

1.22 Standard of Acceptance

.1 Any Submitted proposal must meet all construction details listed within this specification.

.2 Any Submitted proposal must meet all Thermal Performance details listed in this specification.

.3 Any Submitted proposal must fit, and not to exceed field dimensions.

1.23 Installation Assistance

.1 Provide all required supports, rigging and secured means of sufficient weather protection.

.2 Include in the price and provide representative of manufacturer for installation supervision and start up. Allow for 4(four) 8hr visits.

.3 Include in the price and provide representative of manufacturer for Owner training. Train Owner's maintenance personnel to operate and maintain Air Handling Unit and controls including:

- .a Starting and Stopping of Fan Motors
- .b Sequence of Operation
- .c Troubleshooting and Servicing
- .d Routine Maintenance
- .e Schedule training with Owner, allow for 2(two) 4hr visits.

1.12 PRODUCTS

.1 Roof mounted, self-contained single zone unit with gas burner and DX refrigeration and bear label of CSA, CGA, FM, UL and ULC. Yes___No___

.2 The air handling units and major components shall be products of manufacturers regularly engaged in the production of such equipment and with a minimum of five (5) continuous years of proven production. Yes___No___

.3 Substitution of any product other than that specified must ensure no deviation below the stated capacities, air flow rate, heat transfer rate, filtration efficiency and air mixing quality. Power requirements must not be exceeded, and where specifically defined, sound power levels must not be exceeded. Applications for "equal" or "alternate" must address these factors. Yes___No___

.4 Unless stated otherwise, air-handling units are to be shipped to the job in one piece, factory assembled. Modular units assembled achieve a close approximation to the intent of this specification will not be considered equal. All equipment shall where specified and applicable, be pre-wired, and factory certified by an approved testing agency such as CETL, ETLUS, UL, CSA prior to shipment. Yes___No___

.5 Pre-wired air handling units shall bear an approved label with all the necessary identification marks, electrical data. Yes___No___

.a Unit must conform to regulations set out in the Canadian Energy Efficiency conditioners (condensing units). Packaged units shall be tested to CSA Standard C746-98 and must bear an EEV (energy efficiency verification) label provided by CSA. "Where specified as factory packaged air conditioning unit, factory assembled split systems do not conform to the Canadian Energy Efficiency Act and will not be considered." Yes___No___

.6 All electrical circuits shall undergo a dielectric strength test, and shall be factory tested and checked as to proper function. Yes___No___

.7 Units to consist of cabinet and frame, supply fan, return fan heat exchanger, burner with integral induced draft fan, heater control, air filter, refrigerant cooling coil, compressor, condenser coil and fans, motorized outside air damper, return damper, motorized gravity exhaust damper. Yes___No___

.8 Prefabricated roof curb to conform to requirements of National Roofing Contractors Association (NRCA), minimum height 450 mm. Yes___No___

.9 Conform to ANSI/AHRI 210/240, rating for unit larger than 40 kW nominal. Yes___No___

1.13 Cabinet

.1 Cabinets: weatherproofing tested and certified to AGA rain test standards and soundproofing tested to AHRI 270. Yes___No___

.2 Unit casing shall be of minimum 18 gauge (1.3mm) satin coat galvanized sheet metal. Surfaces shall be cleaned with a degreasing solvent to remove oil and metal oxides and primed with a two-part acid based etching primer. Finish coat shall be electro-statically applied enamel, to all exposed surfaces. All unprotected metal and welds shall be factory coated. 16ga floor checker plate. Yes___No___

.3 Provide a 22 gauge (.85mm) solid galvanized metal liner over the entire interior of the unit. Yes___No___

.4 Units shall be provided with access doors to the following components: fans and motors, filters, dampers and operators, access plenums and humidifiers/wet cells, electrical control panels, burner compressor compartments. Access doors shall be large enough for easy access. Removal of screwed panels will not be acceptable. Yes___No___

.5 Units shall be provided with hinged access doors, with e-profile gasket, fully lined, and a minimum of two lever handles, operable from both sides for all units. Yes___No___

.6 Unit shall be internally insulated with 51mm thick 24 kg./cu.m. density insulation. Yes___No___

.7 Provide a 600mm access plenum prior to filters to allow for face loading filters. Yes___No___

