

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:

**Public Works and Government Services Canada
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510**

Request For a Standing Offer Demande d'offre à commandes

Regional Individual Standing Offer (RISO)

Offre à commandes individuelle régionale (OCIR)

Canada, as represented by the Minister of Public Works and Government Services Canada, hereby requests a Standing Offer on behalf of the Identified Users herein.

Le Canada, représenté par le ministre des Travaux Publics et Services Gouvernementaux Canada, autorise par la présente, une offre à commandes au nom des utilisateurs identifiés énumérés ci-après.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
Telus Plaza North/Plaza Telus Nord
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet HVAC Maintenance	
Solicitation No. - N° de l'invitation W0134-13CYKJ/A	Date 2013-06-13
Client Reference No. - N° de référence du client DND	GETS Ref. No. - N° de réf. de SEAG PW-\$EDM-014-9836
File No. - N° de dossier EDM-3-36026 (014)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2013-07-02	Time Zone Fuseau horaire Mountain Daylight Saving Time MDT
Delivery Required - Livraison exigée See Herein	
Address Enquiries to: - Adresser toutes questions à: Lau (EDM), Chris	Buyer Id - Id de l'acheteur edm014
Telephone No. - N° de téléphone (780)497-3981 ()	FAX No. - N° de FAX (780)497-3510
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF NATIONAL DEFENCE WCE Contracts 4 Wing Cold Lake PO Box 6550 Stn Forces COLD LAKE Alberta T9M2C6 Canada	
Security - Sécurité This request for a Standing Offer includes provisions for security. Cette Demande d'offre à commandes comprend des dispositions en matière de sécurité.	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address	
Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone	
Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)	
Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

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General Conditions:

- (i) GC1 General Provisions

R2810D (2013-04-25);

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(ii) GC2 Administration of the Contract	R2820D (2012-07-16);
(iii) GC3 Execution and Control of the Work	R2830D (2010-01-11);
(iv) GC4 Protective Measures	R2840D (2008-05-12);
(v) GC5 Terms of Payment	R2550D (2010-01-11);
(vi) GC6 Delays and Changes in the Work	R2865D (2013-04-25);
(vii) GC7 Default, Suspension or Termination of Contract	R2870D (2008-05-12);
(viii) GC8 Dispute Resolution	R2884D (2008-05-12);
(ix) GC9 Insurance	R2590D (2011-05-16);

Supplementary Conditions, if any;

Fair Wages and Hours of Labour - Labour Conditions

Allowable Costs for Contract Changes Under GC6.4.1

R2940D (2012-07-16);

R2950D (2007-05-25);

ANNEXES

Annex A	Statement of Work
Annex B	Basis of Payment
Annex C	Health & Safety Requirements - Alberta
Annex D	Periodic Usage Report Form
Annex E	Offer
Annex F	Code of Conduct Certifications - List
Annex G	Security Requirements Checklist (SRCL)

PART 1 - GENERAL INFORMATION

1. Introduction

The Request for Standing Offers (RFSO) template is divided into seven parts plus attachments and annexes, as follows:

Part 1, General Information: provides a general description of the requirement;

Part 2, Offeror Instructions: provides the instructions applicable to the clauses and conditions of the RFSO;

Part 3, Offer Preparation Instructions: provides offerors with instructions on how to prepare their offer to address the evaluation criteria specified;

Part 4, Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria which must be addressed in the offer, if applicable, and the basis of selection;

Part 5, Certifications: includes the certifications to be provided;

Part 6, Security, Financial and Insurance Requirements: includes specific requirements that must be addressed by offerors; and

Part 7: 7A, Standing Offer, and 7B, Resulting Contract Clauses:

7A, includes the Standing Offer containing the offer from the Offeror and the applicable clauses and conditions;

7B, includes the clauses and conditions which will apply to any contract resulting from a call-up made pursuant to the Standing Offer.

The Annexes include the Statement of Work, the Basis of Payment, Health & Safety, Usage Reports, Offer, Code of Conduct Certifications - List, and SRCL.

2. Summary

HVAC, Refrigeration and Furnace Standing Offer, 4 Wing, CFB Cold Lake, AB

Work under this Standing Offer comprises the supply of all labour, materials, equipment, transportation and supervision necessary to carry out the preventative maintenance, repair, replacement and installation of furnaces, air conditioning units, ventilation systems and refrigeration in various base buildings for the Department of National Defense, 4 Wing, CFB Cold Lake on an "as and when requested" basis. It is anticipated that 2 firms will be issued the standing offer. The standing offer will be issued for a term of three (3) years. The total expenditures over the term is estimated at \$1,470,000.00 (HST/GST Included). This procurement contains MANDATORY requirements. See Part 4 and 5 of the RFSO for details.

Pursuant to section 01 of Standard Instructions 2006, Offerors must submit a complete list of names of all individuals who are currently directors of the Offeror. Furthermore, as determined by the Special Investigations Directorate, Departmental Oversight Branch, each individual named on the list may be requested to complete a Consent to a Criminal Record Verification form and related documentation.

There is a security requirement associated with this requirement. For additional information, see Part 6 - Security, Financial and Insurance Requirements, and Part 7A - Standing Offer. Offerors should consult the "Security Requirements for PWGSC Bid Solicitations - Instructions for Bidders" document "(<http://www.tpsgc-pwgsc.gc.ca/app-acq/lc-pl/lc-pl-eng.html#a31>) on the Departmental Standard Procurement Documents Web site."

The requirement is subject to the provisions of the Agreement on Internal Trade (AIT).

3. Health & Safety Requirements

There are Health & Safety requirements associated with this requirement. See Annex C

4. Debriefing

After issuance of a standing offer, offerors may request a debriefing on the results of the request for standing offers. Offerors should make the request to the Standing Offer Authority within 15 working days of receipt of notification that their offer was unsuccessful. The debriefing may be provided in writing, by telephone or in person. The debriefing will include an outline of the reasons the submission was not successful, making reference to the evaluation criteria. The confidentiality of information relating to other submissions will be protected.

5. Security Requirement

There is a security requirement associated with the requirement of the Standing Offer. For additional information, see Part 6 - Security, Financial and Insurance Requirements, and Part 7 - Standing Offer and Resulting Contract Clauses.

PART 2 - STANDING OFFER - INSTRUCTIONS TO OFFERORS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the Request for Standing Offers RFSO by title, number and date are set out in the Standard Acquisition Clauses and Conditions Manual issued by Public Works and Government Services Canada (PWGSC). The Manual is available on the PWGSC Web site:
<http://ccua-sacc.tpsgc-pwgsc.gc.ca/pub/acho-eng.jsp>

Offerors who submit an offer agree to be bound by the instructions, clauses and conditions of the RFSO and accept the terms and conditions of the Standing Offer and Resulting Contract(s).

The 2006 (2013-03-21) Standard Instructions - Request for Standing Offers - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the RFSO.

Subsection 5.4 of 2006, Standard Instructions - Request for Standing Offers - Goods or Services - Competitive Requirements, is amended as follows:

DELETE sixty (60) days and **INSERT** one hundred twenty (120) days

2. Submission of Offers

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

2.1 Revision of Offer:

An offer submitted in accordance with these instructions may be revised by letter or facsimile, provided that the revision is received at the office designated for the receipt of offers (Offering address) on or before the date and time set for the closing of the RFSO. The facsimile shall be on the offeror's letterhead or bear a signature that identifies the offeror.

A revision to the unit price schedule must clearly identify the change(s) in the unit price(s) and the specific item(s) to which each change applies.

A letter or facsimile submitted to confirm an earlier revision shall be clearly identified as a confirmation.

Failure to comply with any of the above provisions shall result in the rejection of the non-compliant revision(s) only. The offer shall be evaluated based on the original offer submitted and all other compliant revision(s).

Facsimile number for receipt of revisions: **(780) 497-3510**

2.2 Firm Price and/or Rates:

The Offeror is required to submit firm prices, rates or both that will apply for the entire period of the Standing Offer.

2.3 Form: Offers not submitted on the prescribed Offer Form will not be considered.

2.4 Alterations: Any alteration to the pre-printed or pre-typed sections of the Offer Form, or any condition or qualification placed upon the offer may be cause for disqualification of the offer. Alterations, corrections, changes or erasures made to statements or figures entered on the Offer Form by the offeror shall be initialed by the person or persons signing the offer. Initials shall be original(s). Alterations, corrections, changes or erasures that are not initialed shall be deemed void and without effect.

2.5 Incomplete Offers: Incomplete offers may be rejected.

2.6 Taxes

The offeror is responsible for all applicable taxes.

Offerors are not to include any amounts for the Goods and Services Tax (GST) or Harmonized Sales Tax (HST), whichever is applicable. Any amount levied in respect of the GST/HST shall be billed as a separate item on invoices submitted by the contractor, and shall be paid in addition to the amount approved by Canada for work

performed under any resulting Contract. The Contractor shall be required to remit the appropriate amount to the Canada Revenue Agency in accordance with the applicable legislation.

The Federal Government is exempt from the Quebec Sales Tax (QST). Offerors shall not include in their prices any amount that is intended to cover the QST on goods and services performed in the execution of the Work except for such amounts for which an Input Tax Refund is not available. The successful Offeror should make arrangements directly with the Province of Quebec to recover any QST paid by it in performing the Work under the resulting Contract.

2.7 Performance Evaluation

Offerors shall take note that the performance of the Contractor during and upon completion of the work shall be evaluated by Canada. The evaluation shall be based on the quality of workmanship; timeliness of completion of the work; project management, contract management and management of health and safety. Should the Contractor's performance be considered unsatisfactory, the Contractor's bidding privileges on future work may be suspended indefinitely.

An electronic version of the form PWGSC-TPSGC 2913, SELECT - Contractor Performance Evaluation Report Form, used to record the performance is available on the Public Works and Government Services Canada (PWGSC) Web site.

3. Enquiries - Request for Standing Offers

All enquiries MUST be submitted in writing to the Standing Offer Authority no later than five (5) calendar days before the Request for Standing Offers (RFSO) closing date. Enquiries received after that time may not be answered.

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

4. Applicable Laws

The Standing Offer and any contract resulting from the Standing Offer must be interpreted and governed, and the relations between the parties determined, by the laws in force in the province of work.

PART 3 - OFFER PREPARATION INSTRUCTIONS

1. General

- 1.1 Insert the hourly rate or unit price against each class of labour, plant, or item of specified material listed on the Unit Price Schedule of the Offer form. Insert the percentage mark-up for Unspecified Material, if any; mathematical extensions against all items including the Contractor's Mark-up on Unspecified Material if applicable, and Total Estimated Amount, GST/HST extra.
- 1.2 Submit the Offer, duly completed, to the office designated on page 1 of the RFSO in accordance with the Standard Instructions.
- 1.3 Sign and date the Offer in accordance with the RFSO.

2. Offer Preparation Instructions

Canada requests that offerors provide their offer in separately bound sections as follows:

Section I: Annex E - Financial Offer (1 hard copy)

Section II: Certifications (1 hard copy)

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

Canada requests that offerors follow the format instructions described below in the preparation of their offer.

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to that of the Request for Standing Offers.

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

To assist Canada in reaching its objectives, offerors are encouraged to:

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

Section I: Financial Offer

Offerors must submit their financial offer in accordance with the Annex "B", Basis of Payment. The total amount of Goods and Services Tax or Harmonized Sales Tax must be shown separately, if applicable.

Payment by Credit Card

Canada requests that offerors complete one of the following:

- (a) () Government of Canada Acquisition Cards (credit cards) will be accepted for payment of call-ups against the standing offer.

The following credit card(s) are accepted:

VISA _____

Master Card _____

- (b) () Government of Canada Acquisition Cards (credit cards) will not be accepted for payment of call-ups against the standing offer.

The Offeror is not obligated to accept payment by credit card.

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Acceptance of credit cards for payment of call-ups will not be considered as an evaluation criterion.

Section II: Certifications

Offerors must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Offers will be assessed in accordance with the entire requirement of the Request for Standing Offers including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the offers.
- (c) Offers shall be evaluated on the basis of the lowest price compliant offer, with the lowest offer being ranked first, the second lowest offer second, and so on.

1.1 Technical Evaluation

1.1.1 Mandatory Technical Criteria

a) **MANDATORY REQUIREMENTS** - Required as part of the Offer

- i) Pursuant to the General Instructions, submission of Request for Standing Offer (RFSO), offers must be submitted to the office designated for the receipt of offers, and must be received on or before the date and time set for solicitation closing shown on page 1 of the RFSO. A rate must be entered for each item listed in the unit price schedule of the offer.

b) **MANDATORY REQUIREMENTS** - Precedent to issuance of a Standing Offer

- i) Health & Safety Requirements
- ii) Code of Conduct Certifications (*see Part 5 - Certifications*)
- iii) Insurance
- iv) Security Requirements

1.2. Financial Evaluation

- 1.2.1 Price Schedule - A rate must be entered for each item.
- 1.2.2 Offers retained pursuant to Part 4, will be evaluated on the basis of the total estimated amount quoted, GST/HST extra. It is anticipated that two standing offer holders will be issued to the lowest compliant offerors.

2. Basis of Selection

2.1 Basis of Selection - Lowest Evaluated Price

An offer must comply with the requirements of the Request for Standing Offers to be declared responsive. The responsive offer with the lowest evaluated price will be recommended for issuance of a standing offer.

3. Ranking

3.1 Two (2) firm will be issued a standing offer.

- 3.1.1 the total of all the hourly rates submitted for all the Years will be used to determine the ranking of the Standing Offers.

3.1.2 ranking during the life of the Standing Offer(s) will remain unchanged except if services under a Standing Offer are withdrawn by Canada or the Offeror, in which case, the balance of the work will be distributed to the remaining firms(s) proportionately.

3.2 The Value of the Work will be distributed proportionally between the ranked firms.

- Where 2 Standing Offers are authorized - 55% for the top ranked firm, and 45% for the 2nd.
- Where 1 Standing Offer is authorized - 100% for the top ranked firm.

In the event that there are not two (2) Standing Offers issued, the work distribution will be modified in similar proportions.

PART 5 - CERTIFICATIONS

Offerors must provide the required certifications to be issued a standing offer. Canada will declare an offer non-responsive if the required certifications are not completed and submitted as requested.

Compliance with the certifications offerors provide to Canada is subject to verification by Canada during the offer evaluation period (before issuance of a standing offer) and after issuance of a standing offer. The Standing Offer Authority will have the right to ask for additional information to verify offerors' compliance with the certifications before issuance of a standing offer. The offer will be declared non-responsive if any certification made by the Offeror is untrue, whether made knowingly or unknowingly. Failure to comply with the certifications or to comply with the request of the Standing Offer Authority for additional information will also render the offer non-responsive.

1. Mandatory Certifications Required Precedent to Issuance of a Standing Offer

1.1 Code of Conduct and Certifications - Related documentation

By submitting an offer, the Offeror certifies, for itself and its affiliates, to be in compliance with the Code of Conduct and Certifications clause of the 2006 (2013-03-21) Standard Instructions. The related documentation therein required will help Canada in confirming that the certifications are true.

2. Additional Certifications Precedent to Issuance of a Standing Offer

The certifications listed below should be completed and submitted with the offer, but may be submitted afterwards. If any of these required certifications is not completed and submitted as requested, the Standing Offer Authority will so inform the Offeror and provide the Offeror with a time frame within which to meet the requirement. Failure to comply with the request of the Standing Offer Authority and meet the requirement within that time period will render the offer non-responsive.

2.1 Health & Safety Requirements - per attached Annex C

2.2 Insurance, per article 3 of Part 6. (R2590D GC9 - Insurance)

2.3 Security Requirement - per article 1 of Part 6.

PART 6 - SECURITY, FINANCIAL AND INSURANCE REQUIREMENTS

1. Security Requirement

1. Before issuance of a standing offer, the following conditions must be met:
 - (a) the Offeror must hold a valid organization security clearance as indicated in Part 7A - Standing Offer;
 - (b) the Offeror's proposed individuals requiring access to classified or protected information, assets or sensitive work site(s) must meet the security requirement as indicated in Part 7A - Standing Offer;
 - (c) the Offeror must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites.
2. Offerors are reminded to obtain the required security clearance promptly. Any delay in the issuance of a standing offer to allow the successful offeror to obtain the required clearance will be at the entire discretion of the Standing Offer Authority.
3. For additional information on security requirements, bidders should consult the "Security Requirements for PWGSC Bid Solicitations - Instructions for Bidders" <http://www.tpsgc-pwgsc.gc.ca/app-acq/lc-pl/lc-pl-eng.html#a31> document on the Departmental Standard Procurement Documents Web site.

2. Financial Capability

Financial Statements: In order to confirm an offeror's financial capability to perform the Contract, the Standing Offer Authority may during the RFSO evaluation phase, request from that offeror current financial information. The requested financial information may include, but is not limited to, an offeror's most recent audited financial statements or financial statements certified by an offeror's chief financial officer. The information provided will be considered in the offer evaluation and selection process. If an offer is found to be non-responsive on the basis that an offeror is considered financially incapable of performing the Work, that offeror will receive a written notification from the Standing Offer Authority.

Should an offeror provide the requested information to Canada in confidence while indicating that the disclosed information is confidential, Canada will treat the information in a confidential manner in accordance with the Access to Information Act, R.S. 1985, c.A-1.

3. Insurance Requirements

The Offeror must provide a letter from an insurance broker or an insurance company licensed to operate in Canada stating that the Offeror, if issued a standing offer as a result of the request for standing offer, can be insured in accordance with the Insurance Requirements specified in SACC Manual clause R2590D GC9 - Insurance (2011-05-16)

If the information is not provided in the offer, the Standing Offer Authority will so inform the Offeror and provide the Offeror with a time frame within which to meet the requirement. Failure to comply with the request of the Standing Offer Authority and meet the requirement within that time period will render the offer non-responsive.

Certificate of Insurance form - PWGSC-TPSGC 357 (06/2007) is available at web site:

<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/357.pdf>

PART 7 - CLAUSES & CONDITIONS

PART 7(A) - STANDING OFFER

1. Offer - attached at ANNEX E

- .1 General Provisions
- .2 Financial Terms
- .3 Prices

2. Security Requirement

SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:

1. The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, hold a valid Designated Organization Screening (DOS), issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).
2. The Contractor/Offeror personnel requiring access to sensitive work site(s) must **EACH** hold a valid **RELIABILITY STATUS**, granted or approved by CISD/PWGSC.

Until the security screening of the Contractor personnel required by this Contract has been completed satisfactorily by the CISD, PWGSC, the Contractor personnel **MAY NOT ENTER** sites without an escort.

3. Subcontracts which contain security requirements are **NOT** to be awarded without the prior written permission of CISD/PWGSC.
4. The Contractor/Offeror must comply with the provisions of the:
 - (a) Security Requirements Check List and security guide (if applicable), attached at Annex G;
 - (b) Industrial Security Manual (Latest Edition).

For additional information on security requirements, proponents should consult the Industrial Security web site at:
<http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>.

3. Standard Clauses and Conditions

- 1) .1 General Conditions - Standing Offer, 2005 (2012-11-19)
- 2) The documents identified by title, number and date in paragraph 1) 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/5/R>
- 3) Schedules of Wage Rates for Federal Construction Contracts is included by reference and may be accessed from the Web site: http://www.hrsdc.gc.ca/eng/labour/employment_standards/contracts/schedule/index.shtml

4. Term of Standing Offer

4.1 Period of the Standing Offer

The period for making call-ups against the Standing Offer is for three years from date of Standing Offer issuance.

5. Authorities

5.1 Standing Offer Authority

The Standing Offer Authority is:

Name: *see front page of Standing Offer for details*
Public Works and Government Services Canada
Acquisitions Branch

Directorate: Real Property Contracting

The Standing Offer Authority is responsible for the establishment of the Standing Offer, its administration and its revision, if applicable. Upon the making of a call-up, as Contracting Authority, they are responsible for any contractual issues relating to individual call-ups made against the Standing Offer by any Identified User.

5.2 Project Authority

The Project Authority for the Standing Offer is identified in the call-up against the Standing Offer.

The Project Authority is the representative of the department or agency (Departmental Representative) for whom the Work will be carried out pursuant to a call-up against the Standing Offer and is responsible for all the technical content of the Work under the resulting Contract.

6. Identified users

The Identified User authorized to make call-ups against the Standing Offer is : Department of National Defence, Cold Lake, Alberta,

7. Call-up Procedures

1. Proportional basis: call-ups shall be issued on a proportional basis such that the offeror of the highest ranked standing offer receives the largest predetermined amount of the work, the offeror of the second highest ranked standing offer receives the second largest predetermined amount of the work, etc. This call-up procedure will be followed, unless an offeror did not perform satisfactorily on previous call-ups and a decision has been made not to call upon them again or if they are unable to respond within the specified response time or provide the requisite service, then another offeror may be contacted to perform the work.

For each individual Call-Up, contractors will be approached and considered using a Distribution System. This system will track all call-ups assigned to each contractor and will maintain a running total of the Value of Business Distributed. The system will contain for each contractor an Ideal Business Distribution percentage which has been established as follows; 55% of the business for the top ranked consultant and 45% for the 2nd ranked consultant. In the event fewer than two (2) consultants are successful, the work distribution will be modified in similar proportions. The contractor who is furthest under the ideal amount of business that they should have received in relation to the other consultant will be selected for the next call-up.

The Technical Authority will establish the scope of work to be performed by the successful firm and negotiate the level of effort required to perform the work based on the hourly rates contained in the SO.

Offerors estimated proportion based on Evaluation is: 55%

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8. CALL-UP INSTRUMENTPublic Works and
Government Services
CanadaTravaux publics et
Services gouvernementaux
Canada**CALL-UP AGAINST A STANDING OFFER**
COMMANDE SUBSÉQUENTE À UNE OFFRE
PERMANENTEIn accordance with
STANDING OFFER NO.: _____Conformément à
L'OFFRE PERMANENTE No. _____Call-up no. - No de commande
_____Dated _____
and the terms and conditions therein, you are
Requested to carry out the worked described below.En date du _____
Et les modalités qui y sont énumérées, vous êtes prié
d'exécuter les travaux décrits ci-après.

Contractor's name and address - Nom et adresse de l'entrepreneur		Send invoice to - Expédier la facture à
Fax No. ()		attention:
Project no. - No du projet	Note: Quote standing offer number, project number and call-up number on your invoice. Inscrire le numéro de l'offre permanente, le numéro du projet et le numéro de commande sur la facture.	
Location of work - Endroit des travaux	Call-up cost, GST/HST extra - Coût de la commande, TPS en plus	

Work description - Description des travaux	
Certified pursuant to subsection 32 (1) of the Financial Administration Act Certifié en vertu du paragraphe 32 (1) de la Loi sur la gestion des finances publiques _____ Signature	_____ Date
Departmental Representative - Représentant du ministère _____ Signature	_____ Date

PWGSC-TPSGC 2829 (03/2006)

9. Limitation of Call-ups

Individual call-ups against the Standing Offer must not exceed \$60,000.00 (Goods and Services Tax or Harmonized Sales Tax included).

10. Financial Limitation

The total cost to Canada resulting from call ups against the Standing Offer must not exceed the sum of \$1,400,000.00 (Goods and Services Tax or Harmonized Sales Tax excluded) unless otherwise authorized in writing by the Standing Offer Authority. The Offeror must not perform any work or services or supply any articles in response to call ups which would cause the total cost to Canada to exceed the said sum, unless an increase is so authorized.

The Offeror must notify the Standing Offer Authority as to the adequacy of this sum when 75 percent of this amount has been committed, or three (3) months before the expiry date of the Standing Offer, whichever comes first. However, if at any time, the Offeror considers that the said sum may be exceeded, the Offeror must promptly notify the Standing Offer Authority.

11. Priority Documents

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

- a) the call up against the Standing Offer, including any annexes and any amendments;
- b) the articles of the Standing Offer;
- c) the general conditions 2005 (2012-11-19), General Conditions - Standing Offers - Goods or Services
- d) any amendment or variation in the Standing Offer that is made in accordance with the terms and conditions of the Standing Offer;
- e) the general conditions dated and listed in Part 7B, Resulting Contract Clauses;
- f) the Supplemental general conditions;
- g) Annexes:
 - Annex A, Statement of Work and any amendment to the solicitation document incorporated in the Standing Offer before the date of the Standing Offer;
 - Annex B, Basis of Payment;
 - Annex C, Health & Safety Requirements - Alberta
 - Annex D, Periodic Usage Report Form; and
 - Annex G; Security Requirement Check List (SRCL).
- h) the Offeror's offer Annex E, dated _____ (insert date of offer);

12. Certifications

12.1 Compliance

Compliance with the certifications provided by the Offeror is a condition of authorization of the Standing Offer and subject to verification by Canada during the term of the Standing Offer and of any resulting contract that would continue beyond the period of the Standing Offer. In the event that the Offeror does not comply with any certification or it is determined that any certification made by the Offeror in its offer is untrue, whether made knowingly or unknowingly, Canada has the right to terminate any resulting contract for default and set aside the Standing Offer.

13. Applicable Laws

The Standing Offer and any contract resulting from the Standing Offer must be interpreted and governed, and the relations between the parties determined, by the laws in force in the province of work.

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14. Estimates

Where an estimate of the cost of performing specific work is required, the Identified User will provide the Offeror with a statement of the work required and the Offeror must provide the Identified User with an estimate of the cost of performing the specified work in accordance with the pricing provision of the Standing Offer. The Offeror must not undertake any of the specified work unless and until a call-up is issued by the Identified User. The estimated cost stated in the call-up must not be exceeded without the specific written authorization of the Identified User.

PART 7 (B) - RESULTING CONTRACT CLAUSES

- 1) The following clauses and conditions apply to and form part of any contract resulting from a call-up against the Standing Offer:
 - (a) Statement of Work - The Contractor must perform the Work described in the call-up against the Standing Offer;
 - (b) General Conditions:

(i)	GC1	General Provisions	R2810D	(2013-04-25);
(ii)	GC2	Administration of the Contract	R2820D	(2012-07-16);
(iii)	GC3	Execution and Control of the Work	R2830D	(2010-01-11);
(iv)	GC4	Protective Measures	R2840D	(2008-05-12);
(v)	GC5	Terms of Payment	R2550D	(2010-01-11);
(vi)	GC6	Delays and Changes in the Work	R2865D	(2008-05-12);
(vii)	GC7	Default, Suspension or Termination of Contract	R2870D	(2008-05-12);
(viii)	GC8	Dispute Resolution	R2884D	(2008-05-12);
(ix)	GC9	Insurance	R2590D	(2011-05-16);
 - (c) Supplementary Conditions, if any;
 - (d) Fair Wages and Hours of Labour - Labour Conditions R2940D (2012-07-16);
 - (e) Allowable Costs for Contract Changes Under GC6.4.1 R2950D (2007-05-25);
 - (f) Schedules of Wage Rates for Federal Construction Contracts;
 - (g) Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
 - (h) Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
 - (i) 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 in paragraph 1) 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 Website:
<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>
- 3) Schedules of Wage Rates for Federal Construction Contracts is included by reference and may be accessed from the Website: http://www.hrsdc.gc.ca/eng/labour/employment_standards/contracts/schedule/index.shtml

NOTE: Contractors should note that a copy of the Labour Conditions and the Fair Wage Schedule applicable to the project location must be posted at the work site in a convenient, easily accessible location.

