Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

RETURN BIDS TO:
Agriculture and Agri-Food Canada

Address: Eastern Service Centre

Attention: Jean-François Lemay

Email: aafc.escprocurement-cseapprovisionnement.aac@agr.gc.ca

REQUEST FOR PROPOSAL

Proposal To: Agriculture and Agri-Food Canada
We hereby offer to sell to His Majesty the King in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods and service, and construction as listed herein and on any attached sheets at the price(s) set out therefore.

Comments:

Vendor/Firm Name and Address:

Issuing Office
Agriculture and Agri-Food Canada

Eastern Service Centre
2001 Robert-Bourassa
Montreal, Quebec, H3A 3N2

Solicitation Cover Page

Title: Jordan Farm Pesticide Building HVAC Project B37	
Solicitation Number 01B46-23-208	Date of solicitation: 2024-01-08
Solicitation Closes: At: 2:00pm On: 2024-01-24	Time Zone: EST
Address Enquiries to: Procurement Officer : Name: Jean-François Lemay Email: jean-francois.lemay@agr.gc.ca	
Telephone Number: 343-571-9706	FAX Number:
Destination of Goods, Services and Construction: Agriculture & Agri-Food Canada (AAFC) Jordan Farm 4405 Jordan Road, Jordan Station, L0R 1S0	
Instructions: Municipal taxes are not applicable. Unless otherwise specified herein all prices quoted must include all applicable Canadian customs duties, GST/HST, excise taxes and are to be delivered Delivery Duty Paid including all delivery charges to destination(s) as indicated. The amount of the Goods and Services Tax/Harmonized Sales Tax is to be shown as a separate item.	
Delivery required: 2024-03-31	Delivery offered:
Vendor/Firm Name and Address:	
Name and title of person authorized to sign on behalf of vendor/firm (type or print)	
Signature Date	

INVITATION TO TENDER

Jordan Farm Pesticide Building HVAC Project B37

IMPORTANT NOTICE TO BIDDERS

Note to Bidders, there will no Public Opening for the purposes of this solicitation. See SI07 for further Instructions.

THIS DOCUMENT CONTAINS A SECURITY CLEARANCE REQUIREMENT
For further instructions please consult “Special Instruction to Bidders”, SI11, “Security Clearance Requirements” and “Supplementary Conditions” SC01 “Security Clearance Requirements, Document Safeguarding Location”.

TABLE OF CONTENTS

SPECIAL INSTRUCTIONS TO BIDDERS (SI) 3
SI01 BID DOCUMENTS 3
SI02 ENQUIRIES DURING THE SOLICITATION PERIOD 3
SI03 OPTIONAL SITE VISIT 3
SI04 REVISION OF BID 3
SI05 BID SECURITY REQUIREMENTS 4
SI06 SUBMISSION OF BID 4
SI07 BID RESULTS 5
SI08 INSUFFICIENT FUNDING 5
SI09 BID VALIDITY PERIOD 6
SI10 RIGHTS OF CANADA 6
SI11 SECURITY CLEARANCE REQUIREMENTS 6
SI12 LISTING OF SUBCONTRACTORS AND SUPPLIERS 6
SI13 BID CHALLENGE AND RECOURSE MECHANISMS 6
SI14 CONSTRUCTION DOCUMENTS 7
SI15 WEB SITES 7
R2710T GENERAL INSTRUCTIONS - CONSTRUCTION SERVICES - BID SECURITY REQUIREMENTS (GI) (2021-04-01) 8
CONTRACT DOCUMENTS (CD) 9
SUPPLEMENTARY CONDITIONS (SC) 10
SC01 SECURITY CLEARANCE REQUIREMENTS, DOCUMENT SAFEGUARDING 10
SC02 LIMITATION OF LIABILITY 10
SC03 INSURANCE TERMS 11
SC06 TYPES AND AMOUNTS OF CONTRACT SECURITY 11
BID AND ACCEPTANCE FORM (BA) 13
BA02 LEGAL NAME AND ADDRESS OF BIDDER 13
BA03 THE OFFER 13
BA04 BID VALIDITY PERIOD 13
BA05 ACCEPTANCE AND CONTRACT 13
BA06 CONSTRUCTION TIME 13
BA07 BID SECURITY 13
BA08 SIGNATURE 13
SPECIFICATIONS AND DRAWINGS 14
APPENDIX 1 – INTEGRITY PROVISIONS .....
APPENDIX 2 - LISTING OF SUBCONTRACTORS AND SUPPLIERS .....
ANNEX A - SECURITY REQUIREMENT CHECK LIST (SRCL) .....
ANNEX B - CERTIFICATE OF INSURANCE .....

SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01 BID DOCUMENTS

1. The following are the Bid Documents:

   a. Invitation to Tender - Page 1;
   b. Special Instructions to Bidders;
   c. General Instructions - Construction Services - Bid Security Requirements R2710T (2021-04-01)
      Delete: Subsection GI16 Performance Evaluation: in its entirety
      Insert: GI16 intentionally left blank
      Delete: point 3 in its entirety
   d. Clauses & Conditions identified in “Contract Documents”;
   e. Drawings and Specifications;
   f. Bid and Acceptance Form and related Appendix(s); and
   g. Any amendment issued prior to solicitation closing.

   Submission of a bid constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

2. General Instructions - Construction Services - Bid Security Requirements R2710T is incorporated by reference and is set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

1. Enquiries regarding this bid must be submitted in writing to the Contracting Authority named on the Invitation to Tender - Page 1. Except for the approval of alternative materials as described in GI15 of R2710T, enquiries should be received no later than 5 business days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may result in an answer NOT being provided.

2. To ensure consistency and quality of the information provided to Bidders, AAFC will examine the content of the enquiry and will decide whether to issue an amendment.

3. All enquiries and other communications related to this bid sent throughout the solicitation period must be directed ONLY to the Contracting Authority named in paragraph 1 above. Failure to comply with this requirement may result in the bid being declared non- compliant.

SI03 OPTIONAL SITE VISIT

There will be a site visit on January 15, 2024 @ 10H00AM. Interested bidders are to meet at :
Agriculture & Agri-Food Canada (AAFC)
Jordan Farm
4405 Jordan Road,
Jordan Station, L0R 1S0

The representative of the Bidder must sign the Site Visit Attendance Sheet at the site visit.

SI04 REVISION OF BID

Bids may be revised using the email address indicated on page 1 (cover page) of this invitation to tender (ITT) or using Canada Post Corporation (CPC) Connect service.

Section GI10 of R2710T is replaced by the following;

1. A bid submitted in accordance with these instructions may be revised, provided the revision is received through Canada Post Corporation's (CPC) Connect service, on or before the date and time set for the closing of the solicitation. The revision shall be on the Bidder's letterhead or bear a signature that identifies the Bidder.
   a. The only acceptable email address to use with CPC Connect is: aafc.procbidreceiving-receptiondesoumissionaprov.aac@agr.gc.ca

2. A revision to a bid that includes unit prices must clearly identify the change(s) in the unit price(s) and the specific item(s) to which each change applies.
3. Multiple revisions to a bid must clearly identify the sequence of the revisions (i.e. Bid revision #1; Bid revision #2, etc.).
4. Failure to comply with any of the above provisions may result in the rejection of the non-compliant revision(s) only. The bid shall be evaluated based on the original bid submitted and all other compliant revision(s).
5. For revised bids transmitted by CPC Connect service, Canada will not be responsible for any failure attributable to the transmission or receipt of the bid including, but not limited to, the following:
   i. receipt of a garbled, corrupted or incomplete bid;
   ii. availability or condition of the CPC Connect service;
   iii. incompatibility between the sending and receiving equipment;
   iv. delay in transmission or receipt of the bid;
   v. failure of the Bidder to properly identify the bid;
   vi. illegibility of the bid;
   vii. security of bid data; or,
   viii. inability to create an electronic conversation through the CPC Connect service.

SI05 BID SECURITY REQUIREMENTS

R2710T - General Instructions - Construction Services - Bid Security Requirements is modified as follow:

Delete GI08.2 and replace with the following:

2. A bid bond (form PWGSC-TPSGC 504) shall be in an approved form, properly completed, with valid and enforceable signatures and sealed by the approved bonding company whose bonds are acceptable to Canada either at the time of solicitation closing or as identified in Treasury Board Appendix L, Acceptable Bonding Companies.

2.1 A bid bond may be submitted in an electronic format (Electronic Bonding (E-Bond)) if it meets the following criteria:

a. The version submitted by the Bidder must be an electronic encrypted file with embedded digital certificate verifiable by Canada with respect to the totality and wholeness of the bond form, including: the content; all digital signatures; all digital seals; with the Surety Company, or an approved verification service provider of the Surety Company.
b. The version submitted must be viewable, printable and storable in standard electronic file formats compatible with Canada, and in a single file, allowable format pdf.
c. The verification may be conducted by Canada immediately or at any time during the life of the Bond and at the discretion of Canada.
d. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding Item 2.1.a.
e. Submitting copies **(non-original, non-verifiable or scanned copy)** of signed and sealed bid bond are not acceptable. Failure to submit an original or verifiable bond will render the bid non-compliant. Non-compliant bids will be given no further consideration. A scanned copy of a bond does not constitute a digital bond.

2.2 Bonds failing the verification process will NOT be considered valid.

2.3 Bonds passing the verification process will be treated as original and authentic.

SI06 SUBMISSION OF BID

Section GI09 of R2710T is modified by the following:

Insert the following text under subparagraph 4.

5. Electronic Bid Submission by Canada Post Corporation (CPC) Connect service

a. Unless specified otherwise in the bid solicitation, bids may be submitted by using the Connect service provided by Canada Post Corporation.

The only acceptable email address to use with CPC Connect for responses to bid solicitations issued by Agriculture and Agri-Food Canada is: aafc.procbidreceiving-receptiondesoumissionaprov.aac@agr.gc.ca

Note: Bids will not be accepted if emailed directly to this email address. This email address is to be used to open a CPC Connect conversation, as detailed in "c." below of this solicitation, or to send bids through a CPC Connect message if the bidder is using its own licensing agreement for CPC Connect service.

b. To submit a bid using CPC Connect service, the Bidder must either:
   i. send directly its bid only to the specified AAFC Bid Receiving Unit, using its own licensing agreement for CPC Connect provided by Canada Post Corporation; or
   ii. send as early as possible, and in any case, at least six business days prior to the solicitation closing date and time, (in order to ensure a response), an email that includes the bid solicitation number to the specified AAFC Bid Receiving Unit requesting to open a CPC Connect conversation. Requests to open a CPC Connect conversation received after that time may not be answered.
c. If the Bidder sends an email requesting CPC Connect service to the specified AAFC Bid Receiving Unit in the bid solicitation, an officer of the AAFC Bid Receiving Unit will then initiate a CPC Connect conversation. The CPC Connect conversation will create an email notification from Canada Post Corporation prompting the Bidder to access and action the message within the conversation. The Bidder will then be able to transmit its bid afterward at any time prior to the solicitation closing date and time.
d. If the Bidder is using its own licensing agreement to send its bid, the Bidder must keep the CPC Connect conversation open until at least 30 business days after the solicitation closing date and time.
e. The bid solicitation number should be identified in the CPC Connect message field of all electronic transfers.
f. It should be noted that the use of CPC Connect service requires a Canadian mailing address. Should a bidder not have a Canadian mailing address, they may use the AAFC Bid Receiving Unit address specified in the solicitation in order to register for the CPC Connect service.
g. For bids transmitted by CPC Connect service, Canada will not be responsible for any failure attributable to the transmission or receipt of the bid including, but not limited to, the following:
   i. receipt of a garbled, corrupted or incomplete bid;
   ii. availability or condition of the CPC Connect service;
   iii. incompatibility between the sending and receiving equipment;
   iv. delay in transmission or receipt of the bid;
   v. failure of the Bidder to properly identify the bid;
   vi. illegibility of the bid;
   vii. security of bid data; or,
   viii. inability to create an electronic conversation through the CPC Connect service.
h. AAFC Bid Receiving Unit will send an acknowledgement of the receipt of bid document(s) via the CPC Connect conversation, regardless of whether the conversation was initiated by the supplier using its own license or AAFC Bid Receiving Unit. This acknowledgement will confirm only the receipt of bid document(s) and will not confirm if the attachments may be opened nor if the content is readable.
i. Bidders must ensure that that they are using the correct email address for the AAFC Bid Receiving Unit when initiating a conversation in CPC Connect or communicating with the AAFC Bid Receiving Unit and should not rely on the accuracy of copying and pasting the email address into the CPC Connect system.
j. A bid transmitted by CPC Connect service constitutes the formal bid of the Bidder.
k. Alternate arrangements of bid receipt can be made by contacting the Contracting Authority identified on page 1 of the solicitation package no later than one (1) business day prior to bid closing.

SI07 BID RESULTS

There will be no Public Opening for the purposes of this solicitation.

The responsive bid carrying the lowest price will be recommended for contract award.

SI08 INSUFFICIENT FUNDING

In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may

a. cancel the solicitation; or

b. obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid.

SI09 BID VALIDITY PERIOD

1. Canada reserves the right to seek an extension to the bid validity period prescribed in BA04 of the Bid and Acceptance Form. Upon notification in writing from Canada, Bidders will have the option to either accept or reject the proposed extension.

2. If the extension referred to in paragraph 1. above is accepted, in writing, by all those who submitted bids, then Canada will continue immediately with the evaluation of the bids and its approvals processes.

3. If the extension referred to in paragraph 1.above is not accepted in writing by all those who submitted bids then Canada will, at its sole discretion, either

   a. continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or
   b. cancel the invitation to tender.

4. The provisions expressed herein do not in any manner limit Canada's rights in law or under GI11 of R2710T.

SI10 RIGHTS OF CANADA

1. Canada reserves the right to:

   a. Reject any or all bids received in response to the bid solicitation;
   b. Enter into negotiations with bidders on any or all aspects of their bids;
   c. Accept any bid in whole or in part without negotiations;
   d. Cancel the bid solicitation at any time;
   e. Reissue the bid solicitation;
   f. If no compliant bids are received and the requirement is not substantially modified, reissue the bid solicitation by inviting only the bidders who bid to resubmit bids within a period designated by Canada; and
   g. Negotiate with the sole compliant Bidder to ensure best value to Canada.

SI11 SECURITY CLEARANCE REQUIREMENTS

The Bidder will be given the opportunity to provide any information deemed missing from either Form, or, if required, provide any additional information related to the request for security clearance, within a timeframe set by the Contracting Authority. If the Bidder fails to provide that information within the specified timeframe, the bid will be declared non-compliant.

1. Before award of a contract, the Bidder must hold a valid Security Clearance as indicated in section SC01 of the Supplementary Conditions.
2. The successful Bidder's personnel, as well as any subcontractor and its personnel, who are required to perform any part of the Work pursuant to the subsequent contract must meet the mandatory security requirement as indicated in section SC01 of the Supplementary Conditions. Individuals who do not have the required level of security will not be allowed on site. It is the responsibility of the successful Bidder to ensure that the security requirements are met throughout the performance of the contract. Canada will not be held liable or accountable for any delays or additional costs associated with the successful Bidder's non-compliance with the mandatory security requirement.

SI12 LISTING OF SUBCONTRACTORS AND SUPPLIERS

R2710T, GI07 has been amended to the following.

GI07 (2015-02-25) Listing of Subcontractors and Suppliers
The Bidder must submit the names of Subcontractors and Suppliers for the part or parts of the Work listed. See APPENDIX 2. **Failure to do so will result in the disqualification of its bid**.

SI13 BID CHALLENGE AND RECOURSE MECHANISMS

(a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.

(b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's Buy and Sell website, under the heading "Bid Challenge and Recourse Mechanisms" contains information on potential complaint bodies such as:

- Office of the Procurement Ombudsman (OPO)
- Canadian International Trade Tribunal (CITT)

(c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

SI14 CONSTRUCTION DOCUMENTS

The successful Contractor will be provided (**with 1 electronic or paper copy)** of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Obtaining more copies will be the responsibility of the Contractor including costs.

SI15 WEB SITES

The connection to some of the Web sites in the solicitation documents is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Treasury Board Appendix L, Acceptable Bonding Companies
http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appL

Buy and Sell
https://www.achatsetventes-buyandsell.gc.ca

Canadian economic sanctions
http://www.international.gc.ca/sanctions/index.aspx?lang=eng

Bid Bond (form PWGSC-TPSGC 504)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/504.pdf

Performance Bond (form PWGSC-TPSGC 505)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/505_eng.pdf

Labour and Material Payment Bond (form PWGWSC-TPSGC 506)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/506.pdf

Standard Acquisition Clauses and Conditions (SACC) Manual
https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R

Declaration Form
http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html

Trade agreements
https://buyandsell.gc.ca/policy-and-guidelines/Policy-and-Legal-Framework/Trade-Agreements

R2710T GENERAL INSTRUCTIONS - CONSTRUCTION SERVICES - BID SECURITY REQUIREMENTS (GI) (2021-04-01**)**

The following GI's are included by reference and are available at the following Web Site
https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R/R2710T/23

GI01 Integrity Provisions - Bid
GI02 Completion of Bid
GI03 Identity or Legal Capacity of the Bidder
GI04 Applicable Taxes
GI05 Capital Development and Redevelopment Charges
GI06 Registry and Pre-qualification of Floating Plant
GI07 Listing of Subcontractors and Suppliers
GI08 Bid Security Requirements
GI09 Submission of Bid
GI10 Revision of Bid
GI11 Rejection of Bid
GI12 Bid Costs
GI13 Procurement Business Number
GI14 Compliance with Applicable Laws
GI15 Approval of Alternative Materials
GI16 Performance Evaluation
GI17 Conflict of Interest-Unfair Advantage
GI18 Code of Conduct for Procurement—bid

CONTRACT DOCUMENTS (CD)

1. The following are the Contract Documents:

   a. Contract Page when signed by Canada;
   b. Duly completed Bid and Acceptance Form and any Appendices attached thereto;
   c. Drawings and Specifications;
   d. General Conditions and clauses

GC1	General Provisions – Construction Services	R2810D	(2017-11-28);

   Subsection GC1.22 Performance-evaluation: incorporated by reference above, is amended as follows:
   Delete: in its entirety
   Insert: GC1.22 Intentionally left blank.

GC2	Administration of the Contract	R2820D	(2016-01-28);
GC3	Execution and Control of the Work	R2830D	(2019-11-28);
GC4	Protective Measures	R2840D	(2008-05-12);
GC5	Terms of Payment	R2850D	(2019-11-28);
GC6	Delays and Changes in the Work	R2860D	(2019-05-30);
GC7	Default, Suspension or Termination of Contract	R2870D	(2018-06-21);
GC8	Dispute Resolution	R2880D	(2019-11-28);
GC9	Contract Security	R2890D	(2018-06-21);
GC10	Insurance	R2900D	(2008-05-12);
	Allowable Costs for Contract Changes Under GC6.4.1	R2950D	(2015-02-25);

   e. Supplementary Conditions
   f. Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
   g. Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
   h. Any amendment or variation of the contract documents that is made in accordance with the General Conditions.

2. The documents identified by title, number and date above are incorporated by reference and are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual

3. The language of the contract documents is the language of the Bid and Acceptance Form submitted.

SUPPLEMENTARY CONDITIONS (SC)

SC01 SECURITY CLEARANCE REQUIREMENTS, DOCUMENT SAFEGUARDING

The following security requirement (SRCL and related clauses) applies and form part of the Contract.

The contractor/offeror personnel requiring access to sensitive work site(s) must, at all time, be escorted on Agriculture and Agri-Food Canada premises by the project authority or by a suitable replacement appointed by the project authority.until a **reliability status** is granted or approved by AAFC;

The contractor and/or its employees MUST NOT have access to PROTECTED and/or CLASSIFIED information or assets;

The contractor and/or its employees MUST NOT remove any PROTECTED and/or CLASSIFIED information or assets from the identified work site(s);

The contractor and/or its employees MUST NOT use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data;

Subcontracts which contain security requirements are **not** to be awarded without the prior written permission of the AAFC; and

The contractor/offeror must comply with the provisions of the:

a. Security Requirements Check List and security guide (if applicable), attached at Annex B;
b. Industrial Security Manual (Latest Edition).

SC02 LIMITATION OF LIABILITY

GC1.6 of R2810D is deleted and replaced with the following:

GC1.6 Indemnification by the Contractor

1. The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by Canada or in respect of claims by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor in performing the Work, provided such claims are caused by the negligent or deliberate acts or omissions of the Contractor, or those for whom it is responsible at law.

   The Contractor's obligation to indemnify Canada for losses related to first party liability shall be limited to:

   a. In respect to each loss for which insurance is to be provided pursuant to the insurance requirements of the Contract, the Commercial General Liability insurance limit for one occurrence as referred to in the insurance requirements of the Contract .

   b. In respect to losses for which insurance is not required to be provided in accordance with the insurance requirements of the Contract, the greater of the Contract Amount or $5,000,000, but in no event shall the sum be greater than $20,000,000.

2. The limitation of this obligation shall be exclusive of interest and all legal costs and shall not apply to any infringement of intellectual property rights or any breach of warranty obligations.

3. The Contractor's obligation to indemnify Canada for losses related to third party liability shall have no limitation and shall include the complete costs of defending any legal action by a third party. If requested by Canada, the Contractor shall defend Canada against any third party claims.

4. The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings against Canada charging or claiming that the Work or any part thereof provided or furnished by the Contractor to Canada infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.

5. Notice in writing of a claim shall be given within a reasonable time after the facts, upon which such claim is based, became known.

SC03 INSURANCE TERMS

1) Insurance Contracts

(a) The Contractor must, at the Contractor's expense, obtain and maintain insurance contracts in accordance with the requirements of the Certificate of Insurance. Coverage must be placed with an Insurer licensed to carry out business in Canada.

(b) Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract. The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

2) Period of Insurance

(a) The policies required in the Certificate of Insurance must be in force from the date of contract award and be maintained throughout the duration of the Contract.

(b) The Contractor must be responsible to provide and maintain coverage for Products/Completed Operations hazards on its Commercial General Liability insurance policy, for a period of six (6) years beyond the date of the Certificate of Substantial Performance.

3) Proof of Insurance

(a) Before commencement of the Work, and no later than thirty (30) days after contract award, the Contractor must deposit with Canada a Certificate of Insurance on the form attached herein.

(b) Upon request by Canada, the Contractor must provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Certificate of Insurance.

4) Insurance Proceeds

In the event of a claim, the Contractor must, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.

5) Deductible

The payment of monies up to the deductible amount made in satisfaction of a claim must be borne by the Contractor.

SC04 TYPES AND AMOUNTS OF CONTRACT SECURITY

Remove and Replace GC9.2.2. with the following

A performance bond (form PWGSC-TPSGC 505) and a labour and material payment bond (form PWGSC-TPSGC 506) referred to in subparagraph 1)(a) of GC9.2 shall be in a form and be issued by a bonding or surety company (see Treasury Board Appendix L, *Acceptable Bonding Companies*) that is approved by Canada. They can be in the form of Signed and Sealed paper version OR electronic digital version.

Electronic digital versions must meet the following;

1. A performance bond and a labour and material payment bond may be submitted in an electronic or digital format if it meets the following criteria:

1.1. The versions submitted by the Contractor must be verifiable by Canada with respect to the totality and wholeness of the bonds form, including: the content; all digital signatures; all digital seals; with the Surety Company, or an approved verification service provider of the Surety Company.

1.2. The versions submitted must be viewable, printable and storable in standard electronic file formats compatible with Canada, and in a single file. Allowable formats include pdf.

1.3. The verification may be conducted by Canada immediately or at any time during the life of the bonds and at the discretion of Canada with no requirement for passwords or fees.

1.4. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding Item 1.1.

2. Bonds failing the verification process will NOT be considered to be valid.

BID AND ACCEPTANCE FORM (BA)

Jordan Farm Pesticide Building HVAC Project B37

BA02 LEGAL NAME AND ADDRESS OF BIDDER

Legal Name:					
Operating Name (if any):					
Address:					
Telephone:		Fax:		PBN:	
E-mail address:					
Contract Security Program Organisation Number (when required)					

BA03 THE OFFER

The Bidder offers to Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the Total Bid Amount of

$ _____excluding Applicable Taxe(s).
(amount in numbers)

BA04 BID VALIDITY PERIOD
The bid must not be withdrawn for a period of 30 days following the date of solicitation closing.

BA05 ACCEPTANCE AND CONTRACT
Upon acceptance of the Bidder's offer by Canada, a binding Contract will be formed between Canada and the Bidder. The documents forming the Contract will be the Contract Documents identified in "Contract Documents (CD)" section.

BA06 CONSTRUCTION TIME

The Contractor must perform and complete the Work on, or before March 31, 2024.

BA07 BID SECURITY
The Bidder must enclose bid security with its bid in accordance with GI08 - Bid Security Requirements of R2710T - General Instructions - Construction Services - Bid Security Requirements.

BA08 SIGNATURE

Name and title of person authorized to sign on behalf of Bidder (Type or print)

Signature	Date

SPECIFICATIONS AND DRAWINGS

TABLE OF CONTENTS

SECTION	TITLE	NUMBER OF PAGES
01 32 16	Project Schedules	3
01 33 00	Submittal Procedures	4
01 35 30	Health and Safety Requirements	4
01 35 75	Existing Premises Procedures	3
01 45 00	Quality Control	2
01 74 11	Cleaning	2
01 78 00	Closeout Submittals	8
21 05 00	Basic Mechanical Materials and Methods	8
21 05 53	Equipment Identification	1
23 05 00	Mechanical General Requirements	10
23 05 48.16	Seismic Restraint Systems	13
23 08 01	Performance Verification and Training	2
23 34 12	Fume Hood Exhaust Fan System	5
23 38 16	Fume Hood	4
23 74 16	Packaged Vertical Heat Pump Unit	4
26 03 00	Summary of Work	2
26 05 00	Electrical General Requirements	4
26 05 01	Basic Electrical Materials and Methods	7
26 05 21	Installation and Materials	6
26 05 26	Grounding and Bonding	1
26 05 32	Conduit Boxes and Fittings	4
26 05 53	Electrical Identification	2
26 24 17	Panelboards – Breaker Type	2
26 28 23	Disconnect Switches Fused and Non-Fused	1

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

1.2 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Sunday, inclusive, will provide seven day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Owner Representative and Consultant to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately [7] working days, to allow for progress contract.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

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

.2 Submit to Departmental Representative within [7] working days of Award of Contract Bar (GANTT) Chart as Master Plan for Planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative with [7] working days of receipt of acceptance of Master Plan.

1.5 MASTER PLAN & MILESTONES

.1 Structural schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Consultant will review and return revised schedules within 7 working days.

.3 Revise impractical schedule and resubmit within 3 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

.5 Contractor is required to have the unit ventilators installed and in full operation by March 25th, 2024.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award
.2 Shop Drawings, Samples
.3 Permits
.4 Mobilization
.5 Demolition
.6 Civil work
.7 Receipt of equipment
.7 Electrical Installation
.8 Structural Installation
.8 Mechanical installation
.9 De-mobilization
.10 Testing and Commissioning
.11 Final Review/Acceptance
.12 Close-out documents

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Record minutes of meeting and circulate to attendees within 2 business of meeting. Responsibility of the general contractor

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 45 00 – Quality Control

1.2 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

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

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

.5 Review submittals prior to submission to consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relived by Departmental Representative's review.

.10 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWING AND PRODUCT DATA

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

.2 Submit shop drawings bearing stamp and signature of qualified Professional Engineer registered or licensed in the Province of Ontario, Canada

.3 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 coordinated regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 2 days for Departmental Representative review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, 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.

.8 Submissions Include:
- .1 Date and revision dates
- .2 Project title and number
- .3 Name and address of:
  - .1 Subcontractor
  - .2 Supplier
  - .3 Manufacturer
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 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

.9 After Departmental Representative' review, distribute copies.

.10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.13 Submit 1 electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit 1 electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit 1 electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.17 Submit 1 electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.18 Delete information not applicable to project

.19 Supplement standard information to provide details applicable to project.

.20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.1 This review shall not mean that approve detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relive Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour, digital photography in standard resolution weekly with progress statement as directed by Departmental Representative.

.2 Frequency of photographic documentation: weekly as directed by Consultant.
.1 Upon completion of work as directed by Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

1 General

1.1 SECTION INCLUDES

.1 Health and Safety considerations required to ensure that contractor shows due diligence towards health and safety on construction sites, and meets the requirements laid out in Departmental Policy and Occupational Health and Safety Construction.

.2 Successful contractor shall comply with the requirements of Agriculture and Agri-Food Canada Contractor Safety Package and supplier's Code of conduct.

1.2 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures

1.3 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2005,

1.4 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and Prior to commencement of Work. Health and Safety Plan must include:
.1 Results of site specific safety hazard assessment.
.2 Result of safety and health risk or hazard analysis for site tasks and Operation

.3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction weekly.

.4 Submit copies of report or directions issued by Provincial and Safety Inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within [3] days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within [3] days after receipt of comments from Departmental Representative.

.8 Departmental Representative' review of Contactor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation. regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.10 On-Site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.5 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.6 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.7 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.8 PROJECT/SITE CONDITOINS

.1 Work at site will involve contact with:

.1 Departmental Representative

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and Continue to implement, maintain, and enforce plan until final demobilization form site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety or property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations and ordinances, and with site-specific Health and Safety Plan.

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Health and Safety Act. R.S.O.

.2 Comply with Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q.

.3 Comply with Occupational Health and Safety Regulations, 1996.

.4 Comply with Occupational Health and Safety Act, General Safety Regulations, O.I.C.

.5 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.12 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province, having jurisdiction and advise Departmental Representative verbally and in writing.

1.13 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

- .1 Have site-related working experience specific to activities associated with Petroleum Works.
- .2 Have working knowledge of occupational safety and health regulations.
- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible to implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.14 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction and in consultation with Departmental Representative.

1.15 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.16 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule Considerations for Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

1. **General**

1.1. Perform work in or on existing building in accordance with each applicable Section of the Specification, together with mechanical, and electrical drawings in their entirety as they apply.

1.2. Execute each part of the work in existing building by workers specializing in such work, in accordance with these Specifications for similar work where applicable.

1.3. Schedule demolition to avoid interference with progress of new construction work, and the operation of the existing building.

1.4. Patching or replacement of damaged work shall be done by workers experienced in the type of work to be patched. Make patches indistinguishable in final assembly. Paint surfaces out, wall-to-wall in accordance with requirements of specifications, where areas are patched.

2. Deficiency List

2.1 Before beginning Work and admittance of any workers on the site, the Contractor shall furnish the Departmental Representative with a report in the form of a deficiency list, covering all fittings, fitments, fixtures, surfaces, and any other building component in the existing building and exterior building surfaces or site work where work is being done, whose proximity to alternation work renders it vulnerable to damage.

2.2 Any deficiency not recorded in the report will result in the Contractor being required to make good such deficiency without an increase to the Contract Price.

3. Owner's Use of Existing Building

3.1 The existing buildings will remain in full use and occupancy throughout the duration of construction of the Work.

3.2 Provide and maintain continuation of fire protection, fire walls and fire rated assemblies in buildings.

3.3 Maintain existing exits and provide proper and safe means of egress from all parts of existing buildings to open spaces at all times to the approval of jurisdictional authorities. Identify, provide exit lights, and illuminate temporary means of egress.