.8 Provide a discharge a plenum at a minimum of 1000mm long. Yes___No___

.9 Cooling coil drain pans shall be fabricated of stainless steel and are an integral part of the floor paneling, a minimum of 51mm deep, with welded corners. Drain pans shall extend a minimum of 152mm downstream of coil face and be provided with a 38mm S.S. M.P.T. drain connection. Drain pans must have a fast pan and be sloped and pitched such that there is no standing water. Intermediate fast pans shall be provided between cooling coils where required for effective moisture removal. Yes___No___

.10 Air handling units shall be weatherproofed and

equipped for installation outdoors. This shall includegenerally for the prevention of infiltration of rain and snow into the unit, louvers or hoods on air intakes and exhaust openings with 25mm galvanized inlet screens; rain gutters or diverters over all access doors; all joints caulked with a water resistant sealant; roof joints turned up 51mm with three break interlocking design; outer wall panels extend a minimum of 6mm below the floor panel; drain trap(s) connections for field supply and installation of drain traps. Yes___No___

.11 The unit base frame shall match the existing curb without the use of curb adapters. The base frame shall be constructed in order to sit on existing curb. Where the unit does not cover provide 16ga checker plate. Yes___No___

.12 The supply air plenum shall match the existing opening and be provided with walk over grating. Yes___No___

.13 Supplier to conduct site survey of existing unit and existing ductwork and building openings for ductwork penetrations. New unit has to match exactly site conditions and be set in place with minor modifications to the building structure and existing mechanical infrastructure. Yes___No___

1.14 Fans

.1 Centrifugal fans shall be rated in accordance with AMCA Standard Test Code, Bulletin 210. Fan manufacturer shall be a member of AMCA. All fans and fan assemblies shall be dynamically balanced during factory test run. Fan shafts shall be selected for stable operation at least 20% below the first critical RPM. Fan shafts shall be provided with a rust inhibiting coating. Yes___No___

.2 All other forward curved fan assemblies shall be equipped with greaseable pillow block bearings, supported on a rigid structural steel frame. Return fan shall be a forward curved assembly. Yes___No___

.3 Supply fan shall be an airfoil and/or BI fans shall be equipped with greaseable, self-aligning ball or roller type pillow block bearings. Yes___No___

.4 Provide full section return air fans as scheduled. The use of power exhaust propeller or centrifugal fan arrangements will not be considered. Yes___No___

.a Provide variable air volume fan control for units adjustable frequency drive shall be mounted in a NEMA 1 enclosure and shall be labelled by an approved testing agency such as UL. Yes___No___

.a1 Sine wave carrier input, PWM output. IGBT transistors. Adjustable acceleration and deceleration timing. Yes___No___

a2 Keypad to be removable, with alphanumeric display able to provide output status monitoring, output frequency, output voltage, output RPM, and output current. Include fault log display with capacity for the recent 30 faults with a time stamp. Diagnostic display menus to include reference speed command, heat sink temp, bus voltage, active I/O command status, time from power up, and current setting. Yes___No___

.a3 Unit mounted manual VFD bypass switch locks out VFD, fan runs on maximum set volume. Bypass switch and all interlock contacts are factory mounted and pre-wired. Yes___No___

.a4 Line and load reactors required for all 460 and 575 volt applications. Yes___No___

.a5 Drive shall be factory supplied and installed. Yes___No___

.a6 Minimum CFM of 35% on DX, gas fired heat exchangers, and electric heat systems. Yes___No___

.5 Provide OSHA compliant belt guards on all units with walk in sections over 1524 mm high. Yes___No___

.6 Fan-motor assemblies shall be provided with vibration isolators. Isolators shall be bolted to steel channel welded to unit floor, which is welded to the structural frame of the unit. Provide seismic restraint type isolators containing compressed spring. Use of separate bumper or snubber is not acceptable. Fans shall be attached to the discharge panel by a polyvinyl chloride coated polyester woven fabric, with a sealed double locking fabric to metal connection. Yes___No___

.7 Provide single extended grease line from far side to

access side bearing.
Yes___No___

1.15 Air Filters

.1 Filter sections shall be provided with adequately sized access doors to allow easy removal of filters. Filter removal shall be from one side. Yes___No___