- 4) The language of the contract documents shall be the language of the Bid and Acceptance Form submitted.
- 5) A contract is formed between Canada and the Offeror only when a Call-up duly signed is issued by the Departmental Representative and accepted by the Offeror*. The Offeror shall then be referred to as "the Contractor" and the Contract includes the Offer, the Specifications referred to in the Unit Price Schedule, the General Conditions, and the Call-up .

6) Interpretation

"Accepted by the Offeror" * means that the Offeror has agreed to, and commenced performance of the work.

"Minister" includes a person acting for the Minister, the Minister's successor in office, their lawful deputy and their representatives appointed for the purpose of the Standing Offer.

"Departmental Representative" means the Project Authority who is the representative of the department or agency for whom the Work will be carried out pursuant to a call-up against the Standing Offer and is responsible for all the technical content of the Work under the resulting Contract.

"Superintendent" or *"Supervisor"* means the employee or representative of the Contractor designated by the Contractor to act as Superintendent;

"Unit Price Table" means the table of prices per unit set out in the Offer; and

"Work" means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the work as described in each Call-up, and in the technical specifications or statement of work.

1. SUPPLEMENTAL CONDITIONS

INSERT the following supplementary conditions in the resulting General Conditions:

1.1. T1204 - Direct Request by Customer Department

1.1.1 Pursuant to paragraph 221 (1)(d) of the Income Tax Act, R.S. 1985, c.1 (5th Supp.), payments made by departments and agencies to contractors under applicable services contracts (including contracts involving a mix of goods and services) must be reported on a T1204 Government Service Contract Payments slip.

1.1.2 To enable departments and agencies to comply with this requirement, the Contractor must provide Canada, upon request, its business number or Social Insurance Number, as applicable. (These requests may take the form of a general call-letter to contractors, in writing or by telephone).

1.2. Periodic Reports

1.2.1 The Offeror shall provide to the Standing Offer Authority biannual reports on usage of the Standing Offer, showing the number and total value of call-ups by each consignee. Reports shall be submitted in the format shown on the attached Annex D "Periodic Usage Report Form" and forwarded to the Standing Offer Authority no later than fifteen (15) days after the designated reporting period.

1.2.2 The Offeror understands that failure to comply may result in the setting aside of the Standing Offer.

2. Term of Contract

2.1 Period of the Contract

The Work must be completed in accordance with the call-up against the Standing Offer.

3. Payment

3.1 CHANGES TO GC5 R2550D - TERMS OF PAYMENT

DELETE GC5.4, GC5.5, and GC5.6 and **INSERT** the following:

GC5.4 Payment

.1 Terms of Payment

- Where the duration of the work identified in a call-up is greater than 30 days, the Contractor may submit monthly progress claims, and shall be entitled to receive progress payments at monthly or other agreed intervals. Subject to verification by the Departmental Representative, payment of the Contractor's invoice for work satisfactorily completed shall be made not later than 30 days after receipt thereof. The due date shall be the 30th day following receipt of a properly submitted invoice.

2. The Contractor shall submit a separate invoice for each Call-up to the Departmental Representative in accordance with any invoicing instructions set out herein. The properly submitted invoice shall be delivered to the Departmental Representative in the agreed format with sufficient detail, information, and backup to permit verification.

The Contractor's invoice shall show the following, as separate items:

- (a) the amount of the progress payment being claimed for Work satisfactorily performed excluding GST/HST;
 - (b) the amount for any tax calculated (GST/HST) in accordance with the applicable federal tax legislation; and
 - (c) the total amount which shall be the sum of the amounts referred to in (a) and (b) above.
3. The amount of the tax shown on the invoice shall be paid by Canada to the Contractor in addition to the amount of the progress payment for Work satisfactorily performed.
 4. If, within 15 days of receipt of the invoice, additional information is requested by the Departmental Representative for the purpose of verification, the 30 day payment period shall commence upon receipt of the requested information. Payment shall be made prior to or on the thirtieth (30) day after receipt of the corrected invoice or the required information.
 - .1 Any monthly progress payment made to the Contractor may be subject to a 10% holdback which shall be released to the Contractor with the final payment unless the amount held back is required by Canada to remedy any defect in the Contractor's work.
 - .2 Where the duration of the Work identified in a call-up is equal to or less than thirty (30) days, the Contractor may receive a single payment as full consideration for the Work performed.
 5. Upon completion of the Work in the progress claim, the Contractor maybe requested to provide a completed and signed statutory declaration containing a declaration that, up to the date of the progress claim, the Contractor has complied with all lawful obligations with respect to the Labour Conditions and that, in respect of the Work, all lawful obligations of the Contractor to its Subcontractors and Suppliers, referred to collectively in the declaration as "subcontractors and suppliers", have been fully discharged before any further payment is made.
 6. Upon written notice by a Sub-Contractor, with whom the Contractor has a direct contract, of an alleged non payment to the Sub-Contractor, the Departmental Representative may provide the Sub-Contractor with a copy of the latest approved progress payment made to the Contractor for the Work.
 7. Upon the satisfactory completion of all Work, the amount due, less any payments already made, shall be paid to the Contractor not later than thirty (30) days after receipt of a properly submitted invoice, and upon request, with a Statutory Declaration in accordance with paragraph 5 above.

3.2 Basis of Payment - see Annex B

3.3 Limitation of Price

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

3.4 Payment of Invoices by Credit Card (see PART 3)

The credit cards _____ and _____ are accepted.

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Section GC5.11 Delay in Making Payment, Interest on Overdue Accounts, of GC5 - Terms of Payment R2550D (2010-01-11) will not apply to payments made by credit cards.

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ANNEXES

Annex A	Statement of Work
Annex B	Basis of Payment
Annex C	Health & Safety Requirements
Annex D	Periodic Usage Report Form
Annex E	Offer
Annex F	Code of Conduct Certifications - List
Annex G	Security Requirements Checklist (SRCL)

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ANNEX A

Statement of Work

(Attached)

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ANNEX B

.1 Basis of Payment

Payments in respect of the agreed price shall be made upon satisfactory performance of the Work, and upon approval of the Departmental Representative, but such payments shall not exceed the amount(s) as specified in the Call Up, for the Work without written authorization.

In consideration of the Contractor satisfactorily completing all of its obligations under the resulting Contract, the Contractor will be paid a firm price, Goods and Services Tax or Harmonized Sales Tax extra.

.1 Hourly Rates:

The Contractor will be paid firm hourly rates as follows, for work performed in accordance with the Contract.

See attached for details

ANNEX C

MANDATORY HEALTH AND SAFETY - *for Work in the Province of Alberta*

1.) SPECIAL INSTRUCTIONS TO BIDDERS (SI):

WCB AND SAFETY PROGRAM

- 1) The recommended Bidder shall provide to the Contracting Authority, prior to Standing Offer issue:
 - 1.1 a Workers Compensation Board Premium Rate Statement - Alberta, or equivalent documentation from another jurisdiction;
 - 1.2 a Workers Compensation Board letter of good standing, also listing covered Directors, Principals, Proprietor(s) or Partners who will be or who are anticipated to be present on the work site(s), or equivalent documentation from another jurisdiction; and
 - 1.3 a Certificate of Recognition (COR) or Registered Safety Plan (RSP). A health and safety policy and program, as required by other provincial/territorial Occupational Health and Safety Acts, will be acceptable in lieu of a COR or RSP.
- 2) The recommended Bidder shall deliver all of the above documents to the Contracting Authority on or before the date stated (usually 3-5 days after notification) by the Contracting Authority. Failure to comply with the request may result in the bid being declared non-compliant.

2.) SUPPLEMENTARY CONDITIONS (SC):

Workplace Safety and Health

1. EMPLOYER/PRIME CONTRACTOR

- 1.1 The Contractor shall, for the purposes of the Occupational Health and Safety Act, Alberta, and for the duration of the Work:
 - 1.1.1 act as the Employer, where there is only one employer on the work site, in accordance with the Authority Having Jurisdiction;
 - 1.1.2 accept the role of Prime Contractor, where there are two or more employers involved in work at the same time and space at the work site, in accordance with the Authority Having Jurisdiction; and
 - 1.1.3 agree, in the event of two or more Contractors working at the same time and space at the work site, without limiting the General Conditions, to Canada's order * to:
 - 1.1.3.1 accept, as the Prime Contractor, the responsibility for Canada's other Contractor(s); or
 - 1.1.3.2 accept that Canada's other Contractor is Prime Contractor and conform to that Contractor's Site Specific Health and Safety Plan.

* "order" definition: *after contract award, Contractor is ordered by a Change Order*

2. SUBMITTALS

2.1 The Contractor shall provide to Canada:

- 2.1.1 prior to the pre-construction meeting, a transmittal and copy of a completed Notice of Project form PWGSC - TPSGC 458 (form will be provided to the proposed contractor prior to award), as sent to the Authority Having Jurisdiction (AHJ); and
- 2.1.2 prior to commencement of work and without limiting the terms of the General Conditions:
 - 2.1.2.1 copies of all other necessary permits, notifications and related documents as called for in the scope of work/specifications and/or by the AHJ; and
 - 2.1.2.2 a site specific Health and Safety Plan as requested.

NOTE: Please do not include any forms that include personal 3rd party information such as the names of the contractor's employees and their related claims information.

3. LABOUR AUTHORITY CONTACT:

The contact below represents the Labour Authority in the jurisdiction (AHJ). They are not representatives of the Workers Compensation.

Do not contact the people referenced below for issues pertaining to WCB or WCB Clearances. Those queries must be directed specifically to the WCB, and where the WCB has both a Labour and Compensation component, WCB issues must be directed to the Compensation/Employer Services sections.

ALBERTA North

Alberta Human Resources and Employment
Workplace Health and Safety
10th Floor, 7th Street Plaza
10030-107 Street
Edmonton, Alberta, T5J 3E4

Telephone: (780)422-5949
Facsimile: (780) 427-0999

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ANNEX D Periodic Usage Report Form

As a requirement of this Request for Standing Offer, a report shall be submitted as follows:

Return to:

Christopher Lau	(780) 497-3510	christopher.lau@pwgsc-tpsgc.gc.ca
<i>Name</i>	<i>Fax</i>	<i>Email Address</i>

at:

Public Works and Government Services Canada
Real Property Contracting, Acquisitions Branch
Telus Plaza North
5th Floor, 10025 Jasper Avenue
Edmonton, Alberta T5J 1S6

REPORT ON THE VOLUME OF BUSINESS

SUPPLIER: _____

REPORT FOR THE PERIOD ENDING: _____

Description of Work	Call-up #	TOTAL BILLING

NIL REPORT: We have not done any business with the federal government for this period _____.

PREPARED BY:

NAME: _____

SIGNATURE: _____

TELEPHONE NO.: _____

ANNEX E OFFER

Description of Work: Cold Lake, Alberta
Various Projects, DND
HVAC, Refrigeration and Furnace Standing Offer

1. OFFER

- .1 This Standing Offer is made by the Offeror to Canada;
- .2 This Offer is to furnish all necessary tools, plant, equipment, services, materials and labour to execute and complete the Work described above in careful and workmanlike manner;
- .3 The Work shall be more particularly described in individual Call-ups to be issued by the Project Authority, hereinafter called the "Departmental Representative";
- .4 Individual Call-ups may be issued, from time to time, during the period identified in Part 7A, clause 4.1, hereinafter called the "Term".

2. GENERAL PROVISIONS

- .1 This Offer when signed by or on behalf of the Offeror, the Specifications referred to in the Unit Price Schedule below and the General Conditions shall constitute the complete Offer subject to the provisions contained therein;
- .2 The Hourly Rate and the Unit Price, as offered, govern in calculating each Estimated Total Price; any errors in the extension of the Unit Price and in the addition of the Estimated Total Prices will be corrected in order to obtain the actual Total Estimated Amount;
- .3 This Offer supersedes and cancels all communications, negotiations and agreements relating to the Work other than those contained in the Offer;
- .4 that this tender may not be withdrawn for a period of 60 days following the tender closing time,

The Offeror agrees

- .1 to carry out individual work projects as requisitioned from time to time by the Departmental Representative in **Call- ups Against a Standing Offer**, form PWGSC/TPSGC 2829, copies of which the Offeror acknowledges to have in its possession, in accordance with the requirements set out therein and in consideration of payment of amounts to be determined pursuant to section 3. Below;
- .2 to provide, on demand from the Departmental Representative, a detailed price estimate, calculated in accordance with section 4 below, and a proposed work schedule for each work project; and
- .3 to commence Work promptly upon receipt of each Call-up issued pursuant to this Offer, duly signed by the Departmental Representative.
- .5 This Offer does not constitute a binding contract between Canada and the Offeror. The Departmental Representative shall have the right to issue a Call-up with those other offerors which have also submitted offers to Canada.

-
- .6 A contract is formed between Canada and the Offeror only when a Call-up duly signed is issued by the Departmental Representative and accepted by the Offeror. The Offeror shall then be referred to as "the Contractor" and the Contract includes the Offer, the Specifications referred to in the Unit Price Schedule below, the General Conditions and the Call-up .
 - .7 The estimated number of hours, the quantities of material and plant, and the amount of the Allowance for Unspecified material set out in the Unit Price Schedule are for the purpose of comparative evaluation of the offers and do not express an obligation on the part of Canada to order any or all of the work, material or plant listed therein.
 - .8 The Offeror declares that no bribe, gift or benefit has been or will be paid, given, promised or offered directly or indirectly to any official or employee of Canada or to a member of the family of such person, with a view to influence the entry into or the administration of any contract which may result from this Offer.

3. FINANCIAL TERMS

- .1 Each item specified in the Unit Price Schedule in subsection 4.1 includes wages, traveling time and costs, allowances, supervision, liabilities as employer, insurance, and the use of all tools, tackle, etc., overhead, profit and all other liabilities whatsoever.
- .2 Unspecified Material shall be reimbursed at net cost, as supported by invoices, plus Markup as established in section 4 of this Offer. "Net Cost" means all amounts reasonably and properly paid by the Offeror in respect of materials required for and used in the Work, and includes packing, handling and delivery charges, less any trade discounts received by the Offeror. The Offeror's Markup on Unspecified Material covers overheads, profit, and all other expenses whatsoever.
- .3 The prices inserted in section 4 of this Offer include all applicable federal, provincial, and municipal taxes.
 - .1 However, they do not include any amount for the Goods and Services Tax (GST) or Harmonized Sales Tax (HST). The appropriate GST/HST amounts will be paid by Canada to the Offeror in addition to the amounts paid against the amount of the contract. The Offeror shall make appropriate remittances to Revenue Canada in accordance with the legislation.
 - .2 The prices do not include the Québec Sales Tax. The Offeror shall arrange directly with the Province of Québec for the reimbursement of Provincial Sales Tax paid to this Province for the purpose of any contract resulting from this Offer.
- .4 Payment by Canada for the Offeror's own special equipment not covered by the Unit Price Schedule and required at the job site will be no greater than the local going rental rate for such equipment or the rate published by the local construction association for such equipment, whichever is the lower.
- .5 The cost of subcontract work, including special equipment rentals approved by the Project Authority, shall be reimbursed at actual cost with the addition of ten (10) percent to cover overheads, profit, and all other expenses whatsoever. "Actual cost" means all amounts reasonably and properly paid by the Contractor for those parts of the Work carried out by subcontractors.
- .6 Pricing
 - .1 The prices requested in the Offer are:
 - .1 hourly rates for regular hours;
 - .2 hourly rate for each hour outside of regular hours; and
 - .3 mark up on allowance for unspecified material, replacement parts, required permits and certificates. for purposes of evaluation.

-
- .2 The hourly rates requested in the offer and acceptance for specific types of service shall be the total cost to perform the work including but not limited to:
- .1 labour including supervision, allowances and liability insurance;
 - .2 travel time;
 - .3 transportation/vehicle expenses;
 - .4 tools and tackle;
 - .5 overhead and profit;
 - .6 any other incidental expenses other than supply of materials and replacement parts relating to the delivery of labour.
- .3 It is considered that regular hours of work fall between 0730 and 1600 hours, Monday to Friday.

DPW/MTP 2893 (94-06-08)

	ii) A/C Mechanic	per hour	1400	\$ _____	\$ _____
	iii) Helper	per hour	1400	\$ _____	\$ _____
	b) Outside Regular Hours: After 1600 hours, Monday through Friday				
	i) Gasfitter	per hour	80	\$ _____	\$ _____
	ii) A/C Mechanic	per hour	80	\$ _____	\$ _____
	iii) Helper	per hour	80	\$ _____	\$ _____
	c) Weekends and Statutory Holidays:				
	i) Gasfitter	per hour	40	\$ _____	\$ _____
	ii) A/C Mechanic	per hour	40	\$ _____	\$ _____
	iii) Helper	per hour	40	\$ _____	\$ _____
3.	Contractor's Mark Up on Allowance for unspecified material, replacement parts, required permits and certificates. (% mark up x \$100,000) =	n/a	\$100,000	_____ %	\$
Sub Total A): Estimated Total Amount 1st Year GST/HST Extra					\$

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	ii) A/C Mechanic	per hour	80	\$ _____	\$ _____
	iii) Helper	per hour	80	\$ _____	\$ _____
	c) Weekends and Statutory Holidays:				
	i) Gasfitter	per hour	40	\$ _____	\$ _____
	ii) A/C Mechanic	per hour	40	\$ _____	\$ _____
	iii) Helper	per hour	40	\$ _____	\$ _____
3.	Contractor's Mark Up on Allowance for unspecified material, replacement parts, required permits and certificates. (% mark up x \$100,000) =	n/a	\$100,000	_____ %	\$ _____
Sub Total B): Estimated Total Amount 2nd Year GST/HST Extra					\$ _____

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	ii) A/C Mechanic	per hour	80	\$ _____	\$ _____
	iii) Helper	per hour	80	\$ _____	\$ _____
	c) Weekends and Statutory Holidays:				
	i) Gasfitter	per hour	40	\$ _____	\$ _____
	ii) A/C Mechanic	per hour	40	\$ _____	\$ _____
	iii) Helper	per hour	40	\$ _____	\$ _____
3.	Contractor's Mark Up on Allowance for unspecified material, replacement parts, required permits and certificates. (% mark up x \$100,000) =	n/a	\$100,000	_____ %	\$ _____
Sub Total C): Estimated Total Amount 3rd Year GST/HST Extra					\$ _____

Continued

4.1 Unit Price Schedules - Rates (continued)**4.2 TOTAL EVALUATED PRICE** (Initial 1 Year Term + 2nd Year + 3rd Year)

Col. 1	Col. 2	Col. 3	Col. 4
Sub Total SCHEDULE A) Initial Year Term	Sub Total SCHEDULE B) 2nd Year	Sub Total SCHEDULE C) 3rd Year	Total Evaluated Price (col.1 + col.2 + col.3 = col.4)
\$ _____	\$ _____	\$ _____	\$ _____ GST/HST Extra

These items will be used for cost evaluation purposes only and do not constitute a guarantee or commitment on behalf of Canada of the quantity or amount to be used under the Standing Offer.

A rate must be entered for each item.

The Offeror agrees that the Price(s) per Unit as tendered govern in calculating the Total Evaluated Price. The Offeror understands that any errors in the extension of the Price per Unit, in the addition of the Estimated Total Price, and Estimated Total Amount will be corrected in order to obtain the Total Evaluated Price.

Cost will be evaluated on the Total Evaluated Price in Column 4. It is anticipated that two standing offers will be issued to the lowest compliant offerors.

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ANNEX F

Code of Conduct and Certifications

COMPLETE LIST OF EACH INDIVIDUAL WHO IS CURRENTLY ON THE OFFEROR'S BOARD OF DIRECTORS

NOTE TO OFFERORS: LEGIBLY PRINT OR TYPE DIRECTOR' SURNAMES AND GIVEN NAMES

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Buyer ID - Id de l'acheteur

edm014

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

File No. - N° du dossier

CCC No./N° CCC - FMS No/ N° VME

DND

EDM-3-36026

ANNEX G

Security Requirements Checklist (SRCL)

(Attached)

**DEPARTMENT OF NATIONAL DEFENCE
4 WING - CFB COLD LAKE
WING CONSTRUCTION ENGINEERING**

**STANDING OFFER AGREEMENT (SOA)
FOR**

HVAC, Refrigeration and Furnace SOA-2012



**Job Number:
Date:
Design OPI:
Contract Engineer:**

**L-C252-9900/373
30 Oct 2012
Dwight Schock
MCpl Bosse**

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LIST OF ANNEXES

<u>ANNEX NO.</u>	<u>TITLE</u>
ANNEX A	4 Wing Ground Disturbance Notice
ANNEX B	4 Wing Hot Work Permit
ANNEX C	4 Wing Confined Space Entry Permit
ANNEX D	Prime Contractor Agreement
ANNEX E	4 Wing Road Closure Notice
ANNEX F	4 Wing Environmental Incident & Emergency Plan
ANNEX G	4 Wing Halocarbon Reporting Form

LIST OF DRAWINGS

TITLE

DRAWING NB.

END

PART 1 - GENERAL

- | | | |
|------------------------------------|----|--|
| <u>1.1 Description of Work</u> | .1 | Work under this Contract comprises the supply of all labour, materials, equipment, transportation and supervision necessary to carry out the preventative maintenance, repair, replacement and installation of furnaces, air-conditioning units, ventilation systems and refrigeration in various base buildings for the Department of National Defense, 4 Wing Cold Lake on an 'as and when requested' basis. |
| <u>1.2 Security Authorization</u> | .1 | This project will be issued with an SRCL. |
| <u>1.3 Contract Administration</u> | .1 | This contract will be administered in English. |
| <u>1.4 Documents Required</u> | .1 | Maintain at job site, one copy each of the following:
.1 Contract drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed shop drawings.
.5 Change orders.
.6 Other modifications to Contract.
.7 Copy of approved work schedule.
.8 Manufacturers' installation and application instructions. |
| <u>1.5 Work Schedule</u> | .1 | Provide within 10 working days after Contract award, construction schedule showing anticipated progress stages and final completion of work within time period required by Contract documents. |
| | .2 | Interim reviews of work progress based on work schedule will be conducted as deemed by DND Rep and schedule updated by Contractor in conjunction with and to approval of DND Rep. |
-

1.6 Contractor's Use of Site

Exclusive and complete for execution of work except as follows:

- .1 Movement around site shall be subject to restrictions imposed by Wing Commander and/or DND Rep.
- .2 Do not unreasonably encumber site with materials or equipment.
- .2 PLER/Jimmy Lake special precautions:
 - .1 Day to day restrictions enroute to Jimmy Lake site may occur from time to time while military live range missions are underway. These restrictions are usually of short duration in terms of hours however may result in a full day.
 - .2 No work will be permitted during the multi-nation Maple Flag exercises.
 - .3 Normal working hours are from 0730 to 1600 but are subject to change.
 - .4 Weekend work is permitted with special arrangements.
 - .5 Obtain permission from Wing Operation Range Control 48hrs before proceeding to site.

1.7 Property Damage

- .1 Contractor is responsible to make good any damage to DND property resulting from his work conducted on site. Repairs shall be carried out at the contractors expense.
- .2 The contractor shall immediately notify the DND Rep or Contracting Authority of any damage incident. Damage to any surface feature or underground utility are included in this definition such as gas lines, power lines, water lines, buildings, survey markers, etc.
- .3 Any tree removed or damaged during the work must be replaced with a trees equalling the total diameter of trees removed. The replacement trees should be no less than half the calliper of the trees that are damaged/removed. CE Roads and Grounds (Loc 8432) should be contacted for a list of preferred species; each area will have specific requirements based on location, soils proximity to paved areas, moisture etc.

1.8 Codes and Standards .1 Perform work in accordance with the latest edition of National Building Code of Canada (NBC), and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

1.9 Workmanship .1 Workmanship:
.1 Workmanship shall be executed by workers qualified in respective duties for which they are employed.
.2 Decisions as to quality or fitness of workmanship, in case of dispute, rest solely with DND Rep, whose decision is final.
.2 Qualification:
.1 All work shall be carried out by qualified journeyman or apprentice in accordance with the conditions of the Alberta Provincial Act respecting manpower, vocational training and qualification.
.2 Apprenticed employees registered in the provincial apprenticeship program shall be permitted to work only under the direct supervision of a qualified journeyman.

1.10 Project Meetings .1 DND Rep will arrange project meetings, assume responsibility for setting times and recording and distributing minutes.

1.11 Project Layout .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
.2 Provide devices as required to lay out and construct project.
.3 Supply such devices as straight edges and templates required to facilitate DND Rep's inspection of work.
.4 Supply stakes and other survey markers required for project layout.

1.12 Location of
Equipment and
Fixtures

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform DND Rep of impending installations and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment as required by DND Rep.
- .5 Before the start of construction, the Contractor will be responsible to identify and preserve DND Survey Monuments.
- .6 If during construction, Contractor discovers a DND Survey Monument, (complete with marker post, 50 mm round pipe with 75 x 100 mm aluminium plate), do not disturb the area, carefully preserve survey monuments and inform DND Rep before proceeding.
- .7 Should a DND Survey Monument be disturbed during construction, the Contractor will be responsible to re-survey and replace if the Monument if necessary, by a certified land surveyor approved by DND Rep.

1.13 Cutting and
Patching

- .1 Execute cutting, including excavation, fitting and patching required to allow proper fitting of construction elements.
- .2 Where new elements connect with existing and where existing are altered, cut, patch and make good to match existing.
- .3 Obtain DND Rep's approval before cutting, boring or sleeving load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit construction elements to pipes, sleeves, ducts and conduits.

1.14 Existing
Services

- .1 It is the Contractor's ultimate responsibility to obtain a properly completed "CE Work Clearance Request form" (Annex A) to establish the location and extent of service lines in the area of work, before any clearing/digging is started.
- .2 Ten working days prior to the scheduled start date, the Contractor shall complete the "CE Work Clearance Request form".
- .3 The DND Rep will arrange for the form to be completed and signed by the authorized representative for:
 - .1 Electrical Distribution.
 - .2 POL Distribution.
 - .3 Sewer/Water/Drainage System.
 - .4 Heating Plant.
 - .5 Fire Department.
 - .6 UGSO (Unit General Safety Officer).
 - .7 W TIS
 - .8 Wing Operations.
 - .9 Commercial Utility Companies.
 - .10 Telus(Ticket Number)
 - .11 Alberta First Call
- .4 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- .5 Submit schedule to and obtain approval from DND Rep for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .6 Where unknown services are encountered, immediately advise DND Rep and confirm findings in writing.
- .7 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by DND Rep.
- .8 Record locations of maintained, re-routed and abandoned service lines.