3.4 Maintain access to service and delivery entrances, and for maintenance and inspection services.

3.5 Maintain security of existing building during the Work.

3.6 Execute work in existing building at times approved by Departmental Representative and as mutually agreeable to Departmental Representative, so not to inconvenience his occupation or in any manner hinder his use of building.

3.7 Give Departmental Representative 72 hours notice of intention to commence work in a room or area of existing building. No work is to be performed in any area without approval from the Departmental Representative.

4. Protection

4.1 Work shall include temporary, watertight, dust tight screens or partitions between work area and existing building and as required to localize dust generating activities, and for the

protection of workers, finished area of work and public. Maintain and relocate protection until such Work is complete.

4.2 Provide weatherproof coverings over openings made in walls and roofs of existing building, immediately after they are opened.

4.3 Protection of existing buildings, including roofs, shall be substantial enough to prevent damage to them by falling objects, demolition, and mandatory construction traffic during new work.

4.4 Protection of property in, or on existing buildings shall include equipment, furniture, and other similar furnishings, hardware, trim, and supplies, whether fixed to buildings or not.

4.5 Take all precautions to ensure that no structural damage is caused to existing building by demolition and alteration work, or by new construction.

4.6 Ensure during demolition work that materials, components, and similar items to be reused are protected from damage, and that measures are taken to keep down dust.

5. Removal of Existing Work and Salvage

5.1 Remove building elements, components, materials, and equipment as required to expedite installation of structural, mechanical and electrical services. Store and protect re-used materials from damage for re-installation when above work is complete.

5.2 All materials not relocated and recovered from the existing building, shall become the property of the Contractor and shall be disposed of away from site unless otherwise noted.

5.3 Limit removal of items to smallest areas possible, and make good disturbed existing work.

6 New and Replacement Work

6.1 Make good material, and prepare surfaces and refinish all finished surfaces damaged, marred, replace, or otherwise remedied in the existing building.

7 Contractor's Use of Existing Buildings

7.1 Limit access of construction personnel to existing buildings only at locations approved by Departmental Representative for work being performed at a specific time.

7.2 Ensure that construction personnel perform work in existing buildings only as required under the Contract; and that they do not use it as access to work areas, except for work in existing building for other purposes.

7.3 Assume total responsibility for security of existing buildings upon commencement of Work except for those areas specifically retained by the Owner for his exclusive use during Construction.

7.4 Secure existing building except for those parts retained by the Departmental Representative for his use, by methods compatible with the total security established for buildings.

8 Existing Services

8.1 Ensure that existing services are not damaged during demolition and construction. Immediately cut off and cap concealed services uncovered during work by qualified workers.

8.2 Relocate exposed existing mechanical and electrical services where alteration work occurs.

8.3 Do not interrupt mechanical or electrical services of the existing buildings except for temporary close-downs and as approved by the project schedule or by prior arrangements with Departmental Representative. Give Departmental Representative 3 working days notice of intention to interrupt mechanical or electrical services in existing buildings and obtain written permission from the Departmental Representative.

8.4 Should existing services be accidentally uncovered an disrupted, make complete restoration immediately, and provide adequate protection to avoid further disruption until alternative means of providing permanent continuation of the services are made.

.1 Payment for work specified in the foregoing shall be made by the Contractor at no additional cost to the Departmental Representative, if in the opinion of the Departmental Representative, such work could have been foreseen and which has been caused by lack of proper care and protection.

8.5 Unless otherwise specified, restore services on which work is preformed to original condition.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1

1.2 INSPECTION

.1 Allow Departmental Representative and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative and Consultant instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Owner's Departmental Representative and Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify appropriate agency and Departmental Representative and Consultant in advance of requirement for test in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing as specifically requested in specification. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative and Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Owner Representative and Consultant.

I.7 REPORTS

.1 Submit [2] copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.8 MILL TESTS

.1 Submit mill test certificates as requested.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain work in tidy condition, free from accumulation of waste products and debris including that caused by Owner or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site unless approved by Departmental Representative.

.3 Clear snow and ice from access to building outside of work area as required.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Dispose of waste materials and debris at registered dumping areas off site.

.7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris including that caused by Departmental Representative or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site unless approved by Departmental Representative.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains. spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceiling.

.9 Clean lighting reflectors, lenses. and other lighting surfaces as required.

.10 Vacuum, clean and dust building interiors, behind grilles, louvres and screens.

.11 'Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, and sunken wells as required.

.16 Sweep and wash clean paved areas as required.

.17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.19 Remove snow and ice from access to constructional working areas as required.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 45 00 Quality Control.

1.2 REFERENCES

.1 n/a

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meetings:

.1 Convene meeting one week prior to contract completion with contractor's representative and Owner Representative and Consultant to:

.1 Verify Project requirements.
.2 Review manufacturer's installation instructions and warranty requirements.

.2 Departmental Representative to establish Communication procedures for:

.1 Notifying construction warranty defects.
.2 Determine priorities for type of defects.
.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty work action : provide name, telephone number and address of company authorized for construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is Continuously available, and is responsive to inquiries for warranty work action.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedure.

.2 Two weeks after to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English.

.3 Provide spare parts, maintenance materials and special tools of same quality and Manufacture as products provided in work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

1.5 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x279 with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by process flow under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacture's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.2 Provide scaled CAD files in drawing format on CD.

1.6 CONTENTS - PROJECT RECORD DOCUMENTS

. 1 Table of Contents for Each Volume: provide title of project;

.l Data of submission; names.
.2 Addresses and telephone numbers of Consultant and Contractor with name of responsible parties.
.3 Schedule of products and system, indexed to content of volume.

.2 For each product or system;
.1 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.
.1 Provide logical sequence of instructions for each procedure, incorporating Manufacturer’s instructions specified in Section 01 45 00 - Quality Control.

1.7 AS-BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:

.1 Contract Drawings
.2 Specifications
.3 Addenda
.4 Change Orders and other modifications to Contract
.5 Reviewed shop drawings, product data, and samples

.6 Field text records
.7 Inspection certificates
.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.1 Provide files. racks. and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.

.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by OWNER Representative.

1.8 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.
.1 Do not conceal work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and Appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:

.1 Manufacture. Trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacture's certifications, inspection certifications, field test records, required by individual specifications sections.

1.9 EQUIPMENT AND SYSTEMS

. 1 For each item of equipment and each system include description of unit or system, and component parts.

.1 Give function, normal operation characteristics and limiting conditions.

.2 Include performance curves, with Consultant data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
.1 Include regulation, control, stopping, shut-down, and emergency instructions.
.2 Include summer, winter, and any special operating instructions.

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

.6 Provide servicing and lubrication schedule, and list of lubricants required.

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

.8 Include sequence of operation by controls manufacturer.

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

.10 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

.11 Provide charts of valve tag numbers with location and function of each valve, keyed to flow and control diagrams.

.12 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.13 Include test and balancing reports as specified in Section 0l 45 00 - Quality Control.

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

1.10 MATERIALS AND FINISHES

.1 Building products applied materials, and finishes include product data, with catalogue number, size, composition, and color and texture designations.
.1 Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections.

1.11 MAINTENANCE MATERIALS

.1 Spare Parts:

.l Provide spare parts, in quantities specified in individual specification sections.
.2 Provide items of same manufacture and quality as items in Work.
.3 Deliver to site; place and store.
.4 Receive and catalogue items.
.1 Submit inventory listing to Departmental Representative.
.2 Include approved listings in Maintenance Manual
.5 Obtain receipt for delivered products and submit prior to final payment.

.2 Special Tools:

.1 Provide special tools, in quantities specified in individual specifications section.
.2 Provide items with tags identifying their associated function and equipment.
.3 Deliver to site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Departmental Representative.

.

.2 Include approved listings in Maintenance Manual.

1.12 DELIVERY, STORAGE AND HANDLING

.1 Store spare parts, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace products at own expense and for review by Departmental Representative.

1.13 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan. 5 days before planned pre-warranty conference, to Departmental Representative.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
.2 List subcontractor, supplier and manufacturer, with name, address, and telephone number of responsible principal.
.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
.4 Verify that documents are in proper form contain full information, and are notarized.
.5 Co-execute submittals when required.
.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint 11 months warranty inspection, measured from time of acceptance, with Departmental Representative.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process including points of contact and telephone numbers within the organization of Contractors, subcontractors, manufacturers or suppliers involved.
.2 Listing and status of delivery of Certificate of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors and commissioned system.
.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.
.2 Model and serial numbers.
.3 Location where installed.
.4 Name and phone numbers of manufacturers or suppliers.
.5 Names, addresses and telephone numbers of sources of spare parts.
.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
.7 Cross-reference to warranty certificates as applicable.
.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.
.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
.11 Organization, names and phone numbers of persons to call for warranty service.
.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 11 months post-construction warranty inspections.

.5 Procedures and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operations is critical for warranty and/or safety reasons.

.7 Comprehensive checklists for each tank and appliance.

.8 Respond in timely manner to oral or written notification of required construction warranty repair work.

.9 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.14 WARRANTY TAGS

.1 Tag at time installation, each warranted item. Provide durable, oil and water resistant tag approved by Owner Representative.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

.1 Type of product/material
.2 Model number
.3 Serial number
.4 Contract number
.5 Warranty period
.6 Inspector's signature
.7 Construction Contractor

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Provide all labour, materials, products, equipment and services to supply and install the basic mechanical materials indicated on the Drawings and specified in these Specifications.

1.2 IDENTIFICATION OF MECHANICAL SERVICES

.1 Identify all mechanical services after finish painting is complete.

.2 Use terminology consistent:

.1 With the Drawings and Specifications
.2 With the Owner's requirements and standards

.3 Identify lay-in type acoustic ceilings used for access to equipment and components by a method acceptable to Consultant.

.4 Mark valve and equipment identification on Record Drawings.

.5 Provide typewritten master lists for each Equipment Room. Frame under glass. Insert copies in Operating and Maintenance Instruction Manuals.

.6 Ductwork Identification

.1 Provide SMS Wrap-Mark on all pipe coverings, using Wrap-Mark pipe markers with flow arrow and alternating wording. For outside diameters up to {150 mm} [6"], allow marker to completely wrap pipe. For larger outside diameters, secure markers with stainless steel springs. Secure markers on vertical piping and elsewhere where markers could be inadvertently moved.

.2 Use stencils and stencil paint on ductwork or ductwork insulation. Apply solid black capitalized lettering {50 mm} [2"] high and solid black flow arrows {150 mm} [6"] long x {50 mm} [2"] wide.

.3 Locate identification and flow arrows so they can be seen clearly from floor and service platforms

a) At least once in each room

b) At each piece of equipment

c) At each branch close to connection point to main piping and ductwork

d) At not greater than intervals of {15 metres} [50 ft] on straight runs of exposed piping and ductwork

e) At entry and leaving point to pipe and duct chases, or other concealed spaces

f) Both sides where piping and ductwork passes through walls, partitions and floors

g) Behind each access door and panel

.4 Conform to ASHRAE and ANSI/ASME Standards for primary label colour and with legend and direction arrows in black. Print legend in full wherever feasible, or a recognized abbreviation of the service involved.

.5 Identify electrical tracing of pipes on pipe insulation.

.7 Equipment Nameplates

.1 Identify equipment, starters, and, remote control devices in a manner consistent with the Drawings.

.2 Use solid black capitalized lettering {100 mm} [4"] high.

.3 Where equipment size does not permit stencil identification, use lamacoid labels, engraved white on black, mechanically fastened to the equipment. Minimum lettering size {10 mm} [3/8"].

.4 Do not insulate or paint over Manufacturer's Nameplates.

Part 2 Products

2.1 INSERTS

.1 Submit proposed materials and methods for cast-in-place inserts.

.2 Where inserts must be placed after concrete is poured, use Phillips Red Head Multiset II Anchor system or equivalent Hilti System.

2.2 EQUIPMENT RIGGING SUPPORTS

.1 Provide eyebolts suitable for block and tackle connection, adequately supported by the structure and roof above for:

.1 Packaged vertical heat pump unit
.2 Fume hood c/w exhaust ductwork
.3 Roof mounted exhaust fan
.4 other equipment which will require block and tackle handling

2.3 SLEEVES, WALL AND FLOOR PLATES

.1 Concealed perimeter risers and runouts may have sleeves of {1.31 mm} [18 gauges] galvanized steel set around section of insulation to provide freedom of movement of piping. Extend {50 mm} [2"] above finished floor level.

.2 For piping through exterior walls, cooperate with the waterproofing trade at all times, and do not break any waterproofing seal without consent of the waterproofing trade. Provide waterproof link seals as detailed on Drawings.

.3 Provide {1.31 mm} [18 gauges] galvanized steel duct sleeves. Provide adequate bracing for support of sleeves during concrete and masonry work. For fire rated floors and walls, build fire damper assemblies into structure to attain fire rated construction, in a manner acceptable to the governing authorities.

.4 Cover pipe sleeves in walls and ceilings of finished areas, other than Equipment Rooms, with satin finish stainless steel, or satin finish chrome or nickel plated brass escutcheons, with non-ferrous set screws. Do not use stamped steel split plates. Split cast plates with screw locks, however, may be used.

.5 Cover exposed duct sleeves in finished areas with {1.31 mm} [18 gauge] galvanized steel plates in the form of duct collars. Fix in position with non-ferrous metal screws.

2.4 DRAINS

.1 Provide {40 mm} [1-1/2"] minimum size copper pipe drains from overflows, condensate pans and pump bases to floor drains.

.2 Provide minimum {20 mm} [3/4"] ball valve with hose end adapter, metal cap and chain at all low points of all systems. Locate to allow easy connection of hose.

.3 Provide {40 mm} [1-1/2"] minimum size drains from ductwork connected to intake hoods and wall louvers. Equip drains with deep seal traps. Locate traps in heated areas.

.4 Provide {20 mm} [3/4"] valves with metal caps and chains at the base of all pipe risers. Install hose end ball valve in conjunction with {450 mm} [18"] minimum length full line size dirt leg.

2.5 MOTORS AND MOTOR STARTERS

.1 Motors:

.1 Supply and install all motors for Mechanical equipment.
.2 All motors 1 HP and greater shall be T-Frame AC, three phase and equal to or exceeding the Ontario Hydro EnerMark Efficiency Level as tested to either CSA 390 M1985, or IEEE 112B, and approved under the Canadian Electrical Safety Code.
.3 All single phase motors shall be capacitor type, capable of a minimum 10 starts per hour.
.4 Select motors for quiet, continuous operation to suit the loads which may be imposed by the equipment. Motor horsepowers specified and scheduled are minimum sizes. If larger motors are supplied, ensure that all extra costs for larger motor, starters, power wiring and additional control wiring is included in the Tender.
.5 Motor enclosures shall be selected to suit service conditions as follows:

a) Protected from the weather, entrained moisture or process related liquids: open drip proof motors with service factor 1.15
b) Located in air stream: suitable for operation at maximum air temperature and moisture levels, with drip proof enclosure, encapsulated windings and weatherproof terminal box
c) Where scheduled or otherwise specified: explosion-proof motors
d) Remainder: totally enclosed fan-cooled motors with service factor of 1.00

.6 Submit an accurate schedule of all motors. Show for each motor; horsepower, speed (RPM), nameplate current, equipment served, location, electrical characteristics and identification number.

.2 Contactors and Control Devices:

.1 Magnetic starters, disconnect switches, fuses, etc. for all mechanical equipment shall be supplied and installed by the Electrical contractor, unless otherwise specified

2.6 FLASHING

.1 Provide flashing for duct openings or pre-manufactured roof curbs.

.2 Carry out all counters flashing for roof mounted mechanical equipment and for ducts passing through roof. Fit counter flashing over flashing or curb. Pitch pockets are not acceptable.

2.7 CURBS

.1 Pre-manufactured curbs for mechanical equipment mounted on roof will be supplied by equipment manufacturer and they are specified under other Sections of this Division.

.2 Curbs are required for roof mounted equipment, around ducts passing through roof and surrounding holes where groups of pipes and/or ducts pass through Equipment Room floors and similar areas where water dams are required.

.3 Provide roof curbs at least {300 mm} [12"] above finished roof, unless exceeded by Architectural considerations.

.4 Provide concrete curbs around holes in Equipment Room floors, extending at least {150 mm} [6"] above finished floor. Make watertight connection between curb and floor.

2.8 CONCRETE

.1 Provide {100 mm} [4"] concrete housekeeping pads under all floor mounted mechanical equipment and supports. Extend pads over the full equipment base and isolator area.

.2 Provide floating reinforced concrete bases, and floating floors which are specified under Sound and Vibration Control.

2.9 STEEL

.1 Provide steel of adequate strength to support equipment and materials during all operating and test conditions.

.2 Support suspended equipment from the bottom or from manufacturer's designated suspension points. Support tanks and similar equipment with adequate beam strength by saddles with curvature to match the equipment. Continuously support other equipment.

.3 Provide base supports for all pipe risers. Design to distribute operating and static loads.

.4 Fabricate steel supports in contact with water or humidity conditions from materials having approved corrosion resistance or galvanize after fabrication or brush welds clean and apply a prime coat of rust inhibiting paint.

2.10 FIRESTOPPING

.1 Provide ULC classified fire stopping products by 3M or Hilti which have been tested in accordance with CAN4-S115.

Part 3 Execution

3.1 DUCT AND EQUIPMENT INSTALLATION

.1 Locate distribution systems, equipment and materials for maximum usable space, optimum service clearances and to accommodate current requirements and identified future expansion.

.2 Install equipment and materials to present a neat appearance. Run piping, ducts and conduit parallel to or perpendicular to building planes. Conceal piping, ducts and conduit in finished areas. Install so as to require a minimum amount of furring.

.3 Make provisions for neat insulation finish around equipment and materials. Do not mount equipment within insulation depth.

.4 In electrical rooms and elevator machine rooms, provide drip trays under the entire length of all pipes within the confines of the room. Pipe drip tray to nearest floor drain.

.5 Perform pipe welding to meet ANSI B31.9.

3.2 CONNECTIONS TO EQUIPMENT

.1 Make all sheet metal connections to equipment provided by the Owner.

3.3 INSERTS

.1 Size and space for the loads to be supported
.

.2 Properly locate and firmly secure inserts to forms before concrete is poured.

.3 Place inserts only within main structure and not in any finishing materials.

.4 When inserts are required in precast concrete, supply inserts and location drawings to the precast concrete supplier for casting into material. Otherwise, include the cost of having the precast concrete supplier install inserts at the site.

.5 Do not use powder actuated tools.

3.4 HANGERS

.1 Suspend ductwork and equipment with all necessary hangers and supports required for a safe and neat installation. Ensure that pipes are free to expand and contract and are graded properly. Adjust each hanger to take its full share of the weight.

.2 Suspend hanger rods directly from the structure. Do not suspend pipes, ducts or equipment from other pipes, ducts, equipment, metal work or ceilings.

.3 Provide auxiliary structural steel angles, channels and beams where ductwork, piping and equipment must be suspended between joists or beams.

.4 Use galvanized rods, steel support angles, channels and beams where exposed to direct contact with water or to possible high humidity conditions where condensation can occur.

.5 Space hangers to ensure that structural steel members are not over stressed. In no case shall pipe hangers be further apart than indicated in the tables. When requested, submit detailed drawings showing locations and magnitude of ductwork, piping and equipment loads on the structure. Provide calculations when requested by Consultant

.6 Do not use hooks, chains or straps to support equipment and materials.

.7 For precast concrete work, if inserts cannot be cast into members, pass hanger rods between the members and weld to steel plates resting on the upper surface of the precast material. To prevent raising of the hanger rod, apply a lock nut and {50 mm} [2"] minimum dia. flat washer tight against the under surface of the precast material.

.8 Ensure that copper materials are completely isolated from ferrous materials. Use plastic or epoxy coated hangers and clamps. Use lead inserts between copper piping and other ferrous materials.

.9 Provide round steel threaded rods meeting ASTM A-36. Provide cadmium plated rod and accessories where exposed to direct contact with water or to possible high humidity conditions where condensation can occur.

.10 In addition to these basic requirements, provide hangers in the following location:

.1 To eliminate vibration
.2 On mains at branch takeoffs
.3 To avoid stress on equipment connections

.11 Install spring hangers or other special supports.

.12 Refer to applicable articles of the Specification regarding thermal insulation requirements. Unless shown specifically on Drawings, provide the following support methods.

.13 Generally, support ducts with {2.7 mm} [12 gauge] by {25 mm} [1"] wide galvanized hangers or with {12 mm} [½"] dia. rods and {40 mm} [1-1/2"] rolled angle saddles to meet SMACNA.

.14 Support vertical duct risers at each floor with rolled angle collars bearing on building structure.

3.5 SLEEVES, WALL PLATES, FLOOR PLATES

.1 Set sleeves for piping and ductwork in conjunction with erection of floors and walls. Locate sleeves accurately in accordance with submittal drawings, and as follows:

.2 Through interior walls, set sleeves flush with finished surfaces on both sides.

.3 Through exterior walls above grade, set sleeves flush with finished surfaces on inside and to suit flashing on outside.

.4 For floors in Mechanical Equipment Rooms, Janitors Closets, Kitchens and similar areas where a water dam is required, set sleeves flush to underside of structure and extending {50 mm} [2"] above finished floor.

.5 For other floors, set sleeves flush to both finished surfaces. Refer to Room Finish Schedule.

.6 Size sleeves to provide {25 mm} [1"] clearance around insulated piping and ductwork.

.7 Provide continuous insulation runs through fire separations. Ensure that piping and ductwork do not touch sleeves or for warm and hot water piping and ductwork terminate insulation cover on each side of sleeve. For chilled water and domestic cold water piping, provide same thickness Manville Thermo-12 pipe insulation with all-purpose vapour barrier jacket through fire separation to a point {100 mm} [4"] on each side of fire separation.

.8 Install leak tight seals to meet the manufacturer's requirements. Select the inside diameter of each wall sleeve opening to fit the pipe and leak tight seal, all to ensure watertight joint.

.9 Additional sleeving requirements:

.1 Provide sleeves for systems not part of Contract, but identified to be required on Drawings.

.2 Provide additional sleeves as required by Drawings to accommodate service requirements. Include for the cost of drilling and setting sleeves.

.3 Fill unused sleeves through fire separations with firestop material (see Firestopping article). Fill other unused sleeves with suitable noncombustible materials.

3.6 FIRESTOPPING

.1 Ensure that fire ratings of floors and walls are maintained.

.2 Pack clearance spaces; fill all spaces between openings, pipes and ducts passing through fire separations and install fire stopping systems in accordance with the appropriate ULC system number for the products and type of penetration.

.3 Install firestopping systems using personnel trained or instructed by the product manufacturer.

3.7 PAINTING

.1 Supply ferrous metal work except piping and galvanized and stainless steel ductwork, with at least one factory prime coat, or paint one prime coat on job.

.2 Clean and steel brush surfaces with welds. Then prime coat all steel supports and brackets.

.3 On uninsulated piping, steel brush and prime coat welds.

.4 Touchup or repaint all surfaces damaged during shipment or installation and leave ready for finish painting.

.5 Prime coat material shall conform to Canadian General Standards Board Standard No. 1-GP-48.

END OFSECTION

PART 1 - GENERAL

1.1. **Design Requirements**

Identify Mechanical Systems as follows:

.1 **Manufacturer's Nameplates**

.1 Provide metal nameplate on each piece of equipment, mechanically fastened complete with raised or recessed letters.

.2 Indicate size, equipment model, manufacturer's name, serial number, voltage, cycle, phase and power of motors.

.3 Locate in conspicuous location to facilitate easy reading from operating floor and to properly identify equipment and/or system.

.4 Provide stand-offs for nameplates on insulated surfaces.

.5 Do not insulate or paint over plates.

.2 **Ductwork**

.1 50 mm high black stenciled letters and directional flow arrows 150 mm long x 50 mm high. Provide at points of access.

.3 **Pumps, Motors, Panels, Raceways, Etc.**

.1 Identify each piece of equipment by means of an engraved white core lamicoid plate fastened by means of self-tapping screws to the item of equipment. Information shall give equipment number, system, control location and for motor drives, remote start and stop, voltage and horsepower. For raceways the label shall be on the top side over each outlet indicating circuit number:

PART 2 - PRODUCTS

2.1. Provide all materials and equipment necessary for identification work as specified in this Section.

PART 3 - EXECUTION

3.1. Do identification work in accordance with ASHRAE and ANSI/ASME Standards except where specified otherwise.

END OF SECTION

PART 1 - GENERAL

1.1 General

.1 General Requirements

(a) This Section 23 05 00 applies to and governs the work of all sections of Division 01, 23 and 26.

(b) The Contractor shall visit the site and become thoroughly familiar with all conditions to be met in carrying out the work covered by these specifications, prior to submitting bid. No extras will be allowed for failure to properly evaluate conditions which affect the scope of work included in this Division.

(c) Where a contradiction or discrepancy is found in the specifications or drawings, the Engineer shall be notified prior to tender closing. An addendum may be issued to clarify the intent of the drawings or specification. If the contractor fails to notify the Engineer prior to tender closing, the Engineer reserves the right to interpret the intent of the tender documents at any time.

(d) All equipment and materials shall be new, undamaged and free from defects.

(e) This is a Base Bid specification, see section 2.1.

1.2 Description

.1 Scope of Work

(a) The Mechanical specification and drawings specify complete systems. Include all labour and material required to make them so.

(b) The intent is to provide the Owner complete systems and while no attempt has been made to detail or list each individual part required, include all parts and furnish all labour reasonably implied by these documents in order to deliver to the Owner the complete systems ready for operation.

(c) Remove existing DX heat pump unit c/w indoor and outdoor unit. Recover refrigeration gas and handover to owner for this unit c/w all accessories.

(d) Keep the existing storage cabinets and existing fan.

(e) All equipment removed is left onsite for the client.

(f) Remove existing rated ceiling transfer air from ceiling to the space below.

(g) Provide and install new fume hood c/w exhaust duct work, remote roof mounted exhaust fan, fume hood supporting table at new location as indicated on the drawing. Provide 3M fire wrap at exhaust duct inside the ceiling to maintain fire rating integrity up to roof level. Anchor the exhaust fan on roof structure as per drawings.

(h) Provide new packaged vertical heat pump unit at outside wall c/w supply and return grilles c/w control system.

(i) Provide new two transfer air terminal c/w radiation dampers at ceilings c/w transfer air grille at room 1 and room 6 ceiling as per drawing.

(j) Provide new three transfer air grilles c/w out of wall fire dampers and backdraft dampers at pesticide storage rooms at low level.

(k) Clean and make good three existing exhaust fans at three pesticide storage exterior walls c/w controllers.

(l) Provide TAB work at fume hood as per manufacturers' requirements to CSA and PSPC standards for fume hoods including ASHRAE 110 containment testing. MS 15128-2013 (latest edition) laboratory fume hoods: guidelines for building owners, design professionals, and maintenance personnel and CSA Z316.5-20 and ANSI/ASHRAE 110: Laboratory Fume Hoods Performance Testing.

(m) Provide new supporting system complete with seismic restraint vibration isolators on new structural supporting frames as indicated on drawings.

(n) Provide required supporting at outdoor packaged vertical heat pump unit from wall as well as from ground level supporting system.

(o) Provide new roof supporting system to all external exhaust ductwork as indicated on drawing for new exhaust fan c/w isolation switch on roof.

(p) Provide power cable and control cable mechanical room to outdoor exhaust to complete the fume hood operation.

(q) Provide required thermal insulation to all refrigeration piping c/w jacketing inside the packaged unit.

(r) Plans and specifications augment each other, and any item reasonably implied in one but omitted in the other is interpreted as sufficiently covered, and must be provided.

(s) Furnish all required labour and materials, machinery, scaffolding, tools, implements, or other appliances together with all proper and required facilities for moving and transporting same, so that the contract and all work to be done under it, can and will be carried on in a workmanlike manner, properly, satisfactorily, continuously, and expeditiously, to completion, in all respects, to the satisfaction of the Departmental Representative.

(t) Provide required control system to new fume hood system. Provide complete control commissioning to new system. After successful commissioning of new system, hand over to maintenance staff with training.

(u) Clean all project area as required.

1.3 Requirements of Regulatory Agencies and Codes

.1 Permits, Tests, Regulations, Etc.:

(a) Before tendering, become fully acquainted with by-laws of any local or other authority having jurisdiction.

(b) Carry out all changes and alterations required by the authority inspector of any authority having jurisdiction without delay to the progress of the work and without extra cost.

(c) Upon completion of the contract, issue to the Owner a formal certification of completion of work before final payment for work may be considered due.

(d) Pay for all permits required for completion of this work.

.2 Quality Assurance:

(a) All equipment supplied by this Contractor shall only be by manufacturer's having a current ISO 9001, Quality Management System certification.

(b) Material and workmanship of the highest quality, conforming to the rules and regulations of the latest revisions of the following regulatory agencies and codes:

.1 Ontario Regulation 350/06 (Ontario Building Code)
.2 ASHRAE 110 Laboratory Fume Hoods Performance Testing
.3 Canadian Standards Association; CSA Z316.5-20 Fume hoods and associated exhaust systems
.4 Local Fire Codes
.5 The Construction Lien Act, R.S.O. 1990, c. C.30, as amended.
.6 The Occupational Health and Safety Act, R.S.O. 1990, c. 0.1, as amended.
.7 Workplace Safety and Insurance Act, S.O. 1997 C16, as amended.

(c) The Code, Regulation, Statute, By-Law, or this specification having the most stringent requirement applies. Before tendering, the Contractor shall make himself fully acquainted with by-laws of any local or other Authority Having Jurisdiction and all changes and alterations required by the authorized inspector of any Authority Having Jurisdiction shall be carried out without charge or expense to the Owner.

(d) All changes and alterations required by the Authorities Having Jurisdiction shall be carried out without delay to the progress of the work.

1.4 Minor Field Variations

The location, arrangement and connection of equipment and material as shown on the drawings represent a close approximation to the intent and requirements of the contract. The right is reserved by the Engineer to make reasonable changes required to accommodate conditions arising during the progress of the work. Such changes shall be done at no extra cost to the Owner unless the location, arrangement or connection is more than 5'-0" from that shown.

1.5 Submittals

.1 Manufacturer's Shop Drawings

(a) Comply with the provisions listed herein.

(b) Before fabrication of any materials or equipment, submit six (6) copies of detailed drawings of equipment and apparatus to the Engineer for review. Do not order materials until review has been given. Check the drawings and note comments, date and signature before submitting.

(c) Shop drawings must apply to the equipment under consideration. Advertising literature and comprehensive data sheets are not acceptable. The drawings must contain the actual dimensions of unit and dimensioned location and size of all outlets and connections, model range, capacity, hp, voltage, etc., of all accessories listed in the specifications, and/or being provided, and the operating points of the proposed equipment.

(d) Do not consider review rendered on shop drawings as a guarantee of measurements for building conditions. Where drawings are reviewed, said review does not mean that drawings have been checked in detail. The review does not in any way relieve this contractor from his responsibility or necessity of furnishing material to meet the performance of equipment specified and/or as shown on the contract drawings.