.2 50mm Pleated Panel Disposable Filters: An optimum blend of natural and synthetic fibre media with a rust resistant support grid and high-wet strength beverage board enclosing frame with diagonal support members bonded the air entering and air exiting side of each pleat. The filter media shall have a minimum efficiency of 30-35% on ASHRAE Standard 52.1-92, and a minimum of MERV 8 per ASHRAE 52.2. Rated U.L. Class 2. Yes___No___

.3 For units with filter banks up 1825m high, the filter modules shall be designed to slide out of the unit. Side removal 25mm or 50mm filters shall slide into a formed metal track, sealing against metal spacers at each end of the track._ Yes___No___

.4 Final filters shall be 150mm filter media shall have an average efficiency of 90 95% on ASHRAE 52.1-92 and a MERV 14 when tested under ASHRAE 52.2 Yes___No___

.5 Provide filter bank with "Dwyer 2000 magnehelic" air filter gauge complete with static pressure tips and aluminum tubing all factory installed. Filter gauge to have a range of 0-500 Pa. Yes___No___

.6 Where the filter gauges are provided on outdoor units they shall be mounted inside of a weatherproof enclosure with viewing window. Yes___No___

1.16 Heat Exchangers and Burners

.1 Heating unit shall be indirect natural gas fired approved for both sea level and high altitude areas. The entire package, including damper controls, fan controls, and all other miscellaneous controls and accessories shall be approved by an independent testing authority and carry the approval label of that authority as a complete operating package._Yes___No___

- .a All units must exceed the ASHRAE 90.1 requirement of steady state efficiency at low fire operation. Yes___No___
- .b Operating natural gas pressure at units manifold shall be 1750 Pa. Yes___No___
- .c Optional gas manifolds shall be provided to FM standards. Yes___No___

.d Gas fired units shall be approved for operation in -40°C locations. Yes___No___

.2 Heat Exchanger/Burner Assembly:

.a Heat exchanger shall be a primary drum and multi-tube secondary constructed of titanium stainless steel with multi-plane metal turbulators and shall be of a floating stress relieved design. Heat exchanger shall be provided with condensate drain connection. The heat exchanger casing shall have 25mm of insulation between the outer cabinet and inner heat reflective galvanized steel liner. Blower location shall be engineered to improve the required air flow pattern around the heat exchanger. Using duct type furnaces and closed coupled blowers are not acceptable. Yes___No___

.b The heat exchanger/burner assembly shall be a blow through positive pressure type. Units incorporating the DJM module shall have an interrupted pilot ignition system to provide increased safety. Units using continuous or intermittent pilots are not acceptable. Yes___No___

.c Multiple heat exchangers or tube style heat exchangers with in-shot burners are not acceptable. Yes___No___

.d Flame surveillance shall be from the main flame after ignition not the pilot flame. The burner and gas train shall be in a cabinet enclosure. Atmospheric burners or burners requiring power assisted venting are not acceptable. Yes___No___

.e The heat exchanger/burner assembly shall include 15:1 turn down for all input ranges from 29.3 kW to 410 kW. The high turn down heat exchanger/burner assembly minimum input shall be capable of controlling 6.7% of its rated input, excluding the pilot assembly, without on/off cycling and include built in electronic linearization of fuel and combustion air. Efficiency shall increase from high to low fire._ Yes___No___

1.17 Dampers

.1 Damper frames shall be U-shaped galvanized metal sections securely screwed or welded to the air

handling unit chassis. Pivot rods of 13mm aluminum shall turn in nylon or bronze bushings. Rods shall be secured to the blade by means of straps and set screws. Yes___No___

.2 Blades shall be 18 gauge (1.3mm) galvanized metal with two breaks on each edge and three breaks on centerline for rigidity. The pivot rod shall "nest" in the centerline break. Damper edges shall interlock. Maximum length of damper between supports shall be 1219 mm. Damper linkage brackets shall be constructed of galvanized metal. Yes___No___

.3 Dampers shall be extruded aluminum low leak air foil Tamco Series 1000. Yes___No___

.4 Mixing dampers shall be parallel blade type._ Yes___No___

.5 Gravity relief dampers shall be single blade gasketed design. Yes___No___

1.18 Refrigeration

.1 Conform to CSA B52 and UL 1995 requirements. Yes___No___

.2 Compressor/Condenser Section:

.a Packaged units shall be CETL, ETLUS approved and operate down to 50°F(10°C) as standard. Where applicable, multiple refrigeration circuits shall be separate from each other. Refrigeration circuits shall be complete with liquid line filter-driers, and service ports fitted with Schraeder fittings. Units with over 6 Ton hermetic compressors and all units with semi-hermetic compressors shall also incorporate load compensated thermal expansion valves with external equalizers and combination sight glass moisture indicators. The complete piping system shall be purged and pressure tested with dry nitrogen, then tested again under vacuum. Each system shall be factory run and adjusted prior to shipment. Yes___No___

.b Controls for hermetic compressor units shall include compressor and condenser fan motor contactors, supply fan contactors and overload protection, control circuit transformer, cooling relays, ambient

compressor lockout, automatic reset low pressure controls, and manual reset high pressure controls on compressors over 6 tons. Head pressure actuated fan cycling control shall be provided on all multiple condenser fan units._Yes___No___

.c Fans: propeller type with single piece spun venturi outlets and zinc plated guards. Motors: sequenced for head pressure control. Yes___No___

.d Electrical system: complete with operating controls, oil and refrigerant pressure protection, motor overload protection, weatherproof electrical wiring with weatherproof, rain tight disconnect. Yes___No___

.e Include refrigerant piping with automatic hot gas bypass, sight glass, filter and valves. Yes___No___

.f Condenser: staggered copper tube aluminum fin coil assembly._Yes___No___

.g Capacity reduction: Provide hot gas bypass on the lead compressor to maintain adequate suction pressure in the event of low loads. Yes___No___

.h Refrigerant: 410-A. Yes___No___

.i Provide a minimum of 4 compressors, individually circuited. Yes___No___

.j Compressors shall be located on the side of the unit in a service enclosure complete with hinged access doors c/w leverlok handles for ease of service. Enclosure shall include 50mm acoustical insulation. Yes___No___

.3 Evaporator:

.a Rated to ANSI/AHRI 210/240. Yes___No___

.b Thermostatic expansion valve, with adjustable super heat and external equalizer Yes___No___

.c Coil: NPS 1/2 o.d. staggered seamless copper tubes expanded into aluminum fins and insulated condensation pan. Yes___No___

.d Cooling coil condensate drain pans: designed to avoid standing water, easily cleaned or removable for cleaning. Drain connection: deep seal trap complete with trap seal primer._Yes___No___

1.19 Controls

.1 General:

.a All control for Air handling Unit shall be design for standalone operation and third party BAS interface utilizing BACnet - (Data Communication Protocol for Building Automation and Control Networks). Yes___No___

.b The controller shall automatically start in heating, economizer or cooling mode based on continuously monitored ambient temperature and load requirements. Yes___No___

.c The controller shall include an adjustable low limit set point for freeze protection to cease equipment operation in the event of low discharge temperature. If the discharge air temperature falls below the adjusted set point, the blowers will shut down and the outside air dampers shall close. The low limit bypass timer shall vary automatically depending on the thermal coefficient of the style of heat exchanger. Yes___No___

.d If the discharge air temperature approaches the low limit set point, the controller shall automatically reduce the economizer minimum fresh air down to half of its original setting to compensate. Yes___No___

.e As the ambient temperature falls, the controller shall automatically compensate for outside air thermal expansion by proportionally reducing the amount of outside air. Yes___No___

.f The electronic temperature control system shall provide up to 5 stages of mechanical cooling control (4 compressors and economizer) to maintain discharge temperature. The minimum run and off time for the compressors shall be variable based on load requirements. Yes___No___

.g When in heating mode, the controller shall provide a signal to the programmed logic heating controller. Yes___No___

.h Heating controller general: Yes___No___

.a1 Electronic control heating 'M' module (Modulating Fuel with Modulating Combustion Air) complete with proportional and integral control with discharge air sensor to maintain set point temperature and provide rapid response to incremental changes in discharge air temperature. Combustion air motor speed varies proportionally in response to the modulation

of gas flow to provide optimum fuel/air mixture and efficiency at all conditions. Combustion blower RPM shall be proved using a hall effect speed sensor. Two speed or step speed combustion blowers are not acceptable. Yes___No___

.a2 Combustion efficiency of high efficiency heat exchangers shall increase by 1% to 3% from high fire to low fire while turning down on units incorporating 15:1 turn down (HT Burner). Heat exchangers shall provide a minimum of 80% efficiency throughout the entire operating range. Yes___No___