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| <u>1.15 Additional Drawings</u> | .1 | DND Rep may furnish, if requested, additional copies of drawings and specifications. |
| <u>1.16 Alterations, Additions or Repairs to Existing Building</u> | .1 | Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with DND Rep to facilitate execution of work. |
| | .2 | Where security has been affected by work of Contract, provide temporary means to maintain security. |
| | .3 | Where elevators or conveyors exist in building, only those assigned for Contractor's use may be used for moving men and material within building. Protect walls of passenger elevators to approval of DND Rep before use. Accept liability for damage, safety of equipment and overloading of existing equipment. |
| | .4 | Provide temporary dust screens, barriers, and warning signs in locations where renovation and alteration work is adjacent to areas used by public or government staff. |
| <u>1.17 Restoration of Disturbed Surfaces</u> | .1 | The Contractor shall be responsible for the restoration of all disturbed areas including adjacent areas to excavations, disturbed grassed areas, hard surfaces and any other area damaged due to work carried out, as indicated and to the satisfaction of the DND Rep. |
| <u>1.18 Building Smoking Environment</u> | .1 | 4 Wing Cold Lake has a smoking policy in effect. Contractor is to obtain a copy from DND Rep and adhere to it. |
| <u>1.19 Asbestos Discovery</u> | .1 | If, during execution of contract work, workers uncover or disturb suspected asbestos products that are not covered in the contract specifications, STOP work in that area and advise DND Rep. |
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1.20 Security

- .1 Access
 - .1 Work carried out under the terms of this contract will be conducted within the General Restricted Area (GRA) where special and unique security regulations are enforced. Individuals without authorized passes in their possession will not be permitted to enter the GRA.
- .2 Clearances
 - .1 Work clearance will be granted in two possible ways, please see clause 1.2 for authorization:
 - .1 Security Mitigation Measures
 - .2 Security Requirements Check List.
- .3 Security Mitigation Measures
 - .1 In the case of Security Mitigation Measures, contractor will have access to the GRA only under full time escort.
 - .2 At no time shall the contractor's employees or sub-contractors be found within the GRA without an authorized pass and escort.
 - .3 Every effort will be made to provide escorts according to the provided construction schedule.
 - .4 The Contractor shall give minimum 48 hours notice (two working days) for the processing of the information and subsequent issue of the passes. The Contractor shall ensure that all employees are advised not to enter the GRA without prior authorization (GRA pass) and government issued photo identification.
- .4 Security Requirements Check List
 - .1 All personnel employed by the Contractor and performing work within the GRA will be subject to a Reliability screening performed by Public Works and Government Services Canada Security Division. Prior to commencement of the Work, the Contractor and each of his personnel involved in the performance of the Contract must be security screened by the Canadian and International Industrial Security Division of the Department of Public Works and Government Services at the level of RELIABILITY STATUS.
 - .2 Information that the contractor must provide for this screening include: Date of Birth; Address; Country of Origin; Education/Professional qualifications; Employment history; and References/Personal character. The security Division will perform Criminal Record check and Credit check on each applicant. If significant adverse information

1.20 Security
(Cont'd)

- .4 (Cont'd)
- .2 (Cont'd)
- arises during the conduct of a security assessment, the individual will be notified, in person, and given an opportunity to explain the circumstances. If the Deputy Minister, PWGSC, after reviewing a security assessment, denies the granting of RELIABILITY STATUS, the individual(s) concerned shall be so notified in writing along with information relating to their right of appeal and subsequent admission to the GRA will be prohibited, pending the outcome of any appeal.
- .3 The Contractor shall obtain GRA passes from the Wing Military Police Identification Section from information provided by the Contractor to the Contracting Authority or Contract Inspector. The Contractor shall give minimum 48 hours notice (two working days) for the processing of the information and subsequent issue of the passes. The Contractor shall ensure that all employees are advised not to enter the GRA without prior authorization (GRA pass) and government issued photo identification.
- .4 The Contractor shall be responsible for his sub-contractors, ensuring all security related requirements are met.
- .5 The Contractor shall provide a list of employees and sub-contractors, complete with telephone numbers, who may be contacted during non-working hours in the event of any emergency.
- .6 The Contractor shall ensure that all passes issued to his designated employees and sub-contractors are returned for cancellation prior to issuance of the DND Rep's final certificate of completion.
- .5 CLAWR (Cold Lake Air Weapons Range) Special conditions.
- .1 The contractor shall provide DND a list of personnel who need access to the area to perform work under the terms of the contract.
- .2 All personnel are required to attend a 1 hour "Range Safety Briefing" prior to conducting any work or accessing the PLER site.
- .3 Contractor shall provide schedule minimum 14 days in advance of scheduled work on site. Any changes to this schedule shall be provided to the inspector at a minimum of 48 hours advance notice (two working days) for processing of information and subsequent clearances to PLER. The Contractor shall

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|---------------|----|----------|
| 1.20 Security | .5 | (Cont'd) |
| (Cont'd) | | |
- .3 (Cont'd)
 - ensure that all employees are advised not to enter the PLER without prior authorization.
 - .4 Information that the contractor must provide for access: name of individual(s), dates and times for access, location of work, phone number, drivers licence.
 - .5 Work clearance will be granted by DND through Wing Operations Mr Dick Brakely @ local 7978.
 - .6 The Contractor shall be responsible for his sub-contractors, ensuring all security related requirements are met.
 - .7 Garbage or refuse shall be removed off the CLAWR.
 - .8 Feeding wildlife is prohibited.
 - .9 All meals must be prepared and consumed in a suitable enclosed space or building.
 - .10 Report to Range Safety Officer (RSO) as required by DND.
 - .11 The Contractor shall provide a list of employees and sub-contractors, complete with telephone numbers, who may be contacted during non-working hours in the event of any emergency.

PART 2 - PRODUCTS

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|--------------|----|-----------|
| 2.1 Not Used | .1 | Not Used. |
|--------------|----|-----------|

PART 3 - EXECUTION

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|--------------|----|-----------|
| 3.1 Not Used | .1 | Not Used. |
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END

PART 1 - GENERAL

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|-----------------------------|----|---------------------------------|
| <u>1.1 Section Includes</u> | .1 | Shop drawings and product data. |
| | .2 | Samples. |
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|-----------------------|----|---|
| <u>1.2 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
|-----------------------|----|---|
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|---------------------------|----|---|
| <u>1.3 Administrative</u> | .1 | Submit to DND Rep submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. |
| | .2 | Work affected by submittal shall not proceed 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 DND Rep. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected. |
| | .6 | Notify DND Rep, 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. |
-

- 1.3 Administrative (Cont'd)
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by DND Rep's Consultant's review of submittals.
 - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by DND Rep Consultant review.
 - .10 Keep one reviewed copy of each submission on site.
- 1.4 Shop Drawings
- .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 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.
 - .3 Allow 14 days for DND Rep's review of each submission.
 - .4 Adjustments made on shop drawings by DND Rep are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to DND Rep prior to proceeding with Work.
 - .5 Make changes in shop drawings as DND Rep may require, consistent with Contract Documents. When resubmitting, notify DND Rep in writing of any revisions other than those requested.
 - .6 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.
-

1.4 Shop Drawings
(Cont'd)

- .7 Submissions shall 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.
- .8 After DND Rep's review, distribute copies.
- .9 Submit prints, number as required by contractor plus two(2) copies to be retained by DND Rep, of shop drawings for each requirement requested in specification Sections and as consultant may reasonably request.
- .10 Submit prints, number as required by contractor **plus two(2)** copies to be retained by DND Rep, of product data sheets or brochures for requirements requested in specification Sections and as requested by DND Rep where shop drawings will not be prepared due to standardized manufacture of product.
- .11 Delete information not applicable to project.
- .12 Supplement standard information to provide details applicable to project.
- .13 If upon review by DND Rep, 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
-

1.4 Shop Drawings
(Cont'd)

- .13 (Cont'd)
procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .14 The review of shop drawings by Department of National Defence (DND) is for sole purpose of ascertaining conformance with general concept. This review shall not mean that DND approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. 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 all sub-trades.

1.5 Product Data

- .1 Manufacturers' catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- .2 Submit 2 copies of product data.
- .3 Sheet size: 215 x 280 mm.
- .4 Delete information not applicable to project.
- .5 Supplement standard information to provide details applicable to project.
- .6 Cross-reference product data information to applicable portions of Contract documents.

1.6 Samples

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to DND Rep.
- .3 Notify DND Rep in writing, at time of submission of deviations in samples from requirements of SOA Documents.
-

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|-------------------------|----|--|
| 1.6 Samples
(Cont'd) | .4 | Where colour, pattern or texture is criterion, submit full range of samples. |
| | .5 | Adjustments made on samples by DND Rep are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to DND Rep prior to proceeding with Work. |
| | .6 | Make changes in samples which DND Rep may require, consistent with Contract Documents. |
| | .7 | Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified. |

PART 2 - PRODUCTS

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|--------------|----|-----------|
| 2.1 Not Used | .1 | Not Used. |
|--------------|----|-----------|

PART 3 - EXECUTION

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|--------------|----|-----------|
| 3.1 Not Used | .1 | Not Used. |
|--------------|----|-----------|

END

PART 1 - GENERAL

- | | | |
|---|----|--|
| <u>1.1 Section Includes</u> | .1 | Informational and Warning Devices. |
| | .2 | Protection and Control of Public Traffic. |
| | .3 | Operational Requirements. |
| <u>1.2 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
| <u>1.3 References</u> | .1 | Uniform Traffic Control Devices for Canada, (UTCD) January 1976(distributed by Transportation Association of Canada). |
| | .2 | Manual of Uniform Traffic Control Devices for Streets and Highways, US FHWA, Part IV, - 1988. |
| <u>1.4 Protection of Public Traffic</u> | .1 | Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment. |
| | .2 | When working on travelled way:
.1 Place equipment in position to present minimum of interference and hazard to traveling public.
.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
.3 Do not leave equipment on travelled way overnight. |
| | .3 | Do not close any lanes of road without approval of DND Rep . Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in Part D of UTCD. |
-

- 1.4 Protection of Public Traffic (Cont'd)
- .4 Keep travelled way graded, free of pot holes and of sufficient width for required number of lanes of traffic.
- .1 Provide minimum 7 m wide temporary roadway for traffic in two-way sections through Work and on detours.
- .2 Provide minimum 5 m wide temporary roadway for traffic in one-way sections through Work and on detours.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of DND Rep.
- 1.5 Informational and Warning Devices
- .1 Provide and maintain signs, flashing warning lights and/or other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Part D, Temporary Conditions Signs and Devices, of UTCD manual.
- .3 Place signs and other devices in locations recommended in UTCD manual.
- .4 Meet with DND Rep prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Dnd rep.
- .5 Continually maintain traffic control devices in use by:
- .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
- .2 Removing or covering signs which do not apply to conditions existing from day to day.
- 1.6 Control of Public Traffic
- .1 Provide competent flag persons, trained in accordance with, and properly equipped as specified in, UTCD manual in following situations:
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1.6 Control of
Public Traffic
(Cont'd)

- .1 (Cont'd)
- .1 When public traffic is required to pass working vehicles or equipment which block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 At each end of restricted sections where pilot cars are required.
 - .8 Delays to public traffic due to contractor's operators: maximum 15min.
- .2 Where roadway, carrying two-way traffic, to be restricted to one lane, for 24 h each day, provide portable traffic signal system. Adjust, as necessary, and regularly maintain system during period of restriction. Signal system to meet requirements of Part IV of Manual of Uniform Traffic Control Devices to Street and Highways, US FHWA.

1.7 Operational
Requirements

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified herein and approved by DND Rep to protect and control public traffic.
- .2 Maintain existing conditions for traffic crossing right-of-way.
-

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

- | | | |
|--|----|--|
| <u>1.1 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
| <u>1.2 General Protection</u> | .1 | Do not disrupt airport business except as permitted by DND Rep . |
| | .2 | Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic: |
| | .3 | Provide barricades and lights where directed. |
| <u>1.3 Movement of Equipment and Personnel</u> | .1 | In areas of airport not closed to aircraft traffic:
.1 Obtain DND Rep's approval on scheduling of Work.
.2 Control movements of equipment and personnel as directed by DND Rep .
.3 Provide qualified field personnel at locations designated by DND Rep to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
.4 Obey signals from airport traffic control tower instantly. |
| <u>1.4 Unserviceable Areas</u> | .1 | Mark off areas made unserviceable for aircraft by Work of this Contract by providing plainly visible danger markings by day and red lights by night. Open flames and inflammable fuels are not permitted. |
| | .2 | Park equipment not in use and stockpile materials so that stockpile tops are below 50 to 1 ratio from ends of useable landing strip and below 20 to 1 ratio from sides of aircraft traffic areas. Mark tops with red lights. |
-

- 1.5 Trenching .1 Obtain DND Rep's written permission to undertake trenching on pavements open to aircraft traffic which cannot be completed, backfilled and sealed within one working day.
- 1.6 Airport Facilities .1 DND Rep will arrange for the location of underground facilities such as cables, pipes and ducts. Notify DND Rep of work areas sufficiently in advance of operations so that underground facilities can be located.
- 1.7 Paint Markings .1 Any paint applied to the aerodrome surface must be approved by DND Rep.
- .2 All markings must be of non permanent type such as chalk or water soluble paint.
- 1.8 Radio Communications .1 Base authority will assign call signs.
- .2 Do not use control tower frequencies for idle chatter.
- 1.9 Flight Safety .1 Prior to permitting personnel to cross active runways, taxiways, parking aprons or working within 60 m of active facility, establish radio contact with control tower and obtain specific clearances.
- .2 Prior to starting work, obtain necessary closure of adjacent facilities.
- .3 Maintain continuous radio watch. Obey all instructions promptly and explicitly.
- .4 Radio:
- .1 The Contractor's personnel and equipment authorized to enter the security area, will be given a DND two-way radio. If no radio are available, the Contractor shall be escorted to cross runways, taxiways or parking aprons.
- .2 Any Contractor's employee found outside of the work site limit, will have his security pass revoked and will no longer be allowed inside the security area.
-

- 1.10 Cleaning FOD .1 Where travel routes cross active runways, taxiways or parking aprons, broom clean immediately.
- .2 Where access routes cross active runways, taxiways or parking aprons, keep crossings free of mud and debris at all times.
- .3 See Section 01 74 11 - Cleaning for further FOD info.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

END

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- .2 The contractor will be acting as the Prime Contractor for this contract and will certify this agreement in writing with the DND representative. Refer to Annex D for prime contractors's Agreement.
- 1.2 References .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Alberta Occupational Health and Safety Act, R.S.A. 1980.
- 1.3 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 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to DND Rep weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit Material Safety Data Sheets (MSDS) to DND Rep.
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|--------------------------------|-----|---|
| 1.3 Submittals
(Cont'd) | .7 | DND Rep will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10days after receipt of plan. Revise plan as appropriate and resubmit plan to DND Rep within 10 days after receipt of comments from DND Rep. |
| | .8 | DND Rep 's review of Contractor'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 DND Rep. |
| | .10 | On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations. |
| 1.4 Filing of
Notice | .1 | File Notice of Project with Provincial authorities prior to commencement of Work. |
| 1.5 Safety
Assessment | .1 | Perform site specific safety hazard assessment related to project. |
| 1.6 Meetings | .1 | Schedule and administer Health and Safety meeting with DND Rep prior to commencement of Work. |
| 1.7 Project/Site
Conditions | .1 | Work at site may involve contact with: <ul style="list-style-type: none"> .1 Asbestos. .2 Lead Paint |
| 1.8 General
Requirements | .1 | Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and |

1.8 General
Requirements
(Cont'd)

- .1 (Cont'd)
Safety Plan must address project specifications.
- .2 DND Rep may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 Responsibility

- .1 Be responsible for health and safety of persons on site, safety of 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.

1.10 Compliance Requirements

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta. Reg. 1980. and 4 Wing Safety Measures listed below;
- .2 Contractors and their personnel shall be familiar with this section and its requirements.
- .3 Observe and enforce construction safety measures required by National Building Code 2005, Part 8; Provincial Government, Workmen's Compensation Board and municipal statutes and authorities.
- .4 Hard hats and safety boots shall be worn at all times at construction site.
- .5 Hard hats and safety boots shall be worn at all times while operating mobile equipment.
- .6 Eye or face protection shall be worn when handling any material liable to injure or irritate the eyes or when engaging in any work producing hazard from flying objects or when operating power lawn equipment and tools.
- .7 Hearing protection shall be worn when entering or working in a noise hazardous area. This is to include, but not limited, to the

1.10 Compliance
Requirements
(Cont'd)

- .7 (Cont'd)
flight line when aircraft are running, shop operations where sound levels exceed 85 decibels and operators of vehicles or equipment which produce excessive noise.
 - .8 Respirators shall be worn when a worker is or may be exposed to an oxygen deficient area or to harmful concentration of gas, vapours, smoke, fumes, mist or dust.
 - .9 All employees who handle or are exposed to hazardous materials as defined under the Hazardous Product Act (WHMIS Legislation) shall be WHMIS trained in accordance with the act.
 - .10 Material safety data sheets (MSDS) for all materials falling under the WHMIS program shall be supplied to the work site by the Contractor/Sub-contractor or user(s), and readily accessible to all on-site personnel.
 - .11 No employee shall enter or be permitted to enter a hazardous confined space unless such entry is made in compliance with Occupational Safety and Health and Labour Canada Standards.
 - .12 Confined spaces entry permit must be obtained from the Fire Department and completed prior to the entry into a confined space.
 - .13 Safety belts and lifelines shall be worn when working at heights greater than 3.26 metres above floor level where it is impractical to provide adequate work platforms or staging.
 - .14 All elevated work sites shall have the area underneath cordoned off to prevent injuries from falling debris.
 - .15 All construction sites which present a potential hazard to the public shall be properly cordoned off and signs prominently placed, warning of possible dangers.
 - .16 No burning, cutting, welding or use of any heat producing device is allowed without a hot work permit from the Fire Department (Annex B). A pre-work inspection and post-work inspection is mandatory.
 - .1 Fire Department phone number for Safety/Fire Inspector is:
 - .1 840-8000 ext. 8198.
-

1.10 Compliance
Requirements
(Cont'd)

- .17 All accidents are to be reported through the DND Rep immediately.
- .18 In addition to these 4 Wing Cold Lake's General Safety Contractor Regulations, all Alberta Occupational Health and Safety Regulations shall be adhered to at all times.
- .19 In event of conflict between any provisions of above authorities the most stringent provisions govern.
 - .1 The following are the known hazardous substances and/or hazardous conditions at the work site which will be considered as health or environmental hazards and shall be properly managed should they be encountered as part of the work.
 - .2 Specific hazards that may impact significantly on the contract or present significant risk
 - .1 Excavation
 - .2 Hot work
 - .3 Fall Hazards
 - .4 Heavy Equipment
 - .5 Overhead/underground Utilities
 - .3 Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include in their tender price all work associated in working with, in and around the hazards.
 - .4 The above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of the Contractor,s operations during the course of work. Include the above items into the hazard assessment program specified herein.

1.11 Cell Phones

- .1 Use of cellular phones are prohibited within Refueling Compounds.
- .2 Cell phones shall not be operated within 15M of an aircraft.

1.12 Overloading

- .1 Ensure no part of work is subjected to loading that will endanger its safety or will cause permanent deformation.
-

1.13 Hazardous Material .1 All hazardous material must be identified and labelled in accordance with the Workplace Hazardous Material Information System (WHMIS) and copies of the Material Safety Data Sheet (MSDS) shall be supplied to both the Wing Fire Chief and DND Rep.

1.14 Unforeseen Hazards .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise DND Rep verbally and in writing.

1.15 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 minimum 2 years' site-related working experience specific to construction activities taking place.
- .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 for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of any hazardous Work and report directly to and be under direction of site supervisor.

1.16 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 DND Rep.

- 1.17 Correction of Non-Compliance
- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by DND Rep.
 - .2 Provide DND Rep with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 DND Rep may stop Work if non-compliance of health and safety regulations is not corrected.

- 1.18 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
- .1 Not used.

PART 3 - EXECUTION

- 3.1 Not Used
- .1 Not used.

END

PART 1 - GENERAL

- 1.1 Precedence .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.2 Fire Department Briefing .1 DND Rep will coordinate arrangements for contractor to be briefed on Fire Safety at their pre-work conference by Fire Chief before any work is commenced.
- 1.3 Reporting Fires .1 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .2 Report immediately all fire incidents to the Fire Department as follows:
.1 Activate nearest fire alarm box, or
.2 Telephone 911 in case of EMERGENCY ONLY.
- .3 Person activating fire alarm box will remain at the front entrance to direct Fire Department to scene of fire.
- .4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify the location.
- 1.4 Fire Safety Plan .1 Submit a fire safety plan for the construction site prior to commencement of construction work. The fire safety plan shall conform to the National Fire Code of Canada.
- .2 Post the fire safety plan at the entrance to the construction site or near the construction site's health and safety board.
- .3 The fire safety plan shall conform to the National Fire Code of Canada, and shall contain, at minimum:
.1 Emergency procedures to be used in case of fire, including
.1 Sounding the fire alarm;
.2 Notifying the fire department;
.3 Instructing occupants on procedures to be followed when the fire alarm sounds;
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|---|----|---|
| 1.4 Fire Safety Plan
(Cont'd) | .3 | (Cont'd) |
| | .1 | (Cont'd) |
| | .4 | Evacuating occupants, including special provisions for persons requiring assistance; and |
| | .5 | Confining, controlling and extinguishing fires. |
| | .2 | The appointment and organization of designated supervisory staff to carry out fire safety duties. |
| | .3 | The training of supervisory staff and other occupants in their responsibilities for fire safety. |
| | .4 | Documents including diagrams, showing the type, location and operation of building fire emergency systems. |
| | .5 | The holding of fire drills (where applicable). |
| | .6 | The control of fire hazards in the building. |
| | .7 | The inspection and maintenance of building facilities provided for the safety of occupants. |
| 1.5 Interior and Exterior Fire Protection and Alarm Systems | .1 | Fire protection and alarm system will not be: |
| | .1 | obstructed; |
| | .2 | shut-off; and |
| | .3 | left inactive at end of working day or shift without authorization from Fire Chief. |
| | .2 | Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Chief. |
| 1.6 Fire Protection System Impairment | .1 | Notify the DND Representative and Fire Chief 48 hours prior to shutting down any active fire protection system, including water supply, fire suppression, fire detection and life safety systems. |
| | .2 | Implement all fire protection system impairments in accordance with the National Fire Code of Canada and departmental policy. |
| 1.7 Fire Extinguishers | .1 | Supply fire extinguishers, as scaled by Fire Chief, necessary to protect work in progress and contractor's physical plant on site. |
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1.8 Installation
and/or Repair of
Roof to Include
Contractors
Physical Plant at
Site

- .1 Notify Fire Chief of location of any asphalt kettles and dates that kettles will be in use. Ensure personnel use and take precautions as follows :
 - .1 Use kettles equipped with thermometers or gauges in good working order.
 - .2 Locate kettles in safe place outside of building or, if approved by Fire Chief, on non-combustible roof. Locate to avoid danger of igniting combustible material below.
 - .3 Maintain continuous supervision while kettles are in operation and provide metal covers for kettles to smother any flames in case of fire. Fire extinguishers shall be provided as required in 1.4.
 - .4 Prior to start of work , demonstrate container capacities to Fire Chief.
 - .5 Use only glass fibre roofing mops.
 - .6 Used roofing mops will not be left unattended on roof and shall be stored away from building and combustible materials.
 - .7 All roofing materials will be stored in location no closer than 3 m to any structures.

1.9 Blockage of
Roadways

- .1 Advise Fire Chief of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Chief, erecting of barricades and digging of trenches.
- .2 Wing Transport shall be advised of any work that would impede "Emergency" vehicles located at:
 - .1 Building 4 - Fire Hall
 - .2 Building 5 - Wing Transport
 - .3 Building 785 - MP Station
 - .4 Building 75 - Ambulance location
- .3 Minimum horizontal clearance: clear width of not less than 5m.
- .4 Minimum vertical clearance: overhead height of not less than 6m.

1.10 Smoking
Precautions

- .1 Smoking is prohibited in all DND buildings. Observe posted smoking restrictions near existing buildings.
-

1.11 Rubbish and
Waste Materials

- .1 Rubbish and waste materials are to be kept to a minimum.
- .2 Burning of rubbish is prohibited.
- .3 Removal:
 - .1 Remove all rubbish from work site at end of work day or shift or as directed.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and removed as specified above.

1.12 Flammable and
Combustible Liquids

- .1 Handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
 - .2 Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of Fire Chief.
 - .3 Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
 - .4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
 - .5 Flammable liquids having a flash point below 38° C such as naphtha or gasoline will not be used as solvents or cleaning agents.
 - .6 Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Fire Department is to be notified when disposal is required.
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1.13 Hazardous
Substances

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, will be in accordance with National Fire Code of Canada.
- .2 Obtain from Fire Chief a "Hot Work" permit (Annex B) for work involving welding, burning or use of blow torches and salamanders, in buildings or facilities.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of the Fire Chief. Contractors are responsible for providing fire watch service for work on a scale established and in conjunction with Fire Chief at pre-work conference.
- .4 Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation shall be provided and all sources of ignition are to be eliminated. Fire Chief is to be informed prior to and at cessation of such work.

1.14 Questions or
Clarifications

- .1 Direct any questions or clarification on Fire Safety in addition to above requirements to the DND representative. DND is responsible to obtain clarifications from the Fire Chief.