(e) Mechanical items for which shop drawings are specifically requested are listed in each section of the Specification.

.2 Record Drawings

(a) On two (2) sets of prints of this project, mark all changes and deviations from the original plans. Correctly mark all changes in red ink.

(b) On completion of the project, turn these plans over to the Owner for the Owner's record of the exact location of all piping and equipment.

(c) Certify these plans, "as-built". Plans are not considered certified unless they are signed and sealed by an officer of this contractor's company.

(d) Where piping is buried, dimension locations with respect to building walls and mark levels with respect to the elevation of finished floor below which piping is buried.

.3 Maintenance Data and Operating Instructions

(a) Collect and assemble manufacturer's data and operating and maintenance instructions.

(b) Print name of project and Owner's, Architect's and Engineer's names on the title sheet and cover, and return over two (2) sets of manuals to the Architect for approval before completion of the work.

(c) Assemble all data in logical order and insert in as suitable hard cover, black, three-ring loose leaf binder. Mark each Section with a labeled tab protected with a celluloid cover.

(d) Protect schedules, lists and directories with plastic covers.

(e) Type all notes. Printed literature may be used.

(f) Neatly assemble data complete with a list of contents.

(g) Include a complete list of mechanical equipment supplied and installed under this contract.

(h) Instructions shall include specific warning of maintenance and operation practices or materials which may damage or disfigure the particular material or equipment.

1.6 Final Documents

.1 Issue to the Departmental Representative, through the Engineer

(a) Two (2) copies "As-built" drawings.

(b) Two (2) copies "Operation and Maintenance Brochures".

(c) Final completion and guarantee certificates.

(d) The Engineer's final acceptance of the work is contingent upon these being received.
(e) The above submissions are subject to final Engineer approval.

1.7 Warranty

.1 Guarantee in writing that all materials and workmanship used on the project are in strict accordance with the specifications and will give proper and efficient operation and are free from mechanical or electrical defects. Repair and/or replace any defects which may appear in any of the work within one year after written acceptance by the Owner (except due to ordinary wear and tear) without additional expense to the Owner. Note that the one year period referred to above may exceed the equipment guarantee appreciably, and allowance must be made for this fact.

1.8 System Turnover

.1 Upon completion of the installation, the Contractor shall start up the system, perform all necessary tests, and run diagnostics to ensure proper operation. A full operational test of the heating and control systems shall be performed in the presence of the Owner's representative and the Engineer. They shall be required to be in attendance as long as necessary and shall be prepared to make any necessary adjustments and corrections at their own expense to make the system operational in the manner designated by the Engineer. When the system performance is deemed satisfactory by these observers, the system parts will be accepted for beneficial use, and placed under warranty.

.2 Provide training for maintenance staff on the operation of the installed systems.

.3 Contractor shall provide a Declaration of Completion signed by a responsible officer of the Company indicating that the following procedures and tests have been performed in accordance with the drawings and specifications:

(a) All approvals and permits obtained.
(b) All debris and construction materials removed from mechanical system.
(c) Major equipment identified and installed.
(d) Plumbing system installed, tested and approved.
(e) Final documents approved and submitted.
(f) Operating and maintenance on site instructions provided.
(g) Guarantee submitted and accepted by Owner
(h) Provide new filters for all air handling equipment

PART 2 - PRODUCTS

2.1 Base Bid and Alternative Equipment

.1 This is a base bid specification. Items on the Drawings and subsequent divisions of these specifications are listed with the names of a specific manufacturer, the first of which is a base bid and has been used in the design and is the equipment shown on the Drawings. The price submitted for this contract shall be based on the use of materials and equipment

specified. No alternatives shall be accepted in the base bid unless written approval has been obtained from the Engineer.

.2 Contractor may offer alternative equipment where based on the Contractor's experience and knowledge the alternative equipment provides equal performance and is built to the same quality standards as the base bid equipment. The Contractor shall supply a break out price adjustment for the use of the alternate equipment. The Contractor shall state in his tender:

(a) the name of the manufacturer

(b) adjustment in price

(c) equipment model number and capacity

(d) Provide verification that the manufacturer of the alternative equipment has been regularly engaged in the production of such equipment and with a minimum of fifteen continuous years of proven production experience.

.3 The final price selected, base bid with alternatives (if any), will dictate the scope of equipment supply from the Contractor.

.4 Any additional work associated with the installation of alternate equipment (including back charges from other Contractors) shall be the responsibility of the Contractor.

.5 Any alternative equipment submitted must not exceed space requirements allocated on the Drawings.

.6 All of the materials required for the performance of the work shall be new and the best of their respective kind and be of uniform pattern throughout the work.

PART 3 - EXECUTION

3.1 Preparation

.1 Coordination

(a) Start work and proceed as soon as possible after the contract has been let and in accordance with the construction of the building.

(b) Confer and cooperate with other trades in order to eliminate any unnecessary delays to the construction schedule. Where doubt exists regarding other trades, confer with the Project Manager without delay for detailed instructions concerning how to proceed with the work. Expedite delivery of all equipment and materials to meet the construction schedule.

.2 Layout and Planning

(a) The Mechanical Contractor shall be responsible for laying out, planning, and locating all systems, equipment, ductwork and piping based on accurate field measurements and shop drawings or certified prints as required to properly install, maintain, repair and operate all systems and equipment. Drawings shall not be scaled to locate equipment, ductwork or piping. The drawings are diagrammatic, and indicate the general arrangement and routing only. The Contractor shall plan the work to avoid interferences, minimize offsets, and to provide for a neat and proper installation.

(b) The runs of piping, position of apparatus, etc., specified or shown on the drawings, indicate general arrangements of the equipment. This Contractor shall be required to make without charge, any necessary changes or additions to the runs to accommodate structural or other conditions.

(c) All exposed piping shall be installed neatly and closely to the structure. Pipes which are not installed as they should be, in the opinion of the Engineer, shall be corrected without cost to owner.

(d) Pipes and duct runs shall be installed in such a way as to interfere as little as possible with the free use of the space through which they pass.

(e) The Mechanical Contractor shall test, adjust, startup, and place into proper operational equipment and systems installed under this contract. Prior to the startup of any equipment or system, the Contractor shall make certain that all equipment is clean, free or foreign matter, all bearings are lubricated and all precautions have been followed in accordance with the equipment manufacturer's instructions.

(f) Contractor shall take due care during the installation and ensure no damage shall result to any of the building due to the installation work. Contractor shall only use specified access paths.

.3 Scaling Drawings

(a) All drawings are in general made to scale and where figured dimensions are not given, obtain approximate distance by scaling plans. It is however, distinctly understood that the Contractor does so entirely on his own responsibility as the accuracy of the drawings is not guaranteed.

(b) The drawings upon which this contract is based show the arrangements, general design and extend of the duct and piping and other systems. These systems are suitably outlined on the drawings with regard to sizes, locations, general arrangements

(c) The mains and connections thereto are shown more or less in diagram, except where in certain cases the drawings may include details giving the exact locations and arrangements required. Any necessary change or additions to the runs to accommodate structural conditions are done without additional charge or expense to the Owner. Conceal all ductwork and piping unless shown otherwise. Notify the Engineer immediately and secure his authority in writing for such revisions before proceeding with the work.

3.2 Installation

.1 Cutting and Patching

Cutting of holes and related patching, in floors, roof or walls where required for mechanical installations, shall be provided by this Contractor. Coordinate with General Contractor for openings to be left for mechanical equipment or air circulation. Hire the services of the necessary trade to perform any cutting, core drilling, patching and making good to all materials and surfaces affected by the work disturbed or tampered with, in order that his portion of the contract can be completed satisfactory

.2 Access Doors in Building Construction

(a) Provide access doors in floors, wall, ceilings, etc. to give access to mechanical lubrication points, controls, duct hardware, cleanouts, fire dampers, isolating and balancing valves, air vents, etc.

(b) Appropriate size and type to suit the individual application, and similar to adjoining construction.

(c) 12 gauge prime coated steel access door with heavy duty fully concealed hinges and positive locking and master keyed cylinder lock. Size: 18" x 18" (450mm x 450mm) as manufactured by Mifab.

(d) Fire rated access door has 16 gauge steel frame, 20 gauge insulated steel door attached to frame with continuous hinge with stainless steel in. Self-latching key operated cylinder lock. Size 16" x 167" (400mm x 400mm) as manufactured by Mifab.

(e) Access doors are not necessary where inverted "T" lay-on ceiling tile construction is used.

(f) Supply access doors to the appropriate sub-trade for installation.

(g) Individually specified access doors occurring directly on exposed mechanical items need not be coordinated in the above manner.

.3 Sleeves and Escutcheons

(a) Provide sleeves for piping and ducts, and provide lintels for openings for grilles, fans and similar equipment. Installation by General Contractor.

(b) Do not set pipes in contact with concrete, masonry, wood, steel or similar materials. Pipes must be free to expand, contract or otherwise move without wear or noise.

(c) Pipe insulation shall be carried uninterrupted through pipe sleeves except where otherwise noted or required by Ontario building code or local authority. Where space will not permit application of sectional insulation on pipes in sleeves, pack sleeves with insulation.

(d) Pipe sleeves shall be of the same material and wall thickness series as the pipe. For piping passing through partition walls #22 gauge galvanized steel sleeves are acceptable. Insulation on pipes passing through fire walls to be fit tight to the fire stop material and shall not pass through.

(e) Where exposed pipes pass through floors, walls, etc., finish with solid type escutcheon plates held in place with set screws where necessary. Paint escutcheons to match the walls except when used with chrome piping, when they are chrome plated to match. When pipes are insulated, escutcheons may be omitted, provided the insulation is butted neatly to the wall and completely covered by its finish jacket in a manner acceptable to the Engineer.

.4 Supports

(a) This Contractor shall supply and erect all special structural or concrete work required for the installation of the mechanical equipment. He shall supply and

install all anchor bolts and other fastenings. Where apparatus is required to be mounted on concrete pads, this Contractor shall locate the pads accurately and with neatly chamfered edges and corners.

(b) This Contractor shall supply and install all necessary steel beams, channels, angle iron for supporting the equipment, pipes, apparatus, etc.

(c) Welding to, cutting or burning of structural members by Contractor will not be permitted, except where approved. No holes will be punched or drilled in structural members without the prior consent of the Engineer. Where such permission is not given, all attachments to steel members shall be done with suitable clamps or clips.

.5 Fire Stopping and Smoke Seals

(a) Provide fire stopping and smoke seals where ducts, pipes or conduits penetrate rated fire separations to maintain integrity of fire separations. Fire stopping materials to meet ULC CAN S115 and be ULC listed.

(b) Firestopping to be manufactured by 3M.

(c) Installations to conform to approved ULC details and standards. Seal space between penetrating service and sleeve or opening in slab with firestop and smoke sealing system in accordance with terms and conditions of original ULC approval and manufacturers recommended procedures. Contractor to submit firestopping system details to Engineer for approval prior to installation.

(d) Select firestopping system to allow insulation and vapour barrier to pass un-broken through assembly, as required.

(e) Follow Manufacturer's published installation instructions precisely including field quality control after installation. Surfaces to be clean, dry and free from dust, oil, grease, loose or flaking paint and foreign materials at time of application of materials.

(f) Submit to Consultant, suitable document signed by Manufacturer's local representative, stating:

.1 Div. 23 sub-contractor received sufficient installation instruction from Manufacturer's representative.

.2 Manufacturer's representative witnessed installation procedures on site.

(g) Remove firestopping assembly for random inspection by Consultant and replace at no extra cost to Owner.

.6 Painting

(a) Carefully brush and clean all iron work after installation in order that it may be in proper condition for paint. Paint all metal, unless galvanized or shop primed, with one coat of metal priming paint.

(b) Clean any equipment defaced during construction to restore original finish. All mechanical equipment which comes on the site pained, rusty or otherwise defaced due to construction and installation is to be pained with one coat of paint, oil base type, of the original colour.

(c) Paint all inside surfaces of all duct black, back at least 2' -0" (600mm) from all grilles and registers.

(d) Unless otherwise noted, finish painting will be performed by General Contractor. Provide assistance in the form of supervision to General Contractor to ensure that painting and colour coding of the work of this Division is done correctly.

.7 Electrical Wiring and Starters of Mechanical Devices

(a) All electrical power wiring and non-integral motor starters shall be provided and installed by Division 26.

(b) Advise Division 26 Contractor of the appropriate designations of all starters to enable the Division 26 contractor to label same.

(c) Install motorized equipment. Some of the said equipment contains packaged wiring, etc. such that Division 26 Sub-Contractor will only have to bring power to an electrical connection point.

(d) All devices must bear CSA approval stamp. Verify that the power characteristics specified herein agree with the requirements of the installation before any equipment is ordered.

3.3 Field Quality Control

.1 Efficiency and Capacity Tests

(a) When the systems called for under these specifications are ready to be turned over, subject these systems to continuous runs of 24 hours for the purpose of demonstrating that all heating, ventilating and air conditioning units are operating properly and that the systems are balanced and provide uniform temperature inside the building.

Perform these tests under the direction of the Engineer's representative and if the systems fail to perform the duties a herein specified, and if the apparatus and equipment are not in good condition and do not meet the requirements of the specifications, rectify these defects at no cost to the Owner.

(b) Thoroughly lubricate all bearings and advise the Owner or his representative in regard to the proper maintenance and operation of all equipment. Equipment and systems must be free from objectionable noise. This is a requirement of this Contact.

END OF SECTION

PART 1 - GENERAL

1.1 SEISMIC AND WIND RESTRAINTS

A. General:

1. Provide positive seismic and wind restraints on systems and components required by the applicable building code and by the local authority having jurisdiction. The Contractor shall engage the third party structural Professional Engineer and shall receive the guidance throughout the installation process and provide the compliant report for this installation by this professional engineer's stamp at the end of project. This section covers design, supply, installation and inspection of complete SFRS {Seismic Force Resisting System} for all systems.

2. SFRS to be fully integrated into, compatible with noise and vibration controls in accordance with Section 15072 – VIBRATION ISOLATION AND NOISE CONTROL. See the vibration isolation and seismic restraint schedule on the drawings for equipment specific values to be used in calculating the seismic restraint forces, including component importance factor, (I_E) / (I_P); Reference Code By Jurisdiction.

3. Provide restraint devices as required, specified, and as scheduled for isolated and non-isolated systems and equipment. Provide calculations to determine restraint loadings for all restrained systems and equipment resulting from seismic forces. Certification documents to be signed and sealed by a qualified Professional Engineer with at least 5 years experience in the design of seismic restraints.

4. The contractor shall utilize a supplier familiar/experienced with the design of seismic systems to provide a comprehensive package of isolation and seismic restraint for the project. Provide detailed shop drawings showing the proposed restraint system for all required equipment, piping and ductwork on the project. The shop drawings shall include calculations certified by a registered design professional.

5. Seismic restraints are to be provided for all mechanical & non-structural components of building services in accordance with the current: IBC; NBCC; OBC; ASHRAE Standards "A Practical Guide to Seismic Restraints"; NFPA 13; SMACNA (2nd Edition) "HVAC Duct Construction Standards" and Good Engineering Practice (references listed below):

   a. International Building Code (IBC) year by jurisdiction / National Building Code of Canada (NBCC) 2010 / Ontario Building Code (OBC) 2006.

   b. American Society of Civil Engineers 7-05. (Issue year may vary depending on specified IBC code).

   c. SMACNA (*Sheet Metal and Air-conditioning Contractors' National Association's*) Seismic Restraint Manual Guidelines for Mechanical Systems (2nd ed. Or 3rd ed. depending on specified either by code or Engineer of Record).

   d. ASHRAE (*American Society for Heating, Refrigerating and Air-conditioning Engineers*) *A Practical Guide to Seismic Restraint*; ASHRAE Applications Handbook, Seismic and Wind Restraint Design Chapter; ASHRAE Standard 171-2008: Methods of Test for Seismic restraints.

e. VISCMA (*The Vibration Isolation and Seismic Control Manufacturers Association*) has developed Testing and Rating Standards for Seismic Restraint Components that comply with Code and ASHRAE based requirements.

f. VISCMA 102-2007: Static Qualification Standards for Obtaining a VISCMA Compliant Seismic Component Rating.

g. FEMA (Federal Emergency Management agency) Seismic Restraint Installation Manuals 412, 413 & 414.

1) FEMA 412: Installing Seismic Restraints for Mechanical Equipment.

2) FEMA 413: Installing Seismic Restraints for Electrical Equipment.

3) FEMA 414: Installing Seismic Restraints for Duct and Pipe.

6. Each contractor shall use a single manufacturer to provide and certify seismically rated isolators and restraints. Preferred manufacturer is: Kinetics Noise Control, Inc.

7. At the completion of the project, upon request, there can be a review of the installations on site and a sealed written report, certifying that the installations have been completed in accordance with the specified design(s) and shop drawing(s) can be furnished, by others, upon this request.

1.2 ENGINEERING PERFORMANCE REQUIREMENTS

A. Specified design criteria for seismic and vibration for elements and components are to be designed to accommodate these specific calculation components factors, as taken from the structural drawings for this project. Confirm all factors with structural drawings. In the event of a discrepancy between this data and the data presented on the structural drawings, the structural drawings shall be taken as accurate:

1. Design Ground Acceleration Coefficient **$S_a(0.2) = 0.41$, $S_a(0.5) = 0.20$, $S_a(1.0) = 0.073$, $S_a(2.0) = 0.021$** as appropriate for jurisdiction / code.

2. Design (Site Class) Soil Type **C**. For OBC, **$F_a = 1.236$, $F_v = 1.40$. Confirm with Building Structural engineer.**

3. Importance or Performance Factor appropriate to structure **($I_E = 1.50$)** as appropriate for jurisdiction / code. Classification: (Low, Normal, High, Post Disaster). This building is a Post-Disaster building.

4. Additional Safety Factor above code requirements for engineered components and **SFRS (X)**; (if appropriate).

5. Equipment Schedule (IBC / NBCC / OBC, TI-808-04, 97UBC) The Mechanical Engineer of record will provide a comprehensive Equipment Schedule indicating individual equipment importance factors, I_P / I_E, (including equipment whose importance factor, I_P / I_E, may be increased by proximity to essential life safety or hazardous components), equipment elevation both in the structure and (if floor mounted, relative to the floor), roof elevation and structural interface material, i.e., anchored to concrete, bolted or welded to steel.

6. Schedule or drawings indicating critical **(I_P =1.5) / (I_E =1.5)** Duct / Piping systems, including systems whose importance factor may be increased by proximity to critical components.

7. Wind loads shall be based on the requirements listed in ASCE 7-05 including the recommendations in the commentary for that document.

1.3 SEISMIC DESCRIPTION OF SYSTEM

A. It shall be understood that the requirements of this seismic restraint section are in addition to other requirements as specified elsewhere for the support and attachment of equipment and mechanical services, and for the vibration isolation of same equipment. Nothing on the project drawings or specifications shall be interpreted as justification to waive the requirements of this seismic restraint section.

1. Seismic restraint systems shall be designed to offer seismic restraint in all directions, unless otherwise noted.
2. Anchor types and sizes are to be per the design data as provided by the seismic restraint manufacturer.

3. Seismic restraint capacities, seismic cable restraint system, rod stiffener clamps to be verified by an independent test laboratory or certified by a registered design professional to ensure that the design intent of this specification is realized. Verification shall be by one of the following methods:

a. An NRTL (National Recognized Testing Laboratory), or laboratory recommended by VISCMA.

b. Certified be a registered design professional with at least 5 years experience, using industry standard methods of analysis, which employ common engineering practices. Adherence to the ratings standard within ASHRAE Standard 171-2008 and VISCMA 102-2007 is required.

c. By a nationally recognized agency, such as VISCMA, that has reviewed and approved the restraint.

4. Its the contractors' responsibility to ensure the seismic engineers' requirements have been met.

1.4 SEISMIC SYSTEM DESIGN

A. The seismic restraint manufacturer shall be responsible for the selection of the attachment hardware as required to attach snubbers/restraints to both the equipment and supporting structure on vibration isolated equipment, or to directly attach equipment to the building structure for non-isolated equipment.

B. The contractor shall furnish, to the seismic restraint manufacturer, a complete set of approved shop drawings of all equipment that is to be restrained, from which the selection and design of seismic restraint devices and/or attachment hardware will be completed. The shop drawings furnished shall include, at a minimum, basic equipment layout, length and width dimensions, and installed operating weights of the equipment to be restrained.

C. All piping and ductwork is to be restrained to meet code requirements. At a minimum, the seismic restraint manufacturer shall provide documentation on maximum restraint spacing for various restraint sizes and anchors, as well as "worst case" reaction loads for each restraint and/or anchor size.

D. The contractor shall ensure that all housekeeping pads used are adequately reinforced and are properly dowelled to the building structure, so as to withstand calculated seismic forces.

In addition, the size & thickness of the housekeeping pad is to be coordinated with the seismic restraint manufacturer to ensure that adequate edge distances & embedment depths exist in order to obtain the desired equipment anchor capacities.

1.5 COORDINATION

A. Coordinate size, shape, reinforcement and attachment of all housekeeping pads supporting vibration/seismically rated equipment. Concrete shall have a minimum compressive strength of 3,000 psi, more if so specified by the project engineer.

B. Coordinate with vibration/seismic restraint manufacturer and the structural engineer of record to locate and size structural supports underneath vibration/seismically restrained equipment (e.g. roof curbs, cooling towers and other similar equipment).

1.6 SUBMITTALS

A. All seismic / wind / vibration restraint systems shall be by a single manufacturer.
Base Bid manufacturer is Kinetics Noise Control, Inc.

B. Product Data: Include Seismic Rating Data for each seismically rated isolator or restraint component.

C. Submit shop drawings for all devices specified herein and as indicated and scheduled on the drawings. Submittals shall indicate full compliance with the device specification in Part 2. Any deviation shall be specifically noted and subject to engineer approval. Submittals shall include device dimensions, placement, attachment(s) and anchorage requirements. Shop Drawings shall include the following:

1. Design Calculations: Calculate the load requirements for all seismically rated vibration isolators and seismic restraints. Certification documents to be signed and sealed by a registered design professional with at least 5 years experience in the design of seismic restraint systems.
2. Vibration Isolation Bases: Dimensional drawings including anchorage and attachment to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads.
3. Seismic-Restraint Details: Provide detailed submittal drawings of seismic restraints and snubbers. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors. Include load rating where appropriate.
4. Equipment Manufacturer Seismic Qualification Certification: The Equipment Manufacturer must submit certification that each piece of provided equipment will withstand seismic forces identified in "Performance Requirements"; Include the following:

    a. Basis for Certification: Indicate whether the “withstand” certification is based on actual test of assembled components or on calculations.

    b. Indicate the equipment is certified to be durable enough to:

        1). structurally resist the design forces (non-essential equipment) and/or

        2). will remain functional after the seismic event (essential equipment).

D. Working drawings, materials lists, schematics and full specifications for all components of each SFRS to be provided. Design calculations are to include restraint loads resulting from seismic forces in accordance with {IBC / NBSS / OBC}, detailed work sheets and tables as appropriate.

Separate shop drawings for each SFRS and devices for each system or equipment are to be provided. These drawings shall be designed and bear the signed stamp of a registered design professional licensed to practice in the appropriate discipline and in the projects geographic location.

E. Materials and systems specified herein and detailed or scheduled on the drawings are based upon materials manufactured by: Kinetics Noise Control, Inc. Materials and systems provided by other manufacturers are acceptable, provided that they meet all requirements as listed in this specification.

PART 2: PRODUCTS / MATERIALS

Provide Seismic Restraint Isolators detailed below per the details of the seismic and isolation equipment schedule

2.1 SEISMIC RESTRAINT ISOLATION

A. Isolators

1. Vibration/Seismic Restrained Spring Isolator: Type FLSS – Vibration isolators shall be seismically rated, restrained spring isolators for equipment which is subject to load variations and large external forces. Isolators shall consist of large diameter, laterally stable, steel springs assembled into welded steel housing assemblies designed to limit movement of the supported equipment in all directions. Housing assembly shall be of fabricated steel members and shall consist of a top load plate complete with adjusting and leveling bolts, adjustable vertical restraints, isolation washers, and a bottom plate with internal non-skid noise isolation pads and holes for attaching the housing to supporting structure. Housing shall be hot-dip galvanized for corrosion resistance. Housing shall be designed to provide a constant free and operating height within 1/8" (3 mm). Spring elements shall be selected to provide static deflections as shown on the vibration isolation schedule or as indicated or required in the project documents. Springs shall be color coded or otherwise identified. Spring elements shall have a lateral stiffness greater than 1.2 times the rated vertical stiffness and shall be designed to provide a minimum of 50% overload capacity. Non-welded spring elements shall be polyester powder coated, and shall have a 1000 hr rating when tested in accordance with ASTM B-117. Spring elements shall meet all the specified characteristics described in Section 2.1/E.1 paragraph (23 05 48 Vibration Isolation Section). Oversized base plates may be required and will be determined when seismic certifications are performed. Vibration isolators shall be **Model FLSS** as manufactured by Kinetics Noise Control, Inc.

2.2 SEISMIC CURB/RAIL WITH INTEGRAL CURB ISOLATION

A. Vibration/Seismic Restrained Curb-mounted Spring Rail: Type KSCR w/ seismic restraint – All rooftop air-handling units shall be supported by vibration isolation curbs as manufactured by Kinetics Noise Control. The vibration isolation curbs shall be complete assemblies designed to resiliently support the equipment at the specified elevation and shall constitute a fully enclosed air- and weather-tight system. The isolation curb shall consist of an upper support rail with supply and return flexible connector supports on which the equipment and duct openings rest and a lower support curb which is attached to the roof structure, separated by freestanding, un-housed, laterally stable steel springs and lateral seismic and/or wind load restraints. The upper support rail shall provide continuous structural support for the rooftop equipment and shall be designed to provide isolation against casing-radiated vibration in the rooftop equipment housing and structure-borne vibration from rotating and mechanical equipment in the rooftop package. The upper support rail shall consist of an extruded aluminum structural shape with a minimum height of 4.75" (121 mm) above the spring to preclude interference with the roof top equipment. The upper support rail extrusion shall include a continuous keyway to accommodate the beaded elastomeric weather seal and a channel to maintain proper

spring alignment. The lower support curb shall be a formed channel fabricated of heavy gauge galvanized steel with a continuous 1-1/2" x 1-1/2" (38 mm x 38 mm) nominal wood nailer. The base plate of the curb shall be 1" (25 mm) wide and shall be welded, bolted or screwed to the building support steel. The lower support curb shall have a minimum elevation of 14" (356 mm). Spring components shall be 1" (25 mm) 2" (51 mm) deflection, freestanding, un-housed, laterally stable steel springs. Springs shall have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed for a typical 50% overload to solid. All springs shall have a polyester powder coated finish and be color coded to indicate load capacity. Springs shall rest on a neoprene noise pad. The spring and noise pad shall be captured in a retainer cap secured to the lower support curb. The lateral stabilizers shall be stainless steel spring assemblies factory located and installed to provide seismic and/or wind load restraint. Standard units are designed to withstand a 43 psf. horizontal and 25 psf. vertical wind load. Resistance to higher loads or for ratings on extended height curbs or units attached to wood or concrete will require analysis by KNC, but can in most cases be met with only minor modification. The weather seal shall run continuously around the perimeter of the curb and be joined in the field with one seam using a double-faced elastomeric adhesive. The weather seal shall be fastened to the wood nailer of the lower support curb using screws and an aluminum fascia strip. Supply and return flexible connector support hardware shall be supplied for installation by the contractor in the field. The supports will be clearly marked and dimensioned on the submittal and installation drawings. The support hardware shall be cut-to-length galvanized steel channels supported and connected with stamped and punched galvanized steel duct support hangers. The support hangers shall allow the duct support elevation to be equal to or lower than the equipment rail elevation. Supply and return air duct shall be flexibly attached by the contractor to prevent transmission of vibration to the building structure. The isolation curb assembly shall include a troubleshooting kit to permit the contractor to level or adjust the loading of the isolation system immediately after placement of the rooftop equipment should the actual weight and/or distribution differ from design values. Vibration isolators shall be selected by the manufacturer for each specific application to comply with deflection requirements as shown on the Vibration Isolation Schedule or as indicated on the project documents. Roof Curb Rails with an Integral Curb shall be **Model KSCR**, as manufactured by Kinetics Noise Control, Inc.

2.3 SEISMIC RESTRAINTS

A. Seismic restraint devices

2. Seismic Cable Restraints: Seismic wire rope cable restraints shall consist of steel wire strand cables, sized to resist project seismic loads, arranged to offer seismic restraint capabilities for piping, ductwork, and suspended equipment in all lateral directions. Building and equipment attachment brackets at each end of the cable shall be designed to permit free cable movement in all directions up to a 45-degree misalignment *(Angle is determined from the point of attachment to the structure)*. Protective thimbles shall be used at sharp connection points as required to eliminate potential for dynamic cable wear and strand breakage. Restraints shall be sized based on the capacity of the cable or to the capacity of the anchorage, whichever is the lesser. Seismic wire rope connections shall be made using overlap wire rope “U” clips or seismically rated Kinetics Quakeloc. Vertical suspension rods shall be braced as required to avoid potential for buckling due to vertical ‘up’ forces. Braces shall be structural steel angle uniquely selected to be of sufficient strength to prevent support rod bending. Brace shall be attached to the vertical suspension rod by a series of adjustable clips. Clips shall be capable of securely locking brace to suspension rod without the need for hand tools. Where clevis hanger brackets are used for seismic restraint attachment, they will be fitted with clevis internal braces to prevent buckling of the hanger brackets. **Seismic cable(s)** with use of **“U” clips** & or **Kinetics Quakelocs** shall be as manufactured by Kinetics Noise Control, Inc.

a. Seismic cable building and equipment attachment brackets shall be Model KSUA or KSCA as manufactured by Kinetics Noise Control, Inc.

b. Seismic cable concrete anchor bolts shall be Model KCAB Wedge, Model KCCAB Cracked Concrete, Model KUAB Undercut or KAABC Adhesive, as manufactured by Kinetics Noise Control, Inc.

3. Seismic Restraint Brackets (Curb-Mounted): Type KSMF – Seismic Mushroom Fan Mounting Clips are seismic and wind restraint brackets used to solid-mount mushroom fans to the curb. Attachment of the curb to the building structure is the responsibility of others. The clips are attached to the fan and the curb with sheet metal screws. The KSMF can also be used for similar sized curb-mounted fans and equipment. Selection of **Model KSMF** quantity and locations is included as part of the seismic or wind restraint calculations provided by Kinetics Noise Control, Inc.

4. Concrete Anchor Bolts: Post-installed anchors in concrete shall be qualified for seismic restraint application in accordance with ACI 355.2.

PART 3 - EXECUTION

3.1 COORDINATION AND EXECUTION

A. Coordinate size, shape, reinforcement and attachment of all housekeeping pads supporting vibration/seismically rated equipment. Concrete shall have a minimum compressive strength of 3,000 psi or as specified by the project engineer. Coordinate size, thickness, doweling, and reinforcing of concrete equipment housekeeping pads and piers with vibration isolation and seismic restraint device manufacturer to ensure adequate space, embedment and prevent edge breakout failures. Pads and piers must be adequately doweled in to structural slab.