.a3 Alternate manufacturers units that do not incorporate a variable speed combustion air blower shall have a modulating gas valve and a combustion air damper with a linear linkage connected to an actuator which has a minimum of 100 steps of control. Yes___No___

.4 Controllers for heating units shall include the following standard features:

.a Service analyzer with diagnostic lights for ease of set-up and service. Yes___No___

.b Linear gas and combustion air flow obtained via a built in solid-state linear algorithm. Yes___No___

.c 40°C minimum operating ambient temperature. Yes___No___

.d Four air change pre-purges on units with over 117kW input. Yes___No___

.e Maintained purge to decrease temperature cycles. Yes___No___

.f Post purge. Yes___No___

.g Interrupted pilot. Yes___No___

.h Self check procedure on start-up to make sure air proving and discharge air sensors are operating within design tolerances. Yes___No___

.i Low fire start. Yes___No___

.j Controlled burner start-up and shut down. Yes___No___

.k Blower contactor that starts fan after burner pre-purge. Yes___No___

.l Economizer enable control. Yes___No___

.m Damper contact that allows fan to start after damper opens, damper to close after fan stops, and damper to close on flame failure. Yes___No___

.n Non-recycling auto by-pass low limit with alarm contacts and built-in sensor checking. Yes___No___

.o Built-in alternate blower and damper functions and set back temperatures for unoccupied mode operation using a single room thermostat. Yes___No___

.p Separate gas and air actuators independently

controlled to give the correct air to fuel ratio though out the entire firing range. Yes___No___

.5 Heating control function shall be modulating discharge air with 0-10VDC, BMS reset. Minimum discharge air set point is 10°C if BMS control signal fails. Yes___No___

.6 Discharge air sensor shall be field mounted in supply ductwork by installing contractor. Yes___No___

.7 Volume compensation (VAV only): Yes___No___

.a The controller shall automatically increase the minimum position of the outside air dampers to compensate for the required minimum volume of fresh air as the VAV (Variable Air Volume) system reduces the total volume of air. The economizer function shall be disabled to minimum position if the ambient temperature rises above a predetermined set point. Yes___No___

.b Variable air volume (load shedding) the controller shall automatically compensate the internal control algorithms when a change in air volume from the supply blower variable air volume dampers occurs for improved temperature control. Yes___No___

1.20 Factory Supplied Controls and Wiring

.1 Provide a system of motor control, including all necessary terminal blocks, motor overload protection, grounding lugs, control transformers, auxiliary contactors and terminals for the connection of external control devices or relays. Yes___No___

.2 Gas fired units shall also include high limit and combustion airflow switch. Yes___No___

.3 Fire alarm circuits shall be powered from a relay in unit circuitry. Yes___No___

.4 Factory installed and wired non-fused disconnect switch in CEMA/NEMA configuration, or disconnect with integral door closure mounted on face of control panel. Yes___No___

.5 Automatic controls shall be housed in a panel mounted in or on the air handling unit, which will meet that standard of the specific installations. Yes___No___

.6 Service receptacles powered from unit power supply. Unit to be single point power connection

wired in such a way that the main unit disconnect can be off and the receptacle will still be energized. Provide transformers as required._ Yes___No___

1.21 Capacity Yes___ No____

HVAC (rooftop) Unit Schedule

Tag	Unit	Duty	Supply Fan Air flow L/s *	Return Fan Air flow L/s **	ESP	Htg Capacity ***	Clg Capacity ****	SA Fan Motor	RA Fan Motor	El Service	Amps MCC	Max Breaker	Notes
RTU-1	Rooftop A/C	Main	7580	7580	498 Pa	190 kW input 152 kW out	137 kW	20HP	10 Hp	600V 3ph	95.6 A	110 A	Refrigerant R-410A VAV system

* BAE-DW fan VFD motor
** FC DIDW fan VFD motor
*** Temperature rise 30 deg 15:1 turndown
**** Based on EAT 80/67 (DB/WB) LAT 57.9/57.3

1.22 Standard of Acceptance

.1 Any Submitted proposal must meet all construction details listed within this specification. Yes___No___

.2 Any Submitted proposal must meet all Thermal Performance details listed in this specification._Yes___No___

.3 Any Submitted proposal must fit, and not to exceed field dimensions. Yes___No___