1.15 Fire
Inspection

- .1 Site inspections by Fire Chief will be coordinated through DND Rep.
 - .2 Allow Fire Chief unrestricted access to work site.
 - .3 Co-operate with Fire Chief during routine fire safety inspection of work site.
 - .4 Immediately remedy all unsafe fire situations observed by Fire Chief.
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PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

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| <u>1.1 General</u> | .1 | Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation |
| <u>1.2 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
| <u>1.3 Fires</u> | .1 | Fires and burning of rubbish on site not permitted. |
| <u>1.4 Disposal of Wastes</u> | .1 | Do not bury rubbish and waste materials on site unless approved by DND Rep. |
| | .2 | Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers. |
| | .3 | The contractor shall dispose of all rubbish and residue in accordance with existing provincial and/or municipal regulations and/or bylaws. A disposal manifest will be delivered to the Project Authority to ensure the waste has been accepted by a proper facility. |
| | .4 | Costs associated with appropriate removal, transportation and disposal of ALL WASTE is the responsibility of the Contractor |
| <u>1.5 Drainage</u> | .1 | Provide temporary drainage and pumping as necessary to keep excavations and site free from water. |
| | .2 | Do not pump water containing suspended materials into waterways, sewer or drainage systems. |
| | .3 | Control disposal or runoff of water containing suspended materials or other |
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| 1.5 Drainage
(Cont'd) | .3 | (Cont'd)
harmful substances in accordance with local
authority requirements. |
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| 1.6 Site Clearing
and Plant
Protection | .1 | Protect trees and plants on site and adjacent
properties where indicated. |
| | .2 | Wrap in burlap, trees and shrubs adjacent to
construction work, storage areas and trucking
lanes, and encase with protective wood
framework from grade level to height of 2 m. |
| | .3 | Protect roots of designated trees to dripline
during excavation and site grading to prevent
disturbance or damage. Avoid unnecessary
traffic, dumping and storage of materials over
root zones. |
| | .4 | Minimize stripping of topsoil and vegetation. |
| | .5 | Restrict tree removal to areas indicated or
designated by DND Rep. See Section 01 00 01
1.6.3 for tree replacement requirements. |
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| 1.7 Work Adjacent
to Waterways | .1 | Do not operate construction equipment in
waterways. |
| | .2 | Do not use waterway beds for borrow material. |
| | .3 | Do not dump excavated fill, waste material or
debris in waterways. |
| | .4 | Design and construct temporary crossings to
minimize erosion to waterways. |
| | .5 | Do not skid logs or construction materials
across waterways. |
| | .6 | Avoid indicated spawning beds when
constructing temporary crossings of waterways. |
| | .7 | Do not blast under water or within 100 m of
indicated spawning beds. |
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| 1.8 Pollution
Control | .1 | Maintain temporary erosion and pollution
control features installed under this
contract. |
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| 1.8 Pollution Control
(Cont'd) | .2 | Control emissions from equipment and plant to local authorities emission requirements. |
| | .3 | Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures. |
| | .4 | Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads. |
| 1.9 Protection of Monitoring Wells | .1 | Protect any and all existing groundwater monitoring wells. Report any disturbances or damage to the Project Authority immediately. Wing Environment will need to be informed |
| 1.10 Halocarbons | .1 | Refrigeration units will comply with the Federal Halocarbon Regulations (FHR), 2003. |
| | .2 | Halocarbon refrigerants shall be R410A or a suitable CFC free substitute. Non-halocarbon refrigerants are still acceptable. |
| | .3 | When the unit is installed, serviced, or decommissioned by a contractor, the Halocarbon Reporting Form must be completed and submitted to the Project Authority. |
| | .4 | Report all halocarbon releases to the Project Authority, Wing Fire Hall and Wing Environment. |
| 1.11 Spill Response and Report | .1 | Spill kits will be on site where there is potential for spillage onto the ground. |
| | .2 | Personnel on site will be educated in the use of spill kits and spill response based on the equipment on site. |
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- .3 Secondary containment will be provided for generators or other fuel-powered equipment. This equipment will not be located within 30m of a waterway.
- .4 Secondary containment for temporary fuel storage tanks, held on site by the contractor, will be implemented.
- .5 Any spill, regardless of size, will be reported immediately to the Project Authority following the Environmental Incident and Emergency Plan, so proper reporting procedures can be implemented.
- .6 An Environmental Incident Report will be completed and submitted to Wing Environment to report the spill within 24 hrs, follow-up may be required. Environmental Incident Report forms are available from W Env or Project Authority.
- .7 Should the spill exceed the capabilities of the spill kits and the personnel on site, the Fire Department shall be contacted.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

PART 1 - GENERAL

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|-----------------------|----|---|
| <u>1.1 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
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|-------------------------|-----|---|
| <u>1.2 Associations</u> | .1 | ANSI - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, New York, U.S.A. 10036 URL http://www.ansi.org |
| | .2 | ARI - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, Virginia, U.S.A. 22203 URL http://www.ari.org |
| | .3 | ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, Georgia, U.S.A. 30329 URL http://www.ashrae.org |
| | .4 | ASTM - American Society for Testing and Materials, 100 Barr Harbor Drive West, Conshohocken, Pennsylvania 19428-2959 URL http://www.astm.org |
| | .5 | AWPA - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA U.S.A. 22314-1757 URL http://www.awpa.org |
| | .6 | AWPA - American Wood Preservers' Association, P.O. Box 5690, Granbury Texas, U.S.A. 76049-0690 URL http://www.awpa.com |
| | .7 | AWS - American Welding Society, 550 N.W. LeJeune Road, Miami, Florida U.S.A. 33126 URL http://www.amweld.org |
| | .8 | CCA Canadian Construction Association, 75 Albert St., Suite 400 Ottawa, Ontario, K1P 5E7 URL http://www.cca-acc.com |
| | .9 | CCDC Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC |
| | .10 | CFFM - Canadian Forces Fire Marshal, 101 Colonel By Drive, 8NT MGen George R. Pearkes Bldg., Ottawa, Ontario K1A 0K2 |
| | .11 | CGSB - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier |
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1.2 Associations
(Cont'd)

- .11 (Cont'd)
Street, Hull, Quebec K1A 0S5 URL
<http://w3.pwgsc.gc.ca/cgsb>
 - .12 CISC - Canadian Institute of Steel
Construction, 201 Consumers Road, Suite 300,
Willowdale, Ontario M2J 4G8 URL
<http://www.cisc-icca.ca>
 - .13 CLA - Canadian Lumbermen's Association, 27
Goulburn Avenue, Ottawa, Ontario, K1N 8C7 URL
<http://www.cla-ca.ca>
 - .14 CRCA - Canadian Roofing Contractors
Association, 155 Queen Street, Suite 1300,
Ottawa, Ontario K1P 6L1 URL
<http://www.roofingcanada.com>
 - .15 CSA - Canadian Standards Association
International, 178 Rexdale Blvd., Toronto,
Ontario M9W 1R3 URL
<http://www.csa-international.org>
 - .16 CSC - Construction Specifications Canada, 120
Carlton Street, Suite 312, Toronto, Ontario
M5A 4K2 URL <http://www.csc-dcc.ca>
 - .17 CSDMA - Canadian Steel Door Manufacturers
Association, One Yonge Street, Suite 1801,
Toronto, Ontario M5E 1W7
 - .18 CSSBI - Canadian Sheet Steel Building
Institute, 652 Bishop St. N., Unit 2A,
Cambridge, Ontario N3H 4V6 URL
<http://www.cssbi.ca>
 - .19 CWC - Canadian Wood Council, 1400 Blair
Place, Suite 210, Ottawa, Ontario K1J 9B8 URL
<http://www.cwc.ca>
 - .20 EC - Environment Canada, Conservation and
Protection, Inquiry Centre, 351 St. Joseph
Blvd, Hull, Québec K1A 0H3 URL
<http://www.ec.gc.ca>
 - .21 MPI - The Master Painters Institute, 4090
Graveley Street, Burnaby, BC V5C 3T6 URL
<http://www.paintinfo.com>
 - .22 NABA - National Air Barrier Association, PO
Box 2747, Winnipeg, Manitoba R3C 4E7 URL
<http://www.naba.ca>
-

1.2 Associations
(Cont'd)

- .23 NLGA - National Lumber Grades Authority,
406-First Capital Place, 960 Quayside Drive,
New Westminster, B.C. V3M 6G2
- .24 NRC - National Research Council, Building
M-58, 1200 Montreal Road, Ottawa, Ontario K1A
0R6 URL <http://www.nrc.gc.ca>
- .25 NSPE National Society of Professional
Engineers, 1420 King Street, Alexandria, VA
U.S.A. 22314-2794 URL <http://www.nspe.org>
- .26 QPL - Qualification Program List, c/o
Canadian General Standards Board, Place du
Portage, Phase III, 6B1, 11 Laurier Street,
Hull, Quebec K1A 1G6 URL
<http://www.pwgsc.gc.ca/cgsb>
- .27 RAIC Royal Architectural Institute of Canada,
55 Murray Street, Suite 330, Ottawa, Ontario,
K1N 5M3 URL <http://www.raic.org>
- .28 SCC - Standards Council of Canada, 270 Albert
Street, Suite 2000, Ottawa, Ontario K1P 6N7
URL <http://www.scc.ca>
- .29 UL - Underwriters' Laboratories, 333
Pfungsten Road, Northbrook, Illinois, U.S.A.
60062-2096 URL <http://www.ul.com>
- .30 ULC - Underwriters' Laboratories of Canada, 7
Crouse Road, Toronto, Ontario M1R 3A9 URL
<http://www.ulc.ca>

1.3 Reference
Standards

- .1 Within the text of the specifications,
reference may be made to the following
standards:
 - .1 AA - Aluminum Association
 - .2 ACI - American Concrete Institute
 - .3 ACEC - Association of Consulting
Engineers of Canada
 - .4 AISC - American Institute of Steel
Construction
 - .5 ANSI - American National Standards
Institute
 - .6 API - American Petroleum Institute
 - .7 ASPT - Association for Asphalt Paving
Technologists
 - .8 ASME - American Society of Mechanical
Engineers
 - .9 ASTM - American Society for Testing and
Materials
-

1.3 Reference Standards (Cont'd)	.1 (Cont'd)	
	.10 AWMAC - Architectural Woodwork Manufacturers Association of Canada	
	.11 AWPA - American Wire Producers Association	
	.12 AWS - American Welding Society	
	.13 CCA - Canadian Construction Association	
	.14 CCDC - Canadian Construction Documents Committee	
	.15 CCME - Canadian Council of Ministers of the Environment	
	.16 CEC - Canadian Electrical Code (published by CSA)	
	.17 CEMA - Canadian Electrical Manufacturer's Association	
	.18 CEPA - Canadian Environmental Protection Act	
	.19 CGSB - Canadian General Standards Board	
	.20 CISC - Canadian Institute of Steel Construction	
	.21 CLA - Canadian Lumberman's Association	
	.22 CPCA - Canadian Painting Contractors' Association	
	.23 CPCI - Canadian Prestressed Concrete Institute	
	.24 CPMA - Canadian Paint Manufacturers Association	
	.25 CRCA - Canadian Roofing Contractors Association	
	.26 CSA - Canadian Standards Association	
	.27 CSC - Construction Specifications Canada	
	.28 CSSBI - Canadian Sheet Steel Building Institute	
	.29 ECP - Environmental Choice Program	
	.30 EIMA - EIFS Industry Manufacturer's Association	
	.31 EPA - Environmental Protection Agency	
	.32 FGMA - Flat Glass Manufacturers Association	
	.33 FM - Factory Mutual Engineering Corporation	
	.34 GRI - Geosynthetic Research Institute	
	.35 ICEA - Insulated Cable Engineers Association	
	.36 IEEE - Institute of Electrical and Electronic Engineers	
	.37 IPCEA - Insulated Power Cable Engineers Association	
	.38 LSGA - Laminators Safety Glass Association	
	.39 MSS Manufacturers Standardization Society of the Valve and Fittings Industry	
	.40 NAAMM - National Association of Architectural Metal Manufacturers	
	.41 NBC - National Building Code	

1.3 Reference Standards (Cont'd)	.1	(Cont'd)
	.42	NEMA - National Electrical Manufacturers Association
	.43	NFPA - National Fire Protection Association
	.44	NHLA - National Hardwood Lumber Association
	.45	NLGA - National Lumber Grades Authority
	.46	NSPE - National Society of Professional Engineers
	.47	RAIC - Royal Architectural Institute of Canada
	.48	SSPC - Steel Structures Painting Council
	.49	TTMAC - Terrazzo, Tile and Marble Association of Canada
	.50	ULC - Underwriters' Laboratories of Canada

PART 2 - PRODUCTS

2.1 Not Used	.1	Not Used.
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PART 3 - EXECUTION

.2	Not Used.
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PART 2 - PRODUCTS

2.1 Not Used	.1	Not Used.
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PART 3 - EXECUTION

3.1 Not Used	.1	Not Used.
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END

PART 1 - GENERAL

- | | | |
|--------------------------------------|----|---|
| <u>1.1 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
| <u>1.2 Installation and Removal</u> | .1 | Provide temporary utilities controls in order to execute work expeditiously. |
| | .2 | Remove from site all such work after use. |
| | .3 | Remove temporary facilities from site when directed by Engineer. |
| <u>1.3 Dewatering</u> | .1 | Provide temporary drainage and pumping facilities to keep excavations and site free from standing water. |
| <u>1.4 Water Supply</u> | .1 | DND can provide, free of charge, temporary water for construction purposes. |
| | .2 | Engineer will determine delivery points and quantitative limits. Engineer's written permission is required before any connection is made. |
| | .3 | Provide, at no cost to DND, all equipment and temporary lines to bring these services to work area. |
| | .4 | Supply of temporary services by DND is subject to DND requirements and may be discontinued by Engineer at any time without notice, without any acceptance of any liability for damage or delay caused by such withdrawal of temporary services. |
| <u>1.5 Temporary Power and Light</u> | .1 | DND can provide, free of charge, temporary electric power for construction purposes |
| | .2 | Engineer will determine delivery points and quantitative limits. Engineer's written |
-

1.5 Temporary Power .2
and Light
(Cont'd)

- (Cont'd)
- permission is required before any connection is made. Connect to existing power supply in accordance with Canadian Electrical Code.
- .3 Provide, at no cost to DND, all equipment and temporary lines to bring these services to work area.
- .4 Supply of temporary services by DND is subject to DND requirements and may be discontinued by Engineer at any time without notice, without any acceptance of any liability for damage or delay caused by such withdrawal of temporary services.
- .5 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .6 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Engineer provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.6 Temporary
Communication
Facilities

- .1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment necessary for own use.

1.7 Fire
Protection

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.
-

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

————— END —————

PART 1 - GENERAL

<u>1.1 Section Includes</u>	.1	Construction aids.
	.2	Office and sheds.
	.3	Parking.
	.4	Project identification.
<u>1.2 Precedence</u>	.1	For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
<u>1.3 Related Sections</u>	.1	Section 01 51 00 - Temporary Utilities.
<u>1.4 References</u>	.1	Canadian General Standards Board (CGSB) .1 CGSB 1-GP-189M, Primer, Alkyd, Wood, Exterior. .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
	.2	Canadian Standards Association (CSA International) .1 CAN/CSA-A23.1-00, Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete. .2 CSA O121-M1978 (R1998), Douglas Fir Plywood. .3 CSA Z321-96, Signs and Symbols for the Occupational Environment.
<u>1.5 Installation and Removal</u>	.1	Provide construction facilities in order to execute work expeditiously.
	.2	Remove from site all such work after use.
	.3	Remove temporary facilities from site when directed by DND Rep.

- 1.6 Scaffolding
- .1 Design and construct scaffolding in accordance with CAN/CSA-S269.2-M87 (R1998).
 - .2 Construct and maintain scaffolding in rigid, secure and safe manner.
 - .3 Erect scaffolding independent of walls. Remove promptly when no longer required.
 - .4 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms or temporary stairs.
- 1.7 Hoisting
- .1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
 - .2 Hoists shall be operated by qualified operator.
- 1.8 Elevators
- .1 Designated existing and permanent elevators may be used by construction personnel and transporting of materials. Co-ordinate use with DND Rep.
 - .2 Provide protective coverings for finish surfaces of cars and entrances.
- 1.9 Site Storage/Loading
- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
 - .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.
- 1.10 Construction Parking
- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
 - .2 Provide and maintain adequate access to project site.
-

1.10 Construction
Parking
(Cont'd)

- .3 Build and maintain temporary roads where indicated and provide snow removal during period of Work.
- .4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
- .5 Clean runways and taxi areas where used by Contractor's equipment.

1.11 Security

- .1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m oc. Provide one lockable truck gate. Maintain fence in good repair.
- .2 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays as directed by DND Rep.

1.12 Equipment,
Tool and Materials
Storage

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.13 Sanitary
Facilities

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
 - .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
 - .3 Permanent facilities may be used on approval of DND Rep.
-

- 1.14 Construction Signage .1 Signs and notices for safety and instruction shall be in English or Graphic symbols and shall conform to Z321-96.
- .2 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by DND Rep.

PART 2 - PRODUCTS

- 2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

- 3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

<u>1.1 Section Includes</u>	.1	Progressive cleaning.
	.2	Final cleaning.
<u>1.2 Precedence</u>	.1	For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
<u>1.3 Related Section</u>	.1	Section 01 77 00 - Closeout Procedures.
<u>1.4 Project Cleanliness</u>	.1	Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
	.2	Remove waste materials from site at regularly scheduled times or dispose of as directed by DND Rep. Do not burn waste materials on site.
	.3	Clear snow and ice from access to building, bank/pile snow in designated areas only.
	.4	Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
	.5	Remove all waste materials and debris from site and dispose off DND property. Provide following information to DND Rep: .1 Provide a Certificate of Disposal indicating the following: .1 Date of disposition. .2 Time of disposition. .3 Location of disposition. .4 Name of Vehicle operator. .5 Vehicle License Number.
	.6	Provide on-site containers for collection of waste materials and debris.
	.7	Provide and use clearly marked separate bins for recycling.

1.4 Project
Cleanliness
(Cont'd)

- .8 Remove waste material and debris from site at end of each working day.
- .9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .12 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .14 Foreign Object Damage control or FOD will be exercised on a continuous basis in vicinity of aircraft, runways or aprons. Control all blowing debris at all times. DND Rep will coordinate and approve Contractors plans to fulfill this requirement.

1.5 Final Cleaning

- .1 In preparation for acceptance of the project, on an interim or final certificate of completion, perform final cleaning.
- .2 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review, remove surplus products, tools, construction machinery and equipment.

1.5 Final Cleaning
(Cont'd)

- .5 Remove waste products and debris other than that caused by Owner or other Contractors.
 - .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, and floors.
 - .9 Clean lighting reflectors, lenses, and other lighting surfaces.
 - .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.
 - .16 Sweep and wash clean paved areas.
 - .17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
 - .18 Clean roofs, downspouts, and drainage systems.
 - .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .20 Remove snow and ice from access to building.
-

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Cleaning

Section 01 74 11
Page 4
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.21 Leave entire work area neat and clean.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

END

PART 1 - GENERAL

- | | | |
|---------------------------------------|----|--|
| <u>1.1 Section Includes</u> | .1 | Administrative procedures preceding preliminary and final inspections of Work. |
| <u>1.2 Precedence</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual. |
| <u>1.3 Related Sections</u> | .1 | Section 01 78 00- Closeout Submittals. |
| <u>1.4 Inspection and Declaration</u> | .1 | Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
.1 Notify DND Rep in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
.2 Request DND Rep's Inspection. |
| | .2 | DND Rep's Inspection: DND Rep and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly. |
| | .3 | Completion: submit written certificate that following have been performed:
.1 Work has been completed and inspected for compliance with Contract Documents.
.2 Defects have been corrected and deficiencies have been completed.
.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
.4 Operation of systems have been demonstrated to Owner's personnel.
.5 Work is complete and ready for Final Inspection. |
| | .4 | Final Inspection: when items noted above are completed, request final inspection of Work by DND Rep , and Contractor . If Work is deemed |
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1.4 Inspection and Declaration (Cont'd)	.4	Final Inspection:(Cont'd) incomplete by DND Rep , complete outstanding items and request reinspection.
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PART 2 - PRODUCTS

<u>2.1 Not Used</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 Not Used</u>	.1	Not Used.
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END

PART 1 - GENERAL

<u>1.1 Section Includes</u>	.1	As-built, samples, and specifications.
	.2	Equipment and systems.
	.3	Product data, materials and finishes, and related information.
	.4	Operation and maintenance data.
	.5	Spare parts, special tools and maintenance materials.
	.6	Warranties and bonds.
	.7	Final site survey.
<u>1.2 Precedence</u>	.1	For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
<u>1.3 Related Sections</u>	.1	Section 01 77 00 - Closeout Procedures.
<u>1.4 Submission</u>	.1	Prepare instructions and data using personnel experienced in maintenance and operation of described products.
	.2	Prior to Substantial Performance of the Work, submit to the DND Rep, three final copies of operating and maintenance manuals in English.
	.3	Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
	.4	If requested, furnish evidence as to type, source and quality of products provided.
	.5	Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
	.6	Pay costs of transportation.

- 1.5 Format
- .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual. Organize data in the form of an instructional manual.
 - .2 Organize data into same numerical order as contract specifications.
 - .3 Provide O & M manual in PDF format on CD. Manual is to be FULLY INDEXED or BOOKMARKED.
 - .4 Provide 1:1 scaled CAD files in dwg format on CD.
 - .5 Only If requested by the DND Rep provide O & M Manuals in Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
 - .6 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
 - .7 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
 - .8 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .9 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
 - .10 Text: Manufacturer's printed data, or typewritten data.

- 1.6 Contents - Each Volume
- .1 Cover sheet containing:
 - .1 Date submitted.
 - .2 Project title, location and project number.
 - .3 Names and addresses of Contractor, and all Sub-contractors.
 - .2 Table of Contents.
 - .3 Warranties, guarantees.
 - .4 Copies of approvals, and certificates.
-

- 1.6 Contents - Each .5 Provide data as specified in individual
Volume sections of this specification with schedule
(Cont'd) of products and systems, indexed to content of
volume.
- .6 For each product or system: list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .7 Nameplate information including equipment number, make, size, capacity, model number and serial number.
 - .8 Parts list.
 - .9 Installation details.
 - .10 Operating instructions.
 - .11 Maintenance instructions for equipment.
 - .12 Maintenance instructions for finishes.
 - .13 One complete set of reviewed final shop drawings and product data.
 - .14 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .15 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

- 1.7 As-builts and .1 In addition to requirements in General
Samples Conditions, maintain one record copy of:
- .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for
-

- | | |
|---------------------------------------|--|
| 1.7 As-builts and Samples
(Cont'd) | .2 (Cont'd)
construction. 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. Label each document "PROJECT RECORD" in neat, large, printed letters. |
| | .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes. |
| | .5 Keep record documents and samples available for inspection by DND Rep. |
| | .6 Identify each drawing in lower right hand corner in letters 12 mm high to read: "As Built Drawings", with Signature of Contractor and Date. |
| 1.8 Recording Actual Site Conditions | .1 Record information on set of black lineopaque drawings, provided by DND Rep |
| | .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information. |
| | .3 Maintain project record drawings and record accurately <u>any</u> deviations from Contract documents. |
| | .4 Record information concurrently with construction progress to show all work as actually installed including change orders. Do not conceal Work until required information is recorded. |
| | .5 Contract Drawings and shop drawings: legibly 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. |
-

1.8 Recording Actual Site Conditions (Cont'd)	.5	Contract Drawings and shop drawings:(Cont'd) .5 Changes made by change orders. .6 Details not on original Contract Drawings. .7 References to related shop drawings and modifications.
	.6	Specifications: legibly mark each item to record actual construction, including: .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items. .2 Changes made by Addenda and change orders.
	.7	Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
1.9 As Built Drawings	.1	At completion of project and prior to final inspection, transfer as-built notations to second paper drawing set and submit to DND Rep for review. .1 Prepare as-built drawings in AutoCAD format following same conventions used for original design drawings or use DND CAD Standards ie: levels, colors, weights, etc. .2 In addition to as-built printed set, drawings shall be submitted in electronic file format (both AutoCAD and PDF) on CD or DVD media.
1.10 As Built Survey Drawings	.1	Provide "As-Built Survey" with project deviations relative to DND survey monuments and obtain an accurate record of all manhole locations, catch basins, storm outfalls, sewer alignment, utilities (ie: elec, gas, telecom, etc), paint lines, roads, sidewalks, etc. pertinent to the project.
	.2	Submit survey with final record drawing submission.
	.3	Use GPS and Total station to survey new installations and surface features, including underground utility lines.
	.4	All surveys to be performed by a Registered Alberta Land Surveyor.

1.10 As Built
Survey Drawings
(Cont'd)

- .5 Horizontal and vertical accuracy shall be minimum Third Order. Vertical and horizontal control in the vicinity of survey shall be used.
- .6 All control point information and coordinate system (NAD 83-UTM) used must be obtained at 4 Wing WCE GIS cell prior to starting the survey.
- .7 Accuracy: Horizontal - third order (Northing & Easting coordinates); Vertical (control points, Building floor elevation, Manhole & catchbasin only), - third order. Vertical (all other features), total station elevations.
- .8 Control points and temporary iron bars used, along with their coordinates and elevations must be indicated on each survey drawing.
- .9 An electronic drawing copy of existing site will be provided by WCE GIS.
- .10 Provide one as-built hard copy drawing set. Submit final drawing set on full size media using DND CAD Standard Drawing Sheet.
- .11 In addition to as-built printed set, drawings shall be submitted in electronic file format (both AutoCAD and PDF) on CD/DVD.
- .12 Provide as-built electronic copy in AutoCAD 3D file format. Ensure all features are drawn in 3D (x y z).
- .13 Follow DND CAD and GIS Standards for easy incorporation of data into existing GIS spatial database.
- .14 Provide comma delimited ASCII text file for each survey point: Point Number, Easting, Northing, Elevation, Feature Class Name/Layer Name/Survey Code and optional description.
- .15 For information regarding WCE GIS system contact: 4WCE GIS Co-ordinator at (780)840-8000 ext 8251.

1.11 Water Valve
Markers

- .1 Install DND supplied blue marker stake at each water valve location. Markers are provided by DND WCE Plumbing Shop @ loc 8427.

1.12 Equipment and
Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 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. Include regulation, control, stopping, shut-down, and emergency instructions. 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 installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

1.12 Equipment and
Systems
(Cont'd)

- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports.
- .15 Additional requirements: As specified in individual specification sections.

1.13 Materials and
Finishes

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. 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.

1.14 Spare Parts

- .1 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 location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual. Include the following:
 - .1 Part number.
 - .2 Identification of equipment or system for which parts are applicable.
 - .3 Installation instructions as applicable.
 - .4 Name and address of nearest supplier.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
-

- 1.15 Maintenance Materials
- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual.
 - .5 Identify, on carton or package, colour, room No., system or area as applicable where item is used
 - .6 Obtain receipt for delivered products and submit prior to final payment.

- 1.16 Special Tools
- .1 Provide special tools, in quantities specified in individual specification section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to location as directed; place and store.
 - .4 Receive and catalogue all items. Submit inventory listing to DND Rep. Include approved listings in Maintenance Manual and Include the following:
 - .1 Identification tag reference.
 - .2 Identification of equipment or system for which tools are applicable.
 - .3 Instruction on intended use of tool.

- 1.17 Storage, Handling and Protection
- .1 Store spare parts, maintenance materials, 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.
-

1.17 Storage, Handling and Protection
(Cont'd)

.5 Remove and replace damaged products at own expense and to satisfaction of DND Rep.

1.18 Warranties and Bonds

.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 the applicable item of work.