B. Housekeeping Pads must be adequately reinforced and adequately sized for proper installation of equipment anchors. Refer seismic restraint manufacturer’s written instructions.

C. Coordinate with vibration/seismic restraint manufacturer and the structural engineer of record to locate and size structural supports underneath vibration/seismically restrained equipment (e.g. roof curbs, cooling towers and other similar equipment). Installation of all seismic restraint materials specified in this section shall be accomplished as per the manufacturer’s written instructions. Adjust isolators and restraints after piping systems have been filled and equipment is at its operating weight, following the manufacturer’s written instructions.

D. Isolated and restrained equipment, duct and piping located on roofs must be attached to the structure. Supports (e.g., sleepers) that are not attached to the structure will not be acceptable.

E. Attach piping to the trapeze per seismic restraint manufacturer’s design. Install cables so they do not bend across sharp edges of adjacent equipment or building structures.

F. Do not brace or support equipment to separate portions of the structure that may act differently in response to an earthquake. For example, do not connect a Transverse restraint to a wall and then a Longitudinal restraint to either a floor/ceiling/roof at the same braced location.

G. Install vertical braces to stiffen hanger rods and prevent buckling per seismic restraint manufacturer’s design. Clamp vertical brace to hanger rods. Requirements apply equally to hanging equipment. Do not weld vertical braces to hanger rods.

3.2 SEISMIC RESTRAINTS APPLICATION

A. General:

1. All equipment, piping and ductwork shall be restrained to resist seismic forces per the applicable building code(s) as a minimum; listed herein. Additional requirements specified herein are included specifically for this project; as needed basis.

2. Install seismic restraint devices per the manufacturer's submittals. Any deviation from the manufacturer's instructions shall be reviewed and approved by the manufacturer.

3. Attachment to structure for suspended equipment, pipe and duct: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

4. Provide hanger rod stiffeners where indicated or as required to prevent buckling of rods due to seismic forces. {web based tools to allow easy selections are available on the KNC web site}.

5. Where rigid restraints are used on equipment, ductwork or piping, the support rods for the equipment, ductwork or piping at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.

6. Ensure housekeeping pads have adequate space to mount equipment and seismic restraint devices and shall also be large enough and thick enough to ensure adequate edge distance and embedment depth for restraint anchor bolts to avoid housekeeping pad breakout failure.

B. Concrete Anchor Bolts:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre- or post-tensioned tendons, electrical and telecommunications conduit, and gas lines.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

3. Mechanical Anchors: Protect threads from damage during anchor installation.

4. Adhesive Anchors: Clean holes to remove loose material and drilling dust per manufactures instructions prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.

5. Set anchors to manufacturer's recommended torque, using a torque wrench.

C. Equipment Restraints:

1. Seismically restrain equipment as indicated on the schedule. Install fasteners, straps and brackets as required to secure the equipment.

2. As indicated on the schedule, install seismic snubbers on HVAC equipment supported by floor-mounted, non-seismic vibration isolators. Position snubbers as necessary and attach to equipment base and supporting structure as required.

3. Install neoprene grommet washers or fill the gap with epoxy on equipment anchor bolts where clearance between anchor and equipment support hole exceeds 3.2 mm (0.125 inch).

4. Suspended Equipment: All suspended equipment that meets any of the following conditions requires seismic restraints as specified by the supplier:

    a. Rigidly attached to pipe or duct that is 75 lbs. and greater,

    b. Items hung independently or with flexible connections greater than 20 lbs.. For importance factors greater than {1.0} all suspended equipment requires seismic restraints regardless of the above notes.

    c. Wall mounted equipment weighing more than 20 lbs. with an importance factor of {1.0}.

    d. The 12” rule does not apply to suspended equipment.

5. Base Mounted Equipment: All base mounted equipment that meets any of the following conditions requires attachments and seismic restraints as specified the supplier:

    a. Connections to or containing hazardous material,

    b. With an overturning moment,

    c. Weight greater than 400 lbs.,

    d. Mounted on a stand 4 ft. or more from the floor.

    e. For importance factors greater than {1.0} all base mounted items require seismic restraints regardless of the above notes.

6. Roof Mounted Equipment: Needs to be installed on a structural frame, seismically rated roof curb, or structural curb frame mechanically connected to the structure. Items shall not be mounted onto sleepers or pads that are not mechanically and rigidly attached to the structure. Restraint must be adequate to resist both seismic and wind forces.

7. Rigid Mounted Equipment:

    a. Anchor floor and wall mounted equipment to the structure as per the stamped seismic certifications / drawings.

    b. Suspended equipment shall be restrained using seismic cable restraints, or struts, and hanger rods as per the stamped seismic certifications / drawings.

8. Vibration Isolated Equipment:

    a. Seismic control shall not compromise the performance of noise control, vibration isolation or fire stopping systems.

    b. Equipment supported by vibration-isolation hangers shall be detailed and installed with approximately a 1/8” gap between the isolation hangers and the structure. Isolators at restraint locations must be fitted with uplift limit stops.

D. Piping; Duct; Electrical Systems:

1. All piping, duct electrical systems are to be restrained to meet code requirements.

    a. All piping associated with “Life Safety Systems” shall always have an importance factor of {1.5}. Seismic restraint requirements / exemptions vary with code and seismic acceleration – see specific code and comply with applicable restraint requirements.

    b. All piping systems (regardless of type of pipe) assigned a component importance factor of {1.5} shall require seismic restraints. Seismic restraint requirements / exemptions vary with code and seismic acceleration – see specific code and comply with applicable restraint requirements.

    c. Piping associated with an importance factor of {1.0} may not require seismic restraint; see specific code for requirements.

    d. Seismically restrain / brace all pipes 65 mm (2 ½”) in nominal diameter and larger.

    e. Seismically restrain / brace all piping in boiler rooms, mechanical rooms and refrigeration mechanical rooms 32 mm (1 ¼”) in nominal diameter and larger.

    f. Seismically restrain / brace all Gas (ie: natural gas, medical gas, vacuum, petroleum based liquid, compressed air, etc.) piping 25 mm (1”) in nominal diameter and larger.

    g. Branch lines may not be used to brace main lines.

2. Restraint Spacing For Piping:

    a. For ductile piping: Transverse supports a maximum of 12 m (40’) o.c.

    b. For ductile piping: Longitudinal supports a maximum of 24 m (80’) o.c.

    c. For non-ductile piping (e.g., cast iron, PVC) space Transverse supports a maximum of 6 m (20’) o.c., and Longitudinal supports a maximum of 12 m (40’) o.c. Differential spacing can be designed depending upon pipe size and length(s) of run (design will be indicated on drawings of approved method).

    d. For piping with hazardous material inside (e.g., natural gas, medical gas) space Transverse supports a maximum of 6 m (20’) o.c., and Longitudinal supports a maximum of 12 m (40’) o.c.

    e. For pipe risers, restrain the piping at floor penetrations using the same spacing requirements as above.

3. Seismically restrain per specific code requirements, all ductwork listed below (unless otherwise indicated on the drawings), using seismic cable restraints: (Ductwork not meeting listed below criteria is to be “Exempt”)

    a. All ducts with cross sectional area equal to or greater than 0.55 m^2 (6 ft^2).

    b. All round ducts with diameters equal to or greater than 28” (710 mm).

    c. Any ductwork, pipe or equipment, which if it were to fail would result in damage to a piece of equipment or building function that has a component importance factor of {1.5}.

    d. All ductwork weighing more than 25 kg/m (17 lb/ft).

4. Restraint Spacing For Ductwork:

    a. Transverse supports a maximum of 9 m (30') o.c.

    b. Longitudinal supports a maximum of 18 m (60') o.c.

5. Seismically restrain per specific code requirements all Electrical components listed below (unless otherwise indicated on the drawings), using seismic cable restraints:

    a. Seismically restrain all conduit 65 mm (2 ½") in nominal diameter and larger. {Single *supported conduit is restrained in the same fashion as single clevis supported pipe*}.
    b. Seismically restrain all conduit, bus ducts, or cable trays that are supported on trapeze bars, that have been assigned a Component Importance Factor equal to {1.5}, and that have a total weight greater than 10 lb/ft (146 N/m). This total weight includes not only the conduit, bus duct, or cable trays, but also includes the trapeze bars as well.

6. The electrical contractor / engineer are to provide the weight per unit length for cable trays and bus duct.

7. Single supported conduit and trapeze supported conduit, bus duct, and cable trays to be seismically restrained in a manner similar to pipe and duct.

    a. Conduit: Follow piping spacing requirements and required criteria as listed in Section 3.2.E.2

    b. Bus Ducts and Cable Trays: Follow duct spacing requirements and required criteria as listed in section 3.2.D.2

8. The seismic restraint components provided by Kinetics Noise Control, Inc. are intended to be used with suspended single supported conduit and trapeze supported conduit, cable trays, and bus ducts. Components intended to both support and restrain distribution systems such as wall mounted conduit, cable trays, and bus ducts will need to be designed and evaluated for both the dead weight load and the design horizontal seismic load.

9. To ensure that the seismic forces are transferred properly to the restraint points, the cables should be strapped either individually or in bundles to the cable tray at regular intervals. It is necessary for the conduit, bus ducts, and cable trays to be attached to the trapeze bars sufficiently to resist the design horizontal seismic forces, both transverse (T) and longitudinal (L).

10. Brace a change of direction longer than 3.7 m (12').

11. This specification does not allow the use of the "12-inch rule" where the piping, duct and electrical may be exempted from seismic restraint based on the length of the support rods provided that the rods are not subjected to bending moments.

12. Install restraint cables so they do not bend across edges of adjacent equipment or building structure. Tie back to structure at {45 degrees} to the structure.

13. Longitudinal restraints for single pipe supports shall be attached rigidly to the pipe, not to the pipe hanger.

14. For supports with multiple pipes (trapezes), secure pipes to trapeze member with clamps approved for application.

15. Install flexible metal hose loops in piping which crosses building seismic joints, sized for the anticipated amount of movement.

16. Install flexible piping connectors where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment.

17. Where pipe sizes reduce below required dimensions noted above in Section 3.2.E, the final restraint shall be installed at the transition location.

18. Roof mounted duct is to be installed on sleepers or frames mechanically connected to the building structure. Roof anchors and seismic cables or frames shall be used to resist seismic and wind loading. Wind loading factors shall be determined by the registered design professional.

19. Where duct sizes reduce below required dimensions noted above in Section 3.2.D, the final restraint shall be installed at the transition location.

20. Longitudinal restraints for single conduit supports shall be attached rigidly to the pipe, not to the pipe/conduit hanger.

21. For supports with multiple conduits (trapezes), secure conduit to trapeze member with clamps approved for application.

22. Where conduit, bus ducts, cable trays sizes reduce below required dimensions noted above in Section 3.2.F, the final restraint shall be installed at the transition location.

23. Rod Stiffener Clamps are required where the hanger rod exceeds the maximum length shown in the seismic calculation sheets. They are only required at restraint locations.

24. Seismically Rated Beam Clamps are required where welding to or penetrations to steel beams are not approved.

25. Adjust restraint cables so that they are not visibly slack. Cable not to support weight during normal operation.

26. Seismic systems are to be compatible with requirements for anchoring and guiding of systems.

27. Drilled or power driven anchors or fasteners shall not be permitted for use with seismic control measures.

28. Friction due to gravity does not constitute a seismic attachment.

29. Seismic restraint connections are not to be connected to the bottom chord of steel joists or the bottom flange of steel beams.

30. Standard beam clamps can be used to support restrained components; they cannot be used to connect the seismic restraint to the structure – only for the hanger rods.

31. Brace remaining piping, ductwork, electrical components to code requirements (IBC / OBC / NBCC or TI-809-04)) or in conformance with SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.) “Seismic Restraint Manual Guidelines for Mechanical Systems”, 2nd ed. or 3rd ed. (Depending on Code or EOR).

3.3 INSPECTION AND CERTIFICATION

A. The contractor shall notify the local representative of the seismic restraint materials manufacturer prior to installing any seismic restraint devices. The contractor shall seek the representative's guidance in any installation procedures with which he/she is unfamiliar.

B. The contractor shall notify the local representative of the seismic restraint materials manufacturer mid-way through the listed project if they require an inspection of any and all vibration and seismic restraint devices already installed. A written report of any installation errors, improperly selected devices, or other fault in the system which could affect the performance of the system shall be documented and the contractor shall perform all steps that are required from this written report to properly complete the vibration and seismic restraint work as per the specifications.

C. Upon completion of the installation, arrange for an independent 3rd party Structural Engineer , upon request, is to visit the site to verify the proper installation of all seismic restraint devices herein specified. The local representative of the vibration manufacturer shall, at the contractor's request, be present as well to support the independent professional in the inspection of the completed system. A written report citing any installation errors, improperly selected devices, or other fault in the system which could affect the performance of the system should be generated by the 3rd party professional Engineer for fume hood exhaust system installation and provide final professional structural Engineer's stamp to complete and compliant with the code. Also, the local representative shall verify that isolators are adjusted, with spring's perpendicular to bases or housing, adjustment bolts are tightened up on equipment mountings, and hangers are not cocked.

D. The installing contractor shall submit a report upon request to the building architect and/or engineer, including the manufacturer's representative's final report, indicating that all seismic restraint material has been properly installed, or steps that are to be taken by the contractor to properly complete the seismic restraint work as per the specifications.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 21 08 02 – Cleaning and Start-up of Mechanical Piping Systems.

1.2 FUME HOOD EXHAUST SYSTEM TEST

.1 After fume hood exhaust system test,

- .1 TAB has been completed
- .2 Verification of operating, limit, safety controls.
- .3 Verification of accuracy of temperature and pressure sensors and gauges.

.2 Calculate system capacity at test conditions.

.3 Using manufacturer's published data and calculated capacity at test conditions, extrapolate system capacity at design conditions.

.4 When capacity test is completed, return controls and equipment status to normal operating conditions.

1.3 EMERGENCY EYEWASH AND SHOWER SYSTEM TEST

.1 After emergency eyewash and shower test,

- .1 TAB has been completed
- .2 Verification of operating, limit, safety controls.
- .3 Verification of accuracy of temperature and pressure sensors and gauges.

.2 Calculate system capacity at test conditions.

.3 Using manufacturer's published data and calculated capacity at test conditions, extrapolate system capacity at design conditions.

.4 When capacity test is completed, return controls and equipment status to normal operating conditions.

1.4 VERTICAL PACKAGED HEAT PUMP SYSTEM TEST

.1 After vertical packaged and heat pump test,

- .1 TAB has been completed
- .2 Verification of operating, limit, safety controls.
- .3 Verification of accuracy of temperature and pressure sensors and gauges.

.2 Calculate system capacity at test conditions.

.3 Using manufacturer's published data and calculated capacity at test conditions, extrapolate system capacity at design conditions.

.4 When capacity test is completed, return controls and equipment status to normal operating conditions.

1.5 PESTICIDE STORAGE ROOMS EXHAUST SYSTEMS TEST

.1 After pesticide storage rooms exhaust systems test,

.1 TAB has been completed

.2 Verification of operating, limit, safety controls.

.3 Verification of accuracy of temperature and pressure sensors and gauges.

.2 Calculate system capacity at test conditions.

.3 Using manufacturer's published data and calculated capacity at test conditions, extrapolate system capacity at design conditions.

.4 When capacity test is completed, return controls and equipment status to normal operating conditions.

1.6 TRAINING

.1 Training will begin when the operating and maintenance manuals have been delivered to the Owner and reviewed by the Consultant.

.2 Each training session will be structured to cover:

(a) The operating and maintenance manual

(b) Operating procedures

(c) Maintenance procedures

(d) Trouble-shooting procedures

(e) Spare parts required

Part 2 Products (Not applicable)

Part 3 Execution (Not applicable)

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

A Comply with General Requirements and all documents referred to therein.

B. Single Width Centrifugal Fume Exhaust with Integral Stack.

1.2 RELATED SECTIONS

A. All sections, drawing plans, specifications and contract documents.

1.3 REFERENCES

A. ANSI/AIHA/ASSE Z9.2-2012 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

B. ANSI/AMCA Standard 99-10, “Standards Handbook”

C. ANSI/AMCA Standard 204-05, “Balance Quality and Vibration Levels for Fans”

D. ANSI/AMCA Standard 210-07, “Laboratory Methods of Testing Fans for Aerodynamic Performance Rating”

E. AMCA Publication 211-05, “Certified Ratings Program – Product Rating Manual for Fan Air Performance”

F. ANSI/AMCA Standard 300-08, “Reverberant Room Method for Sound Testing of Fans”

G. AMCA Publication 311-05, “Certified Ratings Program – Product Rating Manual for Fan Sound Performance”

H. AMBA - Method of Evaluating Load Ratings of Bearings ANSI-11 (r1999).

I. AMCA Standard 500-D-12, “Laboratory Methods of Testing Dampers for Rating”

J. OSHA guideline 1910.212 – General requirements for Machine Guarding. (www.osha.gov)

K. OSHA guideline 1910.219 – General requirements for guarding safe use of mechanical power transmission apparatus. (www.osha.gov)

L. OSHA guideline 1926.300 – General requirements for safe operation and maintenance of hand and power tools. (www.osha.gov)

M. UL/cUL 705, Power Ventilators

1.4 QUALITY ASSURANCE

A. Performance ratings: Conform to ANSI/AMCA Standards 210 and 300. Fans must be tested in accordance with AMCA Publications 211 and 311 in an AMCA accredited laboratory and certified for air performance (sizes 6-10) or air and sound performance (size 15). Fans shall be licensed to bear the AMCA ratings seal for air performance (AMCA 210) and sound performance (AMCA 300) – size 15.

B. Fans shall have a Fan Energy Index (FEI) rating that meets or exceeds requirements of the latest edition of ASHRAE 90.1.

C. Fans shall be licensed to bear the Air Movement and Control Association (AMCA) Certified Ratings Program (CRP) seal for FEI.

D. The Fan FEI rating shall be indicated on the design documents and manufacturer product submittals to allow for compliance verification by the building official.

E. Classification for Spark Resistant Construction shall conform to ANSI/AMCA Standard 99.

F. Comply with the National Electrical Manufacturers Association (NEMA) standards for motor and electrical accessories.

1.5 SUBMITTALS

A. Provide dimensional drawings and product data on each fume exhaust centrifugal fan.

B. Provide fan curves for each fan at the specified operation point, with the flow, static pressure and horsepower clearly plotted.

C. Provide outlet velocity of centrifugal fans and fan's inlet sound power readings for the eight octave bands.

D. Strictly adhere to QUALITY ASSURANCE requirements as stated in section 1.4 of this specification.

E. Provide manufacturer's certification that exhaust fan is licensed to bear the Air Movement and Control Association (AMCA) Certified Rating Seal for air performance or air and sound performance.

F. Provide manufacturer's Installation, Operation and Maintenance manual (IOM), including instructions on safety information, receiving, handling, and storage, installation, pulley adjustment, electrical wiring diagrams, operation, maintenance, parts list, troubleshooting guide, and warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer, material, products included, and location of installation.

B. Store materials in a dry area indoor, protected from damage, and in accordance with manufacturer's instructions. For long term storage, follow manufacturer's Installation, Operation and Maintenance manual.

C. Handle and lift fans in accordance with the manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warnings posted by the manufacturer.

1.7 WARRANTY

A. Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
   1. The warranty of this equipment is to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at the manufacturers' option when returned to the manufacturer, transportation prepaid.

2. Motor Warranty is warranted by the motor manufacturer for a period of one year. Should motors furnished prove defective during this period, they should be returned to the nearest authorized motor service station.

2. PRODUCTS

2.1 GENERAL

A. Base fan performance at standard conditions (density 0.075 Lb/ft^3).

B. Fans selected shall be capable of accommodating static pressure and flow variations of +/-15% of scheduled values.

C. Each fan shall be belt in AMCA arrangement 10 according to drawings.

D. Fans are to be equipped with lifting lugs.

E. After fabrication, all carbon steel components shall be cleaned and chemically treated by a phosphatizing process to insure proper removal of grease, oil, scale, etc. Fan shall then be coated with a minimum of 2-4 mils of Permatector (Polyester Urethane), electrostatically applied and baked. Finish color shall be RAL-7023, concrete grey. Coating must exceed 1,000-hour salt spray under ASTM B117 test method

F. When properly anchored to the roof structure, the standard fan / stack assembly shall withstand wind loads of up the equivalent load of 115 mph (185 km/hr) windspeed, without the need for guy wires or additional structural support.

2.2 FAN HOUSING AND INTEGRAL STACK

A. Fan housing is to be aerodynamically designed with high-efficiency inlet, engineered to reduce incoming air turbulence.

B. Fan shall be of airtight PermaLock^{TM} construction with the scroll panel material formed and embedded into the side panels. All interior and exterior surface steel shall be coated with a minimum of 2-4 mils of Permatector (Polyester Urethane), electrostatically applied and baked. Finish color shall be RAL-7023, concrete grey. No uncoated metal fan parts will be allowed.

C. Housing and bearing support shall be constructed of welded structural steel members to prevent vibration and rigidly support the shaft and bearings.

D. Housing shall include discharge stack of same material as fan housing to increase the overall discharge height of the unit. Minimum overall unit height with stack to be 10 feet (3m) from the roof deck.

E. Stack material to be a minimum of 18 gauge. Stack to match outlet dimensions of the fan and shall not add additional static pressure drop to the exhaust fan. Stack discharge shall have tapered design increasing exit velocity and not adding additional static pressure drop to the exhaust fan

F. No discharge rain caps or flapper caps are permitted as to interfere with exhaust airflow.

G. Drain port shall be located at lowest part of scroll housing to prevent moisture build-up in the interior of fan.

H. An OSHA compliant weatherhood shall be included to completely cover the motor pulley and belt(s).

I. Fan shall be AMCA type C spark resistant construction per AMCA 99 standard.

J. Fan shall be provided with integral inlet box and curb cap constructed of same material, with access panel for inspection of fan wheel and duct. It will be coated with a minimum of 2-4 mils of Permatector (Polyester Urethane), electrostatically applied and baked

K. [Units with integral inlet box shall be provided with matching roof curb. Roof curb shall be constructed of 14 ga. galvanized steel, include one inch of insulation and be provided with adjustable duct support bar for connecting building duct to roof curb.

L. Units with integral inlet box shall be provided with gravity, back draft damper to prevent airflow back into the building when exhaust fan is not in operation. Damper sized to match inlet area of inlet box and mounted in the roof curb. Back draft damper shall be constructed with aluminum frame, extruded aluminum blades and vinyl seals on closing edge.

2.3 FAN WHEEL

A. The fan wheel shall be of the non-overloading single width backward inclined centrifugal type. Wheels shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19.

B. Fan wheel shall be manufactured of single thickness blades securely riveted or welded to a heavy gauge back plate and wheel cone.

C. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

2.4 FAN MOTORS AND DRIVE

A. Motors shall meet or exceed EISA (Energy Independence and Security Act) efficiencies. Motors to be NEMA T-frame, 1800 or 3600 RPM, Totally Enclosed Fan Cooled (TEFC) with a 1.15 service factor.

B. Drive belts and sheaves shall be sized for 150% of the fan operating brake horsepower, and shall be readily and easily accessible for service, if required.

C. Fan shaft to be turned and polished steel that is sized so the first critical speed is at least 25% over the maximum operating speed for each pressure class.

D. Fan shaft bearings shall be Air Handling Quality, bearings shall be heavy-duty grease lubricated, self-aligning or roller pillow block type.

E. Air Handling Quality bearings to be designed with low swivel torque to allow the outer race of the bearing to pivot or swivel within the cast pillow block. Bearings shall be 100% tested for noise and vibration by the manufacturer. Bearings shall be 100% tested to insure the inner race diameter is within tolerance to prevent vibration.

F. Bearings shall be selected for a basic rating fatigue life (L-10) of 80,000 hours at maximum operating speed for each pressure class {Average Life or (L-50) of 400,000 hours}.

G. Bearings shall have Zerk fittings to allow for lubrication.

3. EXECUTION

3.1 EXAMINATION

A. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install fans systems as indicated on the contract drawings.
B. Install fans in accordance with manufacturer's Installation, Operation and Maintenance manual.

3.3 ACCEPTABLE MANUFACTURERS

A. Greenheck Fan Corporation Fume hood exhaust system, Labconco Fume hood exhaust fan system, Skyplume Fume Hood exhaust System.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

1.01.01 This specification covers the requirements for the purchase of bench-mounted XPert(r) Nano Enclosure.

1.01.02 Bench-mounted XPert(r) Nano Enclosure in 4 foot widths are covered by this specification.

1.01.03 This specification sets the intent for quality, performance and appearance.

1.02 Quality Assurance:

1.02.01 The manufacturer maintains a testing facility at their place of business for the performance testing of bench-mounted XPert(r) Nano Enclosure. Both system and installation are in conformance to good construction practice and approved by the owner/user. The test facility as well as the manufacturing facility are available for owner/user inspection and its quality control procedures. All balance systems wired for 115 volts, 60 Hz meet or exceed all minimum requirements of UL Standard 3101-1 and CAN/CSA C22.2 No. 1010.1-92 and carry the ETL Testing Laboratories seal in the U.S. and Canada. All balance systems wired for 230 volts, 50 Hz conform to the following CE (European Community) requirements: Electrical Safety Standard: IEC 1010-1 and Electromagnetic Compatibility Directive: 89/336/EEC.

1.03 References:

1.03.01 The bench-mounted XPert(r) Nano Enclosure conform to the following regulations and standards:

UL -- Standard 3101-1/61010-1 (115 volt, 60 Hz models only)
CAN/CSA -- C22.2 No. 1010.1-92 (115 volt, 60 Hz models only)
SEFA 1-2002
Modified ASHRAE 110-1995
ANSI Z9.5-1993
CE Conformity Marking (230 volt models only)

1.04 Submittals:

1.04.01 Bench-mounted XPert(r) Nano Enclosure specification sheets and product manuals will be submitted by the manufacturer upon request. The balance system supplier will submit shop drawings when necessary for clarification.

1.04.02 A copy of the test results conducted prior to shipping to ensure proper operation will be shipped with each cabinet.

1.05 Delivery and Storage:

1.05.01 Bench-mounted XPert(r) Nano Enclosure are delivered adequately protected from damage during shipment.

1.06 Warranty

1.06.01 Manufacturer's warranty against defects in material or workmanship on its balance systems for 1 year from date of installation or 2 years from date of purchase, whichever is sooner, and includes replacement of parts (except HEPA filters and lamps) and labor.

PART 2 - PRODUCTS

2.01 Acceptable Manufacturer:

2.01.01 Labconco Corporation, 8811 Prospect Avenue, Kansas City, Missouri 64132
Canadian Distributor: RA LAB TECHNOLOGIES INC. 13 Edvac Dr Unit# 23, Brampton, ON L6S 5X8 Canada

XPert(r) Nano Enclosure, model numbers as described below:
4 Foot Models: 3887420, 3887421, 3887460, 3887461, 3887462

Scientifically Advanced Interia, 2233 Argentia Road, Suite 302& 302A, Mississauga, ON, L5N 2X7, (904) 250 0335
MOTTlab Canada, 5230 South Service Road, unit 104, Burlington, ON, L7L 5K2 (905) 331-1877.

2.02 Materials:

2.02.01 Static-dissipating, epoxy-coated aluminum and steel is used for the outside frame.

2.02.02 Static-dissipating, 304 stainless steel is used for the inside liner, plenums and baffle. No unreliable plastic to plastic bonding is used.

2.02.03 Static-dissipating, tempered safety glass is used for front sash.

2.02.04 ULPA filters are a minimum of 99.999% efficient on all particles 0.12µm. ULPA filters are industry-standard size.

2.02.05 Fluorescent lighting provides 28 to 35 foot-candles on work surface.

2.02.06 Tempered safety glass sash is 1/4" thick tempered safety glass.

2.02.07 Pressure gauge monitors system pressure and is located on the front panel.

2.02.08 Sparkless motorized impellers are constructed of backward curved centrifugal fans highly resistant to particles with maintenance-free ball bearings and run over 50,000 hours. Two and three-foot models use 1/6 HP impellers. Four, five and six-foot models use 1/3 HP impellers. Five and six-foot models have 2 each motorized impellers.

2.02.09 Built-in impeller is mounted on vibration isolation supports.

2.02.10 Impeller has a 40% reserve so that speed may be adjusted as needed as filter loads.

2.02.11 Internal ductwork is epoxy-coated steel or stainless steel.

2.02.12 Control panel has separate rocker switches that control blowers, lights and optional ionizer.

2.02.13 Upper diffuser screen is constructed of epoxy-coated aluminum.

2.02.14 Static-dissipative stainlees steel work surface is integrated into the cabinet and made of 304 stainless steel.

2.02.15 Optional adjustable height base stand (not included with balance system) is epoxy-coated steel and ADA compliant.

2.03 Fabrication:

2.03.01 Overall exterior dimensional information on benchtop filtered balance systems is as described in the table below.

Model Number	Description	Actual Width	Actual Depth	Actual Height
3887420	4 Foot Model	48.0"	29.1"	38.3"
3887421	4 Foot Model	48.0"	29.1"	38.3"
3887460	4 Foot Model	48.0"	29.1"	38.3"
3887461	4 Foot Model	48.0"	29.1"	38.3"
3887462	4 Foot Model	48.0"	29.1"	38.3"

2.03.02 Sash is angled approximately 10 degrees on two, three, and four-foot models with a fixed opening of 9.4 inches and approximately 7 degrees on five and six-foot models with a fixed opening of 11.8 inches for better visibility. Sash has no visibility-interfering protrusions.

2.03.03 Sash is hinged to pivot upward and locks to a loading height of 19 inches. Five and six-foot models have a sash that incorporates an external gas-assist lift and locks to a loading height of 27.7 inches.
2.03.04 Upper diffusion screen allows for 100% ULPA filter scan.

2.03.05 ULPA filter is located downstream from blower to allow for 100% filter scanning.

2.03.06 The nano enclosure contains a true bag-in/bag-out filter disposal system.

2.03.07 Clean-Sweep(tm) Air Foil allows air to sweep the work surface for maximum containment. Air foil is ergonomic to allow comfortable resting of arms.

2.03.08 Side-Entry Air foils are aerodynamic and located on both sides of sash opening to direct room air along sides of the filtered balance system.

2.03.09 Upper dilution air supply allows air into the filter balance system from above the work area which bathes the back of the sash with room air and directs concentrations away form the sash opening.

2.03.10 Upper containment sash foil allows room air to bleed in between the sash and the handle to reduce turbulence and direct concentrations away from the users breathing zone.

2.03.11. Zone-perforated rear baffle contains three zoned sections of perforations to direct air in a non-turbulent laminar air stream form the sash opening.

2.03.12 The enclosure control has a variable speed control to allow user defined face velocities to be adjusted from 60-100 fpm.

2.03.13 Two utility ports are located in either corner on the lower rear wall to allow for pass-through of electrical cords.

2.03.14 The positive pressure motorized impeller is surrounded by a negative pressure plenum so that if a leak should develop, the unfiltered air is captured and directed through the filter.

2.03.15 Models with Guardian Airflow monitor will continuously monitor airflow with a green LED when airflow is above a selected point and will display a red LED and sound an audible alarm when airflows go below a set velocity.

2.03.16 An 8.2-foot power cord connects to the nano enclosure by a suitable keyed connector (IEC 320 AC inlet connector or equivalent). Permanently attached cords with strain relief connectors are not used.

2.03.17 Provide dedicated electrical receptacle built into the unit. .

2.03.18 Optional trace odor carbon filters are available for work with nuisance odors that are organic, aldehyde, or ammine based.

2.03.19 Optional Canopy Connection Kit and Air-Tight Damper (not included with cabinet) for thimble ducting the nano enclosure to the outside are available.

2.03.20 Optional Ionizer, when activated, floods the work area with positive and negative ions to neutralize static charges on the surface of non-conductive items. Ionizer cannot be installed after manufacture and must be ordered as original equipment.

2.03.21 Optional adjustable-height base stand (not included with cabinet) provide a working height from 30 to 36". Dimensions are as follows:

Nominal Dimensions
4 ft. wide: 48" w x 29" d x 27.5"-33.5" h

PART 3 - EXECUTION

3.01 Inspection
3.01.01 Carefully check the contents of the carton for damage that might have occurred in transit.

3.02 Preparation
3.02.01 Verify equipment rough-in before proceeding with work.

3.02.02 Coordinate with other trades for the proper and correct installation of electrical rough-in and for

rough opening dimensions required for installation of the filtered balance system.

3.03 Installation
3.03.01 Install according to manufacturer's instructions.

3.03.02 Install according to standards required by authority having jurisdiction.

3.03.03 Install equipment square and straight with no distortion and securely anchor as required.

3.03.04 Touch up minor damaged surfaces caused by installation. Replace damaged components as needed.

3.04 Field Quality Control
3.04.01 A qualified independent certifier should perform a HEPA filter leak test to verify the filter has not been damaged in transit.

3.05 Cleaning
305.01 Clean equipment, casework, countertops and all other surfaces as recommended by the manufacturer, rendering all work in a new and unused appearance.

3.05.02 Clean adjacent construction and surfaces, which may have been soiled in the course of installation of work in this section.

3.06 Protection
3.06.01 Provide all necessary protective measures to prevent exposure of equipment and surfaces from exposure to other construction activity.

3.06.02 Advise contractor of procedures and precautions for protection of material and installed equipment and casework from damage by work of other trades.

END OF SECTION

Part 1 General

1.0 QUALIFICATIONS

Manufacturer: Company specializing in manufacture of products specified in this section, with a minimum of 5 years documented experience. Manufacturer shall have available complete catalog data with expanded ratings, installation and maintenance instructions.
GENERAL
Furnish and install self-contained, wall mounted heat pump, suitable for outdoor use. The unit shall be approved and listed by Intertek ETL Listed (ETL US/C). Unit shall be factory assembled, pre-charged, pre-wired, tested and ready to operate. The manufacturer of equipment shall be ISO 9001: 2015 Certified. Unit performance shall be certified by an independent third party testing agency, in accordance with the Air Conditioning, Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units. Unit cooling efficiency shall be specified by EER.

2.0 CONSTRUCTION FEATURES

2.1 CABINET

Construction shall be a single, enclosed, weatherproof casing constructed of 20-gauge galvanized steel, stainless steel, or aluminum (choose one). Unit base is constructed of 16-gauge galvanized steel for painted and aluminum cabinets, stainless steel for stainless cabinets. Each exterior casing panel to be bonderized and finished with baked-on exterior polyester enamel paint prior to assembly. The baked-on cured paint finish shall pass the industry rub test with a minimum of 72 rubs MEK (Methyl, Ethyl Ketone) or standard rub test of a minimum of 100 rubs using Toluene. Cooling section shall be fully insulated with a non-fiberglass material with heavy duty foil facing for durability and ease of cleaning. Fiberglass insulation is not acceptable. Openings shall be provided for power connections. Access openings appropriate for outside structure to all fan motors and compressor for making repairs and for removing internal components without removing unit from its permanent installation. Fresh air intake and outdoor coil shall be protected from intrusions by a sturdy metal grating with less than 1/4 inch openings.

Colors (Select One)
Beige (standard)
White
Gray
Desert Brown
Dark Bronze
Aluminum
Stainless Steel

Painted cabinet construction shall be a minimum of 20 gauge Zinc coated steel, painted units shall have baked on paint, designed and tested to withstand 1000 hours of salt spray test per ASTM B117-03.

Stainless steel construction shall be 316 grade, with stainless steel screws and fasteners for all exposed areas. The condenser fan blade shall be treated with corrosion resistant material, and condenser fan motor mounts shall be stainless steel.

Aluminum exterior cabinet shall be ASTM B 2019 grade aluminum with stucco appearance.

2.2 DRAIN PAN
Drain pan shall be constructed with 20-gauge galvanized steel, bonderized and finished with baked-on exterior polyester enamel paint.

2.3 INSULATION
Insulation shall be non-fiberglass material with foil faced for ease of cleaning. Insulation materials used shall not contain fiberglass or formaldehyde.

2.3.1 Filters
Filters shall be Minimum Efficiency Reporting Value of MERV 8 per ASHRAE Standard 52.2. Filters shall be readily available commercial sizes.

2.4 MOUNTING BRACKETS
Full-length, side mounting brackets shall be an integral part of the cabinet. Bottom mounting bracket shall be provided.

2.5 REFRIGERATION SYSTEM
All models shall use a high efficiency hermetic scroll compressor. The compressor shall be covered by a 5-year parts warranty. The refrigeration circuit shall be equipped with factory installed high and low pressure controls, suction and liquid access valves, compressor control module and liquid line filter dryer. A refrigerant metering device is included. Compressor shall be mounted on rubber grommets. Unit shall be provided with R-410A (HFC) non-ozone depleting refrigerant.

2.6 OUTDOOR SECTION
The condenser coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. The condenser fan, motor and shroud shall be of slide out configuration for easy access. Condenser fan motor shall be enclosed casing with ball bearings. Open winding motors are not acceptable.

2.7 INDOOR SECTION
The evaporator coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes. Aluminum fins shall have hydrophilic coatings to aid in condensate drainage, inhibit mold growth and protect aluminum fins from oxidation. 5-speed indoor blower motor shall be twin wheels with forward curve blades. Motor shall be high efficiency ECM with overload protection.

2.8 ELECTRICAL COMPONENTS
Electrical components are easily accessible for routine inspection and maintenance through front service panels. Circuit breaker is standard on all 208/230 volt models and toggle disconnect standard on all 460 volt models. Circuit breaker/toggle disconnect access is through lockable access panel.

2.9 CONTROL CIRCUIT
The internal control circuit shall consist of a current limiting 24VAC type transformer with resettable circuit. The defrost circuit shall consist of a solid state electronic heat pump control. A 30-minute timer shall initiate a frost cycle if the outdoor coil temperature indicates the possibility of an iced condition. The thermistor sensor, speed-up terminal for service and a ten-minute defrost override shall be standard on the electronic heat pump control. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be factory installed to prevent nuisance tripping during low temperature start-up.

Phase rotation protection and phase failure protection shall be standard factory on all equipment with three-phase power. If unit is wired incorrectly, phase monitor will lock out compressor operation and red warning light shall energize. Once power wiring is corrected at field power wiring location, a green light will energize on phase monitor. If a phase of power is lost, the phase monitor will also lock out.

3.0 COOLING OPTIONS

1.0 STANDARD COOLING

The heat pump shall function with standard cooling sensible and latent capabilities. Provide mechanical dehumidification with hot gas reheat dehumidification for energy efficient humidity removal. Provide suitable electronic expansion valve for dehumidification of this project. Mechanical Dehumidification provides an energy efficient way to remove humidity from HEATING OPTIONS

1.1 HEAT PUMP

The heat pump shall function with standard heating capacities.

2.0 VENTILATION OPTIONS

WH models are designed to provide optional ventilation packages to meet all of ventilation and indoor air quality requirements. All ventilation packages are factory or field installed, and easily removable for service.

Units shall include an independent ventilation low voltage terminal connection, allowing for an independent 24v signal provided by controls to operate the ventilation package. No additional field installed relays shall be required to provide independent ventilation. Ventilation shall be deenergized during unoccupied hours unless otherwise specified.

2.1 COMMERCIAL ROOM VENTILATOR (V)

Modulating Damper Control

The built-in commercial room ventilator is internally mounted and allows outside ventilation air, up to 50% of the total air flow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper. The damper shall accept a 24V on/off signal, 0-10V signal for modulation based on control input. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality**.**

3.0 FILTER OPTIONS – (Provide the following filters)

2” Pleated – MERV 8

4.0 UNIT CONTROL OPTIONS

Low ambient control
Outdoor air thermostat (used as compressor cut-off)
Compressor start kits (1-ph only)
Filter pressure switch

5.0 OPERATING CONTROLS (Field Installed)

Electronic programmable, auto changeover

6.0 INSTALLATION

Installation shall be done in strict adherence to Manufacturer’s Installation Instructions.

7.0 HOT GAS REHEAT DEHUMIDIFICATION The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream in addition to the standard evaporator coil. This coil reheats the supply air after it passes over the cooling coil and is sized to nominally match the sensible cooling capacity of the evaporator coil. Extended run times in dehumidification mode can be achieved using waste heat from the refrigeration cycle to achieve the reheat process, while at the same time, large amounts of moisture can be extracted from the passing air stream. Models that also have electric heaters installed have the electric heat inhibited during dehumidification mode, although it remains available for additional reheat during certain conditions. The dehumidification cycle shall be energized by a rise in relative humidity above set point. The unit shall energize in the cooling mode and also a two position valve will energize, allowing hot refrigerant gas to pass through the reheat coil, reheating the cold air leaving the evaporator coil. An electronic expansion valve (EEV) will be utilized to help maintain a very low sensible capacity and consistent latent capacity. The dehumidification cycle shall have on/off capability. If the thermostat calls for cooling or heating during the dehumidification cycle, the unit shall drop out of dehumidification to satisfy the call from the thermostat.

8.0 WARRANTY

The Bard product specified shall be free from defects in materials and workmanship for a period of 5 years for compressor, and for a period of 5 years for all parts. Warranty period shall start from date of installation as stated on warranty card; or from date of shipment if no warranty card is returned to Bard Manufacturing. Equipment must be used under normal conditions and warranty is subject to Manufacturing’s standard limited warranty statement.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 General Specifications – Sections 01.
.2 Mechanical Specifications – Sections 21 and 23.

1.2 SUBJECT BUILDINGS and AREAS

.1 The following buildings and areas at the Jordan Agriculture and Agri-Food Canada Property are included as part of this project.

.1 Pesticide Building

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the supply, modification, relocation and/or installation of low-voltage equipment, and distribution hardware to facilitate the installation of HVAC upgrades throughout the Pesticide Building.

.2 Overview: Contractor is to provide labour, materials, equipment, services, and any other requirements to supply and install all low-voltage distribution, conductors in conduit, and cables as outlined on the electrical drawings.

.3 Breakout pricing: N/A

1.4 SCHEDULING OF THE WORK

.1 The contract will be awarded on a date to be determined.

.2 Work shall be substantially complete by a date as determined by the Owner.

.3 The Contractor shall perform their work in full cooperation with other trades, and co-ordinate the schedule and sequence of all work with other trades. The Contractor must fully co-ordinate the hours and sequence of the work with the client for each location and abide by those conditions.

1.5 PRE-ORDERED PRODUCTS PRE-BID WORK

.1 N/A

1.6 PRE-PURCHASED EQUIPMENT

.1 N/A

1.7 OWNER FURNISHED ITEMS

.1 N/A

1.8 ALLOWANCES

.1 All allowance cost(s) shall be referenced from the Environment and Climate Change Canada Tender document front end.

Part 2 Products

2.1 PANELBOARDS

.1 Reference section 26 24 17 – Panelboards – Breaker Type.

Part 3 Execution

All power outages must be coordinated with the client to minimize downtime of any area on the property.

SCOPE OF WORK:

3.1 REGULATIONS:

.1 All pertinent regulations are to be complied with, including but not limited to:

.1 Ontario Building Code - 2012
.2 Ontario Electrical Safety Code – 28th Edition/2021
.3 CSA Z462-12 – Workplace Electrical Safety

END OF SECTION

Part 1 General

Division 1 requirements apply to this Section.

1.1 SUMMARY

.1 Section includes General requirements for electrical work. Applies to all Sections of Div. 26

.2 By entering into a contract with the Owner, Project Manager or General Contractor, the Contractor acknowledges that he has thoroughly reviewed and understands the intent of the Drawings and Specifications and acknowledges that the Drawings and Specifications are complete and can produce complete and functional systems.

.3 A 1-year parts and labour warranty on all electrical equipment and the overall installation.

1.2 DESCRIPTION OF WORK

.1 Furnish and install all electrical work in conformance with the requirements of this Section, as a supplement to other general requirements of the project.

.2 The contractor is responsible for all permits, approvals, inspections etc. with the authorities having jurisdiction. Work will not be considered complete until a certificate of a passed ESA final inspection is produced for this project (not the only requirement for project completion).

.3 Furnish and install equipment, devices, units, systems, and components in a completely workable installation to include the following:

.1 Panelboards, feeders, sub-feeders, switches, starters, and controls.

.2 Branch circuits for building equipment connections, and HVAC equipment.

.3 Items not specifically shown or specified but required for a complete operational site.

1.3 LAWS & CODES AND ORDINANCES

.1 All work and material shall conform to the requirements of OSHA and all Federal and Provincial Laws and ordinances having jurisdiction at the job site. The Ontario Electrical Safety Code, 28th Edition, 2021 (OESC), shall be strictly adhered to (OESC requirements are considered "minimum requirements"). Where requirements of the Contract Documents exceed OESC, the Contract Documents govern.

.2 All electrical systems shall be grounded in strict accordance with the requirements of the OESC.

1.4 STANDARDS OF MATERIAL AND WORKMANSHIP

.1 All material shall be new and shall bear the label of CSA approval (or it’s approved equivalent). All material shall be of the best grade and latest pattern of manufacture as specified. All work shall be performed in a neat workmanlike manner and shall present a neat mechanical appearance when completed.

.2 Manufacturer's catalog numbers are specified for the purpose of establishing a standard. Substitutions will be permitted, prior to bidding, when approved by the Architect as being equal to, or better than the specified item in every respect.

1.5 DRAWINGS AND SPECIFICATIONS:

.1 The Drawings and these Specifications are complementary each to the other, and what is called for by one shall be as binding as if called for by both. Carefully examine the Drawings and Specifications and report any discrepancies affecting the work to the Owner.

.2 Circuits and feeders shall be as shown and no deviations from the indicated outlet circuit grouping will be permitted, except by permission of the Architect. Branch circuit numbers indicated are to be followed unless change is approved by Architect.

1.6 INTERFERENCE DRAWINGS

.1 Where equipment of the electrical system must be installed in close proximity to equipment of another trade, this Contractor shall prepare and submit the necessary interference drawings for review and comment.

.2 Submission of the interference drawings to the Engineer for review does not absolve the Contractor of his responsibility for the proper layout and coordination of the work.

1.7 RECORD DRAWINGS

.1 On two (2) sets of prints of this project, mark all changes and deviations from the original plans. Correctly mark all changes in red ink.

.2 On completion of the project, turn these plans over to the Owner for the Owner’s record of the exact location of all piping and equipment.

.3 Certify these plans, “as-built”. Plans are not considered certified unless they are signed and sealed by an officer of this contractor’s company.

.4 Where piping is buried, dimension locations with respect to building walls and mark levels with respect to the elevation of finished floor below which piping is buried.

1.8 FINAL COMPLETION AND TEST:

.1 Upon completion of the work, the various systems shall be tested for faulty circuits and grounds in accordance with the method and resistance values outlined in the OESC and for load balance on feeders and branch circuits.

.2 The completed system shall operate satisfactorily in every respect. Make any repairs or adjustments necessary to this end to the satisfaction of the Owner.

.3 Prior to the start-up of any system, check all devices and verify the manufacturer’s start-up instructions.

.4 Verify that all equipment is connected to the proper voltage and phase wire size and over current protection.

.5 Megger all Panel feeders, Motor feeders and all major equipment feeders, record the readings and include them in the maintenance manuals.

.6 Check rotation on all motors.

.7 Check main service voltage, phasing, ground conditions and ground resistance. Record and include in the maintenance manuals.

.8 Ensure that all devices, wiring, conduit runs and equipment is bonded and grounded in accordance with the latest Ontario Electrical Safety Code.

1.9 QUALITY ASSURANCE

.1 Before tendering, become fully acquainted with by-laws of any local or other authority having jurisdiction.

.2 Carry out all changes and alterations required by the authority inspector of any authority having jurisdiction without delay to the progress of the work and without extra cost.

.3 Materials and labour provided under this contract shall be of the new and of the highest quality and shall be in compliance with the Canadian Standards Association, Ontario Electrical Safety Code, 28th edition, 2021, ULC, Ontario Building Code 2012, and all Fire Department Regulations.

.4 Upon completion of the project provide the owner with a certificate of warranty, certificate of ESA inspection approval, fire-alarm system verification report, as-built drawings, and maintenance manuals. This provision shall be met prior to application for the final draw.

.5 Pay for all permits required for the undertaking and completion of this work.

1.10 SUBMITTALS

.1 Comply with the provisions listed herein.

.2 Before fabrication of any materials or equipment, submit one (1) digital copy of detailed drawings of equipment and apparatus to the Engineer for review. Do not order materials until review has been given. Check the drawings and note comments, date and signature before submitting.

.3 Shop drawings must apply to the equipment under consideration. Advertising literature and comprehensive data sheets are not acceptable. The drawings must contain the actual dimensions of unit and dimensioned location and size of all outlets and connections, model range, capacity, hp, voltage, etc., of all accessories listed in the specifications, and/or being provided, and the operating points of the proposed equipment.

.4 Do not consider review rendered on shop drawings as a guarantee of measurements for building conditions. Where drawings are reviewed, said review does not mean that drawings have been checked in detail. The review does not in any way relieve this contractor from his responsibility or necessity of furnishing material to meet the performance of equipment specified and/or as shown on the contract drawings.

.5 Electrical items for which shop drawings are specifically requested are listed in each section of the Specification.

1.11 QUALIFICATIONS

.1 Electrical Contractors shall hold a valid Electrical Contractor License in Ontario.
All Electrical work shall be performed by qualified electricians holding valid “Certificates of Qualification” issued by the Provincial licensing board.

.2 The journeyman/apprentice ratio shall not exceed 3:1 (three journeyman to one apprentice).

1.12 MINOR FIELD CHANGES

.1 The location, arrangement and connection of equipment and material as shown on the drawings represent a close approximation to the intent and requirements of the contract. The right is reserved by the Architects to make reasonable changes required to accommodate conditions arising during the progress of the work. Such changes shall be made at no extra cost to the Owner, unless the location, arrangement or connection is more than five feet from that shown.

END OF SECTION

Part 1 Basic Materials and Methods

1.1 GENERAL

.1 This section of the Specifications is an integral part of the Contract Documents and shall be read accordingly.

.2 Comply with Division 1 - General Requirements - and all documents referred to therein.

1.2 WORK INCLUDED

.1 Work to be done under this Section shall include furnishings of labour, materials, and equipment required for installation, testing, and putting into proper operation complete Electrical systems as shown, as specified, and as otherwise required. Complete systems shall be left ready for continuous and efficient satisfactory operation.

1.3 STANDARD OF MATERIALS

.1 Where materials and equipment are specifically described and named in either the drawings or these Specifications, it is done so in order to establish a standard of material and workmanship.

.2 Materials required for performance of work shall be new and the best of their respective kinds and of uniform pattern throughout the Work.

.3 Materials shall be of Canadian manufacture where obtainable. Materials of foreign manufacture, unless specified, shall require approval before being used.

.4 Equipment items shall be standard products of approved manufacture. Identical units of equipment shall be of same manufacture. In any unit of equipment, identical component parts shall be of same manufacture, but the various component parts comprising the unit need not be of one manufacture.

.5 Chemical and physical properties of materials and design performance characteristics and methods of construction and installation of items of equipment, specified herein, shall be in accordance with latest issue of applicable Standards or Authorities when such are either mentioned herein, or have jurisdiction over such materials or items of equipment.

.6 Materials shall bear approval labels as required by Code and/or Inspection Authorities.

.7 Install materials must be in strict accordance with manufacturer's recommendations.

.8 Include items of material and equipment not specifically noted on Drawings or mentioned in Specification but which are necessary to make a complete and operating installation.

.9 Remove materials, condemned as not approved for use, from job site and deliver and install suitable approved materials in their place.

.10 Unless otherwise noted, all materials and apparatus shall be new.

1.4 CUTTING AND PATCHING

.1 All cutting and patching performed by Division 26 shall be in accordance with Division 1, requirements. Layout such work for approval before undertaking same.

.2 Cutting shall be kept to an absolute minimum and performed in a neat and workmanlike manner using the proper tools and equipment. Caution shall be exercised in all cutting and procedures to ensure that concealed services are not affected. **Do not cut if in doubt.** Request Consultant's presence to determine if concealed services exist.

.3 Assume responsibility for prompt installation of Work in advance of concrete pouring or similar Work. Should any cutting or repairing of finished/unfinished Work be required because such installation was not done, employ the particular trade whose Work is involved to do such cutting and patching. Pay for any resulting costs. Layout such Work for approval before undertaking same.

1.5 PAINTING

.1 Repair and finish factory finished equipment, damaged, or scratched during installation, in an approved manner.

.2 All structural steel including hangers, brackets, supports and other ferrous metals shall be shop or factory prime painted wherever practicable. Wherever structural steel including hangers, brackets, supports, and other ferrous metals cannot be shop or factory prime painted, wire brush to remove all traces of rust, clean off all traces of dirt, oil, and grease, and apply one coat of an approved rust inhibiting primer in accordance with CGSB-GB-40d and leave ready to receive finish paint.

1.6 EQUIPMENT IDENTIFICATION

.1 Reference section 26 05 53 – Electrical Identification.

1.7 TESTING

.1 Perform tests of equipment and wiring at times requested.

.2 Tests shall include meggered insulation values, voltage, and current readings to determine balance of panels and feeders under full load, and operation of each piece of equipment for correct operation.

.3 Supply meters, materials and personnel as required to carry-out these tests.

.4 Test electrical work to standards and function of Specification and applicable codes in an approved manner. Replace defective equipment and wiring with new material and leave entire system in complete, first-class operating condition.

.5 Connect single phase loads so that there is the least possible unbalance of the supply phases.

.6 Submit all test results in report format.

1.8 CONDUIT SLEEVES AND CURBS

.1 Provide conduit sleeves of galvanized steel for conduit and cable runs passing through concrete walls, beams, slabs, and floor.

.2 Extend galvanized conduit sleeves for conduit rising through slabs 4" minimum above finished floors. Provide sleeves, passing through floors having a waterproof membrane, with an integral flashing clamp.

1.9 SUPPORTS AND BASES

.1 Submit proposed method of attachment of hangers and beam clamps, to cellular steel deck for approval before proceeding with Work

.2 Supply and erect special structural Work required for the installation of electrical equipment.

.3 Provide anchor bolts and other fastenings unless noted otherwise. Mount equipment required to be suspended above floor level, where details are not shown, on a frame or platform bracketed from the wall or suspended from the ceiling. Carry supports to either the ceiling or the floor, or both as required, at locations where, because wall thickness is inadequate, it is not permitted to use such brackets.

.4 Electrical panels, switches or other electrical equipment shall be complete with suitable bases or mounting brackets.

.5 Provide channel or other metal supports where necessary, to adequately support lighting fixtures. Do not use wood unless wood forms part of the building structure. All light fixtures shall be independently supported from the structural deck with chains

.6 Support hangers, in general, from inserts in concrete construction or from building structural steel beams, using beam clamps. Provide additional angle or channel steel members, required between beams for supporting conduits and cables.

.7 Provide any additional supports required from concrete construction for any piping or equipment, by drilling same and installing expansion bolt cinch anchors.

.8 Do not use explosive drive pins in any section of Work without obtaining prior approval.

1.10 HANGERS

.1 Hangers for electrical conduit shall be galvanized after fabrication.

.2 Conduit hangers shall be as manufactured by:

.1 Burndy Canada Ltd.
.2 Canadian Strut Products Ltd.
.3 E. Myatt & Co. Ltd.
.4 Steel City Electric Co.
.5 Pilgrim
.6 Thomas & Betts
.7 B-line

.3 Do not use perforated strapping (grappler bars).

1.11 GROUNDING

.1 Ground electrical equipment and wiring in accordance with these Specifications, the Drawings, the Ontario Electrical Safety Code and Local Inspection Authority's Rules and Regulations.

.2 Reference section 26 05 26 – Grounding and Bonding.

1.12 WIRING METHODS

.1 Install wiring in conduit unless otherwise specified.

.2 Use thin wall conduit, up to and including 53 mm conduit size, for branch circuit and feeder wiring in ceilings, furred spaces, and in hollow walls and partitions. Use rigid galvanized steel conduit for wiring in poured concrete, where exposed, and for conduit 65 mm or larger. Use rigid PVC conduit for wiring in slabs on grade and wiring below grade.

.3 Aluminum conduit may be used, in lieu of rigid steel conduit, in clean and dry locations, but shall not be used in poured concrete, or for signal and intercommunication systems wiring.

.4 Flexible conduit and armored cable will be accepted for a maximum length of 3000 mm (10'-0") for final connection to lighting fixtures. Do not connect from fixture to fixture.

.5 Conduit manufacturer's touch-up enamel shall be used to repair all scratches and gouges on epoxy-coated conduit.

1.13 OUTLET BOXES

.1 Boxes shall conform to C.S.A. Standard C22.2 No. 18-1972..

.2 Where 103 mm square outlet boxes are installed in exposed concrete or cinder block finished areas, blocks will be cut under Masonry Division as instructed under this Section. Opening shall be cut to provide a close fit to boxes and covers so that edges of openings are not visible after installation of plates. Mortar shall not be used to patch up openings that are cut too large or to patch ragged edges.

.3 Ceiling boxes shall be 103 mm octagon or square, complete with fittings, where required to support fixtures.

.4 Switch and receptacle boxes shall be:

.1 103 mm square with plaster ring, where flush mounted in plaster walls.
.2 No. 1104, where flush mounted in wood or drywall, with stud fasteners as required.
.3 Masonry boxes in masonry walls.

.5 Where boxes are surface mounted in unfinished areas they shall be FS conduits.

.6 Standard outlet boxes shall be manufactured from code gauge galvanized steel.

.7 Provide a suitable outlet box for each card-reader, security camera, powered-door operator, light, switch, receptacle, or other outlet, approved for the particular area it is to be installed.

.8 Support outlet boxes independently of conduit and cable.

.9 Locate outlet boxes, mounted in hung ceiling space, so they do not obstruct or interfere with the removal of lay-in ceiling tiles.

.10 Offset outlet boxes, shown back-to-back in partitions, horizontally a min. of 150mm to minimize noise transmission between adjacent rooms.

.11 Use gang boxes at locations where more than one device, of the same system only, is to be mounted. Each system shall utilize separate boxes.

.12 Use tile wall covers where 103 mm square outlet boxes are installed in exposed concrete or cinder block in finished areas.

.13 Flush mount boxes, panels, cabinets, and electrical devices, which are installed in finished areas, shall be provided with suitable flush trims and doors or covers, unless specifically noted otherwise.

.14 Provide pre-formed polyethylene vapor barriers for all boxes located in walls with internal vapor barriers.

1.14 CONDUIT ACCESSORIES, CONDULETS AND FITTINGS

.1 Conduit accessories, conduits and fittings shall conform to C.S.A. Standard C22.2 No. 18-1972.

.2 Rigid conduit bushings shall be as manufactured by:

.1 Thomas & Betts Ltd - Series 5031
.2 Efcor of Canada Ltd - Series 720B
.3 Commander/Iberville.

.3 EMT Connectors shall be as manufactured by:

.1 Thomas & Betts Ltd - Steel City TC 121E Series
.2 Efcor of Canada Ltd - Series 720B
.3 Commander/Iberville

.4 Ground bushing shall be as manufactured by:

.1 Thomas & Betts – Blackjack or 1220 Series
.2 Efcor of Canada Ltd.
.3 Commander / Iberville

.5 Flexible conduit connectors shall be as manufactured by:

.1 Thomas & Betts Ltd - Series 3110
.2 Efcor of Canada Ltd - Series 1001B
.3 Commander/Iberville
.4 EMT couplings shall be steel concrete tight to match connectors.

.6 Conduit fittings shall be as manufactured by:

.1 Crouse-Hinds of Canada Ltd.
.2 Kondu Mfg. Co. Limited
.3 Thomas & Betts Ltd.
.4 Killark of Canada
.5 Efcor of Canada Ltd.
.6 Commander/Iberville

.7 Steel conduit shall be as manufactured by:

.1 Conduits National Co. Ltd.
.2 MBF Industries

.8 Aluminum conduits shall be as manufactured by Alcan Canada Products Ltd.

.9 Terminate rigid conduit entering boxes or enclosures with nylon insulated steel threaded bushings such as Thomas & Betts – 8125 Series

.10 Terminate flexible conduit entering boxes or enclosures with nylon insulated steel connectors such as Thomas & Betts 5332 Series or equivalent.

.11 Install wall entrance seals where conduits pass through exterior walls below grade.

.12 Provide expansion coupling in conduit runs at building expansion joints and in long runs subject to thermal expansion, all in accordance with manufacturer recommendations.

1.15 CONDUCTORS, WIRES AND CABLES

.1 Wiring installed in conduit, unless otherwise noted, shall be 600volt "RW 90 X-Link". However, wiring in channel back of fluorescent fixtures shall be 600volt type GTF or TEW. Lighting and power wiring shall be copper, minimum No. 12 gauge. Size wires for 2% maximum voltage drop to farthest outlet on a maximum 80% loaded circuit.

.2 Home runs to lighting and receptacle panels which exceed 20m (75') in length shall be minimum No. 10 gauge.

.3 Conductors shall be color coded. Conductors #10 gauge and smaller shall have color impregnated into insulation at time of manufacture. Conductors size #8 gauge and larger may be color coded with adhesive color coding tape but only black insulated conductors shall be employed in this case, except for neutrals, which shall be white wherever possible.

.4 Color Coding shall be as follows:

.1 Phase "A" - Red
.2 Phase "B" - Black
.3 Phase "C" - Blue
.4 Control - Orange
.5 Ground - Green
.6 Neutral - White

.5 Wire shall be as manufactured by:

.1 Industrial Wire and Cable (1970) Ltd.
.2 Nexans Canada
.3 Noramco
.4 Phillips Cables Ltd.
.5 Prysmian Group
.6 Southwire
.7 Texcan (Sonepar).

.6 Neatly arrange circuit wiring in cabinets, panels, pull boxes and junction boxes and hold with nylon cable ties.

.7 Splice wire, up to and including No. 6 gauge, with nylon insulated expandable spring type connectors such as Thomas & Betts – Marr Max Series.

.8 Splice large conductors using compression type connections insulated with heat shrink sleeves.

.9 Where color coding tape is utilized, it shall be applied for a minimum of 2" at terminations, junction and pull boxes and conduit fittings. Do not paint conductors under any condition.