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

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

PART 1 - GENERAL

1.1 Related Sections .1 Section 01 33 00 -Submittals

1.2 References .1 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.2-M88, Thermal Insulation, Calcium Silicate, for Piping, Machinery and Boilers.
.2 CAN/CGSB-51.9-92, Mineral Fibre Thermal Insulation for Piping and Round Ducting.
.3 CAN/CGSB-51.11-92, Mineral Fibre Thermal Insulation Blanket.
.4 CAN/CGSB-51.12-M86, Cement, Thermal Insulating and Finishing.
.5 CAN/CGSB-51.40-M80, Thermal Insulation, Flexible, Elastomeric, Unicellular, Sheet and Pipe Covering.
.6 CGSB 51-GP-52Ma-89, Vapour Barrier Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
.7 CGSB 51-GP-53M-77, Jacketing, Polyvinyl, Chloride Sheet, for Insulating Pipes, Vessels and Round Ducts.

.2 Underwriters Laboratories of Canada (ULC)
.1 CAN/ULC-S102-M88, Surface Burning Characteristics of Building Materials and Assemblies.

.3 American Society for Testing and Materials (ASTM)
.1 ASTM B 209M-92a, Specification for Aluminum and Aluminum Alloy Sheet and Plate.
.2 ASTM C 335-95, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.
.3 ASTM C 411-82(1992), Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
.4 ASTM C 449M-88, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.
.5 ASTM C 795-92, Specification for Thermal Insulation for Use with Austenitic Stainless Steel.
.6 ASTM C 921-89, Practice for Determining the Properties Jacketing Materials for Thermal Insulation.

<u>1.2 References</u> (Cont'd)	.4	American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) .1 ASHRAE Standard 90.1-1989
	.5	Manufacturer's Trade Associations .1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.
<u>1.3 Shop Drawings</u>	.1	Submit shop drawings in accordance with Section 01 33 00 - Submittals.
	.2	Submit for approval manufacturer's catalogue literature related to installation, fabrication for pipe, fittings, valves and jointing recommendations.
<u>1.4 Samples</u>	.1	Submit samples in accordance with Section 01 33 00 - Submittals.
	.2	Submit for approval: complete assembly of each type of insulation system, insulation, coating, and adhesive proposed. Mount sample on 12 mm plywood board. Affix typewritten label beneath sample indicating service.
<u>1.5 Installation Instructions</u>	.1	Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittals.
	.2	Installation instructions to include procedures to be used, installation standards to be achieved.
<u>1.6 Qualifications</u>	.1	Installer to be specialist in performing work of this section, and have at least 3 years successful experience in this size and type of project, member of TIAC.
<u>1.7 Delivery, Storage and Handling</u>	.1	Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
	.2	Protect from weather, construction traffic.
	.3	Protect against damage from any source.

1.7 Delivery, Storage and Handling (Cont'd) .4 Store at temperatures and conditions required by manufacturer.

1.8 Definitions .1 For purposes of this section:
.1 "CONCEALED" - insulated mechanical services in suspended ceilings and non-accessible chases and furred-in spaces.
.2 "EXPOSED" - will mean "not concealed" as defined herein.

PART 2 - PRODUCTS

2.1 Fire and Smoke Rating .1 In accordance with CAN/ULC-S102:
.1 Maximum flame spread rating: 25.
.2 Maximum smoke developed rating: 50.

2.2 Insulation .1 Mineral fibre as specified herein includes glass fibre, rock wool, slag wool.
.2 Thermal conductivity ("k" factor) not to exceed specified values at 24 C mean temperature when n tested in accordance with ASTM C 335.
.3 TIAC Code A-1: Rigid moulded mineral fibre without factory applied vapour retarder jacket.
.1 Mineral fibre: to CAN/CGSB-51.9.
.2 Maximum "k" factor: to CAN/CGSB-51.9.
.4 TIAC Code A-3: Rigid moulded mineral fibre with factory applied vapour retarder jacket.
.1 Mineral fibre: to CAN/CGSB-51.9.
.2 Jacket: to CGSB 51-GP-52 Ma.
.3 Maximum "k" factor: to CAN/CGSB-51.9.
.5 TIAC Code C-2: Mineral fibre blanket faced with factory applied vapour retarder jacket (as scheduled in PART 3 of this section).
.1 Mineral fibre: to CAN/CGSB-51.11.
.2 Jacket: to CGSB 51-GP-52 Ma.
.3 Maximum "k" factor: to CAN/CGSB-51.11.

2.2 Insulation (Cont'd)	.6	TIAC Code A.6: Flexible unicellular tubular elastomer. .1 Insulation: to CAN/CGSB-51.40. .2 Jacket: to CGSB 51-GP-52 Ma. .3 Maximum "k" factor: to CAN/CGSB 51.40. .4 To be certified by manufacturer to be free of potential stress corrosion cracking corrodants.
	.7	TIAC Code A.2: Rigid moulded calcium silicate in sections and blocks, and with special shapes to suit project requirements. .1 Insulation: to CAN/CGSB-51.2. .2 Maximum "k" factor: to CAN/CGSB-51.2. .3 Design to permit periodic removal and re-installation.
2.3 Insulation Securement	.1	Tape: Self-adhesive, aluminum, reinforced, 50 mm wide minimum.
	.2	Contact adhesive: Quick setting.
	.3	Canvas adhesive: Washable.
	.4	Tie wire: 1.5 mm diameter stainless steel.
	.5	Bands: Stainless steel, 19 mm wide, 0.5 mm thick.
2.4 Cement	.1	Thermal insulating and finishing cement: .1 To CAN/CGSB-51.12. .2 Air drying on mineral wool, to ASTM C 449.
2.5 Vapour Retarder Lap Adhesive	.1	Water based, fire retardant type, compatible with insulation.
2.6 Indoor Vapour Retarder Finish	.1	Vinyl emulsion type acrylic, compatible with insulation.
2.7 Outdoor Vapour Retarder Finish	.1	Vinyl emulsion type acrylic, compatible with insulation.
	.2	Reinforcing fabric: Fibrous glass, untreated 305 g/m ² .

2.8 Jackets

- .1 Polyvinyl Chloride (PVC):
 - .1 One-piece moulded type and sheet to CGSB 51-GP-53M with pre-formed shapes as required.
 - .2 Colours: to match adjacent finish paint.
 - .3 Minimum service temperatures: -20 C.
 - .4 Maximum service temperature: 65 C.
 - .5 Moisture vapour transmission: 0.02 perm.
 - .6 Thickness: to suit requirements.
 - .7 Fastenings:
 - .1 Use solvent weld adhesive compatible with insulation to seal laps and joints.
 - .2 Tacks.
 - .3 Pressure sensitive vinyl tape of matching colour.
 - .8 Special requirements:
 - .1 Outdoor: UV rated material at least 0.5 mm thick.
- .2 ABS Plastic:
 - .1 One-piece moulded type and sheet with pre-formed shapes as required.
 - .2 Colours: to match adjacent finish paint.
 - .3 Minimum service temperatures: -40 C.
 - .4 Maximum service temperature: 82 C.
 - .5 Moisture vapour transmission: 0.012 perm.
 - .6 Thickness: 0.75 mm.
 - .7 Fastenings:
 - .1 Solvent weld adhesive compatible with insulation to seal laps and joints.
 - .2 Tacks.
 - .3 Pressure sensitive vinyl tape of matching colour.
 - .8 Locations:
 - .1 For outdoor use ONLY.
- .3 Canvas:
 - .1 220 and 120 gm/m² cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C 921.
 - .2 Lagging adhesive: Compatible with insulation.
- .4 Aluminum:
 - .1 To ASTM B 209.
 - .2 Thickness: 0.50 mm sheet.
 - .3 Finish: Smooth.
 - .4 Joining: Longitudinal and circumferential slip joints with 50 mm laps.
 - .5 Fittings: 0.5 mm thick die-shaped fitting covers with factory-attached protective liner.

- | | |
|---|---|
| 2.8 Jackets
(Cont'd) | .4 Aluminum: (Cont'd) |
| | .6 Metal jacket banding and mechanical seals: stainless steel, 19 mm wide, 0.5 mm thick at 300 mm spacing. |
| | .5 Stainless steel: |
| | .1 Type: 304 316. |
| | .2 Thickness: 0.25 mm. |
| | .3 Finish: Smooth. |
| | .4 Joining: Longitudinal and circumferential slip joints with 50 mm laps. |
| | .5 Fittings: 0.5 mm thick die-shaped fitting covers with factory-attached protective liner. |
| | .6 Metal jacket banding and mechanical seals: stainless steel, 19 mm wide, 0.5 mm thick at 300 mm spacing. |
| 2.9 Weatherproof
Caulking for
Jackets Installed
Outdoors | .1 Ensure that all joints and gaps are completely sealed with caulking rated for the environment and material being sealed. |

PART 3 - EXECUTION

- | | |
|---|---|
| 3.1 Pre-
Installation
Requirement | .1 Pressure testing of piping systems and adjacent equipment to be complete, witnessed and certified. |
| | .2 Surfaces to be clean, dry, free from foreign material. |
| 3.2 Installation | .1 Install in accordance with TIAC National Standards. |
| | .2 Apply materials in accordance with manufacturers instructions and this specification. |
| | .3 Use two layers with staggered joints when required nominal wall thickness exceeds 75 mm. |
| | .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes. |
| | .1 Hangers, supports to be outside vapour retarder jacket. |
-

- 3.2 Installation (Cont'd)
- .5 Supports, Hangers:
- .1 Apply high compressive strength insulation, suitable for service, at oversized saddles and shoes where insulation saddles have not been provided.
- 3.3 Removable, Pre-fabricated, Insulation and Enclosures
- .1 Application: At expansion joints, valves, primary flow measuring elements flanges and unions at equipment.
- .2 Design: To permit movement of expansion joint and to permit periodic removal and replacement without damage to adjacent insulation.
- .3 Insulation:
- .1 Insulation, fastenings and finishes: same as system.
- .2 Jacket: high temperature fabric.
- 3.4 Installation of Elastomeric Insulation
- .1 Insulation to remain dry at all times. Overlaps to manufacturers instructions. Ensure tight joints.
- .2 Provide vapour retarder as recommended by manufacturer.
- 3.5 Piping Insulation Schedules
- .1 Includes valves, valve bonnets, strainers, flanges and fittings unless otherwise specified.
- .2 TIAC Code: A-1.
- .1 Securements: Tape @ 300 mm oc.
- .2 Seals: lap seal adhesive, lagging adhesive.
- .3 Installation: TIAC Code 1501-H.
- .3 TIAC Code: A-3.
- .1 Securements: Tape @ 300 mm oc.
- .2 Seals: VR lap seal adhesive, VR lagging adhesive.
- .3 Installation: TIAC Code: 1501-C.
- .4 TIAC Code: C-2 with vapour retarder jacket.
- .1 Insulation securements: tape.
- .2 Seals: lap seal adhesive, lagging adhesive.
- .3 Installation: TIAC Code: 1501-C.
-

3.5 Piping
Insulation
Schedules
(Cont'd)

- .5 TIAC Code: A-2.
.1 Insulation securements: tape.
.2 Seals: lap seal adhesive, lagging adhesive.
.3 Installation: TIAC Code: 1501-H.
- .6 Thickness of insulation to be as listed in following table.
.1 ** Run-outs to individual units and equipment not exceeding 4000 mm long.
.2 ** Do not insulate exposed runouts to plumbing fixtures, chrome plated piping, valves, fittings.

Application	Temp °C	TIAC code		Pipe sizes (NPS) and insulation thickness (mm)					
				Run out	to 1	1 1/4 2	2 1/2 4	5 6	8 & over
Steam	up to 175	A-	1	38	50	65	75	90	90
Steam, Saturated and Superheated	over 175	A-	1	38	65	65	75	90	90
Condensate Return	60 - 94	A-	1	25	38	38	38	38	38
Pumped Condensate return	up to 94	A-	1	25	38	38	38	38	38
Boiler Feed Water		A-	1	25	25	25	25	25	25
Hot Water Heating	60 - 94	A-	1	25	38	38	38	38	38
Hot Water Heating	up to 59	A-	1	25	25	25	25	38	38
Glycol Heating	60 - 94	A-	1	25	38	38	38	38	38
Glycol Heating	up to 59	A-	1	25	25	25	25	38	38
Domestic HWS		A-	1	25	25	25	38	38	38
Chilled Water	4 - 13	A-	3	25	25	25	25	25	25
Chilled Water or Glycol	below 4	A-	3	25	25	38	38	38	38
Dual Temp. Heating		A-	3						
Dual Temp.		A-	3						

3.5 Piping
Insulation
Schedules
(Cont'd)

.6 (Cont'd)
.2 (Cont'd)

Application	Temp °C	TIAC code	Pipe sizes (NPS) and insulation thickness (mm)					
			Run out	to 1	1 1/4 2	2 1/2 4	5 6	8 & over
Cooling Chilled Water Pump Casings Condenser Water Outdoors Condenser Water Indoors Refrigerated Drinking Water Domestic CWS Domestic CWS with vapour retarder Refrigerant 4 - hot gas 13 liquid suction Refrigerant below hot gas 4 liquid suction RWL and RWP Cooling Coil cond. drain Diesel generator exhaust system		A- 3	25	25	25	25	25	25
		A- 3	25	25	25	25	25	25
		A- 3	25	25	25	25	25	25
		C- 2	25	25	25	25	25	25
		A- 6	25	25	25	25	25	25
		A- 6	25	25	38	38	38	38
		C- 2	25	25	25	25	25	25
		C- 2	25	25	25	25	25	25
		A- 2	38	65	65	75	90	90

.7 Finishes:

- .1 Exposed indoors: Canvas jacket.
- .2 Exposed in mechanical rooms: Canvas jacket.
- .3 Concealed, indoors: canvas on valves, fittings. No further finish.
- .4 Use vapour retarder jacket on TIAC code A-3 insulation compatible with insulation.
- .5 Outdoors: Water-proof Aluminum jacket.
- .6 Finish attachments: SS bands, @ 150 mm oc. Seals: closed.

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3.5 Piping .7 Finishes: (Cont'd)
Insulation .7 Installation: To appropriate TIAC code
Schedules CRF/1 through CPF/5.

(Cont'd)

END

- | | | |
|--|----|---|
| <u>1 General</u> | .1 | This section covers items common to all mechanical work. |
| <u>2 Equipment List</u> | .1 | Complete list of equipment and materials to be used on this project and forming part of tender documents by adding manufacturer's name, model number and details of materials, and submit for approval. |
| | .2 | Submit for approval within 48 h after closing of tenders. |
| <u>3 Equipment Installation</u> | .1 | Unions or flanges: provide for ease of maintenance and disassembly. |
| | .2 | Space for servicing, disassembly and removal of equipment and components: provide as recommended by manufacturer or as indicated. |
| | .3 | Equipment drains: pipe to floor drains. |
| | .4 | Install equipment, rectangular cleanouts and similar items parallel to or perpendicular to building lines. |
| <u>4 Anchor Bolts and Templates</u> | .1 | Supply anchor bolts and templates for installation by other divisions. |
| <u>5 Trial Usage</u> | .1 | Engineer may use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing. |
| <u>6 Protection of Openings</u> | .1 | Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system. |
| <u>7 Electrical</u> | .1 | Electrical work to including the following:
.1 Supplier and installer responsibility is indicated in Motor, Control and Equipment Schedule on electrical drawings and related mechanical responsibility is indicated on |
-

- 7 Electrical
 (Cont'd)
- .1 (Cont'd)
 .1 (Cont'd)
 Mechanical Equipment Schedule on mechanical drawings.
 .2 Control wiring and conduit is specified in Division 26 except for conduit, wiring and connections below 50 V which are related to control systems. Refer to Division 26 for quality of materials and workmanship.
- 8 Motors
- .1 Provide motors for mechanical equipment as specified.
- .2 If delivery of specified motor will delay delivery or installation of any equipment, install motor approved by Engineer for temporary use. Final acceptance of equipment will not occur until specified motor is installed.
- .3 Motors under 1/2 HP: speed as indicated, continuous duty, built-in overload protection, resilient mount, single phase, 115/230 V, unless otherwise specified or indicated.
- .4 Motors 1/2 HP and larger: EEMAC Class B, squirrel cage induction, speed as indicated, continuous duty, drip proof, ball bearing, maximum temperature rise 40°C, 3 phase, 575 V, unless otherwise specified or indicated.
- 9 Belt Drives
- .1 Fit reinforced belts in sheave matched to drive. Multiple belts to be matched sets.
- .2 Use cast iron or steel sheaves secured to shafts with removable keys unless otherwise specified.
- .3 For motors under 10 HP: standard adjustable pitch drive sheaves, having plus or minus 10% range. Use mid-position of range for specified r/min.
- .4 For motors 10 HP and over: sheave with split tapered bushing and keyway having fixed pitch unless specifically required for item concerned. Provide sheave of correct size to suit balancing.
- .5 Minimum drive rating: 1.5 times nameplate rating on motor. Keep overhung loads within
-

- 9 Belt Drives
(Cont'd)
- .5 Minimum drive rating: (Cont'd)
manufacturer's design requirements on prime
mover shafts.
 - .6 Motor slide rail adjustment plates to allow
for centre line adjustment.
- 10 Guards
- .1 Provide guards for unprotected drives.
 - .2 Guards for belt drives:
 - .1 Expanded metal screen welded to steel
frame.
 - .2 Minimum 1.2 mm thick sheet metal tops
and bottoms.
 - .3 38 mm dia holes on both shaft centres
for insertion of tachometer.
 - .4 Removable for servicing.
 - .3 Provide means to permit lubrication and use
of test instruments with guards in place.
 - .4 Install belt guards to allow movement of
motors for adjusting belt tension.
 - .5 Guard for flexible coupling:
 - .1 "U" shaped, minimum 1.6 mm thick
galvanized mild steel.
 - .2 Securely fasten in place.
 - .3 Removable for servicing.
 - .6 Unprotected fan inlets or outlets:
 - .1 Wire or expanded metal screen,
galvanized, 19 mm mesh.
 - .2 Net free area of guard: not less than
80% of fan openings.
 - .3 Securely fasten in place.
 - .4 Removable for servicing.
- 11 Equipment
Supports
- .1 Equipment supports supplied by equipment
manufacturer: specified elsewhere.
 - .2 Equipment supports not supplied by equipment
manufacturer: fabricate from structural grade
steel meeting requirements of Section 05 12 23
- Structural Steel for Building. Submit
structural calculations with shop drawings.
 - .3 Mount base mounted equipment on chamfered
edge housekeeping pads, minimum of 100 mm high
and 50 mm larger than equipment dimensions all
around.
-

- 12 Sleeves
- .1 Pipe sleeves: at points where pipes pass through masonry, concrete or fire rated assemblies and as indicated.
 - .2 Schedule 40 steel pipe.
 - .3 Sleeves with annular fin continuously welded at midpoint:
 - .1 Through foundation walls.
 - .2 Where sleeve extends above finished floor.
 - .4 Sizes: minimum 6 mm clearance all around, between sleeve and uninsulated pipe or between sleeve and insulation.
 - .5 Terminate sleeves flush with surface of concrete and masonry walls, concrete floors on grade and 25 mm above other floors.
 - .6 Fill voids around pipes:
 - .1 Caulk between sleeve and pipe in foundation walls and below grade floors with waterproof fire retardant non-hardening mastic.
 - .2 Where sleeves pass through walls or floors, provide space for firestopping. Where pipes/ducts pass through fire rated walls, floors and partitions, maintain fire rating integrity.
 - .3 Ensure no contact between copper tube or pipe and ferrous sleeve.
 - .4 Fill future-use sleeves with lime plaster or other easily removable filler.
 - .5 Coat exposed exterior surfaces of ferrrous sleeves with heavy application of zinc rich paint to CGSB 1-GP-181M+Amdt-Mar-78.
- 13 Preparation for Firestopping
- .1 Firestopping material and installation within annular space between pipes, ducts, insulation and adjacent fire separation: specified in Section 07 84 00 - Firestopping.
 - .2 Uninsulated unheated pipes not subject to movement: no special preparation.
 - .3 Uninsulated heated pipes subject to movement: wrap with non-combustible smooth material to permit pipe to move without damaging firestopping material.
-

13	Preparation for Firestopping (Cont'd)	.4	Insulated pipes and ducts: ensure integrity of insulation and vapour barrier at fire separation.
14	Escutcheons	.1	On pipes passing through walls, partitions, floors and ceilings in finished areas.
		.2	Chrome or nickel plated brass or Type 302 stainless steel, one piece type with set screws.
		.3	Outside diameter to cover opening or sleeve.
		.4	Inside diameter to fit around finished pipe.
15	Tests	.1	Give 24 h written notice of date for tests.
		.2	Insulate or conceal work only after testing and approval by Engineer.
		.3	Conduct tests in presence of Engineer.
		.4	Bear costs including retesting and making good.
		.5	Piping: <ul style="list-style-type: none"> .1 General: maintain test pressure without loss for 4 h unless otherwise specified. .2 Hydraulically test steam and hydronic piping systems at 1-1/2 times system operating pressure or minimum 860 kPa, whichever is greater. .3 Test natural gas systems to CAN1-B149.1-M86 and requirements of authorities having jurisdiction. .4 Test fuel oil systems to CSA B139 1976, CSA B139S1-1982 and authorities having jurisdiction. .5 Test drainage, waste and vent piping to National Building Code and authorities having jurisdiction. .6 Test domestic hot, cold and recirculation water piping at 1-1/2 times system operating pressure or minimum 860 kPa, whichever is greater. .7 Test fire systems in accordance with authorities having jurisdiction and as specified elsewhere.
		.6	Equipment: test as specified in relevant sections.

- 15 Tests
(Cont'd)
- .7 Prior to tests, isolate all equipment or other parts which are not designed to withstand test pressures or test medium.
- 16 Painting
- .1 Apply at least one coat of corrosion resistant primer paint to ferrous supports and site fabricated work.
- .2 Prime and touch up marred finished paintwork to match original.
- .3 Restore to new condition, finishes which have been damaged too extensively to be merely primed and touched up.
- 17 Spare Parts
- .1 Furnish spare parts in accordance with Section 01 78 00 - Closeout Submittals as follows:
- .1 One set of packing for each pump.
- .2 One casing joint gasket for each size pump.
- .3 One head gasket set for each heat exchanger.
- .4 One glass for each gauge glass.
- .5 One set of belts for each piece of machinery.
- .6 One filter cartridge or set of filter media for each filter or filter bank in addition to final operating set.
- 18 Special Tools
- .1 Provide one set of special tools required to service equipment as recommended by manufacturers and in accordance with Section 01 78 00 - Closeout Submittals .
- .1 Furnish one commercial quality grease gun, grease and adapters to suit different types of grease and grease fittings.
- 19 Access Doors
- .1 Supply access doors to concealed mechanical equipment for operating, inspecting, adjusting and servicing.
- .2 Flush mounted 600 x 600 mm for body entry and 300 x 300 mm for hand entry unless otherwise noted. Doors to open 180°, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps.
-

19 Access Doors (Cont'd)	.3	Material: .1 Special areas such as tiled or marble surfaces: use stainless steel with brushed satin or polished finish as directed by Engineer. .2 Remaining areas: use prime coated steel.
	.4	Installation: .1 Locate so that concealed items are accessible. .2 Locate so that hand or body entry (as applicable) is achieved. .3 Installation is specified in applicable sections.
20 Dielectric Couplings	.1	General: .1 To be compatible with and to suit pressure rating of piping system. .2 Where pipes of dissimilar metals are joined.
	.2	Pipes NPS 2 and under: isolating unions.
	.3	Pipes NPS 2-1/2 and over: isolating flanges.
21 Drain Valves	.1	Locate at low points and at section isolating valves unless otherwise specified.
	.2	Minimum NPS 3/4 unless otherwise specified: bronze, with hose end male thread and complete with cap and chain.
22 Demonstration and Operating and Maintenance Instructions	.1	Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
	.2	Where specified elsewhere in Division 15, manufacturers to provide demonstrations and instructions.
	.3	Use operation and maintenance manual, as-built drawings, audio visual aids, etc. as part of instruction materials.
	.4	Instruction duration time requirements as specified in appropriate sections.

22 Demonstration
and Operating and
Maintenance
Instructions
(Cont'd)

- .5 Where deemed necessary, Engineer may record these demonstrations on video tape for future reference.

23 Operation and
Maintenance Manual

- .1 Provide operation and maintenance data for incorporation into manual specified in Section 01 73 03 - Operation and Maintenance Manual.
- .2 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals
- .3 Operation and maintenance manual to be approved by, and final copies deposited with, Engineer before final inspection.
- .4 Operation data to include:
.1 Control schematics for each system including environmental controls.
.2 Description of each system and its controls.
.3 Description of operation of each system at various loads together with reset schedules and seasonal variances.
.4 Operation instruction for each system and each component.
.5 Description of actions to be taken in event of equipment failure.
.6 Valves schedule and flow diagram.
.7 Colour coding chart.
- .5 Maintenance data shall include:
.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
.2 Data to include schedules of tasks, frequency, tools required and task time.
- .6 Performance data to include:
.1 Equipment manufacturer's performance data sheets with point of operation as left after commissioning is complete.
.2 Equipment performance verification test results.
.3 Special performance data as specified elsewhere.
- .7 Approvals:
.1 Submit 2 copies of draft Operation and Maintenance Manual to Engineer for approval.
-

- 23 Operation and Maintenance Manual (Cont'd)
- .7 Approvals: (Cont'd)
 - .1 (Cont'd)
Submission of individual data will not be accepted unless so directed by Engineer.
 - .2 Make changes as required and re-submit as directed by Engineer.
 - .8 Additional data:
 - .1 Prepare and insert into operation and maintenance manual when need for same becomes apparent during demonstrations and instructions specified above.
- 24 Shop Drawings and Product Data
- .1 Submit shop drawings and product data in accordance with Section 01 33 00 -Submittals.
 - .2 Shop drawings and product data shall show:
 - .1 Mounting arrangements.
 - .2 Operating and maintenance clearances.
eg. access door swing spaces.
 - .3 Shop drawings and product data shall be accompanied by:
 - .1 Detailed drawings of bases, supports, and anchor bolts.
 - .2 Acoustical sound power data, where applicable.
 - .3 Points of operation on performance curves.
 - .4 Manufacturer to certify as to current model production.
 - .5 Certification of compliance to applicable codes.
 - .4 In addition to transmittal letter referred to in Section 01 33 00 -Submittals: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.
- 25 Existing Systems
- .1 Connections into existing systems to be made at time approved by Engineer. Request written approval of time when connections can be made.
 - .2 Be responsible for damage to existing plant by this work.
-

- 26 Cleaning
- .1 Clean mechanical (building) systems in accordance with Section 01 74 11 - Cleaning.
 - .2 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.
 - .3 In preparation for final acceptance, clean and refurbish all equipment and leave in operating condition including replacement of all filters in all air and piping systems.
- 27 As-built Drawings
- .1 Site records:
 - .1 Engineer will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of the work. Mark thereon all changes as work progresses and as changes occur. This shall include changes to existing mechanical systems, control systems and low voltage control wiring.
 - .2 On a weekly basis, transfer information to reproducibles, revising reproducibles to show all work as actually installed.
 - .3 Use different colour waterproof ink for each service.
 - .4 Make available for reference purposes and inspection at all times.
 - .2 As-built drawings:
 - .1 Prior to start of Testing, Adjusting and Balancing (TAB), finalize production of as-built drawings.