.10 Color coding shall also apply to bussing in panels and switchgear, disconnects, and metering cabinets.

1.16 SAFETY SWITCHES

.1 Supply and install as required, as per section 26 28 23 – Disconnect Switches Fused and Non- Fused.

1.17 FUSES

.1 Supply and install as required, as per section 26 28 23 – Disconnect Switches Fused and Non- Fused.

1.18 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centre-line of equipment unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install electrical equipment at following heights unless indicated otherwise.

.1 Local switches: 1150 mm (45”) .
.2 Wall receptacles – General: 350 mm (14”).
.3 Wall receptacles – Above top of counters or counter splash backs: 175 mm (7”).
.4 Wall receptacles – In electrical/mechanical service rooms: 700 mm (27”).
.5 Other devices, switches, etc., in barrier-free path of travel: 1000 mm (40”).
.6 Panelboards: as required by Code or as indicated.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 This section covers the materials and installation methods used in the project.

.2 Material supplied shall be new and be approved by the Canadian Standards Association, Underwriter's Laboratory Canada and/or Ontario Electrical Safety Code.

.3 Competent and qualified supervision shall be supplied to oversee the electrical installation on a continuous basis.

.4 The workforce shall consist of at least one foreman and qualified electricians employed in sufficient numbers to ensure the completion of the work in accordance with the project, with the highest quality control. This contractor shall always ensure that their work is completed to such an extent so as to avoid substantial delays to other divisions.

Part 2 Materials

2.1 CONDUIT, WIRE AND CABLE

.1 Power Conductors:

.1 Secondary conductors shall be CSA approved type for 600 volt and be ULC listed.
.2 Conductors shall be copper.
.3 Minimum conductor size shall be 12 AWG stranded, with flame retardant R90 insulation.
.4 For re-worked, relocated, and replaced wiring sections, the new conductor size shall be replaced/re-connected with equivalently sized conductors.
.5 Conductors/cables/conduit shall be installed in a neat and orderly fashion with proper supports/clips etc (as per OESC). The utmost care shall be taken to avoid damage to conductor insulation when cables are installed. Conductors shall be installed in conduit.
.6 Conductors shall be identified with the proper numbers and at all termination and junction points. Brady and Pilgrim type markers are acceptable.
.7 All power conductors shall be colour coded at each termination as follows:

Phase"A"–Red	Ground–Green
Phase"B"–Black	Neutral–White
Phase "C" – Blue	Isolated ground –Green with Black stripe

.2 Control Conductors:

.1 Conductors shall be CSA approved type for 600 volt and be ULC listed, unless otherwise noted.
.2 Conductors shall be copper. Minimum conductor size shall be 14 AWG stranded, with flame retardant TW insulation for 75 degree Celsius.
.3 Control conductor insulation shall be yellow in colour.
.4 Conductors shall be installed in a neat and orderly fashion. The utmost care shall be taken to avoid damage to conductor insulation when cables are installed. All conductors shall be installed in conduit.
.5 Conductors shall be identified with the proper numbers and at all termination and

junction points. Brady and Pilgrim type markers are acceptable.

Metallic and Non-Metallic Sheath Cable:

.1 The use of metallic sheath cable (BX) shall be limited to the inside of metal stud and drywall partitions and to a maximum of 3-meter (120") drops from lighting junction boxes to light fixtures. All other wiring shall be in conduit.

.2 Non-metallic sheath cable (NMD, Romex NMW Farmex) shall not be used.

.3 Conduit and Fittings:

.1 Conduits shall be hot dipped galvanized heavy wall rigid conduit, electrical metallic tubing (EMT), or rigid PVC as shown in the cable schedule on the one line diagram or as outlined below. Conduit fittings for EMT shall be steel set screw type indoors and compression type rain tight outdoors.

.2 The minimum conduit size shall be 19mm (3/4").

.3 All raceways carrying wiring 120 volts and higher shall be equipped with a green ground conductor sized the same as the wiring in the race way up to AWG #8, and sized as shown in Table 18 of the Ontario Electrical Safety Code for wiring with ampacities over 40 amps.

.4 EMT shall be used in all installations except for the following or on approval by the Engineer.

.5 Conceal conduits as far as practicable in the floor, wall, and ceiling construction. Conduits may be run exposed in crawl spaces, fan rooms, penthouses, electrical and mechanical rooms, unless specified or noted otherwise. Approval shall be obtained from the Engineer prior to the installation of any surface conduits in any location other than the above specified areas.

.6 Install conduit neatly in appearance, running parallel to or at right angles to building lines, parallel and equally spaced in groups, not bent over sharp objects. Clean and seal conduit until wiring is installed.

.7 Install grounding bushings, jumpers and ground straps as required to maintain continuity of grounding for the complete system.

.8 Terminate empty conduit for future use with a cap and nylon pull cord in each empty conduit. Tie off pull cord at each end of run.

.9 All conduits shall be fastened securely in place with approved straps and hangers in sufficient number to prevent movement of any part of the conduit. This includes conduit installed in forms before concrete is poured.

.10 Expansion fittings shall be provided at all points where conduit crosses building expansion joints.

.11 All connections to motorized equipment shall be made with sealtite flexible conduit, to minimize vibration.

.12 All conduits shall be installed a minimum of 75mm (3") from any hot water pipes.

.13 Liquid-tight fittings shall be used where sealtite conduit is specified.

.4 Connectors

.1 All conductors that require splices shall be spliced with mechanical or compression type connectors approved for type and application by CSA and be ULC listed.

.2 Connectors and insulation method to be approved by Engineer.

.5 Junction, Pull and Outlet Boxes

.1 NEMA 1 enclosures shall be furnished for dry and clean locations. In wet

.2 Install all boxes so as to be accessible after the building is complete, set to come flush with the finished lines of the wall where recessed and lined and level where surface mounted.

.3 Install junction boxes on all conduit work where necessary to permit easy installation of conductors.

.6 Wiring Devices

.1 Cover Plates shall be stainless steel for all interior wiring devices. Weatherproof cover plates shall be used for devices mounted exterior applications.
.2 All duplex receptacle plates shall have the panel and circuit number of the outlet. permanently affixed to them.
.3 Alternate acceptable manufacturers shall be: Pass & Seymour and Arrow Hart.

.7 Painting

.1 Electrical equipment which becomes defaced due to construction and installation is to be cleaned and painted to restore the original finish.

Part 3 Execution

3.1 PREPARTATION

.1 Sleeves and Escutcheons

.1 Provide and install sleeves for conduits and cables and openings for raceways and equipment. Sleeves in concrete shall be schedule 40 steel pipe sized to allow free passage of the equipment. Sleeves shall extend 150mm (6") on either side of the structure on each side and be packed with resilient fire stop material. All penetrations caused by the electrical work shall be sealed using an approved fire sealing material in accordance with the Ontario Building Code.

.2 Do not set conduits or ducts in contact with concrete, masonry, wood, steel, or similar materials. Conduits must be free to expand, contract or otherwise move without wear or noise.

.3 Where exposed conduits and ducts pass through floors, walls, etc., finish with solid type escutcheon plates held in place with set screws where necessary. Paint escutcheons to match the walls except when used with chrome piping, when they are chrome plated to match. When pipes are insulated, escutcheons may be omitted, provided the insulation is butted neatly to the wall and completely covered by its finish jacket in a manner acceptable to the Engineer.

.2 Cutting and Patching

.1 Cutting and patching of the building structure required due to the demolition of existing electrical equipment or for the installation of new electrical apparatus is the responsibility of the Electrical Contractor. Cutting and patching shall be provided by the trade skilled in the installation of the media to be patched at the expense of the Electrical Contractor.

.2 All cutting and patching shall be laid out for review by the Engineer prior to proceeding and patching shall be completed to a “paint ready” state.

.3 No cutting of structural members shall be permitted without the approval of the Structural Engineer.

.4 Provide and pay for pitch-pockets installed by the roofing contractor where electrical wiring must penetrate the roof.

3.2 INSTALLATION

.1 Final layout of the work is the responsibility of the Electrical Contractor. The contractor shall make every effort to provide a neat and workman like installation. Any work deemed unacceptable to the owner or the Engineer will be removed and re-installed by the electrical contractor at no cost to the owner.

.2 Concealed conduits, boxes, fittings, wiring and cables shall be installed as close to the building structure as possible to insure proper concealment and avoid the necessity for furring.

.3 Verify that dimensioned equipment locations as shown on the drawings can be retained and that proper clearances to adjacent work can be maintained.

.4 The Engineer retains the right to relocate devices, without charge to the owner, up to ten feet from locations shown on the drawings, provided the change is made prior to installation and does not require additional material or labour.

.5 All exposed interior raceways, junction boxes, wiring and equipment shall be installed.

neatly, parallel to building lines and as close together as is possible.

.6 Clearly mark and identify all raceways, junction boxes, feeder cables and other equipment. Identification shall be by means of a Lamacoid tag (white face, black core to provide black letters) lettering shall be 3/8” high. Fasten tags to junction boxes; disconnect switches, motor starters and other flat surfaces with double sided tape. Fasten tags to conduits and cables with ty-wraps.

.7 All terminal strips shall be labeled with the wire numbers corresponding to those of the equipment manufacturer or according to a master list compiled by the contractor and included in the Maintenance Manuals.

.8 Junction and pull boxes shall be identified on the cover using permanent black marker as to the wiring they contain.

Use the following code to identify systems;

.1 NP - Normal Power
.2 EL – Emergency Lighting & Exit Lighting
.3 L - Lighting

.9 Electrical Wiring and Starters of Mechanical Devices

.1 The responsibilities of the electrical contractor in the connection of mechanical equipment is as follows;

a) This Contractor shall provide power wiring carrying full line current of motor or other mechanical systems equipment including wiring of speed controllers, variable speed drives, motor starters, and disconnect switches connected in line between the power source and the motor or other equipment.
b) In general, all motor starters, motor control centers and speed controllers will be provided by division 23 with power and connections by the Electrical Contractor unless noted otherwise in the mechanical equipment schedule on the drawings.
c) Where mechanical equipment is supplied with integral starters only power feeds and local isolation switches will be provided by the Electrical Contractor.
d) All control wiring, but excluding Fire Alarm wiring, will be supplied, and installed by the Mechanical Contractor.
e) Voltage on site is 240V 1 phase, 3 wire.
f) All motors will be supplied and installed by Division 23. All motors will be wired by the electrical contractor.
g) All electric heaters will be supplied installed and wired by the electrical contractor including low and line voltage thermostats.
h) The Electrical Contractor shall verify on site the exact location of mechanical equipment prior to proceeding with the electrical wiring.
i) Obtain from the Division 23 Contractor the appropriate designations of all starters to enable the labeling of same by this Division 26 Contractor.

.2 All devices must bear CSA approval stamp. Verify that the power characteristics specified herein agree with the requirements of the installation before any equipment is ordered.

.10 Supports and Concrete Work

.1 Provide and erect all special structural steel or concrete work required solely for the installation of electrical equipment or wiring and not shown on Architectural, Structural or Mechanical drawings. Supply and install all anchor bolts and other fastenings. Where apparatus is required to be mounted on concrete pads, locate the pads accurately and install with neatly chamfered edges.

.2 This Contractor shall supply and install all necessary steel beams, channels, angle iron for supporting the equipment, conduits, lighting, apparatus, etc.

.11 Painting

.1 Carefully brush and clean all iron work affected by work after work is complete in order that it may be in proper condition for paint. Paint all metal, unless galvanized or shop primed, with one coat of metal priming paint.

.2 Clean any equipment defaced during construction to restore the original finish. All mechanical equipment which comes on the site painted, rusty or otherwise defaced due to construction and installation, is to be painted with one coat of paint, oil base type, of the original colour.

.3 Paint all inside surfaces of all duct black, back at least 2’ -0” (600mm) from all grilles and registers.

3.3 FIELD QUALITY CONTROL

.1 Commissioning and Testing

.1 Prior to the start-up of any system, check all devices and verify the manufacturer's start-up instructions.

.2 Verify that all equipment is connected to the proper voltage and phase wire size and over current protection.

.3 Megger all Panel feeders, Motor feeders and all major equipment feeders, record the readings and include them in the maintenance manuals.

.4 Check rotation on all motors.

.5 Check main service voltage, phasing, ground conditions and ground resistance. Record and include in the maintenance manuals.

.6 Ensure that all equipment is grounded in accordance with the Ontario Electrical Safety Code and that the ground electrode resistance meets the requirements of the code.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

Conform to Section 26 05 01 - General Requirements for Electrical Work

1.2 REFERENCES

.1 Provide system grounding to meet requirements of current Ontario Electrical Code and all applicable Codes.

1.3 DESCRIPTION

.1 Bond and ground all metallic water and waste systems in accordance with code requirements.

.2 Install grounding connections to typical equipment including in, but not necessarily limited to, frames of motors, starters, control panels, and distribution panels.

Part 2 Products

2.1 GROUNDING & BONDING EQUIPMENT

.1 Meet standard of CSA C22.2 No. 41-2007.

2.2 CONDUCTORS

.1 Bare or insulated, stranded, soft drawn annealed copper wire, for: ground bus, electrode interconnections, metal structures, ground connections, telephone ground.

Part 3 Execution

3.1 INSTALLATION

.1 Install complete permanent, continuous, system and circuit, equipment, grounding systems including, conductors, connectors, accessories, as indicated, to conform to requirements local authority having jurisdiction over installation.

.2 Install connectors in accordance with the manufacturer’s instructions.

.3 Protect exposed grounding conductors from mechanical injury.

.4 Use mechanical connectors for grounding connections to equipment provided with lugs.

.5 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solderless lug, clamp or cup washer and screw. Neatly cleat bonding wire to exterior of flexible conduit.

.6 Testing and verification conform to section 26 05 01 - General Requirements for Electrical Work.

END OF SECTION

Part 1 General

Division 1 and Section 26 05 01 requirements apply to this Section.

1.1 SUMMARY

.1 Section includes: Conduit, boxes and fittings.

.2 Furnish and install complete conduit systems for the various electric systems required for this project. Systems shall be complete with supports, mounting devices, pull boxes, etc., as required for installation of wiring systems and terminal devices.

1.2 RELATED WORK IN OTHER SECTIONS

.1 Trenching and backfilling; conductors, panelboards, devices, boxes, and lighting equipment.

Part 2 Products

2.1 MATERIALS

.1 Conduit shall be galvanized steel rigid threaded conduit or galvanized (EMT) steel tube may be used in sizes up to and including two inch in all interior work, except that it shall not be used in concrete, underground, underfloor, in any damp or outdoor locations, or in any locations where there is a likelihood of mechanical injury. The minimum size of conduit is 16mm (1/2") trade size.

.2 All bends for conduit of 35mm (1-1/4") or larger shall either be factory manufactured elbows or be made by the use of bending machine meeting the approval of the Owner's Project Manager.

.3 EMT connectors and couplings shall be watertight compression fittings having steel gland nuts or stamped sheet set screw. Pot metal fittings are prohibited.

.4 Flexible metal conduit, Anaconda Type UA of Liquidtite Type LT shall be used to connect all motor driven equipment, and ceiling mounted light fixtures, lengths not to exceed 60".

.5 Flexible conduit used to meet the above requirements shall be of the liquid-tite type when installed under any of the following conditions:

.1 Exterior locations.
.2 Moisture or humidity laden atmospheres where it is possible for condensation to accumulate.
.3 Where water or spray due to wash down operation is frequent or possible.
.4 Wherever there is a possibility of seepage, dripping, etc., of oil, grease, or water.
.5 PVC type DBII conduit shall be used as indicated on Drawings.
.6 PVC conduit may be used for branch circuits under floor slabs. PVC conduit shall be in the fill below the slab. Minimum size shall be 21mm (3/4").

.6 Outlets and outlet boxes: All outlet boxes, except where otherwise specifically required, shall be one piece construction. They shall be protected against corrosion by an appropriate galvanizing process. All outlet boxes shall be provided with covers of the same manufacture as the boxes proper. The type of cover selected shall be the conditions imposed in every case. All such boxes shall be left in a neat, clean

workmanlike manner. No plaster covers shall have a depth greater than one inch. Outlets shall be finished to l/8" of finished surfaces.

.7 Outlet boxes for various uses shall be Appleton boxes of the following order: Appleton numbers listed first, Universal numbers listed in parenthesis:

.8 In standard partitions and suspended ceilings where 21mm (3/4") conduits are employed, #4SD 3/4, (#54171), boxes shall be used.

.9 In thin partitions measuring 3-l/2" or less #4S 3/4, (#52151) boxes shall be used when one or more conduits are involved.

.10 Wall switch outlets shall involve the use of #4SJD 3/4, (#72171 3/4), boxes in standard walls and #4SJ 3/4, (#72151), boxes in thin walls.

.11 Switch boxes shall not be used as junction boxes.

.12 Where an atmosphere laden with moisture exists, Type FD Series Unilet Boxes shall be used with standard devices. The covers employed shall be adapted for the particular application involved. In such cases, brass screws shall be used and due provision shall be made in all cases, for the escape of any condensate which might accumulate.

Part 3 Execution

3.1 INSTALLATION

.1 All conductors shall be in conduit. Material shall be exposed or concealed as required by the Drawings. Exposed conduit shall be run straight and true to building lines and shall be rigidly supported by means of straps or hangers best suited for the work. Perforated tape or wire shall not be used. If ceiling support system is adequate, one 3/4" maximum conduit may be supported by a Cady Clip to hanger wire. Multiple runs of conduits shall be racked on trapeze hangers. All support material shall be rustproof.

.2 All ends of conduit shall be properly reamed to remove rough edges and whenever a conduit enters a box or other fittings, it shall be securely fastened by the use of a locknut inside and outside of the box or fitting. An approved bushing shall be installed on the ends of all conduits in such a manner as to protect the wire from abrasion. The contractor shall layout and install the conduit systems as to avoid all other services or systems, the proximity of which may prove injurious to the conduit or the wires or conductors which it confines. All conduit systems except those otherwise specifically shown to the contrary, shall be concealed in the building construction.

.3 On exposed systems, support shall be provided at intervals of six feet. No feeder conduit run shall be longer than 45m (150') between junction boxes, cabinets or circuit interrupting devices unless there are no direction changes, and only a straight-in-line pull of wire is involved. In such straight-in-line runs between junction boxes, cabinets or circuit interrupting devices, a run not to exceed 60m (200') in length may be made.

.4 Conduit runs shall be sealed after installation to prevent the accumulations of water, dirt, and other foreign materials. The conduit in which such accumulation occurs shall be cleaned to the satisfaction of the Owner or replaced.

.5 The Contractor shall so layout and install conduit runs as to avoid close proximity to hot

water pipes. In no case shall a conduit be run within 75mm (3") of such pipes, except where crossings are unavoidable, and then the conduit shall be kept at least 25mm (1") from the covering on the pipe crossed.

.6 Conduits routed above the acoustical "lay-in" ceilings shall be anchored to the building structure and not on the ceiling, except as allowed above. Wire shall not be used to anchor boxes and conduit to structure. Junction boxes shall be installed on the structural members and flexible conduit, or BX extended down to light fixture, length not to exceed 6 feet, and in accordance with OESC. The Contractor shall furnish and install a full-length nylon pull cord in every empty conduit installed here under to facilitate the future installations of wires. Identify each terminus of pull wire with linen tags and with complete information as to service and location of terminus of the cord. Galvanized rigid steel conduits 16mm (1/2") and 21mm (3/4") trade size may be installed in concrete beams and walls, providing the outside diameter of the conduit does not exceed 1/3 the thickness of the concrete beam or wall and is located entirely within the center third of the member, and the lateral spacing of conduits is not less than 3 pipe diameters. This shall be done only with approval of the project structural engineer.

.7 Conduit crossing expansion joints shall be provided with suitable expansion fittings.

.8 Exposed conduits and EMT shall be run parallel to or at right angles to the lines of the building. Right angle bends in exposed conduit and EMT runs shall be made with standard elbows, screw jointed conduit fittings or conduit bent to radii not less than those of standard elbows. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside.

.9 Exposed horizontal runs, where permitted, shall be installed close to ceiling or ceiling beams and above water, steam or other piping, where possible. Conduits and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes wherever possible. Conduits and EMT shall not be run through beams.

.10 Exposed conduit shall be supported by approved hangers, clamps, or clips fastened by machine screws to expansion sleeves in inserts or lead anchors. Lead anchors shall not be used for support or conduits larger than 41mm (1 1/2"). Conduit shall be supported on each side of bends.

.11 Conduits run exposed or in suspended ceiling space or roof space, shall be run parallel with the lines of the building unless otherwise shown or noted on the drawings. Conduits, where practicable, shall be placed at same elevation and hung on multiple hangers. Conduits shall not be hung on hangers with any other service, and shall be hung above all other service pipes. Hangers or different service lines running parallel with each other and near together shall be in line with each other and parallel to the lines of the building. Exact location of electric outlets, piping, ducts, etc., shall be coordinated between subcontractors so that there will be no interferences between lighting fixtures, piping, ducts, etc.

.12 Vertical conduit and EMT not larger than 41mm (1 1/2") shall be supported by riser clamps at each floor or by one-hole pipe straps not over 2.5m (8') feet apart. Vertical conduits and EMT larger than 41mm (1 1/2") shall be supported by riser clamps at each floor. Short vertical drops larger than 41mm (1 1/2") shall be supported by hangers close to the elbows at the tops, and additionally secured to walls, columns, etc. by one-hole pipe straps spaced not over eight 2.5m (8') feet apart.

.13 Run two 21mm (3/4") empty conduit from panel to ceiling space for every three spare branch circuits for flush mounted panels.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Conform to Section 26 05 01 - General Requirements for Electrical Work

Part 2 Products

2.1 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates and labels as follows:

.1 Nameplates:

a) Lamacoid 3 mm (1/8 in.) thick plastic engraved sheet, black or red face, white core, mechanically attached with self tapping screws.
b) White letters 12 mm (1/2 in.) high for major switchboards, Panelboards and power transformers.
c) White letters 6 mm (1/4 in.) high for terminal boxes, junction boxes, grid boxes, splitter boxes, disconnect switches starters and contactors.
d) Allow for an average of twenty-five (25) letters per nameplate.
e) Identification to be in English.
f) Black nameplates for normal power.
g) Red nameplates for emergency power.

Sample:

ELECTRICAL PANEL ‘B’
240/120Vac, 225A, 3Φ, 4W
FED FROM ELECTRICAL PANEL ‘A’

.2 Labels:

a) Embossed plastic labels with 6 mm (1/4 in.) high letters unless specified otherwise, for internal components, such as relays, fuses, terminal blocks.
b) Wording on nameplates to be approved by Consultant prior to manufacture.
c) Identification to be in English.
d) Nameplates for terminal cabinets, grid boxes pull boxes, and junction boxes are to indicate the system and/or voltage characteristics.
e) Disconnects, starters and contactors: indicate equipment being controlled and voltage.
f) Transformers: indicate capacity, primary and secondary voltages.

2.2 WIRING IDENTIFICATION

.1 Identify wiring with permanent legible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour code: to CSA C22.1-1998.

.4 Use colour coded wires in communication cables and control wiring, matched throughout system.

2.3 CONDUIT AND CABLE IDENTIFICATION

.1 Colour code conduits, boxes, and metallic sheathed cables.
Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m (19/32 in.) intervals.

.2 Colours: 25 mm (1 in.) wide prime colour and 20 mm (25/32 in.) wide auxiliary colour.

Prime	Auxiliary
.1 up to 250 V	Yellow
.2 up to 600 V	Yellow Green
.3 Telephone	Green
.4 Other communication systems	Green Blue
.5 Fire alarm	Red
.6 Emergency voice	Blue
.7 Other security systems	red Yellow

2.4 WIRING TERMINATION

.1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.

2.5 MANUFACTURERS AND CSA LABELS

.1 Visible and legible after the equipment is installed.

2.6 WARNING SIGNS

.1 Provide warning signs, as specified, and/or to meet the requirements of the Inspection Authorities.

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Conform to Section 26 05 01 – GENERAL REQUIREMENTS FOR ELECTRICAL WORK.

1.2 SHOP DRAWINGS

.1 Submit Shop Drawings in accordance with Section 26 05 01 – GENERAL REQUIREMENTS FOR ELECTRICAL WORK.

.2 Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity, and enclosure dimension.

Part 2 Products

2.1 PANELBOARDS

.1 Panelboards: product of one manufacturer.

.2 Install circuit breakers in panelboards before shipment.

.3 In addition to CSA requirements manufacturer's nameplate must show fault current that the panel including all breakers have been built to withstand.

.4 240 panelboards: bus and breakers rated for interrupting capacity of:

.1 not less then 22kA on 240/120V.

.5 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.6 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

.7 Two keys for each panelboard and key panelboards alike.

.8 Copper bus neutral sized to 100% of the mains rating for 208 V panels unless specified otherwise on panel schedule.

.9 Mains: suitable for bolt-on breakers.

.10 Trim with concealed front bolts and hinges.

.11 Trim and door finish: baked grey enamel.

.12 Drip hoods for sprinkler proofing.

2.2 MOULDED CASE CIRCUIT BREAKERS

.1 Bolt-on moulded case circuit breaker: quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40 deg. C. (104 deg. F.) ambient.

.2 Common-trip breakers: with single handle for multi-pole applications.

.3 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

.4 Main breaker, where indicated: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.5 Lock-on devices for 10 % of 15 to 30 A breakers installed. Turn over unused lock-on devices to Owner.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 01 – GENERAL REQUIREMENTS FOR ELECTRICAL WORK

.2 Complete circuit directory with typewritten legend showing location and load of each circuit.

Part 3 Execution

3.1 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on plywood backboards. Where practical, group panelboards on common backboard. The plywood backboards are to be 19 mm (3/4 in.) thick with a fire-resistant coating on the front.

.3 Mount panelboards to height specified in Section 26 05 01 – GENERAL REQUIREMENTS FOR ELECTRICAL WORK or as indicated.

.4 Connect loads to circuits.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 Conform to Section 26 05 01 - General Requirements for Electrical Work

1.2 REFERENCE

.1 CSA C22.2 No. 4 – Enclosed Switches.

.2 CSA C22.2 No. 39 – Fuseholder Assemblies.

1.3 PRODUCT DATA

.1 Submit product data in accordance with Section 26 05 01 - General Requirements for Electrical Work

Part 2 Products

2.1 DISCONNECT SWITCHES

.1 Fusible or non-fusible, horsepower rated disconnect switch in CSA Enclosure 1, size as indicated.

.2 Provision for padlocking in on-off switch position by three locks.

.3 Mechanically interlocked door to prevent opening when handle in ON position

.4 Fuses: size as indicated, class J, current limiting,

.5 Fuseholders: suitable without adaptors, for type and size of fuse indicated.

.6 Quick-make, quick-break action.

.7 ON-OFF switch position indication on switch enclosure cover.

.8 Meet fault current requirements of the circuit.

2.2 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 01 - General Requirements for Electrical Work

.2 Indicate name of load controlled on nameplate.

Part 3 Execution

3.1 INSTALLATION

.1 Install disconnect switches complete with fuses where applicable.

END OF SECTION

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE HALLEX BOOK SPECIFICATIONS

THESE ELECTRICAL DRAWINGS AND ACCOMPANYING SPECIFICATIONS COMPLEMENT EACH OTHER. CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS. IN THE EVENT OF DISCREPANCIES OR CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS AND/OR APPLICABLE CODES(S), THE MORE STRINGENT SHALL APPLY.

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE HALLEX MECHANICAL DRAWINGS.

ELECTRICAL LEGEND	
	DUPLEX RECEPTACLE, 15A/120V
	DUPLEX RECEPTACLE, 20A/120V
	DUPLEX RECEPTACLE MOUNTED OVER COUNTER, COORDINATE WITH ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHT, 15A/120V
	SPECIAL RATED RECEPTACLE, AMP & VOLT RATING INDICATED OR DIRECT CONNECTION AS REQUIRED
	ELECTRICAL PANEL, RECESSED MTD., SEE SCHEDULE FOR DETAILS
	ELECTRICAL PANEL, SURFACE MTD., SEE SCHEDULE FOR DETAILS
	TOGGLE SWITCH
JB	JUNCTION BOX
TM	INTERMATIC 7-DAY TIMER, ET1705C OR EQUIVALENT
	WEATHERPROOF NON-FUSED DISCONNECT SWITCH

ABBREVIATION TABLE	
CM	CEILING MOUNTED
ER	EXISTING TO BE RELOCATED
EX	EXISTING TO REMAIN
FD	FUSED DISCONNECT SWITCH
PP	POWER PANEL
RL	RELOCATED ITEM
RM	EXISTING TO BE REMOVED
TX	TRANSFORMER
WP	WEATHER PROOF

NOTE:
1. REFER TO MECHANICAL DRAWINGS FOR ALL MECHANICAL/PLUMBING EQUIPMENT ABBREVIATIONS

STANDARD MOUNTING HEIGHTS	
LOCAL SWITCHES	1150 mm
WALL RECEPTACLES - GENERAL	350 mm
WALL RECEPTACLES - IN ELECTRICAL/MECHANICAL SERVICE ROOMS	700 mm
THERMOSTATS, BARRIER - FREE	1200 mm
OTHER DEVICES, SWITCHES, ETC., IN BARRIER - FREE PATH OF TRAVEL	1000 mm
PANELBOARDS	AS REQUIRED BY CODE OR AS INDICATED

BASEBOARD HEATER SCHEDULE

TAG	MANUFACTURER	MODEL	ELECTRICAL			DESCRIPTION
			KW	VOLT./PH.	AMPS	
BBH1	OUELLET	OFM2000	2.0	240/1	9.6	WALL MOUNTED C/W THERMOSTAT KIT-OFM-TB6-AV
BBH2	OUELLET	OFM0302	0.3	120/1	2.5	WALL MOUNTED C/W THERMOSTAT KIT-OFM-TB6-AV
BBH3	OUELLET	OFM0302	0.3	120/1	2.5	WALL MOUNTED C/W THERMOSTAT KIT-OFM-TB6-AV

ELECTRICAL LEGENDS

SCALE: N.T.S.

MECHANICAL / ELECTRICAL COORDINATION SCHEDULE

DEVICE DETAILS			ELECTRICAL CHARACTERISTICS							F/A SHUTDOWN (BY DIV. 16.)	CONTROL (THIS COLUMN REFERS TO INTERLOCKING ONLY. NOT THE EQUIPMENT ITSELF) REMOTE								NOTES
TAG	DESCRIPTION	LOCATION	HORSEPOWER	KW	FULL LOAD AMPS	MINIMUM CIRCUIT AMPS	VOLTAGE	PHASE	ISOLATING DEVICE	EQUIPMENT TO SHUTDOWN	THERMOSTAT	R/A THERMOSTAT	BMS	SWITCH	SENSOR	TIMER	INTERLOCKED WITH	CONTROL INTERLOCKED BY	CONTROL SUPPLIED BY	CONTROL INSTALLED BY	
BBH-1	BASEBOARD HEATER	ROOM 06		2.00			240	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
BBH-2	BASEBOARD HEATER	ROOM 06		0.3			120	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
BBH-3	BASEBOARD HEATER	ROOM 06		0.3			120	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
EF-1	EXHAUST FAN	ROOF	0.75				240	1	PANEL 'A'									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.
FH	FUME HOOD	ROOM 06				5.6	240	1	PANEL 'A'									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.
HP-1	HEAT PUMP	OUTSIDE EAST WALL				42	240	1	MAIN PANEL									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.

MECHANICAL / ELECTRICAL COORDINATION TABLE

SCALE: N.T.S.

DRAWING LIST

E1 ELECTRICAL NOTES, ELECTRICAL LEGENDS, AND LOCATION PLAN

E2 PARTIAL SINGLE LINE DIAGRAM, ELECTRICAL PANEL SCHEDULES, AND ELECTRICAL SITE PLAN

E3 DEMOLITION AND ELECTRICAL PLANS

LOCATION PLAN

SCALE: N.T.S.

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REV.	ISSUED FOR:	YYYY/MM/DD
0	CONSTRUCTION	2023/12/15

CLIENT:
AGRICULTURE AND
AGRI-FOOD CANADA
1391 SANDFORD STREET
LONDON, ONTARIO
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PROJECT:
JORDAN PESTICIDE
STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
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SHEET TITLE:
ELECTRICAL NOTES,
ELECTRICAL LEGENDS, AND
LOCATION PLAN

JOB NUMBER:	230818
DATE:	NOVEMBER, 2023
DRAWN BY:	KL
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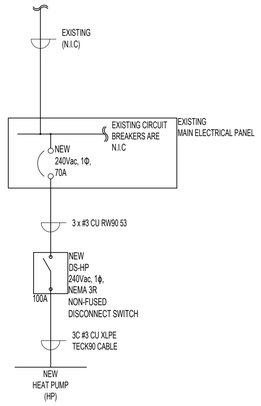
CHECKED BY:	MW / JD
SCALE:	AS SHOWN
DWG.	E1
REV.	0



PARTIAL SINGLE LINE DIAGRAM

SCALE: N.T.S.

EXISTING ELECTRICAL PANEL 'A'

32 CIRCUIT 100A, 1PH, SURFACE MOUNTED
C/W 100AMP MAIN BREAKER

CIRCUIT #		DESCRIPTION	AMPS A	AMPS B	VOLTS	PHASE	C.B.A.T.
1		EXISTING - PLUGS AND VENT HOOD	X		120	1	15
3		EXISTING - EXHAUST FANS		X	120	1	15
5		EXISTING - FURNANCE	X		120	1	15
7		EXISTING - PLUGS AND VENT HOOD		X	120	1	15
9		EXISTING - LOCKER EXHAUST FAN	X		120	1	15
11		EXISTING - BASEBOARD HEATERS - *OFF		X	120	1	15
13		EXISTING - BASEBOARD HEATERS - *OFF	X		120	1	15
15		EXISTING - HOT WATER TANK		X	240	1	30
17			X				
19		EXISTING - HOT WATER TANK		X	240	1	30
21			X				
23		EXISTING - LIGHTS		X	120	1	15
25		EXISTING - HIGH ALARM	X		120	1	15
27		EXISTING - SUMP PLUG		X	120	1	15
29		EXISTING -	X		120	1	15
31		EXISTING - CHEM. SHACK		X	120	1	15
	2	SPACE					
	4	EXISTING - DRYER		X	120	1	15
	6	EXISTING - N/E BARN LIGHTS & PLUGS	X		120	1	15
	8	**FUME HOOD (FM)**		**6**	**240**	**1**	**15***
	10		**6**				
	12	**EXHAUST FAN (EF-1)**		**4**	**240**	**1**	**15***
	14		**4**				
	16	**BASEBOARD HEATER (BBH-1) (2.0kW)**		**10**	**240**	**1**	**15***
	18		**10**				
	20	**BASEBOARD HEATER (BBH-2) (0.3kW)**		**3**	**120**	**1**	**15***
	22	**BASEBOARD HEATER (BBH-3) (0.3kW)**	**3**		**120**	**1**	**15***
	24	**FUME HOOD - LIGHT**		**5**	**120**	**1**	**15***
	26	**FUME HOOD - RECEPTACLE**	**5**		**120**	**1**	**15***
	28	EXISTING - DUCTLESS UNIT		X	240	1	15
	30		X				
	32						

THE ELECTRICAL CONTRACTOR IS TO CONFIRM FINAL CIRCUIT LOAD AND ENSURE CIRCUIT PROTECTION, WIRING AND CONDUIT IS SIZED TO SATISFY THE ONTARIO ELECTRICAL SAFETY CODE

	TOTAL PHASE A	28	
	TOTAL PHASE B		28

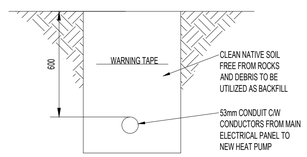
* = SUPPLY AND INSTALL NEW CIRCUIT BREAKER

ELECTRICAL PANEL SCHEDULE

SCALE: N.T.S.

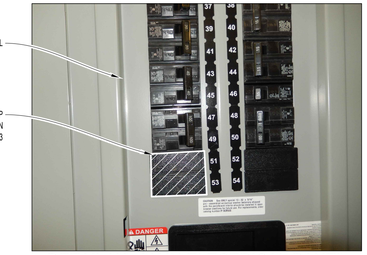
ELECTRICAL SITE PLAN

SCALE: N.T.S.



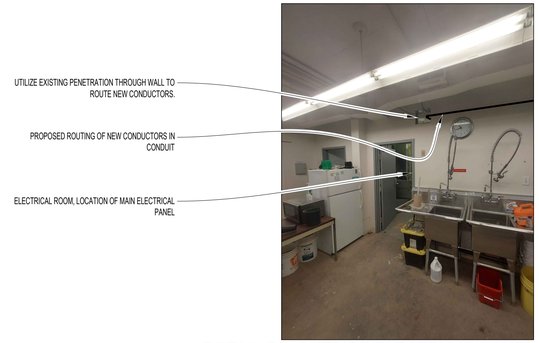
ELECTRICAL TRENCH DETAIL 'A-A'

SCALE: N.T.S.



DETAIL 'A' - MAIN ELECTRICAL PANEL

SCALE: N.T.S.

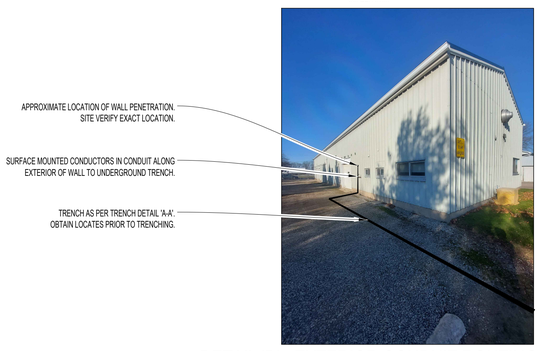


DETAIL 'B' - OUTSIDE ELECTRICAL PANEL

SCALE: N.T.S.

DETAIL 'C' - INTERIOR CONDUIT ROUTING

SCALE: N.T.S.



DETAIL 'D' - EXTERIOR CONDUIT ROUTING

SCALE: N.T.S.

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N5V 4T3

PROJECT:
JORDAN PESTICIDE
STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
PARTIAL SINGLE LINE
DIAGRAM, ELECTRICAL PANEL
SCHEDULES, AND
ELECTRICAL SITE PLAN

JOB NUMBER:	230818
DATE:	NOVEMBER, 2023
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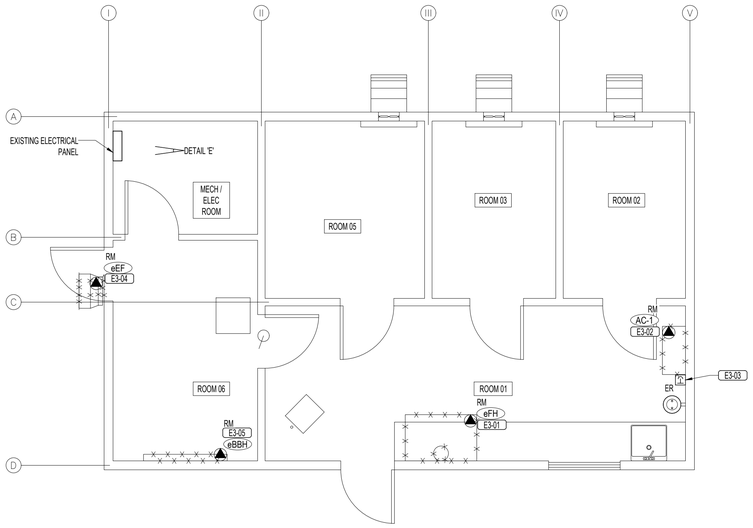
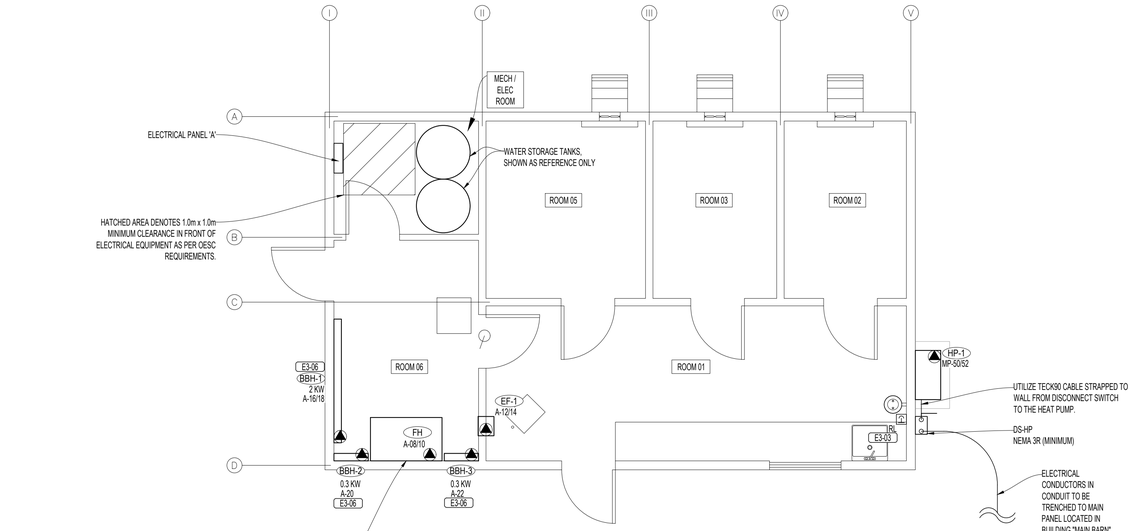
DWG.	E2
REV.	0



DEMOLITION PLAN

SCALE: 1/4" = 1' - 0"



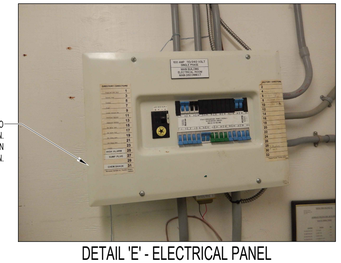
ELECTRICAL PLAN

SCALE: 1/4" = 1' - 0"

E3 DRAWING NOTES	
E3-01	EXISTING FUME HOOD TO BE REMOVED BY OWNER. REMOVE CONDUCTORS AND CONDUIT AND TERMINATE APPROPRIATELY TO THE NEAREST JUNCTION BOX OR ISOLATION DEVICE. CONFIRM CIRCUIT ON SITE.
E3-02	EXISTING AC UNIT TO BE REMOVED BY THE MECHANICAL TRADE. REMOVE CONDUCTORS AND CONDUIT AND TERMINATE APPROPRIATELY TO THE NEAREST JUNCTION BOX OR ISOLATION DEVICE. CONFIRM CIRCUIT ON SITE.
E3-03	EMERGENCY BUTTON / INDICATOR LIGHT IS TO BE RELOCATED. EXTEND ALL CONDUCTORS IN CONDUIT. SUPPLY AND INSTALL JUNCTION BOXES AS REQUIRED TO FACILITATE THE RELOCATION. COORDINATE WITH THE MECHANICAL CONTRACTOR ON SITE TO ENSURE NO CONFLICTS WITH THE NEW HEAT PUMP INSTALLATION.
E3-04	EXISTING EXHAUST FAN IS TO BE REMOVED BY THE MECHANICAL TRADE. REMOVE CONDUCTORS AND CONDUIT AND TERMINATE APPROPRIATELY TO THE NEAREST JUNCTION BOX OR ISOLATION DEVICE. CONFIRM CIRCUIT ON SITE.
E3-05	EXISTING BASEBOARD HEATER TO BE REMOVED BY THIS CONTRACTOR. REMOVE CONDUCTORS AND CONDUIT AND TERMINATE APPROPRIATELY TO THE NEAREST JUNCTION BOX OR ISOLATION DEVICE. CONFIRM CIRCUIT ON SITE.
E3-06	NEW BASEBOARD HEATERS SUPPLIED AND INSTALLED BY THIS CONTRACTOR. PROPOSED LOCATIONS AS PER THE MECHANICAL DRAWINGS. COORDINATE ON SITE FOR INSTALLATION.

ABBREVIATION TABLE	
ER	EXISTING TO BE RELOCATED
EX	EXISTING TO REMAIN
RL	RELOCATED ITEM
RM	EXISTING TO BE REMOVED

GENERAL E3 NOTES	
1	ENSURE 1.0m CLEARANCE IS MAINTAINED IN FRONT OF ALL NEW ELECTRICAL EQUIPMENT.
2	ALL SURFACE MOUNTED DEVICES AND CONDUIT SHALL BE KEPT TO A MINIMUM. WHERE CONDUIT / DEVICES ARE REQUIRED TO BE SURFACE MOUNTED, INSTALLATION(S) SHALL BE NEAT AND SQUARE TO ALL ADJACENT SURFACES. SURFACE MOUNTED CONDUCTORS ARE TO BE MADE IN CONDUIT. EXPOSED AND VISIBLE MC CABLE IS NOT ACCEPTABLE. SURFACE MOUNTED DEVICE BOXES (SINGLE GANG, DOUBLE GANG, ETC) ARE TO BE DIE-CAST ALUMINUM OR EQUIVALENT, OR MANUFACTURER PROVIDED SURFACE MOUNT BACK BOX; NO KNOCKOUTS ARE TO BE VISIBLE.
3	COORDINATE WITH THE GENERAL CONTRACTOR FOR ALL ROOF PENETRATIONS. ALL PENETRATIONS ARE TO BE WATER TIGHT AND WEATHERPROOF.
4	UTILIZE TECK90 CABLE FOR ALL CONNECTIONS TO EXTERIOR MECHANICAL EQUIPMENT (EXHAUST FAN, HEAT PUMP, ETC).



EXISTING ELECTRICAL PANEL IS TO REMAIN TO FACILIATE NEW ELECTRICAL INSTALLATION. REFERENCE THE ELECTRICAL PANEL SCHEDULE ON DRAWING E2 FOR ADDITIONAL INFORMATION.

DETAIL 'E' - ELECTRICAL PANEL

SCALE: N.T.S.

LICENSED PROFESSIONAL ENGINEER
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12/15/2023
230818
PROVINCE OF ONTARIO

Do not scale drawings. Report any discrepancies to Hallex Engineering Ltd. before proceeding.

This drawing must be signed and sealed by the Engineer prior to use in construction or submission for building permit.

All construction shall be in accordance with latest edition of the Ontario Building Code and all applicable Ontario regulations.

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N5V 4T3

PROJECT:
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STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
DEMOLITION AND
ELECTRICAL PLANS

JOB NUMBER:	230818
DATE:	NOVEMBER, 2023
DRAWN BY:	KL
DESIGNED BY:	KL
CHECKED BY:	MW / JD
SCALE:	AS SHOWN
DWG.	E3
REV.	0

VERTICAL PACKAGED HEAT PUMP UNIT WITH OUTSIDE AIR

TAG	DESCRIPTION	CAPACITY (TONS)	AIRFLOW (L/s)	OUTSIDE AIR (L/s)	EXTERNAL STATIC PRESSURE (Pa)	REFRIGERANT	COOLING				HEATING			ELECTRICAL			REMARKS
							EDB (°C)	TOTAL (KW)	SENSIBLE (KW)	EER	EDB (°C)	TOTAL (KW)	COP	VOLTAGE	MCA (A)	MOCP	
HP-1	HEAT PUMP	2	378	189	62.21	R-410A	40	5.36	4.86	11.30	-17.8	2.72	1.67	208-230/1/60	63	70	WALL MOUNT HEAT PUMP C/W RIGHT HAND ACCESS, COMM ROOM VENTILATOR, MODULATING 51 mm PLEATED MERV 8 FILTER, BUCKEYE GREY CABINET, COATED EVAPORATOR AND CONDENSER COILS, ECM BLOWER MOTOR ENCLOSED BALL BEARING CONDENSER MOTOR, PHASE ROTATION MONITOR, LOW AMBIENT CONTROL, AUTO RESET HEIGHT/LOW PRESSURE CONTROL, LIQUID LINE FILTER DRIER, ALARM RELAY, T6 PRO T-STAT HONEYWELL PROGRAMMABLE THERMOSTAT, SUPPLEMENTAL HEATING, MECHANICAL DEHUMIDIFICATION, 'RG-2W' 508 mm x 305 mm WITH 50 mm FLANGE RETURN GRILLE, 'SG-2W' 508 mm x 203 mm WITH 50 mm FLANGE SUPPLY GRILLE.

FUME HOOD

TAG	DESCRIPTION	AIRFLOW (L/s)	WEIGHT (KG)	ELECTRICAL		REMARKS
				VOLTAGE	AMPS	
FH	FUME HOOD	340	138.3	208-230/1/60	5.6	1219 mm WIDTH ENCLOSURE FUME HOOD C/W HOOD WITH ACID STORAGE CABINET WITH DUAL DOORS, CANOPY CONNECTIONS, SEISMIC VIBRATION ISOLATOR; FUME HOOD TO COME WITH A DEDICATED ELECTRICAL RECEPTACLE BUILT INTO UNIT, 150 mm STAINLESS STEEL 314 EXHAUST.

FUME HOOD EXHAUST SYSTEM

TAG	DESCRIPTION	AIRFLOW (L/s)	ESP (Pa)	FAN RPM	DRIVE	POWER (KW)	WEIGHT (KG)	ELECTRICAL		REMARKS
								VOLTAGE	AMPS	
EF-1	EXHAUST FAN	340	151	4050	BELT	0.56	152	208/1/60	3.5	150 mm STAINLESS STEEL 314 EXHAUST DUCT, MOTOR C/W CAPACITOR START, CSA APPROVAL, CLASS B OR GREATER INSULATION, STANDARD DRIVES, COATED WITH LABCOAT, RAL7023 ENTIRE UNIT, SWITCH NEMA-3R TOGGLE FOR OUTDOOR USE, MOUNTED AND WIRED, TURNED AND POLISHED STEEL WITH PROTECTIVE COATING SHAFT MATERIAL, ISOLATION DAMPER, EXTRUDED COATED 305 mm x 305 mm ALUMINUM PARALLEL BLADES MOUNTED IN ROOF CURB, ONE PER FLOW STATION, FACTORY VIBRATION TEST, EXTENDED NYLON LUBE LINES, MOTOR COVER, 1 YR WARRANTY.

AIR DISTRIBUTION SCHEDULE

TAG	DESCRIPTION
A	STEEL TRANSFER GRILLE, STEEL SUITABLE DRY WALL MOUNTING
B	SUPPLY REGISTER C/W STEEL DAMPER, SUITABLE FOR DUCT MOUNTING, OPPOSED BLADE DAMPER
FD	OUT OF WALL FIRE DAMPER, GALVANIZED STEEL FRAME TYPE, GALVANIZED STEEL BLADE MATERIAL, FUSIBLE LINK
RD	LOW PROFILE CEILING RADIATION DAMPER, GALVANIZED STEEL, STANDARD FRAME TYPE, GALVANIZED STEEL BLADE MATERIAL, FUSIBLE LINK
BD-1	VERTICAL MOUNT BACKDRAFT DAMPER, GALVANIZED STEEL
BD-2	HORIZONTAL MOUNT BACKDRAFT DAMPER, GALVANIZED STEEL

MECHANICAL / ELECTRICAL COORDINATION SCHEDULE

DEVICE DETAILS			ELECTRICAL CHARACTERISTICS							F/A SHUTDOWN (BY DIV. 16.)	REMOTE CONTROL (THIS COLUMN REFERS TO INTERLOCKING ONLY. NOT THE EQUIPMENT ITSELF)									NOTES
TAG	DESCRIPTION	LOCATION	HORSEPOWER	KW	FULL LOAD AMPS	MINIMUM CIRCUIT AMPS	VOLTAGE	PHASE	ISOLATING DEVICE	EQUIPMENT TO SHUTDOWN	THERMOSTAT	R/A THERMOSTAT	BMS	SWITCH	SENSOR	TIMER	INTERLOCKED WITH	CONTROL INTERLOCKED BY	CONTROL SUPPLIED BY	CONTROL INSTALLED BY	LEGEND: E = ELECTRICAL CONTRACTOR M = MECHANICAL CONTRACTOR O = OTHER
BBH-1	BASEBOARD HEATER	ROOM 06		2.00			240	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
BBH-2	BASEBOARD HEATER	ROOM 06		0.3			120	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
BBH-3	BASEBOARD HEATER	ROOM 06		0.3			120	1	PANEL 'A'									E	E	E	CONTROLLED BY INTEGRAL THERMOSTAT, SUPPLIED & INSTALLED BY DIV.26.
EF-1	EXHAUST FAN	ROOF	0.75				240	1	PANEL 'A'									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.
FH	FUME HOOD	ROOM 06				5.6	240	1	PANEL 'A'									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.
HP-1	HEAT PUMP	OUTSIDE EAST WALL				42	240	1	MAIN PANEL									M	M	M	LOW VOLTAGE CONNECTIONS BY DIV. 23. HIGH VOLTAGE CONNECTIONS BY DIV. 26.

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ENTIRE HALLEX BOOK SPECIFICATIONS

SYMBOL LEGEND

UH	UNIT HEATER
FH	FUME HOOD
BD	BACK DRAFT DAMPER
RD	RADIATION DAMPER
BBH	BASEBOARD HEATER
EW	EYEWASH STATION
LAV	LAVATORY
HP	HEAT PUMP
F EF	EXHAUST FAN
	SUPPLY AIR DUCT UP
	SUPPLY AIR DUCT DOWN
S	SQUARE SUPPLY AIR DIFFUSER
	RETURN/EXHAUST AIR DUCT UP
	RETURN/EXHAUST AIR DUCT DOWN
	RETURN/EXHAUST AIR GRILLE (EGGCRATE)
F/D FD	FIRE DAMPER
	ACOUSTIC INSULATION
T	THERMOSTAT
	BALANCE DAMPER
A 406x406 243	DIFFUSER / GRILLE SIZE (mm) DIFFUSER TYPE AIR QUANTITY (L/s)
exx	PREFIX "e" DENOTES EXISTING (LINE TYPES WILL APPEAR THINNER)
Uxx	PREFIX "U" DENOTES UNDERGROUND (LINE TYPES REMAIN THE SAME)
Cxx	PREFIX "C" DENOTES CEILING (LINE TYPES REMAIN THE SAME)

DRAWING LIST

M1.0	LEGEND, LOCATION PLAN, MECHANICAL SCHEDULES, AND M&E COORDINATION TABLE
M1.2	MECHANICAL DETAILS 1
M1.3	MECHANICAL DETAILS 2
M2.0	GROUND FLOOR HVAC DEMOLITION PLAN
M2.1	PROPOSED GROUND FLOOR AND ROOF HVAC PLAN

LOCATION PLAN

SCALE: NTS

LICENSED PROFESSIONAL ENGINEER
T. A. KESZTHELYI
12/15/2023
230818
PROVINCE OF ONTARIO

N

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1391 SANDFORD STREET
LONDON, ONTARIO
N5V 4T3

PROJECT:
JORDAN PESTICIDE
STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
LEGEND, LOCATION PLAN, MECHANICAL SCHEDULES, AND M&E COORDINATION TABLE

JOB NUMBER:	230818
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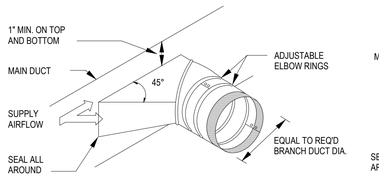
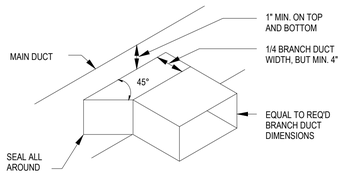
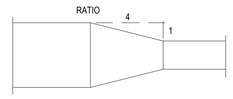
DESIGNED BY:	TAB
CHECKED BY:	TK
SCALE:	AS SHOWN
DWG.	M1.0
REV.	0



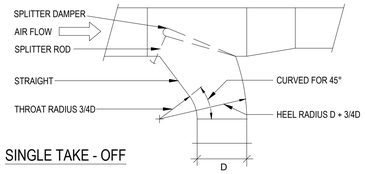
ROUND TAKE - OFF



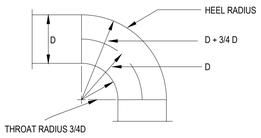
SQUARE TAKE - OFF



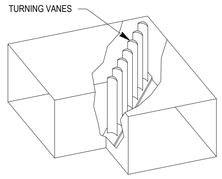
DUCT TRANSITION



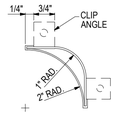
SINGLE TAKE - OFF



FULL-RADIUS ELBOW



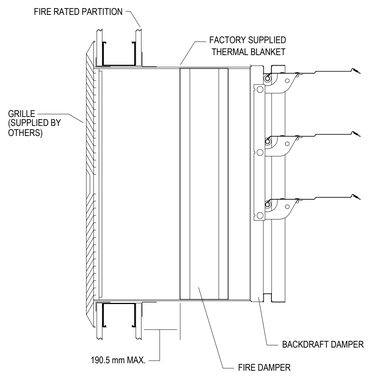
SQUARE ELBOW



TURNING VANE

1 TYPICAL DUCT FITTING DETAILS

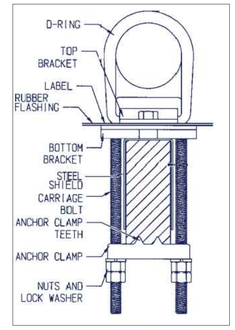
M1.2 SCALE: N.T.S.



2 FIRE DAMPER DETAIL

M1.2 SCALE: N.T.S.

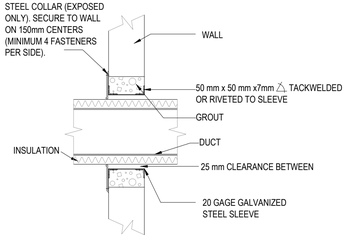
ROOF CABLE SUPPORT SYSTEM AND ROOF ANCHOR CALCULATIONS TO BE DONE BY LICENSED STRUCTURAL ENGINEER. CALCULATIONS TO BE PROVIDED FOR OUR APPROVAL.



3 REFERENCE ROOF ANCHOR DETAIL

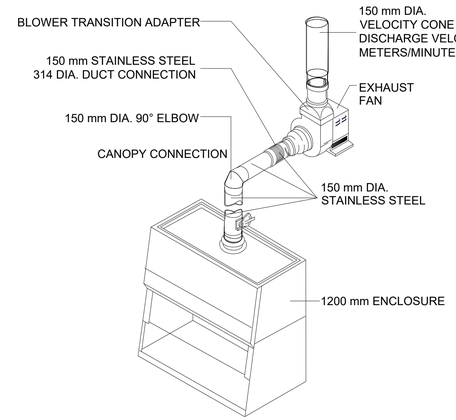
M1.2 SCALE: N.T.S.

EXTENT OF SEISMIC SUPPORT IS DEPENDENT ON SIZE OF SEISMIC ZONE



4 DUCT SLEEVE

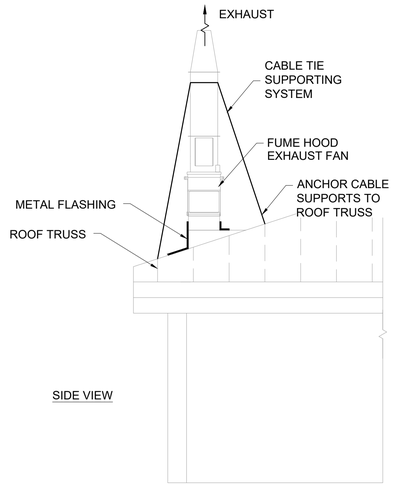
M1.2 SCALE: N.T.S.



5 TYPICAL FUME HOOD EXHAUST

M1.2 SCALE: N.T.S.

CONFORM TO ANSI/AIHA Z9.5, EXIT VELOCITY OF EXHAUST IS AT A MINIMUM 914 METERS/MINUTE AND STACK HEIGHT EXTENDS 3 METERS ABOVE ROOF LEVEL.



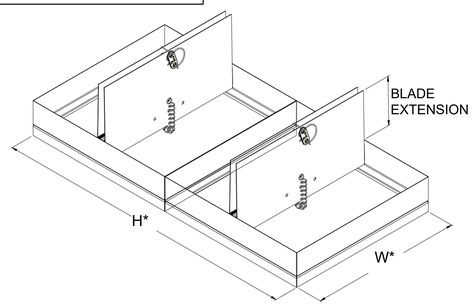
SIDE VIEW

6 TYPICAL EXHAUST FAN SUPPORT

M1.2 SCALE: N.T.S.

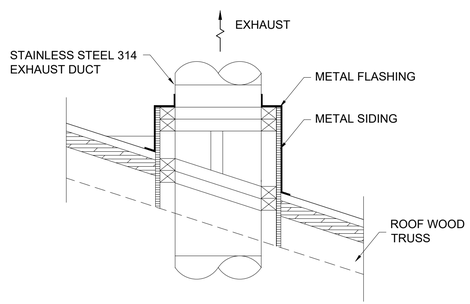
RADIATION DAMPER C/W BACK DRAFT DAMPER. TRANSFER GRILLES INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTION AND CERTIFIED THESE INSTALLATIONS BY THIS MANUFACTURER.

PROVIDE MINIMUM 400mm HEIGHT AIR PLENUM AND INSTALL BACK DRAFT DAMPER AT TOP OF AIR PLENUM BOX (600mm x 600mm). RADIATION DAMPER SHALL BE AT RATED CEILING. PROVIDE CEILING GRILLE UNDER THE RADIATION DAMPER.



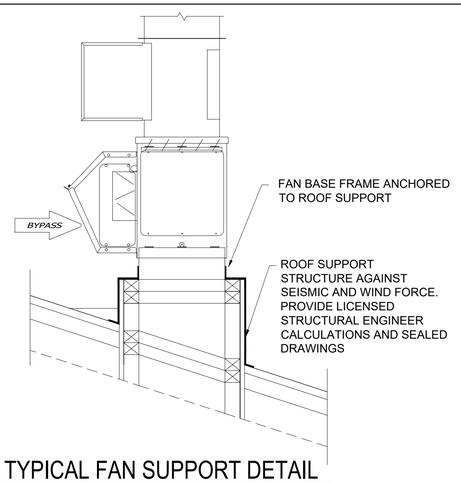
7 TYPICAL RADIATION DAMPER

M1.2 SCALE: N.T.S.