PART 1 - GENERAL

- | | | |
|---|----|---|
| <u>1.1 References</u> | .1 | ANSI/ASME B40.1-1990, Gauges-Pressure, Indicating Dial Type-Elastic Element. |
| | .2 | CAN/CGSB-14.4-M88, Thermometers, Liquid-in-Glass, Self Indicating, Commercial/Industrial Type. |
| | .3 | CAN/CGSB-14.5-M88, Thermometers, Bimetallic, Self-Indicating, Commercial/Industrial Type. |
| <u>1.2 Shop Drawings and Product Data</u> | .1 | Submit shop drawings and product data in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. |
| | .2 | Submit manufacturer's product data for following items: |
| | .1 | Thermometers. |
| | .2 | Pressure gauges. |
| | .3 | Stop cocks. |
| | .4 | Syphons. |
| | .5 | Wells. |

PART 2 - PRODUCTS

- | | | |
|--|----|---|
| <u>2.1 General</u> | .1 | Design point to be at mid point of scale or range. |
| | .2 | Ranges: as indicated. |
| <u>2.2 Direct Reading Thermometers</u> | .1 | Industrial, variable angle type, liquid filled, 125 mm scale length: to CAN/CGSB 14.4. |
| <u>2.3 Remote Reading Thermometers</u> | .1 | 100 mm diameter liquid filled vapour activated dial type: to CAN/CGSB-14.5, accuracy within one scale division, brass movement, stainless steel capillary, stainless steel spiral armour, stainless steel bulb and polished stainless steel case for wall mounting. |
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- 2.4 Thermometer Wells
- .1 Copper pipe: copper or bronze.
 - .2 Steel pipe: brass or stainless steel.

- 2.5 Pressure Gauges
- .1 112 mm, dial type: to ANSI/ASME B40.1, Grade 2A, stainless steel bourdon tube having 0.5% accuracy full scale unless otherwise specified.
 - .2 Provide:
 - .1 Siphon for steam service.
 - .2 Snubber for pulsating operation.
 - .3 Diaphragm assembly for corrosive service.
 - .4 Gasketed pressure relief back with solid front.
 - .5 Bronze stop cock.
 - .6 Oil filled for high vibration applications.

PART 3 - EXECUTION

- 3.1 General
- .1 Install so they can be easily read from floor or platform. If this cannot be accomplished, install remote reading units.
 - .2 Install between equipment and first fitting or valve.

- 3.2 Thermometers
- .1 Install in wells on all piping. Provide heat conductive material inside well.
 - .2 Install in locations as indicated and on inlet and outlet of:
 - .1 Heat exchangers.
 - .2 Water heating and cooling coils.
 - .3 Water boilers.
 - .4 Chillers.
 - .5 Cooling towers.
 - .3 Install wells as indicated only for balancing purposes.
 - .4 Use extensions where thermometers are installed through insulation.
-

- 3.3 Pressure Gauges .1 Install in following locations:
- .1 Suction and discharge of pumps.
 - .2 Upstream and downstream of PRV's.
 - .3 Upstream and downstream of control valves.
 - .4 Inlet and outlet of coils.
 - .5 Inlet and outlet of liquid side of heat exchangers.
 - .6 Outlet of boilers.
 - .7 In other locations as indicated.
- .2 Install gauge cocks for balancing purposes, elsewhere as indicated.
- .3 Use extensions where pressure gauges are installed through insulation.
-
- 3.4 Nameplates .1 Install engraved lamicoid nameplates as specified in Section 23 05 54 - Mechanical Identification, identifying medium.

END

PART 1 - GENERAL

- 1.1 References
- .1 American National Standards Institute/
American Society of Mechanical Engineers
(ANSI/ASME)
 - .1 ANSI/ASME B31.1-1989, Power Piping, (SI Edition).
 - .2 American Society for Testing and Materials
(ASTM)
 - .1 ASTM A 125-81(1988), Specification for Steel Springs, Helical, Heat-Treated.
 - .2 ASTM A 307-94, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM A 563-94, Specification for Carbon and Alloy Steel Nuts.
 - .3 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)
 - .1 MSS SP-58-1988, Pipe Hangers and Supports - Materials, Design and Manufacture.
 - .2 MSS SP-69-1983, Pipe Hangers and Supports - Erection and Application.
- 1.2 Design Requirements
- .1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's's regular production components, parts and assemblies.
 - .2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 or MSS SP-58.
 - .3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.
 - .4 Design hangers and supports to support systems under all conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.
 - .5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment to be in accordance with MSS SP-58.
-

- 1.3 Shop Drawings and Product Data
- .1 Submit shop drawings and product data in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.
 - .2 Submit shop drawings and product data for following items:
 - .1 All bases, hangers and supports.
 - .2 Connections to equipment and structure.
 - .3 Structural assemblies.
- 1.4 Maintenance Data
- .1 Provide maintenance data for incorporation into manual specified in Section 01 71 00 - Operation and Maintenance Manual.

PART 2 - PRODUCTS

- 2.1 General
- .1 Fabricate hangers, supports and sway braces in accordance with ANSI B31.1 and MSS-SP-58.
 - .2 Use components for intended design purpose only. Do not use for rigging or erection purposes.
- 2.2 Pipe Hangers
- .1 Finishes:
 - .1 Pipe hangers and supports: galvanized or painted with zinc-rich paint after manufacture.
 - .2 Use hot dipped galvanizing process.
 - .3 Ensure steel hangers in contact with copper piping are copper plated.
 - .2 Upper attachment structural: Suspension from lower flange of I-Beam.
 - .1 Cold piping HPS 2 maximum: Ductile iron C-clamp with hardened steel cup point setscrew, locknut and carbon steel retaining clip. Rod: 13 mm FM approved.
 - .2 Cold piping NPS 2 1/2 or greater, all hot piping: Malleable iron beam clamp, eye rod, jaws and extension with carbon steel retaining clip, tie rod, nuts and washers, UL listed to MSS-SP-58 and MSS-SP-69.
 - .3 Upper attachment structural: Suspension from upper flange of I-Beam.
 - .1 Cold piping NPS 2 maximum: Ductile iron top-of-beam C-clamp with hardened steel cup
-

2.2 Pipe Hangers
(Cont'd)

- .3 Upper attachment structural: (Cont'd)
 - .1 Cold piping NPS 2 maximum: (Cont'd) point setscrew, locknut and carbon steel retaining clip, UL listed to MSS-SP-69.
 - .2 Cold piping NPS 2 1/2 or greater, all hot piping: Malleable iron top-of-beam jaw-clamp with hooked rod, spring washer, plain washer and nut UL listed.
- .4 Upper attachment to concrete.
 - .1 Ceiling: Carbon steel welded eye rod, clevis plate, clevis pin and cotters with weldless forged steel eye nut. Ensure eye 6 mm minimum greater than rod diameter.
 - .2 Concrete inserts: wedge shaped body with knockout protector plate UL listed to MSS-SP-69.
- .5 Hanger rods: threaded rod material to MSS SP-58.
 - .1 Ensure that hanger rods are subject to tensile loading only.
 - .2 Provide linkages where lateral or axial movement of pipework is anticipated.
 - .3 Do not use 22 mm rod.
- .6 Pipe attachments: material to MSS SP-58.
 - .1 Attachments for steel piping: carbon steel galvanized.
 - .2 Attachments for copper piping: copper plated black steel.
 - .3 Use insulation shields for hot pipework.
 - .4 Oversize pipe hangers and supports.
- .7 Adjustable clevis: material to MSS SP-69 UL listed, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis.
 - .1 Ensure "U" has hole in bottom for rivetting to insulation shields.
- .8 Yoke style pipe roll: carbon steel yoke, rod and nuts with cast iron roll, to MSS SP-69.
- .9 U-bolts: carbon steel to MSS SP-69 with 2 nuts at each end to ASTM A 563.
 - .1 Finishes for steel pipework: galvanized.
 - .2 Finishes for copper, glass, brass or aluminum pipework: galvanized, with formed portion plastic coated.
- .10 Pipe rollers: cast iron roll and roll stand with carbon steel rod to MSS SP-69.

2.3 Riser Clamps

- .1 Steel or cast iron pipe: galvanized carbon steel to MSS-SP-58, type 42, UL listed.
- .2 Copper pipe: carbon steel copper plated to MSS-SP-58, type 42.
- .3 Bolts: to ASTM A 307.
- .4 Nuts: to ASTM A 563.

2.4 Insulation
Protection Shields

- .1 Insulated cold piping:
 - .1 64 kg/m³ density insulation plus insulation protection shield to: MSS SP-69, galvanized sheet carbon steel. Length designed for maximum 3 m span.
- .2 Insulated hot piping:
 - .1 Curved plate 300 mm long, with edges turned up, welded-in centre plate for pipe sizes NPS 12 and over, carbon steel to comply with MSS SP-69.

2.5 Constant
Support Spring
Hangers

- .1 Springs: alloy steel to ASTM A 125, shot peened, magnetic particle inspected, with +/- 5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.
- .2 Load adjustability: 10% minimum adjustability each side of calibrated load. Adjustment without special tools. Adjustments not to affect travel capabilities.
- .3 Provide upper and lower factory set travel stops.
- .4 Provide load adjustment scale for field adjustments.
- .5 Total travel to be actual travel + 20%. Difference between total travel and actual travel 25 mm minimum.
- .6 Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

2.6 Variable
Support Spring
Hangers

- .1 Vertical movement: 13 mm minimum, 50 mm maximum, use single spring pre-compressed variable spring hangers.
- .2 Vertical movement greater than 50 mm: use double spring pre-compressed variable spring hanger with 2 springs in series in single casing.
- .3 Variable spring hanger to be complete with factory calibrated travel stops. Provide certificate of calibration for each hanger.
- .4 Steel alloy springs: to ASTM A 125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with CMTR.

2.7 Equipment
Supports

- .1 Fabricate equipment supports not provided by equipment manufacturer from structural grade steel. Submit calculations with shop drawings.

2.8 Equipment
Anchor Bolts
and Templates

- .1 Provide templates to ensure accurate location of anchor bolts.

2.9 House-keeping
Pads

- .1 For base-mounted equipment: Concrete, at least 100 mm high, 50 mm larger all around than equipment, and with chamfered edges.

2.10 Other
Equipment Supports

- .1 From structural grade steel meeting requirements as stated in 2.5
- .2 Submit structural calculations with shop drawings.

PART 3 - EXECUTION

3.1 Installation

- .1 Install in accordance with:
 - .1 Manufacturer's instructions and recommendations.
- .2 Vibration Control Devices:
 - .1 Install on piping systems at pumps, boilers, chillers, cooling towers, elsewhere as indicated.
- .3 Clamps on riser piping:
 - .1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.
 - .2 Bolt-tightening torques to be to industry standards.
 - .3 Steel pipes: Install below coupling or shear lugs welded to pipe.
 - .4 Cast iron pipes: Install below joint.
- .4 Clevis plates:
 - .1 Attach to concrete with 4 minimum concrete inserts at each corner.
- .5 Provide supplementary structural steelwork where structural bearings do not exist or where concrete inserts are not in correct locations.
- .6 Use approved constant support type hangers where:
 - .1 vertical movement of pipework is 13 mm or more,
 - .2 transfer of load to adjacent hangers or connected equipment is not permitted.
- .7 Use variable support spring hangers where:
 - .1 transfer of load to adjacent piping or to connected equipment is not critical.
 - .2 variation in supporting effect does not exceed 25% of total load.

3.2 Hanger Spacing

- .1 Plumbing piping: most stringent requirements of Canadian Plumbing Code, Provincial Code, or authority having jurisdiction.
- .2 Fire protection: to applicable fire code.
- .3 Gas and fuel oil piping: up to NPS 1/2: every 1.8 m.

3.2 Hanger Spacing
(Cont'd)

- .4 Copper piping: up to NPS 1/2: every 1.5 m.
- .5 Flexible joint roll groove pipe: in accordance with table below, but not less than one hanger at joints.
- .6 Within 300 mm of each elbow.

Pipe Size: NPS	Maximum Spacing Steel	Maximum Spacing Copper
up to 1-1/4	2.1 m	1.8 m
1-1/2	2.7 m	2.4 m
2	3.0 m	2.7 m
2-1/2	3.6 m	3.0 m
3	3.6 m	3.0 m
3-1/2	3.9 m	3.3 m
4	4.2 m	3.6 m
5	4.8 m	
6	5.1 m	
8	5.7 m	
10	6.6 m	
12	6.9 m	

- .7 Pipework greater than NPS 12: to MSS SP-69.

3.3 Hanger
Installation

- .1 Install hanger so that rod is vertical under operating conditions.
- .2 Adjust hangers to equalize load.
- .3 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

3.4 Horizontal
Movement

- .1 Angularity of rod hanger resulting from horizontal movement of pipework from cold to hot position not to exceed 4° from vertical.
- .2 Where horizontal pipe movement is less than 13 mm, offset pipe hanger and support so that rod hanger is vertical in the hot position.

3.5 Final
Adjustment

- .1 Adjust hangers and supports:
 - .1 Ensure that rod is vertical under operating conditions.
 - .2 Equalize loads.

- 3.5 Final
Adjustment
(Cont'd)
-
- .2 Adjustable clevis:
 - .1 Tighten hanger load nut securely to ensure proper hanger performance.
 - .2 Tighten upper nut after adjustment.
 - .3 C-clamps:
 - .1 Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.
 - .4 Beam clamps:
 - .1 Hammer jaw firmly against underside of beam.

END

PART 1 - GENERAL

- | | | |
|-----------------------------|----|--|
| <u>1.1 Related Sections</u> | .1 | Section 09 91 23 - Interior Painting. |
| <u>1.2 References</u> | .1 | Canadian General Standards Board (CGSB).
.1 CAN/CGSB-1.60-M89, Interior Alkyd Gloss Enamel.
.2 CAN/CGSB-24.3-92, Identification of Piping Systems. |
| | .2 | Canadian Gas Association (CGA).
.1 CAN/CGA B149.1-M95.
.2 CAN/CGA B149.2-M91. |
| | .3 | National Fire Protection Association
.1 NFPA 13-1989, Installation of Sprinkler Systems.
.2 NFPA 14-1986, Standpipe and Systems. |
| | .4 | Submit product data in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. |
| | .5 | Product data to include paint colour chips, all other products specified in this section. |
| <u>1.3 Samples</u> | .1 | Submit samples in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. |
| | .2 | Samples to include nameplates, labels, tags, lists of proposed legends. |

PART 2 - PRODUCTS

- | | | |
|--|----|---|
| <u>2.1 Manufacturer's Equipment Nameplates</u> | .1 | Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer. |
| | .2 | Lettering and numbers to be raised or recessed. |
| | .3 | Information to include, as appropriate:
.1 Equipment: Manufacturer's name, model, size, serial number, capacity. |
-

- 2.1 Manufacturer's
Equipment
Nameplates
(Cont'd)

.3 (Cont'd)
.2 Motor: voltage, Hz, phase, power factor,
duty, frame size.
- 2.2 System
Nameplates

.1 Colours:
.1 Hazardous: red letters, white
background.
.2 Elsewhere: black letters, white
background (except where required otherwise by
applicable codes).
.2 Construction:
.1 3 mm thick laminated plastic or white
anodized aluminum, matte finish, with square
corners, letters accurately aligned and
machine engraved into core.
.3 Sizes:
.1 Conform to following table: Size #
No. of Height of mm Sizes (mm) Lines
Letters 1 10 x 50 1 3
2 13 x 75 1 5 3 13 x 75 2
3
4 20 x 100 1 8
5 20 x 100 2 5
6 20 x 200 1 8
7 25 x 125 1 12
8 25 x 125 2 8
9 35 x 200 1 20
.2 Use maximum of 25 letters/numbers per
line.
.4 Identification for PWC Preventive Maintenance
Support System (PMSS):
.1 Use arrangement of Main identifier,
Source identifier, Destination identifier.
.2 Equipment in Mechanical Room:
.1 Main identifier: Size #9.
.2 Source and Destination identifiers:
Size #6.
.3 Terminal cabinets, control panels:
Size #5.
.3 Equipment elsewhere: Sizes as
appropriate.

2.3 Existing
Identification
Systems

- .1 Apply existing identification system to new work.
- .2 Where existing identification system does not cover for new work, use identification system specified this section.
- .3 Before starting work, obtain written approval of identification system from Engineer.

2.4 Piping Systems
Governed by Codes

- .1 Identification:
 - .1 Natural gas: To CAN/CGA B149.1 authority having jurisdiction.
 - .2 Propane gas: To CAN/CGA B149.2 authority having jurisdiction.
 - .3 Sprinklers: To NFPA 13.
 - .4 Standpipe and hose systems: To NFPA 14.

2.5 Identification
of Piping Systems

- .1 Identify contents by background colour marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.
- .2 Pictograms:
 - .1 Where required, to Workplace Hazardous Materials Information System (WHMIS) regulations.
- .3 Legend:
 - .1 Block capitals to sizes and colours listed in CAN/CGSB-24.3.
- .4 Arrows showing direction of flow:
 - .1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.
 - .2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.
 - .3 Use double-headed arrows where flow is reversible.
- .5 Extent of background colour marking:
 - .1 To full circumference of pipe or insulation.
 - .2 Length to accommodate pictogram, full length of legend and arrows.
- .6 Materials for background colour marking, legend, arrows:
 - .1 Pipes and tubing 20 mm and smaller: Waterproof and heat-resistant pressure sensitive plastic marker tags.

Contents	Background colour marking	Legend
Raw water	Green	RAW WATER
Condenser water supply	Green	COND. WTR. SUPPLY
Condenser water return	Green	COND. WTR. RETURN
Chilled water supply	Green	CH. WTR. SUPPLY
Chilled water return	Green	CH. WTR. RETURN
Hot water heating supply	Yellow	HEATING SUPPLY
Hot water heating return	Yellow	HEATING RETURN
High temp HW Htg. supply	Yellow	HTHW HTG. SUPPLY++
High temp HW Htg. return	Yellow	HTHW HTG. RETURN++
Make-up water	Yellow	MAKE-UP WTR
Boiler feed water	Yellow	BLR. FEED WTR
Steam kPa	Yellow	kPa STEAM
Steam condensate (gravity)	Yellow	ST.COND.RET (GRAVITY)
Steam condensate (pumped)	Yellow	ST.COND.RET (PUMPED)
Safety valve vent	Yellow	STEAM VENT
Intermittent blow-off	Yellow	INT. BLOW-OFF
Continuous blow-off	Yellow	CONT. BLOW-OFF
Chilled drinking water	Green	CH. DRINK WTR
Drinking water return	Green	CH. DRINK WTR. CIRC
Domestic hot water supply	Green	DOM. HW SUPPLY
Dom. HWS recirculation	Green	DOM. HW CIRC
Domestic cold water supply	Green	DOM. CWS
Waste water	Green	WASTE WATER
Contaminated lab waste	Yellow	CONT. LAB WASTE
Acid waste	Yellow	ACID WASTE (add source)
Storm water	Green	STORM

2.5 Identification of Piping Systems (Cont'd) .7 Colours and Legends: (Cont'd)
.3 (Cont'd)

Contents	Background colour marking	Legend
Sanitary	Green	SAN
Plumbing vent	Green	SAN. VENT
Refrigeration suction	Yellow	REF. SUCTION
Refrigeration liquid	Yellow	REF. LIQUID
Refrigeration hot gas	Yellow	REF. HOT GAS
No. fuel oil suction	Yellow	# FUEL OIL
No. fuel oil return	Yellow	# FUEL OIL
Engine exhaust	Yellow	ENGINE EXHAUST
Lubricating oil	Yellow	LUB. OIL
Hydraulic oil	Yellow	HYDRAULIC OIL
Natural gas	to Codes	
Propane	to Codes	
Gas regulator vents	to Codes	
Nitrogen	Yellow	NITROGEN
Oxygen	Yellow	OXYGEN
Compressed air (700 kPa)	Green	COMP. AIR kPa
Vacuum	Green	VACUUM
Fire protection water	Red	FIRE PROT. WTR
Sprinklers	Red	SPRINKLERS
Carbon dioxide	Red	CO2
Instrument air	Green	INSTRUMENT AIR
Control air tubing	To Section 15950	
Conduit for low voltage control wiring	To Section 15950	
** Add design temperature		
++ Add design temperature and pressure		

2.6 Identification of Ductwork Systems .1 50 mm high stencilled letters and directional arrows 150 mm long x 50 mm high.

.2 Colours: Black, or co-ordinated with base colour to ensure strong contrast.

2.7 Valves, Controllers .1 tags with 12 mm stamped identification data filled with black paint.

.2 Include flow diagrams for each system, of approved size, showing charts and schedules with identification of each tagged item, valve type, service, function, normal position, location of tagged item.

- | | | |
|---|----|--|
| <u>2.8 Controls Components Identification</u> | .1 | Identify all systems, equipment, components, controls, sensors with system nameplates specified in this section. |
| | .2 | Inscriptions to include function and (where appropriate) fail-safe position. |

- | | | |
|---------------------|----|----------------------------------|
| <u>2.9 Language</u> | .1 | Identification to be in English. |
|---------------------|----|----------------------------------|

PART 3 - EXECUTION

- | | | |
|-------------------|----|---|
| <u>3.1 Timing</u> | .1 | Provide identification only after all painting specified Section 09 91 23 - Interior Painting has been completed. |
|-------------------|----|---|

- | | | |
|-------------------------|----|--|
| <u>3.2 Installation</u> | .1 | Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise. |
| | .2 | Provide ULC and or CSA registration plates as required by respective agency. |
| | .3 | Identify systems, equipment to conform to PWGSC PMSS. |

- | | | |
|-----------------------|----|--|
| <u>3.3 Nameplates</u> | .1 | Locations:
.1 In conspicuous location to facilitate easy reading and identification from operating floor. |
| | .2 | Standoffs:
.1 Provide for nameplates on hot and/or insulated surfaces. |
| | .3 | Protection
.1 Do not paint, insulate or cover in any way. |

- | | | |
|--|----|--|
| <u>3.4 Location of Identification on Piping and Ductwork Systems</u> | .1 | On long straight runs in open areas in boiler rooms, equipment rooms, galleries, tunnels: At not more than 17 m intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles. |
|--|----|--|
-

3.4 Location of
Identification on
Piping and Ductwork
Systems
(Cont'd)

- .2 Adjacent to each change in direction.
- .3 At least once in each small room through which piping or ductwork passes.
- .4 On both sides of visual obstruction or where run is difficult to follow.
- .5 On both sides of separations such as walls, floors, partitions.
- .6 Where system is installed in pipe chases, ceiling spaces, galleries, other confined spaces, at entry and exit points, and at each access opening.
- .7 At beginning and end points of each run and at each piece of equipment in run.
- .8 At point immediately upstream of major manually operated or automatically controlled valves, dampers, etc. Where this is not possible, place identification as close as possible, preferably on upstream side.
- .9 Identification to be easily and accurately readable from usual operating areas and from access points.
 - .1 Position of identification to be approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

3.5 Valves,
Controllers

- .1 Valves and operating controllers, except at plumbing fixtures, radiation, or where in plain sight of equipment they serve: Secure tags with non-ferrous chains or closed "S" hooks.
- .2 Install one copy of flow diagrams, valve schedules mounted in frame behind non-glare glass where directed by Engineer . Provide one copy (reduced in size if required) in each operating and maintenance manual.
- .3 Number valves in each system consecutively.

PART 1 - GENERAL

1.1 Related
Sections .1 Section 23 05 29 - Pipe Hangers and Supports.

1.2 References .1 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.2-M88, Thermal Insulation, Calcium Silicate, for Piping, Machinery and Boilers.
.2 CAN/CGSB-51.9-92, Mineral Fibre Thermal Insulation for Piping and Round Ducting.
.3 CAN/CGSB-51.10-92, Mineral Fibre Board Thermal Insulation.
.4 CAN/CGSB-51.11-92, Mineral Fibre Thermal Insulation Blanket.
.5 CAN/CGSB-51.12-M86, Cement, Thermal Insulating and Finishing.
.6 CAN/CGSB-51.40-M80, Thermal Insulation, Flexible, Elastomeric, Unicellular, Sheet and Pipe Covering.
.7 CGSB 51-GP-52Ma-89, Vapour Barrier Jacket and Facing Material for Pipe, Duct and Equipment Thermal Insulation.
.2 Underwriters Laboratories of Canada (ULC)
.1 CAN/ULC-S102-M88, Surface Burning Characteristics of Building Materials and Assemblies.
.3 American Society for Testing and Materials (ASTM).
.1 ASTM B 209M-92a, Specification for Aluminum and Aluminum Alloy Sheet and Plate.
.2 ASTM C 335-95, Test Method for Steady State Heat Transfer Properties of Horizontal Pipe Insulation.
.3 ASTM C 411-82(1992), Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
.4 ASTM C 449M-88, Standard Specification for Mineral Fiber-Hydraulic-Setting Thermal Insulating and Finishing Cement.
.5 ASTM C 795-92, Specification for Thermal Insulation for Use with Austenitic Stainless Steel.
.6 ASTM C 921-89, Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.

<u>1.2 References</u> (Cont'd)	.4	American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) .1 ASHRAE Standard 90.1-1989.
	.5	Manufacturer's Trade Associations. .1 Thermal Insulation Association of Canada (TIAC): National Insulation Standards.
<u>1.3 Shop Drawings</u>	.1	Submit shop drawings in accordance with Section 01 33 00 - Submittals.
	.2	Submit for approval manufacturer's catalogue literature related to installation, fabrication for duct jointing recommendations.
<u>1.4 Samples</u>	.1	Submit for approval: complete assembly of each type of insulation system, insulation, coating, and adhesive proposed. Mount sample on 12 mm plywood board. Affix typewritten label beneath sample indicating service.
<u>1.5 Installation Instructions</u>	.1	Submit manufacturer's installation instructions in accordance with Section 01 33 00 - Submittals.
	.2	Installation instructions to include procedures to be used, installation standards to be achieved.
<u>1.6 Qualifications</u>	.1	Installer to be specialist in performing work of this section, and have at least 3 years successful experience in this size and type of project, member of TIAC.
<u>1.7 Delivery, Storage and Handling</u>	.1	Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
	.2	Protect from weather and construction traffic.
	.3	Protect against damage from any source.
	.4	Store at temperatures and conditions required by manufacturer.

- 1.8 Definitions .1 For purposes of this section:
- .1 "CONCEALED" - insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.
 - .2 "EXPOSED" - will mean "not concealed" as defined herein.
 - .3 Insulation systems - insulation material, fasteners, jackets, and other accessories.

PART 2 - PRODUCTS

- 2.1 Fire and Smoke Rating .1 In accordance with CAN/ULC S102:
- .1 Maximum flame spread rating: 25.
 - .2 Maximum smoke developed rating: 50.