8 TYPICAL EXHAUST DUCT ROOF PENETRATION

M1.2 SCALE: N.T.S.



9 TYPICAL FAN SUPPORT DETAIL

M1.2 SCALE: N.T.S.

LICENSED PROFESSIONAL ENGINEER
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12/15/2023
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N5V 4T3

PROJECT:
JORDAN PESTICIDE STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
MECHANICAL DETAILS 1

JOB NUMBER:	230818
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SCALE:	AS SHOWN
DWG.	M1.2
REV.	0

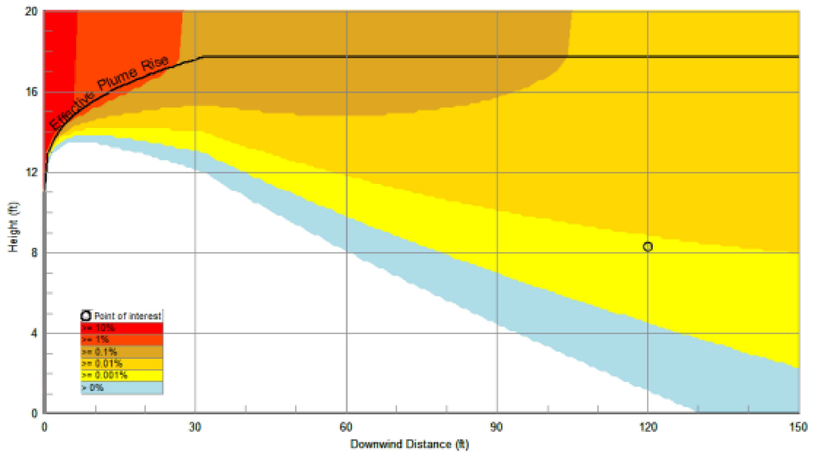
Plume Concentration Levels

Point of Interest - Concentration Level (%): 0.008

Measurement Method:	Percentage (%)	Point of Interest - Height (ft):	8
Concentration Level Entering Fan (%):	10	Point of Interest - Downwind Distance (ft):	120

Plume Rise Calculation Inputs:

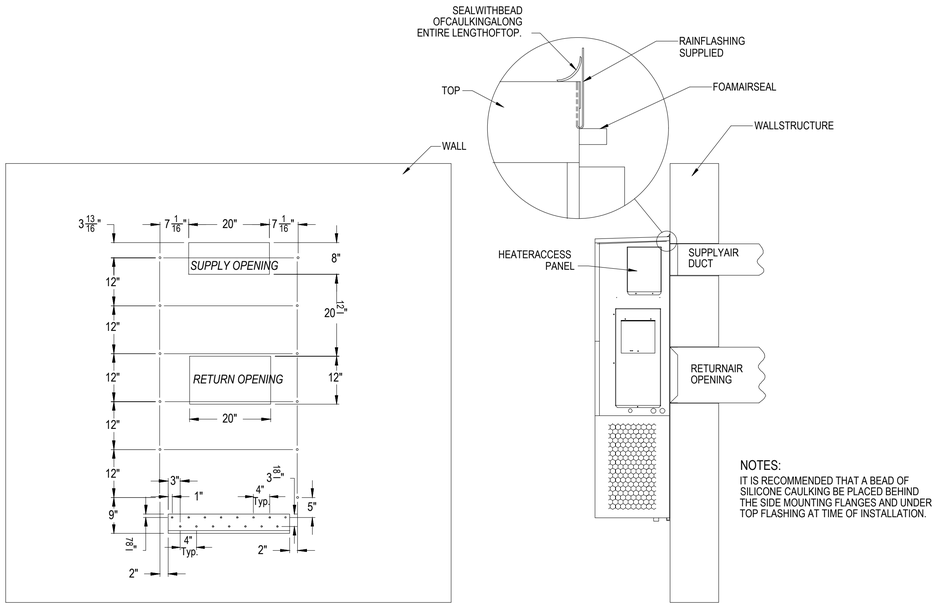
Wind Speed (MPH):	10.0	Stack Cap Factor:	1
Terrain Category:	Flat, Water/Desert	Building Height (ft):	32
Surface Roughness (ft):	0.03	Stack Exit Velocity (ft/min):	3,600



10 / M1.3 PLUME CONCENTRATION LEVELS

SCALE: N.T.S.

HEAT PUMP MOUNTING INSTRUCTIONS



WALL OPENING AND HOLE LOCATION VIEW

RIGHT SIDE VIEW

11 / M1.3 HEAT PUMP WALL MOUNTING DETAIL

SCALE: N.T.S.

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SHEET TITLE:
MECHANICAL DETAILS 2

JOB NUMBER:	230818
DATE:	NOVEMBER 14, 2023
DRAWN BY:	TAB
DESIGNED BY:	TAB
CHECKED BY:	TK
SCALE:	AS SHOWN

DWG. M1.3 REV. 0

GENERAL HVAC NOTES:

A. CONTRACTOR SHALL PROVIDE FIRE DAMPERS IN ALL NEW DUCTWORK AT ALL DUCT PENETRATIONS OF FIRE SEPARATIONS, INCLUDING LOCATIONS NOT SPECIFICALLY INDICATED ON THESE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE SEPARATION LOCATIONS AND RATINGS.

B. ALL LOW VOLTAGE WIRING AND CONDUIT SHALL BE BY DIV 23.

C. THIS DRAWING IS DIAGRAMMATIC AND APPROXIMATE AND IS SUBJECT TO REARRANGEMENT FOR PROPER INSTALLATION.THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT. CERTAIN RUNS OF DUCTWORK AND PIPING SHOWN DISTORTED TO AVOID CONFUSION. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION.

D. DUCT CONSTRUCTION SHALL COMPLY WITH SMACNA STANDARDS.

E. MECHANICAL CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR AND ALL EQUIPMENT SUPPLIERS PRIOR TO INSTALLATION OF MECHANICAL SERVICES TO EQUIPMENT SUPPLIED BY OTHERS.

F. ALL NEW DUCTWORK TO RUN BELOW EXISTING OWSJ AND STEEL BEAMS.

G. ALL EXHAUST TERMINATIONS TO BE A MINIMUM OF 3 METERS AWAY (ANY DIRECTION) FROM ANY MECHANICAL AIR INTAKE. ALL FLUE VENT TERMINATIONS FROM ANY GAS FIRED EQUIPMENT TO BE A MINIMUM OF 1.8 METERS AWAY (ANY DIRECTION) FROM ANY MECHANICAL AIR INTAKE.

H. CONTRACTOR SHALL ENSURE MECHANICAL SERVICES, INCLUDING MECHANICAL UNITS, DUCTWORK, PIPING, CONDUIT, ETC. MEET LOCAL SEISMIC REQUIREMENTS. CONTRACTOR SHALL SUBMIT SHOP DRAWING AND/OR LETTER BY A PROFESSIONAL ENGINEER IN ONTARIO FOR APPROVAL.

GENERAL DEMOLITION NOTES:

A. THIS DRAWINGS IS INTEDED TO ASSIST THE CONTRACTOR WITH COSTING THE DEMOLITION NECESSARY FOR THE CONTRACT. IT IS NOT TO BE TAKEN AS AN ALL INCLUSIVE INVENTORY OF THE WORK. THE CONTRACTOR MUST ESTABLISH THE FULL EXTENT OF THIS WORK FROM ON SITE EXAMINATION. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER. NO EXTRAS WILL BE ALLOWED FOR FAILURE TO PROPERLY ASSESS THE SCOPE OF WORK.

B. DEMOLITION SHALL BE COORDINATED WITH SITE ENGINEER AND CARRIED OUT SO THAT THE WORK WILL NOT INTERFERE WITH THE OWNER'S BUSINESS OPERATIONS.

C. LIMIT ACCESS BY CONSTRUCTION PERSONNEL TO ONLY THOSE AREAS REQUIRED FOR NEW WORK OR TO ACCESS NEW WORK. MAKE GOOD ALL EXISTING SURFACES DISTURBED BY NEW WORK.

D. LIMIT REMOVAL OF ITEMS TO SMALLEST AREA POSSIBLE AND MAKE GOOD ALL EXISTING SURFACES DISTURBED BY NEW WORK.

E. TAKE ALL PRECAUTIONS NECESSARY TO PROTECT THE EXISTING STRUCTURE, ETC. NOT PART OF THE DEMOLITION WORK. PROVIDE AND PLACE BRACING OR SHORING AS REQUIRED. BE RESPONSIBLE FOR SAFETY AND SUPPORT ALL PARTS OF THE BUILDING STRUCTURE, UTILITIES OR PARTS OF SUCH BUILDING OR STRUCTURE AND BE LIABLE FOR ANY MOVEMENT, SETTLEMENT, DAMAGE OR INJURY.

F. CONTROL DUST WITH DUSTPROOF PARTITION AROUND WORKING AREAS.

G. ALL WASTE MATERIALS SHALL BE REMOVED FROM SITE AND DISPOSED OF, UNLESS OTHERWISE SPECIFIED BY THE OWNER.

H. PATCH AND MAKE GOOD ALL SURFACES WHERE DEMOLITION, REMOVAL OR ALTERATIONS OCCUR. SURFACES TO BE FINISHED FLUSH WITH ADJACENT PLANES. TEXTURE AND PAINT TO MATCH EXISTING ADJACENT SURFACES.

I. ALL DEMOLITION WORK TO BE CARRIED OUT WITH RESPECT TO CANADIAN SAFETY RULES.

J. ALL REMOVED EQUIPMENT TO BE REMOVED FROM SITE AND DISPOSED OF UNLESS OTHERWISE SPECIFIED BY THE OWNER. SCRAP METAL TO BE REMOVED FROM SITE AND DISPOSED OF.

K. ANY AND ALL EXISTING EQUIPMENT WHICH IS TO REMAIN SHALL BE MAINTAINED IN GOOD WORKING ORDER DURING THE ENTIRE CONSTRUCTION PHASE. ANY REWORKING OF EXISTING PIPING, DUCTWORK, WIRING, ETC. REQUIRED TO MAINTAIN EXISTING SYSTEMS OPERATION AND FUNCTIONALITY SHALL BE INCLUDED THIS CONTRACT REGARDLESS OF WHETHER SUCH ITEMS ARE EXPLICITLY SHOWN IN THIS DRAWING PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY FINAL REQUIREMENTS FOR REWORKING ON SITE AND INCLUDE SUCH ITEMS IN THE TENDER PRICE.

SPECIFIC NOTES:

1. EXISTING EF-1 EXHAUST DUCTWORK TO BE REMAIN.
2. HIGH LEVEL GRILLE TO BE REMOVED. PATCH AND MATCH EXISTING FIRE RATING.
3. HIGH LEVEL GRILLE AND ASSOCIATED FAN TO BE REMOVED. PATCH AND MATCH EXISTING FIRE RATING.
4. EXISTING TRANSFER AIR DUCT SHALL BE REMOVED. PATCH AND PROVIDE NEW FIRE RATED CEILING TO MATCH EXISTING. SEE DWG M2.1 TO SEE REPLACEMENT SIZE OF SUPPLY GRILLE C/W RADIATION DAMPER AND BACK DRAFT DAMPER ASSEMBLY.
5. EXISTING ATTIC ACCESS DOOR. DO NOT BLOCK.
6. ALL EQUIPMENT REMOVED IS LEFT ONSITE FOR THE CLIENT.
7. EXISTING TRANSFER AIR DUCT SHALL BE REMOVED. LEAVE EQUIPMENT ONSITE FOR CLIENT. PATCH AND PROVIDE NEW FIRE RATED CEILING TO MATCH EXISTING.
8. EXISTING FUME HOOD TO REMAIN. SEE DWG. M2.1 FOR LOCATION OF NEW FUME HOOD.

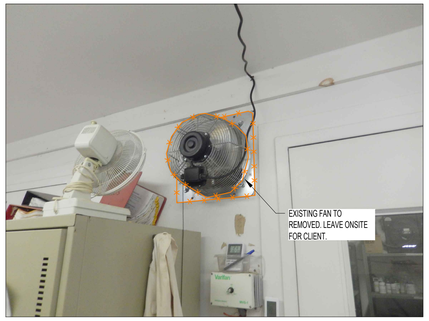
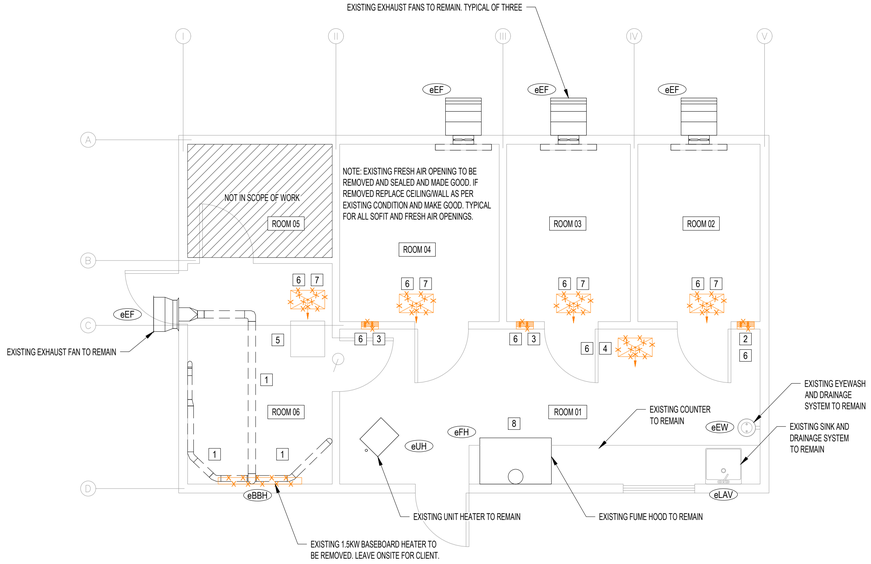


IMAGE #1: EXISTING FAN

SCALE: NTS

IMAGE #2: EXISTING FAN COIL INDOOR UNIT

SCALE: NTS



GROUND FLOOR HVAC DEMOLITION PLAN

SCALE: 1/4" = 1'-0"

LICENSED PROFESSIONAL ENGINEER
T. A. KESZTHELYI
12/15/2023
230818
PROVINCE OF ONTARIO

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LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
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DEMOLITION PLAN

JOB NUMBER:	230818
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DESIGNED BY:	TAB
CHECKED BY:	TK
SCALE:	AS SHOWN
DWG.	M2.0
REV.	0

GENERAL HVAC NOTES:

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B. ALL LOW VOLTAGE WIRING AND CONDUIT SHALL BE BY DIV 23.

C. THIS DRAWING IS DIAGRAMMATIC AND APPROXIMATE AND IS SUBJECT TO REARRANGEMENT FOR PROPER INSTALLATION.THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT. CERTAIN RUNS OF DUCTWORK AND PIPING SHOWN DISTORTED TO AVOID CONFUSION. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION.

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SPECIFIC NOTES:

1. FIRE DAMPER TO BE ATTACHED TO TRANSFER GRILLE AND BACK DRAFT DAMPER AT LOW LEVEL. DO NOT INTERFERE WITH EXISTING RACKS, COORDINATE ON SITE.
2. 406 mm x 406 mm TRANSFER DUCT AT LOW LEVEL, TYPICAL THREE.
3. PROVIDE FIRE RATED DUCT WRAP 3M' FOR EXHAUST DUCTING IN ROOF. LEVEL OF FIRE RATING TO MEET AND MATCH EXISTING FIRE RATING.
4. NEW 406 mm x406 mm TRANSFER GRILLE C/W FIRE DAMPER AT LOW LEVEL, TYPICAL THREE. SEE SCHEDULE FOR DETAILS.
5. EXISTING UNIT HEATER TO REMAIN.
6. THERMOSTAT TO CONTROL HEAT PUMP OPERATION FOR COOLING AND HEATING.
7. SUPPLY GRILLE C/W RADIATION DAMPER AND GRAVITY BACK DRAFT DAMPER.
8. CONNECT NEW EXHAUST 152 mm Ø STAINLESS STEEL 314 DUCTWORK FROM FUME HOOD TO NEW ROOF EXHAUST FAN. REFER TO DETAIL ON DWG. M1.2.
9. DO NOT INTERFERE ENLARGED SUPPLY GRILLE OPENING WITH EXISTING ATTIC ACCESS DOOR. CONTRACTOR TO COORDINATE ON SITE AND REPORT DISCREPANCIES TO ENGINEER.

SEQUENCE OF OPERATIONS FOR VENTILATION OF PESTICIDE STORAGE AREA:

#1- NEW VERTICAL PACKAGED HEAT PUMP UNIT WILL OPERATE COOLING AND HEATING TO MAINTAIN THE SPACE TEMPERATURE AT 21 DEGREES CELSIUS DURING THE WINTER AND 23-27 DEGREES CELSIUS IN THE SUMMER. IN SUMMER MODE THE UNIT SHALL PROVIDE DEHUMIDIFICATION OPERATION IF OUTSIDE AIR IS MORE THAN 60% RELATIVE HUMIDITY.

#2- ALL STORAGE ROOMS 02, 03, & 04 SHALL BE OPERATING WITH EXISTING EXHAUST AT MINIMUM 57 L/s (10 AIR CHANGES PER HOUR) AND MAKE UP AIR SHALL BE RECEIVED FROM VERTICAL PACKAGED HEAT PUMP UNIT.

#3- IF THE STORAGE ROOM EXHAUST CAPACITY IS INCREASED, OUTSIDE AIR SHALL RECEIVE FROM CEILING TRANSFER AIT TERMINAL AND MIXED WITH TREATED AIR FROM VERTICAL PACKAGED HEAT PUMP UNIT.

#4- IF THE SPACE TEMPERATURE CANNOT BE MAINTAINED BY HEAT PUMP UNIT, SUPPLEMENTARY ELECTRICAL HEAT WILL BE ACTIVATED.

SEQUENCE OF OPERATIONS FOR VENTILATION OF NEW FUME HOOD:

#1- FUME HOOD OPERATION SHALL BE AS PER MD 15128- 2013 GUIDELINES.

#2- FUME HOOD EXHAUST FAN SHOULD NOT BE TURNED OFF UNLESS HOOD HAS SERVICES PROCEDURE.

#3- FUME HOOD HAS A GREEN LIGHT INDICATOR INDICATED POWER ON AND SAFE TO OPERATE CONDITIONS FOR ALL THE TIME.

#4- FUME HOOD SHALL BE USED ONLY IF ALL SAFETY CONTROLS ARE SATISFIED.

#5- FUME HOOD FACE VELOCITY SHALL BE 0.5 METER/SEC. +/-0.02 METER/SEC. DURING IN OPERATION.

#6- MAKE UP AIR SHALL BE INTRODUCED FROM CEILING LEVEL TRANSFER AIR TERMINAL AND MAKE SURE THAT TRANSFER AIR OPENING IS NOT BLOCKED BY RADIATION FIRE DAMPER INSIDE THE CEILING.

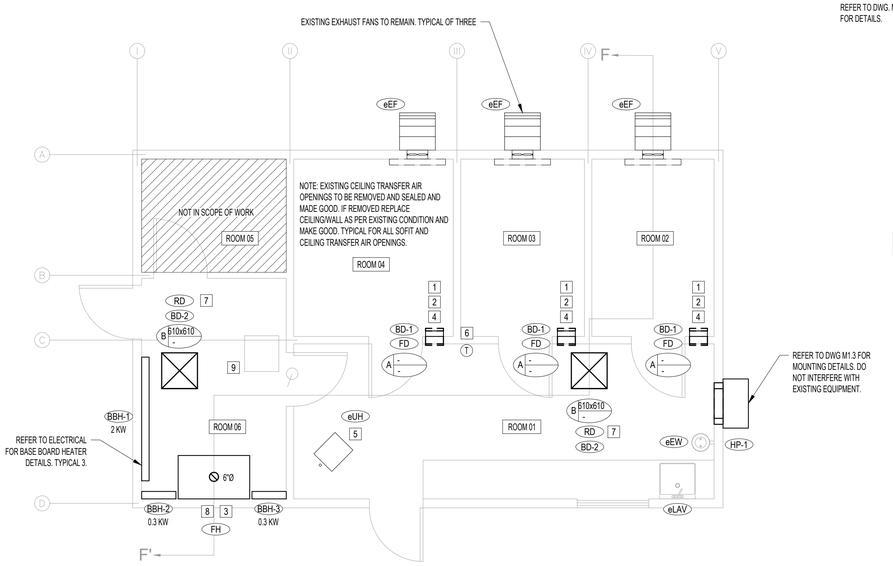
#7- IN CASE OF ANY PROBLEM ARISES, FUME HOOD EXHAUST SYSTEM SHALL BE SWITCHED OFF FROM MANUAL CONTROL SWITCH MOUNTED ON FUME HOOD EXTERIOR PANEL.

IMAGE #1: ROOF PENETRATIONS

SCALE: NTS

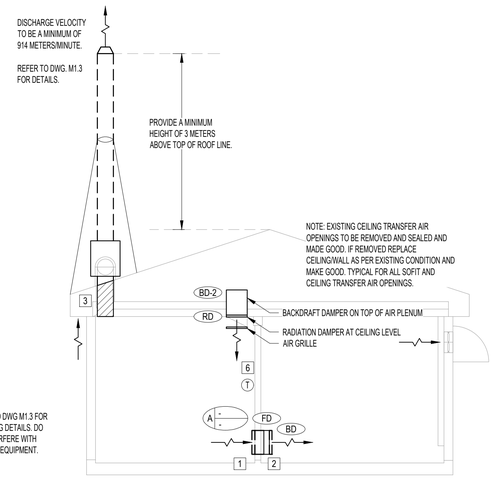
IMAGE #2: EXISTING ROOF TRUSS

SCALE: NTS



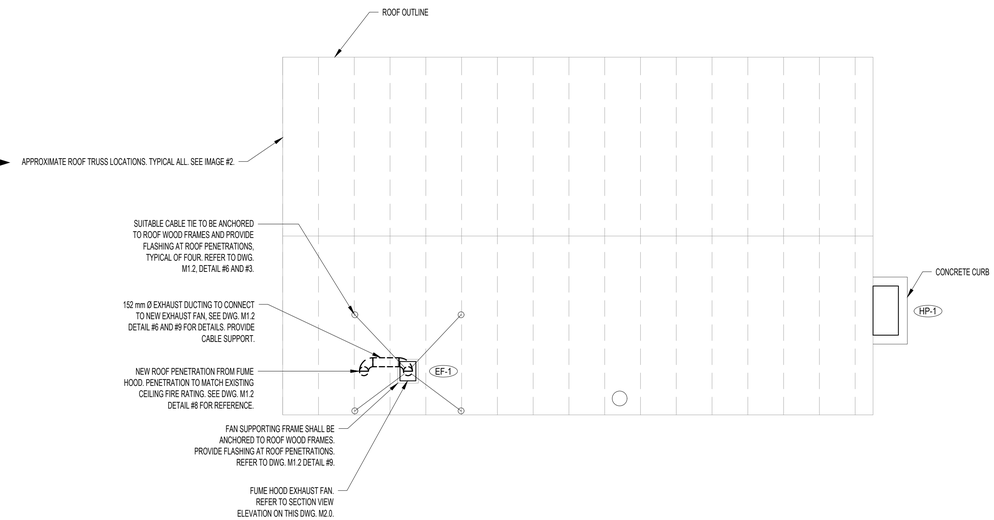
PROPOSED GROUND FLOOR HVAC PLAN

SCALE: 1/4" = 1'-0"



SECTION VIEW HVAC PLAN

SCALE: 1/4" = 1'-0"



PROPOSED ROOF HVAC PLAN

SCALE: 1/4" = 1'-0"

LICENSED PROFESSIONAL ENGINEER
T. A. KESZTHELYI
12/15/2023
230818
PROVINCE OF ONTARIO

HALLEX ENGINEERING LTD.
745 South Service Rd. Unit 205,
Stoney Creek, ON L8E 5Z2
Tel: 905-561-4016
4999 Victoria Ave.,
Niagara Falls, ON L2E 4C9
Tel: 905-357-4015 Fax: 905-353-1105

REV.	ISSUED FOR:	YYYY/MM/DD
0	CONSTRUCTION	2023/12/15

CLIENT:
AGRICULTURE AND
AGRI-FOOD CANADA
1391 SANDFORD STREET
LONDON, ONTARIO
N5V 4T3

PROJECT:
JORDAN PESTICIDE
STORAGE BUILDING HVAC
4405 JORDAN ROAD
LINCOLN, ONTARIO
L0R 1S0

SHEET TITLE:
PROPOSED GROUND FLOOR
AND ROOF HVAC PLAN

JOB NUMBER:	230818
DATE:	NOVEMBER 14, 2023
DRAWN BY:	TAB
DESIGNED BY:	TAB
CHECKED BY:	TK
SCALE:	AS SHOWN
DWG.	M2.1
REV.	0

APPENDIX 1 – INTEGRITY PROVISIONS

(Text copied from the Ineligibility and Suspension Policy http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html dated 2016-04-04)

List of names: All Bidders, regardless of their status under the Policy, must submit the following information when participating in a procurement process or real property transaction:

- Bidders that are corporate entities, including those bidding as joint ventures, must provide a complete list of the names of all current directors or, for a privately owned corporation, the names of the owners of the corporation;
- Bidders Bidding as sole proprietors, including sole proprietors bidding as joint ventures, must provide a complete list of the names of all owners; or
- Bidders that are a partnership do not need to provide a list of names.

If the list of names has not been received in a procurement process or real property transaction by the time the evaluation of Bids or Offers is completed, or has not been received in a procurement process or real property transaction where no Bid/Offer will be submitted, the Contracting Authority will inform the Bidder of a time within which to provide the information. Providing the required names is a mandatory requirement for award of a contract or real property agreement. Failure to provide the list of names within the time specified will render a Bid or Offer non-responsive, or the Bidder otherwise disqualified for award of a contract or real property agreement.

APPENDIX 2 - LISTING OF SUBCONTRACTORS AND SUPPLIERS

The Bidder must submit the list of Subcontractors and Suppliers for any division of the Work as listed in the table below. If “own forces” of the General Contractor are planned to be used to execute certain division(s) of work it must also be indicated in the table below.

	Subcontractor and Suppliers	Division
1		
2		
3		
4		

ANNEX A - SECURITY REQUIREMENT CHECK LIST (SRCL)

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
TBD
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

AAFC plans on enetering into two contracts, one with consultant another with a construction firm. To install a new HVAC system in B37 Jordan On.

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 ☐	**NATO / OTAN** ☐	**Foreign / Étranger** ☐
7. b) Release restrictions / Restrictions relatives à la diffusion		
No release restrictions / Aucune restriction relative à la diffusion ☐	All NATO countries / Tous les pays de l'OTAN ☐	No release restrictions / Aucune restriction relative à la diffusion ☐
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐
Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :
7. c) Level of information / Niveau d'information		
PROTECTED A / PROTÉGÉ A ☐	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☐	PROTECTED A / PROTÉGÉ A ☐
PROTECTED B / PROTÉGÉ B ☐	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☐	PROTECTED B / PROTÉGÉ B ☐
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☐	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☐	NATO SECRET / NATO SECRET ☐	CONFIDENTIAL / CONFIDENTIEL ☐
SECRET / SECRET ☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☐
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

Government of Canada / Gouvernement du Canada

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 / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
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 / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

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

☑ RELIABILITY STATUS COTE DE FIABILITÉ	☐ CONFIDENTIAL CONFIDENTIEL	☐ SECRET SECRET	☐ TOP SECRET TRÈS SECRET
☐ TOP SECRET– SIGINT TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL NATO CONFIDENTIEL	☐ NATO SECRET NATO SECRET	☐ COSMIC TOP SECRET COSMIC TRÈS SECRET
☐ SITE ACCESS ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : If reliability status cannot be achieved in a timely manor, they will be escorted

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 / Non ☑ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?

If Yes, will unscreened personnel be escorted? — ☐ No / Non ☑ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

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 / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

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

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

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 / Non ☐ Yes / Oui
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?

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

Government of Canada / Gouvernement du Canada

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

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 A	 B	 C	CONFIDENTIAL CONFIDENTIEL	SECRET	TOP SECRET TRES SECRET
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?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / Oui

Type text here

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier 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?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / 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, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

Government of Canada / Gouvernement du Canada

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
Joe Pratt	Facility Manager	Joe Pratt

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
519-719-8245		Joe.pratt@agr.gc.ca	July 13 2023

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)	Title - Titre	Signature
Lise Levesque-Masson	SRCL Coordinator	Lise Levesque-Masson Digitally signed by Lise Levesque-Masson Date: 2023.07.14 13:44:30 -04'00'

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
		Lise.Levesque-Masson@AGR.GC.CA	

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? ☐ No / Non ☐ Yes / Oui

16. Procurement Officer / Agent d'approvisionnement

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

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

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 Divulgation 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 assujetti 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 EMPLACEMENTS

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, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer 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.

ANNEX B - CERTIFICATE OF INSURANCE

(Not required at solicitation closing)

CERTIFICATE OF INSURANCE Page 1 of 2

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

Description and Location of Work	Contract No.
	Project No.

Name of Insurer, Broker or Agent	Address (No., Street)	City	Province	Postal Code
Name of Insured (Contractor)	**Address (No., Street)**	**City**	**Province**	**Postal Code**

Additional Insured

His Majesty the King in right of Canada as represented by the Minister of Public Works and Government Services

Type of Insurance	Insurer Name and Policy Number	Inception Date D / M / Y	Expiry Date D / M / Y	Limits of Liability		
				Per Occurrence	Annual General Aggregate	Completed Operations Aggregate
Commercial General Liability				**$**	**$**	**$**
Umbrella/Excess Liability				**$**	**$**	**$**

I certify that the above policies were issued by insurers in the course of their Insurance business in Canada, are currently in force and include the applicable insurance coverage's stated on page 2 of this Certificate of Insurance, including advance notice of cancellation / reduction in coverage.

Name of person authorized to sign on behalf of Insurer(s) (Officer, Agent, Broker)

Telephone number

Signature

Date D / M / Y

General

The insurance policies required on page 1 of the Certificate of Insurance must be in force and must include the insurance coverage listed under the corresponding type of insurance on this page.

The policies must insure the Contractor and must include His Majesty the King in right of Canada as represented by the Minister of Public Works and Government Services as an additional Insured.

The Policy shall be endorsed to provide the Owner with not less than 30 days' notice in writing in advance of any cancellation or change or amendment restricting coverage.

Without increasing the limit of liability, the policies must protect all insured parties to the full extent of coverage provided. Further, the policies must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.

Commercial General Liability

The insurance coverage provided must not be substantially less than that provided by the latest edition of IBC Form 2100.
The policy must either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:
(a) Blasting.
(b) Pile driving and caisson work.
(c) Underpinning.
(d) Removal or weakening of support of any structure or land whether such support be natural or otherwise if the work is performed by the insured contractor.
(e) Damage to existing structure
The policy must have the following minimum limits:
(a) **$5,000,000** Each Occurrence Limit;
(b) **$10,000,000** General Aggregate Limit per policy year if the policy contains a General Aggregate; and
(c) **$5,000,000** Products/Completed Operations Aggregate Limit.
Umbrella or excess liability insurance may be used to achieve the required limits.