- 2.2 Insulation .1 Mineral fibre as specified herein includes glass fibre, rock wool, slag wool.
- .2 Thermal conductivity ("k" factor) not to exceed specified values at 24 C mean temperature when tested in accordance with ASTM C 335.
- .3 TIAC Code C-1: Rigid mineral fibre board to CAN/CGSB 51.10, with without factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this Section).
- .4 TIAC Code C-2: Mineral fibre blanket to CAN/CGSB 51.11 faced with without factory applied vapour retarder jacket to CGSB 51-GP-52Ma (as scheduled in PART 3 of this section).
- .1 Mineral fibre: to CAN/CGSB 51.11.
 - .2 Jacket: to CGSB 51-GP-52 Ma.
 - .3 Maximum "k" factor: to CAN/CGSB 51.11.

- 2.3 Jackets .1 Canvas:
- .1 220 gm/m² cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C 921.
- .2 Lagging adhesive: Compatible with insulation.
-

2.3 Jackets
(Cont'd)

- .3 Aluminum:
 - .1 To ASTM B 209 with moisture barrier as scheduled in PART 3 of this section.
 - .2 Thickness: 0.50 mm sheet.
 - .3 Finish: Smooth.
 - .4 Jacket banding and mechanical seals: 12 19 mm wide, 0.5 mm thick stainless steel.
- .4 Stainless steel:
 - .1 Type: 304 316.
 - .2 Thickness: 0.25 0.50 mm sheet.
 - .3 Finish: Smooth.
 - .4 Jacket banding and mechanical seals: 12 19 mm wide, 0.5 mm thick stainless steel.

2.4 Accessories

- .1 Vapour retarder lap adhesive:
 - .1 Water based, fire retardant type, compatible with insulation.
- .2 Indoor Vapour Retarder Finish:
 - .1 Vinyl emulsion type acrylic, compatible with insulation.
- .3 Insulating Cement: hydraulic setting on mineral wool, to ASTM C 449.
- .4 ULC Listed Canvas Jacket:
 - .1 220 gm/m² cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C 921.
- .5 Outdoor Vapour Retarder Mastic:
 - .1 Vinyl emulsion type acrylic, compatible with insulation.
 - .2 Reinforcing fabric: Fibrous glass, untreated 305 g/m².
- .6 Tape: self-adhesive, aluminum, reinforced, 50 75 mm wide minimum.
- .7 Contact adhesive: quick-setting
- .8 Canvas adhesive: washable.
- .9 Tie wire: 1.5 mm stainless steel.
- .10 Banding: 12 19 mm wide, 0.5 mm thick stainless steel.
- .11 Facing: 25 mm galvanized steel hexagonal wire mesh stitched on of insulation one face of insulation with expanded metal lath on other face.

- 2.4 Accessories (Cont'd)
- .12 Fasteners: 2 4 mm diameter pins with 35 mm diameter clips, length to suit thickness of insulation.

PART 3 - EXECUTION

- 3.1 Pre-installation Requirements
- .1 Pressure testing of ductwork systems to be complete, witnessed and certified.
- .2 Surfaces to be clean, dry, free from foreign material.

- 3.2 Installation
- .1 Install in accordance with TIAC National Standards.
- .2 Apply materials in accordance with manufacturers instructions and this specification.
- .3 Use two layers with staggered joints when required nominal thickness exceeds 75 mm.
- .4 Maintain uninterrupted continuity and integrity of vapour retarder jacket and finishes.
.1 Hangers, supports to be outside vapour retarder jacket.
- .5 Supports, Hangers in accordance with Section 23 05 29 - Pipe Hangers and Supports
.1 Apply high compressive strength insulation where insulation may be compressed by weight of ductwork.
- .6 Fasteners: At 300 mm oc. in horizontal and vertical directions, minimum two rows each side.

- 3.3 Ductwork Insulation Schedule
- .1 Insulation types and thicknesses: Conform to following table:

	TIAC Code	Vapour Retarder	Thickness mm
Rectangular cold and dual temperature supply air ducts	C-1	yes	50
Round cold and dual temperature supply air ducts	C-2	yes	50
Rectangular warm air ducts	C-1	no	25
Round warm air ducts	C-1	no	25

3.3 Ductwork

.1 (Cont'd)

Insulation Schedule

(Cont'd)

	TIAC Code	Vapour Retarder	Thickness mm
Supply, return and exhaust ducts exposed in space being served			none
Outside air ducts to mixing plenum	C-1	yes	25
Mixing plenums	C-1	yes	25
Exhaust duct between dampers and louvres	C-1	no	25
Rectangular ducts outside	C-1	special	50
Round ducts outside	C-1	special	50
Acoustically lined ducts	none		

- .2 Exposed round ducts 600 mm and larger, smaller sizes where subject to abuse:
- .1 Use TIAC code C-1 insulation, scored to suit diameter of duct.
- .3 Finishes: Conform to following table:

	TIAC Code	
	Rectangular	Round
Indoor, concealed	none	none
Indoor, exposed within mechanical room	CRF/1	CRD/2
Indoor, exposed elsewhere	CRF/2	CRD/3
Outdoor, exposed to precipitation	CRF/3	CRD/4
Outdoor, elsewhere	CRF/4	CRD/5

PART 1 - GENERAL

- 1.1 References
- .1 ANSI/ASME B16.22-1989, Wrought Copper and Copper Alloy Solder - Joint Pressure Fittings.
 - .2 ANSI/ASME B16.24-1991, Cast Copper Pipe Flanges and Flanged Fittings.
 - .3 ANSI/ASME B16.26-1988, Cast Copper Alloy Fittings for Flared Copper Tubes.
 - .4 ANSI/ASME B31.5-1987, Refrigeration Piping.
 - .5 ASTM A307-91, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
 - .6 ASTM B280-92, Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
 - .7 CSA B52-M1991, Mechanical Refrigeration Code.
 - .8 EPS 1/RA/1-1991, Code of Practice for the Reduction of CFC's (Environment Canada).

PART 2 - PRODUCT

- 2.1 Tubing
- .1 Processed for refrigeration installations, deoxidized, dehydrated and sealed.
 - .1 Hard copper: to ASTM B280, type ACR B.
 - .2 Annealed copper: to ASTM B280, with minimum wall thickness as per CSA B52 and ANSI/ASME B31.5.
- 2.2 Fittings
- .1 Service: design pressure 2070 kPa and temperature 121°C.
 - .2 Brazed:
 - .1 Fittings: wrought copper to ANSI/ASME B16.22.
 - .2 Joints: silver solder, 45% Ag-15% Cu or copper-phosphorous, 95% Cu-5%P and non-corrosive flux.
 - .3 Flanged:
 - .1 Bronze or brass, to ANSI/ASME B16.24, Class 150 and Class 300.
 - .2 Gaskets: suitable for service.
-

- 2.2 Fittings (Cont'd)
- .3 Flanged: (Cont'd)
 - .3 Bolts, nuts and washers: to ASTM A307, heavy series.
 - .4 Flared:
 - .1 Bronze or brass, for refrigeration, to ANSI/ASME 16.26.

- 2.3 Pipe Sleeves
- .1 Hard copper or steel, sized to provide 6 mm clearance all around between sleeve and uninsulated pipe or between sleeve and insulation.

- 2.4 Valves
- .1 22 mm and under: Class 500, 3.5 Mpa, globe or angle non-directional type, diaphragm, packless type, with forged brass body and bonnet, moistureproof seal for below freezing applications, brazed connections.
 - .2 Over 22 mm: Class 375, 2.5 Mpa, globe or angle type, diaphragm, packless type, back-seating, cap seal, with cast bronze body and bonnet, moistureproof seal for below freezing applications, brazed connections.

PART 3 - EXECUTION

- 3.1 General
- .1 Install in accordance with CSA B52, EPS 1/RA/1 and ANSI/ASME B31.5.
 - .2 Connect to equipment with isolating valves and unions.
 - .3 Provide space for servicing, disassembly and removal of equipment and components all as recommended by manufacturer.
 - .4 Protect all openings in piping against entry of foreign material.

- 3.2 Brazing Procedures
- .1 Bleed inert gas into pipe during brazing.
 - .2 Remove valve internal parts, solenoid valve coils, sight glass.
-

- 3.2 Brazing Procedures
(Cont'd)
- .3 Do not apply heat near expansion valve and bulb.
- 3.3 Piping Installation
- .1 General:
.1 Soft annealed copper tubing: bend without crimping or constriction
Hard drawn copper tubing: do not bend. Minimize use of fittings.
- .2 Hot gas lines:
.1 Pitch at least 1:240 down in direction of flow to prevent oil return to compressor during operation.
.2 Provide trap at base of risers greater than 2400 mm high and at each 7600 mm thereafter.
.3 Provide inverted deep trap at top of each riser.
.4 Provide double risers for compressors having capacity modulation.
.1 Large riser: install traps as specified above.
.2 Small riser: size for 5.1 m/s at minimum load. Connect upstream of traps on large riser.
- 3.4 Pressure and Leak Testing
- .1 Close valves on factory charged equipment and other equipment not designed for test pressures.
- .2 Leak test to CSA B52 before evacuation to 2 MPa and 1 MPa on high and low sides respectively.
- .3 Test Procedure: Build pressure up to 35 kPa with refrigerant gas on high and low sides. Supplement with nitrogen to required test pressure. Test for leaks with electronic or halide detector. Repair leaks and repeat tests.
- 3.5 Dehydration and Charging
- .1 Close service valves on factory charged equipment.
- .2 Ambient temperatures to be at least 13°C for at least 12 h before and during dehydration.
-

3.5 Dehydration
and Charging
(Cont'd)

- .3 Use copper lines of largest practical size to reduce evacuation time.
- .4 Use 2-stage vacuum pump with gas ballast on 2nd stage capable of pulling 5 Pa absolute and filled with dehydrated oil.
- .5 Measure system pressure with vacuum gauge. Take readings with valve between vacuum pump and system closed.
- .6 Triple evacuate all system components containing gases other than correct refrigerant or having lost holding charge as follows:
 - .1 Twice to 14 Pa absolute and hold for 4h
 - .2 Break vacuum with refrigerant to 14 kPa.
 - .3 Final to 5 Pa absolute and hold for at least 12 h.
 - .4 Isolate pump from system, record vacuum and time readings until stabilization of vacuum.
 - .5 Submit all test results to Engineer.
- .7 Charging:
 - .1 Charge system through filter-drier and charging valve on high side. Low side charging not permitted.
 - .2 With compressors off, charge only amount necessary for proper operation of system. If system pressures equalize before system is fully charged, close charging valve and start up. With unit operating, add remainder of charge to system.
 - .3 Re-purge charging line if refrigerant container is changed during charging process.
- .8 Checks:
 - .1 Make all checks and measurements as per manufacturer's operation and maintenance instructions.
 - .2 Record and report all measurements to Engineer.

3.6 Instructions

- .1 Post instructions in frame with glass cover in accordance with Section 01 73 03 - Operation and Maintenance Manual and CSA B52.

PART 1 - GENERAL

- | | | |
|-------------------------|----|---|
| <u>1.1 Related Work</u> | .1 | Thermal insulation: |
| | .2 | Vibration isolation: |
| | .3 | Mechanical General |
| | .4 | Annex G- 4 Wing Halocarbon Reporting Form |
-
- | | | |
|-----------------------|-----|---|
| <u>1.2 References</u> | .1 | ANSI/AMCA-210-1985, Laboratory Methods of Testing Fans for Rating. |
| | .2 | ANSI/ASHRAE-17-1986(R1990), Method of Testing for Capacity Rating of Thermostatic Refrigerant Expansion Valves. |
| | .3 | ANSI/ARI-450-87, Water Cooled Refrigerant Condensers, Remote Type. |
| | .4 | ANSI/ARI-495-85, Refrigerant Liquid Receivers. |
| | .5 | ANSI/ARI-520-85, Positive Displacement Refrigerant Compressors, Compressor Units, and Condensing Units. |
| | .6 | ANSI/ARI-710-86, Liquid Line Driers. |
| | .7 | ANSI/ASME-B16.26-1988, Cast Copper Alloy Fittings for Flared Copper Tubes. |
| | .8 | ANSI/ASME-B16.29-1986, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV. |
| | .9 | ANSI/ASME-B31.5-1987, Refrigeration Piping. |
| | .10 | ANSI/ASME-B16.34-1988, Valves-Flanged, Threaded and Welding End. |
| | .11 | ASTM-B280-92, Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service. |
| | .12 | ANSI/AWS-A5.8-89, Specification for Brazing Filler Metals. |
| | .13 | CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing. |
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- 1.2 References (Cont'd)
- .14 CSA B52-M1991, Mechanical Refrigeration Code.
 - .15 CAN/CSA-080 Series-M89, Wood Preservation.
 - .16 ANSI/ASME Boiler and Pressure Vessel Code, 1992.
 - .17 EPS 1/RA/1-1991, Code of Practice for the Reduction of Chlorofluorocarbons Emissions from Refrigeration and Air Conditioning Systems, Canadian Environmental Protection Act Code of Practice.

- 1.3 Qualifications
- .1 Process refrigeration manufacturer shall be regularly engaged in production of specified equipment, and one who issues catalogue information with correction factors where published ratings are based on parameters different from those specified.
 - .2 Installation shall be performed by certified refrigeration mechanics/technician.
 - .3 Installation must comply with requirements listed in EPS 1/RA/1.

- 1.4 Source Quality Control
- .1 Factory leak test air-cooled condenser coils at minimum gauge pressure of 2.1 MPa.
 - .2 Test water-cooled condensers in accordance with ANSI/ASME Boiler and Pressure Vessel Code, Section 8 and Section 9 and ANSI/ARI-450, for water-cooled refrigerant condensers.
 - .3 Factory leak test evaporator coils to industry standards.

- 1.5 Maintenance Data
- .1 Provide operation and maintenance data for process refrigeration for incorporation into manual specified in Section 01 73 03 - Operation and Maintenance Manual.
 - .2 Include exploded views of components.
-

- 1.6 Delivery and Storage .1 Ship equipment factory dehydrated and sealed with holding charge of specified refrigerant and charge of lubricating oil.
- 1.7 Warranty .1 For refrigerant piping system loss of refrigerant and satisfactory operation of welded hermetic compressor, the warranty period is 12 months.
- 1.8 Shop Drawings .1 Submit shop drawings in accordance with Section 01 33 00 -Submittals.
- .2 Provide diagrams of field installation, internal wiring and piping for field assembly, with refrigerant flows, pipe sizes, pressure drops in equipment and suction lines.

PART 2 - PRODUCTS

- 2.1 Compressor .1 Same type as listed in equipment schedule with ratings based on ANSI/ARI 520, complete with motor having adjustable v-beltor direct drive hermeticor semi-hermetic motor compressor assembly mounted on welded structural steel base or in existing base of original equipment.
- .2 Capacity control:
.1 Step controlled capacity through suction valve unloaders, actuated whenever suction pressure varies below set point. Operate lifting mechanism using lubricating oil pressure orelectrically operated unloaders. Provide for unloaded compressor start. Capacity reduction steps shall be 75, 50, 25%
.2 Achieve further capacity reduction using hot gas bypass method, as specified or indicated.
- .3 Lubrication:
.1 Except for sealed hermetic units, provide forced feed lubrication for compressors 2.8 kW and larger, using positive displacement oil pump driven by compressor crankshaft and incorporating serviceable oil filter, pressure control, oil pressure safety switch with time delay and oil pressure gauges.
-

- 2.1 Compressor
(Cont'd)
- .4 Crankcase heaters: manufacturer's standard.
- .5 Vibration isolators:
- .1 Semi-hermetic or Open units, shipped on factory supplied mounting base or frame. Include manufacturer's combination of mounting springs and neoprene and rubber spacers. Set base of frame on neoprene or rubber isolating pads.
- .2 Set sealed hermetic units with spring mounted internal machinery on neoprene or rubber isolating pads.
- .3 Mount 5 kW and larger units on vibration isolators with 5 % maximum transmissibility.
- .6 Pressure relief: where required by authority having jurisdiction, supply compressor with factory installed pressure relief device, located between compressor and stop valve on discharge side. Vent in accordance with CSA B52.
- .7 Dual pressure control: automatic reset low pressure cut-out and automatic reset high pressure cut-out set to manufacturer's acceptable limits.
- .8 Motors and controls:
- .1 Conform to Section 23 05 00 - Common Work Results - Mechanical.
- .2 Protect hermetic units against overheating and overcurrent by internal thermostats breaking control circuit when sensing overheat and combining with external current sensing relay to provide close tolerance locked rotor protection. Protect each phase individually.
- 2.2 Condenser
- .1 Air cooled condensers:
- .1 As indicated with horizontal or vertical air flow and total heat rejection as original equipment when condensing refrigerant R 22 at recommended saturated suction temperature by manufacturer and air entering condenser as per manufacturers design.
- .2 Continuous hot dipped galvanized sheet steel casing and supports with zinc plated nuts and bolts, complete with hinged access door with electrical safety locking device and full width galvanized steel divider plates to separate fan sections in multiple fan models. Equip with heavy gauge die formed or
-

- 2.2 Condenser
(Cont'd)
- .1 (Cont'd)
- .2 (Cont'd)
- structural steel legs, anchoring plates and external lube lines.
- .3 Director V-belt drive, dynamically and statically balanced propeller type fan, complete with:
- .1 Aluminium fan blades, individually gauged for contour and alignment.
- .2 3 mm thick steel wire, formed, welded, zinc plated fan guards.
- .3 Spun bell mouth fan orifice entrance.
- .4 Cowl to direct discharge vertically for horizontal discharge fans.
- .5 Multiple fan units with separate standard, protected drip proof drive motors having weather protection covers, adjustable motor mounts and drives. Conform to Section 23 05 00 - Common Work Results - Mechanical.
- .6 Sound insulation as indicated or specified on inlet and outlet of unit.
- .4 For indoor installations, centrifugal fans shall be Class I operation rated in accordance with ANSI/AMCA 210. Fan shall handle air volumes and pressure heads as indicated by original equipment.
- .5 Provide units with adjustable motor bases and drives.
- .2 Head pressure control:.
- .1 Air cooled condenser:
- .1 Provide modulating, freeze-up protected dampers as per original equipment. Position using pneumatic or electric operator to maintain minimum 18°C temperature of air entering condenser.
- .2 Flood condenser with refrigerant.
- .2 For remote condensers located outside building, provide each separate refrigeration circuit with head pressure control system sized and installed to details as indicated and adjusted to maintain minimum receiver gauge pressure recommended by manufacturer.
- 2.3 Receiver
- .1 For design pressure, materials, welding test and relief devices, conform to ANSI/ASME Boiler and Pressure Vessel Codes and ANSI/ARI 495, refrigerant liquid receivers.

<u>2.3 Receiver</u> (Cont'd)	.2	Compute pump-down capacity of receiver as being 110% of its internal storage volume, expressed in kilograms of refrigerant liquid at 32°C temperature.
	.3	Replace with original manufacturer parts if where ever possible.
<u>2.4 Condensing Unit</u>	.1	Provide certified ratings in accordance with ANSI/ARI 520.
	.2	Unit shall consist of compressor and v-belt or direct drive motor, hermetic or semi-hermetic motor compressor assembly, oil separator where in original equipment, condenser, receiver, controls, service valves piped, ready for external connection to evaporator, and complete with hardware and fasteners. Provide flexible connectors 1 m in length.
	.3	Replace with original equipment parts where evber possible.
<u>2.5 Evaporator</u>	.1	Provide ARI certified coils of 16 mm nominal od seamless tubing with fins as per original equipment factory dehydrated and sealed with dielectric connections.
	.2	Coils, with hot gas bypass for capacity control or defrost, to have auxiliary connection on distributor and less than 300 mm of tubing between distributor and expansion valve.
	.3	Provide connections as indicated.
	.4	Include insulated heated drip pan.
	.5	Provide gravity coil with sloping, removable, baffle assemblies, dripping into troughs. Install at ends of coil assembly.
	.6	Provide unit coolers with: <ul style="list-style-type: none"> .1 Aluminum casing reinforced with galvanized steel hanging profiles and drip pan insulated on outside. .2 Propeller type fans with aluminum blades, dieformed venturi discharge and lubricating fittings. Motor shall be drip proof wired through junction box.

- 2.5 Evaporator
(Cont'd)
- .7 Provide product coolers with:
- .1 Cabinet of continuous heavy gauge galvanized steel having removable leakproof panels with access doors.
 - .2 Self-draining pan, externally insulated with 25 mm of fire-rated foam insulation where electric defrost is used.
 - .3 Forward curved centrifugal or Propeller type fans, driven by open drip proof motor wired through junction box.
- .8 Replace with original manufacturer parts if where ever possible.
- 2.6 Defrost Control
- .1 Replace with original manufacturers parts. Replace with same systems as in original equipment. Following is a list of probable occurances.
- .2 For evaporators operating below minus 1°C provide:
- .1 Re-evaporator or Suction accumulator in suction line, as per original equipment.
 - .2 Interlock defrost cycles for two or more evaporators in same area.
- .3 Provide industry standard defrost or off-cycle defrosting as follows: for cold rooms at and above 2°C, use automatic pump-down control with fan on. Follow steps or program, and provide timer to shut-off liquid line solenoid valve. Compressor shall stop on low pressure control. Use coil sensing thermostat to end defrost cycle when temperature specified limit by manufacturer of original equipment is reached; for electric defrost, clamp moisture proof sheathed elements to tubing. Provide capacity in accordance with schedule.
- .4 Provide hot gas defrost piping, as indicated, with:
- .1 Hot gas entering drain pan heating coil.
 - .2 hot gas or electric cable drain pipe heating.
 - .3 Spring loaded check valve in piping from drain pan heater to inlet of evaporator.
 - .4 Shut-off valve, strainer and solenoid valve with suction accumulator and heat exchanger coil in suction line.
-

2.6 Defrost Control .5
(Cont'd)

- Provide defrost timer to function as follows:
- .1 Stop evaporator fans, shut liquid solenoid valve and open hot gas bypass valves.
 - .2 Energize defrost hot gas solenoid valve and electric drain heater.
 - .3 When compressor stops on low pressure, interlock relay shall stop evaporator fan and energize electric defrost heaters, drip pan and drain heaters.
 - .4 Evaporators with dampers isolating coil from ambient air are to close as long as heaters are on.
 - .5 Two-stage thermostat sensing coil temperature shall end defrost cycle when pre-determined temperature is reached, then restart cooling cycle; evaporator fan and drain heaters are to remain on until coil temperature reaches minus 2°C.
- .6 Provide drip pan drains with:
- .1 Copper tube dwv from pan outlet to main drain in frost free area.
 - .2 Heating cable 23 W/m applied straightor spiral wound, prior to installation.

2.7 Refrigerant
Piping

- .1 Use factory cleaned and sealed seamless ACR copper.
- .2 Conform to ANSI/ASME-B31.5 and ASTM B280 requirements and EPS 1/RA/1.
- .3 Relief valve discharge pipe on outdoor installations shall be black steel pipe, schedule 40, with welded or screwed joints.
- .4 Fittings:
- .1 Conform to ANSI/ASME-B16.26 and ANSI/ASME-B16.29.
 - .2 Long radius type for elbows and return bends.
 - .3 Wrought copper or forged brass solder type, except that flared fittings may be used for soft annealed copper tubing.
 - .4 Brazing materials shall conform to ANSI/AWS A5.8 and be SIL-FOS-15 phosphor-copper-silver alloy for copper piping jointed by copper fittings; 170 MPa silver solder for brass fittings; 95-5 solder for connections to equipment or accessories.
 - .5 Flexible connections: 10 mm nominal or less shall be made using coiled soft copper tubing. For larger sizes, use seamless flexible bronze hose with bronze wire braid

2.7 Refrigerant
Piping
(Cont'd)

- .4 Fittings: (Cont'd)
 - .5 Flexible connections: (Cont'd)
covering. Use factory sealed neoprene jacket unit where freezing may occur.
- .5 Identify all refrigerant piping in accordance with Section 23 05 54 - Mechanical Identification.

2.8 Valves

- .1 Meet ANSI/ASME-B16.34 for valve construction.
 - .2 Service valves:
 - .1 Forged brass Class 500 up to 3.5 MPa packless and cast bronze Class 375 up to 2.5 MPa.
 - .2 Moisture proof seal type for below freezing applications.
 - .3 Back seated and ball check for inspection and replacement under pressure.
 - .4 Removable seal cap and gauge port for control capillary connections for compressors.
 - .5 Stop valves:
 - .1 22 mm nominal od or less shall be diaphragm packless type with integral mounting bracket, forged brass bodies and bonnets, globe and angle, non-directional type.
 - .2 28 mm nominal od or larger shall be heavy globe or angle body, positive sealing, self-aligning, heavy nylon disc.
 - .3 Purge, drain, charging, angle or globe type with flare or brazing type outlet connection shall have stem for socket wrench and removable seal cap.
 - .3 Relief valves:
 - .1 Safety relief type with fusible plug or rupture disc in forged brass body.
 - .2 Reseating type with forged brass body.
 - .3 Duplex valves as indicated or by code regulations arranged so that only one valve can be rendered inoperative at a time.
 - .4 Check valves:
 - .1 Spring operated, guided piston type with forged brass body in flare connection sizes up to 22 mm nominal od.
 - .2 Guided piston type, spring operated with bolted bonnet or cover plate in sweat connections 28 mm nominal od and above.
-

2.8 Valves
(Cont'd)

- .5 Solenoid valves:
 - .1 With field replaceable coil, serviceable without removing valve from line. For pumpdowns, use manual lift stem. Rate coils according to temperature service.
 - .2 Provide upstream of thermostatic expansion valves and strainers.
- .6 Expansion valves, to ANSI/ASHRAE-17, as indicated by manufacturers manuals or:
 - .1 Thermostatic type with external equalizer, adjustable superheat setting, capacity and bulb charge to suit operating conditions.
- .7 Back pressure valves:
 - .1 Direct acting or with external pilot sensing, convertible in field to internal sensing with manual opening stem for pump down. Install with solenoid valve in pilot line for stop valve operation. Provide manual, pneumatic, electric or self contained temperature sensing activator adjustable pressure setting as per original equipment.
- .8 Crankcase pressure regulators:
 - .1 Hold-back valves for low and medium pressure compressor suction line to prevent over-loading of motors on full "pump" down and defrost cycle. Range of gauge pressure to be 0-275 kPa with a pressure drop design of 3.5 to 7 kPa.
- .9 Hot gas by-pass valves:
 - .1 Changeable for use with external equalizer or internal equalizer in field. Adjustable range of gauge pressure as required where called for. Provide electric, pneumatic or manual type positioner for adjustment.
- .10 Water regulating valves:
 - .1 Pressure activated two-way straight-through type.
 - .2 For three-way regulators, install balancing valve in by-pass, adjusted to maintain constant system flow rate irrespective of valve position.

2.9 Driers

- .1 Provide liquid line driers to ANSI/ARI 710, UL approved and rated to SWP-3.5 MPa.

- 2.9 Driers
(Cont'd)
- .2 Size as indicated, but not less than recommended by equipment manufacturer's nominal tonnage rating for type of refrigerant used.
 - .3 Size 16 mm od or larger shall be replaceable cartridge type and installed as indicated. Provide isolating and relief valves.
 - .4 Provide suction line driers as per liquid line drier and manufacturer's suction line ratings, with pressure drops rated to refrigerant used and operating suction pressure.
- 2.10 Sight Glass
- .1 Provide moisture indicating, double sight glass:
 - .1 Upstream from expansion valve.
 - .2 Near receiver outlet.
 - .3 Elsewhere as indicated.
- 2.11 Mufflers
- .1 Provide as indicated and as recommended by compressor manufacturer.
- 2.12 Oil Separators
- .1 Provide, as indicated, and for automatic return of trapped oil to compressor crank case using float valve. Insulate non-heated separator drum.
- 2.13 Heat Interchangers
- .1 Provide liquid suction type employing soldered tube, tube-in tube, shell and finned coil of size and type as indicated.
- 2.14 Suction Receivers
- .1 Size capacity of receiver for 125% of pump down capacity, expressed in kilograms of refrigerant liquid at 32°C temperature.
 - .2 Design for re-evaporation of liquid refrigerant.
-

PART 3 - EXECUTION

- 3.1 Inspection .1 Upon delivery, inspect components for damage or gas loss and report to Engineer in writing.
- 3.2 Accessibility .1 Provide clearance around all equipment and components for observation of operation, inspection, service and maintenance without removal of any equipment, components or piping.
- .2 Install access doors in equipment and ducts, and as necessary to provide accessibility.
- 3.3 Installation .1 Install systems and related controls in accordance with manufacturers instructions and shop drawings.
- .2 Drains:
- .1 Install drains to permit removal of condensate and allow cleaning of coils.
- .2 Run drain lines to floor drains.
- .3 Locate vibration and noise isolation as indicated. Where units are supplied with sound attenuator, conform to manufacturer's instructions. Ensure adequate base or foundation.
- .4 Units installed 3.5 m or more above ground level:
- .1 Install guard railed platform.
- .2 Install cat walk around unit. Cat walk to be of non conductive material.
- .5 Install disconnect switch adjacent to each unit.
- .6 Mount roof mounted condenser units on base consisting of two 190 x 190 mm pressure treated structural timbers weatherproofed to CAN/CSA-080 Series, including S1, S2, S3 and S4 revisions. Timber material shall be BC fir, construction grade D.
- .7 Piping:
- .1 Clean and Purge refrigerant lines and fittings.
-

3.3 Installation
(Cont'd)

- .7 Piping: (Cont'd)
- .2 When multiple runs are installed, spread pipes 150 mm minimum to allow for expansion and contraction.
 - .3 Install straight, parallel and close to walls and ceilings, with specified pitch.
 - .4 Keep elbows and fittings to minimum.
 - .5 Correlate equipment provided with Engineer and propose changes to line sizing required, before proceeding with installation.
 - .6 Grade horizontal pipe carrying gases 1:240 down in direction of flow.
 - .7 Locate double risers in hot gas or suction piping as indicated.
 - .8 Locate trap every 4.5 m of vertical rise in any suction riser 9 m or more in length.
 - .9 Install piping to prevent condensate or oil from flowing back into compressor or evaporator. Locate suction accumulator in suction line between evaporator and compressor.
 - .10 Connect branch suction lines from top of suction main using wye-fitting. Install ancillaries and accessories such as back pressure compensating regulators and back pressure regulators horizontal.
 - .11 To avoid interference with services to compressor, do not obstruct view of oil level bulls-eye or run piping.
 - .12 Enclose tubing exposed to mechanical injury in rigid or flexible conduit.
 - .13 Keep piping joints sealed except when fabricating.
 - .14 Limit breakable joints to equipment connections not normally brazed. Limit flared joints to 10 mm nominal outside diameter for field assembly and 16 mm nominal outside diameter for factory assembly.
 - .15 Bleed dry nitrogen into piping when sweating connections.
 - .16 Braze flexible pipe vibration isolators and stub connectors on sealed hermetic compressors using alloys which melt at 620°C or below.
 - .17 Directly connect vibration isolators to compressor and firmly anchor other end.
- .8 Thermal expansion valves:
- .1 Mount thermal expansion valve bulb on suction line at evaporator outlet. Suction line to be horizontal, pitched for drainage from bulb location. If suction line rises after bulb, precede rise with P-trap.
 - .2 Connect external equalizer to suction line immediately downstream of thermal

3.3 Installation
(Cont'd)

- .8 Thermal expansion valves: (Cont'd)
 - .2 (Cont'd)
expansion valve bulb, midway on pipe diameter,
to sense refrigerant liquid and gas.
- .9 Accessories:
 - .1 Install as indicated and as specified by
manufacturer.
 - .2 Standard:
 - .1 Ball check isolating valves at
receiver sight glass.
 - .2 Charging valve for high and low
side filter drier, solenoid valve and
thermostatic expansion valve..
 - .3 Special accessories:
 - .1 Oil separator with automatic oil
return to crankcase, through filter,
automatic stop valve with bypass valve,
external float valve.
 - .2 Capacity controls: evaporator
pressure controls; crankcase pressure
controller; hot gas by-pass to suction
line with desuperheat control; hot gas
by-pass to evaporator inlet.
 - .3 Purge valve to be installed at high
point of condenser only for units
operated at vacuum suction pressure.
 - .4 Dehydrator assemblies: install with
three valves.
 - .5 Liquid suction heat interchangers:
as indicated shell and finned coil
interchangers pitched at approximately
15° angle with oil returned to suction
line through metering needle valve,
solenoid valve and sight glass.

3.4 Field Quality
Control

- .1 Pressure and leak testing:
 - .1 Perform leak test before evacuating
system. Meet requirements of CSA B52, but not
less than a gauge pressure of 2 MPa high side
and 1 MPa low side.
 - .2 Use non ozone depleting gas as tracer
with dry nitrogen to develop pressure.
 - .3 Compressors with refrigerant holding
charge shall remain isolated from system.
Protect accessories when performing test.
 - .4 Build 35 kPa initial pressure in high
and low side and add dry nitrogen to field
test pressure.
 - .5 Test for leaks with detector.
 - .6 Repair leaks and retest.

3.5 Cleaning

- .1 Reclaim refrigerant by pumping down through filtration system.
- .2 Pressurize system with non ozone depleting agent approved by Engineer and hold charge for 2 h.

3.6 Dehydration

- .1 Carry out work in presence of Engineer
- .2 Evacuate using two stage vacuum pump with gas ballast on second stage capable of pulling vacuum of 0.05 mm. Fill pump with fresh dehydrated oil.
- .3 Do not use refrigerants compressors to pull vacuum.
- .4 Maintain ambient temperature of 13°C or higher throughout refrigeration system for at least 12 h before and during dehydration.
- .5 Connect high vacuum hose or seamless copper tubing jumper lines to both high and low pressure sides. Line size not less than 6 mm nominal od for units up to 70 L internal volume and 10 mm nominal or 12 mm nominal od for larger units.
- .6 Install thermo couple vacuum gauge with mm scale to measure system pressure. Locate manual isolating valve between pump and gauge and take readings only with system isolated from pump.
- .7 When compressor/condensing unit has refrigerant holding charge intact, service valves shall remain closed during evacuation. Evacuate any equipment received with dry air, wrong refrigerant, or lost holding charge.
- .8 Evacuate field installed system 3 times as follows: twice to 1.5 mm and hold for 4 h. Break vacuum to a gauge pressure of 14 kPa each time with refrigerant. For final evacuation, continue pumping through minimum 12 h after reaching 0.5 mm. After completion of final evacuation, isolate pump from system and make graphic record of rate of any increase in vacuum reading which may take place inside following hours. Continue readings until vacuum has stabilized. Provide Engineer with 3 copies of graphic record. Charge through filter drier. Use receivers or

3.6 Dehydration
(Cont'd)

- .8 (Cont'd)
other technology to contain CFC-13 or other ozone depleting refrigerant used for triple evacuation. If this is not possible, an alternative to triple evacuation such as de vacuum evacuation should be employed.

3.7 Charging

- .1 Give initial charge through high side charging valve with pressure gauge and new filter-drier installed in connection to charging valve.
- .2 Charge only amount of refrigerant necessary for proper operation of refrigeration system. When amount has been charged, close liquid charging valve. With system in operation, observe sight glass near receiver outlet to recheck.
- .3 When refrigerant container must be changed during charging process, re-purge charging line.
- .4 Low side charging shall be permitted only for charging small amounts in gaseous state.
- .5 Provide 2 days notice of leak testing, dehydration and charging.
- .6 Prime oil separator with operating charge of compressor oil.

3.8 Start-Up and
Adjustment

- .1 Provide necessary instruments, gauges and testing equipment required. Adjust controls, to obtain design requirements and manufacturer's ratings.
- .2 Ensure that insulation of refrigerant piping and accessories completed.
- .3 Test and record cooling apparatus entering and leaving air temperatures, dry bulb and wet bulb.
- .4 Test and record voltage and running amperes and compare to motor nameplate data, and starter heater rating against design requirements. Check each phase which must be accurate to nearest 100 VA.

3.8 Start-Up and
Adjustment
(Cont'd)

- .5 Ensure that refrigerant temperatures are accurate to within 0.5°C of design requirements.
- .6 In co-operation with control manufacturer's representative and Engineer, set and adjust automatic control system to achieve required sequence of operations.
- .7 Bring equipment into operation, trial run and make up any loss of oil and refrigerant.

END

ANNEX A

4 Wing Ground Disturbance & Clearance Notice

R-2010-08-010

Project Name: _____	Project File No.: _____
Contact Name: _____	Telephone #: _____
Organization: _____	RETURN FAX #: _____
Work Location (incl. Base address and Legal with diagram/sketch attached) _____	Disturbance Depth: _____
Description of Work: _____	Site pre-marked: _____

Utility / Contact Information	Remarks & Date	Name and sign-off
Wing Operations Loc 8006/Fax 780-840-7341		
4 Wing Fire Dept Loc 8401/Fax 780-840-7317		
PMO - GIS Records Loc 8251/Fax 780-840-7316		
Wing Environment Loc 8430/ Fax 780-840-7305		
TIS Line/Help Desk Loc 7053 /Fax 780-840-7349	Remedy Ticket #	
Electrical- CE Electrical Loc 8429/ Fax 780-840-4029		
Water/Sewer/Steam/Gas -CE Plumbing Loc 8427/ Fax 780-840-4000		
WFE Loc 8960/8411/ Fax 780-840-7314		
Alberta 1-Call Phone: 1-800-242-3447	Ticket #	No response required
Eastlink Fax 780-826-7028		
Canada Locators Fax 1-780-636-3575	(Telus)	
Alberta Supernet Fax 1-780-488-9875		
ATCO Electric Fax 780-594-3090		
ATCO Gas Fax 780-594-3090		
ATCO PIPELINES 1-780-808-0777		
ALTA GAS Fax 780-826-4712		
DCC Loc 7058 Fax: 780-594-6161	Information only	No response required

INSTRUCTIONS:

- * ALLOW MINIMUM 5 WORKING DAYS NOTICE FOR COMPLETION OF NOTICE LOCATES.
- In case of any delay beyond 14 days or conditions at job site change the entire ground disturbance permit process must be completed again.
- A person does not commit an offence under the act if he can demonstrate that he made all reasonable efforts to procure inspection and supervision required for the undertaking.
- The contractor shall confirm to their satisfaction that the work area is clearly staked/ marked and correctly color coded to Standards. Contractor shall not proceed with any ground disturbance if work area is not properly identified or if doubts to actual location of marked utilities.
- ALL ground disturbances within 1 meter of marked/flagged electrical/communications and within 5 meters of gas lines must be hand exposed by hand digging (or hydrovac) prior to use of mechanical equipment.

Annex B

4 WING COLD LAKE HOT WORK AUTHORIZATION PERMIT # _____

Date : _____ Start Time : _____ Expiry Time : _____ Date : _____

INSPECTOR : Rank _____ Name _____ LOCATION : _____

Type of work : ☐ Welding/Cutting ☐ Soldering ☐ Hot Roofing ☐ Other _____

CONFINED SPACE : ☐ Yes ☐ No

Confined Space Entry Permit on site ☐ Yes ☐ No

- Note : If a confined space entry permit is required and not on site, then a hot work authorization chit may not be issued.
- Before approving any hot work, the Fire Inspector shall inspect the work site and surrounding area to confirm that all precautions have been taken to prevent fire IAW NFPA 51B.
- If hot work is to be done in a Hangar, all Aircraft SHALL be removed.

GENERAL PRECAUTIONS () Sprinkler/alarms in service. (if applicable) () Welding Equipment in good repair.	FIRE WATCH () To be provided during and 30 min after operation. () Serviceable Fire Extinguisher. () Trained in Action in event of a Fire.
<u>WITHIN 11M OF WORK AREA</u> () Combustible Products removed from area. () Combustible floors wet down or covered with non combustible material. () Flammable and Combustible liquids removed or safely stored. () Wall and floor openings covered. () If practicle, covers suspended beneath work to collect sparks.	<u>WORK WITHIN WALLS OR CEILINGS</u> () Non combustible construction and without combustible coverings. () Combustibles removed from other side of partition. <u>HERMAN NELSON HEATERS</u> () Personnel trained in proper start-up, shut down and re-fueling procedures prior to use. () Fire extinguisher available.
<u>HOT ROOFING OPERATIONS</u> () Tar kettle located in a safe location at least 5 meters from an exit or combustible materials, including walls, or on a non-combustible roof (unless approved by WFC). () Thermostate on the kettle is operational and kettle is constantly supervised. () Servicable Dry Chemical or CO2 fire extinguisher available. () A metal lid that can be closed in case of a fire. () Inform the contractor that : used mops and rags shall be cleaned and stored away from the building and other combustible materials at the end of each work day or disposed separate from other waste. <u>NOT LEFT ON THE ROOF.</u>	

CONTRACTOR : Name : _____ COMPANY _____

Address : _____

Phone Number : _____ Cell Phone : _____

I have received the Fire Department briefing and agree to comply with all regulations. The Fire Department shall be notified of any changes affecting the operations authorized by this permit.

Failure to comply with these safety precautions may result in you or your company being held responsible for any damages incurred.

The Fire Department is to be notified at 840-8000 Loc 8401 when the inspection 30 minutes after the completion of any hot work for that day has been completed.

Signature of on site Supervisor _____

Approved by _____ Wing Fire Department.

Fire Department Emergency Number 840-8333 OR Loc. 8333

ANNEX C
4 Wing Confined Space Entry Permit

NOTE: This permit is valid only for the work and time described!

Fire Hall must be notified prior to entry Ph 840-8000 Ext 8401 **EMERGENCY RESCUE PHONE EXT 911**

Permit # _____ Date: ____/____/____ Time of Entry: ____ Hrs Expiration: ____ Hrs

Type/Class of Space: _____ Location: _____

Unit/Section: _____ Supervisor: _____

Description of Work: _____

ATMOSPHERIC TESTER Make: _____ Model: _____ Ser#: _____

Date of Last Calibration: ____/____/____ Calibrator: _____

Pre Entry Test Results

TEST	ACCEPTABLE LEVEL			AMOUNT TESTED	SIGNATURE		
Oxygen	Min 19.5% Max 23%						
Explosive Gases	5% LEL						
Carbon Monoxide (CO)	10 ppm (max)						
Hydrogen Sulfide (H ₂ S)	5 ppm (max)						
Toxic Gases	50% of TLV (max)						
EQUIPMENT REQ'D	Y	N	TYPE USED	PRE ENTRY REQUIREMENTS		Y	N
Respirators				Hazard Assessment Report Reviewed			
Air Line Respirators				Bleed Pressure			
SCBA Equip				Drain			
Ventilation Equip				Purge			
Communications				Ventilation			
Fall Arrest Equip				Electrical Lockout/Tagout			
Mechanical Lifting Device				Blinding/Blanking			
Personal Alarms				Hot Work Permit (Fire Hall)			
Fire Extinguishers				All Safety Equip on Site			
Life Jackets				Barricades/Signs Erected			
Barricades				Fire Hall Notified			
Non Sparking Tools				Others (Specify)			

Special Instructions _____

I certify that I have performed all required tests and preventive measures (IAW the Hazard Assessment Report) for the safe entry into this confined space.

Qualified Person (Print)

Signature

I certify that I have reviewed the Hazard Assessment Report and have been briefed on all tests and preventive measures required for safe entry into this confined space.

First Name (print)

Last Name (print)

Signature

I certify that all personnel have exited this confined space and the Fire Hall has been notified.

Name (print)

Signature

NOTE: This report is to be retained by the supervisor for a minimum of two years

ANNEX D



Defence Construction Canada
Construction de Défense Canada

Date:

Subject: Prime Contractor Agreement

Contract Description:

Project No.:

Contract No.:

Award Date:

Completion Date:

DCC Site Office:

Site Office Address:

Contractors Name:

Contractors Address:

Provincial / Territory
Reference: (Alberta Occupational Health & Safety Act, Section 3)

The "Contractor" is required to fully comply with all Provincial / Territory Safety Acts, Codes and Regulations. For this reason, this letter is to certify that the "Contractor" referenced above will be acting as the "Prime (Principal) Contractor" for this contract.

(Contractors Representative: Print Name and Title)

(Signature)

(Date)

ANNEX E

4 Wing Road Closure Notice

R-2010-08-10

Project Name:	_____	Project File No.:	_____
Contact Name:	_____	Telephone #:	_____
Organization:	_____	RETURN FAX #:	_____
		Road Closure	_____
		Start Date:	_____
		End Date:	_____
		Road Closure	_____
		Start Time:	_____
		End Time:	_____
Work Location (incl. Base address and Legal with diagram/sketch attached) _____			
Description of Work: _____			

Contact Information	Remarks & Date	Name and sign-off
4 Wing Fire Dept Loc 8401/Fax 780-840-7317		
Wing Ops O Fax 780-840-7341 (If within GRA)		
Wing Logistics Fax 780-840-7366		<i>John White</i>
NCO I/C GPV Fax 780-840-4028		
Wing Secur O Fax 780-840-7339		
DCC Loc 7058 Fax: 780-594-6161	<i>Information only</i>	<i>No response required</i>

INSTRUCTIONS:

- * ALLOW MINIMUM 7 WORKING DAYS NOTICE FOR COMPLETION OF NOTICE.
- In case of any delay during an active closure past the stated "work end date" the entire road closure permit process must be completed again a minimum of 48 hours in advance.
- A person does not commit an offence under the act if he can demonstrate that he made all reasonable efforts to procure inspection and supervision required for the undertaking.
- The contractor shall provide traffic accommodation to the satisfaction of the designated 4 Wing Representative.
- The contractor shall provide road closure notice to effected businesses and or residents a minimum of 48 hours in advance of scheduled closure as required by 4 Wing Representative.
- Contractor shall not proceed with any closure of work area prior to sign off from above 4 Wing representative sections listed above.
- The following closure(s) will apply to all except authorized and emergency vehicles.



Defence Construction Canada
Construction de Défense Canada

ENVIRONMENTAL INCIDENT & EMERGENCY PLAN

In the event of an environmental incident or emergency or such as:

1. *Chemical or Petroleum Spill;*
2. *Poisonous or Caustic Gas Emission;*
3. *Biological or Chemical Explosion;*
4. *Sewage Spill; or*
5. *Release of Hazardous Material or Contaminated Water into Waterways, Ditches, Storm Sewers, or Atmosphere.*

An **emergency** is a situation that cannot be handled safely and effectively by the personnel on site without risk to health, safety, and the environment. A **non-emergency** can be handled on site safely.

EMERGENCY ACTION LIST

1. Call Base Fire Hall at 840-8333.
2. State what type of environmental incident.
3. Give your name, number, and location.
4. Notify your Supervisor or Superintendent.
5. Notify DCC Representative at 594-3395.
6. Complete the Environmental Incident Report and fax to 840-7305 within 24 hrs.

NON-EMERGENCY ACTION LIST

1. Commence clean-up with on site spill kits.
2. Notify your Superior or Superintendent
3. Notify DCC Representative at 594-3395.
4. Complete the Environmental Incident Report and fax to 840-7305 within 24 hrs.

PLAN D'URGENCE EN CAS D'INCIDENTS ENVIRONNEMENTAL

Dans le cas d'un incident environnementale ou d'un accident, tel que:

1. *Déversement accidentel de produit chimique ou pétrole;*
2. *Dégagement de gaz caustique ou toxique;*
3. *Explosion chimique ou biologique;*
4. *Déversement d'eaux d'égout; ou*
5. *Dégagement de matières dangereuses ou de l'eau contaminé dans les voies navigables, les fossés, les canalisation d'égouts, ou l'atmosphère.*

Un **urgence** est une situation qui ne peut pas être manipulé sans risque et efficacement par les personnes sur le site sans risque à la santé, la sécurité ou l'environnement. Un **cas d'incident non-urgent** peut être manipulé sur le site sans risque.

MARCHE À SUIVRE EN CAS D'URGENCE

1. Téléphoner au service des incendies de la base au 840-8333.
2. Mentionner le type d'urgence.
3. Donner votre nom, numéro de téléphone et l'endroit.
4. Aviser votre superviseur ou votre surintendant.
5. Aviser le représentant du CDC au 594-3395.
6. Remplir le formulaire d'incident de l'environnement et télécopier au 840-7305 en moins de 24 hrs.

MARCHE À SUIVRE EN CAS D'INCIDENTS

1. Faire le nettoyage avec les trousse de déversement accidentel.
2. Aviser votre superviseur ou votre surintendant.
3. Aviser le représentant du CDC au 594-3395.
4. Remplir le formulaire d'incident de l'environnement et télécopier à 840-7305 en moins de 24 hrs.

WCEO/OGCE
D.R.Henley, LCol

Date

DCC/CDC
Clint Horyn, Site Manager

Date

WEnv/Env Ere
Jennifer Carr, Wing Environment Officer

ANNEX G

Halocarbon Reporting Form Work Performed by Contractor at 4 Wing

Company Information			
Service Performed	New Installation <input type="checkbox"/>	Service <input type="checkbox"/>	Decommissioning <input type="checkbox"/>
Date Work Started		Date Work Completed	
Equipment Serviced	System Type		
	Manufacturer		
	Model #		
	Serial #		
	Equipment ID (if any)		
	Volts/PH/Hz		
	Equipment Ownership		
Equipment Location	Building Name & Number		
	Location within Building		
Contact Information	Building Contact Name		
	Phone #		
Halocarbon Charge	Halocarbon Type		
	Halocarbon Charge		lbs; Kg
	Unit Capacity		KW; BTUH; Hp; Tons
Leak Test Performed	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Method of Leak Test	Electronic <input type="checkbox"/>	Soap & Bubble <input type="checkbox"/>	
Release of Product	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Amount of Release			Lbs - Kgs
Refrigerant Added	YES <input type="checkbox"/>	NO <input type="checkbox"/>	
Amount Added			Lbs - Kgs
Amount Reclaimed			Lbs - Kgs
Servicing Completed			
Technicians Name		HRAI Number	
Technicians Signature			
CONTRACTOR/SERVICING AGENT COMMENTS:			
Notes			
1. All leaks must be reported to the FHR coordinator immediately (Local 6831).			
2. If unit is being decommissioned, refrigerant must be reclaimed, tags removed from the unit and sent to the FHR Coordinator at WCE, RM Shop and a decommissioned tag attached.			
3. If unit is a new installation or if any service has been performed then the technician must perform a leak check.			

THIS FORM IS AN INTEGRAL COMPONENT OF THE SCOPE OF WORK AND MUST ACCOMPANY THE INVOICE IN ORDER FOR PAYMENT TO BE ISSUED.



Government of Canada
Gouvernement du Canada

Contract Number / Numéro du contrat

W0134-13CYKJ

Security Classification / Classification de sécurité
UNCLASSIFIED

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 National Defence		2. Branch or Directorate / Direction générale ou Direction 4 Wing Cold Lake
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 HVAC/R INSTALLATIONS AND REPAIRS		
5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
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?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
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)		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
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.		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes
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?		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès		
Canada <input type="checkbox"/>	NATO / OTAN <input type="checkbox"/>	Foreign / Étranger <input type="checkbox"/>
7. b) Release restrictions / Restrictions relatives à la diffusion		
No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>	All NATO countries Tous les pays de l'OTAN <input type="checkbox"/>	No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>
Not releasable À ne pas diffuser <input type="checkbox"/>		
Restricted to: / Limité à: <input type="checkbox"/>	Restricted to: / Limité à: <input type="checkbox"/>	Restricted to: / Limité à: <input type="checkbox"/>
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 <input type="checkbox"/>	NATO UNCLASSIFIED NATO NON CLASSIFIÉ <input type="checkbox"/>	PROTECTED A PROTÉGÉ A <input type="checkbox"/>
PROTECTED B PROTÉGÉ B <input type="checkbox"/>	NATO RESTRICTED NATO DIFFUSION RESTREINTE <input type="checkbox"/>	PROTECTED B PROTÉGÉ B <input type="checkbox"/>
PROTECTED C PROTÉGÉ C <input type="checkbox"/>	NATO CONFIDENTIAL NATO CONFIDENTIEL <input type="checkbox"/>	PROTECTED C PROTÉGÉ C <input type="checkbox"/>
CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>	NATO SECRET NATO SECRET <input type="checkbox"/>	CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>
SECRET SECRET <input type="checkbox"/>	COSMIC TOP SECRET COSMIC TRÈS SECRET <input type="checkbox"/>	SECRET SECRET <input type="checkbox"/>
TOP SECRET TRÈS SECRET <input type="checkbox"/>		TOP SECRET TRÈS SECRET <input type="checkbox"/>
TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>		TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>

TBS/SCT 350-103(2004/12)

Security Classification / Classification de sécurité
UNCLASSIFIED

Canada



Government of Canada
Gouvernement du Canada

Contract Number / Numéro du contrat

W0134-13CYKJ

Security Classification / Classification de sécurité
UNCLASSIFIED

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

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

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

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

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

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

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

Special comments:

Commentaires spéciaux :

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

REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

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

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

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

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

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

PRODUCTION

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

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

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data?
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? ☒ No ☐ Yes
Non Oui

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

TBS/SCT 350-103(2004/12)

Security Classification / Classification de sécurité
UNCLASSIFIED

Canada



Government of Canada
Gouvernement du Canada

Contract Number / Numéro du contrat

W0134-13CYKJ

Security Classification / Classification de sécurité
UNCLASSIFIED

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

For users completing the form manually use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire manuellement doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form online (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire en ligne (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

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

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature 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".
Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée
« Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
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, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée
« Classification de sécurité » au haut et au bas du formulaire et indiquez qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).